Air Quality Study Report

State Route 57/State Route 60
Confluence Project

July 2012

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APPENDICES

Tables

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Acronyms and Abbreviations

$\mu g/m^3$	micrograms per cubic meter
2007 AQMP	2007 Air Quality Management Plan
AB 1493	Assembly Bill 1493
AB 32	Assembly Bill 32
ADT	Average Daily Traffic
CAA	Clean Air Act
CAAA 1990	Clean Air Act 1990 Amendments
CAAQS	California Ambient Air Quality Standards
California CAA	California Clean Air Act
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CARB Land Use Handbook	Air Quality and Land Use Handbook: A Community Health Perspective
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CH_4	methane
City	City of Industry
CO	carbon monoxide
CO Protocol	Transportation Project-Level Carbon Monoxide Protocol
CO_2	carbon dioxide
DOT	U.S. Department of Transportation
DPM	diesel particulate matter
EIR/EA	environmental impact report/environmental assessment
EPA	U.S. Environmental Protection Agency
F&E	Freeway and Expressway
FHWA	Federal Highway Administration
FR	Federal Register
FTIP	Federal Transportation Improvement Program
GHG	greenhouse gas
HAPs	hazardous air pollutants
HFCs	hydrofluorocarbons

HOV	high-occupancy vehicle
I-10	Interstate 10
I-210	Interstate 210
I-5	Interstate 5
IAC	interagency consultation
IPCC	Intergovernmental Panel on Climate Change
IRIS	Integrated Risk Information System
ITS	Intelligent Transportation Systems
MSAT	mobile-source air toxics
NAAQS	National Ambient Air Quality Standards
NATA	National Air Toxics Assessment
NEPA	National Environmental Policy Act
NHS	National Highway System
NO	nitric oxide
NO_2	nitrogen dioxide
NOA	naturally occurring asbestos
NO_X	oxides of nitrogen
O_3	ozone
PFCs	perfluorocarbons
PM10	particulate matter less than or equal to 10 microns in diameter
PM2.5	particulate matter less than or equal to 2.5 microns in diameter
POAQC	Project of Air Quality Concern
POM	polycyclic organic matter
ppm	parts per million
ROG	reactive organic gases
RTIP	Regional Transportation Improvement Program
RTP	Regional Transportation Plan
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SMAQMD	Sacramento Metropolitan Air Quality Management District
SO_2	sulfur dioxide
SO_X	sulfur oxides
SR	State Route

TACs	Toxic Air Contaminants
TCMs	Transportation Control Measures
TOG	total organic gas
VMT	vehicle miles travelled

Chapter 1 Introduction

This technical report has been prepared to assess the air quality effects of a proposal by the City of Industry, in conjunction with the California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA), to reconfigure the approximately 2-mile confluence of State Route (SR) 57 and SR-60, a project that would include the addition of auxiliary lanes and associated on-ramp/off-ramp reconfigurations. SR-57 and SR-60 are major inter-regional freeways, linking cities in the San Gabriel Valley and the Inland Empire with Los Angeles and Orange counties. Please refer to Chapter 2, "Project Description," for a detailed description of the build alternatives.

The results of this technical report will be incorporated into a joint environmental impact report/environmental assessment (EIR/EA) to be prepared by Caltrans, under authority delegated by FHWA, as the federal and state lead agency under the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), respectively, and the City of Industry, as the responsible agency under CEQA.

This report evaluates the effects of the proposed project on air quality resources according to the measures of effectiveness and traffic volumes under existing (2009), open-to-traffic-year (2017), and design-year (2037) conditions reported by the project traffic engineers, KOA Corporation.

1.1 Scope and Content of the Report

This report describes the environmental and regulatory setting, the transportation conformity conclusions and potential effects of the project, and the measures to minimize the potential effects of the project. This report is organized as described below.

- Chapter 1, "Introduction," introduces the report and describes the purpose, scope, and content of the report. It also provides a summary of the key findings of the air quality analysis.
- Chapter 2, "Project Description," describes the location, purpose and need, project characteristics and alternatives, phasing, schedule, and required permits and approvals associated with the proposed project.
- Chapter 3, "Affected Environment, Environmental Consequences, and Minimization Measures," describes the physical and regulatory setting, discloses the potential effects of the build alternatives, identifies minimization measures to avoid or minimize adverse effects, and provides a summary of federal conformity determinations associated with the build alternatives.
- Chapter 4, "Climate Change (CEQA)," provides an analysis of potential climate change effects according to CEQA requirements and identifies minimization measures.
- Chapter 5, "References Cited," lists the printed references and personal communications used in writing this report.

1.2 Summary and Conclusions

This section summarizes the key findings of the air quality and climate change analyses presented in Chapter 3, “Affected Environment, Environmental Consequences, and Minimization Measures,” and Chapter 4, “Climate Change (CEQA).”

1.2.1 Transportation Conformity

For the proposed project to be approved, it must meet federal transportation conformity requirements. The proposed project must meet regional conformity requirements as well as project-level conformity requirements.

1.2.1.1 Regional Transportation Conformity

To be determined a regionally conforming project, the project must be listed and accounted for in the modeling associated with the currently conforming Regional Transportation Plan (RTP) and the Federal Transportation Improvement Program (FTIP). In accordance with Section 93.114 of the U.S. Environmental Protection Agency (EPA) transportation conformity regulations, the proposed project is included in the Southern California Association of Governments (SCAG) 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) and the SCAG 2011 FTIP under project number LA0D450.

Within the modeling lists for the currently conforming 2012-2035 RTP/SCS and 2011 FTIP documents, project number LA0D450 is described as follows: “*RECONSTRUCT SR 60/GRAND AV INTERCHANGE - WIDEN GRAND AV: SB ADD 1THRU LN (2 EXSTNG); NB ADD 1 THRU LN (3 EXSTNG), REPLACE GRAND AV OC, ADD EB LOOP ON-RAMP, CONSTRUCT ADDITIONAL EB THRU LN FROM GRAND AVE TRAP LN TO SR57 ADD LN, ADD TWO BYPASS RAMP CONNECTORS, ADD AUX LNS EB AND WB FROM EAST TO WEST JUNCTION OF THE CONFLUENCE.*” The project as currently proposed is consistent with this description.

The 2012-2035 RTP/SCS was adopted by SCAG on April 4, 2012 and approved by FHWA on June 4, 2012. The 2011 FTIP was adopted by SCAG on September 2, 2010, and approved by FHWA on December 14, 2010. In addition, Amendment #11-24 to the 2011 FTIP was adopted by SCAG on April 4, 2012 and is the latest FTIP consistency amendment approved by FHWA, which granted approval on June 4, 2012.

Since the currently conforming 2012-2035 RTP/SCS and 2011 FTIP model lists include the proposed project (Project ID #LA0D450), the proposed project’s regional conformity requirements have been satisfied. Please refer to Appendix A for project-related documentation from the 2012-2035 RTP/SCS and the 2011 FTIP.

1.2.1.2 Project-level Transportation Conformity

Project-level carbon monoxide (CO) and particulate matter (PM) were evaluated to determine if the proposed project would contribute to localized exceedances of the National Ambient Air

Quality Standards (NAAQS) or California Ambient Air Quality Standards (CAAQS) for CO, PM less than or equal to 10 microns in diameter (PM10), or PM less than or equal to 2.5 microns in diameter (PM2.5). It was determined that project implementation would not result in higher CO concentrations than those existing within the region at the time of attainment demonstration, according to Caltrans' *Transportation Project-level Carbon Monoxide Protocol* (Garza et al. 1997). Furthermore, no violations of the CAAQS or NAAQS for CO are anticipated to occur with implementation of the proposed project.

In accordance with the *Transportation Conformity Guidance for Qualitative Hot-spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas* (Federal Highway Administration and U.S. Environmental Protection Agency 2006), it was determined that both build alternatives (Alternative 2 and Alternative 3) represent a Project of Air Quality Concern (POAQC) that requires a qualitative PM2.5 and PM10 hot-spot analysis.[1] The qualitative PM hot-spot analysis provided in Appendix C demonstrates how the proposed project would meet project-level PM conformity requirements for PM10 and PM2.5. Implementation of the proposed project would not be expected to contribute to additional exceedances of the NAAQS or CAAQS.

The proposed project has undergone the required interagency consultation (IAC) process (40 Code of Federal Regulations [CFR] 93.105) to review the PM conformity documentation for adequacy and completeness. On January 24, 2012, attendees of the IAC meeting agreed that (1) the PM hot-spot analysis demonstrates how the proposed project meets project-level PM conformity requirements for PM10 and PM2.5 and (2) the PM hot-spot analysis documentation prepared for the proposed project is acceptable for NEPA circulation. The outcome from this most recent meeting supersedes the outcome from the Transportation Conformity Working Group's (TCWG's) October 26, 2010, meeting, which concurred with the determination that the proposed project is not a POAQC. Changes in project scope that have occurred since that date required that the project be resubmitted to the TCWG for review. As such, the October 26, 2010, finding is no longer valid. A copy of the January 24, 2012, concurrence, as well as the *Qualitative Particulate Matter Conformity Hot-spot Analysis* completed for the project, is provided in Appendix C of this air quality report.

1.2.2 Mobile-source Air Toxics

An analysis of potential mobile-source air toxic (MSAT) effects was performed in accordance with FHWA's *Interim Guidance Update on Mobile-source Air Toxic Analysis in NEPA Documents* (2009a). The traffic impact analysis conducted for the project suggests that, under the build alternatives, the proposed improvements would result in some arterial surface street vehicle miles traveled (VMT) shifting to the freeway (see Appendix F). This shift to the freeway is noteworthy because surface street MSAT emissions occur near most sensitive receptors. Although MSAT exposure at most sensitive receptors may be reduced under the build alternatives when compared with the No-Build Alternative, sensitive receptors that are located immediately adjacent to freeway locations may experience an increase in MSAT emissions,

[1] The availability of new EPA guidance documents (i.e., documents for completing quantitative particulate matter [PM2.5 and PM10] hot-spot analyses) was announced in the Federal Register on December 20, 2010, (75 Federal Register [FR] 79370). The announcement provides a 2-year grace period before use of the new quantitative particulate matter hot-spot guidance is required for project-level particulate matter conformity determinations. Until December 20, 2012, project-level conformity determinations made using the 2006 qualitative guidance remain appropriate.

particularly emissions of diesel particulate matter (DPM). It is also important to note that all MSAT emissions, including emissions of DPM, are expected to decrease below existing conditions (2009) under both build alternatives at the opening year (2017) and the horizon year (2037).

1.2.3 Criteria Pollutants

1.2.3.1 Construction

According to federal transportation conformity requirements, construction projects lasting less than 5 years are considered temporary. Therefore, they are not considered part of the transportation conformity determination analysis. Because the project is anticipated to start in the fall of 2014 and end by the fall of 2017, a period of roughly three years, project construction emissions were not evaluated under the transportation conformity analysis.

Construction-period criteria pollutant emissions were estimated using the Road Construction Model, version 6.3.2. A summary of emissions estimates is provided in Table 3-19. Implementation of the exhaust and fugitive dust emission control measures identified in Section 3.3, “Minimization Measures,” would avoid and/or minimize any impacts related to air quality.

1.2.3.2 Operation

Emissions of criteria pollutants were modeled using Caltrans’ CT-EMFAC emissions model (version 4.1). Entrained road dust was calculated in accordance with the emission factor equation found in EPA’s *Compilation of Air Pollutant Emission Factors*, AP-42, Section 13.2.1 (U.S. Environmental Protection Agency 2011) and the California Air Resources Board’s (CARB’s) methodology to determine county-specific emissions inventories found in *Entrained Paved Road Dust, Paved Road Travel*, Section 7.9 (California Air Resources Board 1997).

CEQA

CEQA requires proposed project emissions at the opening year to be compared with existing conditions (2009). When compared with existing conditions, both build alternatives would result in increased emissions of sulfur oxide (SO_X) and carbon dioxide (CO_2), 6% and 7%, respectively, at the opening year (2017). In large part, this would be caused by the 5% increase in VMT anticipated to occur by that time. Emissions of reactive organic gas (ROG), nitrogen oxide (NO_X), CO, PM10, and PM2.5 in 2017 and 2037 are anticipated to decrease when compared with existing conditions. These reductions in exhaust emissions in 2017 would be attributable to the retirement of older, higher emitting vehicles. When combined with re-entrained road dust emissions, PM10 and PM2.5 emissions are anticipated to remain unchanged at the opening year (2017) under both build alternatives when compared with existing conditions. Any increases in re-entrained road dust would be due to the regional increases in VMT that are expected to occur over time. Therefore, the increases would be accounted for in the region’s Air Quality Management Plan.

NEPA

NEPA requires proposed project emissions to be compared with no-project conditions for the opening year and the horizon year. When compared with opening year (2017) and the horizon year (2037) no-build conditions, both build alternatives would result in decreased ROG, CO, PM10, and PM2.5 exhaust emissions but increased NO_X, SO_X and CO_2 emissions. Build Alternative 2 NO_X emissions are anticipated to increase by 113 pounds per day and 28 pounds per day in 2017 and 2037, respectively, when compared with the No-Build Alternative. Build Alternative 3 NO_X emissions are anticipated to increase by 139 pounds per day and 22 pounds per day in 2017 and 2037, respectively, when compared with the No-Build Alternative. Build Alternative 2 SO_X emissions are anticipated to increase by less than 1 pound per day in 2017 and 2037 when compared with the No-Build Alternative. Build Alternative 3 SO_X emissions are anticipated to increase by 1 pound per day in 2017 and then decrease by 1 pound per day in 2037 when compared with the No-Build Alternative. Build Alternative 2 CO_2 emissions are anticipated to increase by 15 pounds per day and 32 pounds per day in 2017 and 2037, respectively, when compared with the No-Build Alternative. Build Alternative 3 CO_2 emissions are anticipated to increase by 24 pounds per day and 20 pounds per day in 2017 and 2037, respectively, when compared with the No-Build Alternative. When combined with re-entrained road dust emissions, PM10 and PM2.5 emissions are anticipated to decrease by approximately 1% under both build alternatives at opening year 2017 and horizon year 2037.

Chapter 2 Project Description

2.1 Introduction

The City of Industry, in cooperation with Caltrans, is proposing freeway improvements to the SR-57/SR-60 confluence at the Grand Avenue interchange in Los Angeles County. Figure 2-1 and Figure 2-2 show the regional vicinity and project location. The proposed project would be subject to both CEQA and NEPA. Caltrans would be the lead agency under CEQA and NEPA.

SR-57 is a major north/south freeway, serving the cities and communities of the Greater Los Angeles area, and part of the National Highway System and the State Freeway and Expressway System. The freeway's northern terminus is at its junction with Interstate (I) 210 in the City of Glendora, and its southern terminus is at its junction with I-5 and SR-22 in the City of Orange. The portion of SR-57 within the project area is located in the Pomona Valley.

SR-60 is a major east/west freeway that also serves the cities and communities of the Greater Los Angeles area. The freeway is also part of the National Highway System and the State Freeway and Expressway System. SR-60 begins near the Los Angeles River in the City of Los Angeles and continues eastward to Riverside County, serving the cities and communities on the east side of the Los Angeles metropolitan area and on the south side of the San Gabriel Valley. The western terminus of the freeway is at the East Los Angeles interchange with I-10, I-5, and U.S. 101; the eastern terminus is at its junction with I-10 in the City of Beaumont.

There is a gap in SR-57 at its junction with SR-60. SR-57 terminates at the west end of the confluence with SR-60. SR-60, which carries traffic from both freeways, maintains six lanes in each direction under Grand Avenue. SR-57 resumes at the split with SR-60 at the east end of the confluence near Diamond Bar Boulevard.

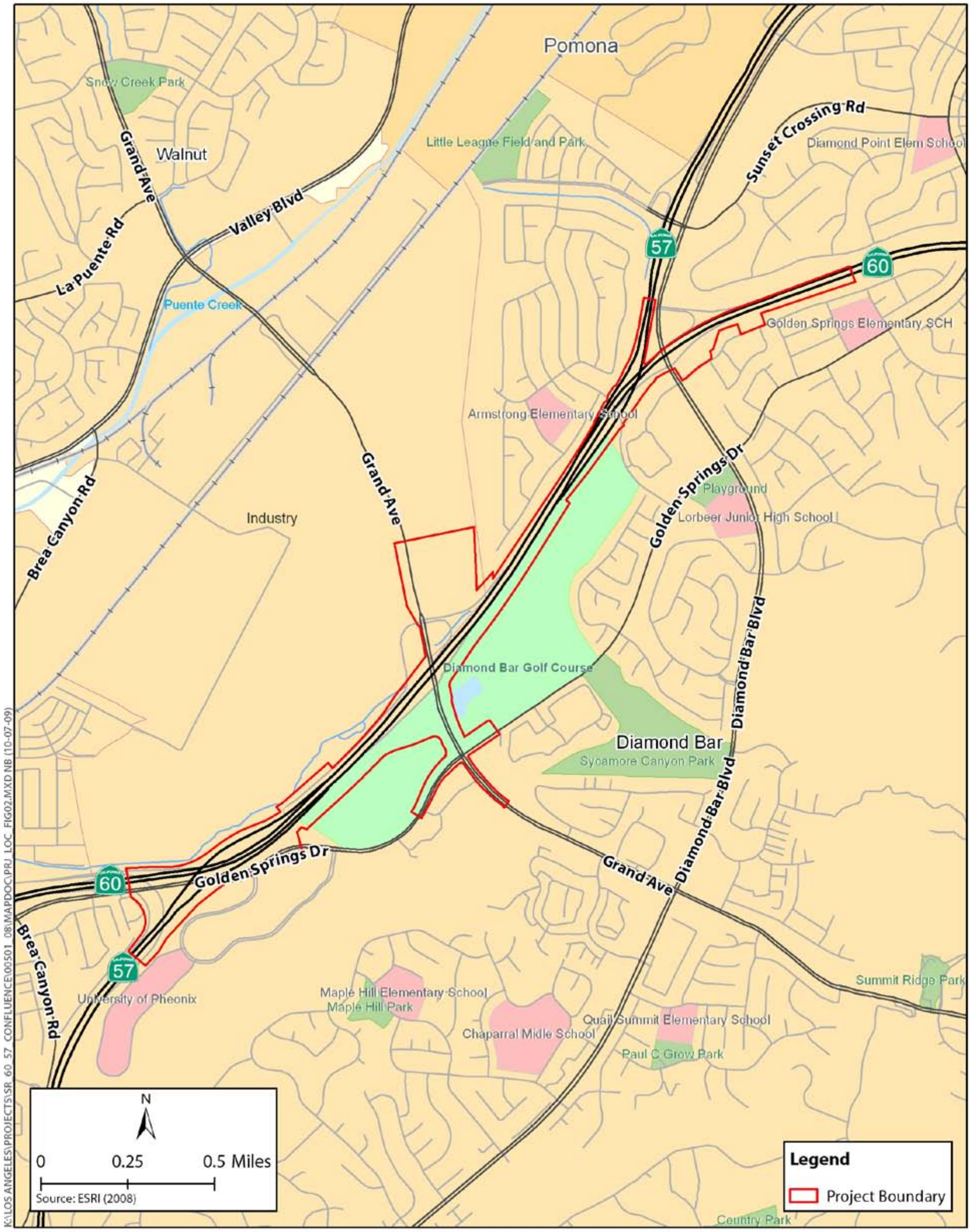
The primary purpose of the proposed project is to improve traffic operations and safety on SR-57 and SR-60 at the Grand Avenue interchange.

2.2 Project Description

The proposed project would reconfigure the approximately 2-mile confluence of SR-57 and SR-60, which would entail the addition of auxiliary lanes and associated on-ramp/off-ramp reconfigurations. SR-57 and SR-60 are major inter-regional freeways that link cities in the San Gabriel Valley and the Inland Empire with Los Angeles and Orange counties.

Figure 2-1: Regional Vicinity Map

Figure 2-2: Project Location Map



2.2.1 Alternative 1 – No-Build Alternative

The No-Build (or No-Action) Alternative would result in no structural or physical changes to SR-57, SR-60, or the Grand Avenue interchange. Existing deficient capacity and congestion conditions due to short weaving distances on SR-57, SR-60, and Grand Avenue would not change under this alternative.

2.2.2 Build Alternatives

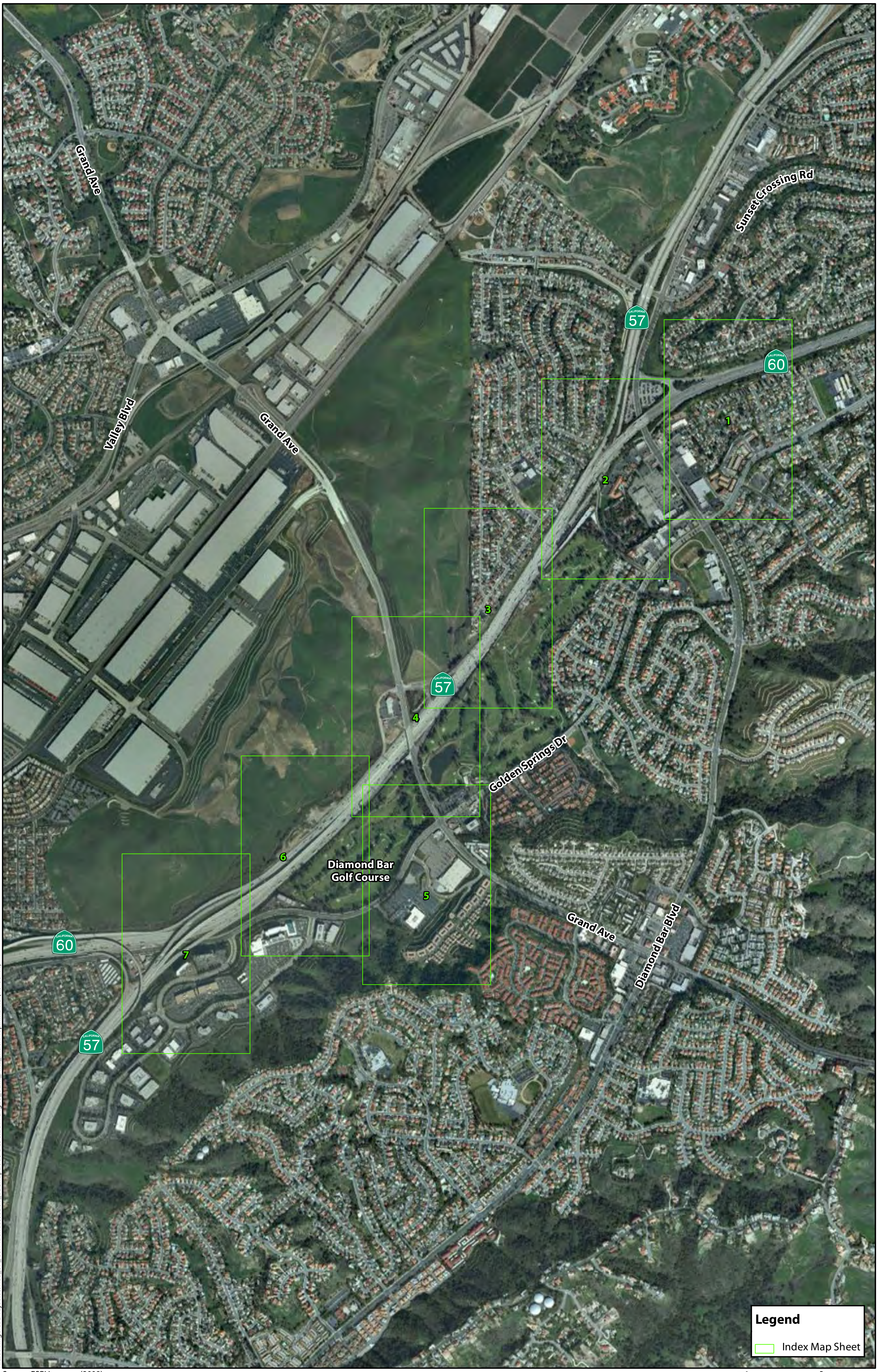
Two build alternatives are being considered (i.e., Alternative 2: Combination Cloverleaf/ Diamond Interchange Configuration and Alternative 3: Partial Cloverleaf Interchange Configuration) (see Figures 2-3 and 2-4). Under both build alternatives, a new bypass off-ramp is proposed for eastbound SR-60 west of the southern/western SR-57/SR-60 junction. The bypass off-ramp would be barrier separated from SR-57/SR-60 traffic until passing the SR-57 diverge to the Grand Avenue off-ramp. Northbound SR-57 traffic would exit to Grand Avenue by using an optional exit from the third SR-57 lane. The off-ramp lane would add to the one-lane eastbound SR-60 bypass off-ramp. The off-ramp would widen to three lanes at the final approach to the intersection at Grand Avenue.

Currently, the third lane on SR-57 ends at the Grand Avenue off-ramp, then begins again 4,200 feet to the east. The build alternatives would both add this lane between the Grand Avenue off-ramp and the additional lane near the SR-57 diverge at the east end.

An auxiliary lane would be added adjacent to the added through lane to serve traffic entering from Grand Avenue. At the east end of the confluence, a bypass connector would be built to connect the Grand Avenue eastbound on-ramp auxiliary lane with eastbound SR-60. This connector would require a new overcrossing structure at Prospector Road and Diamond Bar Boulevard as well as realignment of the Diamond Bar Boulevard on-ramp.

In the westbound direction, the dropped southbound SR-57 lane would be extended 2,500 feet to the realigned westbound SR-60 off-ramp to Grand Avenue, creating a two-lane exit ramp. The exit ramp would expand to five lanes at the intersection.

Operational improvements along Grand Avenue include widening the roadway to four through lanes in each direction under both build alternatives. Grand Avenue would be widened easterly, encroaching on the existing westbound loop on-ramp. Grand Avenue would be realigned approximately 50 feet east of the existing centerline to avoid a right-of-way acquisition from a vacant automobile dealership on Grand Avenue north of SR-60. The centerline shift of Grand Avenue would require the westbound off-ramp to be relocated approximately 100 feet north of the existing intersection on Grand Avenue. The intersection relocation would also require realignment of the two-lane westbound loop on-ramp as well as Old Brea Canyon Road (to be renamed Grand Crossing Parkway).



Source: ESRI Imagery (2008)

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Figure 3-Index Map
Alternative 2, Combination Cloverleaf / Diamond Interchange Configuration
State Route 57/State Route 60 Confluence at Grand Avenue Project

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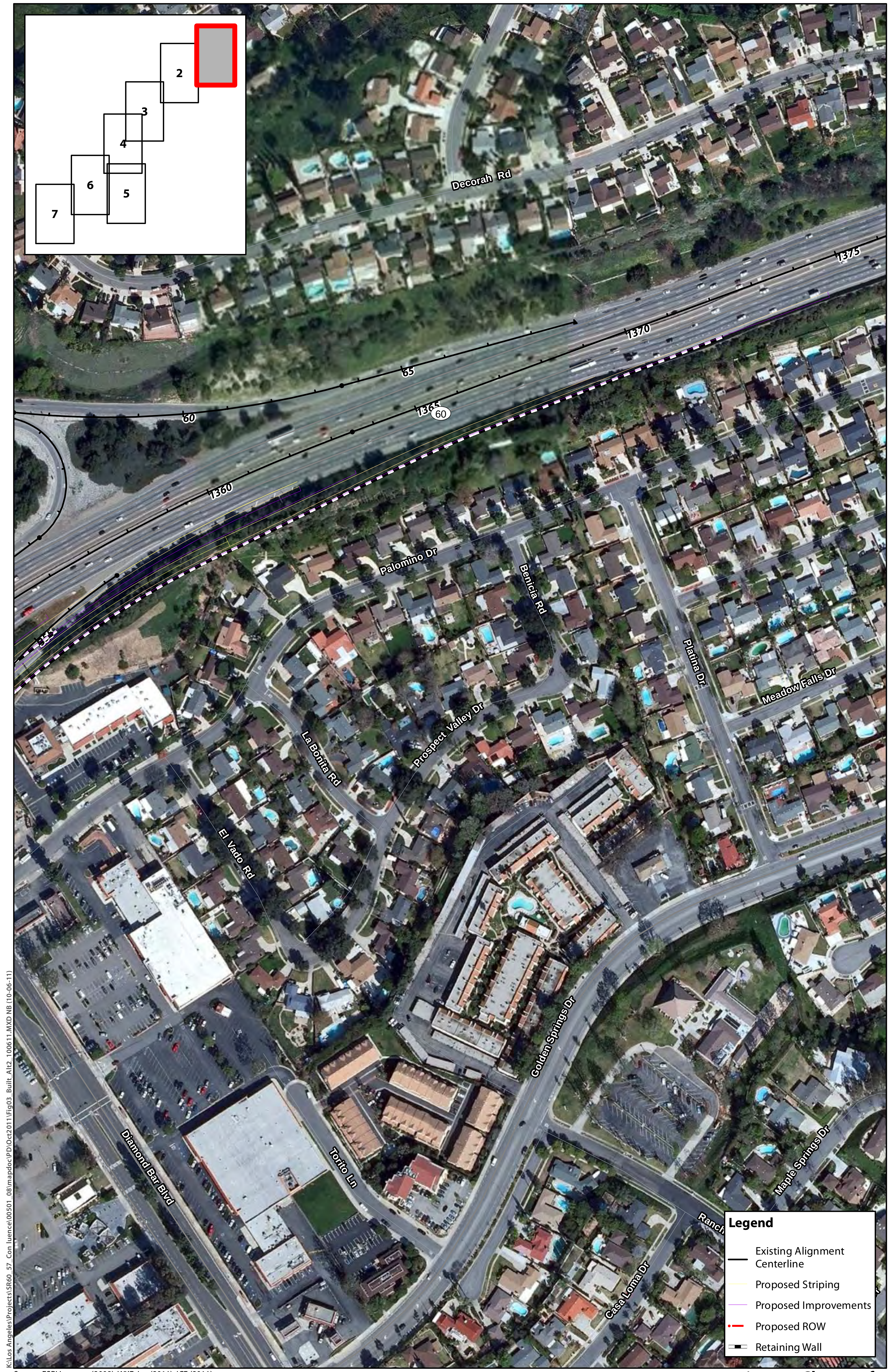

Source: ESRI Imagery (2008), WKE, Inc.(2011), ICF (2011)

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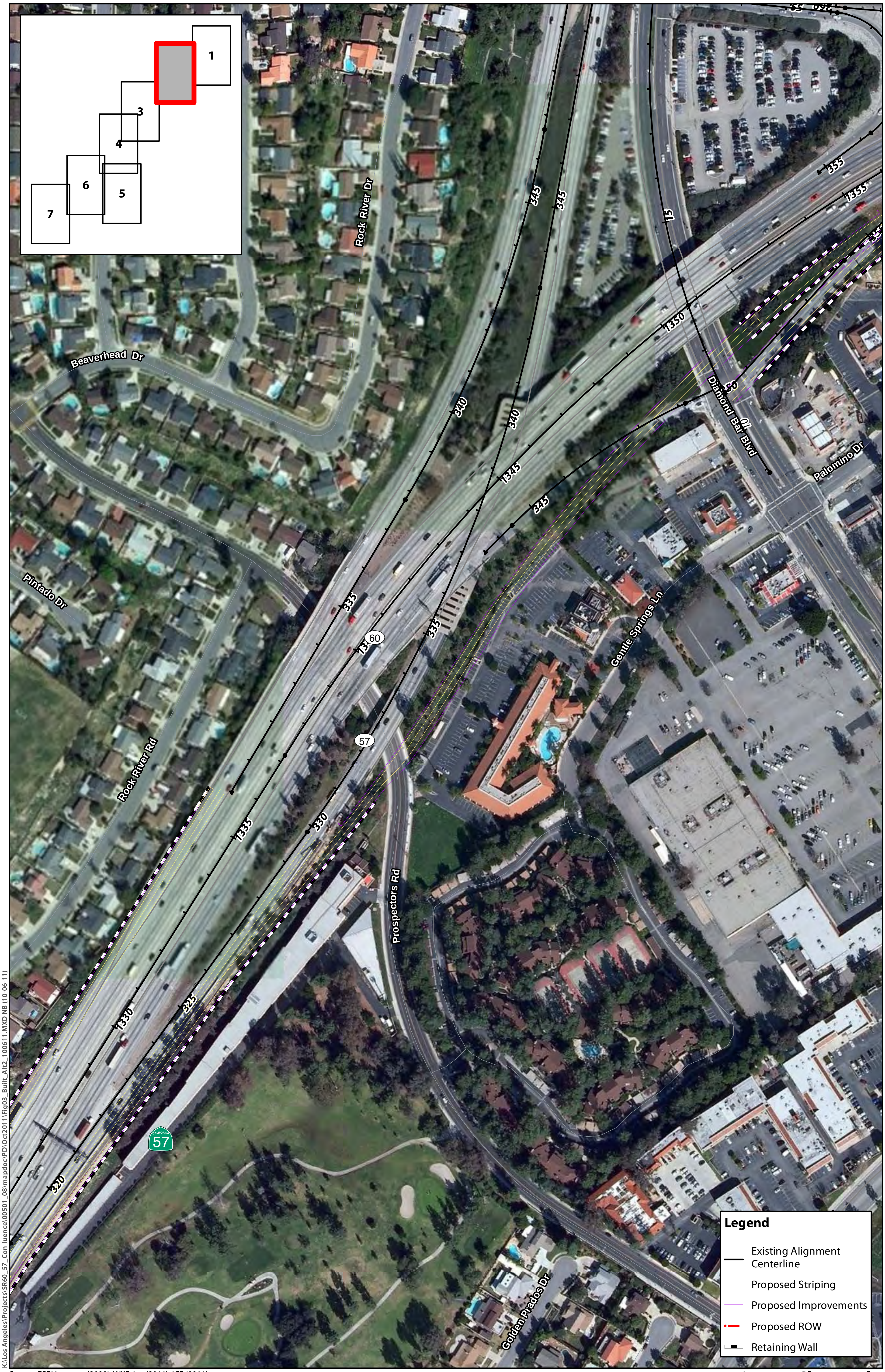
Figure 3-Sheet 1 of 7
Alternative 2, Combination Cloverleaf / Diamond Interchange Configuration
State Route 57/State Route 60 Confluence at Grand Avenue Project



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Source: ESRI Imagery (2008), WKE, Inc.(2011), ICF (2011)

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Figure 3-Sheet 2 of 7
Alternative 2, Combination Cloverleaf / Diamond Interchange Configuration
State Route 57/State Route 60 Confluence at Grand Avenue Project

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Source: ESRI Imagery (2008), WKE, Inc.(2011), ICF (2011)

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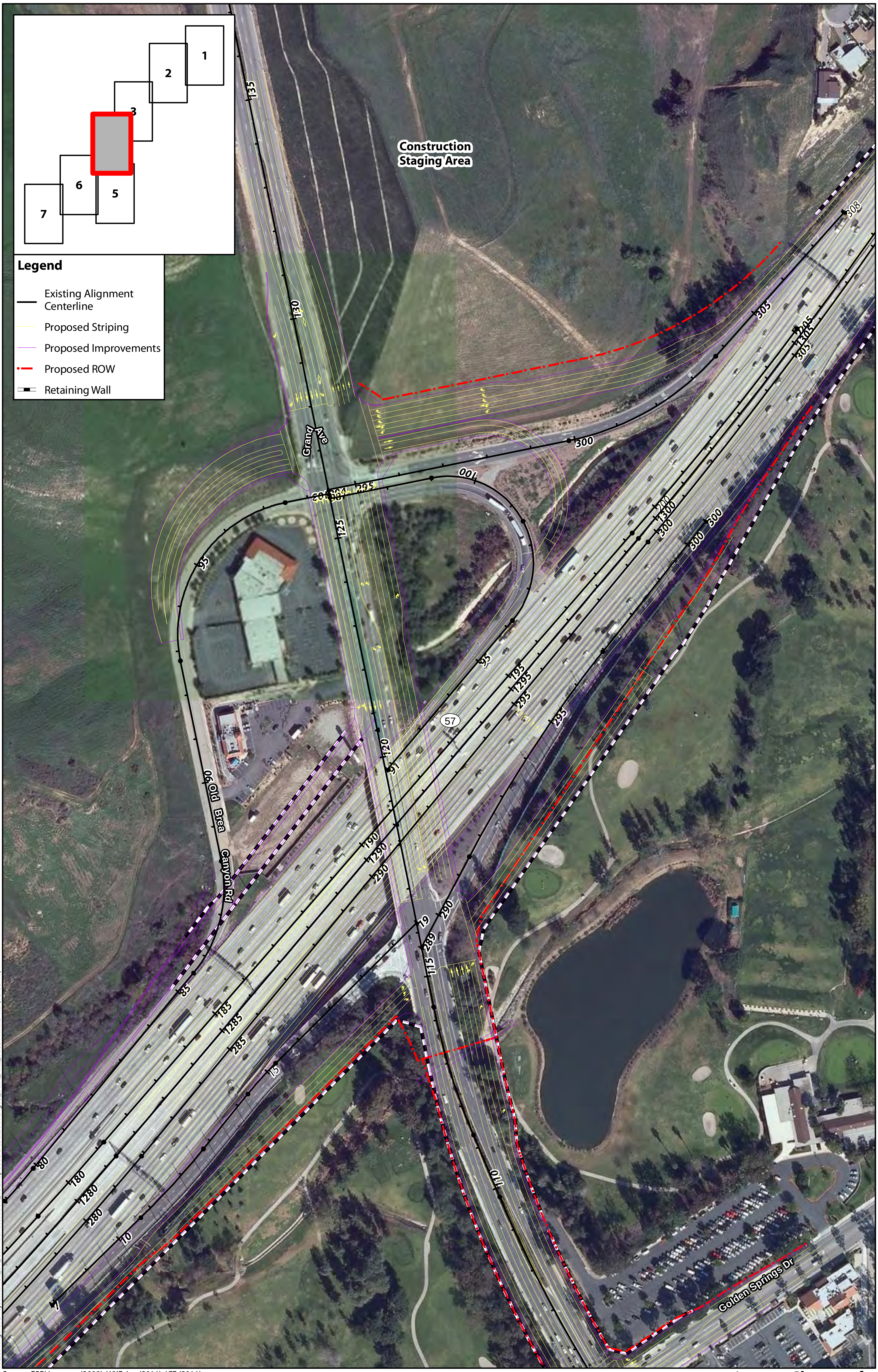
Figure 3-Sheet 3 of 7
Alternative 2, Combination Cloverleaf / Diamond Interchange Configuration
State Route 57/State Route 60 Confluence at Grand Avenue Project



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Source: ESRI Imagery (2008), WKE, Inc.(2011), ICF (2011)

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Figure 3-Sheet 4 of 7
Alternative 2, Combination Cloverleaf / Diamond Interchange Configuration
State Route 57/State Route 60 Confluence at Grand Avenue Project

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Source: ESRI Imagery (2008), WKE, Inc.(2011), ICF (2011)

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Figure 3-Sheet 5 of 7
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Source: ESRI Imagery (2008), WKE, Inc.(2011), ICF (2011)

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Figure 3-Sheet 6 of 7
Alternative 2, Combination Cloverleaf / Diamond Interchange Configuration
State Route 57/State Route 60 Confluence at Grand Avenue Project

Source: ESRI Imagery (2008), WKE, Inc.(2011), ICF (2011)

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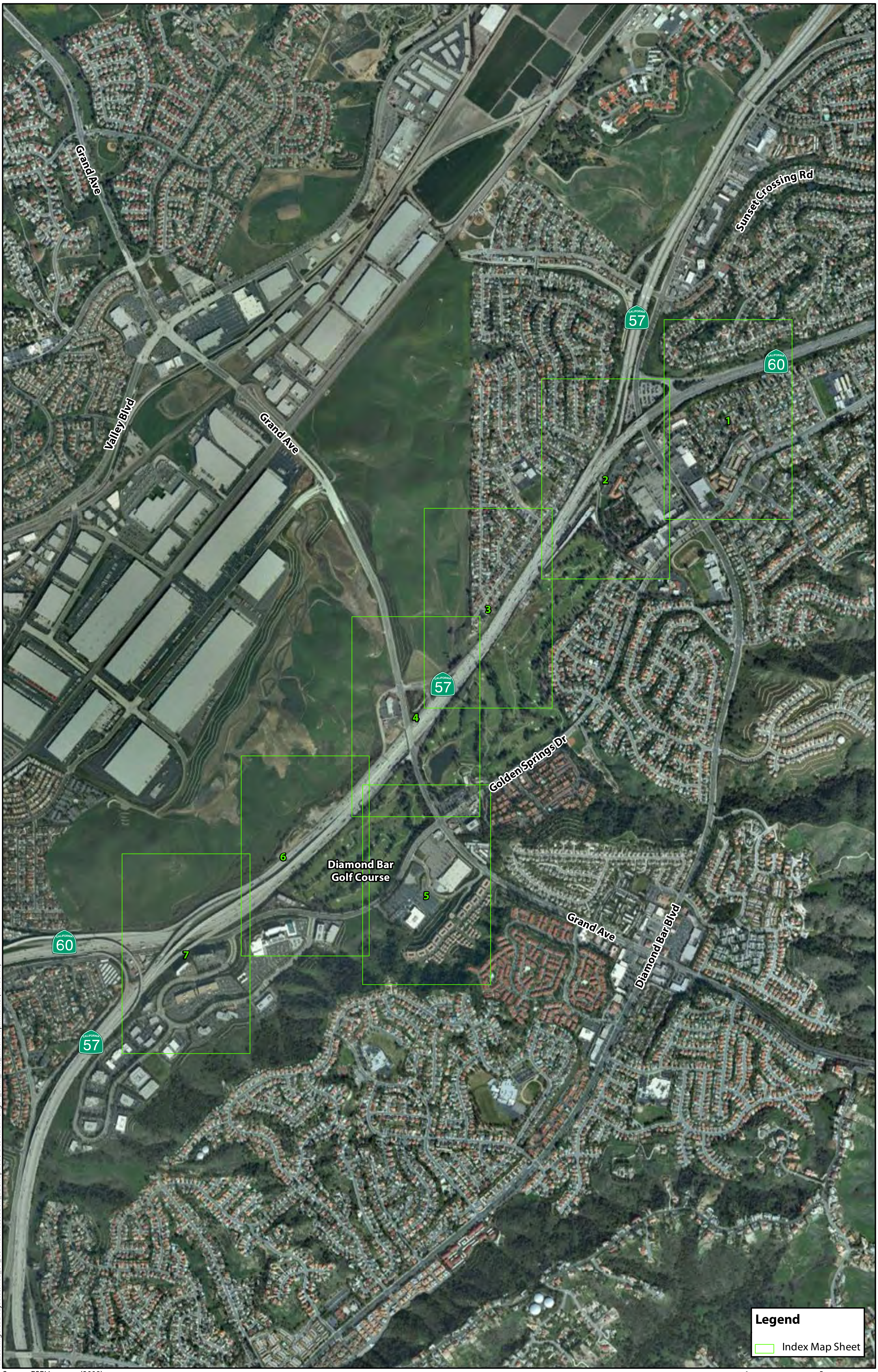
Figure 3-Sheet 7 of 7
Alternative 2, Combination Cloverleaf / Diamond Interchange Configuration
State Route 57/State Route 60 Confluence at Grand Avenue Project



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Source: ESRI Imagery (2008)

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Figure 4-Index Map
Alternative 3, Partial Cloverleaf Interchange Configuration
State Route 57/State Route 60 Confluence at Grand Avenue Project

Source: ESRI Imagery (2008), WKE, Inc.(2011), ICF (2011)

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Figure 4-Sheet 1 of 7
Alternative 3, Partial Cloverleaf Interchange Configuration
State Route 57/State Route 60 Confluence at Grand Avenue Project

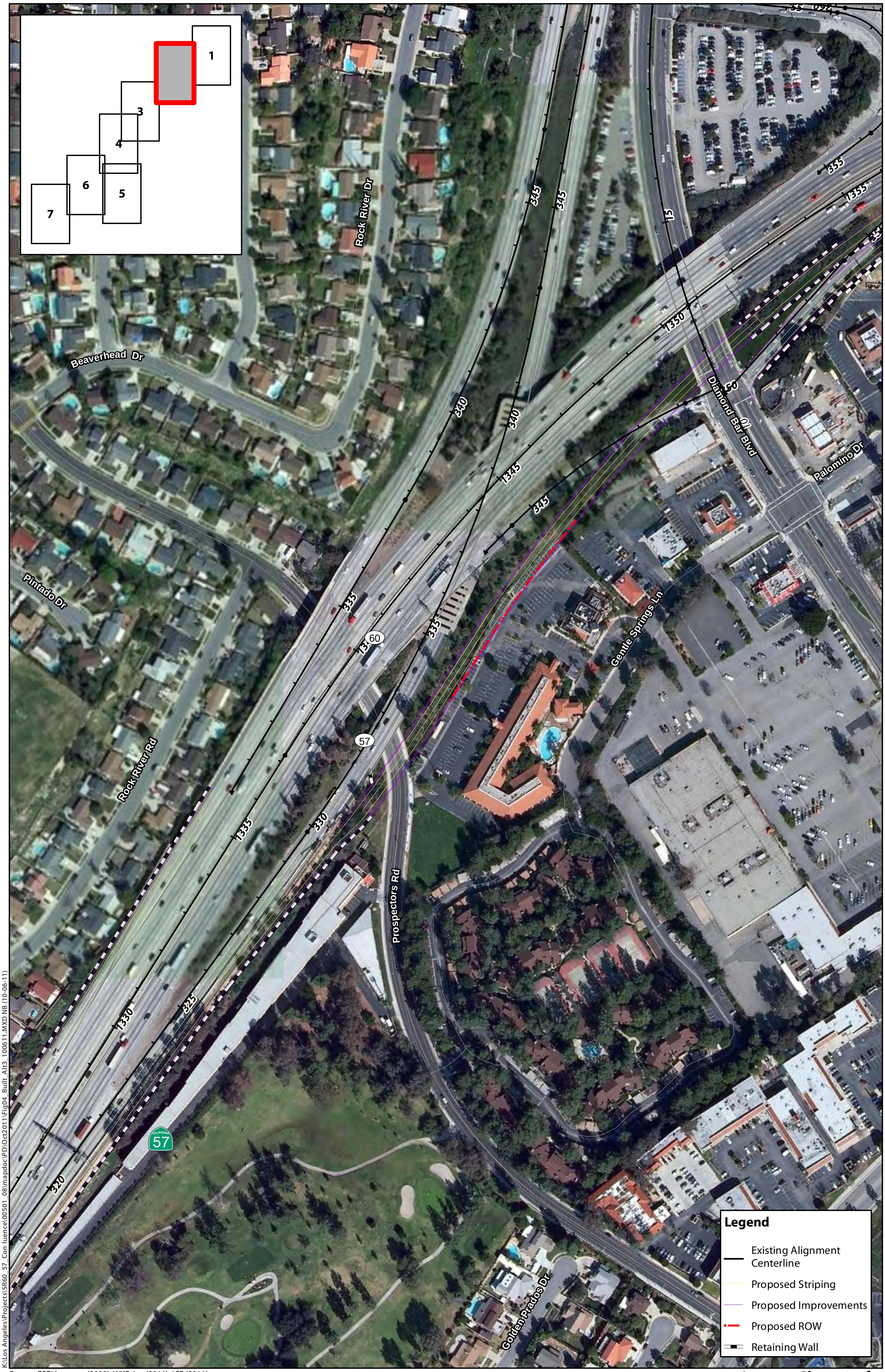

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Figure 4-Sheet 2 of 7
Alternative 3, Partial Cloverleaf Interchange Configuration
State Route 57/State Route 60 Confluence at Grand Avenue Project

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Source: ESRI Imagery (2008), WKE, Inc.(2011), ICF (2011)

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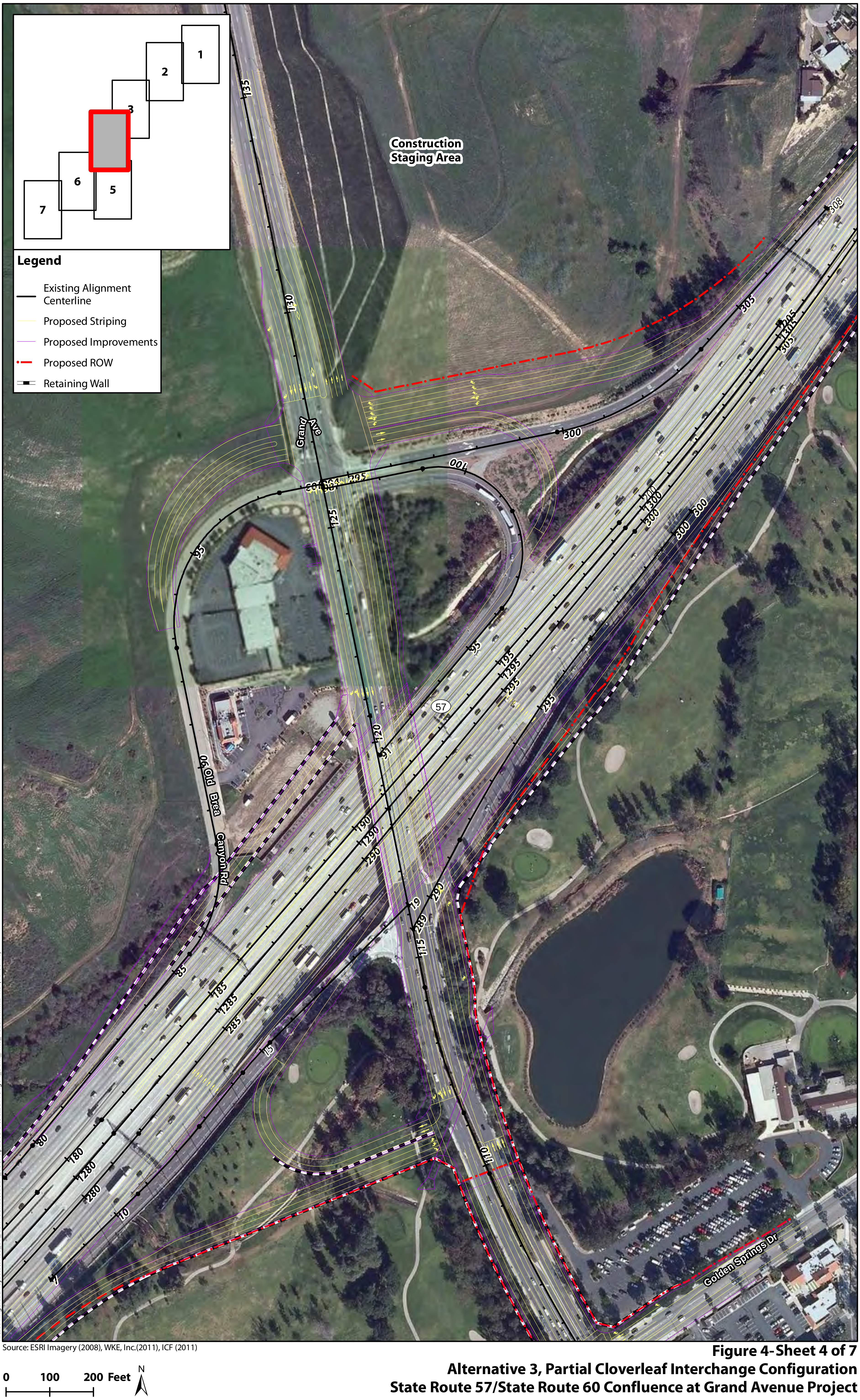
Figure 4-Sheet 3 of 7
Alternative 3, Partial Cloverleaf Interchange Configuration
State Route 57/State Route 60 Confluence at Grand Avenue Project



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Source: ESRI Imagery (2008), WKE, Inc.(2011), ICF (2011)

Figure 4-Sheet 4 of 7
Alternative 3, Partial Cloverleaf Interchange Configuration
State Route 57/State Route 60 Confluence at Grand Avenue Project

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Source: ESRI Imagery (2008), WKE, Inc.(2011), ICF (2011)

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Figure 4-Sheet 5 of 7
Alternative 3, Partial Cloverleaf Interchange Configuration
State Route 57/State Route 60 Confluence at Grand Avenue Project

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Source: ESRI Imagery (2008), WKE, Inc.(2011), ICF (2011)

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Figure 4-Sheet 6 of 7
Alternative 3, Partial Cloverleaf Interchange Configuration
State Route 57/State Route 60 Confluence at Grand Avenue Project

Source: ESRI Imagery (2008), WKE, Inc.(2011), ICF (2011)

Figure 4-Sheet 7 of 7
Alternative 3, Partial Cloverleaf Interchange Configuration
State Route 57/State Route 60 Confluence at Grand Avenue Project

The existing Grand Avenue overcrossing does not have sufficient length to accommodate an added northbound SR-57 through lane or sufficient vertical clearance over SR-60 to allow for widening. Therefore, it would be replaced. The replacement bridge would be longer and deeper, resulting in a raised profile along Grand Avenue.

The widening of Grand Avenue would continue south to Golden Springs Drive. Golden Springs Drive would be widened to allow additional through lanes, double left-turn lanes, and one right-turn lane on three legs of the intersection of Grand Avenue and Golden Springs Drive. One right-turn lane would be provided on Grand Avenue at the northbound approach to Golden Springs Drive. Street widening would occur on the north, east, and west legs of the intersection. Approximately 600 feet of northbound Grand Avenue south of the intersection at Golden Springs Drive would be restriped to three lanes.

A continuous pedestrian walkway is currently provided on the west side of Grand Avenue between Golden Springs Drive and Old Brea Canyon Road. However, on the east side of Grand Avenue, no pedestrian walkway is provided north of the overcrossing. Under both alternatives, 8-foot-wide walkways on both sides of Grand Avenue would be constructed from Golden Springs Drive to Old Brea Canyon Road. Construction of build the alternatives would not affect pedestrian walkways on other local roads.

New rights-of-way and easements would be required to accommodate the proposed improvements for both build alternatives. It is anticipated that all right-of-way acquisitions would be partial acquisitions. Both alternatives would require property from Diamond Bar Golf Course.

Reconstruction of the northbound SR-57 connector to eastbound SR-60 would require partial acquisition of undevelopable slopes on three parcels. Construction of the new eastbound bypass connector would require aerial easements from three commercial parcels with a hotel and restaurants. Within two of the easements, the potential exists for a few parking stalls to be eliminated to accommodate bridge columns and foundations. The eliminated parking would not be replaced. The land for this partial acquisition would come from an undevelopable slope. In addition, a sliver of landscaping area would need to be acquired from a local shopping mall on Grand Avenue near the intersection with Golden Springs Drive. On the north side of the project area, undeveloped land in the City of Industry would need to be acquired to reconstruct the westbound SR-60 off-ramp to Grand Avenue.

Alternative 2 would require 7.1 acres from Diamond Bar Golf Course. This would necessitate realigning four fairways within the remaining property. Alternative 3 would require 10.1 acres from Diamond Bar Golf Course. This would necessitate relocating six fairways within the remaining property and making minor improvements to the remaining 12 fairways. Both alternative would also require reconfiguration of a secondary clubhouse driveway to Grand Avenue but no change to the parking configuration.

Retaining walls are proposed in lieu of slopes to limit the area of right-of-way acquisitions from businesses as well as the golf course. Temporary construction easements (TCEs) ranging from 10 to 15 feet wide would be needed along the proposed right-of-way to construct retaining walls. In addition, permanent maintenance or footing easements would be needed along the retaining walls.

Under both alternatives, two utility easements would need to be relocated. A Los Angeles County Sanitation District easement in the slope of the Ayres Hotel would require relocation, and the Southern California Edison distribution line that runs parallel to eastbound SR-60, north of Grand Avenue, would be relocated southward (within the golf course and four commercial parcels).

Alternative 2 would require 173,702 square feet (3.99 acres) of TCEs, and Alternative 3 would require 192,447 square feet (4.42 acres) of TCEs.

2.2.2.1 Alternative 2 – Combination Cloverleaf/Diamond Configuration Interchange

Alternative 2 would maintain the existing interchange configuration (compact diamond) for the eastbound SR-60 on- and off-ramps. The interchange configuration at Grand Avenue for Alternative 2 would remain a combination partial cloverleaf for the westbound SR-60 on- and off-ramps. An auxiliary lane would be added, connecting the new three-lane on-ramp at Grand Avenue to the new connector, which would bypasses the north/east SR-57/SR-60 interchange.

The existing Grand Avenue overcrossing does not have sufficient length to accommodate an added northbound SR-57 through lane or sufficient vertical clearance over SR-60 to allow for widening. Therefore, it would be replaced. Under Alternative 2, the existing Grand Avenue overcrossing would be replaced by a 10-lane, 148-foot-wide structure over SR-60. The longer span would require a deeper structure, raising the Grand Avenue profile by about 4 feet. The bridge would contain eight through lanes and two 450-foot-long double left-turn lanes from southbound Grand Avenue to the eastbound on-ramp.

2.2.2.2 Alternative 3 – Partial Cloverleaf Interchange Configuration

The main difference between Alternative 2 and Alternative 3 is the configuration of the eastbound SR-60 interchange at Grand Avenue. Under Alternative 3, the existing eastbound on- and off-ramps at Grand Avenue, which form a compact diamond interchange, would be reconfigured to form a partial cloverleaf interchange. The new intersection at Grand Avenue and the new eastbound on- and off-ramps would be located approximately 500 feet south of the existing intersection (i.e., midway between the freeway and Golden Springs Drive). The new eastbound on-ramp from southbound Grand Avenue would be a loop on-ramp that would join SR-60 as a new eastbound auxiliary lane. The existing eastbound on-ramp would be realigned to accommodate the widened Grand Avenue and merge into the eastbound auxiliary lane created by the new loop on-ramp from southbound Grand Avenue to eastbound SR-60. The auxiliary lane would connect to the new connector that bypasses the north/east SR-57/SR-60 interchange.

The existing Grand Avenue overcrossing would be replaced by a new structure over SR-60. However, unlike Alternative 2, a double left-turn lane from southbound Grand Avenue to the eastbound on-ramp would not be required because vehicles traveling southbound on Grand Avenue would access northbound SR-57 and eastbound SR-60 by way of the new loop on-ramp on the west side of Grand Avenue. The new Grand Avenue overcrossing would be widened to accommodate eight through lanes and a center divider/median (a total width of 136 feet). A longer span would be required to accommodate the third SR-57 through lane and the loop on-ramp auxiliary lane. The longer span would require a deeper structure, raising the Grand Avenue profile by about 4 feet.

2.2.2.3 Construction Activities and Staging

The construction scenarios would be similar for both Alternative 2 and Alternative 3. The construction phase of the proposed project is anticipated to begin in the fall of 2014 and end by the fall of 2017. The proposed project would involve clearing, excavation, grading, and other site preparation activities prior to structural work and paving. On-site construction staging would occur just north of the westbound SR-60/southbound SR-57 Grand Avenue on- and off-ramps. This area, which is east of Grand Avenue, is owned by the City of Industry.

Chapter 3 Affected Environment, Environmental Consequences, and Minimization Measures

This chapter describes the environmental setting (existing conditions and regulatory setting) for air quality as it relates to the proposed project, the potential effects on air quality that may result from the proposed project, and the minimization measures to reduce these effects, where applicable.

3.1 Affected Environment

3.1.1 Regulatory Setting

The proposed project is located in the South Coast Air Basin (SCAB) of Los Angeles County and under the jurisdiction of the South Coast Air Quality Management District (SCAQMD), which administers air quality regulations developed at the federal, state, and local levels. These regulations are described below.

3.1.1.1 Federal Air Quality Standards

The federal Clean Air Act (CAA), enacted in 1963 and amended several times thereafter (including the 1990 amendments, known as CAAA 1990, which are the current governing regulations for air quality), establishes the framework for modern air pollution control. In addition, EPA established the NAAQS for criteria pollutants (see Table 3-1), which include CO, nitrogen dioxide (NO_2), sulfur dioxide (SO_2), ozone, PM10, PM2.5, and lead. Most standards have been set to protect public health. For some pollutants, standards have been based on values such as protection of crops, protection of materials, or avoidance of nuisance conditions.

3.1.1.2 Federal Conformity Requirements

The concept of *transportation conformity* was introduced in the 1977 federal CAA. However, the conformity requirements were made substantially more rigorous with CAAA 1990. Transportation conformity requires no federal dollars to 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. The U.S. Department of Transportation (DOT) and EPA developed the transportation conformity regulation that details implementation of the new requirements for determining conformity of transportation plans, programs, and projects in November 1993 in the Transportation Conformity Rule (40 CFR 51 and 40 CFR 93).

Under CAAA 1990, DOT cannot fund, authorize, or approve federal actions to support programs or projects that are not first found to conform to an EPA-approved State Implementation Plan (SIP) for achieving NAAQS goals. CAAA 1990 requires states to address in the SIP how federal standards will be achieved for areas designated as nonattainment areas for the NAAQS.

Table 3-1. Ambient Air Quality Standards Applicable in California and the Attainment Status of the South Coast Air Basin

Pollutant	Symbol	Average Time	Standard (parts per million)		Standard (micrograms per cubic meter)		Violation Criteria		Attainment Status of the South Coast Air Basin	
			California	National	California	National	California	National	California	National
Ozone	O_3	1 hour	0.09	NA	180	NA	If exceeded	NA	Extreme nonattainment	NA
		8 hours	0.070	0.075	137	147	If exceeded	If fourth-highest 8-hour concentration in a year, averaged over 3 years, is greater than the standard	Nonattainment	Extreme nonattainment
Carbon monoxide	CO	8 hours	9.0	9	10,000	10,000	If exceeded	If exceeded on more than 1 day per year	Attainment	Attainment/ maintenance
		1 hour	20	35	23,000	40,000	If exceeded	If exceeded on more than 1 day per year	Attainment	Attainment/ maintenance
(Lake Tahoe only)		8 hours	6	NA	7,000	NA	If equaled or exceeded	NA	Attainment	NA
Nitrogen dioxide	NO_2	Annual arithmetic mean	0.030	0.053	57	100	If exceeded	If exceeded on more than 1 day per year	Nonattainment	Attainment/ unclassified
		1 hour	0.18	0.100	339	188	If exceeded	If the 3-year average of the 98^{th} percentile of the daily maximum 1-hour average at each monitor within an area exceeds the standard	Nonattainment	Attainment/ unclassified
Sulfur dioxide	SO_2	24 hours	0.04	NA	105	NA	If exceeded	NA	Attainment	NA
		3 hours	NA	NA	NA	NA	NA	NA	Attainment	NA
		1 hour	0.25	0.075	655	196	If exceeded	If the 3-year average of the 99^{th} percentile of the daily maximum 1-hour average at each monitor within an area exceeds the standard	Attainment	Attainment/un classified
Hydrogen sulfide	H_2S	1 hour	0.03	NA	42	NA	If equaled or exceeded	NA	Unclassified	NA
Vinyl chloride	C_2H_3Cl	24 hours	0.01	NA	26	NA	If equaled or exceeded	NA	No information available	NA

Pollutant	Symbol	Average Time	Standard (parts per million)		Standard (micrograms per cubic meter)		Violation Criteria		Attainment Status of the South Coast Air Basin	
			California	National	California	National	California	National	California	National
Inhalable particulate matter	PM10	Annual arithmetic mean	NA	NA	20	NA	If exceeded	NA	Nonattainment	NA
		24 hours	NA	NA	50	150	If exceeded	If exceeded on more than 1 day per year	Nonattainment	Serious nonattainment
	PM2.5	Annual arithmetic mean	NA	NA	12	15.0	If exceeded	If the 3-year average of the weighted annual mean from single or multiple community-oriented monitors exceeds the standard	Nonattainment	Nonattainment
		24 hours	NA	NA	NA	35	NA	If less than 98% of the daily concentrations, averaged over 3 years, is equal to or less than the standard	NA	Nonattainment
Sulfate particles	SO_4	24 hours	NA	NA	25	NA	If equaled or exceeded	NA	Attainment	NA
Lead particles	Pb	Calendar quarter	NA	NA	NA	1.5	NA	If exceeded on more than 1 day per year	NA	NA
		30-day average	NA	NA	1.5	NA	If equaled or exceeded	NA	Nonattainment	NA
		Rolling 3-month average	NA	NA	NA	0.15	NA	Averaged over a rolling 3-month period	Nonattainment (Los Angeles County only)	Nonattainment (Los Angeles County only)

Notes:

National standards shown are the primary (public health) standards. All equivalent units are based on a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas. NA = not applicable.

Sources*:* California Air Resources Board 2010a; California Air Resources Board 2010b; U.S. Environmental Protection Agency 2010a.

Failing to submit a SIP that addresses nonattainment or to secure approval could lead to denial of federal funding and permits (in cases where a state-submitted SIP fails to demonstrate achievement of the federal standards, EPA prepares a federal implementation plan).

In addition to the SIP, Section 93.114 of the EPA transportation conformity regulations requires a currently conforming RTP and transportation improvement program (TIP) to be in place at the time of project approval. The RTP and TIP are comprehensive listings of all transportation projects planned for a region over a period of years, usually about 20, that will receive federal funds or be subject to a federally required action, such as a review for effects on air quality. The TIP also lists non-federal, regionally significant projects for information and air quality modeling purposes. The RTP and TIP include projects whose emissions are within the budget planned in the SIP, with the goal of attaining the NAAQS.

Using the projects included in the RTP, an air quality model is run to determine whether the implementation of those projects would conform to emission budgets or other tests showing that federal CAA attainment requirements would be met. If the conformity analysis is successful, regional planning organizations and the appropriate federal agencies, such as FHWA, make the determination that the RTP is in conformity with the SIP for achieving the goals of the NAAQS. 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 the design and scope described in the RTP, the proposed project is deemed to be a project that meets the regional conformity requirements for purposes of project-level analysis. Conformity with the NAAQS goals of the federal CAA is determined at both the regional level and at the project level. The proposed project must conform at both the regional and project level to be approved.

Typically, a regional transportation conformity determination is made by evaluating whether a project is included in a conforming RTP and/or TIP. Any project listed in an RTP and/or TIP must demonstrate conformity with the SIP because the SIP demonstrates how federal standards will be achieved for the region. The design and scope of the project being evaluated must match the design and scope of the project listed in the RTP and/or TIP. Regional-level conformity in California is concerned with how well the region is meeting the standards set for CO, NO_2, ozone, and particulate matter. Project-level conformity determinations for CO, PM10, and PM2.5 are made to verify that a project would not exacerbate an existing NAAQS violation or create a new exceedance and trigger the requirement for a hot-spot analysis.

Conformity at the project level requires hot-spot analysis if a region is designated a nonattainment or maintenance area for CO and/or particulate matter. Hot-spot analysis is essentially the same, for technical purposes, as a CO or particulate matter analysis performed for NEPA purposes. In general, projects must not cause the CO standard to be violated, and in nonattainment regions, the project must not cause any increase in the number and severity of violations. If known CO or particulate matter violations are located in the project vicinity, the project must include measures to reduce or eliminate the existing violations as well.

In California, the federal EPA has delegated authority to prepare SIPs to the California Air Resources Board (CARB), which, in turn, has delegated that authority to individual air districts and planning entities. SCAG is the designated metropolitan planning agency (MPO) and state Regional Transportation Planning Agency for Los Angeles County. As such, SCAG coordinates the region's major transportation projects and programs and develops the RTP and FTIP. (Note that the term "FTIP" is new to the 2011 planning document; it will be prepared on an odd-year cycle, which started in 2011.) Previous transportation improvement programs were called Regional Transportation Improvement Programs (RTIPs). The FTIP sets forth SCAG's investment priorities for transit and transit-related improvements, highways and roadways, and other surface transportation improvements in the South Coast region. The FTIP is in accord with EPA's Transportation Conformity Rule as it pertains to attainment of air quality standards in the South Coast area.

In accordance with Section 93.114 of the EPA transportation conformity regulations, the proposed project is included in the SCAG *2012-2035 Regional Transportation Plan/Sustainable Communities Strategy* (RTP/SCS) and the SCAG 2011 FTIP under project number LA0D450 (Southern California Association of Governments 2012a, 2012b). The 2012-2035 RTP/SCS was adopted by SCAG on April 4, 2012 and approved by FHWA on June 4, 2012. The 2011 FTIP was adopted by SCAG on September 2, 2010, and approved by FHWA on December 14, 2010. In addition, Amendment #11-24 to the 2011 FTIP was adopted by SCAG on April 4, 2012 and is the latest FTIP consistency amendment approved by FHWA, which granted approval on June 4, 2012.

Within the modeling lists for the currently conforming 2012-2035 RTP/SCS and 2011 FTIP documents, project number LA0D450 is described as follows: "*RECONSTRUCT SR 60/GRAND AV INTERCHANGE - WIDEN GRAND AV: SB ADD 1THRU LN (2 EXSTNG); NB ADD 1 THRU LN (3 EXSTNG), REPLACE GRAND AV OC, ADD EB LOOP ON-RAMP, CONSTRUCT ADDITIONAL EB THRU LN FROM GRAND AVE TRAP LN TO SR57 ADD LN, ADD TWO BYPASS RAMP CONNECTORS, ADD AUX LNS EB AND WB FROM EAST TO WEST JUNCTION OF THE CONFLUENCE.*" The project as currently proposed is consistent with this description.

Because the proposed project is included in the modeling lists for the currently conforming SCAG 2012-2035 RTP/SCS and SCAG 2011 FTIP, it can be concluded that the proposed project's operational emissions meet the regional transportation conformity requirements imposed by EPA and SCAQMD. Although the project meets conformity requirements for regional emissions, it will require both a CO and a PM10/PM2.5 hot-spot analysis to determine project-level conformity. Please refer to Appendix A for project-related documentation from the SCAG 2012-2035 RTP/SCS and the SCAG 2011 FTIP.

3.1.1.3 State Air Quality Standards

Responsibility for achieving the CAAQS, which, for certain pollutants and averaging periods, are more stringent than federal standards, is placed on CARB and local air pollution control districts (see Table 3-1). State standards are to be achieved through district-level air quality management plans that are incorporated into the SIP. Traditionally, CARB has established state air quality standards, maintained oversight authority in air quality planning, developed programs for reducing emissions from motor vehicles, developed air emissions inventories, collected air quality and meteorological data, and approved SIPs developed by the individual air districts.

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

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

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

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

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

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

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

3.1.1.4 Local and Regional Implementation of Federal Requirements

The air quality management agencies of direct importance in Los Angeles County include EPA, CARB, and SCAQMD. EPA has established federal standards for which CARB and SCAQMD have primary implementation responsibility. CARB and SCAQMD are responsible for ensuring that state standards are met. SCAQMD is responsible for implementing strategies for air quality improvement and recommending mitigation measures for new growth and development. At the local level, air quality is managed through land use and development planning practices, which are implemented in the county through the general planning process. SCAQMD is responsible for establishing and enforcing local air quality rules and regulations that address the requirements of federal and state air quality laws.

The SCAB is classified as a serious nonattainment area for PM10 and a nonattainment area for PM2.5 (see Table 3-1). Rule 403 is intended to reduce the amount of particulate matter in the ambient air resulting from anthropogenic fugitive dust sources by requiring projects to prevent, reduce, or mitigate fugitive dust emissions. All construction activity sources of fugitive dust are required to implement the best available control measures indicated in Rule 403 and summarized in Table 3-2.

3.1.2 Physical Setting

Ambient air quality is affected by climatological conditions, topography, and the types and amounts of pollutants emitted. The following discussion describes relevant characteristics of the air basin and offers an overview of conditions affecting ambient air concentrations of pollutants in the basin.

3.1.2.1 Climate and Topography

The project site is located within the SCAB, an approximately 6,745-square-mile area bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto mountains to the north and east. The SCAB includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties in addition to the San Gorgonio Pass area in Riverside County. The terrain and geographical location determine the distinctive climate of the SCAB, which is a coastal plain with connecting broad valleys and low hills.

The greatest air pollution effects occur throughout the SCAB from June through September. This condition is generally attributed to the large amount of pollutant emissions, light winds, and shallow vertical atmospheric mixing. This frequently reduces pollutant dispersion, thus causing elevated air pollution levels. Pollutant concentrations in the SCAB vary with location, season, and time of day. Ozone concentrations, for example, tend to be lower along the coast, higher in the near inland valleys, and lower in the far inland areas of the SCAB and adjacent desert (ICF Jones & Stokes 2009).

The average project area summer (July) high and low temperatures are 89°F and 59°F, respectively. The average project area winter (December) high and low temperatures are 68°F and 41°F, respectively. Annual average rainfall for the project area is 1.41 inches (Weather Channel 2009).

Wind patterns in the project vicinity display a unidirectional flow, with winds arising primarily from the west at an average speed of 1.71 meters per second. Calm wind conditions are present 17.48% of the time (Servin 2003).

Table 3-2. South Coast Air Quality Management District's Best Available Control Measures

Source Category	Control Measure	Guidance
Backfilling	01-1 Stabilize backfill material when not actively handling; and 01-2 Stabilize backfill material during handling; and 01-3 Stabilize soil at completion of activity.	✓ Mix backfill soil with water prior to moving ✓ Dedicate water truck or high-capacity hose to backfilling equipment ✓ Empty loader bucket slowly so that no dust plumes are generated ✓ Minimize drop height from loader bucket
Clearing and grubbing	02-1 Maintain stability of soil through pre-watering of site prior to clearing and grubbing; and 02-2 Stabilize soil during clearing and grubbing activities; and 02-3 Stabilize soil immediately after clearing and grubbing activities.	✓ Maintain live perennial vegetation where possible ✓ Apply water in sufficient quantity to prevent generation of dust plumes
Clearing forms	03-1 Use water spray to clear forms; or 03-2 Use sweeping and water spray to clear forms; or 03-3 Use vacuum system to clear forms.	✓ Use of high-pressure air to clear forms may cause exceedance of rule requirements
Crushing	04-1 Stabilize surface soils prior to operation of support equipment; and 04-2 Stabilize material after crushing.	✓ Follow permit conditions for crushing equipment ✓ Pre-water material prior to loading into crusher ✓ Monitor crusher emissions opacity ✓ Apply water to crushed material to prevent dust plumes
Cut and fill	05-1 Pre-water soils prior to cut-and-fill activities; and 05-2 Stabilize soil during and after cut-and-fill activities.	✓ For large sites, pre-water with sprinklers or water trucks and allow time for penetration ✓ Use water trucks/pulls to water soils to depth of cut prior to subsequent cuts
Demolition – mechanical/manual	06-1 Stabilize wind erodible surfaces to reduce dust; and 06-2 Stabilize surface soil where support equipment and vehicles will operate; and 06-3 Stabilize loose soil and demolition debris; and 06-4 Comply with SCAQMD Rule 1403.	✓ Apply water in sufficient quantities to prevent the generation of visible dust plumes
Disturbed soil	07-1 Stabilize disturbed soil throughout the construction site; and 07-2 Stabilize disturbed soil between structures	✓ Limit vehicular traffic and disturbances on soils where possible ✓ If interior block walls are planned, install as early as possible ✓ Apply water or a stabilizing agent in sufficient quantities to prevent the generation of visible dust plumes
Earthmoving Activities	08-1 Pre-apply water to depth of proposed cuts; and 08-2 Re-apply water as necessary to maintain soils in a damp condition and to ensure that visible emissions do not exceed 100 feet in any direction; and 08-3 Stabilize soils once earthmoving activities are complete.	✓ Grade each project phase separately, timed to coincide with construction phase ✓ Upwind fencing can prevent material movement on site ✓ Apply water or a stabilizing agent in sufficient quantities to prevent the generation of visible dust plumes

Source Category	Control Measure	Guidance
Importing/exporting of bulk materials	09-1 Stabilize material while loading to reduce fugitive dust emissions; and 09-2 Maintain at least 6 inches of freeboard on haul vehicles; and 09-3 Stabilize material while transporting to reduce fugitive dust emissions; and 09-4 Stabilize material while unloading to reduce fugitive dust emissions; and 09-5 Comply with California Vehicle Code (CVC) Section 23114.	✓ Use tarps or other suitable enclosures on haul trucks ✓ Check seals on belly dump trucks regularly and remove any trapped rocks to prevent spillage ✓ Comply with track-out prevention/mitigation requirements ✓ Provide water while loading and unloading to reduce visible dust plumes
Landscaping	10-1 Stabilize soils, materials, slopes	✓ Apply water to materials to stabilize ✓ Maintain materials in a crusted condition ✓ Maintain effective cover over materials ✓ Stabilize sloping surfaces using soil binders until vegetation or ground cover can effectively stabilize the slopes ✓ Hydroseed prior to rainy season
Road shoulder Maintenance	11-1 Apply water to unpaved shoulders prior to clearing; and 11-2 Apply chemical dust suppressants and/or washed gravel to maintain a stabilized surface after completing road shoulder maintenance.	✓ Install curbing and/or paving ✓ Shoulders can reduce recurring maintenance costs ✓ Use of chemical dust suppressants can inhibit vegetation growth and reduce future road shoulder maintenance costs
Screening	12-1 Pre-water material prior to screening; and 12-2 Limit fugitive dust emissions to opacity and plume length standards; and 12-3 Stabilize material immediately after screening.	✓ Dedicate water truck or high-capacity hose to screening operation ✓ Drop material through the screen slowly and minimize drop height ✓ Install wind barrier with a porosity of no more than 50% upwind of screen to the height of the drop point
Staging areas	13-1 Stabilize staging areas during use; and 13-2 Stabilize staging area soils at project completion.	✓ Limit size of staging area ✓ Limit vehicle speeds to 15 miles per hour ✓ Limit number and size of staging area entrances/exists
Stockpiles/ Bulk Material Handling	14-1 Stabilize stockpiled materials; and 14-2 Stockpiles within 100 yards of off-site occupied buildings must not be greater than 8 feet in height or must have a road bladed to the top to allow water truck access or must have an operational water irrigation system that is capable of complete stockpile coverage.	✓ Add or remove material from the downwind portion of the storage pile ✓ Maintain storage piles to avoid steep sides or faces
Traffic areas for construction activities	15-1 Stabilize all off-road traffic and parking areas; and 15-2 Stabilize all haul routes; and 15-3 Direct construction traffic over established haul routes.	✓ Apply gravel/paving to all haul routes as soon as possible to all future roadway areas ✓ Barriers can be used to ensure vehicles are used only on established parking areas/haul routes

Source Category	Control Measure	Guidance
Trenching	16-1 Stabilize surface soils where trencher or excavator and support equipment will operate; and 16-2 Stabilize soils at the completion of trenching activities.	✓ Pre-watering of soils prior to trenching is an effective preventive measure. For deep trenching activities, pre-trench to 18 inches, soak soils via the pre-trench, and resuming trenching ✓ Washing mud and soils from equipment at the conclusion of trenching activities can prevent crusting and drying of soil on equipment
Truck loading	17-1 Pre-water material prior to loading; and 17-2 Ensure that freeboard exceeds 6 inches (CVC 23114)	✓ Empty loader bucket so no visible dust plumes are created ✓ Ensure that the loader bucket is close to the truck to minimize drop height while loading
Turf Overseeding	18-1 Apply sufficient water immediately prior to conducting turf vacuuming activities to meet opacity and plume length standards; and 18-2 Cover haul vehicles prior to exiting the site.	✓ Haul waste material immediately off-site
Unpaved roads/parking lots	19-1 Stabilize soils to meet the applicable performance standards; and 19-2 Limit vehicular travel to established unpaved roads (haul routes) and unpaved parking lots.	✓ Restricting vehicular access to established unpaved travel paths and parking lots can reduce stabilization requirements
Vacant land	20-1 In instances where vacant lots are 0.10 acre or larger and have a cumulative area of 500 square feet or more that are driven over and/or used by motor vehicles and/or off-road vehicles, prevent motor vehicle and/or off-road vehicle trespassing, parking, and/or access by installing barriers, curbs, fences, gates, posts, signs, shrubs, trees or other effective control measures.	
Source: South Coast Air Quality Management District 2005a.		

3.1.2.2 Description of Pollutants

The following is a general description of the pollutants for which there are standards (criteria pollutants) and ambient measurements. A description of toxic air contaminants (TACs) and naturally occurring asbestos (NOA), for which there are no standards, is also included. Ozone, and its precursors, ROG and NO_X; sulfates; visibility reducing particles; NO_2; and PM10 and PM2.5 are considered to be regional pollutants because they or their precursors affect air quality on a regional scale. NO_2 reacts photochemically with ROGs to form ozone, while PM10 and PM2.5 can form from the chemical reaction of atmospheric chemicals, including NO_X, sulfates, nitrates, and ammonia. These processes can occur at some distance downwind of the source of pollutants. Pollutants such as CO, SO_2, lead, and particulate matter are considered to be local pollutants because they tend to disperse rapidly with distance from the source. Although PM10 and PM2.5 are considered to be regional pollutants, they can also be localized pollutants because direct emissions of particulate matter from automobile exhaust can accumulate in the air locally near the emission source. Table 3-1 provides references for the state and federal standards and the SCAB's attainment status for the pollutants.

Although NOA is common in certain counties of California, it is not likely to be found in Los Angeles County (California Department of Conservation 2000).

Ozone

Ozone is a respiratory irritant that increases susceptibility to respiratory infections. It is also an oxidant that can cause substantial damage to vegetation and other materials.

Ozone is not emitted directly into the air but is formed by a photochemical reaction in the atmosphere. Ozone precursors (ROG and NO_X) react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem.

State and federal standards for ozone have been set for 1- and 8-hour averaging times. The state 1-hour ozone standard is 0.09 part per million (ppm), not to be exceeded. EPA revoked the 1-hour ozone standard on June 15, 2005. The federal 8-hour standard of 0.075 ppm went into effect on January 30, 2006. The California 1-hour standard remains in effect. In addition, the state 8-hour standard is 0.070 ppm, not to be exceeded.

The SCAB is designated as an extreme nonattainment area for the state 1-hour ozone standard and a nonattainment area for the state 8-hour ozone standard. For the federal 8-hour ozone standard, the SCAB is designated as an extreme nonattainment area.

Carbon Monoxide

CO is a public health concern because it combines readily with hemoglobin and reduces the amount of oxygen transported in the bloodstream. CO can cause health problems such as fatigue, headache, confusion, dizziness, and even death.

Motor vehicles are the dominant source of CO emissions in most areas. High CO levels develop primarily during winter when periods of light winds combine with the formation of ground-level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures.

State and federal CO standards have been set for 1- and 8-hour averaging times. The state 1-hour standard is 20 ppm, not to be exceeded, whereas the federal 1-hour standard is 35 ppm, not to be exceeded more than 1 day per year. The state 8-hour standard is 9.0 ppm, while the federal standard is 9 ppm. This means that a monitored 8-hour CO concentration from 9.1 to 9.4 ppm violates the state but not the federal standard.

The SCAB is designated as an attainment area for the state 1- and 8-hour CO standards and an attainment/maintenance area for both the federal 1- and 8-hour CO standards.

Inhalable Particulate Matter

Particulates can damage human health and retard plant growth. Health concerns associated with suspended particulate matter focus on those particles small enough to reach the lungs when inhaled. Particulates also reduce visibility and corrode materials.

PM10 sources in Los Angeles County comprise both rural and urban sources, including agricultural burning, tilling of agricultural fields, industrial emissions, dust suspended by vehicle traffic, and secondary aerosols formed by reactions in the atmosphere.

The federal and state ambient air quality standard for particulate matter applies to two classes of particulates: PM2.5 and PM10. The state PM10 standards are 50 micrograms per cubic meter ($\mu g/m^3$) as a 24-hour average and 20 $\mu g/m^3$ as an annual arithmetic mean. The federal PM10 standard is 150 $\mu g/m^3$ as a 24-hour average. For PM2.5, the state has adopted a standard of 12 $\mu g/m^3$ for the annual arithmetic mean. The federal PM2.5 standards are 35 $\mu g/m^3$ for the 24-hour average and 15.0 $\mu g/m^3$ for the annual arithmetic mean.

The SCAB is designated as a nonattainment area for both the state 24-hour and arithmetic mean PM10 standards and a serious nonattainment area for the federal 24-hour PM10 standard. In addition, the SCAB is designated as a nonattainment area for the state annual arithmetic mean PM2.5 standard and a nonattainment area for both the federal 24-hour and annual arithmetic PM2.5 standards.

Nitrogen Dioxide

NO_X is part of a family of highly reactive gases—the primary precursors to the formation of ground-level ozone—that react in the atmosphere to form acid rain. NO_X, a mixture of nitric oxide (NO) and NO_2, is produced from natural sources, motor vehicles, and other fuel combustion processes. NO, which is colorless and odorless, is oxidized in the atmosphere to form NO_2. NO_2 is an odorous, brown, acidic, highly corrosive gas that can affect human health and the environment. NO_X is a critical component of photochemical smog. NO_2 produces the yellowish-brown color of the smog. EPA has set a NAAQS for NO_2 but not for NO.

NO_X can irritate the lungs, cause lung damage, and lower resistance to respiratory infections such as influenza. The effects of short-term exposure are still unclear, but continued or frequent exposure to concentrations that are typically much higher than those normally found in the ambient air may cause increased incidences of acute respiratory illness in children. Health effects associated with NO_X are increased incidences of chronic bronchitis and lung irritation. Chronic exposure to NO_2 may lead to eye and mucus membrane aggravation along with pulmonary dysfunction. NO_X can cause fading of textile dyes and additives, deterioration of cotton and nylon, and corrosion of metals due to the production of particulate nitrates. Airborne NO_X can impair visibility.

NO_X, a major component of acid deposition in California, may affect both terrestrial and aquatic ecosystems. NO_X in the air is a potentially significant contributor to a number of environmental effects, such as acid rain and eutrophication in coastal waters. Eutrophication occurs when a body of water suffers an increase in nutrients that reduces the amount of oxygen in the water, producing an environment that is destructive to fish and other animal life.

The state NO_2 standards are 0.18 ppm as a 1-hour average and 0.030 ppm as an annual arithmetic mean. The federal NO_2 standards are 0.100 ppm as a 1-hour average and 0.053 ppm as an annual arithmetic mean.

The SCAB is designated as a nonattainment area for both the state 1-hour and annual arithmetic mean NO_2 standards and an attainment/unclassified area for the federal 1-hour and annual arithmetic mean NO_2 standard.

Sulfur Oxide

SO_X is a family of colorless, pungent gases, including SO_2, that form primarily through the combustion of sulfur-containing fossil fuels (mainly coal and oil), metal smelting, and other industrial processes. SO_X can react to form sulfates, which significantly reduce visibility. SO_X is a precursor to particulate matter formation, which is considered to be in nonattainment status in the project area.

The major health concerns associated with exposure to high concentrations of SO_X include effects related to breathing, respiratory illness, alterations in pulmonary defenses, and aggravation of existing cardiovascular disease. Major subgroups of the population that are most sensitive to SO_X include individuals with cardiovascular disease or chronic lung disease (such as bronchitis or emphysema) as well as children and the elderly. SO_X emissions can also damage tree foliage and agricultural crops. Together, SO_X and NO_X are the major precursors to acid rain, which is associated with the acidification of lakes and streams and accelerated corrosion of buildings and monuments.

There are state and federal ambient air quality standards for SO_2 but not for SO_X. The state standards are 0.25 ppm as a 1-hour average and 0.04 ppm as a 24-hour average. The federal standard is 0.075 ppm as a 1-hour average.

The SCAB is designated as an attainment area for both the 1- and 24-hour state SO_2 standards and an attainment/unclassified area for the federal 1-hour standard.

Lead

Lead is a natural constituent of air, water, and the biosphere. Lead is neither created nor destroyed in the environment, so it essentially persists forever. Automobiles were once a major source of airborne lead because, prior to being phased out, lead was used as a gasoline additive to increase the octane rating. However, in recent years, ambient concentrations of lead have dropped dramatically.

Short-term exposure to high levels of lead can cause vomiting, diarrhea, convulsions, coma, or even death. However, even small amounts of lead can be harmful, especially to infants, young children, and pregnant women. Symptoms of long-term exposure to lower levels of lead may be less noticeable but still serious. Anemia is common, and damage to the nervous system may cause impaired mental function. Other symptoms are appetite loss, abdominal pain, constipation, fatigue, sleeplessness, irritability, and headache. Continued excessive exposure, as in an industrial setting, can affect the kidneys.

Lead exposure is most serious for young children because they absorb lead more easily than adults and are more susceptible to its harmful effects. Even low-level exposure may harm the intellectual development, behavior, size, and hearing of infants. During pregnancy, and especially in the last trimester, lead can cross the placenta and affect the fetus. Female workers exposed to high lead levels have more miscarriages and stillbirths.

The state lead standard is 1.5 $\mu g/m^3$ over a 30-day average; the federal lead standards are 1.5 $\mu g/m^3$ averaged over a calendar quarter and 0.15 $\mu g/m^3$ as a rolling 3-month average.

The Los Angeles County portion of the SCAB is designated as a nonattainment area for the state 30-day average lead standard and a nonattainment area for the federal rolling 3-month average lead standard.

Mobile-source Air Toxics/Toxic Air Contaminants

TACs are pollutants that may result in an increase in mortality or serious illness or pose a present or potential hazard to human health. Health effects of TACs include cancer, birth defects, neurological damage, damage to the body's natural defense system, and diseases that lead to death. In 1998, following a 10-year scientific assessment process, CARB identified particulate matter from diesel-fueled engines as a TAC. Compared with other air toxics CARB has identified and controlled, diesel particulate matter (DPM) emissions are estimated to be responsible for about 70% of the total ambient air toxics risk (California Air Resources Board 2000).

Through the CAAA 1990, Congress mandated EPA to regulate 188 air toxics, which are also known as hazardous air pollutants (HAPs). In EPA's latest final rule (2007) on the control of hazardous air pollutants from mobile sources (72 FR 8430), the agency identified 93 compounds that are emitted from mobile sources, which are listed in EPA's Integrated Risk Information System (IRIS). From this list of 93 compounds, EPA has identified seven as priority MSATs. The high regulation priority of these seven MSATs was based on EPA's 1999 National Air Toxics Assessment (NATA) (Federal Highway Administration 2009a).

The seven priority MSATs are as follows:

- Acrolein
- Benzene
- 1,3-Butadiene
- Diesel particulate matter/diesel exhaust organic gases
- Formaldehyde
- Naphthalene
- Polycyclic organic matter (POM)

The 2007 rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using EPA's MOBILE6.2 model, even if vehicle activity (i.e., VMT) increases by 145%, as assumed, a combined reduction of 72% in the total annual emission rate for the priority MSATs is projected from 1999 to 2050 (Federal Highway Administration 2009a).

Naturally Occurring Asbestos

NOA is a fibrous material found in certain types of rock formations. It is the result of natural geologic processes and commonly found near earthquake faults in California. Some rock types known to produce asbestos fibers are varieties of chrysotile, crocidolite, amosite, anthophyllite, tremolite, and actinolite.

Asbestos is harmless when it is left undisturbed under the soil, but if it becomes airborne, it can cause serious health problems. Human disturbance, or natural weathering, can break down asbestos into microscopic fibers that are easily inhaled. Inhalation of asbestos fibers can cause lung cancer, mesothelioma (a rare form of cancer found in the lining of internal organs), and asbestosis (a progressive, non-cancer disease of the lungs involving a buildup of scar tissue, which inhibits breathing) (U.S. Environmental Protection Agency 2008a, 2008b).

Both EPA and CARB have issued guidance for reducing exposure to NOA. EPA's suggested measures include leaving NOA material undisturbed, covering or capping NOA material, limiting dust-generating activities, or excavating and disposing of NOA material (U.S. Environmental Protection Agency 2008c). CARB has adopted Airborne Toxic Control Measures (ATCMs), which are required for road construction and maintenance projects, unless the project is found to be exempt. These ATCMs include stabilizing unpaved surfaces subject to vehicle traffic, reducing vehicle speeds, wetting or chemically stabilizing storage piles, and eliminating track-out material from equipment (California Air Resources Board 2008a).

3.1.2.3 Existing Air Quality Conditions

Existing air quality conditions in the project area can be characterized in terms of the ambient air quality standards that the federal and state governments have established for various pollutants (see Table 3-1) and the monitoring data collected in the region. Monitoring data concentrations are typically expressed in terms of ppm or $\mu g/m^3$. The nearest air quality monitoring station in the vicinity of the project area is the Pomona monitoring station, located at 924 North Garey

Avenue in Pomona, California, which is approximately 6 miles away from the project area. The Pomona monitoring station monitors for ozone, CO, and NO_2. The next-closest monitoring station to the project area is the Azusa monitoring station, located at 803 North Loren Avenue in Azusa, California, which is approximately 11 miles away from the project area. The Azusa monitoring station monitors for ozone, CO, NO_2, PM10, and PM2.5.

Through consultation with SCAQMD, it was found that the most important factors when choosing a representative monitoring station for a particular project area are topography and meteorology. Furthermore, in the March 2006 qualitative particulate matter analysis guidance document, EPA and FHWA indicated that it is very important for traffic conditions at any surrogate monitoring station to be similar to conditions at the project location. Based on Caltrans' 2010 traffic data, annual average daily traffic (AADT) volume along the SR-57/SR-60 confluence was 343,000, with 6.9% truck traffic. This compares to the AADT volume of 245,000, with 6.7% truck traffic, along the portion of I-10 located north of the Pomona monitoring station and 265,000, with 6.8% truck traffic, along the portion of I-210 located south of the Azusa monitoring station (California Department of Transportation 2010).

Of all the monitoring stations in the SCAB, the Pomona and Azusa monitoring stations are most representative of the project area because they 1) are located in the same unique geographic location as the proposed project (i.e., north of the Chino Hills), 2) are located in proximity to major freeways that have similar percentages for truck traffic volumes, and 3) are the monitoring stations located closest to the project area.

Air quality monitoring data from the Pomona and Azusa monitoring stations is summarized in Table 3-3. Monitoring values for ozone and CO were obtained from the Pomona monitoring station, and monitoring values for PM10 and PM2.5 were obtained from the Azusa monitoring station. These data represent air quality monitoring results for the last three years (2008–2010) from which complete data are available.

Table 3-3. Ambient Air Quality Monitoring Data Measured at the Pomona and Azusa Monitoring Stations

Pollutant Standards	2008	2009	2010
1-Hour Ozone			
Maximum 1-hour concentration (ppm)	0.141	0.138	0.115
1-hour California designation value	0.15	0.14	0.13
1-hour expected peak-day concentration	0.145	0.137	0.133
Number of days standard exceeded[a]			
CAAQS 1-hour (> 0.09 ppm)	32	25	9
8-Hour Ozone			
National maximum 8-hour concentration (ppm)	0.110	0.099	0.082
National second-highest 8-hour concentration (ppm)	0.104	0.098	0.081
State maximum 8-hour concentration (ppm)	0.110	0.100	0.082
State second-highest 8-hour concentration (ppm)	0.104	0.099	0.081
8-hour national designation value	0.103	0.099	0.090
8-hour California designation value	0.120	0.110	0.104
8-hour expected peak-day concentration	0.122	0.115	0.108
Number of days standard exceeded[a]			
NAAQS 8-hour (> 0.075 ppm)	35	21	4
CAAQS 8-hour (> 0.070 ppm)	47	37	17

Pollutant Standards	**2008**	**2009**	**2010**
Carbon Monoxide (CO)			
National[b] maximum 8-hour concentration (ppm)	1.81	1.83	1.80
National[b] second-highest 8-hour concentration (ppm)	1.79	1.80	1.72
California[c] maximum 8-hour concentration (ppm)	1.98	2.21	1.80
California[c] second-highest 8-hour concentration (ppm)	1.81	1.80	1.72
Maximum 1-hour concentration (ppm)	2.6	—	—
Second-highest 1-hour concentration (ppm)	2.6	—	—
Number of days standard exceeded[a]			
NAAQS 8-hour (≥ 9 ppm)	0	0	0
CAAQS 8-hour (≥ 9.0 ppm)	0	0	0
NAAQS 1-hour (≥ 35 ppm)	0	—	—
CAAQS 1-hour (≥ 20 ppm)	0	—	—
Particulate Matter (PM10)[d]			
National[b] maximum 24-hour concentration (μg/m^3)	98.0	74.0	70.0
National[b] second-highest 24-hour concentration (μg/m^3)	75.0	65.0	59.0
State[c] maximum 24-hour concentration (μg/m^3)	96.0	72.0	68.0
State[c] second-highest 24-hour concentration (μg/m^3)	74.0	64.0	58.0
State annual average concentration (μg/m^3)[e]	—	—	—
Number of days standard exceeded[a]			
NAAQS 24-hour (> 150 μg/m^3)[f]	0	0	0
CAAQS 24-hour (> 50 μg/m^3)[f]	12	7	5
Particulate Matter (PM2.5)			
National[b] maximum 24-hour concentration (μg/m^3)	53.0	72.0	44.4
National[b] second-highest 24-hour concentration (μg/m^3)	48.1	46.9	35.4
State[c] maximum 24-hour concentration (μg/m^3)	53.0	72.0	44.4
State[c] second-highest 24-hour concentration (μg/m^3)	48.1	46.9	35.4
National annual designation value (μg/m^3)	15.1	—	—
National annual average concentration (μg/m^3)	14.0	—	—
State annual designation value (μg/m^3)	—	—	—
State annual average concentration (μg/m^3)[e]	—	—	—
Number of days standard exceeded[a]			
NAAQS 24-hour (> 35 μg/m^3)	5	6	1

Notes: CAAQS = California Ambient Air Quality Standards.
NAAQS = National Ambient Air Quality Standards.
– = insufficient data available to determine the value.

[a] An exceedance is not necessarily a violation.
[b] National statistics are based on standard conditions data. In addition, national statistics are based on samplers using federal reference or equivalent methods.
[c] State statistics are based on local conditions data, except in the South Coast Air Basin, for which statistics are based on standard conditions data. In addition, state statistics are based on California-approved samplers.
[d] Measurements usually are collected every 6 days.
[e] State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.
[f] Mathematical estimate of how many days concentrations would have been measured as higher than the level of the standard had each day been monitored.

Sources: California Air Resources Board 2011c; U.S. Environmental Protection Agency 2011b.

As shown in Table 3-3, the Pomona monitoring station has experienced 66 violations of the state 1-hour ozone standard, 60 violations of the federal 8-hour ozone standard, 101 violations of the state 8-hour ozone standard, and no violations of the federal or state CO standards during the 3-year monitoring period. The Azusa monitoring station has experienced no violations of the national PM10 standard, 24 violations of the state PM10 standard, and 12 violations of the national PM2.5 standard during the 3-year monitoring period.

Attainment Status

EPA has classified the SCAB as an extreme nonattainment area for the federal 8-hour ozone standard. For both the 1-hour and 8-hour federal CO standard, EPA has classified the SCAB as an attainment/maintenance area. EPA has classified the SCAB as a serious nonattainment area for the federal PM10 standard and a nonattainment area for to the federal PM2.5 standard. CARB has classified the SCAB as an extreme nonattainment area for the state 1-hour ozone standard and a nonattainment area for the state 8-hour ozone standard. For the state CO standard, CARB has classified the SCAB as an attainment area. CARB has classified the SCAB as a nonattainment area for the state PM10 and PM2.5 standards. The SCAB's attainment status for each of these pollutants relative to the NAAQS and CAAQS is summarized in Table 3-1.

3.1.2.4 Sensitive Receptors

Caltrans defines *sensitive receptors* (aka: sensitive land uses) as schools, medical centers and similar health care facilities, child care facilities, parks, and playgrounds (California Department of Transportation 2008). The area surrounding the project site consists of open space and residential uses west and northwest of the SR-57/SR-60 confluence; residential uses west and northwest of the southwest project limit; residential uses northwest, north, and east of the northeast project limit; and recreational uses (a golf course) south of the SR-57/SR-60 confluence. A fast-food restaurant and an auto dealership that is no longer in business are located southwest of the Grand Avenue/SR-60 westbound off-ramp intersection, and a Target store is located southwest of the Grand Avenue/Golden Springs Drive intersection. The fast-food restaurant has a former children's playground area that faces the freeway. The playground area has been closed for some time and will not be reopened, according to restaurant management (Aragues pers. comm.). The restaurant manager said on a site visit on June 2, 2009, and in a subsequent telephone conversation on June 12, 2009, that no replacement playground equipment or other sensitive uses are planned for the area currently occupied by the playground.

The closest sensitive receptors to the project area are residences located approximately 100 feet northwest of the SR-57/SR-60 confluence; residences approximately 150 feet southwest of the northeast project limit; a private preschool, La Petite Academy, located approximately 200 feet south of the Grand Avenue/Golden Springs Drive intersection (approximately 50 feet west of Grand Avenue); and the Diamond Bar Montessori Academy, located approximately 200 feet southwest of SR-60 and about 0.20 mile northeast of the SR-57/SR-60 split. There are numerous other schools within 0.50 mile of the project site. Some of the residences northwest of the SR-57/SR-60 confluence are located on a hill. Residences in this area that are not elevated above the freeway are separated by a sound wall. The residences southwest of the northeast project limit and the Diamond Bar Montessori Academy southwest of SR-60, about 0.20 mile northeast of the SR-57/SR-60 split, are separated from the freeway by dense trees. The La Petite Academy is not separated from Grand Avenue by any intervening barriers or trees (see Figure 3-1 for general locations of sensitive receptors in the project vicinity). Other schools within the project vicinity include California Intercontinental University, the University of Phoenix – Diamond Bar Learning Center, the University of California, and Towne and Country Preschool and Infant Care Center.

3.2 Environmental Consequences

3.2.1 Methods

The proposed project would generate construction-related and operational emissions. The methodology used to evaluate construction and operational effects is described below.

3.2.1.1 Construction Effect Assessment Methodology

Construction of the proposed project, which is anticipated to last from fall 2014 to fall 2017, a period of approximately 3 years, could be a source of fugitive dust and exhaust emissions that could have substantial temporary effects on local air quality (i.e., exceed state air quality standards for PM2.5 and PM10). Such emissions would result from earthmoving and the use of heavy equipment as well as land clearing, ground excavation, cut-and-fill operations, and the construction of roadways. Dust emissions can vary substantially from day to day, depending on the level of activity, the specific operations, and the prevailing weather. A major portion of dust emissions for the proposed project would most likely be caused by construction traffic in temporary construction areas. A quantitative analysis of construction emissions is provided in Section 3.2.2.3, below, to disclose potential air quality effects that may result from the proposed project.

3.2.1.2 Operational Effect Assessment Methodology

The primary operational emissions associated with the proposed project are CO, PM10, PM2.5, ozone precursors (ROG and NO_X), and CO_2 emitted as vehicle exhaust. In addition to emissions from vehicle exhaust, PM10 and PM2.5 can result from dust emissions from vehicles on paved roads (entrained dust). With respect to criteria pollutants, the evaluation of transportation conformity was done by evaluating the inclusion of the proposed project in the most-recent RTP and FTIP. In addition, estimates of criteria pollutants (ozone precursors, CO, PM10, and PM2.5) as well as CO_2 emissions were quantified by using Caltrans' CT-EMFAC emissions model (version 4.1) and calculating entrained dust in accordance with the emission factor equation found in EPA's *Compilation of Air Pollutant Emission Factors*, AP-42, Section 13.2.1 (U.S. Environmental Protection Agency 2011); CARB's methodology to calculate county-specific emissions inventories, Section 7.9, *Entrained Paved Road Dust Paved Road Travel* (California Air Resources Board 1997); and CARB's methodology to calculate county-specific emissions inventories using traffic data provided by the project traffic engineers, KOA Corporation (KOA Corporation 2011). The potential impacts related to localized CO hot-spot emissions were evaluated following the methodology prescribed in the *Transportation Project-level Carbon Monoxide Protocol* (CO Protocol) developed for Caltrans by the Institute of Transportation Studies at the University of California, Davis (Garza et al. 1997).

Figure 3-1: Air Quality Sensitive Receptors

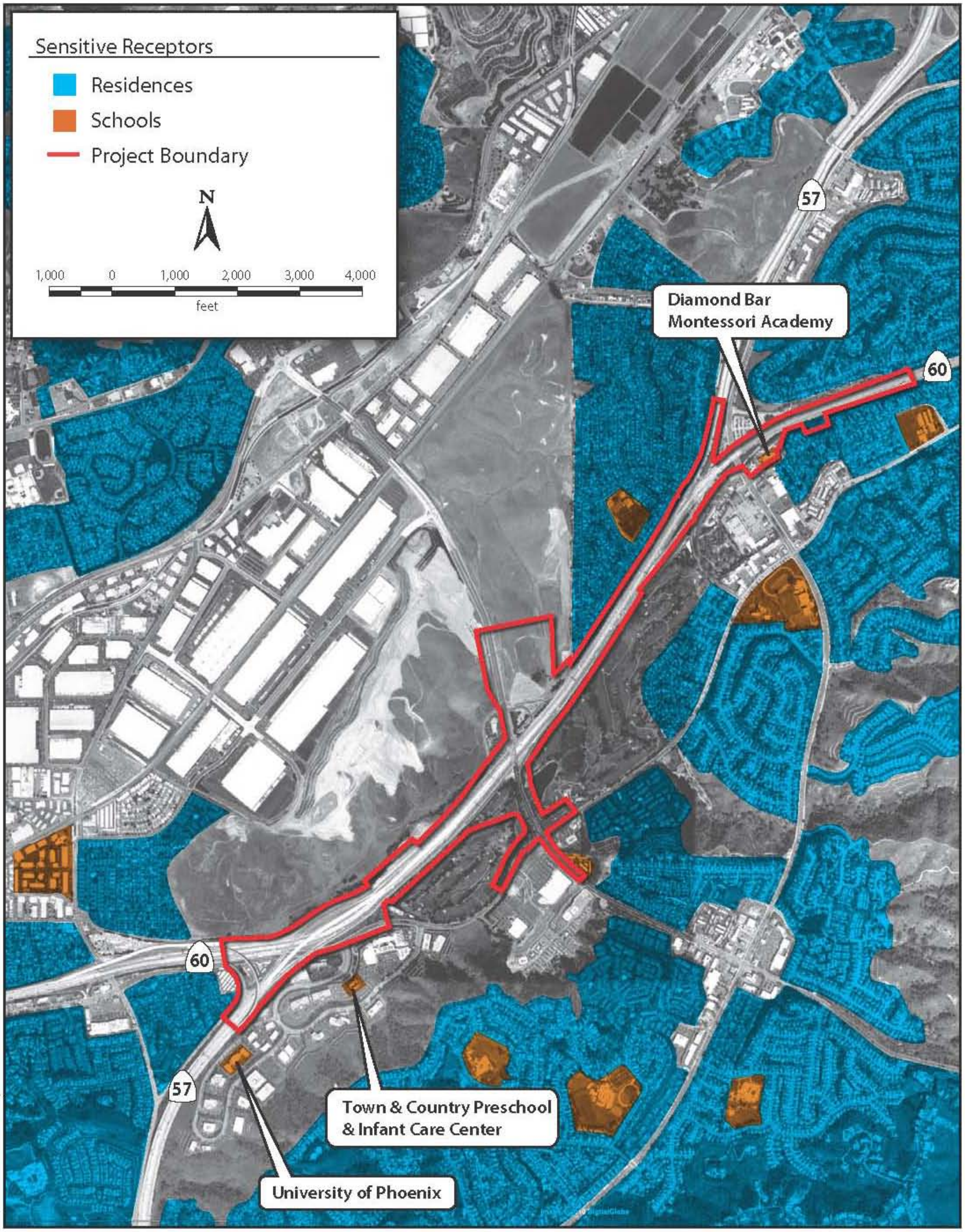

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Figure 3-1
Air Quality Sensitive Receptors

The potential impacts related to localized particulate matter were evaluated using the EPA and FHWA's guidance manual, *Transportation Conformity Guidance for Qualitative Hot-spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas* (Federal Highway Administration and U.S. Environmental Protection Agency 2006). MSAT emissions were evaluated using the Federal Highway Administration's *Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents* (Federal Highway Administration 2009a) and preliminary California-specific guidance from Caltrans (Brady pers. comm.; California Air Resources Board 2005).

Transportation Conformity

Regional Conformity

The proposed project is located in an extreme nonattainment area for the federal 8-hour ozone standard (Table 3-1). Because ozone and its precursors are regional pollutants, the proposed project must be evaluated under the transportation conformity requirements described earlier. An affirmative regional conformity determination must be made before the proposed project can proceed. A determination of conformity can be made if the proposed project is described in an approved RTP and TIP and has not been significantly altered in design concept or scope.

Project-level Conformity

Carbon Monoxide

The proposed project is located in an attainment/maintenance area for the federal CO standard (Table 3-1). Consequently, the evaluation of transportation conformity for CO is required. The CO transportation conformity analysis is based on the CO Protocol developed for Caltrans by the Institute of Transportation Studies at the University of California, Davis (Garza et al. 1997). The CO Protocol details a qualitative step-by-step procedure to determine whether project-related CO concentrations have the potential to generate new air quality violations, worsen existing violations, or delay attainment of the CAAQS or NAAQS for CO.

Particulate Matter

The proposed project is located in a serious nonattainment area for the federal PM10 standard and a nonattainment area for the federal PM2.5 standard (Table 3-1). On March 10, 2006, EPA published a final rule that establishes the transportation conformity criteria and procedures for determining which transportation projects must be analyzed for local air quality effects in PM2.5 and PM10 nonattainment and maintenance areas. The final rule requires PM10 and PM2.5 hot-spot analyses to be performed for any POAQC or any other project identified by the PM2.5 SIP as a localized air quality concern.

For the assessment of PM10 hot spots, the final rule has separate requirements for PM10 nonattainment/maintenance areas with and without approved conformity SIPs. For areas without approved conformity SIPs, the assessment methodology is similar to the PM2.5 analysis in that a hot-spot analysis is to be performed only for POAQCs. For areas with an approved conformity SIP, the final rule does not apply (i.e., when a state withdraws the existing provisions from its approved conformity SIP and EPA approves the withdrawal or when a state includes the revised PM10 hot-spot requirements in a SIP revision and EPA approves that SIP revision), and an analysis must be performed that meets the requirements in the approved PM10 SIP.

In March 2006, FHWA and EPA issued a guidance document titled *Transportation Conformity Guidance for Qualitative Hot-spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas* (Federal Highway Administration and U.S. Environmental Protection Agency 2006). This guidance identifies examples of projects that are most likely POAQCs and details a qualitative step-by-step screening procedure to determine whether project-related particulate emissions have the potential to generate new air quality violations, worsen existing violations, or delay attainment of the NAAQS for PM2.5 or PM10. In addition to the 2006 guidance, EPA approved guidance for *quantitative* analysis in PM2.5 and PM10 nonattainment and maintenance areas on December 20, 2010 (75 FR 79370). In the Federal Register announcement, EPA provides a 2-year grace period before use of the quantitative guidance is *required* for project-level particulate matter conformity determinations. Therefore, project-level conformity determinations made using the 2006 qualitative guidance are allowed until December 20, 2012 (U.S. Environmental Protection Agency 2010c). As such, the methodology described in the 2006 qualitative guidance document was used to evaluate this proposed project.

POAQCs are certain highway and transit projects that involve significant levels of diesel traffic or any other project identified in the PM2.5 or PM10 SIP as a 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 AADT greater than 125,000 where 8% 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 level of service [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 busses and/or diesel trucks.

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

- Any new or expanded highway project that services primarily gasoline-powered vehicle traffic (i.e., does not involve a significant number or increase in the number of diesel-powered 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 PM2.5 or PM10 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, do not involve any increases in idling, and are be expected to have a neutral or positive influence on PM2.5 or PM10 emissions as a result.

For projects identified as not being a POAQC, qualitative PM2.5 and PM10 (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 because such projects have been found to not be of air quality concern under 40 CFR 93.123(b)(1).

For areas with an approved conformity SIP, the final rule does not apply (i.e., when a state withdraws the existing provisions from its approved conformity SIP and EPA approves the withdrawal or when a state includes the revised PM10 hot-spot requirements in a SIP revision and EPA approves that SIP revision). For these areas, the assessment should continue to follow the PM10 hot-spot procedures in their existing conformity SIPs until the SIP is updated and subsequently approved by EPA.

The guidance for conducting a PM10 hot-spot analysis for conformity purposes has separate requirements for PM10 nonattainment/maintenance areas with and without approved conformity SIPs. The CFR indicates that a conformity SIP for particulate matter has not been approved for the SCAB by EPA (40 CFR 52.223). Consequently, if the project is a POAQC, it must undergo a PM10 (and PM2.5) hot-spot conformity determination. Projects identified as not being a POAQC do not require qualitative PM2.5 and PM10 hot-spot analyses. Because the proposed project would be located in an area classified as a nonattainment area for the federal PM10 and PM2.5 standards, a determination must be made as to whether it would result in a PM10 or PM2.5 hot spot.

Mobile-source Air Toxics

MSAT emissions were evaluated using a combination of FHWA's *Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents* (Federal Highway Administration 2009a) and preliminary California-specific guidance from Caltrans. At this time, the California-specific guidance is identical to the FHWA's guidance, except for California-specific criteria for performing qualitative and quantitative analysis (Brady pers. comm.). The California-specific criteria are found in CARB's *Air Quality and Land Use Handbook: A Community Health Perspective* (CARB Land Use Handbook) (Brady pers. comm.; California Air Resources Board 2005). FHWA's interim guidance uses a tiered approach regarding how MSATs should be addressed in NEPA documents for highway projects (Federal Highway Administration 2009a). Depending on the specific project circumstances, FHWA has identified three levels of analysis:

1. No analysis for exempt projects or projects with no potential for meaningful MSAT effects
2. Qualitative analysis for projects with low potential MSAT effects
3. Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects

Exempt Projects or Projects with No Meaningful Potential MSAT Effects

The types of projects included in this category are:

- Projects qualifying for a categorical exclusion under 23 CFR 771.117(c)
- Projects exempt under the CAA conformity rule under 40 CFR 93.126
- Other projects with no meaningful effects on traffic volumes or vehicle mix

Projects that are categorically excluded under 23 CFR 771.117(c), or are exempt under the CAA pursuant to 40 CFR 93.126, require no analysis or discussion of MSATs. Documentation sufficient to demonstrate that the project qualifies for a categorical exclusion and/or is exempt will suffice. For other projects with no or negligible traffic effects, regardless of the class of NEPA environmental document, no MSAT analysis is required.[1] However, the project record must document the basis for the determination of "no meaningful potential effects" with a brief description of the factors considered.

Projects with a Low Potential MSAT Effects

This category covers a broad range of projects because projects included in this category are those that serve to improve operations of highway, transit, or freight without adding substantial new capacity or without creating a facility that is likely to increase emissions meaningfully.

FHWA anticipates that most highway projects will fall into this category. Any projects not meeting the criteria for higher potential effects should be included in this category. Examples of these types of projects are minor widening projects and new interchanges, such as those that replace a signalized intersection on a surface street or where design-year AADT is projected to be less than 150,000. In California, the corresponding AADT criteria under which a project is considered to have low potential MSAT effects are 100,000 for urban non-freeways and 50,000 for rural non-freeways. In addition, California has a third criterion, which states that if freeway modifications are to be completed more than 500 to 1,000 feet from a sensitive land use (e.g., residences, schools, day care centers, playgrounds, and medical facilities), the project is anticipated to result in low potential MSAT effects (Brady pers. comm.; California Air Resources Board 2005). A qualitative assessment of emissions projections should be conducted for these projects. The qualitative assessment would compare, in narrative form, the expected effect of the proposed project on traffic volumes, vehicle mix, or routing of traffic and the associated changes in MSATs for the project alternatives, based on VMT, vehicle mix, and speed. The assessment would also discuss national trend data projecting substantial overall reductions in emissions due to stricter engine and fuel regulations issued by EPA. Because the emission effects of these projects would be low, FHWA expects that there would be no appreciable difference in overall MSAT emissions among the various alternatives. In addition, quantitative emissions analysis of these types of projects will not yield credible results that are useful to project-level decision-making because of the limited capabilities of the transportation and emissions forecasting tools.

Projects with Higher Potential MSAT Effects

Projects included in this category have the potential for meaningful differences among project alternatives. FHWA expects only a limited number of projects to meet this two-pronged test. To fall into this category, projects must create or significantly alter a major intermodal freight facility that has the potential to concentrate high levels of DPM in a single location or create new or add significant capacity to urban highways such as interstates, urban arterials, or urban collector-distributor routes where the AADT volumes are projected to be in the range of 140,000

[1] The types of projects categorically excluded under 23 CFR 771.117(d) or exempt from certain conformity requirements under 40 CFR 93.127 do not warrant an automatic exemption from an MSAT analysis, but they usually will have no meaningful impact.

to 150,000,[2] or greater, by the design year. Projects in this category must also be proposed to be located in proximity to populated areas or in rural areas in proximity to concentrations of vulnerable populations (i.e., people in schools, nursing homes, hospitals). In California, the corresponding AADT criteria over which a project is considered to have higher potential for MSAT effects are 100,000 for urban non-freeways and 50,000 for rural non-freeways. In addition, California considers a project to have higher potential MSAT effects if modifications to freeways are proposed to take place within 500 to 1,000 feet of sensitive land uses (e.g., residences, schools, day care centers, playgrounds, and medical facilities) (Brady pers. comm.; California Air Resources Board 2005).

Projects falling in this category should be more rigorously assessed for effects, and FHWA should be contacted for assistance in developing a specific approach for assessing effects. This approach would include a quantitative analysis that would attempt to measure the level of emissions for the seven priority MSATs for each alternative for use as a basis of comparison. This analysis also may address the potential for cumulative effects, where appropriate, based on local conditions. How and when cumulative effects should be considered would be addressed as part of the assistance outlined above. If the analysis for a project in this category indicates meaningful differences in levels of MSAT emissions, mitigation options should identified and considered.

Applicable Project MSAT Category Assessment

KOA Corporation supplied average daily traffic (ADT) data for SR-57 and SR-60 (mainline), Grand Avenue and Golden Springs Drive (arterials), and the SR-60 ramps connecting SR-60 and Grand Avenue. The ADT data for the mainline and arterials were segmented by major interchange or overcrossing and divided by traffic direction. For example, along SR-57, KOA Corporation provided northbound and southbound ADT for 10 segments, from Brea Canyon Road to Temple Avenue. Likewise, along SR-60, KOA Corporation provided eastbound and westbound ADT for 20 segments, from Fullerton Road to the Philips Ranch Road. For illustrative purposes, Tables 3-4 and 3-5 summarize the complete mainline and arterial data supplied by the traffic engineers, respectively (KOA Corporation 2011).

The analysis of MSAT effects requires total ADT, which, depending on the direction of the road, is the sum of either eastbound and westbound or northbound and southbound ADT. Therefore, to calculate total ADT along SR-57, northbound and southbound ADT data for each corresponding roadway segment were summed; total ADT along SR-60 was calculated by adding eastbound and westbound ADT. Northbound and southbound ADT data were summed to calculate total ADT on Grand Avenue, and eastbound and westbound ADT data were summed to calculate total ADT on Golden Springs Drive. Note that along SR-60, eastbound traffic from Brea Canyon Road and the SR-57 merge was divided into two segments, while westbound traffic within this reach was provided as one single segment. To obtain total ADT, the eastbound traffic volumes were first averaged before they were added to westbound ADT. In addition, only northbound

[2] Using EPA's MOBILE6.2 emissions model, FHWA technical staff determined that this range of AADT would be roughly equivalent to the CAA definition of a major HAP source (i.e., 25 tons per year for all HAPs or 10 tons per year for any single HAP). Significant variations in conditions such as congestion or vehicle mix could warrant a different range for AADT.

Table 3-4. Directional ADT along SR-57 and SR-60

Index	Segment	Existing (2009)	2017 Interim Alt 1	2017 Interim Alt 2	2017 Interim Alt 3	2037 Future Alt 1	2037 Future Alt 2	2037 Future Alt 3
SR-57 Freeway Links								
67	SR-57 NB south of Brea Canyon Rd on-ramp	56,028	59,000	59,300	59,300	65,500	66,600	66,600
167/165	SR-57 NB btwn Brea Canyon Rd on-ramp and Diamond Bar Blvd on-ramp	59,928	62,500	62,600	62,600	68,100	68,400	68,400
168/166/171	SR-57 NB btwn Diamond Bar Blvd on-ramp and Pathfinder Rd on-ramp	64,400	65,000	65,100	65,100	66,300	66,600	66,600
7/132	SR-57 NB btwn Pathfinder Rd on-ramp and SR-60 WB off-ramp	60,700	64,000	64,400	64,400	71,400	72,600	72,600
27	SR-57 NB btwn SR-60 WB off-ramp and SR-60 EB merge	52,500	53,400	54,700	54,700	55,300	59,500	59,500
122	SR-57 NB btwn SR-60 EB split and Temple Ave off-ramp	50,500	54,400	57,200	57,200	63,100	72,000	72,000
3	SR-57 SB btwn Temple Ave on-ramp and SR-60 WB merge	55,300	57,900	60,300	60,300	63,700	71,200	71,200
23	SR-57 SB btwn SR-60 WB split and SR-57 SB on-ramp from SR-60 EB	65,100	67,500	67,600	67,600	72,600	73,200	73,200
6	SR-57 SB btwn SR-57 on-ramp from SR-60 EB and Pathfinder Rd off-ramp	58,800	63,100	63,300	63,300	72,600	73,200	73,200
66	SR-57 SB btwn Pathfinder Rd off-ramp and Diamond Bar off-ramp	74,646	77,400	76,200	76,200	83,600	79,700	79,700
SR-60 Freeway Links								
8	SR-60 EB west of Fullerton Rd on-ramp	65,300	67,202	67,202	67,202	71,400	71,400	71,400
22/153	SR-60 EB btwn Fullerton Rd off-ramp and on-ramp	64,100	67,818	68,188	68,188	76,200	77,400	77,400
154/155	SR-60 EB btwn Fullerton Rd on-ramp and Nogales St off-ramp	67,000	71,500	71,676	71,676	81,500	82,100	82,100
156/157	SR-60 EB btwn Nogales St off-ramp and on-ramp	69,900	74,400	74,767	74,767	84,500	85,700	85,700
158/159	SR-60 EB btwn Nogales St on-ramp and Fairway Dr off-ramp	64,800	71,100	71,452	71,452	85,100	86,300	86,300
160/161	SR-60 EB btwn Fairway Dr off-ramp and on-ramp	60,900	67,900	68,227	68,227	83,300	84,500	84,500
162/163	SR-60 EB btwn Fairway Dr on-ramp and Brea Canyon Rd on-ramp	65,900	72,500	74,725	74,725	87,200	94,400	94,400
9	SR-60 EB btwn Brea Canyon Rd on-ramp and SR-57 SB off-ramp	67,000	78,500	80,538	80,538	104,100	110,700	110,700
10/150	SR-60 EB btwn SR-57 SB off-ramp and SR-57 NB merge	62,600	67,300	69,000	69,000	77,900	83,300	83,300
1	SR-60 EB btwn SR-57 NB merge and Grand Ave off-ramp	115,100	120,500	123,500	123,500	132,700	142,200	142,200
2	SR-60 EB btwn Grand Ave off-ramp and Grand Ave on-ramp	107,900	112,100	116,100	116,100	121,400	134,500	134,500
146/148/134	SR-60 EB btwn Grand Ave on-ramp and SR-57 NB split	116,500	122,600	127,600	127,600	136,300	152,300	152,300
15	SR-60 EB btwn SR-57 NB split and Diamond Bar Blvd on-ramp	60,000	64,600	63,800	63,800	74,700	72,300	72,300
57	SR-60 EB btwn Diamond Bar Blvd on-ramp and Philips Ranch Rd off-ramp	69,700	73,400	75,400	75,400	81,500	88,100	88,100
16	SR-60 WB btwn Philips Ranch Rd on-ramp and Diamond Bar Blvd on-ramp	60,900	65,700	66,200	66,200	76,500	77,900	77,900
147/164	SR-60 WB btwn Diamond Bar Blvd on-ramp and SR-57 SB merge	65,100	67,600	68,300	68,300	73,200	75,600	75,600
141	SR-60 WB btwn SR-57 SB merge and Grand Ave off-ramp	109,500	118,000	121,300	121,300	136,900	147,600	147,600
4/143	SR-60 WB btwn Grand Ave off-ramp and Grand Ave on-ramp	118,900	119,600	121,700	121,700	121,400	127,900	127,900
5/11	SR-60 WB btwn Grand Ave on-ramp and SR-57 SB split	53,700	57,400	59,900	59,900	65,500	73,800	73,800
12	SR-60 WB btwn SR-57 SB split and Brea Canyon Rd off-ramp	59,800	63,800	65,500	65,500	72,600	77,900	77,900

NB = northbound; SB = southbound; WB = westbound; EB = eastbound.
Source: KOA Corporation 2011.

Table 3-5. Directional ADT along Grand Avenue and Golden Springs Drive

		2017 Interim			2037 Future		
Link	**Existing**	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 1**	**Alt 2**	**Alt 3**
Grand Ave SB north of SR-60 WB on-/off-ramps	13,700	17,700	19,500	19,500	26,500	32,300	32,300
Grand Ave SB btwn SR-60 WB off-ramp and WB on-ramp – No Match	13,300	20,300	20,300	20,300	35,800	35,800	35,800
Grand Ave SB btwn SR-60 WB on-ramp and EB ramps	13,300	19,000	17,500	17,500	31,500	26,700	26,700
Grand Ave SB btwn SR-60 EB on-ramp and EB loop on-ramp – No Match	12,900	17,500	17,500	17,500	26,700	26,700	26,700
Grand Ave SB btwn SR-60 EB ramps and Golden Springs Dr	12,900	14,100	15,300	15,300	16,700	20,600	20,600
Grand Ave SB btwn Golden Springs Dr and Chardonay Dr	12,000	13,200	13,700	13,700	16,000	17,500	17,500
Grand Ave NB north of SR-60 WB on-/off-ramps	16,100	19,900	21,300	21,300	28,500	33,000	33,000
Grand Ave NB btwn SR-60 EB and WB ramps	14,800	18,600	19,200	19,200	27,100	29,000	29,000
Grand Ave NB btwn Golden Springs Dr and SR-60 EB ramps	14,700	17,700	18,000	18,000	24,300	25,400	25,400
Grand Ave NB btwn Golden Springs Dr and Chardonay Dr	13,100	15,300	15,700	15,700	20,300	21,600	21,600
Golden Springs Dr EB btwn Grand Ave and Lavender Dr	13,400	14,900	14,300	14,300	18,000	16,300	16,300
Golden Springs Dr EB btwn Grand Ave and Racquet Club Dr	8,000	9,000	8,900	8,900	11,400	11,000	11,000
Golden Springs Dr WB btwn Grand Ave and Lavender Dr	10,700	12,800	12,500	12,500	17,500	16,700	16,700
Golden Springs Dr WB btwn Grand Ave and Racquet Club Dr	8,800	10,400	9,800	9,800	14,100	12,200	12,200
Source: KOA Corporation 2011.							

traffic volumes south of Diamond Bar Boulevard along SR-57 and eastbound traffic volumes west of Brea Canyon Road along SR-60 were provided by KOA Corporation. Consequently, total mainline ADT for these reaches was not calculated. Table 3-6 summarizes the total mainline ADT used for the analysis of potential MSAT effects. Table 3-7 summarizes the total ADT on Grand Avenue and Golden Springs Drive used for the analysis of potential MSAT effects. Similar to the mainline ADT segments, the northbound counterparts for the following two southbound segments were not provided by KOA Corporation: (1) Grand Avenue southbound between the SR-60 westbound off-ramp and westbound on-ramp and (2) Grand Avenue southbound between the SR-60 eastbound on-ramp and eastbound loop on-ramp. Consequently, total ADT on Grand Avenue for these reaches was not calculated.

In addition, Tables 3-8 and 3-9 summarize anticipated diesel truck percentages provided by the traffic engineers for the mainline and arterials, respectively (Knox pers. comm. [A]; KOA Corporation 2010). Similar to the ADT provided by KOA Corporation, diesel truck percentages were separated by direction.

Table 3-6. Mainline ADT on SR-57 and SR-60

SR-57							
	Existing	2017 Interim			2037 Future		
Segment	(2009)	Alt 1	Alt 2	Alt 3	Alt 1	Alt 2	Alt 3
Diamond Bar Blvd and Pathfinder Rd	139,046	142,400	141,300	141,300	149,900	146,300	146,300
Pathfinder Rd and SR-60	119,500	127,100	127,700	127,700	144,000	145,800	145,800
SR-60 on-/off-ramps and SR-60 split	117,600	120,900	122,300	122,300	127,900	132,700	132,700
SR-60 and Temple Ave	105,800	112,300	117,500	117,500	126,800	143,200	143,200
SR-60							
	Existing	2017 Interim			2037 Future		
Segment	(2009)	Alt 1	Alt 2	Alt 3	Alt 1	Alt 2	Alt 3
Brea Canyon Rd and SR-57	124,600	136,700	140,269	140,269	163,600	174,900	174,900
SR-57 and Grand Ave	168,800	177,900	183,400	183,400	198,200	216,000	216,000
Btwn Grand Ave on-/off-ramps	226,800	231,700	237,800	237,800	242,800	262,400	262,400
Grand Ave and SR-57 split	226,000	240,600	248,900	248,900	273,200	299,900	299,900
SR-57 split and Diamond Bar Blvd	125,100	132,200	132,100	132,100	147,900	147,900	147,900
Diamond Bar Blvd and Philips Ranch Rd	130,600	139,100	141,600	141,600	158,000	166,000	166,000
Adapted from: KOA Corporation 2011.							

Table 3-7. Arterial ADT along Grand Avenue and Golden Springs Drive

Grand Avenue							
		2017 Interim			2037 Future		
Segment	Existing	Alt 1 (No Project)	Alt 2	Alt 3	Alt 1 (No Project)	Alt 2	Alt 3
Grand Ave north of SR-60 WB on-/off-ramps	29,800	37,600	40,800	40,800	55,000	65,300	65,300
Grand Ave btwn SR-60 WB on-ramp and EB ramps	28,100	37,600	36,700	36,700	58,600	55,700	55,700
Grand Ave btwn SR-60 EB ramps and Golden Springs Dr	27,600	31,800	33,300	33,300	41,000	46,000	46,000
Grand Ave btwn Golden Springs Dr and Chardonay Dr	25,100	28,500	29,400	29,400	36,300	39,100	39,100
Golden Springs Drive							
		2017 Interim			2037 Future		
Segment	Existing	Alt 1 (No Project)	Alt 2	Alt 3	Alt 1 (No Project)	Alt 2	Alt 3
Golden Springs Dr btwn Grand Ave and Lavender Dr	24,100	27,700	26,800	26,800	35,500	33,000	33,000
Golden Springs Dr btwn Grand Ave and Racquet Club Dr	16,800	19,400	18,700	18,700	25,500	23,200	23,200
Adapted from: KOA Corporation 2011.							

Table 3-8. Directional Diesel Truck Percentages on SR-57 and SR-60

SR-57	
Link	**Truck Percentage[a]**
SR-57 NB south of Brea Canyon Rd on-ramp	2.4
SR-57 NB btwn Brea Canyon Rd on-ramp and Diamond Bar Blvd on-ramp	2.4
SR-57 NB btwn Diamond Bar Blvd on-ramp and Pathfinder Rd on-ramp	2.4
SR-57 NB btwn Pathfinder Rd on-ramp and SR-60 WB on-ramp	2.4
SR-57 NB btwn SR-60 WB on-ramp and SR-60 EB merge	2.4
SR-57 NB btwn SR-60 EB split and Temple Ave off-ramp	8
SR-57 SB btwn Temple Ave on-ramp and SR-60 WB merge	4.6
SR-57 SB btwn SR-60 WB split and SR-57 SB on-ramp from SR-60 EB	4.6
SR-57 SB btwn SR-57 on-ramp from SR-60 EB and Pathfinder Rd off-ramp	8.5
SR-57 SB btwn Pathfinder Rd off-ramp and Diamond Bar off-ramp	8.5
SR-60	
Link	**Truck Percentage[a]**
SR-60 EB west of Fullerton Rd on-ramp	6.2
SR-60 EB btwn Fullerton Rd off-ramp and on-ramp	6.2
SR-60 EB btwn Fullerton Rd on-ramp and Nogales St off-ramp	6.2
SR-60 EB btwn Nogales St off-ramp and on-ramp	6.2
SR-60 EB btwn Nogales St on-ramp and Fairway Dr off-ramp	6.2
SR-60 EB btwn Fairway Dr off-ramp and on-ramp	6.2
SR-60 EB btwn Fairway Dr on-ramp and Brea Canyon Rd on-ramp	6.2
SR-60 EB btwn Brea Canyon Rd on-ramp and SR-57 SB off-ramp	6.2
SR-60 EB btwn SR-57 SB off-ramp and SR-57 NB merge	6.2
SR-60 EB btwn SR-57 NB merge and Grand Ave off-ramp	5.2
SR-60 EB btwn Grand Ave off-ramp and Grand Ave on-ramp	5.2
SR-60 EB btwn Grand Ave on-ramp and SR-57 NB split	5.2
SR-60 EB btwn SR-57 NB split and Diamond Bar Blvd on-ramp	5.2
SR-60 EB btwn Diamond Bar Blvd on-ramp and Philips Ranch Rd off-ramp	5.2
SR-60 WB btwn Philips Ranch Rd on-ramp and Diamond Bar Blvd on-ramp	8.2
SR-60 WB btwn Diamond Bar Blvd on-ramp and SR-57 SB merge	8.2
SR-60 WB btwn SR-57 SB merge and Grand Ave off-ramp	8
SR-60 WB btwn Grand Ave off-ramp and Grand Ave on-ramp	8
SR-60 WB btwn Grand Ave on-ramp and SR-57 SB split	8
SR-60 WB btwn SR-57 SB split and Brea Canyon Rd off-ramp	8

[a] Truck percentages are anticipated to be the same for existing (2009), interim (2017), and future (2037) scenarios.

Sources: Knox pers. comm. [A]; KOA Corporation 2011.

Table 3-9. Directional Diesel Truck Percentages on Grand Avenue and Golden Springs Drive

Grand Avenue	
Link	**Truck Percentage[a]**
Grand Ave SB north of SR-60 WB on-/off-ramps	10
Grand Ave SB btwn SR-60 WB off-ramp and WB on-ramp	10
Grand Ave SB btwn SR-60 WB on-ramp and EB ramps	10
Grand Ave SB Btwn SR-60 EB on-ramp and EB loop on-ramp	10
Grand Ave SB btwn SR-60 EB Ramps and Golden Springs Dr	2
Grand Ave SB btwn Golden Springs Dr and Chardonay Dr	2
Grand Ave NB north of SR-60 WB on-/off-ramps	10
Grand Ave NB btwn SR-60 EB and WB ramps	10
Grand Ave NB btwn Golden Springs Dr and SR-60 EB ramps	2
Grand Ave NB btwn Golden Springs Dr and Chardonay Dr	2
Golden Springs Drive	
Link	**Truck Percentage[a]**
Golden Springs Dr EB btwn Grand Ave and Lavender Dr	2
Golden Springs Dr EB btwn Grand Ave and Racquet Club Dr	2
Golden Springs Dr WB btwn Grand Ave and Lavender Dr	2
Golden Springs Dr WB btwn Grand Ave and Racquet Club Dr	2

[a] Truck percentages are anticipated to be the same for existing (2009), interim (2017), and future (2037) scenarios.

Sources: Knox per. comm. [A]; KOA Corporation 2011.

As discussed previously, the analysis of MSAT effects requires total ADT, which, depending on the direction of the road, is the sum of either eastbound and westbound or northbound and southbound ADT. Therefore, the directional truck percentages must be averaged so that they correspond with the total ADT for the mainline and arterials (see Tables 3-6 and 3-7). A weighted average based on directional ADT for existing conditions (2009) and the directional truck percentages (see Tables 3-8 and 3-9) was used to determine the appropriate truck percentage corresponding to the total ADT summarized in Tables 3-6 and 3-7. Tables 3-10 and 3-11 show the averaged truck percentages associated with the segments in Tables 3-6 and 3-7, respectively.

As shown in Table 3-6, mainline ADT on SR-57 is anticipated to change as follows, under Build Alternatives 2 and 3, when compared with the No-Build Alternative:

- Along the Diamond Bar Boulevard to the Pathfinder Road segment, ADT is expected to decrease by 1,100, from 142,400 to 141,300, at opening year 2017 and decrease by 3,600, from 149,900 to 146,300, at horizon year 2037.
- Along the Pathfinder Road to the SR-60 segment, ADT is expected to increase by 600, from 127,100 to 127,700, at opening year 2017 and increase by 1,800, from 144,000 to 145,800, at horizon year 2037.
- Along the SR-60 on-/off-ramps to the SR-60 split segment, ADT is expected to increase by 1,400, from 120,900 to 122,300, during opening year 2017 and increase by 4,800, from 127,900 to 132,700, at horizon year 2037.
- Along the SR-60 to the Temple Avenue segment, ADT is expected to increase by 5,200, from 112,300 to 117,500, during opening year 2017 and increase by 16,400, from 126,800 to 143,200, at horizon year 2037.

Table 3-10. Diesel Truck Percentages on SR-57 and SR-60

SR-57	
Segment	**Truck Percentage[a, b]**
Diamond Bar Blvd and Pathfinder Rd	5.3
Pathfinder Rd and SR-60	5.4
SR-60 on-/off-ramps and SR-60 split	3.6
SR-60 and Temple Ave	6.2
SR-60	
Segment	**Truck Percentage[a, b]**
Brea Canyon Rd and SR-57	6.8
SR-57 and Grand Ave	6.1
Btwn Grand Ave on-/off-ramps	6.7
Grand Ave and SR-57 split	6.6
SR-57 split and Diamond Bar Blvd	6.8
Diamond Bar Blvd and Philips Ranch Rd	6.6

[a] Truck percentages are anticipated to be the same for existing (2009), interim (2017), and future (2037) scenarios (Knox pers. comm. [A]).
[b] To determine the appropriate truck percentage for the total ADT for each segment, the weighted average was calculated with the directional ADT summarized in Table 3-4 and the directional truck percentages summarized in Table 3-8.
Adapted from KOA Corporation 2011.

Table 3-11. Diesel Truck Percentages on Grand Avenue and Golden Springs Drive

Grand Avenue	
Segment	**Truck Percentage[a, b]**
Grand Ave north of SR-60 WB on-/off-ramps	10.0
Grand Ave btwn SR-60 WB on-ramp and EB ramps	10.0
Grand Ave btwn SR-60 EB ramps and Golden Springs Dr	2.0
Grand Ave btwn Golden Springs Dr and Chardonay Dr	2.0
Golden Springs Drive	
Segment	**Truck Percentage[a, b]**
Golden Springs Dr btwn Grand Ave and Lavender Dr	2.0
Golden Springs Dr btwn Grand Ave and Racquet Club Dr	2.0

[a] Truck percentages are anticipated to be the same for existing (2009), interim (2017), and future (2037) scenarios (Knox pers. comm. [A]).
[b] To determine the appropriate truck percentage for the total ADT for each segment, the weighted average was calculated with the directional ADT summarized in Table 3-5 and the directional truck percentages summarized in Table 3-9.
Adapted from: KOA Corporation 2011.

Also shown in Table 3-6, mainline ADT on SR-60 is anticipated to change as follows, under Build Alternatives 2 and 3, when compared with the No-Build Alternative:

- Along the Brea Canyon Road to the SR-57 segment, ADT is expected to increase by 3,569, from 136,700 to 140,269, at opening year 2017 and increase by 11,300, from 163,600 to 174,900, at horizon year 2037.
- Along the SR-57 to the Grand Avenue segment, ADT is expected to increase by 5,500, from 177,900 to 183,400, during opening year 2017 and increase by 17,800, from 198,200 to 216,000, at horizon year 2037.

- Between the Grand Avenue on-/off-ramp segment, ADT is expected to increase by 6,100, from 231,700 to 237,800, during opening year 2017 and increase by 19,600, from 242,800 to 262,400, at horizon year 2037.
- Along the Grand Avenue to the SR-57 split segment, ADT is expected to increase by 8,300, from 240,600 to 248,900, during opening year 2017 and increase by 26,700, from 273,200 to 299,900, at horizon year 2037.
- Along the SR-57 split to the Diamond Bar Boulevard segment, ADT is expected to decrease by 100, from 132,200 to 132,100, during opening year 2017 and remain unchanged at 147,900 during horizon year 2037.
- Along the Diamond Bar Boulevard to the Philips Ranch Road segment, ADT is expected to increase by 2,500, from 139,100 to 141,600, during opening year 2017 and increase by 8,000, from 158,000 to 166,000, at horizon year 2037.

At horizon year 2037, it is estimated that mainline ADT on SR-57 and SR-60 would be in excess of the 140,000 ADT criteria established by FHWA for all segments except one under Build Alternatives 2 or 3. In addition, as previously mentioned in Section 3.1.2.4, "Sensitive Receptors," the project is proposed to be located in proximity to populated areas.

As discussed above, in addition to the federal criteria, California has its own criteria for when a project is considered to have higher potential MSAT effects. California considers freeway projects and high-traffic roads (urban roads with 100,000 vehicles per day or rural roads with 50,000 vehicles per day) located 500 to 1,000 feet from sensitive land uses to have higher potential MSAT effects (Brady pers. comm.; California Air Resources Board 2005). California considers the following to be sensitive land uses: residences, schools, day care centers, playgrounds, and medical facilities (California Air Resources Board 2005). Grand Avenue and Golden Springs Drive would be considered "urban roads," according to CARB's *Land Use Handbook*, but as shown in Table 3-7, ADT on these roads would not exceed the 100,000 criterion California uses for higher potential MSAT effects. SR-60 would be considered a freeway according to California criteria, and as noted previously, there are residences approximately 100 feet northwest of the SR-57/SR-60 confluence. Therefore, under California's criteria, the proposed project is considered to be a project with higher potential MSAT effects, and MSAT emissions must be quantified and further evaluated.

CT-EMFAC Model (Version 4.1). CT-EMFAC is a California-specific project-level analysis tool developed for Caltrans by the University of California, Davis to model criteria pollutant and CO_2 emissions from on-road mobile sources. The model uses the latest version of the California Mobile Source Emission Inventory and Emission Factors Model, EMFAC2007, to quantify running exhaust and running loss emissions using user-input traffic data, including peak-period and off-peak-period VMT data allocated into 5 mph speed bins. Running exhaust emissions are emitted from the vehicle tailpipe while the vehicle is traveling, while running loss emissions are evaporative total organic gas (TOG) emissions that occur when hot fuel vapors escape from the fuel system or overwhelm the carbon canister while the vehicle is operating. CT-EMFAC will estimate emission factors and project-level emissions for the following pollutants:

- **Criteria pollutants:** Ozone precursors (TOG and NO_X)**,** CO, SO_X, PM10, and PM2.5

- **Greenhouse gases:** CO_2
- **Mobile-source Air Toxics:** acrolein, benzene, 1,3-butadiene, diesel particulate matter, formaldehyde, napthalene, and polycyclic organic matter

Entrained Paved Road Dust Methodology. Although CT-EMFAC calculates particulate matter emissions resulting from vehicle exhaust, it does not account for entrained paved road dust. Fugitive dust emissions from vehicle travel on paved roads (i.e., entrained dust) can be calculated according to the emission factor equation found in EPA's *Compilation of Air Pollutant Emission Factors*, AP-42 Section 13.2.1 document (U.S. Environmental Protection Agency 2011). In addition, the CARB methodology to calculate county-specific emissions inventories provide factors specific to Los Angeles County. The AP-42 emission factor equation requires the input of several variables, such as particle size multiplier, the roadway silt loading factor, and average vehicle weight, all of which are county specific, except for particle size. The emission factor equation and associated variables are provided below:

*Road Emissions (Pounds Particulate Matter/Day) = Daily VMT * Emission Factor (E)*

$E = [k(sL)^{0.91}(W)^{1.02}](1 - P/4N)$ *where:*

E = particulate emission,
k = particle size multiplier for particle size range and units of interest,
sL = roadway silt loading (g/m^2),
W = average weight of vehicles traveling the road (tons),
P = number of "wet" days with at least 0.254 mm (0.01 in) of precipitation during the averaging period, and
N = number of days in the averaging period (e.g., 365 for annual, 91 for seasonal, 30 for monthly).

Criteria Pollutant Emission Modeling Procedures

The estimation of criteria pollutant emissions associated with the build alternatives was conducted using Caltrans' CT-EMFAC model and AP-42 using vehicle activity data provided by the project traffic engineer, KOA Corporation (KOA Corporation 2011).

Roadway and Traffic Conditions. Modeled traffic volumes and operating conditions were obtained from the traffic data prepared by the project traffic engineer, KOA Corporation (KOA Corporation 2011). Emissions of ozone precursors (TOG and NO_X), CO, PM10, PM2.5, and CO_2 were modeled for the existing year (2009), interim-year (2017) with and without the project, and the design future year (2037) with and without the project. KOA Corporation provided peak- and off-peak-period VMT data distributed into 5 mph speed bins from 5 to 75 mph. VMT data included vehicle activity within the immediate project region. The traffic data provided by KOA Corporation is summarized in Table 3-12.

Vehicle Emission Rates. Vehicle emission rates were determined using Caltrans' CT-EMFAC model and the VMT data presented in Table 3-12. The CT-EMFAC model assumed the SCAB region of Los Angeles County regional traffic data operating over an annual season. Vehicle fleet mix for the project was based on data provided by the project traffic engineer, KOA Corporation (KOA Corporation 2011; Knox pers. comm. [A]).

Qualitative Analysis of Carbon Monoxide

The project was evaluated using the CO Protocol described earlier. The CO Protocol includes two flowcharts that illustrate when a detailed CO analysis needs to be prepared. The first flowchart, Figure 1 of the CO Protocol (also provided in Appendix B), is used to ascertain the CO modeling requirements for new projects. The questions (shown in the first flowchart) relevant to the project, and the answers to those questions are as follows:

3.1.1: Is the project exempt from all emissions analyses?

Response: No, the project does not qualify for an exemption. As shown in Table 1 of the CO protocol (provided in Appendix B), the proposed project does not fall into a project category that is exempt from all emissions analysis (proceed to 3.1.2).

3.1.2: Is the project exempt from regional emissions analyses?

Response: No, the project is not exempt from a regional emissions analysis. As shown in Table 2 of the CO Protocol (provided in Appendix B), the proposed project does not meet the criteria of any of the project categories identified as exempt from regional emissions analysis (proceed to 3.1.3).

3.1.3: Is the project locally defined as regionally significant?

Response: Yes, the proposed project is considered a regionally significant transportation project according to 40 CFR 93.101 (proceed to 3.1.4).

3.1.4: Is the project in a federal attainment area?

Response: No, the proposed project is located in the SCAB, which is a federal extreme nonattainment area for ozone, a serious nonattainment area for PM10, and a nonattainment area for PM2.5 and lead (Table 3-1). If a project area is not classified as an attainment area for all transportation-related criteria pollutants, the project is subject to a regional conformity determination (proceed to 3.1.5)

Table 3-12. VMT and Speed Data Provided by KOA Corporation

Peak Period															
Speed Bin	**Actual Bin**	**Existing (2009)**		**2017 No Project**		**2017 Alternative 2**		**2017 Alternative 3**		**2037 No Project**		**2037 Alternative 2**		**2037 Alternative 3**	
		VMT	**%**	**VMT**	**%**	**VMT**	**%**	**VMT**	**%**	**VMT**	**%**	**VMT**	**%**	**VMT**	**%**
5	0.0–4.99	0	0	0	0	0	0	0	0	6,039	< 1	0	0	0	0
10	5.0–9.99	2,814	< 1	2,522	< 1	4,747	< 1	2,511	< 1	8,747	< 1	6,203	< 1	4,521	< 1
15	10.0–14.99	3,232	< 1	21,568	1	27,623	1	22,489	1	55,454	2	39,115	2	33,509	1
20	15.0–19.99	46,377	2	150,887	8	33,557	2	32,010	2	159,645	7	50,525	2	59,534	3
25	20.0–24.99	106,642	6	126,771	6	121,544	6	125,782	6	295,064	13	227,367	10	222,194	10
30	25.0–29.99	368,227	20	448,362	22	416,178	20	422,302	21	447,627	20	437,396	19	443,609	19
35	30.0–34.99	371,147	20	283,481	14	281,204	14	231,124	11	362,647	16	203,107	9	203,107	9
40	35.0–39.99	159,467	9	197,935	10	179,847	9	89,865	4	146,199	6	202,994	9	202,994	9
45	40.0–44.99	19,543	1	10,455	1	12,168	1	102,150	5	150,401	7	14,247	1	14,247	1
50	45.0–49.99	24,463	1	142,576	7	53,187	3	53,187	3	97,595	4	63,553	3	63,553	3
55	50.0–54.99	62,650	3	32,471	2	0	0	0	0	10,695	< 1	0	0	0	0
60	55.0–59.99	45,646	2	7,880	< 1	9,212	< 1	-	0	53,008	2	231,840	10	341,243	15
65	60.0–64.99	659,186	35	573,658	29	904,983	44	964,275	47	501,568	22	857,489	37	748,087	32
70	65.0–69.99	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	70.0–74.99	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	1,869,394	100	1,998,566	100	2,044,250	100	2,045,695	100	2,294,689	100	2,333,836	100	2,336,598	100
Off-Peak Period															
Speed Bin	**Actual Bin**	**Existing (2009)**		**2017 No Project**		**2017 Alternative 2**		**2017 Alternative 3**		**2037 No Project**		**2037 Alternative 2**		**2037 Alternative 3**	
		VMT	**%**	**VMT**	**%**	**VMT**	**%**	**VMT**	**%**	**VMT**	**%**	**VMT**	**%**	**VMT**	**%**
5	0.0–4.99	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	5.0–9.99	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	10.0–14.99	0	0	0	0	0	0	0	0	4,026	< 1	4,034	< 1	4,034	< 1
20	15.0–19.99	3,637	< 1	145,192	8	3,992	< 1	3,773	< 1	34,482	2	41,505	2	10,194	1
25	20.0–24.99	21,809	1	25,866	1	24,164	1	24,384	1	51,634	3	30,608	2	85,413	5
30	25.0–29.99	61,906	4	87,722	5	73,525	4	73,525	4	74,687	4	103,829	5	119,086	6
35	30.0–34.99	152,281	9	195,665	11	149,707	9	150,997	9	264,736	14	201,567	11	248,128	13
40	35.0–39.99	233,981	13	410,173	23	312,921	18	251,493	14	574,954	30	346,298	18	264,961	14
45	40.0–44.99	132,693	8	106,582	6	147,421	8	98,222	6	128,833	7	98,436	5	97,491	5
50	45.0–49.99	9,438	1	138,674	8	18,359	1	50,807	3	0	0	0	0	0	0
55	50.0–54.99	81,400	5	33,570	2	0	0	32,452	2	82,067	4	0	0	0	0
60	55.0–59.99	149,112	9	7,730	< 1	169,283	10	176,535	10	0	0	94,148	5	254,867	13
65	60.0–64.99	895,682	51	646,456	36	857,350	49	895,826	51	720,849	37	970,184	51	809,465	43
70	65.0–69.99	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	70.0–74.99	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	1,741,939	100	1,797,630	100	1,756,722	100	1,758,014	100	1,936,268	100	1,890,609	100	1,893,639	100

Source: KOA Corporation 2011.

3.1.5: Is there a currently conforming RTP and TIP?

Response: Yes, the 2012-2035 RTP/SCS and 2011 FTIP (proceed to 3.1.6).

3.1.6: Is the project included in the regional emissions analysis supporting the currently conforming RTP and TIP?

Response: Yes, the proposed project is included in the modeling lists in both the SCAG 2012-35 RTP/SCS and the SCAG 2011 FTIP under project ID #LA0D450. The 2012-2035 RTP/SCS was adopted by SCAG on April 4, 2012 and approved by FHWA on June 4, 2012. The 2011 FTIP was adopted by SCAG on September 2, 2010, and approved by FHWA on December 14, 2010. In addition, Amendment #11-24 to the 2011 FTIP was adopted by SCAG on April 4, 2012 and is the latest FTIP consistency amendment approved by FHWA, which granted approval on June 4, 2012. Please refer to Appendix A for project-related documentation from the 2012-2035 RTP/SCS and the 2011 FTIP (proceed to 3.1.7).

3.1.7: Has the project design concept and/or scope changed significantly from that in the regional analysis?

Response: No, within the currently conforming 2012-2035 RTP/SCS and 2011 FTIP documents, the proposed project (Project ID #LA0D450) is described as "*RECONSTRUCT SR 60/GRAND AV INTERCHANGE - WIDEN GRAND AV: SB ADD 1THRU LN (2 EXSTNG); NB ADD 1 THRU LN (3 EXSTNG), REPLACE GRAND AV OC, ADD EB LOOP ON-RAMP, CONSTRUCT ADDITIONAL EB THRU LN FROM GRAND AVE TRAP LN TO SR57 ADD LN, ADD TWO BYPASS RAMP CONNECTORS, ADD AUX LNS EB AND WB FROM EAST TO WEST JUNCTION OF THE CONFLUENCE.*" The project as currently proposed is consistent with this description (proceed to 3.1.9).

3.1.9: The conclusion from this series of questions and answers is that the project needs to be examined for its local air impacts (proceed to Section 4, Figure 3 of the CO Protocol).

On the basis of the answers to the first flowchart, a second flowchart, Figure 3 of the CO Protocol, is used to determine the level of local CO effect analysis required for the project.

The questions applicable to the project in the second flowchart (also provided in Appendix B) and the answers to those questions are as follows:

Level 1: Is the project in a CO nonattainment area?

Response: No, the SCAB is classified as an attainment/maintenance area for the federal CO standards (Table 3-1).

Level 1: Was the area redesignated as an attainment area after the 1990 Clean Air Act?

Response: Yes, the SCAB was reclassified to attainment/maintenance status from serious nonattainment, effective June 11, 2007.

Level 1: Has "continued attainment" been verified with the local air district, if appropriate?

Response: Yes, based on ambient air monitoring data collected by SCAQMD, the SCAB has continually met the federal ambient air quality standards for CO since 2003 (California Air Resources Board 2009c) (Proceed to Level 7).

Level 7: Does project worsen air quality?

Response: Yes. According to Section 4.7.1 of the CO Protocol, the following criteria provide a basis for determining if a project has potential to worsen localized air quality:

- *The project significantly increases the percentage of vehicles operating in the cold start mode. Increasing the number of vehicles in cold-start mode by as little as 2% should be considered potentially significant.*

  Given the nature of the proposed project, which is to reconfigure the approximately 2-mile confluence of SR-57 and SR-60, including the addition of auxiliary lanes and associated on-ramp/off-ramp reconfigurations, there would be no measurable effect on the percentage of vehicles operating in the cold-start mode.

- *The project significantly increases traffic volumes. Increases in traffic volumes in excess of 5% should be considered potentially significant. Increasing the traffic volume by less than 5% may still be potentially significant if there is also a reduction in average speeds.*

Table 3-13 summarizes anticipated intersection volumes for with and without project conditions. As shown therein, traffic volumes are anticipated to increase by more than 5% at multiple intersection locations under both build alternatives compared with the No-Build Alternative at interim year 2017 and future year 2037. As such, the anticipated increase in traffic volumes is considered potentially adverse.

- *The project worsens traffic flow. For uninterrupted roadway segments, a reduction in average speeds (within a range of 3 to 50 mph) should be regarded as worsening traffic flow. For intersection segments, a reduction in average speed or an increase in average delay should be considered a worsening of traffic flow.*

Table 3-13. Intersection Peak-hour Volumes for With- and Without-Project Conditions

Interim-Year (2017)						
	Alternative 1 (No-Project)		Alternative 2		Alternative 3	
Intersection	AM Peak-Hour Volumes	PM Peak-Hour Volumes	AM Peak-Hour Volumes	PM Peak-Hour Volumes	AM Peak-Hour Volumes	PM Peak-Hour Volumes
Grand Ave at SR-60 westbound off-ramp	4,840	5,040	5,180	5,370	5,180	5,370
Grand Ave at SR-60 eastbound off-ramp	4,240	4,150	4,440	4,510	4,440	4,510
Grand Ave at Golden Springs Dr	5,140	5,900	5,080	6,060	5,080	6,060
Grand Avenue at SR-60 westbound slip ramp	3,980	4,350	4,120	4,490	4,120	4,490
Design-Year (2037)						
	Alternative 1 (No-Project)		Alternative 2		Alternative 3	
Intersection	AM Peak-Hour Volumes	PM Peak-Hour Volumes	AM Peak-Hour Volumes	PM Peak-Hour Volumes	AM Peak-Hour Volumes	PM Peak-Hour Volumes
Grand Ave at SR-60 westbound off-ramp	6,580	7,750	7,675	8,830	7,675	8,830
Grand Ave at SR-60 eastbound off-ramp	5,540	5,630	6,175	6,780	6,175	6,780
Grand Ave at Golden Springs Dr	6,550	7,260	6,375	7,740	6,375	7,740
Grand Avenue at SR-60 westbound slip ramp	5,270	6,440	5,875	7,070	5,875	7,120
Adapted from KOA Corporation 2011.						

Intersection operation data for the proposed project was provided by the project traffic engineer, KOA Corporation (KOA Corporation 2011). Table 3-14 summarizes intersection operations for existing (2009) conditions, interim-year (2017) with- and without-project conditions, and design-year (2037) with- and without-project conditions. As shown in Table 3-14, the proposed project alternatives improve LOS in most cases or LOS remains the same. In addition, average delays are estimated to improve substantially.

Although implementation of either build alternative would result in average delay improvements, the proposed project would nonetheless add more than a 5% increase to traffic volumes at multiple intersection locations.

Level 7: Is the project suspected of resulting in higher CO concentrations than those existing within the region at the time of attainment demonstration?

Note: The *Final 2007 Air Quality Management Plan* (AQMP) is the most recent AQMP, but no additional regional or hot-spot CO modeling was conducted to demonstrate further attainment of the 8-hour average ozone standard. This is because SCAQMD submitted a request to EPA to redesignate the SCAB as an attainment area for the 8-hour federal CO standard (South Coast Air Quality Management District 2007). Therefore the 2003 AQMP is used as the basis for the following analysis. In addition, the 2003 AQMP did not provide model input assumptions. Instead, it refers to the 1992 CO Plan where a general description of input assumptions was provided (South Coast Air Quality Management District 2003).

Response: No. According to Section 4.7.2 of the CO Protocol, project sponsors are encouraged to use the following criteria to determine the potential for the project to result in higher CO concentrations than those existing within the region at the time of attainment demonstration:

a. *The receptors at the location under study are at the same distance or farther from the traveled roadway than the receptors at the location where attainment as been demonstrated.*

   A receptor distance of 3 meters from the traveled roadway was used in the CO attainment demonstration prepared for the 2003 AQMP. With respect to the proposed project, all sensitive receptors are located more than 3 meters from the traveled roadway.

b. *The roadway geometry of the two locations is not significantly different. An example of a significant difference would be a larger number of lanes at the location under study compared with the location where attainment has been demonstrated*.

   In the CO attainment demonstration prepared for the 2003 AQMP, four approach lanes in all directions were used to model the intersections at Wilshire/Veteran and La Cienega/Century, while three approach lanes in all directions were used to model the intersections at Sunset/Highland and Long Beach/Imperial. Therefore, if the total number of intersection approach lanes associated with any of the proposed project alternatives exceeds 16 lanes, the intersection could result in a potentially adverse effect. Table 3-15 summarizes approach lanes associated with the proposed project alternatives.

Table 3-14. Summary of Intersection Peak-Hour Operations for the Proposed Project

Existing (2009)						
	AM Peak Hour			PM Peak Hour		
Intersection	Queue Length (feet)	Delay[c]	LOS	Queue Length (feet)	Delay[c]	LOS
Grand Ave at SR-60 westbound off-ramp[a]	283	42.2	D	192	20.1	C
Grand Ave at SR-60 eastbound off-ramp[a]	220	16.2	B	88	11.3	B
Grand Ave at Golden Springs Dr[b]	349	38.6	D	306	54.0	D
Interim Year (2017)						
No Build (Alternative 1)						
	AM Peak Hour			PM Peak Hour		
Intersection	Queue Length (feet)	Delay[c]	LOS	Queue Length (feet)	Delay[c]	LOS
Grand Ave at SR-60 westbound off-ramp[a]	461	29.7	C	303	33.4	C
Grand Ave at SR-60 eastbound off-ramp[a]	257	27.8	C	87	17.6	B
Grand Ave at Golden Springs Dr[b]	466	54.9	D	433	48.3	D
Alternative 2						
	AM Peak Hour			PM Peak Hour		
Intersection	Queue Length (feet)	Delay[c]	LOS	Queue Length (feet)	Delay[c]	LOS
Grand Ave at SR-60 westbound off-ramp[a]	331	21.0	C	149	17.9	B
Grand Ave at SR-60 eastbound off-ramp[a]	186	15.9	B	101	12.6	B
Grand Ave at Golden Springs Dr[b]	493	35.7	D	400	38.7	D
Alternative 3						
	AM Peak Hour			PM Peak Hour		
Intersection	Queue Length (feet)	Delay[c]	LOS	Queue Length (feet)	Delay[c]	LOS
Grand Ave at SR-60 westbound off-ramp[a]	285	20.2	C	144	17.7	B
Grand Ave at SR-60 eastbound off-ramp[a]	201	9.8	A	89	6.2	A
Grand Ave at Golden Springs Dr[b]	250	31.3	C	274	31.6	C
Design Year (2037)						
No Build (Alternative 1)						
	AM Peak Hour			PM Peak Hour		
Intersection	Queue Length (feet)	Delay[c]	LOS	Queue Length (feet)	Delay[c]	LOS
Grand Ave at SR-60 westbound off-ramp[a]	1,005	99.7	F	700	178.9	F
Grand Ave at SR-60 eastbound off-ramp[a]	628	81.9	F	268	84.3	F
Grand Ave at Golden Springs Dr[b]	615	111.6	F	673	103.6	F
Alternative 2						
	AM Peak Hour			PM Peak Hour		
Intersection	Queue Length (feet)	Delay[c]	LOS	Queue Length (feet)	Delay[c]	LOS
Grand Ave at SR-60 westbound off-ramp[a]	508	35.7	D	361	46.8	D
Grand Ave at SR-60 eastbound off-ramp[a]	635	49.6	D	432	55.4	E
Grand Ave at Golden Springs Dr[b]	523	50.6	D	558	64.6	E
Alternative 3						
	AM Peak Hour			PM Peak Hour		
Intersection	Queue Length (feet)	Delay[c]	LOS	Queue Length (feet)	Delay[c]	LOS
Grand Ave at SR-60 westbound off-ramp[a]	527	37.5	D	305	51.4	D
Grand Ave at SR-60 eastbound off-ramp[a]	443	20.0	C	172	10.3	B
Grand Ave at Golden Springs Dr[b]	372	49.6	D	469	53.9	D

[a] Queue length in feet on freeway off-ramp approach
[b] Queue length in feet on southbound approach
[c] Delay in seconds per vehicle average
Source: KOA Corporation.

Table 3-15. Approach Lanes for the Proposed Project Alternatives

Alternative 1 (No-Project)				
Intersection	**Eastbound**	**Westbound**	**Southbound**	**Northbound**
Grand Ave at SR-60 westbound off-ramp	0	1	3	2
Grand Ave at SR-60 eastbound off-ramp	0	0	2	2
Grand Ave at Golden Springs Dr	2	2	2	2
Alternative 2				
Intersection	**Eastbound**	**Westbound**	**Southbound**	**Northbound**
Grand Ave at SR-60 westbound off-ramp	0	1	5	4
Grand Ave at SR-60 eastbound off-ramp	0	0	4	4
Grand Ave at Golden Springs Dr	2	2	3	3
Alternative 3				
Intersection	**Eastbound**	**Westbound**	**Southbound**	**Northbound**
Grand Ave at SR-60 westbound off-ramp	0	1	5	4
Grand Ave at SR-60 eastbound off-ramp	0	0	4	4
Grand Ave at Golden Springs Dr	2	2	3	3
Adapted from KOA Corporation 2011.				

As shown in Table 3-15, for Alternatives 2 and 3, both the Grand Avenue at SR-60 westbound off-ramp intersection and the Grand Avenue at Golden Springs Drive intersection would include 10 approach lanes, while the Grand Avenue at SR-60 eastbound off-ramp intersection would have eight approach lanes. As such, the total number of intersection approach lanes at all intersections under both build alternatives would be less than the number (16 lanes) used in the attainment demonstration.

c. *Expected worse-case meteorology at the location under study is the same or better than the worst-case meteorology at the location where attainment has been demonstrated. Relevant meteorological variables include wind speed, wind direction, temperature, and stability class*.

In the CO attainment demonstration prepared for the 2003 AQMP, a wind speed of 1 meter per second, stability class D, and worst-case wind angle were used as modeling assumptions. These assumptions are considered worst-case; as such, the expected worst-case meteorology at the location under study would be the same or better. In addition, there is no meaningful difference in temperature between the attainment demonstration intersection locations and the proposed project intersection location.

d. *Traffic lane volumes at the location under study are the same or lower than those at the location where attainment has been demonstrated.*

A comparison of the traffic volumes per lane used for modeling in the attainment plan demonstration and volumes per lane projected to occur at study intersection locations is provided in Tables 3-16 and 3-17, respectively.

As shown in Tables 3-16 and 3-17, the total per lane volumes associated with proposed project intersections under both Alternative 2 and Alternative 3 are approximately 50% to 60% lower than the total approach lane volumes of the attainment demonstration intersections at opening year 2017 and approximately 24% to 49% lower at horizon year 2037. Therefore, the traffic lane volumes under both Alternative 2 and Alternative 3 for all scenarios are expected to be lower than those for the attainment demonstration intersections at opening year 2017 and horizon year 2037.

e. *Percentage of vehicles operating in cold-start mode at the location under study is the same or lower than the percentage at the location where attainment has been demonstrated.*

The proposed project would not increase the percentage of vehicles operating in cold-start mode in the project area because no parking facilities would be constructed as part of the proposed project.

Table 3-16. Peak-Hour Approach Lane Volumes Used in the 2003 AQMP Attainment Demonstration

Location	Eastbound (AM/PM)	Westbound (AM/PM)	Southbound AM/PM)	Northbound (AM/PM)
Wilshire and Veteran (four lanes, all directions)	1,238/517	458/829	180/350	**140/233**
Sunset and Highland (three lanes, all directions)	472/588	447/513	768/611	**517/746**
La Cienega and Century (four lanes, all directions)	635/561	473/682	346/507	**205/419**
Long Beach and Imperial (three lanes, all directions)	406/673	587/467	160/315	**252/383**
Source: South Coast Air Quality Management District 2003.				

Table 3-17. Proposed Project Peak-Hour Approach Lane Volumes

Interim Year (2017): Alternative 2				
	Eastbound (AM/PM)	**Westbound (AM/PM)**	**Southbound (AM/PM)**	**Northbound (AM/PM)**
Grand Ave at SR-60 westbound off-ramp Lanes: 0 eastbound, 1 westbound, 5 southbound, 4 northbound	0/0	100/30	248/470	458/275
Grand Ave at SR-60 eastbound off-ramp Lanes: 0 eastbound, 0 westbound, 4 southbound, 4 northbound	0/0	0/0	285/385	375/308
Grand Ave at Golden Springs Dr Lanes: 2 eastbound, 2 westbound, 3 southbound, 3 northbound	90/435	365/240	223/343	467/273
Interim Year (2017): Alternative 3				
	Eastbound (AM/PM)	**Westbound (AM/PM)**	**Southbound (AM/PM)**	**Northbound (AM/PM)**
Grand Ave at SR-60 westbound off-ramp Lanes: 0 eastbound, 1 westbound, 5 southbound, 4 northbound	0/0	100/30	248/470	458/275
Grand Ave at SR-60 eastbound off-ramp Lanes: 0 eastbound, 0 westbound, 4 southbound, 4 northbound	0/0	0/0	285/385	470/460
Grand Ave at Golden Springs Dr Lanes: 2 eastbound, 2 westbound, 3 southbound, 3 northbound	90/435	365/240	223/343	467/273
Design Year (2037): Alternative 2				
	Eastbound (AM/PM)	**Westbound (AM/PM)**	**Southbound (AM/PM)**	**Northbound (AM/PM)**
Grand Ave at SR-60 westbound off-ramp Lanes: 0 eastbound, 1 westbound, 5 southbound, 4 northbound	0/0	250/100	367/752	688/378
Grand Ave at SR-60 eastbound off-ramp Lanes: 0 eastbound, 0 westbound, 4 southbound, 4 northbound	0/0	0/0	389/515	520/420
Grand Ave at Golden Springs Dr Lanes: 2 eastbound, 2 westbound, 3 southbound, 3 northbound	120/470	395/315	338/430	613/450
Design Year (2037): Alternative 3				
	Eastbound (AM/PM)	**Westbound (AM/PM)**	**Southbound (AM/PM)**	**Northbound (AM/PM)**
Grand Ave at SR-60 westbound off-ramp Lanes: 0 eastbound, 1 westbound, 5 southbound, 4 northbound	0/0	250/100	367/762	688/378
Grand Ave at SR-60 eastbound off-ramp Lanes: 0 eastbound, 0 westbound, 4 southbound, 4 northbound	0/0	0/0	389/515	630/640
Grand Ave at Golden Springs Dr Lanes: 2 eastbound, 2 westbound, 3 southbound, 3 northbound	120/470	395/315	338/430	613/450
Adapted from: KOA Corporation 2011.				

f. *Percentage of heavy-duty gas trucks at the location under study is the same or lower than the percentage at the location where attainment has been demonstrated.*

The attainment area demonstration intersections (Table 3-16) are located along urban arterial roadways with a similar mix of urban land uses (commercial with some residential) within the SCAB, and the project area intersections (Table 3-17) are located along suburban arterials in a mainly residential area with some commercial land uses. Therefore, the project area is anticipated to have a similar or lower percentage of heavy-duty trucks than the attainment demonstration intersections.

g. *For projects involving intersections, average delay and queue length figures for each approach are the same or smaller for the intersection under study compared with those found in the intersection where attainment has been demonstrated.*

As shown in Tables 3-16 and 3-17, design-year (2037) total approach lane traffic volumes for both Alternative 2 and Alternative 3 would be lower than total approach lane traffic volumes for the attainment demonstration intersections; therefore, overall average delay and queue length figures for the proposed project alternatives are anticipated to be less than those at the attainment demonstration intersections.

h. *Background concentration at the location under study is the same or lower than the background concentration at the location where attainment has been demonstrated.*

As shown earlier in Table 3-3, background CO concentrations in the project area have ranged from 1.81 ppm to 2.23 ppm during the past few years for the 8-hour averaging period. These CO background concentrations have shown a downward trend from 2006 to 2008 (i.e., 2.23 ppm in 2006, 1.97 ppm in 2007, 1.81 ppm in 2008). These values compare with the 8-hour average maximum background concentration of 7.8 ppm (2005) used for the 2003 AQMP attainment demonstration.

Because the answer to the second Level 7 question is “no,” per the CO Protocol, the project is satisfactory and no further analysis is needed. Because project implementation would not result in CO concentrations that exceed the 1-hour or 8-hour ambient air quality standards, on the basis of CO Protocol analysis methodology, the build alternatives are not expected to result in a new or more severe exceedance of either the NAAQS or CAAQS.

3.2.2 Conformity Determinations and Emissions Analysis

This section summarizes conclusions of the transportation conformity analysis, potential effects that could result from implementation of the proposed project, and minimization measures to reduce these effects.

3.2.2.1 Transportation Conformity

Regional Transportation Conformity

In accordance with Section 93.114 of the EPA transportation conformity regulations, the proposed project is included in the modeling lists for both the SCAG 2012-2035 RTP/SCS and SCAG 2011 FTIP under project numberLA0D450. Within the currently conforming 2012-2035 RTP/SCS and 2011 FTIP documents, the proposed project (number LA0D450) is described as "*RECONSTRUCT SR 60/GRAND AV INTERCHANGE - WIDEN GRAND AV: SB ADD 1THRU LN (2 EXSTNG); NB ADD 1 THRU LN (3 EXSTNG), REPLACE GRAND AV OC, ADD EB LOOP ON-RAMP*, *CONSTRUCT ADDITIONAL EB THRU LN FROM GRAND AVE TRAP LN TO SR57 ADD LN, ADD TWO BYPASS RAMP CONNECTORS, ADD AUX LNS EB AND WB FROM EAST TO WEST JUNCTION OF THE CONFLUENCE.*" The project as currently proposed is consistent with this description.

The 2012-2035 RTP/SCS was adopted by SCAG on April 4, 2012 and approved by FHWA on June 4, 2012. The 2011 FTIP was adopted by SCAG on September 2, 2010, and approved by FHWA on December 14, 2010. In addition, Amendment #11-24 to the 2011 FTIP was adopted by SCAG on April 4, 2012 and is the latest FTIP consistency amendment approved by FHWA, which granted approval on June 4, 2012.

Since the currently conforming 2012-2035 RTP/SCS and 2011 FTIP model lists include the proposed project (Project ID #LA0D450), the proposed project's regional conformity requirements have been satisfied. Air quality modeling conducted by SCAG for the 2012-2035 RTP/SCS and 2011 FTIP indicates that emissions are within the allowable budgets for criteria pollutants. Consequently, the proposed project has met regional transportation conformity requirements for regional nonattainment pollutants. The design concept and scope of the proposed project have not changed from what was analyzed for air quality conformity.

The regional emissions analysis found that regional emissions will not exceed the SIP's emission budgets for mobile sources in the build year, a horizon year at least 20 years from when conformity analysis started, and additional years meeting conformity regulation requirements for periodic analysis. The regional emissions analysis was based on the latest population and employment projections for Los Angeles County adopted by SCAG at the time the conformity analysis was started. These assumptions are less than 5 years old. The modeling was conducted using current and future population, employment, traffic, and congestion estimates. The traffic data, including the fleet mix data, were based on the most recently available vehicle registration data included in the EMFAC2007 model. Because this project is included in the most recently adopted RTP and FTIP, has not significantly changed in design concept and scope, fewer than 3 years have passed since the most recent step to advance the project, and a supplemental environmental document for air quality purposes has not been initiated, regional transportation conformity requirements have been met.

Project-level Transportation Conformity

As previously noted, if a project is located in a nonattainment or maintenance area for a given pollutant, then additional air quality analysis and reduction measures for that pollutant are required. This hot-spot analysis is most frequently done for CO and particulate matter.

Project-Level Conformity for Carbon Monoxide

As previously indicated, the proposed project was evaluated using Figures 1 and 3 of the CO Protocol (provided in Appendix B). Through this process, it was determined the build alternatives are not expected to result in a new or more severe exceedance of either the NAAQS or CAAQS.

Project-level Conformity for Particulate Matter

EPA's transportation conformity rules stipulate that transportation projects considered a POAQC, or any other project that is identified by the PM2.5 SIP as a localized air quality concern, must undergo hot-spot analysis in PM2.5 nonattainment and maintenance areas. For areas without approved conformity SIPs, a PM10 hot-spot analysis is to be performed only for POAQCs. For areas with an approved conformity SIP, the 2006 Particulate Matter Conformity Final Rule does not apply, and an analysis must be performed that meets the requirements in the approved PM10 SIP until the SIP is updated and subsequently approved by EPA. The CFR indicates that a conformity SIP for particulate matter has not been approved for the SCAB by EPA (40 CFR 52.223). Consequently, if the project is a POAQC, it must undergo PM10 (and PM2.5) hot-spot conformity determinations (O'Connor pers. comm.). Because the proposed project area is located in a serious nonattainment area with respect to the PM10 standard and in a nonattainment area with respect to the PM2.5 standard (see Table 3-1), and violations of the NAAQS currently exist, a hot-spot analysis must be performed for PM10 and PM2.5.

Given the guidance provided by FHWA and EPA (Federal Highway Administration and U.S. Environmental Protection Agency 2006), ADT on SR-60 and SR-57 is anticipated to exceed the FHWA and EPA POAQC criteria of 125,000 at the interim year (2017) and future year (2037), as shown in Table 3-6. As such, a qualitative PM2.5 and PM10 hot-spot evaluation was performed. The analysis concluded that it is unlikely that the proposed project would generate new air quality violations, worsen existing violations, or delay attainment of the NAAQS for PM2.5 and PM10. The SCAG TCWG concurred with this determination on January 24, 2012, and agreed that the particulate matter conformity documentation prepared for the proposed project is acceptable for NEPA circulation.[3] A copy of this finding, as well as the *Qualitative PM Conformity Hot-Spot Analysis* completed for the project, is provided in Appendix C of this air quality report. The CAA, 40 CFR Part 93.116, requirements are met.

3.2.2.2 Mobile-source Air Toxics

Air toxics analysis is an emerging area of research. Currently, limited tools and techniques are available for assessing project-specific health effects from MSATs because there are no established criteria for determining when MSAT emissions should be considered a significant issue with respect to NEPA.

To comply with Council on Environmental Quality (CEQ) regulations (40 CFR 1502.22[b]) regarding incomplete or unavailable information, Appendix D contains a discussion regarding how air toxics analysis is an emerging field and current scientific techniques, tools, and data are not sufficient to estimate accurately the human health effects that would result from a

[3] The outcome from the January 24, 2012, meeting supersedes the outcome from the meeting held on October 26, 2010, when the TCWG concurred that the proposed project was not a POAQC. Changes in project scope that occurred since that date required the project to be resubmitted to the TCWG for review. As such, the October 26, 2010, finding is no longer valid.

transportation project in a way that would be useful to decision-makers. Also in compliance with 40 CFR 150.22(b), Appendix D contains a summary of current studies regarding the health effects of MSATs.

As previously discussed, in addition to the federal criteria, California has its own criteria for when a project is considered to have higher potential MSAT effects. California considers freeway projects located within 500 to 1,000 feet of sensitive land uses to have higher potential MSAT effects (Brady pers. comm.; California Air Resources Board 2005). As noted previously, there are residences approximately 100 feet northwest of the SR-57/SR-60 confluence; therefore, under California's criteria, the proposed project is considered to be a project with higher potential MSAT effects, and MSAT emissions must be quantified and evaluated further.

An evaluation of MSAT emissions for existing (2009), interim-year (2017), and design-year (2037) conditions was performed using the CT-EMFAC model and the traffic data presented in Table 3-12. Table 3-18 presents modeled MSAT emissions for the conditions analyzed. The differences in emissions between with- and without-project conditions represent emissions generated directly as a result of implementation of the proposed project.

Table 3-18 indicates that implementation of the proposed alternatives would result in slight increases of DPM, benzene, acrolein and butadiene at the opening year (2017) and horizon year (2037) compared with the No-Build Alternative. Given the associated *decrease* in VMT anticipated to occur under the build alternatives compared with the No-Build Alternative at the horizon year (2037), a brief explanation of the results is warranted. A parabolic relationship is typically observed between emission rates and vehicle speeds when speeds are from 0 to 25 mph or above 55 mph; the lowest rates are typically observed at 45 mph. When compared with the No-Build Alternative, implementation of either build alternative would result in a significantly higher proportion of VMT occurring above the 55 mph speed bin at horizon year 2037 (see Table 3-12). As a result, the emission decreases typically observed with VMT reductions are masked by the higher proportion of vehicles traveling above 55 mph.

The traffic impact analysis conducted for the project suggests that, under the build alternatives, the proposed improvements would result in some arterial surface street VMT shifting to the freeway (see Appendix D). This shift to the freeway is noteworthy because surface street MSAT emissions occur near sensitive receptors. As such, MSAT exposure at sensitive receptors may be reduced under the build alternatives when compared with the No-Build Alternative. In addition, all MSAT emissions are expected to decrease below existing conditions (2009) under both build alternatives at the opening year (2017) and the horizon year (2037), as shown in Table 3-18.

Table 3-18. MSAT Emissions (grams per day)

Scenario	Daily VMT[a]	Grams per Day							
		DPM	Benzene	Acrolein	Acetaldehyde	Formaldehyde	Butadiene	Naphthalene	POM
Existing (2009)	3,611,333	40,395	17,841	768	7,466	20,291	3,425	7,593	1,033
2017 No Build	3,796,197	22,810	8,873	342	4,213	10,840	1,549	6,903	955
2017 Alternative 2	3,800,971	23,525	8,713	346	4,123	10,673	1,565	6,794	941
2017 Alternative 3	3,803,708	23,749	8,721	348	4,114	10,670	1,575	6,816	944
2037 No Build	4,230,956	11,277	5,422	209	2,312	6,066	944	7,023	982
2037 Alternative 2	4,224,446	11,686	5,578	227	2,244	6,042	1,018	6,960	974
2037 Alternative 3	4,230,237	11,624	5,514	223	2,233	5,994	1,002	6,906	966
Alternative Increase/(Decrease) Compared with Existing 2009									
Scenario	**Daily VMT**	**DPM**	**Benzene**	**Acrolein**	**Acetaldehyde**	**Formaldehyde**	**Butadiene**	**Naphthalene**	**POM**
2017 Alternative 2 vs. Existing	189,638	(16,870)	(9,128)	(422)	(3,343)	(9,618)	(1,860)	(799)	(92)
2017 Alternative 3 vs. Existing	192,375	(16,646)	(9,120)	(420)	(3,352)	(9,621)	(1,850)	(777)	(89)
2037 Alternative 2 vs. Existing	613,113	(28,709)	(12,263)	(541)	(5,222)	(14,249)	(2,407)	(633)	(59)
2037 Alternative 3 vs. Existing	618,904	(28,771)	(12,327)	(545)	(5,233)	(14,297)	(2,423)	(687)	(67)
Alternative Increase/(Decrease) Compared with Respective No Build at 2017 and 2037									
Scenario	**Daily VMT**	**DPM**	**Benzene**	**Acrolein**	**Acetaldehyde**	**Formaldehyde**	**Butadiene**	**Naphthalene**	**POM**
2017 Alternative 2 vs. No Build	4,774	715	(160)	4	(90)	(167)	16	(109)	(14)
2017 Alternative 3 vs. No Build	7,511	939	(152)	6	(99)	(170)	26	(87)	(11)
2037 Alternative 2 vs. No Build	(6,510)	409	156	18	(68)	(24)	74	(63)	(8)
2037 Alternative 3 vs. No Build	(719)	347	92	14	(79)	(72)	58	(117)	(16)

[a] Daily VMT was obtained by summing peak- and off-peak-period VMT, which is summarized in Table 3-12.

This Air Quality Study Report (AQSR) includes a basic quantitative analysis of the likely MSAT emissions of this project. However, available technical tools do not enable an accurate prediction of the project-specific health effects of the emission changes associated with the alternatives (see Appendix D for more information regarding this issue). Although current models and procedures do not provide an accurate prediction of the health effects associated with MSATs, EPA regulations for vehicle engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades. Given the regulations now in effect, an analysis of national trends with EPA's MOBILE6.2 model forecasts a combined reduction of 72% in the total annual emission rate for the priority MSATs from 1999 to 2050, while VMT are projected to increase by 145%. This will reduce the background level of MSAT emissions within the project vicinity.

3.2.2.3 Criteria Pollutants

Construction

Implementation of the proposed project would result in the construction of widened roads, overcrossings, interchange reconfigurations, as well as bypass connectors. Construction is anticipated to begin in fall 2014 and end by fall 2017. Temporary construction emissions would result from grubbing/land clearing, grading/excavation, drainage/utility/subgrade construction, paving, and the commuting patterns of construction workers. Pollutant emissions would vary daily, depending on the level of activity, specific operations, and prevailing weather.

During construction, short-term degradation of air quality may occur because of the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and other activities related to construction. Emissions from construction equipment also are anticipated and would include CO, NO_X, ROG, directly emitted particulate matter (PM10 and PM 2.5), and toxic air contaminants (aka: MSATs), such as diesel exhaust particulate matter. Ozone is a regional pollutant that is derived from NO_X and ROG in the presence of sunlight and heat.

Site preparation and roadway construction would involve clearing, cut-and-fill activities, grading, removing or improving existing roadways, and paving roadway surfaces. Construction-related effects on air quality from most highway projects would be greatest during the site preparation phase because most engine emissions are associated with the excavation, handling, and transport of soils to and from the site. If not properly controlled, these activities would temporarily generate PM10, PM2.5, and small amounts of CO, SO_2, NO_X, and ROG. Sources of fugitive dust would include disturbed soils at the construction site and the trucks that carry uncovered loads of soil. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. PM10 emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM10 emissions would depend on soil moisture, silt content of soil, wind speed, and the amount of equipment operating. Larger dust particles would settle near the source, while fine particles would be dispersed greater distances from the construction site.

In addition to dust-related PM10 emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO_2, NOx, ROG and some soot particulate (PM10 and PM2.5) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while vehicles are delayed. These emissions would be temporary and limited to the immediate area surrounding the construction site.

SO_2 is generated by oxidation during combustion of organic sulfur compounds contained in diesel fuel. Off-road diesel fuel meeting federal standards can contain up to 5,000 ppm of sulfur, whereas on-road diesel is restricted to less than 15 ppm of sulfur. However, under California law and CARB regulations, off-road diesel fuel used in California must meet the same sulfur and other standards as on-road diesel fuel; therefore, SO_2-related issues due to diesel exhaust would be minimal. Some phases of construction, particularly asphalt paving, would result in short-term odors in the immediate area of each paving site. Such odors would be quickly dispersed below detectable thresholds as distance from the site increases.

Construction-period criteria pollutant emissions were estimated using the Sacramento Metropolitan Air Quality Management District's Road Construction Model, version 6.3.2 (Sacramento Metropolitan Air Quality Management District 2009). While the model was developed for Sacramento-area conditions in terms of fleet emission factors, silt loading, and other modeling assumptions, it is considered adequate by the San Joaquin Valley Air Pollution Control District for estimating road construction emissions under its indirect source regulations and SCAQMD in its CEQA guidance. As such, it is used for that purpose in this project analysis. A summary of emissions estimates is provided in Table 3-19. Modeling assumptions are detailed in Appendix E. The implementation of the exhaust and fugitive dust emission control measures identified below in Section 3.3 would avoid and/or minimize any impacts on air quality.

Table 3-19. Estimate of Criteria Pollutant Emissions during Construction (pounds per day)

Construction Phase	ROG	CO	NO_X	PM10	PM2.5
Grubbing and Clearing	6	23	35	52	12
Grading/Excavation	6	27	37	52	12
Drainage/Utilities/Sub-Grade	5	22	29	52	12
Paving	4	17	18	2	1
Daily Maximum Regional Emissions	6	27	37	52	12
SCAQMD Regional Emissions Daily Significance Threshold	75	550	100	150	55
Daily Maximum Localized Emissions[a]	N/A	23	33	52	12
SCAQMD Localized Emissions Daily Significance Threshold[b]	N/A	2,158	265	36	9

Source: ICF International, December 2011. Detailed calculation assumptions provided in Appendix E.
[a] ROG emissions have no SCAQMD localized emissions threshold.
[b] SCAQMD SRA 10, 5-acre site, 50-meter receptor distance.

Operation

Long-term air quality effects are those associated with motor vehicles operating on the roadway network, predominantly those operating in the project vicinity. Emissions of TOG, NO_X, CO, PM10, PM2.5, and CO_2 for existing (2009), interim-year (2017), and design-year (2037) conditions were evaluated through modeling conducted using Caltrans' CT-EMFAC model and EPA's *Compilation of Air Pollutant Emission Factors*, AP-42, Section 13.2.1, with traffic data provided by the project traffic engineer, KOA Corporation (KOA Corporation 2011).

CT-EMFAC does not calculate ROG emissions but instead calculates TOG emissions. Therefore, emissions of ROG were calculated from CT-EMFAC-estimated TOG emissions by multiplying the TOG emissions by a factor of 0.92.

To analyze potential effects of projects, NEPA requires a comparison of a project's emissions to no-build conditions at the opening year and horizon year, whereas CEQA requires a comparison of a project's opening-year emissions with existing conditions. Table 3-20 summarizes the CT-EMFAC-modeled daily emissions. Vehicular emission rates, in general, are anticipated to decrease in future years because of continuing improvements in engine technology and the retirement of older, higher emitting vehicles. Daily emissions of entrained dust are summarized in Table 3-21. The NEPA and CEQA analyses of the proposed project's operational emissions of ROG, CO, NO_X, SO_X, CO_2, PM10, and PM2.5 are provided below.

CEQA

As shown in Table 3-20, when compared with existing conditions, both build alternatives would result in decreases of ROG, CO, NO_X, PM10, and PM2.5 exhaust emissions at the opening year (2017) when compared with existing conditions. Because VMT increases when compared with existing conditions (Table 3-20), these emissions reductions are attributable to the retirement of older, higher emitting vehicles. Emissions of SO_X and CO_2 would increase.

As shown in Table 3-21, PM10 and PM2.5 entrained dust emissions are anticipated to increase by about 2.2 tons per year and 2.3 tons per year under Build Alternatives 1 and 2, respectively, at the opening year (2017) when compared with existing conditions. This is because of increases in VMT that are expected to occur over time and thus are accounted for in the region's Air Quality Management Plan.

Table 3-20. Summary of CT-EMFAC-modeled Operational Emissions

Scenario	Daily VMT[a]	Pounds per Day for All, Except CO_2, which Is Tons per Day						
		ROG	CO	NO_X	SO_X	CO_2	PM10[b]	PM2.5[b]
Existing (2009)	3,611,333	1,694	25,304	5,517	33	1,694	186	170
2017 No Build	3,796,197	964	13,784	2,892	34	1,785	172	160
2017 Alternative 2	3,800,971	920	13,450	3,005	34	1,800	170	158
2017 Alternative 3	3,803,708	916	13,411	3,031	35	1,809	170	158
2037 No Build	4,230,956	569	7,029	1,087	39	1,997	177	163
2037 Alternative 2	4,224,446	559	6,939	1,115	39	2,029	176	160
2037 Alternative 3	4,230,237	556	6,922	1,109	38	2,017	174	159
Alternative Increase/(Decrease) Compared with Existing 2009								
Scenario	**Daily VMT[a]**	**ROG**	**CO**	**NO_X**	**SO_X**	**CO_2**	**PM10[b]**	**PM2.5[b]**
2017 Alternative 2 vs. Existing	189,638	(774)	(11,853)	(2,512)	1	106	(16)	(12)
2017 Alternative 3 vs. Existing	192,375	(778)	(11,893)	(2,485)	2	115	(16)	(12)
2037 Alternative 2 vs. Existing	613,113	(1,135)	(18,365)	(4,402)	6	335	(10)	(10)
2037 Alternative 3 vs. Existing	618,904	(1,138)	(18,381)	(4,408)	5	323	(12)	(11)

Alternative Increase/(Decrease) Compared with Respective No Build at 2017 and 2037								
Scenario	**Daily VMT**[a]	**ROG**	**CO**	**NO_X**	**SO_X**	**CO_2**	**PM10**[b]	**PM2.5**[b]
2017 Alternative 2 vs. No Build	4,774	(44)	(334)	113	<1	15	(2)	(2)
2017 Alternative 3 vs. No Build	7,511	(47)	(373)	139	1	24	(2)	(2)
2037 Alternative 2 vs. No Build	(6,510)	(11)	(90)	28	<1	32	(1)	(3)
2037 Alternative 3 vs. No Build	(719)	(14)	(107)	22	(1)	20	(3)	(4)

[a] Daily VMT was obtained by summing peak- and off-peak-period VMT, which is summarized in Table 3-12.
[b] Particulate matter emissions include exhaust, tire wear, and brake wear only. Re-entrained dust emissions are provided in Table 3-21.

Table 3-21. Entrained Paved Road Dust (tons/year)

Alternative	PM10 Tons/Year			PM2.5 Tons/Year		
	Freeway	**Arterial**	**Total**	**Freeway**	**Arterial**	**Total**
Existing (2009)	52.3	115.5	167.8	12.8	28.3	41.2
2017 No-Build	54.4	123.3	177.8	13.4	30.3	43.6
2017 Build Alternative 2	55.0	121.8	176.8	13.5	29.9	43.4
2017 Build Alternative 3	55.0	122.1	177.0	13.5	30.0	43.5
2037 No-Build	59.8	140.7	200.4	14.7	34.5	49.2
2037 Build Alternative 2	60.2	138.7	198.9	14.8	34.0	48.8
2037 Build Alternative 3	60.2	139.2	199.3	14.8	34.2	48.9
Alternative Increase/(Decrease) Compared with Existing 2009						
Alternative	**Freeway**	**Arterial**	**Total**	**Freeway**	**Arterial**	**Total**
2017 Alternative 2 vs. Existing	2.7	6.3	9.0	0.7	1.6	2.2
2017 Alternative 3 vs. Existing	2.7	6.6	9.2	0.7	1.7	2.3
2037 Alternative 2 vs. Existing	7.9	23.2	31.1	2.0	5.7	7.6
2037 Alternative 3 vs. Existing	7.9	23.7	31.5	2.0	5.9	7.7
Alternative Increase/(Decrease) Compared with Respective No Build at 2017 and 2037						
Alternative	**Freeway**	**Arterial**	**Total**	**Freeway**	**Arterial**	**Total**
2017 Alternative 2 vs. No Build	0.6	(1.5)	(1.0)	0.1	(0.4)	(0.2)
2017 Alternative 3 vs. No Build	0.6	(1.2)	(0.8)	0.1	(0.3)	(0.1)
2037 Alternative 2 vs. No Build	0.4	(2.0)	(1.5)	0.1	(0.5)	(0.4)
2037 Alternative 3 vs. No Build	0.4	(1.5)	(1.1)	0.1	(0.3)	(0.3)

NEPA

As shown in Table 3-20, both build alternatives would result in decreases of ROG, CO, PM10, and PM2.5 exhaust emissions but increases in NO_X, SO_X and CO_2 emissions at the opening year (2017) and horizon year (2037) when compared with the no-build condition. Build Alternative 2 NO_X emissions are anticipated to increase by 113 pounds per day and 28 pounds per day at future years 2017 and 2037, respectively, when compared with the No-Build Alternative. Build Alternative 3 NO_X emissions are anticipated to increase by 139 pounds per day and 22 pounds per day at future years 2017 and 2037, respectively, when compared with the No-Build Alternative. Build Alternative 2 SO_X emissions are anticipated to increase by less than 1 pound per day at future years 2017 and 2037 compared with the No-Build Alternative. Build Alternative 3 SO_X emissions are anticipated to increase by 1 pound per day at future year 2017, then decrease by 1 pound per day at future year 2037 compared with the No-Build Alternative. Build Alternative 2 CO_2 emissions are anticipated to increase by 15 pounds per day and 32 pounds per day at future years 2017 and 2037, respectively, compared with the No-Build Alternative. Build Alternative 3 CO_2 emissions are anticipated to increase by 24 pounds per day and 20 pounds per day at future years 2017 and 2037, respectively, compared with the No-Build Alternative. When combined with re-entrained road dust emissions, PM10 and PM2.5 emissions are anticipated to decrease by approximately 1% under both build alternatives at opening year 2017 and horizon year 2037.

As shown in Table 3-21, entrained dust in the study area is anticipated to decrease with implementation of either build alternative when compared with no-build conditions. The traffic impact analysis conducted for the project suggests that, under the build alternatives, the proposed improvements would result in some arterial surface street VMT shifting to the freeway (see Table E-1 and Table E-2 of Appendix F). This shift is noteworthy because of the difference in silt load factors on surface arterials compared with freeways. The AP-42 re-entrained dust calculation formula worksheets accommodate each of these project-specific factors (i.e., VMT, average vehicle weight, annual precipitation rate, and roadway type). Calculation worksheets are provided in Appendix A of Appendix C (TCWG PM Conformity Documentation). Because no increase in entrained dust is expected to occur with implementation of either build alternative, compared with no-build conditions, the proposed project is not anticipated to contribute to new violations of the NAAQS or CAAQS.

3.3 Minimization Measures

Implementation of the following measures would minimize air quality effects from construction activities.

3.3.1 Construction

3.3.1.1 Implement California Department of Transportation Standard Specifications

Most of the construction impacts on air quality are short-term in duration and, therefore, will not result in long-term adverse conditions. Implementation of the following measures, some of which may also be required for other purposes such as stormwater pollution control, will reduce any air quality impacts resulting from construction activities:

- The construction contractor shall comply with Caltrans' Standard Specifications in Section 14 (2010).
  - Section 14-9.01specifically requires compliance by the contractor with
  - all applicable laws and regulations related to air quality, including air pollution control district and air quality management district regulations and local ordinances.
- Section 14-9.02 is directed at controlling dust. If dust palliative materials other than water are to be used, material specifications are contained in Section 18.
- Apply water or dust palliative to the site and equipment as frequently as necessary to control fugitive dust emissions. Fugitive emissions generally must meet a "no visible dust" criterion either at the point of emission or at the right-of-way line, depending on local regulations.
- Spread soil binder on any unpaved roads used for construction purposes and all project construction parking areas.
- Wash off trucks as they leave the right-of-way as necessary to control fugitive dust emissions.
- Properly tune and maintain construction equipment and vehicles. Use low-sulfur fuel in all construction equipment, as provided in California Code of Regulations Title 17, Section 93114.
- Develop a dust control plan documenting sprinkling, temporary paving, speed limits, and expedited revegetation of disturbed slopes as needed to minimize construction impacts on existing communities.
- Locate equipment and material storage sites as far away from residential and park uses as practical. Keep construction areas clean and orderly.
- Establish Environmentally Sensitive Areas (ESAs) or their equivalent near sensitive air receptors where construction activities involving extended idling of diesel equipment would be prohibited, to the extent feasible.
- Use track-out reduction measures such as gravel pads at project access points to minimize dust and mud deposits on roads affected by construction traffic.
- Cover all transported loads of soils and wet materials prior to transport or provide adequate freeboard (space from the top of the material to the top of the truck) to minimize emissions of dust (particulate matter) during transportation.
- Promptly and regularly remove dust and mud on paved public roads from construction activity and traffic to decrease particulate matter.
- Route and schedule construction traffic to avoid peak travel times as much as possible to reduce congestion and related air quality impacts caused by idling vehicles along local roads.
- Install mulch or plant vegetation as soon as practical after grading to reduce windblown particulate in the area. Be aware that certain methods of mulch placement, such as straw blowing, may themselves cause dust and visible emission issues; controls, such as dampened straw, may be needed.

3.3.1.2 Comply with SCAQMD's Rule 403 Requirements to Control Construction Emissions of Fugitive Dust

To control the generation of construction-related fugitive dust emissions, Caltrans will require construction contractors to comply with SCAQMD's Rule 403 requirements, which are summarized in Table 3-2. Compliance with SCAQMD's Rule 403 is required for all construction projects.

Chapter 4 Climate Change (CEQA)

4.1 Climate Change

Climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system. An ever-increasing body of scientific research attributes these climatological changes to greenhouse gases (GHGs), particularly those generated from the production and use of fossil fuels.

While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations and World Meteorological Organization in 1988 has led to increased efforts devoted to GHG emission reductions and climate change research and policy. These efforts are concerned primarily with the emissions of GHGs related to human activity that include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), tetrafluoromethane, hexafluoroethane, sulfur hexafluoride, HFC-23 (fluoroform), HFC-134a (s, s, s, 2 –tetrafluoroethane), and HFC-152a (difluoroethane).

There are typically two terms used when discussing the impacts of climate change. *GHG mitigation* refers to reducing GHG emissions to reduce or *mitigate* the impacts of climate change. *Adaptation* refers to planning for and adapting to impacts due to climate change (such as adjusting transportation design standards to withstand more intense storms and higher sea levels).[1]

Transportation sources (passenger cars, light-duty trucks, other trucks, buses, and motorcycles) in the state of California make up the largest source (second to electricity generation) of GHG emitting sources. Conversely, the main source of GHG emissions in the United States is electricity generation, followed by transportation. The dominant GHG emitted is CO_2, mostly from fossil fuel combustion.

There are four primary strategies for reducing GHG emissions from transportation sources: 1) improve system and operation efficiencies, 2) reduce growth of VMT, 3) transition to lower GHG fuels, and 4) improve vehicle technologies. To be most effective, all four should be pursued collectively.

The following regulatory setting section outlines state and federal efforts to comprehensively reduce GHG emissions from transportation sources.

4.1.1 Project Analysis

An individual project does not generate enough GHG emissions to influence global climate change significantly. Rather, global climate change is a cumulative impact. This means that a project may participate in a potential impact through its incremental contribution combined with

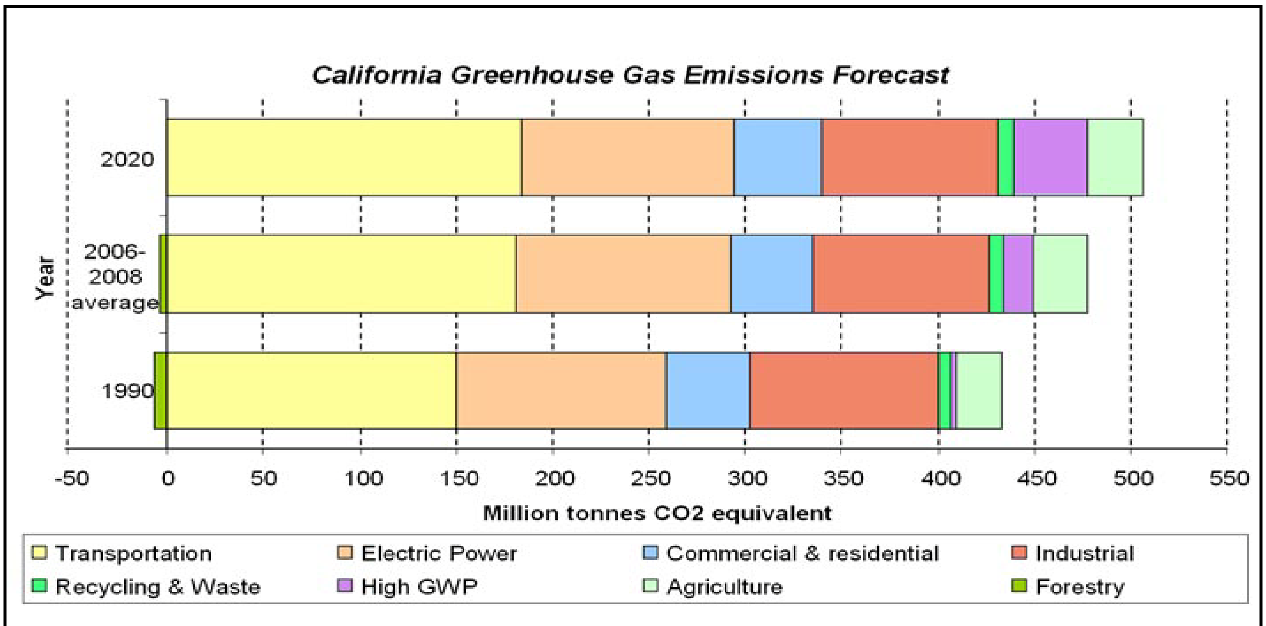
[1] Source: http://climatechange.transportation.org/ghg_mitigation/.

the contributions of all other sources of GHG.[2] In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable" (see State CEQA Guidelines Sections 15064(h)(1) and 15130). To make this determination the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects and make this determination is a difficult if not impossible task.

The Assembly Bill 32 scoping plan contains the main strategies California will use to reduce GHG. As part of its supporting documentation for the draft scoping plan, CARB released the GHG inventory for California (forecast last updated October 28, 2010) (see Figure 4-1). The forecast is an estimate of the emissions expected to occur in 2020 if none of the foreseeable measures included in the scoping plan are implemented. The base year used for forecasting emissions is the average of statewide emissions in the GHG inventory for 2006, 2007, and 2008.

Caltrans and its parent agency, the Business, Transportation, and Housing Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that 98% of California's GHG emissions are from the burning of fossil fuels and 40% of all human-made GHG emissions are from transportation, Caltrans has created and is implementing the Climate Action Program at Caltrans, which was published in December 2006.[3]

Figure 4-1: California GHG Emissions (1990, 2002–2004 [Average], and 2020 [Projected])



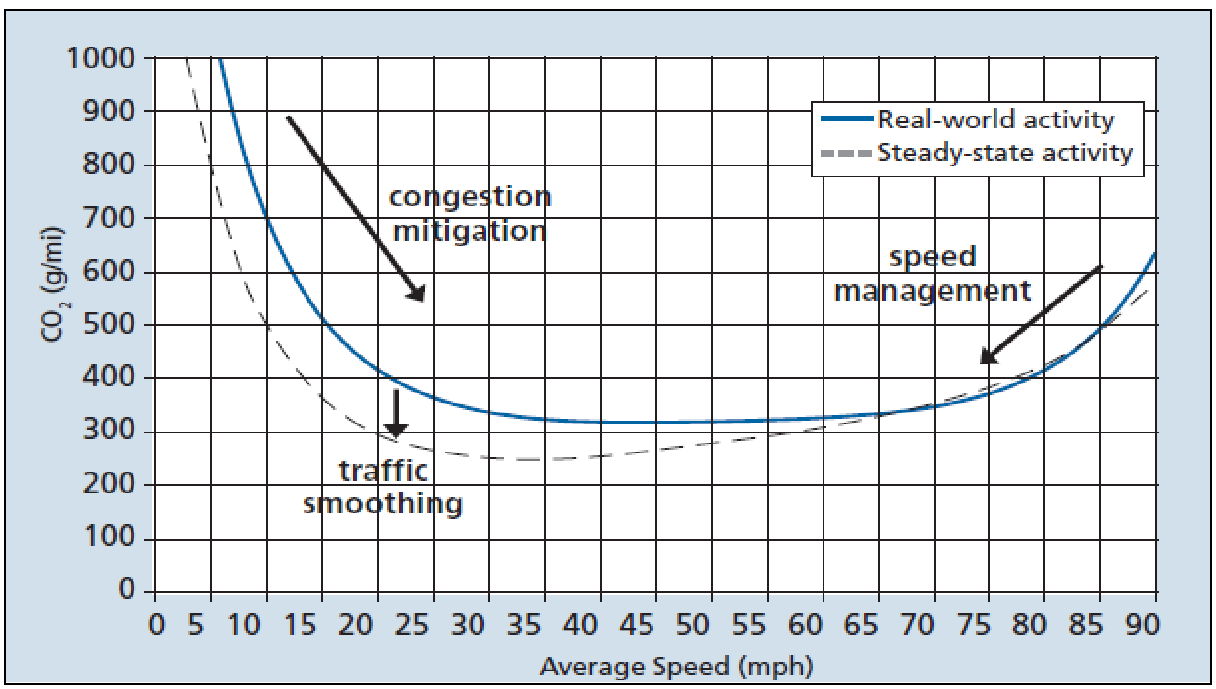
Source: California Air Resources Board 2009.[4]

[2] This approach is supported by the Association of Environmental Professionals in *Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate Change in CEQA Documents* (March 5, 2007) as well as SCAQMD (Chapter 6: The CEQA Guide, April 2011) and the U.S. Forest Service (Climate Change Considerations in Project-level NEPA Analysis, July 13, 2009).
[3] The Caltrans Climate Action Program is located at the following web address: <http://www.dot.ca.gov/hq/tpp/offices/ogm/key_reports_files/State_Wide_Strategy/Caltrans_Climate_Action_Program.pdf>.
[4] Source: http://www.arb.ca.gov/cc/inventory/data/forecast.htm.

One of the main strategies in Caltrans' Climate Action Program to reduce GHG emissions is to make California's transportation system more efficient. The highest levels of carbon dioxide from mobile sources, such as automobiles, occur at stop-and-go speeds (0–25 mph) and speeds over 55 mph; the most severe emissions occur from 0–25 mph (see Figure 4-2). To the extent that a project relieves congestion by enhancing operations and improving travel times in high-congestion travel corridors, GHG emissions, particularly CO_2, may be reduced.

As indicated in Table 3-14, in Section 3.2.1.2 of Chapter 3, in the design year (2037) under Alternative 2, in the AM peak period at the Grand Avenue/SR-60 westbound off-ramp intersection, average delay is reduced from 99.7 seconds to 35.7 seconds with project implementation, a reduction of 64 seconds. At the same intersection in the PM peak period, average delay is reduced from 178.9 seconds to 46.8 seconds with project implementation, a reduction of 132.1 seconds. In the AM peak period at the Grand Avenue/SR-60 eastbound off-ramp intersection, average delay is reduced from 81.9 seconds to 49.6 seconds with project implementation, a reduction of 32.3 seconds. In the PM peak period at the same intersection, average delay is reduced from 84.3 seconds to 55.4 seconds with project implementation, a reduction of 28.9 seconds. At the Grand Avenue/Golden Springs Drive intersection in the AM peak period, average delay is reduced from 111.6 seconds to 50.6 seconds with project implementation, a reduction of 61.0 seconds. In the PM peak period at the same intersection, average delay will decrease from 103.6 seconds to 64.6 seconds with project implementation, a reduction of 39 seconds.

Figure 4-2: Possible Effect of Traffic Operation Strategies in Reducing On-road CO_2 Emissions[5]



[5] Barth, Matthew, and Kanok Boriboonsomsin. 2010. Traffic Congestion and Greenhouse Gases. *TR News* 268 May–June. Available: <http://onlinepubs.trb.org/onlinepubs/trnews/trnews268.pdf>.

As shown in Table 3-14, for Alternative 3, in the AM peak period at the Grand Avenue/SR-60 westbound off-ramp intersection, average delay is reduced from 99.7 seconds to 37.5 seconds with project implementation, a reduction of 62.2 seconds. At the same intersection in the PM peak period, average delay is reduced from 178.9 seconds to 51.4 seconds with project implementation, a reduction of 127.5 seconds. In the AM peak period at the Grand Avenue/SR-60 eastbound off-ramp intersection, average delay is reduced from 81.9 seconds to 20.0 seconds with project implementation, a reduction of 61.9 seconds. In the PM peak period at the same intersection, average delay is reduced from 84.3 to 10.3 seconds with project implementation, a reduction of 74.0 seconds. At the Grand Avenue/Golden Springs Drive intersection in the AM peak period, average delay is reduced from 111.6 seconds to 49.6 seconds with project implementation, a reduction of 62 seconds. In the PM peak period at the same intersection, average delay would decrease from 103.6 seconds to 64.6 seconds with project implementation, a reduction of 49.7 seconds.

The traffic data shown in Table 3-12, along with the EMFAC 2007 emission rates (CT-EMFAC version 4.1), were used to calculate the CO_2 emissions based on existing/baseline 2009, opening-year (2017), and horizon-year (2037) travel conditions. The forecast of CO_2 emissions within each build alternative is provided in Table 4-1.

As shown in Table 4-1, the modeled CO_2 emissions in the future years (2017 and 2037) are higher than those for the existing/baseline year (2009), which is attributed to the growth in VMT. At both the opening year (2017) and horizon year (2037), modeled CO_2 emissions under the build alternatives would be higher than those under the No-Build Alternative. As shown in Figure 4-2, CO_2 emissions factors increase as travel speed increases up to and beyond approximately 55 mph.

Table 4-1. Summary of CT-EMFAC-modeled CO_2 Emissions

Scenario	Daily VMT[a]	Tons per Day CO_2, Emissions
Existing/Baseline (2009)	3,611,333	1,694
2017 No Build	3,796,197	1,785
2017 Alternative 2	3,800,971	1,800
2017 Alternative 3	3,803,708	1,809
2037 No Build	4,230,956	1,997
2037 Alternative 2	4,224,446	2,029
2037 Alternative 3	4,230,237	2,017
Alternative Increase/(Decrease) Compared with Existing 2009		
2017 Alternative 2 vs. Existing	189,638	106
2017 Alternative 3 vs. Existing	192,375	115
2037 Alternative 2 vs. Existing	613,113	335
2037 Alternative 3 vs. Existing	618,904	323
Alternative Increase/(Decrease) Compared with Respective No Build at 2017 and 2037		
2017 Alternative 2 vs. No Build	4,774	15
2017 Alternative 3 vs. No Build	7,511	24
2037 Alternative 2 vs. No Build	(6,510)	32
2037 Alternative 3 vs. No Build	(719)	20

[a] Daily VMT was obtained by summing peak- and off-peak-period VMT, which is summarized in Table 3-12.

In conclusion, it is important to note that these modeled CO_2 emission estimates are useful only for comparison between project alternatives. These estimates are not necessarily an accurate reflection of what the true CO_2 emissions will be because CO_2 emissions are dependent on other factors that are not part of the model, such as the fuel mix,[6] rate of acceleration, and the aerodynamics and efficiency of the vehicles.

In addition, the 2012-2035 RTP/SCS includes strategies to reduce VMT and associated per capita energy consumption from the transportation sector as well as mitigation measures related to energy that are designed to reduce consumption and increase the use and availability of renewable sources of energy in the region (Southern California Association of Governments 2012a). Potential mitigation programs identified in the 2012-2035 RTP/SCS to reduce GHG emissions include increased construction of infrastructure and automobile fuel efficiency to accommodate increased use of alternative-fuel motor vehicles as well as coordinating transportation, land use, and air quality planning to reduce VMT, energy use, and GHG emissions (Southern California Association of Governments 2012a).

The EIR for the 2012-2035 RTP/SCS performed a GHG emission reduction strategy consistency analysis to evaluate impacts related to climate change associated with the 2012-2035 RTP/SCS. This consistency analysis evaluated consistency with the CARB; Public Utilities Commission; Business, Transportation, and Housing Agency; State and Consumer Services Agency; and EPA GHG reduction strategies and found that impacts on climate change are considered significant even with implementation of mitigation measures. To help mitigate impacts associated with the 2012-2035 RTP/SCS, SCAG identified mitigation measures to mitigate the impacts of growing transportation energy demand associated with the RTP (Southern California Association of Governments 2012a).

4.1.2 Construction Emissions

Greenhouse gas emissions for transportation projects can be divided into those produced during construction and those produced during operations. Construction GHG emissions include emissions produced as a result of material processing, emissions produced by onsite construction equipment, and emissions arising from traffic delays due to construction. These emissions will be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases. In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, the GHG emissions produced during construction can be mitigated to some degree by longer intervals between maintenance and rehabilitation events.

A qualitative analysis of construction-related emissions was provided in Section 3.2.2.3 of Chapter 3. As stated in Chapter 3, construction emissions of criteria pollutants are considered temporary emissions. This is not the case with GHGs because of the cumulative nature of GHGs,

[6] EMFAC model emission rates are only for direct engine-out CO_2 emissions, not full fuel cycle. Fuel cycle emission rates can vary dramatically, depending on the amount of additives like ethanol and the source of the fuel components.

which remain in the earth's atmosphere long after the time of emission. As detailed in the construction emissions calculation worksheet provided in Appendix E, approximately 1,853 tons of CO_2 emissions associated with proposed project construction would endure in the atmosphere under construction of Alternative 2 or Alternative 3.

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State Route 57/State Route 60 Confluence Project
Air Quality Study Report
APPENDICES
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- **APPENDIX A -** 2012-2035 RTP/SCS and 2011 FTIP References to the Proposed Project
- **APPENDIX B -** CO Protocol
- **APPENDIX C -** TCWG PM Conformity Documentation
- **APPENDIX D -** Compliance with 40 CFR 1502.22 and Summary of Current Studies Regarding Health Effects of MSAT Emissions Exposure
- **APPENDIX E -** Emissions Modeling Outputs
- **APPENDIX F -** Traffic Data

APPENDIX A

2012-2035 RTP/SCS and 2011 FTIP (through Amendment No. 11-24)
References to Proposed Project

PROJECT LIST APPENDIX

REGIONAL TRANSPORTATION PLAN
2012–2035
SUSTAINABLE COMMUNITIES STRATEGY
Towards a Sustainable Future
RTP

Southern California Association of Governments

ADOPTED APRIL 2012

FTIP Projects					
County	**System**	**FTIP ID**	**Route**	**Description**	**Project Cost ($1,000's)**
LOS ANGELES	STATE HIGHWAY	LA0F098	10	ROUTE 010: L.A. COUNTY I-10 AND I-605 IC;CONSTRUCT ONE/TWO LANE BRIDGE STRUCTURE, BRANCHING OFF SB OF RTE 605 TO EB OF RTE 10 AT-GRADE CONNECTOR RAMP (EA 24540, PPNO 3529; CONSTRUCT ONE-LANE CONNECTOR FROM SB I-605 TO WB I-10.	$78,760
LOS ANGELES	STATE HIGHWAY	LA01342	10	ROUTE 010: RT 10 FROM RT 605 TO PUENTE AVE HOV LANES (8+0 TO 8+2) (EA# 117070, PPNO 0306H) PPNO 3333 3382 AB 3090 REP (TCRP #40)	$200,064
LOS ANGELES	STATE HIGHWAY	LA000548	10	ROUTE 10: FROM PUENTE TO CITRUS HOV LANES FROM 8 TO 10 LANES & SOUNDWALLS (C-ISTEA 77720, 95 STIP-IIP) (EA# 117080,11172, 1170U, PPNO# 0309N, 0309S)	$184,522
LOS ANGELES	STATE HIGHWAY	LA0B875	10	ROUTE 10: HOV LANES FROM CITRUS TO ROUTE 57/210 – (EA# 11934, PPNO# 0310B)	$192,643
LOS ANGELES	STATE HIGHWAY	LA0G665	14	COMPLETE PA/ED FOR AN APPROXIMATE 63-MILE WEST-EAST FREEWAY/EXPRESSWAY AND POSSIBLE TOLL FACILITY BETWEEN SR-14 IN LA COUNTY AND SR-18 IN SB COUNTY. HIGH DESERT CORRIDOR PA/ED COMBINES THE LA COUNTY MEASURE R PROJECT FROM SR-14 TO I-15 AND SB COUNTY FEDERAL EARMARKS PROVIDED TO CITY OF VICTORVILLE FOR US-395 TO SR-18. BOTH PROJECTS AND FUNDS ARE COMBINED TO COMPLETE THE PA/ED FROM SR-14 TO SR-18. [EA 26000]	$30,000
LOS ANGELES	STATE HIGHWAY	LA0C8102	14	ROUTE 14: SR-14 FREEWAY/AVENUE I INTERCHANGE IMPROVEMENTS-WIDENING AVE I FROM 2 TO 3 LANES IN EACH DIRECTION, ADDING DUAL LEFT TURN LANES, AND WIDENING A BRIDGE STRUCTURE. PPNO 3123.	$10,581
LOS ANGELES	STATE HIGHWAY	LA0D336	14	ROUTE 14: SR14/AVENUE K INTERCHANGE IMPROVEMENTS. WIDEN NORTHBOUND OFFRAMP AND 15TH STREET WEST. WIDEN N/B OFFRAMP FROM 3 TO 4 LANES AT AVE K/15TH ST-W.	$4,250
LOS ANGELES	STATE HIGHWAY	LAE0357	19	CONSTRUCT NEW LEFT TURN LANE AT THE STATE ROUTE 19 AND TELSTAR. THE ADDITION OF A SECONDARY LEFT TURN LANE AND TRAFFIC SIGNAL AT THE INTERSECTION OF ROSEMEAD BLVD (STATE) AND TELSTAR AVE. PROJECT USING $347 TOLL CREDIT FOR CONSTRUCTION PHASE IN FY 10/11 FOR STPL AND DEMO FUNDS.	$2,360
LOS ANGELES	STATE HIGHWAY	LA0G600	47	ROUTE 047: REPLACEMENT OF SCHUYLER HEIM BRIDGE TO INCLUDE 2 THRU LANES AND 1 AUX LANE NB; AND 3 THRU LANES AND 1 AUX LANE SB (EA 13820, PPNO 0444E).	$278,993
LOS ANGELES	STATE HIGHWAY	LA0D45	47	SR-47 EXPRESSWAY:REPLACEMENT OF SCHUYLER HEIM BRIDGE TO INCLUDE 2 THRU LANES AND 1 AUX LANE NB; AND 3 THRU LANES AND 1 AUX LANE SB; CONSTRUCT EXPRESSWAY AND 2-LANE FLYOVER. SAFETEA-LU #712 & #3797	$687,000
LOS ANGELES	STATE HIGHWAY	LA0D391	47	VINCENT THOMAS BRIDGE STUDY – DEVELOP AND ANALYZE ALTERNATIVES TO INCREASE NEEDED CAPACITY. SAFETEA-LU HPP # 297 NON-CAPACITY	$1,400
LOS ANGELES	STATE HIGHWAY	LA0D393	60	GRAND AVENUE/SR 57/60 INTERCHANGE MODIFICATION: RESTRIPE THE EXISTING GRAND AVE, ADD WB ON-RAMP AND ADD WB AUX LANE, ADD SECOND SB LFT TURN LN AT EB RAMP (09 CFP 3137)	$19,002
LOS ANGELES	STATE HIGHWAY	LA0D450	60	RECONSTRUCT SR 60/GRAND AV INTERCHANGE – WIDEN GRAND AV: SB ADD 1THRU LN (2 EXSTNG); NB ADD 1 THRU LN (3 EXSTNG), REPLACE GRAND AV OC, ADD EB LOOP ON-RAMP, CONSTRUCT ADDITIONAL EB THRU LN FROM GRAND AVE TRAP LN TO SR57 ADD LN, ADD TWO BYPASS RAMP CONNECTORS, ADD AUX LNS EB AND WB FROM EAST TO WEST JUNCTION OF THE CONFLUENCE.	$257,900
LOS ANGELES	STATE HIGHWAY	LA0D399	60	ROUTE 60: CONSTRUCTION OF NEW PARTIAL DIAMOND INTERCHANGE FOR STATE ROUTE 60 (SR-60) AT LEMON AVE (SAFETEA-LU # 587).	$19,000
LOS ANGELES	STATE HIGHWAY	LA0B951	71	ROUTE 71: ROUTE 10 TO ROUTE 60 – EXPRESSWAY TO FREEWAY CONVERSION – ADD 1 HOV LANE AND 1 MIXED FLOW LANE . (2001 CFP 8349, TCRP #50) (EA# 210600, PPNO 2741) (TCRP #50)	$250,000
LOS ANGELES	STATE HIGHWAY	LA0G317	71	STATE ROUTE 71 EXPANSION FROM SR 60 TO I-10 POMONA CA (ADD PA&ED ONLY).	$878

U.S. Department of Transportation
Federal Highway Administration

California Division

650 Capitol Mall, Suite 4-100
Sacramento, CA 95814
(916) 498-5001
(916) 498-5008 (fax)

June 4, 2012

In Reply Refer To:
HDA-CA
Doc#: 63,437

Mr. Hasan Ikhrata
Executive Officer
Southern California Association of Governments
818 West 7th Street, 12th Floor
Los Angeles, CA 90017

Dear Mr. Ikhrata:

SUBJECT: CONFORMITY DETERMINATION FOR SCAG's 2012 RTP/SCS and 2010/11 FTIP through AMENDMENT NO. 11-24

The Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) have completed our review of the conformity determinations for the Southern California Association of Governments' (SCAG) 2012 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) – *Towards a Sustainable Future*, and the 2010/11 Federal Transportation Improvement Program (FTIP) through Amendment No. 11-24. A FTA/FHWA air quality conformity determination is required pursuant to the Environmental Protection Agency's (EPA) *Transportation Conformity Rule*, 40 Code of Regulations (CFR) Parts 51 and 93, and the United States Department of Transportation's *Metropolitan Planning Rule*, 23 CFR Part 450. SCAG's new conformity determination for the 2010/11 FTIP was completed to ensure consistency with the new RTP.

On April 4, 2012 SCAG adopted the 2012 RTP/SCS and the associated Consistency Amendment No. 11-24 to the 2010/11 FTIP via Resolution No. 12-538-2. The conformity analysis submitted by SCAG indicates that all air quality conformity requirements have been met. Based on our review, we find that the 2012 RTP/SCS and 2010/11 FTIP through Amendment No. 11-24 conform to the applicable state implementation plan in accordance with the provisions of 40 CFR Parts 51 and 93. In accordance with the July 15, 2004 *Memorandum of Understanding (MOU) between the Federal Highway Administration California Division and Federal Transit Administration Region IX*, the FTA has concurred with this conformity determination. Furthermore, this conformity determination was made in consultation with the EPA's Region IX office.

In accordance with the MOU between the FHWA and FTA mentioned above, the FHWA's single signature constitutes the FHWA and FTA's joint air quality conformity determination for SCAG's new 2012 RTP/SCS and amended 2010/11 FTIP via Amendment No. 11-24. If you have any questions pertaining to this conformity finding, please contact Stew Sonnenberg at (916) 498-5889, or by email at stew.sonnenberg@dot.gov.

Sincerely,

For
Vincent P. Mammano
Division Administrator

cc: (email)
Hasan Ikhrata, SCAG (ikhrata@scag.ca.gov)
Rich Macias, SCAG (macias@scag.ca.gov)
Jonathan Nadler, SCAG (nadler@scag.ca.gov)
Naresh Amatya, SCAG (amatya@scag.ca.gov)
Rosemary Ayala, SCAG (ayala@scag.ca.gov)
Ted Matley, FTA Region IX
Abhijit Bagde, Caltrans Programming (abhijit_bagde@dot.ca.gov)
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Karina O'Connor, EPA Region IX
Lisa Hanf, EPA Region IX
Marchelle Berry, FHWA-CA
Kara Magdaleno, FHWA-CA
Jermaine Hannon, FHWA-CA
Stew Sonnenberg, FHWA-CA
Michael Morris, FHWA-CA

cc:
SCAG 2012 RTP Binder
SCAG 2010/11 FTIP Binder

MM/mb

ProjectID	County	Air Basin	Model	RTP ID	Program	Route	Begin	End	System	Conformity Category	Amendment
LA0D399	Los Angeles	SCAB		LA0D399	CARH3	60	23	22	S	NON-EXEMPT	17
Description:							PTC	19,000	Agency	DIAMOND BAR	

Route 60: CONSTRUCTION OF NEW PARTIAL DIAMOND INTERCHANGE FOR STATE ROUTE 60 (SR-60) AT LEMON AVE (SAFETEA-LU # 587).

Fund	ENG	R/W	CON	Total	Prior	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	Total
DEMO-SAFETEA-LU		1,120	8,400	9,520				1,120	8,400			9,520
AGENCY	2,500			2,500	2,500							2,500
CITY FUNDS		1,107	3,206	4,313			2,389		1,924			4,313
PROP "C25" FUNDS			2,294	2,294				2,294				2,294
LA0D399 Total	2,500	2,227	13,900	18,627	2,500		2,389	3,414	10,324			18,627

ProjectID	County	Air Basin	Model	RTP ID	Program	Route	Begin	End	System	Conformity Category	Amendment
LA0D393	Los Angeles	SCAB		1M0104	CAR75	60	23.87	24.48	S	NON-EXEMPT	1
Description:							PTC	19,002	Agency	INDUSTRY	

GRAND AVENUE/SR 57/60 INTERCHANGE MODIFICATION: RESTRIPE THE EXISTING GRAND AVE, ADD WB ON-RAMP AND ADD WB AUX LANE, ADD SECOND SB LFT TURN LN AT EB RAMP (09 CFP 3137)

Fund	ENG	R/W	CON	Total	Prior	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	Total
AGENCY	1,500	3,287	5,464	10,251	1,500		1,051	3,246	4,454			10,251
PROP "C25" FUNDS		3,287	5,464	8,751			1,051	3,246	4,454			8,751
LA0D393 Total	1,500	6,574	10,928	19,002	1,500		2,102	6,492	8,908			19,002

ProjectID	County	Air Basin	Model	RTP ID	Program	Route	Begin	End	System	Conformity Category	Amendment
LA0D450	Los Angeles	SCAB		1M0104	CAYT3	60	30.4	24.5	S	NON-EXEMPT	24
Description:							PTC	257,900	Agency	INDUSTRY	

RECONSTRUCT SR 60/GRAND AV INTERCHANGE - WIDEN GRAND AV: SB ADD 1THRU LN (2 EXSTNG); NB ADD 1 THRU LN (3 EXSTNG), REPLACE GRAND AV OC, ADD EB LOOP ON-RAMP, CONSTRUCT ADDITIONAL EB THRU LN FROM GRAND AVE TRAP LN TO SR57 ADD LN, ADD TWO BYPASS RAMP CONNECTORS, ADD AUX LNS EB AND WB FROM EAST TO WEST JUNCTION OF THE CONFLUENCE.

Fund	ENG	R/W	CON	Total	Prior	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	Total
AGENCY	8,500	9,000	17,500	35,000	7,000		10,500	17,500				35,000
CITY FUNDS			222,900	222,900				38,225	73,225	73,225	38,225	222,900
LA0D450 Total	8,500	9,000	240,400	257,900	7,000		10,500	55,725	73,225	73,225	38,225	257,900

ProjectID	County	Air Basin	Model	RTP ID	Program	Route	Begin	End	System	Conformity Category	Amendment
LA0B951	Los Angeles	SCAB		LA0B951	CAR62	71	.5	4.8	S	TCM Committed	17
Description:							PTC	250,000	Agency	CALTRANS	

Route 71: ROUTE 10 TO ROUTE 60 - EXPRESSWAY TO FREEWAY CONVERSION - ADD 1 HOV LANE AND 1 MIXED FLOW LANE . (2001 CFP 8349, TCRP #50) (EA# 210600, PPNO 2741) (TCRP #50)

Fund	ENG	R/W	CON	Total	Prior	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	Total
NATIONAL HWY SYSTEM	1,592			1,592	1,592							1,592
TRAFFIC CONGESTION RELIEF	11,800			11,800	4,800			7,000				11,800
LA0B951 Total	13,392			13,392	6,392			7,000				13,392

U.S. Department of Transportation
Federal Highway Administration

California Division

June 4, 2012

650 Capitol Mall, Suite 4-100
Sacramento, CA 95814
(916) 498-5001
(916) 498-5008 (fax)

In Reply Refer To:
HDA-CA
Doc#: 63,436

Ms. Rachel Falsetti
Division Chief
Transportation Programming Federal Resources Office, M.S. 82
California Department of Transportation
1120 N Street
Sacramento, CA 95814

Dear Ms. Falsetti:

SUBJECT: SCAG 2010/11 – 2013/14 FTIP/FSTIP AMENDMENT NO. 11-24

The Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) have completed our reviews of Amendment No. 11-24 to the Southern California Association of Governments' (SCAG) 2010/11 – 2013/14 Federal Transportation Improvement Program (FTIP), which was submitted by your letter dated April 24, 2012. As detailed in your letter's enclosure, this amendment requests to add twenty-four (24) new individual project listings, to modify ninety-five (95) individual project listings, and to remove thirty-nine (39) individual project listings that were previously approved for inclusion in the 2010/11 – 2013/14 FTIP and California's Federal Statewide Transportation Improvement Program (FSTIP).

This amendment is a consistency amendment in association with adoption of SCAG's 2012 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). We have determined that the added project listings and modifications from this amendment conform and are consistent with the new regional emissions analysis for SCAG's 2012 RTP/SCS, and all non-exempt projects have been incorporated into SCAG's model. Acceptance of this amendment is pursuant to a joint FHWA and FTA air quality conformity determination, which is required by the U.S. Environmental Protection Agency's (EPA) transportation conformity rule – 40 Code of Federal Regulations (CFR) Part 51 and 40 CFR § 93.122(g) – and the FHWA/FTA Metropolitan Planning Regulations – 23 CFR § 450. This finding has been coordinated with Region IX of the EPA in accordance with the procedures outlined in the *National Memorandum of Understanding (MOU) between the Department of Transportation (DOT) and EPA on Transportation Conformity*, dated April 25, 2000. Accordingly, we find that the SCAG 2010/11 – 2013/14 FTIP, including Amendment No. 11-24, conforms to the applicable State Implementation Plan (SIP) for air quality.

Pursuant to the July 15, 2004 *MOU, between the FHWA – California Division and FTA – Region IX*, and based on our review of information submitted with the State's proposed 2010/11 – 2013/14 FSTIP, which includes revenues, proposed project funding information to demonstrate financial constraint, and statewide and metropolitan planning process documentation, we accept these FSTIP modifications proposed for the SCAG region in accordance with the Final Rule on Statewide and Metropolitan Transportation Planning that was published in the February 14, 2007 Federal Register. We have determined that the amended SCAG FTIP, including Amendment No. 11-24, is financially constrained as required by the Federal surface transportation programs authorizing legislation and statewide planning, metropolitan planning, and programming regulations. SCAG's FTIP was developed through a continuing, cooperative, and comprehensive transportation planning process in accordance with the metropolitan transportation planning provisions of 23 United States Code (U.S.C.) § 134 and 49 U.S.C. Chapter 53. Any project or project phase, however, listed in SCAG's FTIP that is not included in SCAG's RTP/SCS is not approved for inclusion in the FSTIP pursuant to 23 CFR § 450.216(k) and § 450.324(g).

Project listings and/or project phases that indicate no funds are proposed for obligation during the four-year SCAG FTIP period cannot be advanced to implementation without an action by the FHWA and FTA on the FSTIP pursuant to 23 CFR §§ 450.216(l) and 450.328(e). In addition, project or project phase funding included in SCAG's FTIP proposed for obligation outside the fiscally constrained portion of the FTIP is accepted by the FHWA and FTA as "informational" in accordance with 23 CFR §§ 450.216(a) and 450.324(a).

We are approving the 2010/11 – 2013/14 FSTIP with the understanding that the eligibility of individual projects for funding is subject to the applicant's satisfaction of all administrative and statutory requirements. This joint FHWA and FTA approval of the FSTIP does not constitute an eligibility determination for the federal funds proposed for obligation on the listed projects. If you have any questions or need additional information concerning our FSTIP approval for this SCAG FTIP amendment, please contact Michael Morris of the FHWA California Division's Cal-South office at (213) 894-4014, or by email at michael.morris@dot.gov; or Ted Matley of the FTA Region IX office at (415) 744-2590, or by email at ted.matley@dot.gov.

Sincerely,

/s/ Leslie T. Rogers

Leslie T. Rogers
Regional Administrator
Federal Transit Administration

For
Vincent P. Mammano
Division Administrator
Federal Highway Administration

cc: (email)
Hasan Ikhrata, SCAG
Rich Macias, SCAG
Rosemary Ayala, SCAG
Ted Matley, FTA Region IX
Abhijit Bagde, Caltrans Programming (abhijit_bagde@dot.ca.gov)
Muhaned Aljabiry, Caltrans Programming (muhaned_aljabiry@dot.ca.gov)
Karina O'Connor, EPA Region IX
Lisa Hanf, EPA Region IX
Marchelle Berry, FHWA-CA
Kara Magdaleno, FHWA-CA
Stew Sonnenberg, FHWA-CA
Michael Morris, FHWA-CA

cc:
SCAG 2010/11 FTIP Binder

MM/mb

APPENDIX B

CO Protocol

Table 1. Projects Exempt from All Emissions Analyses

<u>Safety</u>
Railroad/highway crossing
Hazard elimination program
Safer non-Federal-aid system roads
Shoulder improvements
Increasing sight distance
Safety improvement program
Traffic control devices and operating assistance other than signalization projects
Railroad/highway crossing warning devices
Guardrails, median barriers, crash cushions
Pavement resurfacing and/or rehabilitation
Pavement marking demonstration
Emergency relief (23 U.S.C. 125)
Fencing
Skid treatments
Safety roadside rest areas
Adding medians
Truck climbing lanes outside the urbanized area
Lighting improvements
Widening narrow pavements or reconstructing bridges (no additional travel lanes)
Emergency truck pullovers
<u>Mass Transit</u>
Operating assistance to transit agencies
Purchase of support vehicles
Rehabilitation of transit vehicles[2]
Purchase of office, shop, and operating equipment for existing facilities
Purchase of operating equipment for vehicles (e.g. radios, fareboxes, lifts, etc.)
Construction of renovation of power, signal, and communications systems
Construction of small passenger shelters and information kiosks
Reconstruction or renovation of transit buildings and structures (e.g., rail or bus buildings, storage and maintenance facilities, stations, terminals, and ancillary structures).
Rehabilitation or reconstruction of track structures, track and track bed in existing right-of-way
Purchase of new buses and rail cars to replace exiting vehicles or for minor expansions of the fleet[2]
Construction of new bus or rail storage/maintenance facilities categorically excluded in 23 CFR Part 771
<u>Air Quality</u>
Continuation of ride-sharing and van-pooling promotion activities at current level
Bicycle and pedestrian facilities
<u>Other</u>
Specific activities which do not involve or lead directly to construction, such as:
Planning and technical studies
Grants for training and research programs
Planning activities conducted pursuant to titles 23 and 49 U.S.C.
Federal-aid systems revisions

[2] PM_{10} nonattainment or maintenance areas, such projects are exempt only if they are in compliance with control measures in the applicable implementation plan.

Table 1 (continued). Projects Exempt from all Emissions Analyses

<u>Other (cont.)</u>
Engineering to assess social, economic, and environmental effects of the proposed action or alternatives to that action
Noise attenuation
Emergency or hardship advance land acquisitions [23 CFR 712.204(d)]
Acquisition of scenic easements
Plantings, landscaping, etc.
Sign removal
Directional and informational signs
Transportation enhancement activities (except rehabilitation and operation of historic transportation buildings, structures, or facilities)
Repair of damage caused by natural disasters, civil unrest, or terrorist acts, except projects involving substantial functional, locational or capacity changes

Source: 40 CFR Part 93, Table 2

Resources Board (CARB), Caltrans, EPA, and the FHWA (in the case of a highway project) or the FTA (in the case of a transit project) concur that a project has potential adverse local and/or regional emissions impacts for any reason [40 CFR § 93.126].

2.15 Project Exempt from Regional Emissions Analyses

Certain projects are ordinarily exempt from all regional emissions analyses according to Table 3 of 40 CFR § 93.127, reproduced in Table 2 of the Protocol. However, the exempt status may be revoked if the MPO, in consultation with the local air district, the California Air Resources Board (CARB), Caltrans, EPA, and the FHWA (in the case of a highway project) or the FTA (in the case of a transit project) concur that a project has potential regional emissions impacts for any reason [40 CFR § 93.127].

Table 2. Projects Exempt from Regional Emissions Analysis

Intersection channelization projects
Intersection signalization projects at individual intersections
Interchange reconfiguration projects
Changes in vertical and horizontal alignment
Truck size and weight inspection stations
Bus terminals and transfer points

Source: 40 CFR Part 93, Table 3

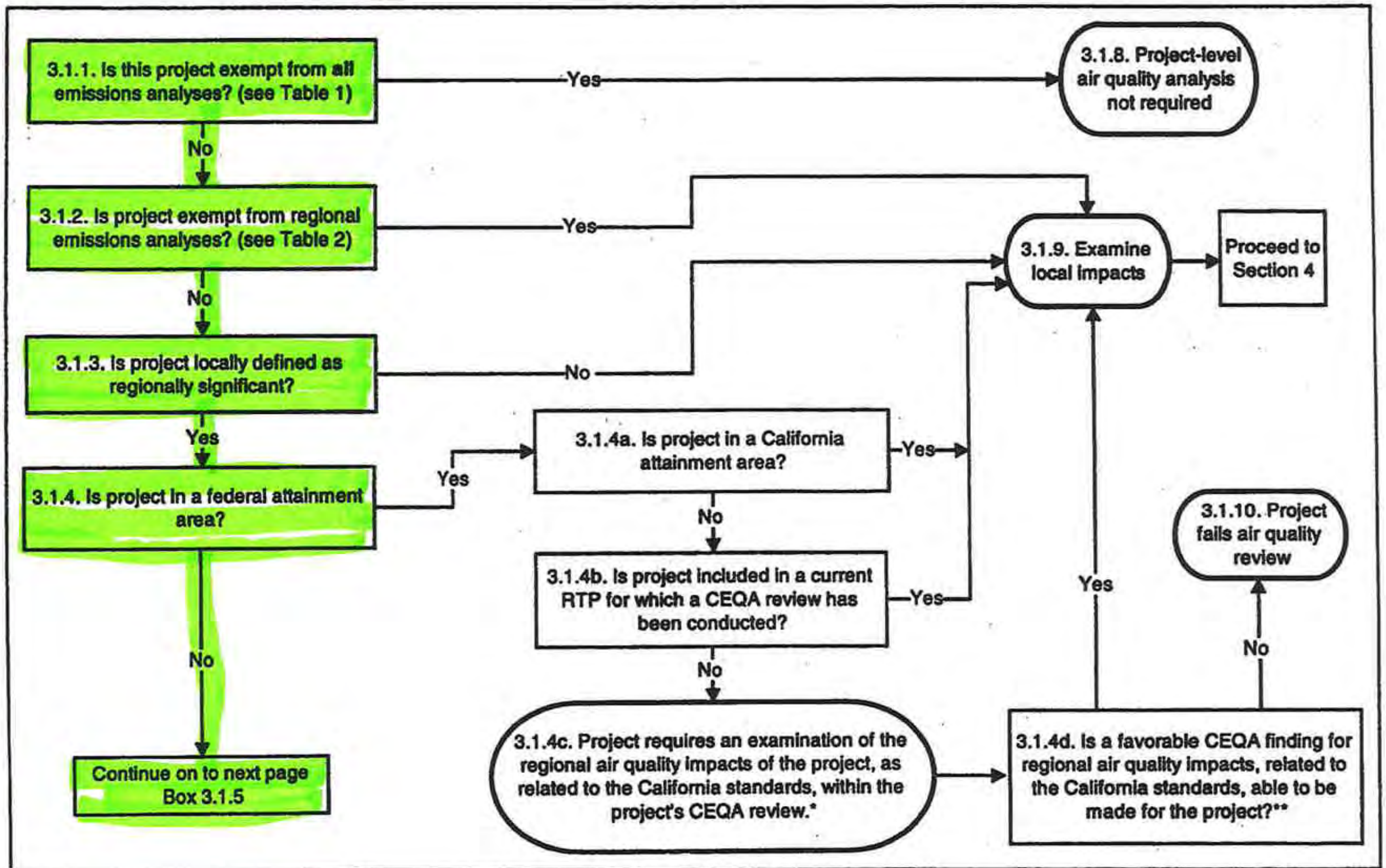

Figure 1. Requirements for New Projects

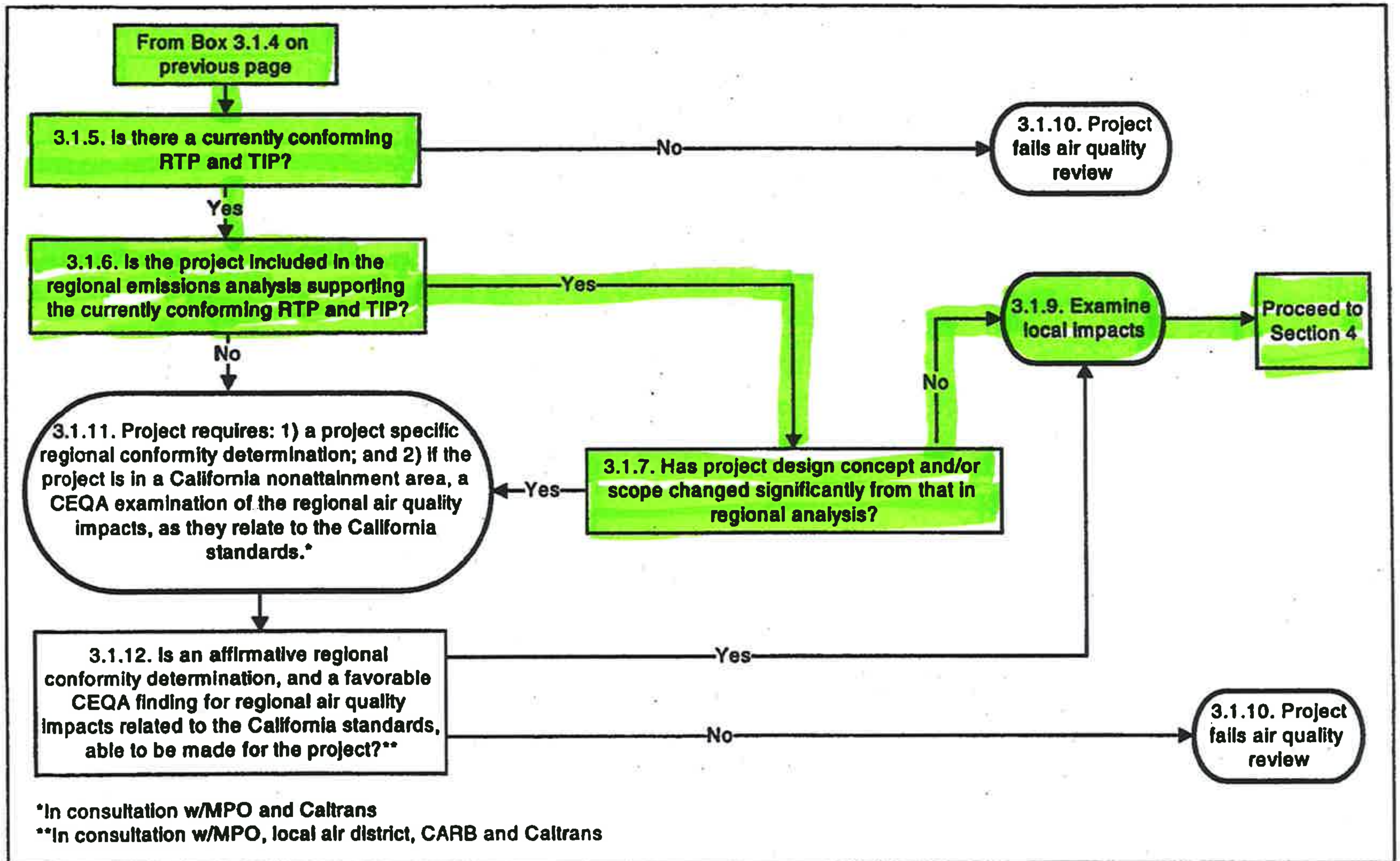

Figure 1 (cont.). Requirements for New Projects

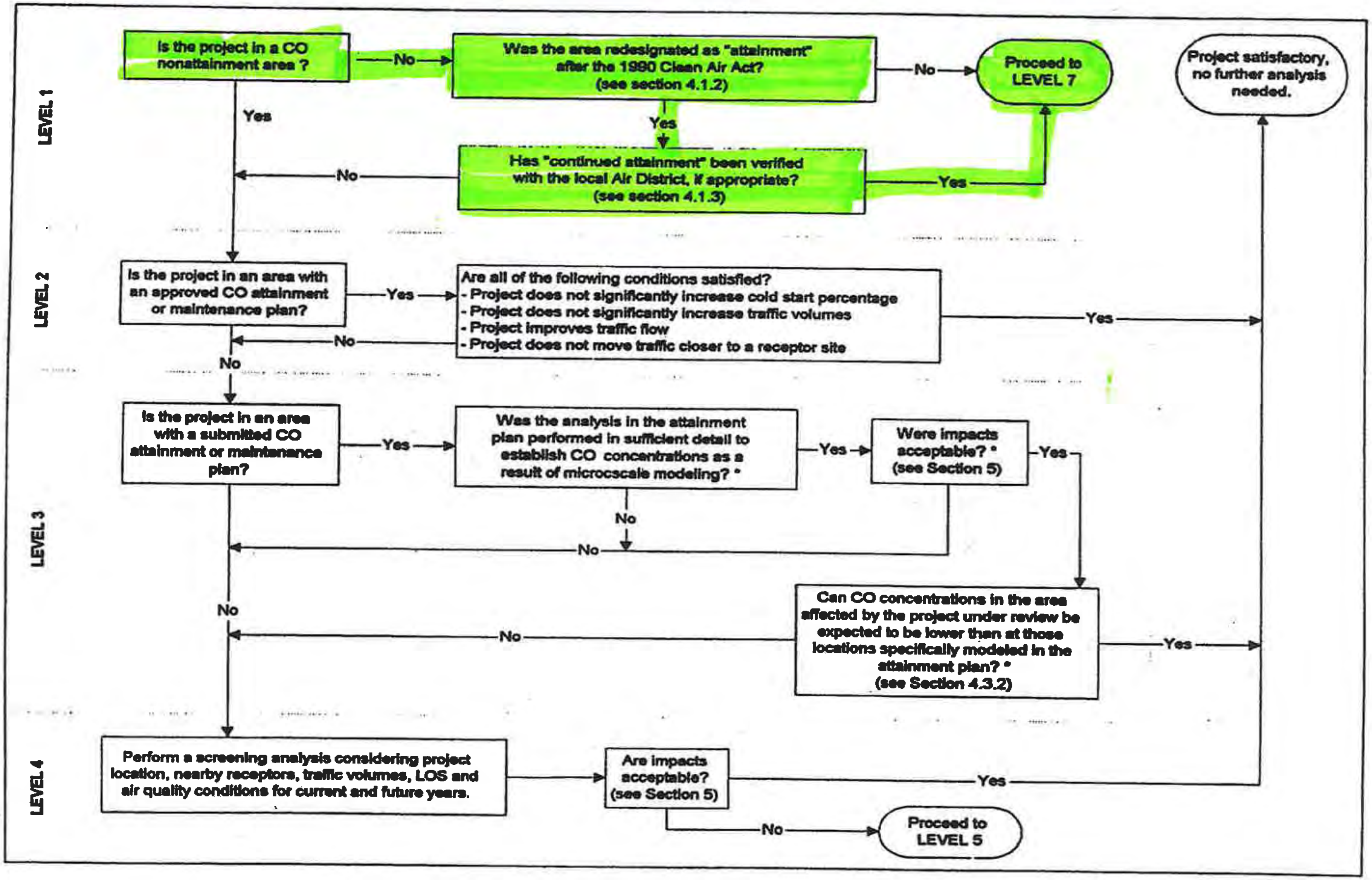

Figure 3. Local CO Analysis

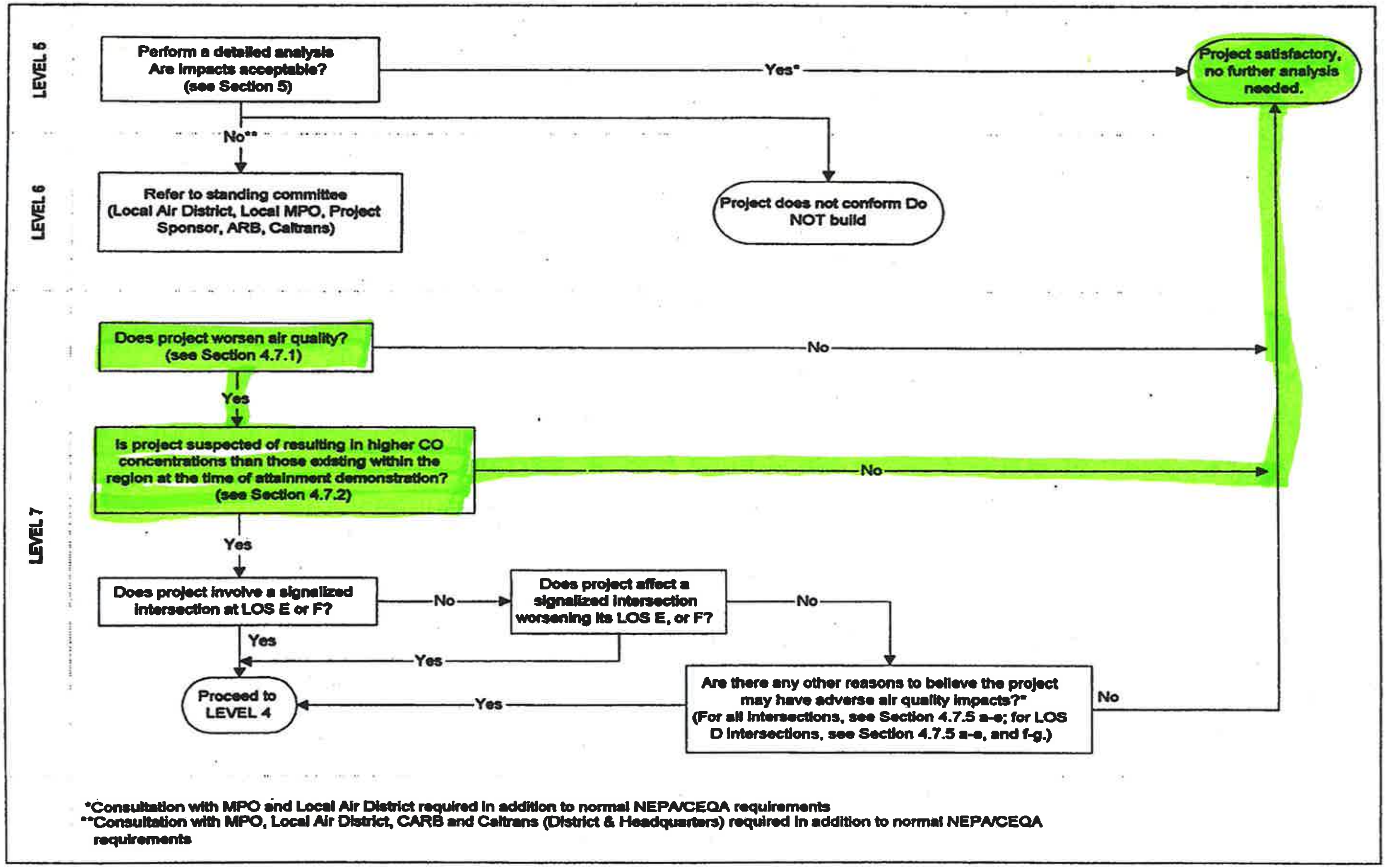

Figure 3 (cont.). Local CO Analysis

APPENDIX C

Transportation Conformity Working Group PM Conformity Documentation

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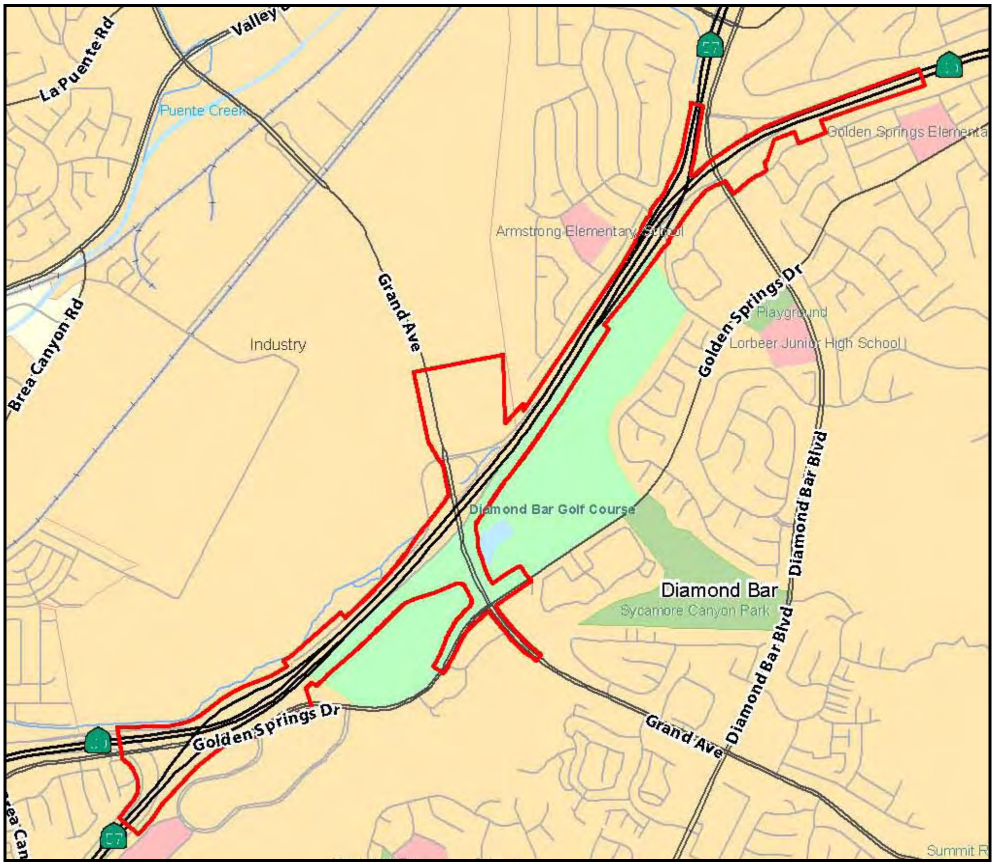
TCWG Review of Qualitative Analyses

Qualitative PM Hot Spot Analysis Review

January 2012	Determination
LA0B952	Pending, Additional questions and comments will be circulated via email.
LA0D450 LA0D450 Appendix	Analysis deemed acceptable for NEPA circulation.

State Route 57/State Route 60 Confluence Project



Qualitative PM10 and PM2.5 Hot-Spot Analysis

City of Industry, California

07-LA-57-PM-R4.3/R4.5 and R4.5/R4.8
07-LA-60-PM-R23.7/R26.5

EA Number: 279100

January 2012

Caltrans

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APPENDIX A

Tables

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Figures

Acronyms and Abbreviations

$\mu g/m^3$	micrograms per cubic meter
ADT	Average Daily Traffic
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
California CAA	California Clean Air Act
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
City	City of Industry
DOT	U.S. Department of Transportation
DPM	diesel particulate matter
EIR/EA	environmental impact report/environmental assessment
EPA	U.S. Environmental Protection Agency
FHWA	Federal Highway Administration
FR	Federal Register
FTIP	Federal Transportation Improvement Program
IAC	interagency consultation
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
PM10	particulate matter less than or equal to 10 microns in diameter
PM2.5	particulate matter less than or equal to 2.5 microns in diameter
POAQC	Project of Air Quality Concern
ppm	parts per million
RTIP	Regional Transportation Improvement Program
RTP	Regional Transportation Plan
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SR	State Route
VMT	vehicle miles travelled

Chapter 1 Introduction

The City of Industry, in cooperation with the California Department of Transportation (Caltrans or Department) District 7 and the Federal Highway Administration (FHWA), proposes to reconfigure the approximately 2.5-mile confluence of State Route (SR) 57 and SR-60. This would include the addition of auxiliary lanes and associated on-ramp/off-ramp reconfigurations. SR-57 and SR-60 are major inter-regional freeways that link cities in the San Gabriel Valley and the Inland Empire with Los Angeles and Orange counties. Please refer to Chapter 2, "Project Description," for a detailed description of the build alternatives.

The proposed project is included in the Southern California Association of Governments (SCAG) 2008 Regional Transportation Plan (RTP) Amendment #4 and the SCAG 2011 Federal Transportation Improvement Program (FTIP or TIP) under project identification number LA0D450. The 2011 FTIP was adopted by SCAG on September 2, 2010, and FHWA approved the TIP on December 14, 2010. The 2011 FTIP model list replaces the RTP Amendment #4 model list. Because the 2011 FTIP model list includes the proposed project (Project ID# LA0D450), the proposed project is considered to have satisfied regional conformity requirements. Please refer to Appendix A for documentation from 2008 RTP Amendment #4 and the 2011 FTIP.

This project-level particulate matter hot-spot analysis for the SR-57/SR-60 Confluence Project responds to the U.S. Environmental Protection Agency's (EPA's) requirement for a hot-spot analysis for particulate matter less than or equal to 10 microns in diameter (PM10) and/or particulate matter less than or equal to 2.5 microns in diameter (PM2.5), as required in EPA's March 10, 2006, Final Transportation Conformity Rule (71 Federal Register [FR] 12468). The effects of localized PM10 and PM2.5 hot spots were evaluated with use of the EPA and FHWA guidance manual, *Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas* (Federal Highway Administration and U.S. Environmental Protection Agency 2006).[1] This qualitative particulate matter hot-spot analysis demonstrates how the proposed project meets project-level particulate matter conformity requirements for PM10 and PM2.5.

[1] The availability of new EPA guidance documents for completing quantitative particulate matter (PM2.5 and PM10) hot-spot analyses was announced in the Federal Register on December 20, 2010 (75 FR 79370). The announcement provides a 2-year grace period before use of the new quantitative particulate matter hot-spot guidance is required for project-level particulate matter conformity determinations. Until December 20, 2012, project-level conformity determinations made using the 2006 qualitative guidance remain appropriate.

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Chapter 2 Project Description

2.1 Introduction

The City of Industry, in cooperation with Caltrans, is proposing freeway improvements to the SR-57/SR-60 confluence at the Grand Avenue interchange in Los Angeles County. Figure 2-1 and Figure 2-2 show the regional location and project vicinity. The proposed project would be subject to both the California Environmental Quality Act (CEQA) and the federal National Environmental Policy Act (NEPA). The City of Industry would be the lead agency under CEQA, and Caltrans would be the lead agency under NEPA.

SR-57 is a major north-south freeway, serving the cities and communities of the Greater Los Angeles area. This freeway's north terminus is at its junction with Interstate (I) 210 in the City of Glendora, and its south terminus is at its junction with I-5 and SR-22 in the City of Orange. The portion of SR-57 within the project area is located in the Pomona Valley.

SR-60 is a major east-west freeway and also serves the cities and communities of the Greater Los Angeles area. SR-60 is part of the National Highway System (NHS) and the State Freeway and Expressway (F&E) System. SR-60 runs from I-10 in the City of Los Angeles, near the Los Angeles River, east to I-10 in Riverside County, serving the cities and communities on the east side of the Los Angeles metropolitan area and on the south side of the San Gabriel Valley. The west terminus of the freeway is at the East Los Angeles interchange, and the east terminus is at its junction with I-10 in the City of Beaumont.

SR-57 and SR-60 meet and interconnect in the City of Diamond Bar and the City of Industry. The two freeways have a generally northeasterly/southwesterly orientation, with northbound/eastbound traffic sharing the alignment for approximately 1.26 miles and southbound/westbound traffic sharing the alignment for approximately 1.34 miles.

The primary purposes of the proposed project are to improve traffic operations and safety on SR-57 and SR-60 at the Grand Avenue interchange.

2.2 Project Description

The proposed project would consist of the reconfiguration of the approximately 2.5-mile confluence of SR-57 and SR-60. This would include the addition of auxiliary lanes and associated on-ramp/off-ramp reconfigurations. SR-57 and SR-60 are major inter-regional freeways that link cities in the San Gabriel Valley and the Inland Empire with Los Angeles and Orange counties.

Figure 2-1: Regional Vicinity Map

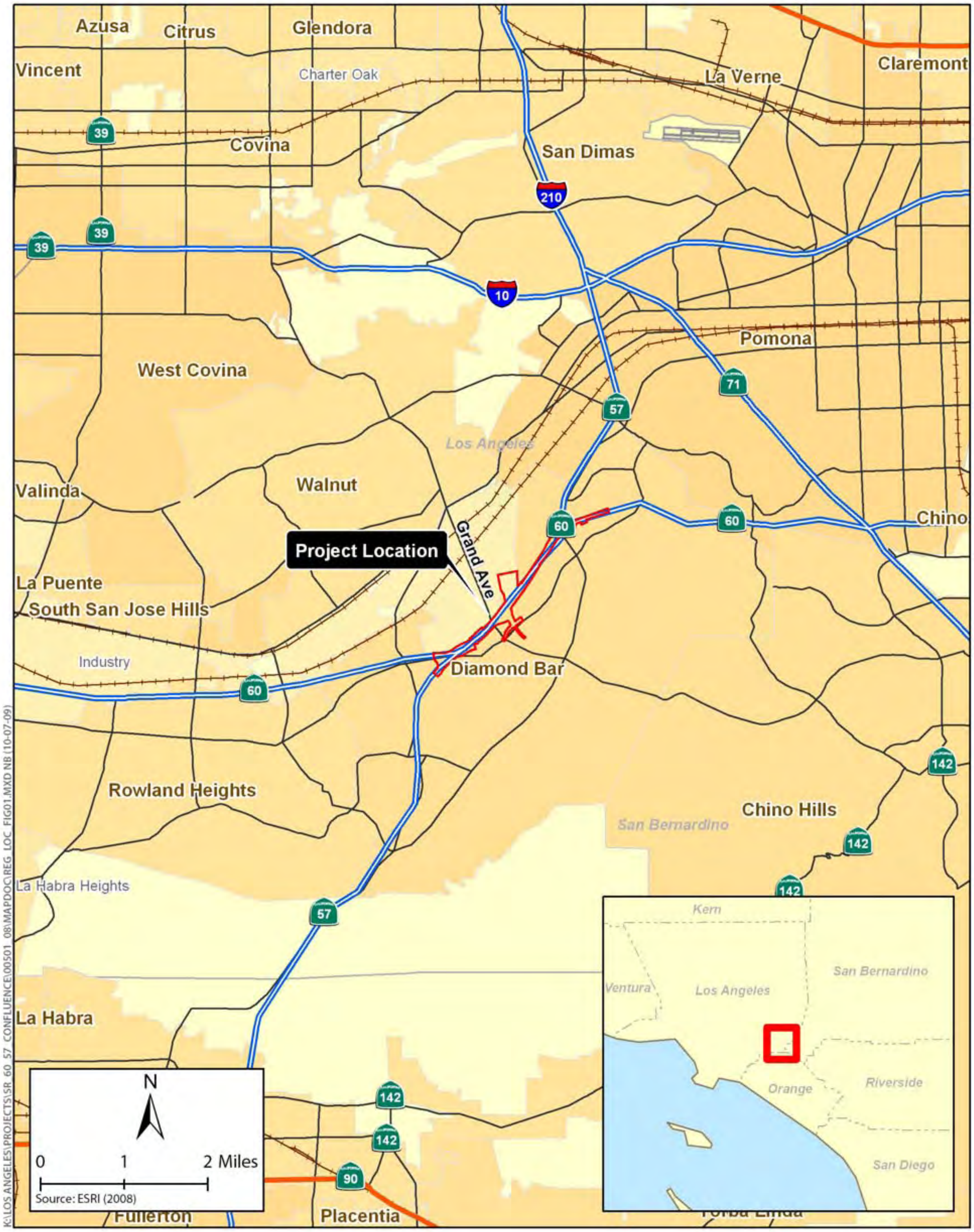
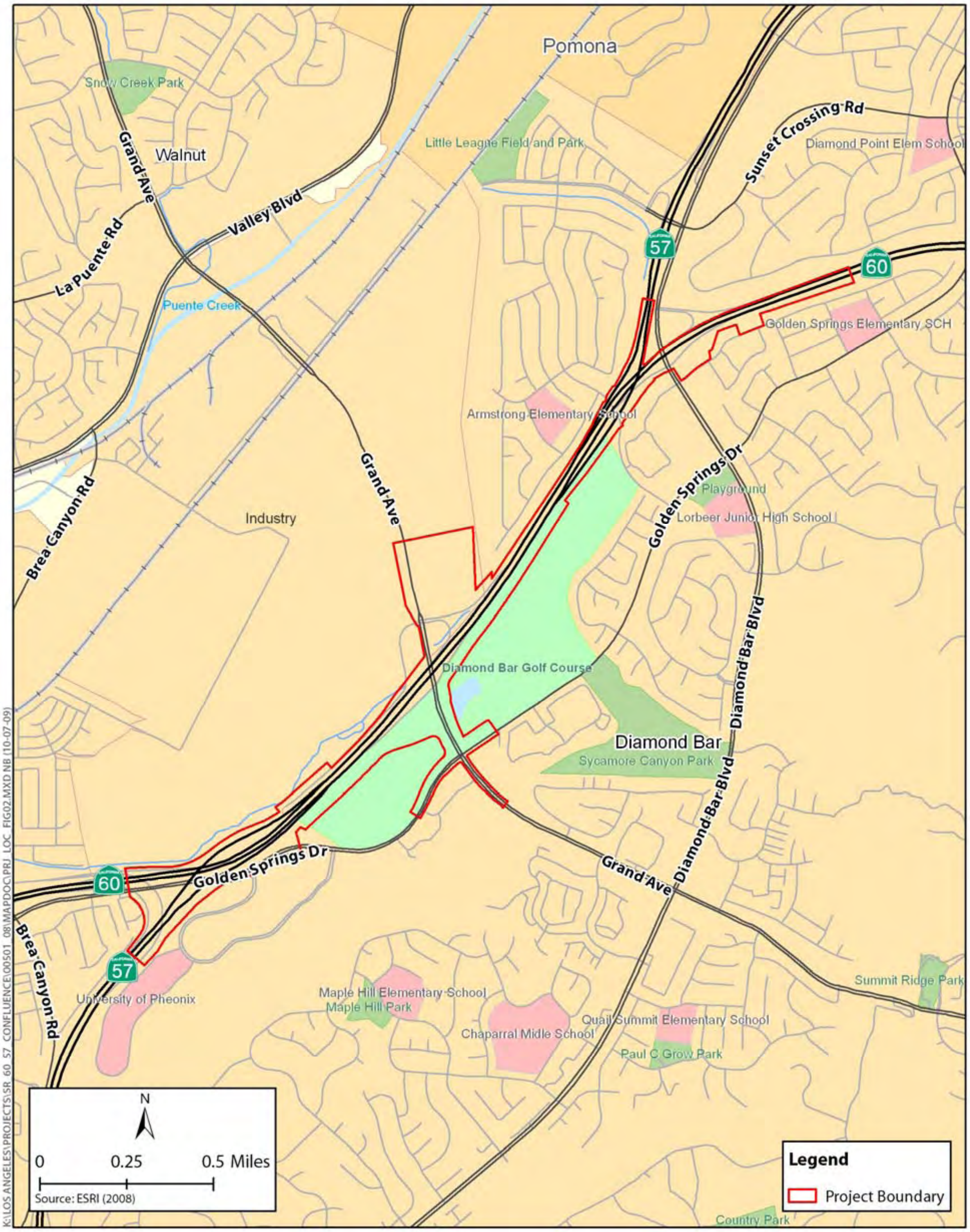


Figure 2-2: Project Location Map



2.2.1 Alternative 1 – No-Build Alternative

The No-Build (or No-Action) Alternative would result in no structural or physical changes to SR-57, SR-60, or the Grand Avenue interchange. Existing deficient capacity and congestion conditions due to short weaving sections on SR-57, SR-60, and Grand Avenue would not change under this alternative.

2.2.2 Build Alternatives

Two build alternatives are being considered. The two build alternatives (Alternatives 2 and 3) are described below and shown in Figures 2-3 and 2-4. Under both build alternatives, a new bypass off-ramp is proposed for eastbound SR-60 west of the southern/western SR-57/SR-60 junction. The bypass off-ramp would be barrier separated from SR-57/SR-60 traffic until passing the Grand Avenue off-ramp. Northbound SR-57 traffic would exit to Grand Avenue by using an optional exit from the third SR-57 lane. The off-ramp lane would combine with the one-lane eastbound SR-60 bypass off-ramp. The off-ramp would widen to three lanes at the final approach to the intersection at Grand Avenue.

Currently, the third lane on SR-57 ends at the Grand Avenue off-ramp but begins again 4,200 feet to the east. The build alternatives would both add this lane between the Grand Avenue off-ramp and the additional lane near the SR-57 diverge at the east end. An auxiliary lane would be added adjacent to the added through lane to serve traffic entering from Grand Avenue.

At the east end of the confluence, a bypass connector would be built to connect the Grand Avenue eastbound on-ramp auxiliary lane with eastbound SR-60. This connector would require new overcrossing structures at Prospector Road and Diamond Bar Boulevard as well as realignment of the Diamond Bar Boulevard on-ramp.

In the westbound direction, the dropped southbound SR-57 lane would be extended 2,500 feet to the realigned westbound SR-60 off-ramp to Grand Avenue, creating a two-lane exit ramp. The exit ramp would expand to five lanes at the intersection.

Operational improvements along Grand Avenue include widening the roadway to four through lanes in each direction under both build alternatives. Grand Avenue would be widened easterly, encroaching on the westbound loop on-ramp. Grand Avenue would be realigned approximately 50 feet east of the existing centerline to avoid a right-of-way take from a vacant automobile dealership on Grand Avenue north of SR-60. The centerline shift of Grand Avenue would require the westbound off-ramp to be relocated approximately 100 feet north of the existing intersection on Grand Avenue. The intersection relocation would also require realignment of the two-lane westbound loop on-ramp and Old Brea Canyon Road (to be renamed Grand Crossing Parkway).

Figure 2-3: Alternative 2, Combination Cloverleaf/Diamond Interchange Configuration

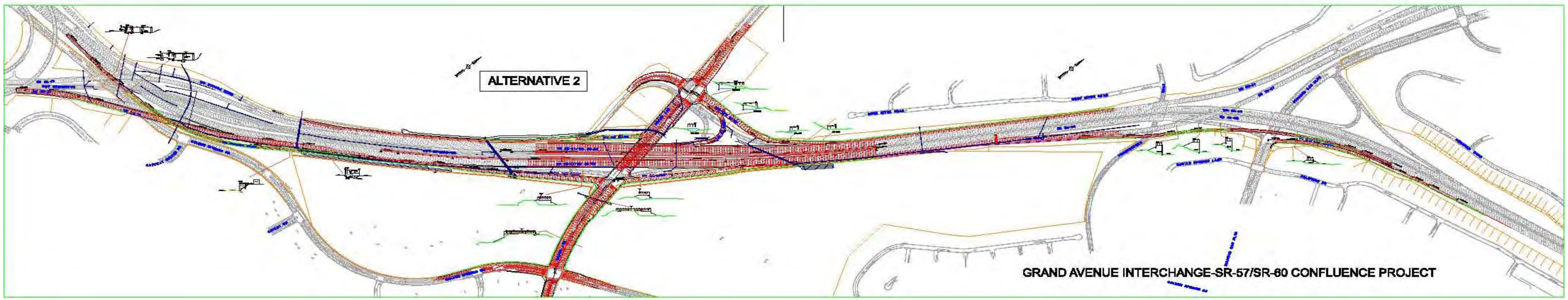


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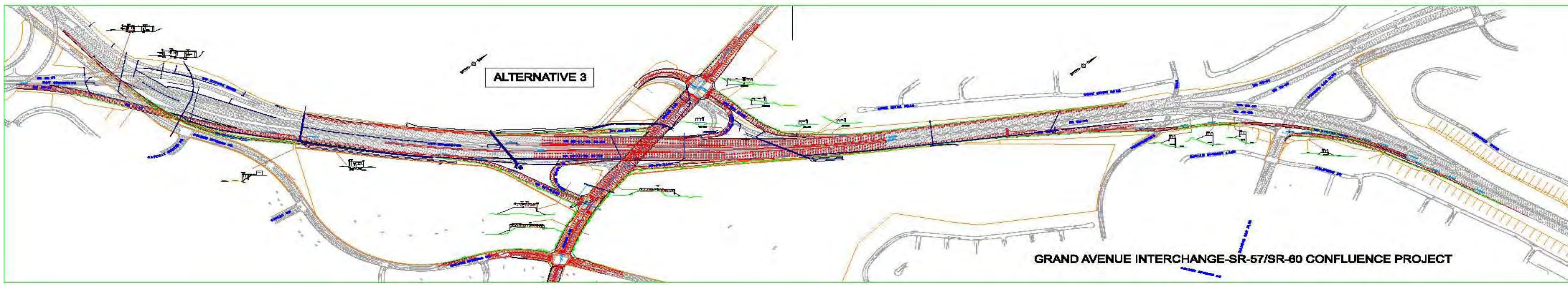
Figure 2-4: Alternative 3, Partial Cloverleaf Interchange Configuration



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The existing Grand Avenue overcrossing does not have sufficient length to accommodate an added northbound SR-57 through lane or sufficient vertical clearance over SR-60 to allow for widening. Therefore, it would be replaced. The replacement bridge would be longer and deeper, resulting in a raised profile along Grand Avenue.

The widening of Grand Avenue would continue south to Golden Springs Drive. Golden Springs Drive would be widened to allow additional through lanes, double left-turn lanes, and one right-turn lane on three legs of the intersection of Grand Avenue and Golden Springs Drive. One right-turn lane would be provided on Grand Avenue at the northbound approach to Golden Springs Drive. Approximately 600 feet of northbound Grand Avenue south of the intersection at Golden Springs Drive would be restriped to three lanes.

A continuous pedestrian walkway is currently provided on the west side of Grand Avenue between Golden Springs Drive and Old Brea Canyon Road. However, on the east side of Grand Avenue, no pedestrian walkway is provided north of the overcrossing. Under both alternatives, 8-foot-wide walkways on both sides of Grand Avenue would be constructed from Golden Springs Drive to Old Brea Canyon Road. Construction of build the alternatives would not affect pedestrian walkways on other local roads.

The eastbound bypass off-ramp would require a sliver right-of-way take from a hotel property on Golden Springs Drive. The bypass connector from the eastbound on-ramp would require sliver right-of-way takes from several commercial properties on Diamond Bar Boulevard, a hotel and restaurant on Gentle Springs Lane, and a gas station and restaurant on Palomino Drive. No impact on residential properties is anticipated under either build alternative. Under both build alternatives, temporary construction easements totaling 3.4 acres, excluding the golf course property, would be required during the construction period.

2.2.2.1 Alternative 2: Combination Cloverleaf/Diamond Configuration Interchange Alternative

Alternative 2 would maintain the existing interchange configuration (compact diamond) for the eastbound SR-60 on- and off-ramps. The interchange configuration at Grand Avenue for Alternative 2 would remain a combination partial cloverleaf for the westbound SR-60 on- and off-ramps. An auxiliary lane would be added, connecting the new three-lane on-ramp at Grand Avenue to the new connector, which would bypasses the north/east SR-57/SR-60 interchange.

As discussed above, the existing Grand Avenue overcrossing does not have sufficient length to accommodate an added northbound SR-57 through lane or sufficient vertical clearance over SR-60 to allow for widening. Therefore, it would be replaced. Under Alternative 2, the existing Grand Avenue overcrossing would be replaced by a 10-lane, 148-foot-wide structure over SR-60. The longer span would require a deeper structure, raising the Grand Avenue profile by about 4 feet. The bridge would contain eight through lanes and two 450-foot-long double left-turn lanes from southbound Grand Avenue to the eastbound on-ramp.

2.2.2.2 Alternative 3: Partial Cloverleaf Interchange Configuration Alternative

The main difference between Alternative 2 and Alternative 3 is the configuration of the eastbound SR-60 interchange at Grand Avenue. Under Alternative 3, the existing eastbound on- and off-ramps at Grand Avenue, which form a compact diamond interchange, would be reconfigured to form a partial cloverleaf interchange. The new intersection at Grand Avenue and the new eastbound on- and off-ramps would be located approximately 500 feet south of the existing intersection (i.e., midway between the freeway and Golden Springs Drive). The new eastbound on-ramp from southbound Grand Avenue would be a loop on-ramp that would join SR-60 as a new eastbound auxiliary lane. The existing eastbound on-ramp would be realigned to accommodate the widened Grand Avenue and merge into the eastbound auxiliary lane created by the new loop on-ramp from southbound Grand Avenue to eastbound SR-60. The auxiliary lane would connect to the new connector that bypasses the north/east SR-57/SR-60 interchange.

As discussed above, the existing Grand Avenue overcrossing would be replaced by a new structure over SR-60. However, unlike Alternative 2, a double left-turn lane from southbound Grand Avenue to the eastbound on-ramp would not be required because vehicles traveling southbound on Grand Avenue would access northbound SR-57 and eastbound SR-60 by way of the new loop on-ramp on the west side of Grand Avenue. The new Grand Avenue overcrossing would be widened to accommodate eight through lanes and a center divider/median.

2.2.2.3 Construction Activities and Staging

The construction phase of the proposed project is anticipated to begin in the fall of 2014 and end by the fall of 2017. The proposed project would involve clearing, excavation, grading, and other site preparation activities prior to structural work and paving. On-site construction staging would occur just north of the westbound SR-60/southbound SR-57 Grand Avenue on- and off-ramps. This area, which is east of Grand Avenue, is owned by the City of Industry.

Chapter 3 PM10 and PM2.5 Hot-Spot Analysis

The following is the SR-57/SR-60 Confluence Project hot spot conformity analysis for particulate matter less than or equal to 10 microns in diameter (PM10) and particulate matter less than or equal to 2.5 microns in diameter (PM2.5). In accordance with the final Transportation Conformity Rule, 40 CFR 93.116 and 93.123 (b)(1), this project is defined as a Project of Air Quality Concern (POAQC) and requires a qualitative PM2.5 and PM10 hot spot analysis.

3.1 Regulatory Background

Under 1990 Clean Air Act 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 Southern California Association of Governments (SCAG) for Riverside County and the appropriate federal agencies, such as the Federal Highway Administration (FHWA), make the determination that the RTP is in conformity with the State Implementation Plan for achieving the goals of the Clean Air Act. Otherwise, the projects in the RTP must be modified until conformity is attained. If the design and scope of the proposed transportation project are the same as described in the RTP, then the proposed project is deemed to meet regional conformity requirements for purposes of project-level analysis.

Conformity at the project-level also requires “hot spot” analysis if an area is “nonattainment” or “maintenance” for carbon monoxide (CO) and/or particulate matter. A region is a “nonattainment” area if one or more monitoring stations in the region fail to attain the relevant standard. Areas that were previously designated as nonattainment areas but have recently met the standard are called “maintenance” areas. “Hot spot” analysis is essentially the same, for technical purposes, as CO or particulate matter analysis performed for NEPA purposes. Conformity does include some specific standards for projects that require a hot spot analysis. In general, projects must not cause the CO standard to be violated, and in “nonattainment” areas the project must not cause any increase in the number and severity of violations. If a known CO or particulate matter violation is located in the 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 new air quality violations of the NAAQS. Conformity requirements were made substantially more rigorous in the 1990 CAAA, 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 SCAG is the designated federal MPO and state regional transportation planning agency for Los Angeles County. As such, SCAG 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 PM10 and PM2.5 nonattainment and maintenance areas. The final rule requires a hot spot analysis to be performed for a POAQC or any other project identified by the PM2.5 and PM10 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 State Implementation Plan (SIP). The rule provides criteria and procedures to ensure that these activities will not cause or contribute to new violations, increase the frequency or severity of any existing violations, or delay timely attainment of the relevant NAAQS as described in 40 CFR 93.101.

EPA's final rule, 40 CFR 93.123(b)(1) defines a POAQC 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 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 PM2.5 or PM10 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 PM2.5 and PM10 Nonattainment and Maintenance Areas* (Federal Highway Administration and U.S. Environmental Protection Agency 2006). This guidance details a qualitative step-by-step screening procedure to determine whether project-related particulate emissions have a potential to cause or contribute to new air quality violations, increase the frequency or severity of existing violations, or delay timely attainment of NAAQS for PM2.5 or PM10. The PM2.5 and PM10 hot spot analyses are required for project-level conformity because the area is in non-attainment for both PM 2.5 and PM10 standards.

For the assessment of PM2.5 and PM10 hotspots, the final rule is that a hotspot analysis is to be performed only for POAQCs. POAQCs are certain highway and transit projects that involve significant levels of diesel traffic or any other project identified in the PM2.5 or PM10 SIP as a 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% 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 (operated 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 busses 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 services 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 PM2.5 or PM10 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 PM2.5 or PM10 emissions.

For projects identified as not being a POAQC, qualitative PM2.5 and PM10 hotspot 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 hotspot analysis, since such projects have been found to not be of air quality concern under *40 CFR 93.123(b)(1).* Because this analysis assumes the area is classified as a nonattainment area for the federal PM2.5 and PM10 standard, a determination must be made as to whether it would result in a PM2.5 or PM10 hotspot.

Of these five POAQC types identified above, the project most likely falls into the first category of a "new or expanded highway projects that have a significant number of or significant increase in diesel vehicles." As indicated in Table 3-1, traffic volumes along SR-57 and SR-60 are anticipated to exceed the EPA and FHWA's POAQC guideline of 125,000 ADT volumes.

Table 3-1: Mainline ADT on SR-57 and SR-60

SR-57							
	Existing (2009)	2017 Interim			2037 Future		
Segment		Alt 1	Alt 2	Alt 3	Alt 1	Alt 2	Alt 3
Diamond Bar Blvd and Pathfinder Rd	124,100	125,900	125,900	125,900	151,200	147,600	147,600
Pathfinder Rd and SR-60	119,500	120,700	120,700	120,700	145,200	147,000	147,000
SR-60 on-/off-ramps and SR-60 split	117,600	121,100	122,600	122,600	129,000	133,800	133,800
SR-60 and Temple Ave	105,800	112,700	117,800	117,800	127,800	144,400	144,400
SR-60							
	Existing (2009)	2017 Interim			2037 Future		
Segment		Alt 1	Alt 2	Alt 3	Alt 1	Alt 2	Alt 3
Brea Canyon Rd and SR-57	126,800	130,800	130,800	130,800	178,200	190,200	190,200
SR-57 and Grand Ave	168,800	178,400	184,000	184,000	199,800	217,800	217,800
Btwn Grand Ave on-/off-ramps	226,800	232,400	238,500	238,500	244,800	264,600	264,600
Grand Ave and SR-57 split	226,000	241,300	249,700	249,700	275,400	302,400	302,400
SR-57 split and Diamond Bar Blvd	125,100	132,600	132,500	132,500	149,100	149,100	149,100
Diamond Bar Blvd and Philips Ranch Rd	130,600	139,500	142,000	142,000	159,300	167,400	167,400
Adapted from: KOA Corporation 2011.							

In addition, heavy truck traffic volumes on the SR-57/SR-60 mainline are expected to exceed the POAQC guideline of 10,000 truck ADT, on multiple segments under both build alternatives at horizon year 2037, as shown in Table 3-2.

Table 3-2: Mainline Truck ADT Volumes on SR-57 and SR-60

SR-57							
Segment	Existing (2009)	2017 Interim			2037 Future		
		Alt 1	Alt 2	Alt 3	Alt 1	Alt 2	Alt 3
Diamond Bar Blvd and Pathfinder Rd	6,577	6,673	6,673	6,673	8,014	7,823	7,823
Pathfinder Rd and SR-60	6,453	6,518	6,518	6,518	7,841	7,938	7,938
SR-60 on-/off-ramps and SR-60 split	4,234	4,360	4,414	4,414	4,644	4,817	4,817
SR-60 and Temple Ave	6,560	6,987	7,304	7,304	7,924	8,953	8,953
SR-60							
Segment	Existing (2009)	2017 Interim			2037 Future		
		Alt 1	Alt 2	Alt 3	Alt 1	Alt 2	Alt 3
Brea Canyon Rd and SR-57	8,622	8,894	8,894	8,894	12,118	12,934	12,934
SR-57 and Grand Ave	10,297	10,882	11,224	11,224	12,188	13,286	13,286
Btwn Grand Ave on-/off-ramps	15,196	15,571	15,980	15,980	16,402	17,728	17,728
Grand Ave and SR-57 split	14,916	15,926	16,480	16,480	18,176	19,958	19,958
SR-57 split and Diamond Bar Blvd	8,507	9,017	9,010	9,010	10,139	10,139	10,139
Diamond Bar Blvd and Philips Ranch Rd	8,620	9,207	9,372	9,372	10,514	11,048	11,048
Adapted from: KOA Corporation 2011.							

With respect to affected arterial streets, total ADT volumes and truck ADT volumes would remain well below the POAQC guidelines of 125,000 ADT and 10,000 truck ADT, respectively. Arterial street ADT and truck ADT volumes are shown below in Table 3-3 and Table 3-4, respectively.

Table 3-3: Arterial ADT along Grand Avenue and Golden Springs Road

Grand Avenue							
		2017 Interim			2037 Future		
Segment	Existing	Alt 1 (No Project)	Alt 2	Alt 3	Alt 1 (No Project)	Alt 2	Alt 3
Grand Ave north of SR-60 WB on-/off-ramps	29,800	37,600	40,800	40,800	55,000	65,300	65,300
Grand Ave btwn SR-60 WB on-ramp and EB ramps	28,100	37,600	36,700	36,700	58,600	55,700	55,700
Grand Ave btwn SR-60 EB ramps and Golden Springs Rd	27,600	31,800	33,300	33,300	41,000	46,000	46,000
Grand Ave btwn Golden Springs Rd and Chardonay Dr	25,100	28,500	29,400	29,400	36,300	39,100	39,100
Golden Springs Drive							
		2017 Interim			**2037 Future**		
Segment	**Existing**	**Alt 1 (No Project)**	**Alt 2**	**Alt 3**	**Alt 1 (No Project)**	**Alt 2**	**Alt 3**
Golden Springs Rd btwn Grand Ave and Lavender Dr	24,100	27,700	26,800	26,800	35,500	33,000	33,000
Golden Springs Rd btwn Grand Ave and Racquet Club Dr	16,800	19,400	18,700	18,700	25,500	23,200	23,200
Adapted from: KOA Corporation 2011.							

Table 3-4: Arterial Truck ADT Volumes along Grand Avenue and Golden Springs Road

Grand Avenue							
		2017 Interim			2037 Future		
Segment	Existing	Alt 1 (No Project)	Alt 2	Alt 3	Alt 1 (No Project)	Alt 2	Alt 3
Grand Ave north of SR-60 WB on-/off-ramps	2,980	3,760	4,080	4,080	5,500	6,530	6,530
Grand Ave btwn SR-60 WB on-ramp and EB ramps	2,810	3,760	3,670	3,670	5,860	5,570	5,570
Grand Ave btwn SR-60 EB ramps and Golden Springs Rd	552	636	666	666	820	920	920
Grand Ave btwn Golden Springs Rd and Chardonay Dr	502	570	588	588	726	782	782
Golden Springs Drive							
		2017 Interim			2037 Future		
Segment	Existing	Alt 1 (No Project)	Alt 2	Alt 3	Alt 1 (No Project)	Alt 2	Alt 3
Golden Springs Rd btwn Grand Ave and Lavender Dr	482	554	536	536	710	660	660
Golden Springs Rd btwn Grand Ave and Racquet Club Dr	336	388	374	374	510	464	464
Adapted from: KOA Corporation 2011.							

Because SR-57/SR/60 mainline ADT and truck ADT volumes are anticipated to exceed POAQC guideline criteria, the project is considered to be a POAQC. Consistent with the FHWA and EPA's 2006 qualitative hot spot analysis guidance, the proposed project was evaluated to assess whether the project would cause or contribute to any new localized PM2.5 or PM10 violations; or increase the frequency or severity of any existing violations; or delay timely attainment of the PM10 or PM2.5 national ambient air quality standards (NAAQS).

3.1.2 National Ambient Air Quality Standards

PM2.5 NAAQS:

- 24-hour Standard: The old 1997 standard of 65 $\mu g/m^3$ was revised in 2006 to 35 $\mu g/m^3$
- Annual Standard: 15 $\mu g/m^3$

PM10 NAAQS:

- 24-hour Standard: 150 $\mu g/m^3$

The South Coast Air Basin (SCAB), the basin in which the City of Industry portion of Los Angeles County resides, was designated as a serious nonattainment area from its previous designation of moderate nonattainment area for the federal PM10 standard on February 8, 1993. The SCAB was classified as a nonattainment area on April 5, 2005 for the federal PM2.5 standard (South Coast Air Quality Management District 2003 & South Coast Air Quality Management District 2007).

The 24-hour PM10 standard is based on the number of days in the calendar year with 24-hour recorded concentrations greater than 150µg/m^3; the number of days must be equal to or less than one. The annual PM10 standard is no longer used for determining federal attainment status. The 24-hour PM2.5 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 PM2.5 recorded concentrations. A PM2.5 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 PM2.5 hot-spot analysis meets statutory and regulatory requirements for both standards, depending on the factors that are evaluated for a given project.

3.2 Surrounding Land Uses

Caltrans defines sensitive receptors (aka: sensitive land uses) as schools, medical centers and similar healthcare facilities, child care facilities, parks, and playgrounds (California Department of Transportation 2008). The area surrounding the project site consists of open space and residential uses west and northwest of the SR-57/SR-60 confluence; residential uses west and northwest of the southwest project limit; residential uses northwest, north, and east of the northeast project limit; and recreational uses (a golf course) south of the SR-57/SR-60 confluence. There is a fast-food restaurant and a former auto dealership that is no longer in business to the southwest of the Grand Avenue at SR-60 westbound off-ramp intersection, and there is a Target store to the southwest of the Grand Avenue at Golden Springs Road intersection. The fast-food restaurant has a former children's playground area that faces the freeway. The playground area has been closed for some time and will not be reopened, according to restaurant management (Aragues pers. comm.). The restaurant manager said on a site visit on June 2, 2009, and a subsequent telephone conversation on June 12, 2009, that no replacement playground equipment or other sensitive uses are planned for the area currently occupied by the playground.

The closest sensitive receptors to the project area are residences located approximately 100 feet northwest of the SR-57/SR-60 confluence; residences approximately 150 feet southwest of the northeast project limit; a private preschool, La Petite Academy, located approximately 200 feet south of the Grand Avenue at Golden Springs Road intersection and approximately 50 feet west of Grand Avenue, and; the Diamond Bar Montessori Academy located approximately 200 feet to the southwest of SR-60 about 0.20 miles northeast of the SR-57/SR-60 split. There are also numerous schools located within 0.50 miles of the project site. Some of the residences northwest of the SR-57/SR-60 confluence are located up on a hill, and residences in this area that are not elevated from the freeway are protected by a sound wall. The residences southwest of the northeast project limit and the Diamond Bar Montessori Academy southwest of SR-60 about 0.20 miles northeast of the SR-57/SR-60 split are protected from the freeway by dense trees. The La Petite Academy is not protected from Grand Avenue. Refer to Figure 3-1 for general locations of sensitive receptors in the project vicinity. For clarification, although the large area southwest of the eastern limit of the SR-57/SR-60 confluence is designated “schools,” SCAQMD and various commercial uses are also located in this area. The area is designated “schools” to show that this sensitive-receptor category is present throughout the area, which includes California Intercontinental University, the University of Phoenix – Diamond Bar Learning Center, the University of California, and Towne and Country Preschool and Infant Care Center.

3.3 Hot-Spot Analysis

The final Transportation Conformity Rule requires a hot spot analysis to be performed for POAQC, while projects identified as not being a POAQC are not required to undergo a hot spot analysis. As indicated above, data from Table 3-1 and Table 3-2 indicates that the project is a POAQC based on roadway traffic and truck ADT. As such, and a qualitative PM2.5 and PM10 hot spot analysis consistent with FHWA and EPA’s 2006 qualitative hot spot analysis guidance is required.

A hot-spot analysis is defined in Section 93.101 of 40 CFR 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 on a 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 within the project-level conformity determination that is made by FHWA or the Federal Transit Administration (FTA).

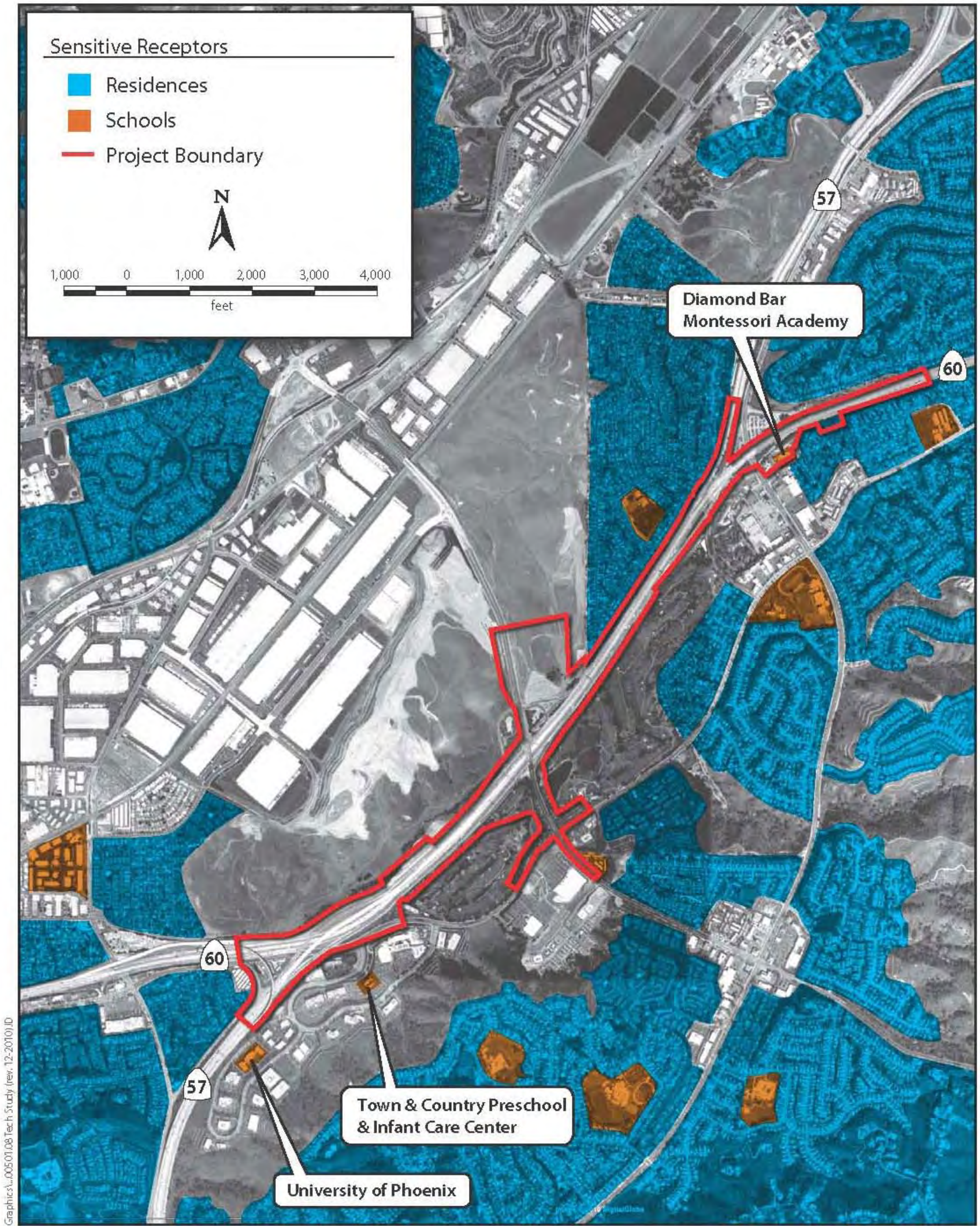
3.3.1 Analysis Methodology and Types of Emissions Considered

The EPA and FHWA established in the *Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas* (Federal Highway Administration and U.S. Environmental Protection Agency 2006) the following two methods for completing a PM2.5 and PM10 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 PM2.5 or PM10 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.

Figure 3-1: Air Quality Sensitive Receptors



The analysis was based on directly emitted PM2.5 and PM10 emissions, including tailpipe, brake wear, and tire wear. Re-entrained road dust is also included in the qualitative analysis, as PM10 re-entrained dust must be considered per conformity requirements and PM2.5 re-entrained road dust must be considered because the California Air Resources Board (ARB) has determined that re-entrained road dust is a significant contributor to ambient PM2.5 concentrations in the region (South Coast Air Quality Management District 2007).

Secondary particles formed through PM2.5 and PM10 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 PM2.5 and PM10 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 begin in the summer of 2014 and end by the fall of 2017. As such, construction duration would be less than five years. In addition, the project must comply with South Coast Air Quality Management District (SCAQMD) construction-related fugitive dust control measures (Rule 403), which will ensure that fugitive dust from construction activities are minimized. Consequently, construction-related PM2.5 and PM10 emissions were not included in the hot spot analysis per 40 CFR 93123(c)(5).

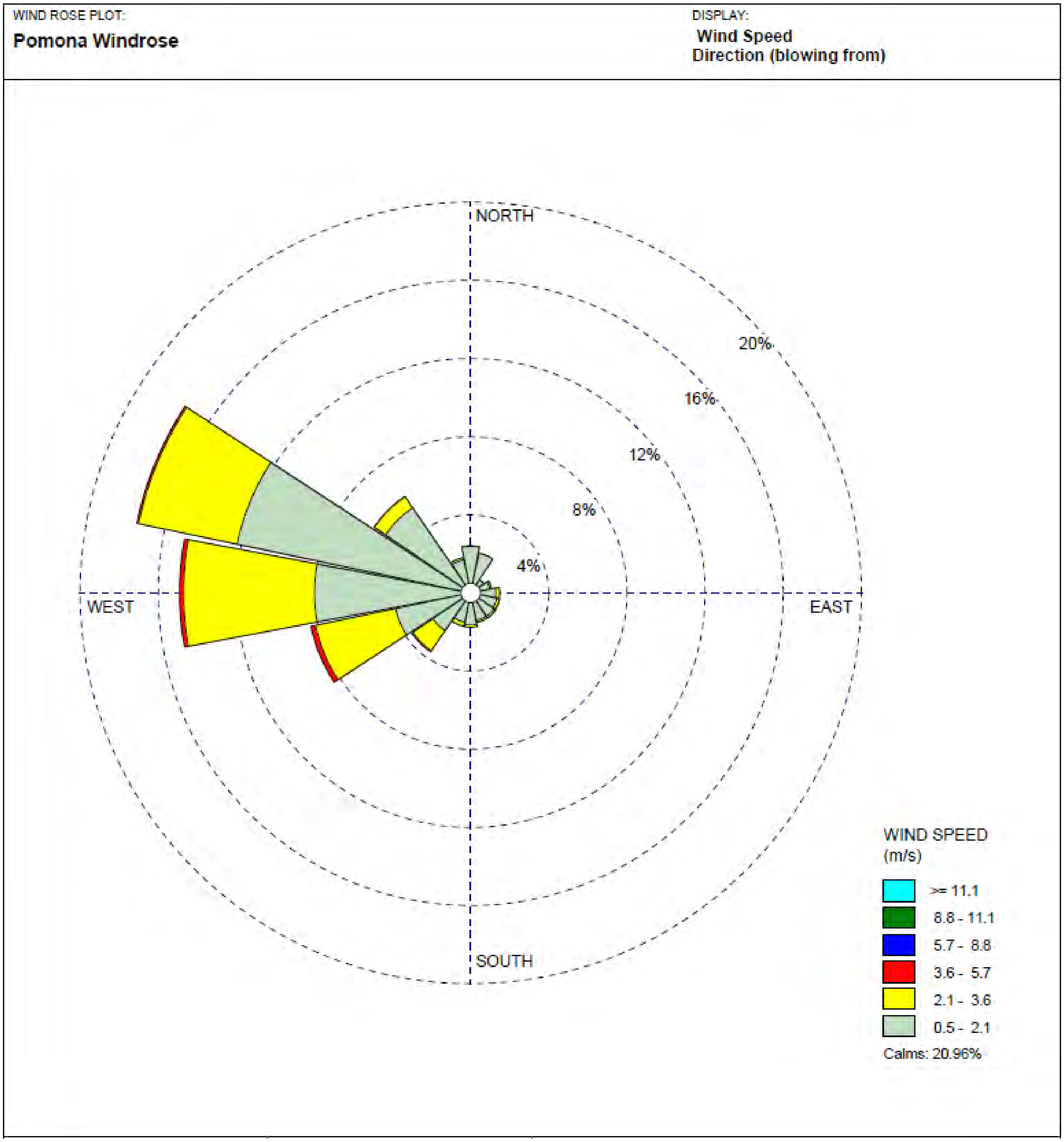
3.3.2 Air Quality Trend Analysis

The Pomona monitoring station does not monitor PM; therefore, local air quality data was obtained from the Azusa monitoring station (ARB Number 70060), which is the nearest monitoring station that monitors PM10 and PM2.5 concentrations. Local meteorological data was obtained from the Pomona weather station, located approximately 4 miles northeast of the project corridor. In addition, the Azusa weather station is located approximately ten miles northwest of the project corridor. Data from both the Pomona and Azusa weather stations have been included to characterize wind patterns in the project area. In addition to monitoring data, this analysis presents project-level PM2.5 and PM10 emissions in the future (2017 and 2037) years to help characterize the project's impact on total PM emissions generated in the project area and the impacts of the project and the likelihood of these impacts interacting with the ambient PM levels to cause PM hot spots.

3.3.2.1 Climate and Topography

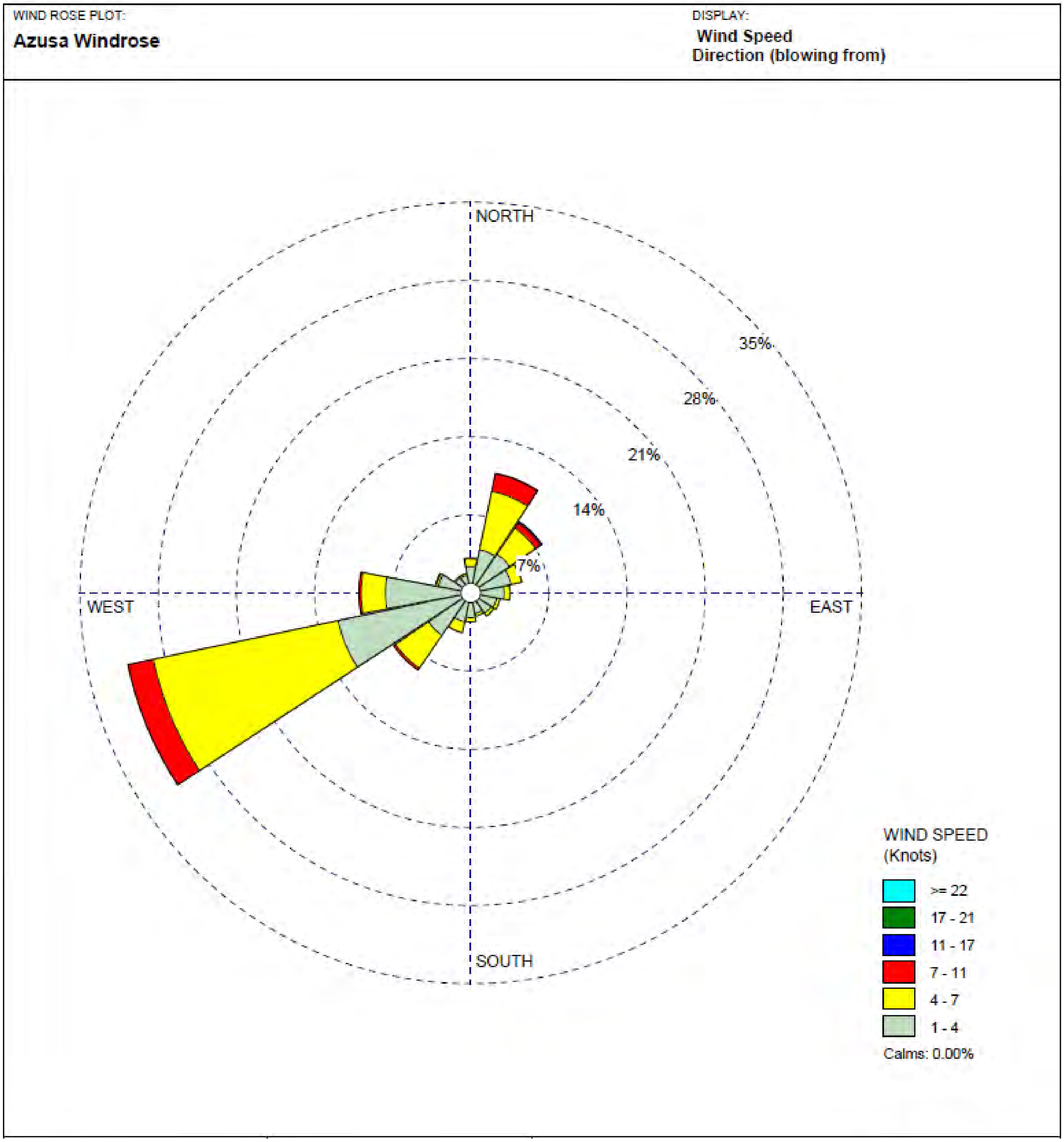
The proposed project lies within the 6,745 square mile SCAB. The SCAB is bounded by the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east and the Pacific Ocean to the West. The light winds and shallow vertical atmospheric mixing characteristic to the SCAB are present due to the region's terrain and geographical features. These characteristics contribute to the severity of air pollution issues in the SCAB. Figure 3-2 and Figure 3-3 indicate the predominant wind direction in the region based on meteorological data from the Pomona and Azusa monitoring stations discussed above (South Coast Air Quality Management District 2009a and b).

Figure 3-2: Predominant Wind Direction at Pomona Station



Source: South Coast Air Quality Management District 2009a

Figure 3-3: Predominant Wind Direction at Azusa Station



Source: South Coast Air Quality Management District 2009b

3.3.2.2 Trends in Monitored Particulate Matter Concentrations

As required by the applicable transportation conformity regulations for PM, a trend analysis has been conducted and compared to the NAAQS.

PM2.5

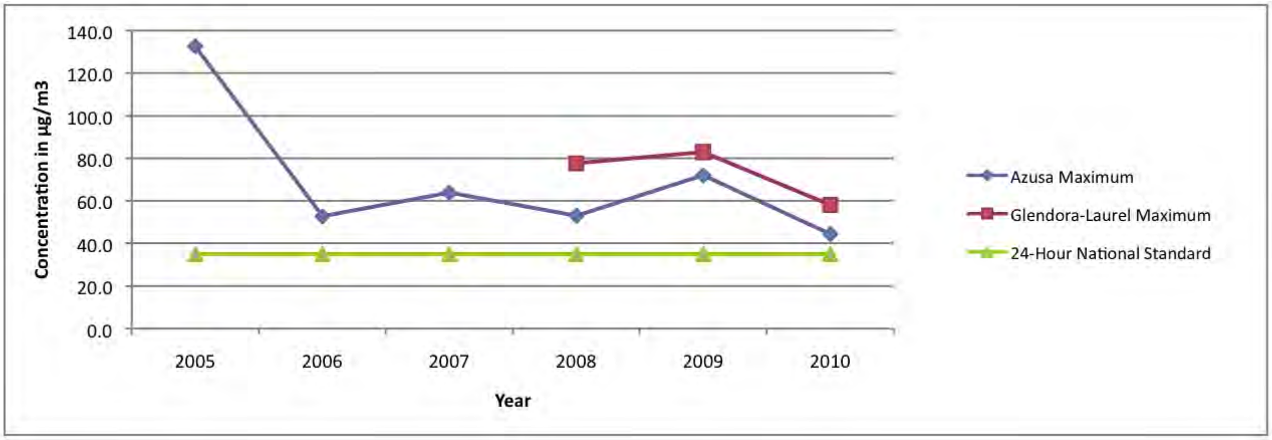
Monitored PM2.5 concentrations for the Azusa and Glendora-Laurel monitoring stations are presented in Table 3-5. Monitored data presented in Table 3-5 is for the three-year period from 2008 to 2010, the last year which complete data is available.

Table 3-5: Ambient PM2.5 Monitoring Data (μg/m^3) at the Azusa and Glendora-Laurel Monitoring Stations

Metric	2005	2006	2007	2008	2009	2010
Asuza						
Maximum 24-Hour Concentration	132.6	52.7	63.8	53.0	72.0	44.4
24-Hour Standard 98th Percentile	53.2	38.4	49.2	34.8	42.9	35.4
Exceeds the federal 24-hour standard (35 μg/m^3)?	Yes	Yes	Yes	Yes	Yes	Yes
Number of days federal standard exceeded?	18	8	19	5	6	1
National annual average	16.9	15.4	15.7	14.0	NA	NA
Exceeds the federal annual average standard (15.0 μg/m^3)?	Yes	Yes	Yes	No	NA	NA
*Glendora-Laurel***						
Maximum 24-Hour Concentration	NA	NA	NA	77.6	82.9	58.1
24-Hour Standard 98th Percentile	NA	NA	NA	NA	NA	NA
Exceeds the federal 24-hour standard (35 μg/m^3)?	NA	NA	NA	NA	NA	NA
Number of days federal standard exceeded?	NA	NA	NA	NA	NA	NA
National annual average	14.3	14.3	14.3	14.3	NA	NA
Exceeds the federal annual average standard (15.0 μg/m^3)?	NA	NA	NA	NA	NA	NA
** Glendora-Laurel Station came online in 2008. Source: California Air Resources Board 2011, compiled by ICF International January 2012.						

As indicated in Table 3-5 and Figure 3-4, below, maximum 24-hour PM2.5 concentrations at the both the Azusa and Glendora-Laurel monitoring stations have been somewhat erratic from year to year. For example, maximum concentrations at both stations were lower in 2010 than in 2008. However, both stations experienced concentrations in 2009 that exceeded 2008 measurements. While the national 24-hour PM2.5 standard has been exceeded at both stations in past years, Table 3-2 shows that the Azusa station measured one exceedance of the national standard in 2010, compared to 19 exceedances in 2007. In addition, the annual average concentration at the both the Azusa Glendora-Laurel stations did not exceed the national average national standard in 2008. No data is available to ascertain the number of daily exceedances for the Glendora-Laurel station.

Figure 3-4: PM2.5 24-hour Concentrations at the Azusa and Glendora-Laurel Stations



Source: California Air Resources Board 2011, compiled by ICF International January 2012.

PM10

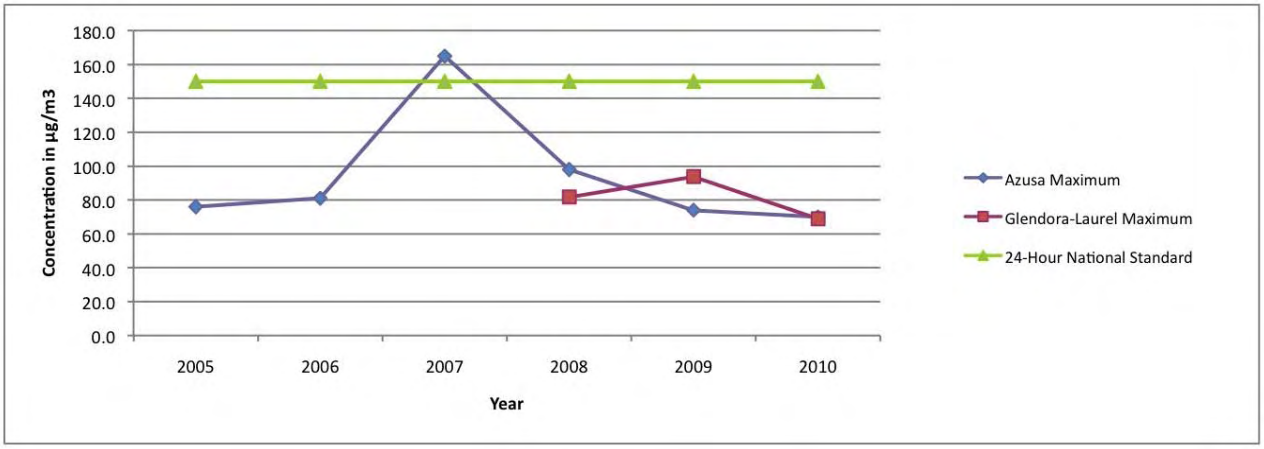
Monitored PM10 concentrations for the Azusa and Glendora-Laurel monitoring stations are presented in Table 3-6. Monitored data presented in Table 3-6 is for the three-year period from 2008 to 2010, the last year which complete data is available.

As indicated in Table 3-6 and Figure 3-5, below, maximum 24-hour PM10 concentrations at the Azusa monitoring station have steadily decreased from between 2008 (98.0 µg/m^3) and 2010 (70.0 µg/m^3). Table 3-6 and Figure 3-5 also show that at the Glendora-Laurel monitoring station, 24-hour PM10 concentrations have decreased from 81.7 µg/m^3 in 2008 to 69.8 µg/m^3 in 2010. Maximum values at both stations have remained below the current national standard of 150 µg/m^3.

Table 3-6: Ambient PM10 Monitoring Data at the Azusa and Glendora-Laurel Monitoring Stations

	2005	2006	2007	2008	2009	2010
Azusa						
Maximum 24-Hour Concentration	76.0	81.0	165.0	98.0	74.0	70.0
Exceeds the federal 24-hour standard (150 µg/m^3)?	No	No	Yes	No	No	No
*Glendora-Laurel***						
Maximum 24-Hour Concentration	NA	NA	NA	81.7	93.8	68.9
Exceeds the federal 24-hour standard (150 µg/m^3)?	NA	NA	NA	No	No	No
** Glendora-Laurel Station came online in 2008. Source: California Air Resources Board 2011, compiled by ICF International January 2012.						

Figure 3-5: PM10 24-hour Concentrations at the Azusa and Glendora-Laurel Stations



Source: California Air Resources Board 2011, compiled by ICF International January 2012.

3.3.2.3 Future Trends

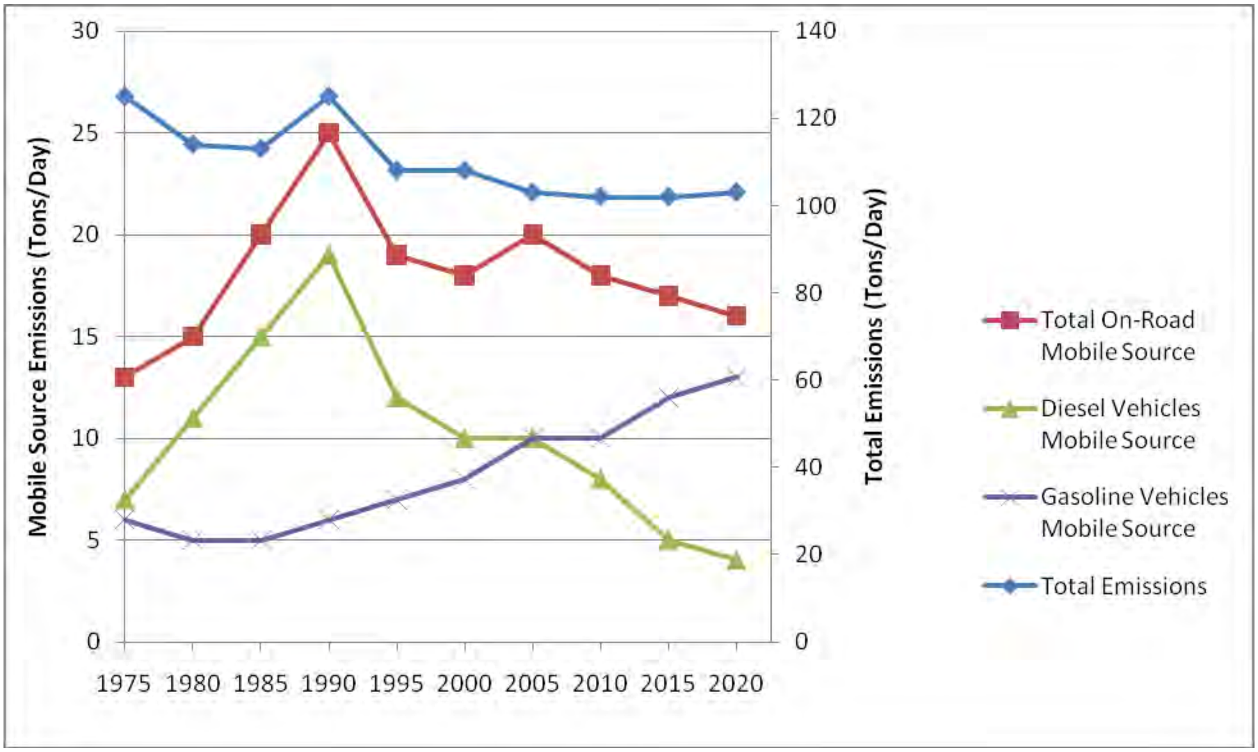
Emission trend data for the SCAB published in the 2009 edition of *The California Almanac of Emissions and Air Quality* published by the ARB was used to provide an estimate of potential PM2.5 and PM10 trends in the vicinity of the project area (California Air Resources Board 2009). While the ARB's Almanac 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 project area, 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 3-7 and Figure 3-6, below, present PM2.5 emission trends in the SCAB for the years 1975-2020 based on ARB Almanac data (California Air Resources Board 2009).

Table 3-7: PM2.5 Emission Trends in South Coast Air Basin (tons per day)

Year	Total Emissions	Total On-Road Mobile Source	Diesel Vehicles Mobile Source	Gasoline Vehicles Mobile Source
1975	125	13	7	6
1980	114	15	11	5
1985	113	20	15	5
1990	125	25	19	6
1995	108	19	12	7
2000	108	18	10	8
2005	103	20	10	10
2010	102	18	8	10
2015	102	17	5	12
2020	103	16	4	13
Source: California Air Resources Board 2009				

Figure 3-6: PM2.5 Emission trends in South Coast Air Basin (tons per day)



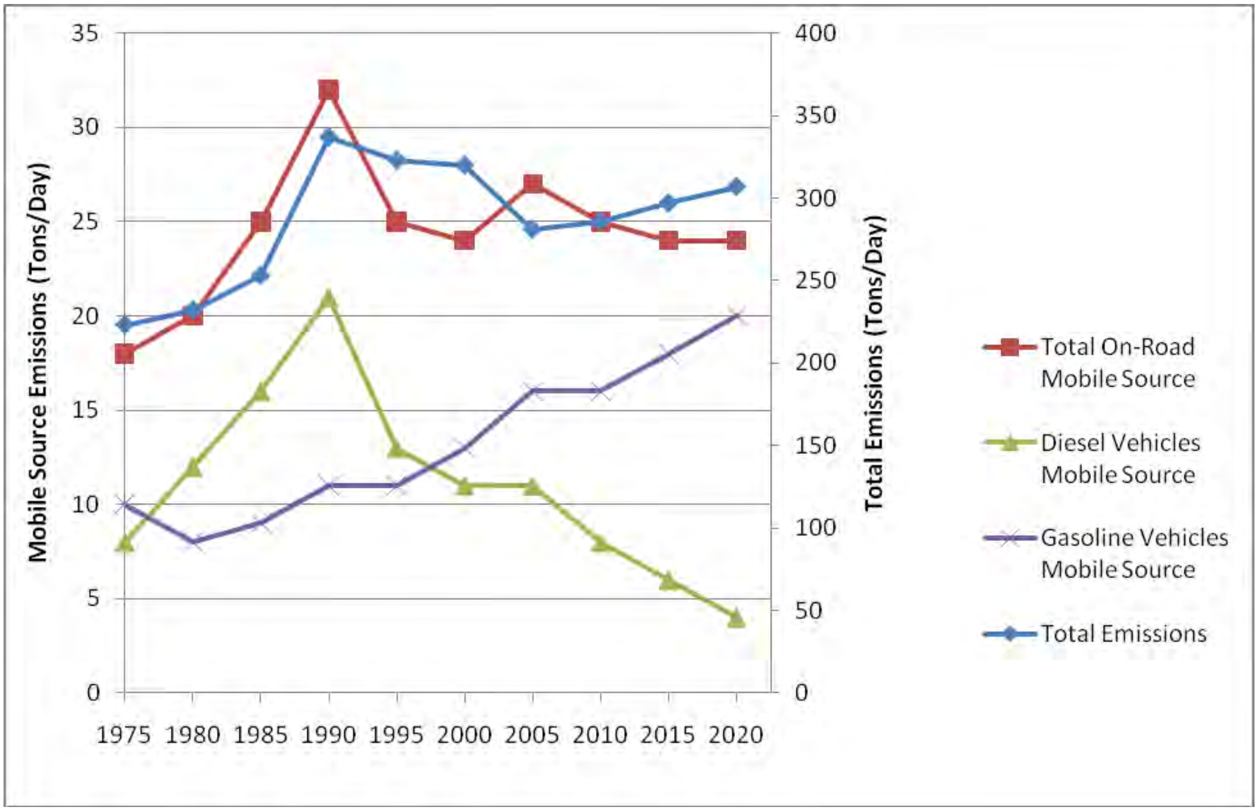
Source: California Air Resources Board 2009, compiled by ICF International October 2011.

Table 3-8 and Figure 3-7, below, present PM10 emission trends in the SCAB for the years 1975-2020 based on ARB Almanac data (California Air Resources Board 2009).

Table 3-8: PM10 Emission Trends in South Coast Air Basin (tons per day)

Year	Total Emissions	Total On-Road Mobile Source	Diesel Vehicles Mobile Source	Gasoline Vehicles Mobile Source
1975	223	18	8	10
1980	232	20	12	8
1985	253	25	16	9
1990	337	32	21	11
1995	323	25	13	11
2000	320	24	11	13
2005	281	27	11	16
2010	286	25	8	16
2015	297	24	6	18
2020	307	24	4	20
Source: California Air Resources Board 2009				

Figure 3-7: PM10 Emission trends in the South Coast Air Basin (tons per day)



Source: California Air Resources Board 2009, compiled by ICF International October 2011

The emissions trends presented above in Table 3-7 (PM2.5) and Table 3-8 (PM10) and Figure 3-6 (PM2.5) and Figure 3-7 (PM10) indicate that total on-road emissions are expected to maintain a decreasing trend 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 PM2.5 and PM10 from diesel motor vehicles have been decreasing since their peak levels in 1990 even though population and vehicles miles traveled (VMT) are increasing due to adoption of more stringent emission standards.

Total on-road PM2.5 and PM10 emissions increased between 1975 and 1990, the year in which emissions peaked (25 tons/day for PM2.5 and 32 tons/day for PM10). Total on-road emissions decreased between 1990 and 2000, increased in 2005, and are projected to show a decreasing trend through 2020.

3.3.3 Population and Traffic Growth

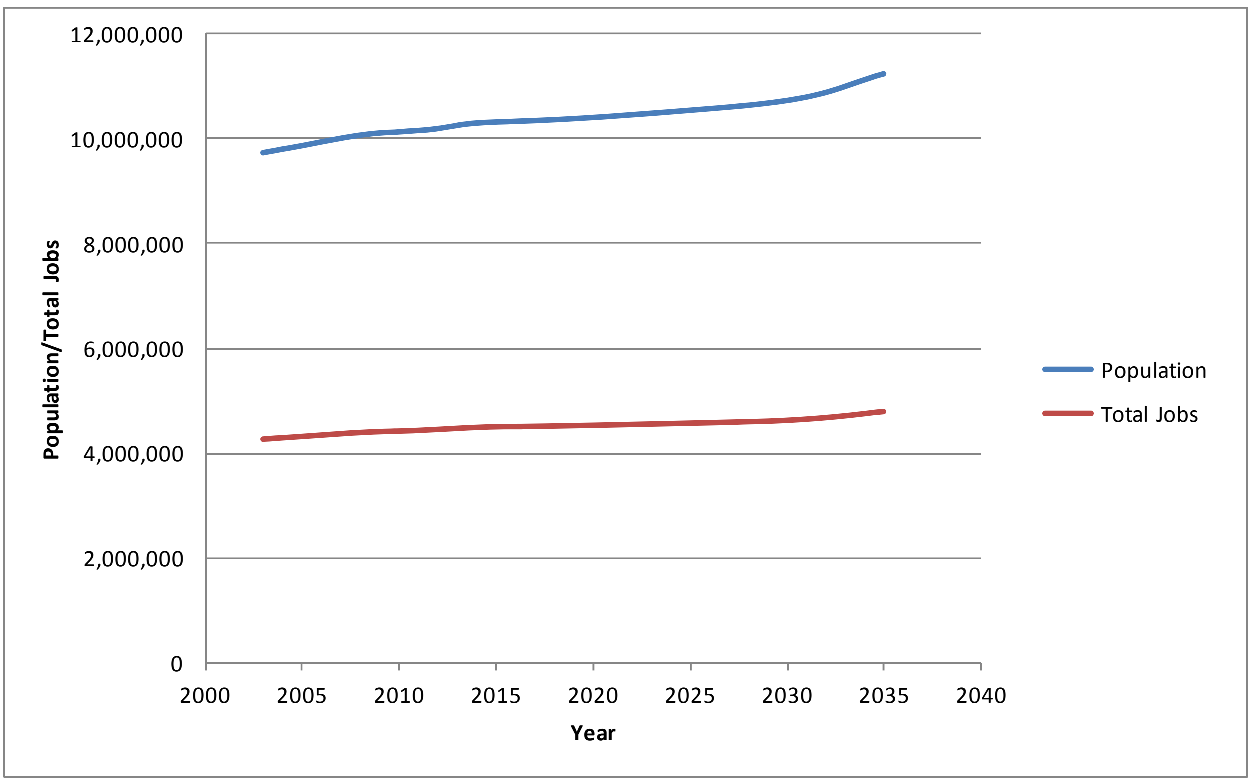
3.3.3.1 Regional Population Growth

As indicated above, total PM2.5 and PM10 emissions in the SCAB are projected to increase slightly through 2020, although total on-road emissions are expected to decrease through 2020. This trend is despite the fact that Los Angeles County population residing in the SCAB is anticipated to increase from 9,716,000 in 2003 to 10,721,000 in 2020 and jobs are anticipated to increase from 4,270,000 in 2003 to 4,626,000 in 2020, as indicated in Table 3-9 and Figure 3-8.

Table 3-9: SCAG Regional Population and Employment Projections for Los Angeles County

	2003	2008	2010	2012	2014	2020	2030	2035
Population	9,716,000	10,055,000	10,117,000	10,179,000	10,288,000	10,395,000	10,721,000	11,236,000
Total Jobs	4,270,000	4,395,000	4,423,000	4,450,000	4,493,000	4,532,000	4,626,000	4,791,000
Source: Southern California Association of Governments 2008								

Figure 3-8: SCAG Regional Population and Housing Projections



Source: Southern California Association of Governments 2008

3.3.3.2 Regional Traffic Growth

With population and employment growth expected to occur regionally (Table 3-9 and Figure 3-8), it is anticipated that this anticipated growth 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, KOA Corporation. Peak-period and off-peak period volumes were provided by 5-mph speed-bin. Summaries of project-area VMT apportioned into 5-mph speed-bins for the baseline/existing condition (2009), opening year (2017) and horizon year (2037) are provided below in Table 3-10 (Peak Period Summary), Table 3-11 (Non-Peak Period Summary and Table 3-12 (Peak Period plus Non-Peak Period Summary). VMT data included vehicle activity for affected roadways in the immediate project area.

Table 3-10: Peak Period Vehicle Miles Traveled by Speed

Speed Bin	Existing 2009	Opening Year 2017			Horizon Year 2037		
		No-Build	Alt 2	Alt 3	No-Build	Alt 2	Alt 3
5	-	-	-	-	6,039	-	-
10	2,814	2,522	4,747	2,511	8,747	6,203	4,521
15	3,232	21,568	27,623	22,489	55,454	39,115	33,509
20	46,377	150,887	33,557	32,010	159,645	50,525	59,534
25	106,642	126,771	121,544	125,782	295,064	227,367	222,194
30	368,227	448,362	416,178	422,302	447,627	437,396	443,609
35	371,147	283,481	281,204	231,124	362,647	203,107	203,107
40	159,467	197,935	179,847	89,865	146,199	202,994	202,994
45	19,543	10,455	12,168	102,150	150,401	14,247	14,247
50	24,463	142,576	53,187	53,187	97,595	63,553	63,553
55	62,650	32,471	-	-	10,695	-	-
60	45,646	7,880	9,212	-	53,008	231,840	341,243
65	659,186	573,658	904,983	964,275	501,568	857,489	748,087
70	-	-	-	-	-	-	-
75	-	-	-	-	-	-	-
Total	1,869,394	1,998,566	2,044,250	2,045,695	2,294,689	2,333,836	2,336,598
Adapted from: KOA Corporation 2011.							

Table 3-11: Non-Peak Period Vehicle Miles Traveled by Speed

Speed Bin	Existing 2009	Opening Year 2017			Horizon Year 2037		
		No-Build	Alt 2	Alt 3	No-Build	Alt 2	Alt 3
5	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-
15	-	-	-	-	4,026	4,034	4,034
20	3,637	145,192	3,992	3,773	34,482	41,505	10,194
25	21,809	25,866	24,164	24,384	51,634	30,608	85,413
30	61,906	87,722	73,525	73,525	74,687	103,829	119,086
35	152,281	195,665	149,707	150,997	264,736	201,567	248,128
40	233,981	410,173	312,921	251,493	574,954	346,298	264,961
45	132,693	106,582	147,421	98,222	128,833	98,436	97,491
50	9,438	138,674	18,359	50,807	-	-	-
55	81,400	33,570	-	32,452	82,067	-	-
60	149,112	7,730	169,283	176,535	-	94,148	254,867
65	895,682	646,456	857,350	895,826	720,849	970,184	809,465
70	-	-	-	-	-	-	-
75	-	-	-	-	-	-	-
Total	1,741,939	1,797,630	1,756,722	1,758,014	1,936,268	1,890,609	1,893,639
Adapted from: KOA Corporation 2011.							

Table 3-12: Peak Plus Non-Peak Period Vehicle Miles Traveled by Speed

Speed Bin	Existing 2009	Opening Year 2017			Horizon Year 2037		
		No-Build	Alt 2	Alt 3	No-Build	Alt 2	Alt 3
5	-	-	-	-	6,039	-	-
10	2,814	2,522	4,747	2,511	8,747	6,203	4,521
15	3,232	21,568	27,623	22,489	59,480	43,149	37,543
20	50,014	296,079	37,549	35,783	194,127	92,030	69,728
25	128,451	152,637	145,708	150,166	346,698	257,975	307,607
30	430,133	536,084	489,703	495,827	522,314	541,225	562,695
35	523,428	479,146	430,911	382,121	627,383	404,674	451,235
40	393,448	608,108	492,768	341,358	721,153	549,292	467,955
45	152,236	117,037	159,589	200,372	279,234	112,683	111,738
50	33,901	281,250	71,546	103,994	97,595	63,553	63,553
55	144,050	66,041	-	32,452	92,762	-	-
60	194,758	15,610	178,495	176,535	53,008	325,988	596,110
65	1,554,868	1,220,114	1,762,333	1,860,101	1,222,417	1,827,673	1,557,552
70	-	-	-	-	-	-	-
75	-	-	-	-	-	-	-
Total	3,611,333	3,796,196	3,800,972	3,803,709	4,230,957	4,224,445	4,230,237
Adapted from: KOA Corporation 2011.							

Roadway and Intersection Level of Service

Intersection operation data for the proposed project was provided by the project traffic engineers, KOA Corporation (KOA Corporation 2011). Table 3-13 summarizes intersection operations for existing (2009) conditions, interim-year (2017) with- and without-project conditions, and design-year (2037) with- and without-project conditions. As shown in Table 3-13, the proposed project alternatives improve LOS in most cases, or LOS remains the same. In addition, average delays are estimated to improve substantially.

Table 3-13: Summary of Intersection Operations for the Proposed Project

Existing (2009)						
	AM Peak Hour			PM Peak Hour		
Intersection	Queue Length (feet)	Delay[c]	LOS	Queue Length (feet)	Delay[c]	LOS
Grand Ave at SR-60 westbound off-ramp[a]	283	42.2	D	192	20.1	C
Grand Ave at SR-60 eastbound off-ramp[a]	220	16.2	B	88	11.3	B
Grand Ave at Golden Springs Dr[b]	349	38.6	D	306	54.0	D
Interim Year (2017)						
No Build (Alternative 1)						
	AM Peak Hour			PM Peak Hour		
Intersection	Queue Length (feet)	Delay[c]	LOS	Queue Length (feet)	Delay[c]	LOS
Grand Ave at SR-60 westbound off-ramp[a]	461	29.7	C	303	33.4	C
Grand Ave at SR-60 eastbound off-ramp[a]	257	27.8	C	87	17.6	B
Grand Ave at Golden Springs Dr[b]	466	54.9	D	433	48.3	D
Alternative 2						
	AM Peak Hour			PM Peak Hour		
Intersection	Queue Length (feet)	Delay[c]	LOS	Queue Length (feet)	Delay[c]	LOS
Grand Ave at SR-60 westbound off-ramp[a]	331	21.0	C	149	17.9	B
Grand Ave at SR-60 eastbound off-ramp[a]	186	15.9	B	101	12.6	B
Grand Ave at Golden Springs Dr[b]	493	35.7	D	400	38.7	D
Alternative 3						
	AM Peak Hour			PM Peak Hour		
Intersection	Queue Length (feet)	Delay[c]	LOS	Queue Length (feet)	Delay[c]	LOS
Grand Ave at SR-60 westbound off-ramp[a]	285	20.2	C	144	17.7	B
Grand Ave at SR-60 eastbound off-ramp[a]	201	9.8	A	89	6.2	A
Grand Ave at Golden Springs Dr[b]	250	31.3	C	274	31.6	C
Design Year (2037)						
No Build (Alternative 1)						
	AM Peak Hour			PM Peak Hour		
Intersection	Queue Length (feet)	Delay[c]	LOS	Queue Length (feet)	Delay[c]	LOS
Grand Ave at SR-60 westbound off-ramp[a]	1,005	99.7	F	700	178.9	F
Grand Ave at SR-60 eastbound off-ramp[a]	628	81.9	F	268	84.3	F
Grand Ave at Golden Springs Dr[b]	615	111.6	F	673	103.6	F

Alternative 2						
	AM Peak Hour			PM Peak Hour		
Intersection	Queue Length (feet)	Delay[c]	LOS	Queue Length (feet)	Delay[c]	LOS
Grand Ave at SR-60 westbound off-ramp[a]	508	35.7	D	361	46.8	D
Grand Ave at SR-60 eastbound off-ramp[a]	635	49.6	D	432	55.4	E
Grand Ave at Golden Springs Dr[b]	523	50.6	D	558	64.6	E
Alternative 3						
	AM Peak Hour			PM Peak Hour		
Intersection	Queue Length (feet)	Delay[c]	LOS	Queue Length (feet)	Delay[c]	LOS
Grand Ave at SR-60 westbound off-ramp[a]	527	37.5	D	305	51.4	D
Grand Ave at SR-60 eastbound off-ramp[a]	443	20.0	C	172	10.3	B
Grand Ave at Golden Springs Dr[b]	372	49.6	D	469	53.9	D

[a] Queue length in feet on freeway off-ramp approach
[b] Queue length in feet on southbound approach
[c] Delay in seconds per vehicle average
Source: KOA Corporation 2011.

Congestion Relief and System-Wide Improvements

The project would provide congestion relief and improve system-wide operations by improving traffic flow. The project would increase overall speeds during both the opening year and horizon year (see Table 3-10 through Table 3-10) under both build alternatives when compared to no-build. PM emissions typically follow a U-shaped curve relative to speed, with highest emissions observed at the lowest and highest speeds. Exhaust emissions are typically higher at the lowest speeds and tend to decrease as speeds increase to the most efficient/ lowest emission speed of around 45 mph. As speeds increase from 45 mph upward, emissions tend to increase as speeds increase. Thus, 45 mph, the speed at which emissions are at a minimum, is the approximate target speed for reducing PM emissions. Since KOA Corporation provided VMT estimates apportioned into 5-mph speed-bins for each build alternative as well as the no-build condition, the traffic emissions analysis provided below takes into account the effect that congestion relief would have on exhaust PM emissions under the build conditions when compared to no-build.

3.3.4 Traffic Emissions Analysis

The project traffic engineers (KOA Corporation) provided estimates of daily VMT apportioned into 5-mph speed-bins for the baseline/existing (2009) condition, opening year (2017) condition and horizon year (2037) condition. Future year VMT estimates were provided for both build alternatives, as well as the no-build alternative.

The Caltrans' CT-EMFAC model[2] was then used to estimate PM2.5 and PM10 emissions related to mobile exhaust, tire wear, and brake wear for each project alternative under both future evaluation years (i.e., 2017 and 2037). The baseline/existing year 2009 was also evaluated. Emissions estimates are included below in Table 3-14, where they are combined with re-entrain road dust emissions to ascertain total PM emissions. The CT-EMFAC program assumed a SCAB vehicle fleet mix, with an 8 percent truck fleet, operating under annual-average conditions.

3.3.4.1 Re-entrained Road Dust Analysis

The CT-EMFAC model does not estimate re-entrained road dust emissions. Therefore, re-entrained road dust emissions were calculated using the empirical equation found in Section 13.2.1 of the EPA's *AP-42 Compilation of Air Pollutant Emission Factors*, which was updated in January 2011. Emissions were calculated using VMT traffic data supplied by the traffic engineers (Appendix A) and the emission factor as calculated using the empirical road dust equation. Variables to calculate road dust emissions were taken from traffic data (VMT and vehicle weight) and from nearby climate stations (precipitation).

According to the project's traffic impact study, proposed improvements would result in some surface street arterial VMT shifting to the freeway under the build conditions, when compared to no-build. Under Build Alternative 2, this daily VMT shift is estimated to be 17,789 at opening year 2017 and 23,944 at horizon year 2037; and for Build Alternative 3, the estimate is 15,053 at opening year 2017 and 18,153 at horizon year 2037. This shift is noteworthy because of the difference in silt load factors on surface arterials compared to freeways. The AP-42 re-entrained dust calculation formula worksheets accommodate each of these project-specific factors (i.e., VMT, average vehicle weight, annual precipitation rate, and roadway type). Calculation worksheets are provided in Appendix A.

Table 3-14 summarizes the modeled daily emissions resulting from exhaust, brake and tire wear, and re-entrained road dust along the SR-57/60 project limits. Emissions associated with implementation of the proposed project were obtained by comparing future Build Alternative emissions to future No Build emissions for both 2017 and 2037. The differences in emissions between each build alternative and the no-build alternative represent the net project-related emissions for each build alternative.

Comparison of Build Alternatives to Baseline/Existing Condition

As shown in Table 3-14, total PM10 emissions would increase by approximately 3 percent at opening year 2017 under the build alternatives when compared to existing conditions, while PM2.5 emissions would remain relatively unchanged. At horizon year 2037, total PM10 and PM2.5 emissions would increase by approximately 15 percent and 8 percent, respectively, when compared to existing conditions.

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[2] CT-EMFAC is a California-specific project-level analysis tool for modeling criteria pollutant and carbon dioxide emissions from on-road mobile sources. The model uses the latest version of the California Mobile Source Emission Inventory and Emission Factors model, EMFAC2007. While regulations and emissions controls adopted after 2007 are not reflected in the model emission factors, CT-EMFAC is the latest on-road emissions modeling tool and is used as standard practice in air quality technical analyses.

Comparison of Build Alternatives to No-Build Condition

As shown in Table 3-14, total PM10 and PM2.5 emissions would decrease by approximately 1 percent at opening year 2017 and horizon year 2037 under the build alternatives when compared to no-build.

3.4 Conclusion

Within the project corridor, total emissions of both PM2.5 and PM10 are anticipated to marginally decrease under both build alternatives by approximately 1 percent, at both opening year 2017 and horizon year 2037, when compared to the no-build condition. The mobile exhaust portion of total emissions would decrease as a result of improved travel speeds, and the re-entrained dust portion of total emissions would decrease as a result of VMT shifting from surface arterials to the freeway.

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 new violations of the NAAQS, increase the frequency or severity of any existing violation, or delay timely attainment of the NAAQS. As required by Final EPA rule published on March 10, 2006, this qualitative assessment demonstrates that the SR-57/SR-60 Confluence Project meets the CAA conformity requirements and will not conflict with state and local measures to improve regional air quality.

Table 3-14: SR-57/60 Confluence Project-Related Particulate Emissions (pounds per day)

	PM10			**PM2.5**		
Scenario	**Exhaust/ Brake/ Tire Wear**	**Road Dust**	**Total**	**Exhaust/ Brake/ Tire Wear**	**Road Dust**	**Total**
Existing (2009)	33.9	167.8	201.7	31.1	41.2	72.3
2017 No build	31.4	177.8	209.2	29.3	43.6	72.9
2017 Alternative 2	31.0	176.8	207.8	28.8	43.4	72.2
2017 Alternative 3	31.1	177.0	208.1	28.8	43.5	72.3
2037 No build	32.4	200.4	232.8	29.7	49.2	78.9
2037 Alternative 2	32.1	198.9	231.0	29.3	48.8	78.1
2037 Alternative 3	31.8	199.3	231.1	29.0	48.9	77.9
Comparison of Emissions between Build Alternatives and Existing Conditions						
2017 Alternative 1 - Existing	(2.9)	9.0	6.1	(2.3)	2.2	(0.1)
2017 Alternative 2 - Existing	(2.8)	9.2	6.4	(2.3)	2.3	-
2037 Alternative 1 - Existing	(1.8)	31.1	29.3	(1.8)	7.6	5.8
2037 Alternative 2 - Existing	(2.1)	31.5	29.4	(2.1)	7.7	5.6
Comparison of Emissions (Percent Change)between Build Alternatives and Existing Conditions						
2017 Alternative 1 - Existing	-8.6%	5.4%	3.0%	-7.4%	5.3%	-0.1%
2017 Alternative 2 - Existing	-8.3%	5.5%	3.2%	-7.4%	5.6%	0.0%
2037 Alternative 1 - Existing	-5.3%	18.5%	14.5%	-5.8%	18.4%	8.0%
2037 Alternative 2 - Existing	-6.2%	18.8%	14.6%	-6.8%	18.7%	7.7%

Comparison of Emissions between Build Alternatives and No-Build Conditions						
2017 Alt 1 – 2017 No Build	(0.4)	(1.0)	(1.4)	(0.5)	(0.2)	(0.7)
2017 Alt 2 -– 2017 No Build	(0.3)	(0.8)	(1.1)	(0.5)	(0.1)	(0.6)
2037 Alt 1 – 2037 No Build	(0.3)	(1.5)	(1.8)	(0.4)	(0.4)	(0.8)
2037 Alt 2 – 2037 No Build	(0.6)	(1.1)	(1.7)	(0.7)	(0.3)	(1.0)
Comparison of Emissions (Percent Change) between Build Alternatives and No-Build Conditions						
2017 Alt 1 – 2017 No Build	-1.3%	-0.6%	-0.7%	-1.7%	-0.5%	-1.0%
2017 Alt 2 -– 2017 No Build	-1.0%	-0.4%	-0.5%	-1.7%	-0.2%	-0.8%
2037 Alt 1 – 2037 No Build	-0.9%	-0.7%	-0.8%	-1.3%	-0.8%	-1.0%
2037 Alt 2 – 2037 No Build	-1.9%	-0.5%	-0.7%	-2.4%	-0.6%	-1.3%

Implementation of the proposed project will not result in new violations of the federal PM2.5 or PM10 air quality standards for the following reasons:

- Based on representative monitoring data, ambient PM2.5 are on a decreasing trend (see Figure 3-4). Ambient PM10 concentrations are following a decreasing trend as well. (see Figure 3-5).
- Based on representative monitoring data, PM10 24-hour concentrations have not exceeded the national standard, 150 $\mu g/m^3$, in the past three years.
- While the Azusa and Glendora-Laurel monitoring stations have experienced exceedances of the federal PM2.5 NAAQS, representative monitoring data indicates that PM2.5 concentration have decreased over the past three years, is nearing the national standards, and concentrations should be below the annual average PM2.5 standard if the trend continues.
- In general, construction of either build alternative would result in improved level of service in the local project region as a whole, as the project increases efficiency of the roadway, resulting in improvements in regional emissions.
- Construction of either build alternative would result in improvement to overall speeds in the project corridor and local project region at both opening year 2017 and horizon year 2037, resulting in improvements in regional emissions.
- Total project-related emissions within the project region would show a net decrease, relative to no build alternative under either build alternative at both opening year 2017 and horizon year 2037.

For these reasons, future or worsened PM2.5 or PM10 violations of any standards are not anticipated. Therefore, the proposed SR-57/SR-60 Confluence Project meets the conformity hot spot requirements in 40 CFR 93.116 and 93.126 for PM10 and PM2.5.

Chapter 4 References

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APPENDIX A

CARB PM2.5 and PM10 Monitoring Station Data

CT-EMFAC Input and Output Sheets

AP-42 Calculation Worksheets

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Highest 4 Daily 24-Hour PM10 Averages

Glendora-Laurel

FAQs

Year:	2008		2009		2010	
	Date	24-Hr Average	Date	24-Hr Average	Date	24-Hr Average
National:						
First High:	Jul 5	81.7	Aug 26	93.8	Jul 5	68.9
Second High:	Jul 4	58.7	Jul 5	76.6	Oct 15	55.7
Third High:	Aug 29	55.8	Aug 31	72.9	Oct 12	55.6
Fourth High:	Nov 16	51.8	Oct 27	66.7	Aug 25	55.5
California:						
First High:		*		*		*
Second High:		*		*		*
Third High:		*		*		*
Fourth High:		*		*		*
Measured:						
# Days Above Nat'l Standard:		0		0		0
# Days Above State Standard:		*		*		*
Estimated:						
3-Yr Avg # Days Above Nat'l Std:		*		*		*
# Days Above Nat'l Standard:		0.0		*		*
# Days Above State Standard:		*		*		*
State 3-Yr Maximum Average:		*		*		*
State Annual Average:		*		*		*
National 3-Year Average:		*		*		25
National Annual Average:		25.4		23.0		26.1
Year Coverage:		0		0		0

Go Backward One Year | New Top 4 Summary | Go Forward One Year

Notes: All concentrations are expressed in micrograms per cubic meter.
The national annual average PM10 standard was revoked in December 2006 and is no longer in effect.
Statistics related to the revoked standard are shown in *italics* or *italics*.
National exceedances are shown in orange. State exceedances are shown in yellow.
An exceedance is not necessarily a violation.
Statistics may include data that are related to an exceptional event.
State and national statistics may differ for the following reasons:
State statistics are based on California approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods.

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Highest 4 Daily 24-Hour PM2.5 Averages

Glendora-Laurel

FAQs

Year:	2008		2009		2010	
	Date	24-Hr Average	Date	24-Hr Average	Date	24-Hr Average
National:						
First High:		*		*		*
Second High:		*		*		*
Third High:		*		*		*
Fourth High:		*		*		*
California:						
First High:	Jul 5	77.6	Aug 26	82.9	Jul 5	58.1
Second High:	Nov 16	49.3	Jul 5	75.9	Oct 15	39.4
Third High:	Dec 4	48.9	Aug 27	66.7	Jul 4	36.2
Fourth High:	Nov 23	46.7	Aug 31	66.1	Dec 10	35.2
Estimated Days > Nat'l 24-Hr Std:		*		*		*
Measured Days > Nat'l 24-Hr Std:		*		*		*
Nat'l 24-Hr Std Design Value:		*		*		*
Nat'l 24-Hr Std 98th Percentile:		*		*		*
National Annual Std Design Value:		*		*		*
National Annual Average:		*		*		*
State Ann'l Std Designation Value:		14		14		14
State Annual Average:		14.3		*		*
Year Coverage:		*		*		*

Go Backward One Year | New Top 4 Summary | Go Forward One Year

Notes: All concentrations are expressed in micrograms per cubic meter.
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State and national statistics may therefore be based on different samplers.
State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.
Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.

Highest 4 Daily 24-Hour PM10 Averages

Azusa

Year:	2008		2009		2010	
	Date	24-Hr Average	Date	24-Hr Average	Date	24-Hr Average
National:						
First High:	Jul 5	98.0	Sep 22	74.0	Aug 24	70.0
Second High:	Nov 20	75.0	Nov 3	65.0	Jul 13	59.0
Third High:	Sep 15	70.0	Sep 4	59.0	Apr 26	55.0
Fourth High:	Oct 21	70.0	Sep 28	56.0	Aug 18	54.0
California:						
First High:	Jul 5	96.0	Sep 22	72.0	Aug 24	68.0
Second High:	Nov 20	74.0	Nov 3	64.0	Jul 13	58.0
Third High:	Oct 21	69.0	Sep 4	58.0	Apr 26	54.0
Fourth High:	Sep 15	68.0	Sep 28	54.0	Aug 18	53.0
Measured:						
# Days Above Nat'l Standard:		0		0		0
# Days Above State Standard:		12		7		5
Estimated:						
3-Yr Avg # Days Above Nat'l Std:		*		*		*
# Days Above Nat'l Standard:		*		*		0.0
# Days Above State Standard:		*		*		*
State 3-Yr Maximum Average:		32		*		*
State Annual Average:		*		*		*
National 3-Year Average:		34		33		31
National Annual Average:		32.0		30.3		29.8
Year Coverage:		77		88		93

Go Backward One Year | New Top 4 Summary | Go Forward One Year

Notes: All concentrations are expressed in micrograms per cubic meter.
The national annual average PM10 standard was revoked in December 2006 and is no longer in effect.
Statistics related to the revoked standard are shown in *italics* or *italics*.
National exceedances are shown in orange. State exceedances are shown in yellow.
An exceedance is not necessarily a violation.
Statistics may include data that are related to an exceptional event.
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Highest 4 Daily 24-Hour PM10 Averages

Azusa

FAQs

Year:	2005		2006		2007	
	Date	24-Hr Average	Date	24-Hr Average	Date	24-Hr Average
National:						
First High:	Mar 11	76.0	Jul 4	81.0	Jul 5	165.0
Second High:	Sep 1	65.0	May 11	68.0	Apr 12	83.0
Third High:	Aug 26	64.0	Feb 4	64.0	Nov 20	80.0
Fourth High:	Aug 30	63.0	Feb 10	64.0	Aug 16	71.0
California:						
First High:	Mar 11	75.0	Jul 4	79.0	Jul 5	161.0
Second High:	Sep 1	64.0	May 11	66.0	Apr 12	81.0
Third High:	Aug 26	63.0	Feb 4	63.0	Nov 20	78.0
Fourth High:	Aug 30	61.0	Feb 10	63.0	Aug 16	70.0
Measured:						
# Days Above Nat'l Standard:		0		0		1
# Days Above State Standard:		10		7		11
Estimated:						
3-Yr Avg # Days Above Nat'l Std:		*		*		2.0
# Days Above Nat'l Standard:		0.0		0.0		6.1
# Days Above State Standard:		*		47.1		*
State 3-Yr Maximum Average:		43		32		32
State Annual Average:		*		31.9		*
National 3-Year Average:		37		33		35
National Annual Average:		34.8		32.6		37.7
Year Coverage:		88		89		95

Go Backward One Year | New Top 4 Summary | Go Forward One Year

Notes: All concentrations are expressed in micrograms per cubic meter.

The national annual average PM10 standard was revoked in December 2006 and is no longer in effect.
Statistics related to the revoked standard are shown in *italics* or *italics*.

National exceedances are shown in orange. State exceedances are shown in yellow.

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Statistics may include data that are related to an exceptional event.

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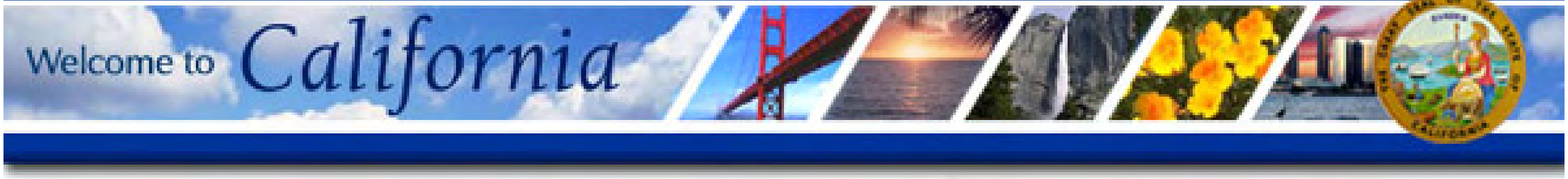

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Highest 4 Daily 24-Hour PM2.5 Averages

Azusa

FAQs

Year:	2008		2009		2010	
	Date	24-Hr Average	Date	24-Hr Average	Date	24-Hr Average
National:						
First High:	Nov 23	53.0	Aug 26	72.0	Apr 2	44.4
Second High:	Nov 16	48.1	Jan 1	46.9	Oct 14	35.4
Third High:	Dec 2	39.2	Jan 2	46.9	Dec 10	31.5
Fourth High:	Dec 4	39.1	Mar 20	42.9	Jul 4	24.9
California:						
First High:	Nov 23	53.0	Aug 26	72.0	Apr 2	44.4
Second High:	Nov 16	48.1	Jan 1	46.9	Oct 14	35.4
Third High:	Dec 2	39.2	Jan 2	46.9	Dec 10	31.5
Fourth High:	Dec 4	39.1	Mar 20	42.9	Jul 4	24.9
Estimated Days > Nat'l 24-Hr Std:		6.1		*		*
Measured Days > Nat'l 24-Hr Std:		5		6		1
Nat'l 24-Hr Std Design Value:		41		42		38
Nat'l 24-Hr Std 98th Percentile:		34.8		42.9		35.4
National Annual Std Design Value:		15.1		*		*
National Annual Average:		14.0		*		*
State Ann'l Std Designation Value:		*		*		*
State Annual Average:		*		*		*
Year Coverage:		89		40		26

Go Backward One Year | New Top 4 Summary | Go Forward One Year

Notes: All concentrations are expressed in micrograms per cubic meter.
National exceedances are shown in orange. State exceedances are shown in yellow.
An exceedance is not necessarily a violation.
State and national statistics may differ for the following reasons:
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Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.

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Air Resources Board

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Highest 4 Daily 24-Hour PM2.5 Averages

Azusa

FAQs

Year:	2005		2006		2007	
	Date	24-Hr Average	Date	24-Hr Average	Date	24-Hr Average
National:						
First High:	Jul 5	132.6	Nov 23	52.7	Nov 18	63.8
Second High:	Nov 7	61.0	Feb 4	52.3	Nov 20	57.9
Third High:	Jul 4	59.2	Nov 24	49.5	Oct 26	56.5
Fourth High:	Oct 21	57.0	Nov 22	40.7	Nov 19	55.1
California:						
First High:	Jul 5	132.6	Nov 23	52.7	Nov 18	63.8
Second High:	Nov 7	61.0	Feb 4	52.3	Nov 20	57.9
Third High:	Jul 4	59.2	Nov 24	49.5	Oct 26	56.5
Fourth High:	Oct 21	57.0	Nov 22	40.7	Nov 19	55.1
Estimated Days > Nat'l 24-Hr Std:		*		*		*
Measured Days > Nat'l 24-Hr Std:		18		8		19
Nat'l 24-Hr Std Design Value:		54		48		47
Nat'l 24-Hr Std 98th Percentile:		53.2		38.4		49.2
National Annual Std Design Value:		18.2		16.9		16.0
National Annual Average:		16.9		15.4		15.7
State Ann'l Std Designation Value:		*		*		*
State Annual Average:		*		*		*
Year Coverage:		74		67		81

Go Backward One Year | New Top 4 Summary | Go Forward One Year

Notes: All concentrations are expressed in micrograms per cubic meter.
National exceedances are shown in orange. State exceedances are shown in yellow.
An exceedance is not necessarily a violation.
State and national statistics may differ for the following reasons:
State statistics are based on California approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods.
State and national statistics may therefore be based on different samplers.
State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.
Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.

VMT Distribution by Speed by Segment

57/60 2009 Existing

		Entire Corridor						Segment1		Segment2	
Speed Bin ID	Speed Range	Tot VMT	Tot %	PK VMT	PK %	OP VMT	OP %	PK %	OP %	PK %	OP %
1	<5 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
2	5 mph ~ 10 mph	2814	0.08	2814	0.15	0	0.00	0.15	0.00		
3	10 mph ~ 15 mph	3232	0.09	3232	0.17	0	0.00	0.17	0.00		
4	15 mph ~ 20 mph	50014	1.38	46377	2.48	3637	0.21	2.48	0.21		
5	20 mph ~ 25 mph	128451	3.56	106642	5.70	21809	1.25	5.70	1.25		
6	25 mph ~ 30 mph	430133	11.91	368227	19.70	61906	3.55	19.70	3.55		
7	30 mph ~ 35 mph	523428	14.49	371147	19.85	152281	8.74	19.85	8.74		
8	35 mph ~ 40 mph	393448	10.89	159467	8.53	233981	13.43	8.53	13.43		
9	40 mph ~ 45 mph	152236	4.22	19543	1.05	132693	7.62	1.05	7.62		
10	45 mph ~ 50 mph	33901	0.94	24463	1.31	9438	0.54	1.31	0.54		
11	50 mph ~ 55 mph	144050	3.99	62650	3.35	81400	4.67	3.35	4.67		
12	55 mph ~ 60 mph	194758	5.39	45646	2.44	149112	8.56	2.44	8.56		
13	60 mph ~ 65 mph	1554868	43.06	659186	35.26	895682	51.42	35.26	51.42		
14	65 mph ~ 70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
15	>70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
	Total	3611333	100	1869394	100	1741939	100	1869394	1741939		

Scenario:	2009 Existing	
Geographic Area:	Los Angeles (SC)	
Analysis Year:	2009	
Season:	Annual	
Truck %		
PK:	8	%
OP:	8	%

VMT Distribution by Speed by Segment

57/60 2017 No-build

		Entire Corridor						Segment1		Segment2	
Speed Bin ID	**Speed Range**	**Tot VMT**	**Tot %**	**PK VMT**	**PK %**	**OP VMT**	**OP %**	**PK %**	**OP %**	**PK %**	**OP %**
1	**<5 mph**	0	0.00	0	0.00	0	0.00	0.00	0.00		
2	**5 mph ~ 10 mph**	2522	0.07	2522	0.13	0	0.00	0.13	0.00		
3	**10 mph ~ 15 mph**	21568	0.57	21568	1.08	0	0.00	1.08	0.00		
4	**15 mph ~ 20 mph**	296079	7.80	150887	7.55	145192	8.08	7.55	8.08		
5	**20 mph ~ 25 mph**	152637	4.02	126771	6.34	25866	1.44	6.34	1.44		
6	**25 mph ~ 30 mph**	536084	14.12	448362	22.43	87722	4.88	22.43	4.88		
7	**30 mph ~ 35 mph**	479146	12.62	283481	14.18	195665	10.88	14.18	10.88		
8	**35 mph ~ 40 mph**	608108	16.02	197935	9.90	410173	22.82	9.90	22.82		
9	**40 mph ~ 45 mph**	117037	3.08	10455	0.52	106582	5.93	0.52	5.93		
10	**45 mph ~ 50 mph**	281250	7.41	142576	7.13	138674	7.71	7.13	7.71		
11	**50 mph ~ 55 mph**	66041	1.74	32471	1.62	33570	1.87	1.62	1.87		
12	**55 mph ~ 60 mph**	15610	0.41	7880	0.39	7730	0.43	0.39	0.43		
13	**60 mph ~ 65 mph**	1220114	32.14	573658	28.70	646456	35.96	28.70	35.96		
14	**65 mph ~ 70 mph**	0	0.00	0	0.00	0	0.00	0.00	0.00		
15	**>70 mph**	0	0.00	0	0.00	0	0.00	0.00	0.00		
	Total	3796196	100	1998566	100	1797630	100	1998566	1797630		

Scenario:	2017 No-build
Geographic Area:	Los Angeles (SC)
Analysis Year:	2017
Season:	Annual
Truck %	
PK:	8 %
OP:	8 %

VMT Distribution by Speed by Segment

57/60 2017 Alternative 2

		Entire Corridor						Segment1		Segment2	
Speed Bin ID	**Speed Range**	**Tot VMT**	**Tot %**	**PK VMT**	**PK %**	**OP VMT**	**OP %**	**PK %**	**OP %**	**PK %**	**OP %**
1	<5 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
2	5 mph ~ 10 mph	4747	0.12	4747	0.23	0	0.00	0.23	0.00		
3	10 mph ~ 15 mph	27623	0.73	27623	1.35	0	0.00	1.35	0.00		
4	15 mph ~ 20 mph	37549	0.99	33557	1.64	3992	0.23	1.64	0.23		
5	20 mph ~ 25 mph	145708	3.83	121544	5.95	24164	1.38	5.95	1.38		
6	25 mph ~ 30 mph	489703	12.88	416178	20.36	73525	4.19	20.36	4.19		
7	30 mph ~ 35 mph	430911	11.34	281204	13.76	149707	8.52	13.76	8.52		
8	35 mph ~ 40 mph	492768	12.96	179847	8.80	312921	17.81	8.80	17.81		
9	40 mph ~ 45 mph	159589	4.20	12168	0.60	147421	8.39	0.60	8.39		
10	45 mph ~ 50 mph	71546	1.88	53187	2.60	18359	1.05	2.60	1.05		
11	50 mph ~ 55 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
12	55 mph ~ 60 mph	178495	4.70	9212	0.45	169283	9.64	0.45	9.64		
13	60 mph ~ 65 mph	1762333	46.37	904983	44.27	857350	48.80	44.27	48.80		
14	65 mph ~ 70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
15	>70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
	Total	3800972	100	2044250	100	1756722	100	2044250	1756722		

Scenario:	2017 Alt 2	
Geographic Area:	Los Angeles (SC)	
Analysis Year:	2017	
Season:	Annual	
Truck %		
PK:	8	%
OP:	8	%

VMT Distribution by Speed by Segment

57/60 2037 No-build

		Entire Corridor						Segment1		Segment2	
Speed Bin ID	Speed Range	Tot VMT	Tot %	PK VMT	PK %	OP VMT	OP %	PK %	OP %	PK %	OP %
1	<5 mph	6039	0.14	6039	0.26	0	0.00	0.26	0.00		
2	5 mph ~ 10 mph	8747	0.21	8747	0.38	0	0.00	0.38	0.00		
3	10 mph ~ 15 mph	59480	1.41	55454	2.42	4026	0.21	2.42	0.21		
4	15 mph ~ 20 mph	194127	4.59	159645	6.96	34482	1.78	6.96	1.78		
5	20 mph ~ 25 mph	346698	8.19	295064	12.86	51634	2.67	12.86	2.67		
6	25 mph ~ 30 mph	522314	12.35	447627	19.51	74687	3.86	19.51	3.86		
7	30 mph ~ 35 mph	627383	14.83	362647	15.80	264736	13.67	15.80	13.67		
8	35 mph ~ 40 mph	721153	17.04	146199	6.37	574954	29.69	6.37	29.69		
9	40 mph ~ 45 mph	279234	6.60	150401	6.55	128833	6.65	6.55	6.65		
10	45 mph ~ 50 mph	97595	2.31	97595	4.25	0	0.00	4.25	0.00		
11	50 mph ~ 55 mph	92762	2.19	10695	0.47	82067	4.24	0.47	4.24		
12	55 mph ~ 60 mph	53008	1.25	53008	2.31	0	0.00	2.31	0.00		
13	60 mph ~ 65 mph	1222417	28.89	501568	21.86	720849	37.23	21.86	37.23		
14	65 mph ~ 70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
15	>70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
	Total	4230957	100	2294689	100	1936268	100	2294689	1936268		

Scenario:	2037 No-build
Geographic Area:	Los Angeles (SC)
Analysis Year:	2037
Season:	Annual
Truck %	
PK:	8 %
OP:	8 %

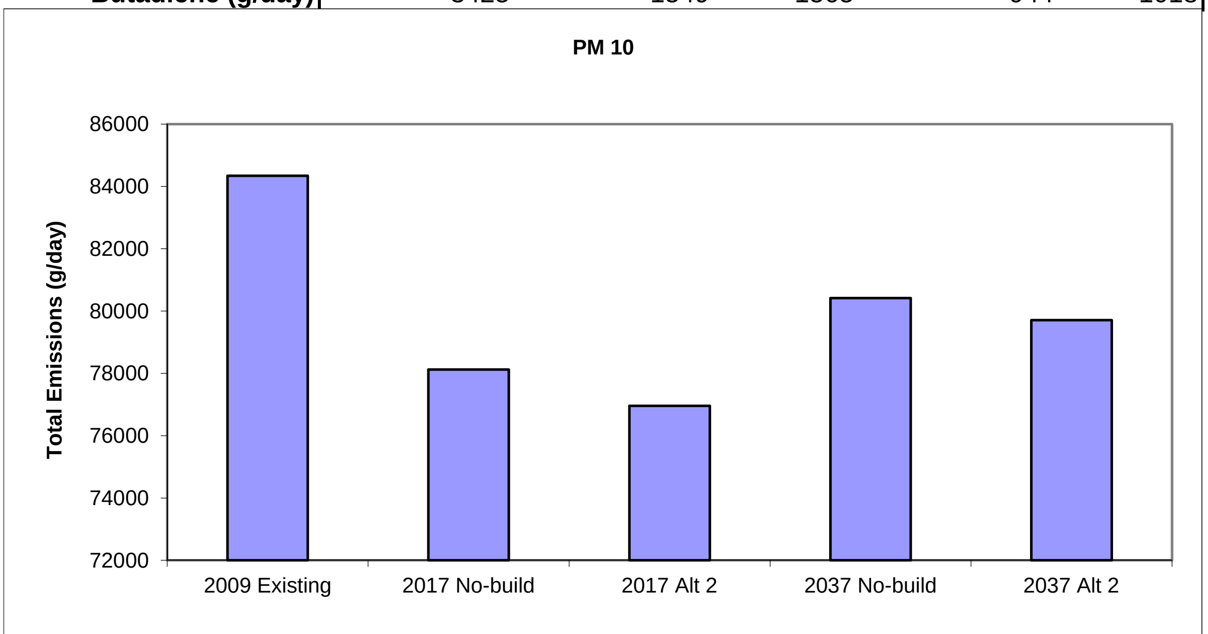
VMT Distribution by Speed by Segment

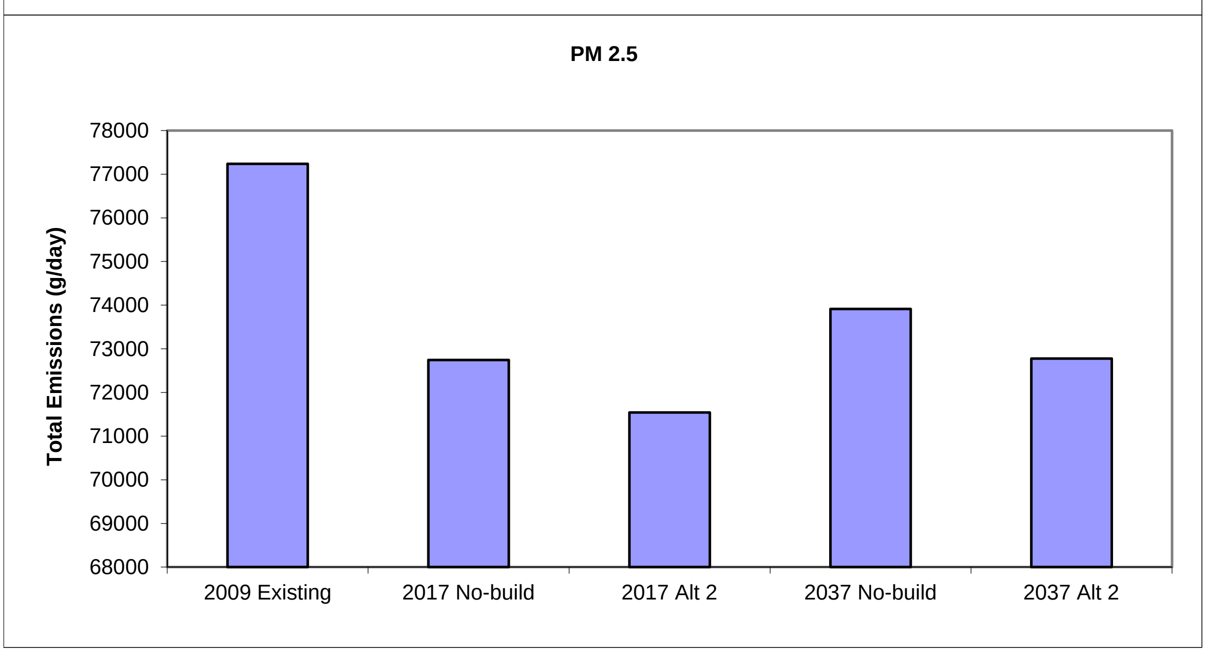
57/60 2037 Alternative 2

		Entire Corridor						Segment1		Segment2	
Speed Bin ID	Speed Range	Tot VMT	Tot %	PK VMT	PK %	OP VMT	OP %	PK %	OP %	PK %	OP %
1	<5 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
2	5 mph ~ 10 mph	6203	0.15	6203	0.27	0	0.00	0.27	0.00		
3	10 mph ~ 15 mph	43149	1.02	39115	1.68	4034	0.21	1.68	0.21		
4	15 mph ~ 20 mph	92030	2.18	50525	2.16	41505	2.20	2.16	2.20		
5	20 mph ~ 25 mph	257975	6.11	227367	9.74	30608	1.62	9.74	1.62		
6	25 mph ~ 30 mph	541225	12.81	437396	18.74	103829	5.49	18.74	5.49		
7	30 mph ~ 35 mph	404674	9.58	203107	8.70	201567	10.66	8.70	10.66		
8	35 mph ~ 40 mph	549292	13.00	202994	8.70	346298	18.32	8.70	18.32		
9	40 mph ~ 45 mph	112683	2.67	14247	0.61	98436	5.21	0.61	5.21		
10	45 mph ~ 50 mph	63553	1.50	63553	2.72	0	0.00	2.72	0.00		
11	50 mph ~ 55 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
12	55 mph ~ 60 mph	325988	7.72	231840	9.93	94148	4.98	9.93	4.98		
13	60 mph ~ 65 mph	1827673	43.26	857489	36.74	970184	51.32	36.74	51.32		
14	65 mph ~ 70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
15	>70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
	Total	4224445	100	2333836	100	1890609	100	2333836	1890609		

Scenario:	2037 Alt 2
Geographic Area:	Los Angeles (SC)
Analysis Year:	2037
Season:	Annual
Truck %	
PK:	8 %
OP:	8 %

Total Emissions	2009 Existing	2017 No-build	2017 Alt 2	2037 No-build	2037 Alt 2
TOG (g/day)	835050	474916	453592	280644	275519
CO (g/day)	11477532	6252182	6101027	3188474	3147404
NOx (g/day)	2502284	1311922	1362969	493089	505539
SOx (g/day)	14897	15499	15597	17496	17726
CO2 (ton/day)	1694	1785	1800	1997	2029
PM10 (g/day)	84344	78125	76958	80419	79711
PM2.5 (g/day)	77239	72744	71543	73913	72778
Diesel PM (g/day)	40395	22810	23525	11277	11686
DEOG (g/day)	67128	42059	40341	22182	20164
Benzene (g/day)	17841	8873	8713	5422	5578
Acrolein (g/day)	768	342	346	209	227
Acetaldehyde (g/day)	7466	4213	4123	2312	2244
Formaldehyde (g/day)	20291	10840	10673	6066	6042
Butadiene (g/day)	3425	1549	1565	944	1018





VMT Distribution by Speed by Segment

57/60 2009 Existing

		Entire Corridor						Segment1		Segment2	
Speed Bin ID	**Speed Range**	**Tot VMT**	**Tot %**	**PK VMT**	**PK %**	**OP VMT**	**OP %**	**PK %**	**OP %**	**PK %**	**OP %**
1	**<5 mph**	0	0.00	0	0.00	0	0.00	0.00	0.00		
2	**5 mph ~ 10 mph**	2814	0.08	2814	0.15	0	0.00	0.15	0.00		
3	**10 mph ~ 15 mph**	3232	0.09	3232	0.17	0	0.00	0.17	0.00		
4	**15 mph ~ 20 mph**	50014	1.38	46377	2.48	3637	0.21	2.48	0.21		
5	**20 mph ~ 25 mph**	128451	3.56	106642	5.70	21809	1.25	5.70	1.25		
6	**25 mph ~ 30 mph**	430133	11.91	368227	19.70	61906	3.55	19.70	3.55		
7	**30 mph ~ 35 mph**	523428	14.49	371147	19.85	152281	8.74	19.85	8.74		
8	**35 mph ~ 40 mph**	393448	10.89	159467	8.53	233981	13.43	8.53	13.43		
9	**40 mph ~ 45 mph**	152236	4.22	19543	1.05	132693	7.62	1.05	7.62		
10	**45 mph ~ 50 mph**	33901	0.94	24463	1.31	9438	0.54	1.31	0.54		
11	**50 mph ~ 55 mph**	144050	3.99	62650	3.35	81400	4.67	3.35	4.67		
12	**55 mph ~ 60 mph**	194758	5.39	45646	2.44	149112	8.56	2.44	8.56		
13	**60 mph ~ 65 mph**	1554868	43.06	659186	35.26	895682	51.42	35.26	51.42		
14	**65 mph ~ 70 mph**	0	0.00	0	0.00	0	0.00	0.00	0.00		
15	**>70 mph**	0	0.00	0	0.00	0	0.00	0.00	0.00		
	Total	3611333	100	1869394	100	1741939	100	1869394	1741939		

Scenario:	2009 Existing
Geographic Area:	Los Angeles (SC)
Analysis Year:	2009
Season:	Annual
Truck %	
PK:	8 %
OP:	8 %

VMT Distribution by Speed by Segment

57/60 2017 No-build

		Entire Corridor						Segment1		Segment2	
Speed Bin ID	Speed Range	Tot VMT	Tot %	PK VMT	PK %	OP VMT	OP %	PK %	OP %	PK %	OP %
1	<5 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
2	5 mph ~ 10 mph	2522	0.07	2522	0.13	0	0.00	0.13	0.00		
3	10 mph ~ 15 mph	21568	0.57	21568	1.08	0	0.00	1.08	0.00		
4	15 mph ~ 20 mph	296079	7.80	150887	7.55	145192	8.08	7.55	8.08		
5	20 mph ~ 25 mph	152637	4.02	126771	6.34	25866	1.44	6.34	1.44		
6	25 mph ~ 30 mph	536084	14.12	448362	22.43	87722	4.88	22.43	4.88		
7	30 mph ~ 35 mph	479146	12.62	283481	14.18	195665	10.88	14.18	10.88		
8	35 mph ~ 40 mph	608108	16.02	197935	9.90	410173	22.82	9.90	22.82		
9	40 mph ~ 45 mph	117037	3.08	10455	0.52	106582	5.93	0.52	5.93		
10	45 mph ~ 50 mph	281250	7.41	142576	7.13	138674	7.71	7.13	7.71		
11	50 mph ~ 55 mph	66041	1.74	32471	1.62	33570	1.87	1.62	1.87		
12	55 mph ~ 60 mph	15610	0.41	7880	0.39	7730	0.43	0.39	0.43		
13	60 mph ~ 65 mph	1220114	32.14	573658	28.70	646456	35.96	28.70	35.96		
14	65 mph ~ 70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
15	>70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
	Total	3796196	100	1998566	100	1797630	100	1998566	1797630		

Scenario:	2017 No-build
Geographic Area:	Los Angeles (SC)
Analysis Year:	2017
Season:	Annual
Truck %	
PK:	8 %
OP:	8 %

VMT Distribution by Speed by Segment

57/60 2017 Alternative 3

		Entire Corridor						Segment1		Segment2	
Speed Bin ID	**Speed Range**	**Tot VMT**	**Tot %**	**PK VMT**	**PK %**	**OP VMT**	**OP %**	**PK %**	**OP %**	**PK %**	**OP %**
1	<5 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
2	5 mph ~ 10 mph	2511	0.07	2511	0.12	0	0.00	0.12	0.00		
3	10 mph ~ 15 mph	22489	0.59	22489	1.10	0	0.00	1.10	0.00		
4	15 mph ~ 20 mph	35783	0.94	32010	1.56	3773	0.21	1.56	0.21		
5	20 mph ~ 25 mph	150166	3.95	125782	6.15	24384	1.39	6.15	1.39		
6	25 mph ~ 30 mph	495827	13.04	422302	20.64	73525	4.18	20.64	4.18		
7	30 mph ~ 35 mph	382121	10.05	231124	11.30	150997	8.59	11.30	8.59		
8	35 mph ~ 40 mph	341358	8.97	89865	4.39	251493	14.31	4.39	14.31		
9	40 mph ~ 45 mph	200372	5.27	102150	4.99	98222	5.59	4.99	5.59		
10	45 mph ~ 50 mph	103994	2.73	53187	2.60	50807	2.89	2.60	2.89		
11	50 mph ~ 55 mph	32452	0.85	0	0.00	32452	1.85	0.00	1.85		
12	55 mph ~ 60 mph	176535	4.64	0	0.00	176535	10.04	0.00	10.04		
13	60 mph ~ 65 mph	1860101	48.90	964275	47.14	895826	50.96	47.14	50.96		
14	65 mph ~ 70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
15	>70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
	Total	3803709	100	2045695	100	1758014	100	2045695	1758014		

Scenario: 2017 Alt 2
Geographic Area: Los Angeles (SC)
Analysis Year: 2017
Season: Annual
Truck %
PK: 8 %
OP: 8 %

VMT Distribution by Speed by Segment

57/60 2037 No-build

		Entire Corridor						Segment1		Segment2	
Speed Bin ID	**Speed Range**	**Tot VMT**	**Tot %**	**PK VMT**	**PK %**	**OP VMT**	**OP %**	**PK %**	**OP %**	**PK %**	**OP %**
1	<5 mph	6039	0.14	6039	0.26	0	0.00	0.26	0.00		
2	5 mph ~ 10 mph	8747	0.21	8747	0.38	0	0.00	0.38	0.00		
3	10 mph ~ 15 mph	59480	1.41	55454	2.42	4026	0.21	2.42	0.21		
4	15 mph ~ 20 mph	194127	4.59	159645	6.96	34482	1.78	6.96	1.78		
5	20 mph ~ 25 mph	346698	8.19	295064	12.86	51634	2.67	12.86	2.67		
6	25 mph ~ 30 mph	522314	12.35	447627	19.51	74687	3.86	19.51	3.86		
7	30 mph ~ 35 mph	627383	14.83	362647	15.80	264736	13.67	15.80	13.67		
8	35 mph ~ 40 mph	721153	17.04	146199	6.37	574954	29.69	6.37	29.69		
9	40 mph ~ 45 mph	279234	6.60	150401	6.55	128833	6.65	6.55	6.65		
10	45 mph ~ 50 mph	97595	2.31	97595	4.25	0	0.00	4.25	0.00		
11	50 mph ~ 55 mph	92762	2.19	10695	0.47	82067	4.24	0.47	4.24		
12	55 mph ~ 60 mph	53008	1.25	53008	2.31	0	0.00	2.31	0.00		
13	60 mph ~ 65 mph	1222417	28.89	501568	21.86	720849	37.23	21.86	37.23		
14	65 mph ~ 70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
15	>70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
	Total	4230957	100	2294689	100	1936268	100	2294689	1936268		

Scenario:	2037 No-build
Geographic Area:	Los Angeles (SC)
Analysis Year:	2037
Season:	Annual
Truck %	
PK:	8 %
OP:	8 %

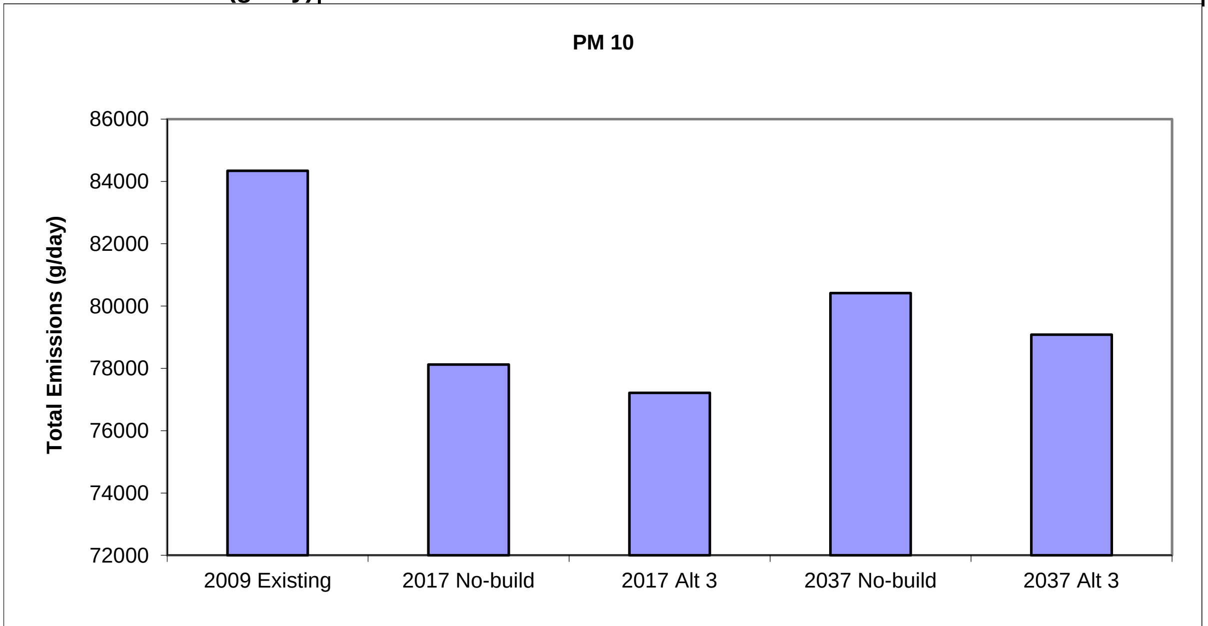
VMT Distribution by Speed by Segment

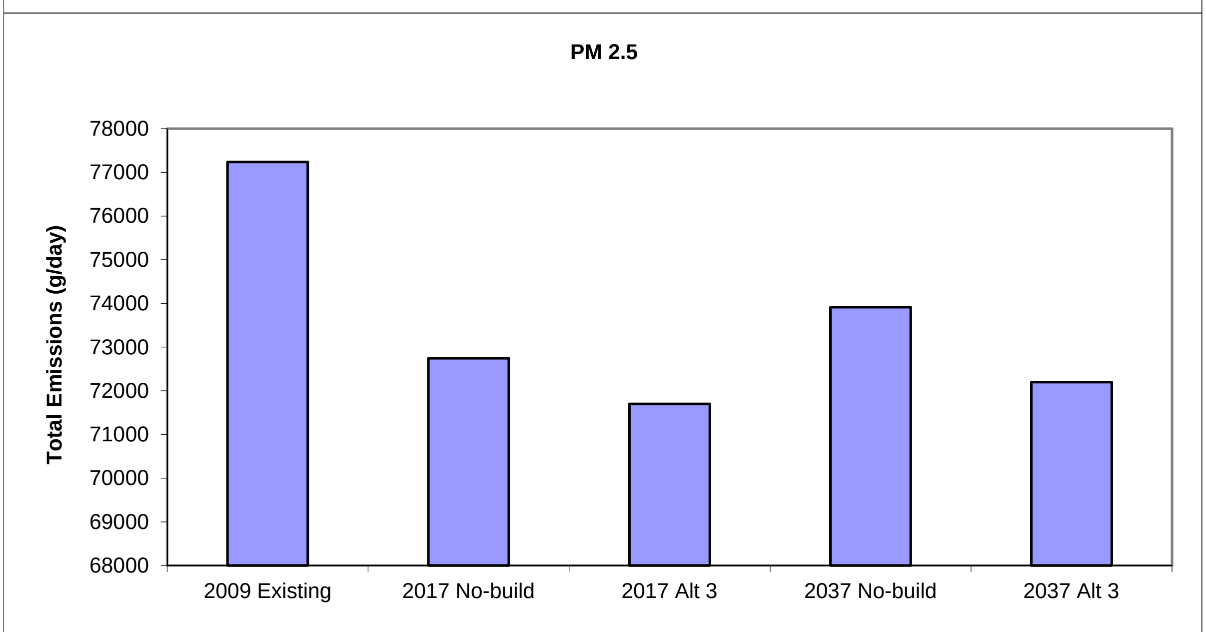
57/60 2037 Alternative 3

		Entire Corridor						Segment1		Segment2	
Speed Bin ID	**Speed Range**	**Tot VMT**	**Tot %**	**PK VMT**	**PK %**	**OP VMT**	**OP %**	**PK %**	**OP %**	**PK %**	**OP %**
1	**<5 mph**	0	0.00	0	0.00	0	0.00	0.00	0.00		
2	**5 mph ~ 10 mph**	4521	0.11	4521	0.19	0	0.00	0.19	0.00		
3	**10 mph ~ 15 mph**	37543	0.89	33509	1.43	4034	0.21	1.43	0.21		
4	**15 mph ~ 20 mph**	69728	1.65	59534	2.55	10194	0.54	2.55	0.54		
5	**20 mph ~ 25 mph**	307607	7.27	222194	9.51	85413	4.51	9.51	4.51		
6	**25 mph ~ 30 mph**	562695	13.30	443609	18.99	119086	6.29	18.99	6.29		
7	**30 mph ~ 35 mph**	451235	10.67	203107	8.69	248128	13.10	8.69	13.10		
8	**35 mph ~ 40 mph**	467955	11.06	202994	8.69	264961	13.99	8.69	13.99		
9	**40 mph ~ 45 mph**	111738	2.64	14247	0.61	97491	5.15	0.61	5.15		
10	**45 mph ~ 50 mph**	63553	1.50	63553	2.72	0	0.00	2.72	0.00		
11	**50 mph ~ 55 mph**	0	0.00	0	0.00	0	0.00	0.00	0.00		
12	**55 mph ~ 60 mph**	596110	14.09	341243	14.60	254867	13.46	14.60	13.46		
13	**60 mph ~ 65 mph**	1557552	36.82	748087	32.02	809465	42.75	32.02	42.75		
14	**65 mph ~ 70 mph**	0	0.00	0	0.00	0	0.00	0.00	0.00		
15	**>70 mph**	0	0.00	0	0.00	0	0.00	0.00	0.00		
	Total	4230237	100	2336598	100	1893639	100	2336598	1893639		

Scenario:	2037 Alt 2
Geographic Area:	Los Angeles (SC)
Analysis Year:	2037
Season:	Annual
Truck %	
PK:	8 %
OP:	8 %

Total Emissions	2009 Existing	2017 No-build	2017 Alt 3	2037 No-build	2037 Alt 3
TOG (g/day)	835050	474916	451619	280644	273962
CO (g/day)	11477532	6252182	6083049	3188474	3139849
NOx (g/day)	2502284	1311922	1374944	493089	502870
SOx (g/day)	14897	15499	15687	17496	17450
CO2 (ton/day)	1694	1785	1809	1997	2017
PM10 (g/day)	84344	78125	77216	80419	79081
PM2.5 (g/day)	77239	72744	71699	73913	72199
Diesel PM (g/day)	40395	22810	23749	11277	11624
DEOG (g/day)	67128	42059	40074	22182	20209
Benzene (g/day)	17841	8873	8721	5422	5514
Acrolein (g/day)	768	342	348	209	223
Acetaldehyde (g/day)	7466	4213	4114	2312	2233
Formaldehyde (g/day)	20291	10840	10670	6066	5994
Butadiene (g/day)	3425	1549	1575	944	1002





57/60 Confluence Re-entrained Fugitive Dust Emissions Summary

Alternative	PM10 Tons/Year Freeway	PM10 Tons/Year Arterial	PM10 Tons/Year Total	Change vs. No-Build Tons	Change vs. No-Build Percent	PM2.5 Tons/Year Freeway	PM2.5 Tons/Year Arterial	PM2.5 Tons/Year Total	Change vs. No-Build Tons	Change vs. No-Build Percent
Existing (2009)	52.3	115.5	167.8	--	--	12.8	28.3	41.2	--	--
2017 No-Build	54.4	123.3	177.8	--	--	13.4	30.3	43.6	--	--
2017 Build Alt 2	55.0	121.8	176.8	-0.9	-0.5%	13.5	29.9	43.4	-0.2	-0.5%
2017 Build Alt 3	55.0	122.1	177.0	-0.7	-0.4%	13.5	30.0	43.5	-0.2	-0.4%
2037 No-Build	59.8	140.7	200.4	--	--	14.7	34.5	49.2	--	--
2037 Build Alt 2	60.2	138.7	198.9	-1.6	-0.8%	14.8	34.0	48.8	-0.4	-0.8%
2037 Build Alt 3	60.2	139.2	199.3	-1.1	-0.5%	14.8	34.2	48.9	-0.3	-0.5%

57/60 Confluence Re-entrained Fugitive Dust Analysis - Freeway

Methodology

Calculation Methodology: USEPA AP-42, Paved Roads, Section 13.2.1, Revised January 2011

http://www.epa.gov/ttn/chief/ap42/ch13/final/c13s2s01.pdf

Emission Factor Calculation

$$E_{ext} = [\ k\ (sL)^{0.91} \times (W)^{1.02}\ ]\ (1 - P/4N)$$

Pollutant	Variables				
	k	sL	W	P	N
PM_{10}	0.0022	0.015	2.7	40	365
$PM_{2.5}$	0.00054	0.015	2.7	40	365

E = particulate emission factor (lbs of particulate matter/VMT) --
k = particle size multiplier (lb/VMT) *AP-42 Table 13.2.1-1*
sL = roadway silt loading (g/m2) *AP-42 Table 13.2.1-2*
W = average weight of vehicles on the road (tons) *Weighted avg for Los Angeles County*
P = number of wet days with at least 0.254mm of precipitation *AP-42 Figure 13.2.1-2*
N = number of days in the averaging period *Annual*

Emission Factor and Emission Calculations

Alternative	Daily VMT	PM10 Emission Factor (E)	PM10 lbs/day	PM10 tons/yr	PM10 Percent change over No Project	PM2.5 Emission Factor (E)	PM2.5 lbs/day	PM2.5 tons/yr	PM2.5 Percent change over No Project
Existing (2009)	2,222,237	0.00013	287	52	--	0.00003	70	13	--
2017 No-Build	2,312,605	0.00013	298	54	--	0.00003	73	13	--
2017 Build Alt 2	2,335,168	0.00013	301	55	1.0%	0.00003	74	13	1.0%
2017 Build Alt 3	2,335,169	0.00013	301	55	1.0%	0.00003	74	13	1.0%
2037 No-Build	2,538,526	0.00013	327	60	--	0.00003	80	15	--
2037 Build Alt 2	2,555,960	0.00013	330	60	0.7%	0.00003	81	15	0.7%
2037 Build Alt 3	2,555,960	0.00013	330	60	0.7%	0.00003	81	15	0.7%

57/60 Confluence Re-entrained Fugitive Dust Analysis - Arterials

Methodology

Calculation Methodology: USEPA AP-42, Paved Roads, Section 13.2.1, Revised January 2011

http://www.epa.gov/ttn/chief/ap42/ch13/final/c13s2s01.pdf

Emission Factor Calculation

$$E_{ext} = [\ k\ (sL)^{0.91} \times (W)^{1.02}\ ]\ (1 - P/4N)$$

Pollutant	Variables				
	k	sL	W	P	N
PM_{10}	0.0022	0.06	2.7	40	365
$PM_{2.5}$	0.00054	0.06	2.7	40	365

E = particulate emission factor (lbs of particulate matter/VMT)	--
k = particle size multiplier (lb/VMT)	*AP-42 Table 13.2.1-1*
sL = roadway silt loading (g/m2)	*AP-42 Table 13.2.1-2*
W = average weight of vehicles on the road (tons)	*Weighted avg for Los Angeles County*
P = number of wet days with at least 0.254mm of precipitation	*AP-42 Figure 13.2.1-2*
N = number of days in the averaging period	*Annual*

Emission Factor and Emission Calculations

Alternative	Daily VMT	PM10				PM2.5			
		Emission Factor (E)	lbs/day	tons/yr	Percent change over No Project	Emission Factor (E)	lbs/day	tons/yr	Percent change over No Project
Existing (2009)	1,389,096	0.00046	633	115	--	0.00011	155	28	--
2017 No-Build	1,483,592	0.00046	676	123	--	0.00011	166	30	--
2017 Build Alt 2	1,465,803	0.00046	668	122	-1.2%	0.00011	164	30	-1.2%
2017 Build Alt 3	1,468,539	0.00046	669	122	-1.0%	0.00011	164	30	-1.0%
2037 No-Build	1,692,430	0.00046	771	141	--	0.00011	189	35	--
2037 Build Alt 2	1,668,486	0.00046	760	139	-1.4%	0.00011	187	34	-1.4%
2037 Build Alt 3	1,674,277	0.00046	763	139	-1.1%	0.00011	187	34	-1.1%

APPENDIX D

Compliance with 40 CFR 1502.22 Language

Summary of Current Studies Regarding Health Effects of MSAT Emissions Exposure

Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA - Appendix C

Sec. 1502.22 INCOMPETE OR UNAVAILABLE INFORMATION

When an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an environmental impact statement and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking.

a. If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement.

b. If the information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known, the agency shall include within the environmental impact statement:

    1. a statement that such information is incomplete or unavailable;
    2. a statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment;
    3. a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment; and
    4. the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community. For the purposes of this section, "reasonably foreseeable" includes impacts that have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.

c. The amended regulation will be applicable to all environmental impact statements for which a Notice to Intent (40 CFR 1508.22) is published in the Federal Register on or after May 27, 1986. For environmental impact statements in progress, agencies may choose to comply with the requirements of either the original or amended regulation.

INCOMPLETE OR UNAVAILABLE INFORMATION FOR PROJECT-SPECIFIC MSAT HEALTH IMPACTS ANALYSIS

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The U.S. Environmental Protection Agency (EPA) is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, http://www.epa.gov/ncea/iris/index.html). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, http://pubs.healtheffects.org/view.php?id=282) or in the future as vehicle emissions substantially decrease (HEI, http://pubs.healtheffects.org/view.php?id=306).

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts - each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable. The results produced by the EPA's MOBILE6.2 model, the California EPA's Emfac2007 model, and the EPA's DraftMOVES2009 model in forecasting MSAT emissions are highly inconsistent. Indications from the development of the MOVES model are that MOBILE6.2 significantly underestimates diesel particulate matter (PM) emissions and significantly overestimates benzene emissions.

Regarding air dispersion modeling, an extensive evaluation of EPA's guideline CAL3QHC model was conducted in an NCHRP study (http://www.epa.gov/scram001/dispersion_alt.htm#hyroad), which documents poor model performance at ten sites across the country - three where intensive monitoring was conducted plus an additional seven with less intensive monitoring. The study indicates a bias of the CAL3QHC model to overestimate concentrations near highly congested intersections and underestimate concentrations near uncongested intersections. The consequence of this is a tendency to overstate the air quality benefits of mitigating congestion at intersections. Such poor model performance is less difficult to manage for demonstrating compliance with National Ambient Air Quality Standards for relatively short time frames than it is for forecasting individual exposure over an entire lifetime, especially given that some information needed for estimating

70-year lifetime exposure is unavailable. It is particularly difficult to reliably forecast MSAT exposure near roadways, and to determine the portion of time that people are actually exposed at a specific location.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (http://pubs.healtheffects.org/view.php?id=282). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA (http://www.epa.gov/risk/basicinformation.htm#g) and the HEI (http://pubs.healtheffects.org/getfile.php?u=395) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine a "safe" or "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million;in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than safe or acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

Due to the limitations cited, a discussion such as the example provided in this Appendix (reflecting any local and project-specific circumstances), should be included regarding incomplete or unavailable information in accordance with Council on Environmental Quality (CEQ) regulations [40 CFR 1502.22(b)]. The FHWA Headquarters and Resource Center staff Victoria Martinez (787) 766-5600 X231, Shari Schaftlein (202) 366-5570, and Michael Claggett (505) 820-2047, are available to provide guidance and technical assistance and support.

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Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA - Appendix D

Human epidemiology and animal toxicology experiments indicate that many chemicals or mixtures termed air toxics have the potential to impact human health. As toxicology, epidemiology and air contaminant measurement techniques have improved over the decades, scientists and regulators have increased their focus on the levels of each chemical or material in the air in an effort to link potential exposures with potential health effects. The FHWA has embarked on an air toxics research program with the intent of understanding the mobile source contribution and its impact on local and national air quality. Several studies either initiated or supported by FHWA are described below[1].

Air toxics emissions from mobile source have the potential to impact human health and often represent a regulatory agency concern. The FHWA has responded to this concern by developing an integrated research program to answer the most important transportation community questions related to air toxics, human health, and the NEPA process. To this end, FHWA has performed or is currently managing several research projects. Many of these projects are based on an Air Toxics Research Workplan that provides a roadmap for agency research efforts[2]. These efforts include:

ESTIMATING THE TRANSPORTATION CONTRIBUTION TO PARTICULATE MATTER POLLUTION (AIR TOXICS SUPERSITE STUDY)

The purpose of this study was to improve understanding of the role of highway transportation sources in particulate matter (PM) pollution.In particular, it was important to examine uncertainties, such as the effects of the spatial and temporal distribution of travel patterns, consequences of vehicle fleet mix and fuel type, the contribution of vehicle speed and operating characteristics, and influences of geography and weather.The fundamental methodology of the study was to combine EPA research-grade air quality monitoring data in a representative sample of metropolitan areas with traffic data collected by State departments of transportation (DOTs) and local governments.

Phase I of the study, the planning and data evaluation stage, assessed the characteristics of EPA's ambient PM monitoring initiatives and recruited State DOTs and local government to participate in the research.After evaluating and selecting potential metropolitan areas based on the quality of PM and traffic monitoring data, nine cities were selected to participate in Phase II.The goal of Phase II was to determine whether correlations could be observed between traffic on highway facilities and ambient PM concentrations.The Phase I report was published in September 2002.Phase II included the collection of traffic and air quality data and data analysis.Ultimately, six cities participated:New York City (Queens), Baltimore, Pittsburgh, Atlanta, Detroit and Los Angeles.

In Phase II, air quality and traffic data were collected.The air quality data was obtained from EPA AIRS AQS system, Supersite personnel, and NARSTO data archive site. Traffic data included ITS (roadway surveillance), Coverage Counts (routine traffic monitoring) and Supplemental Counts (specifically for research project).Analyses resulted in the conclusion that only a weak correlation existed between PM2.5 concentrations and traffic activity for several of the sites.The existence of general trends indicates a relationship, which however is primarily unquantifiable.Limitations of the study include the assumption that traffic sources are close enough to ambient monitors to provide sufficiently strong source strength, that vehicle activity is an appropriate surrogate for mobile emissions, and lack of knowledge of other factors such as non-traffic sources of PM and its precursors.A paper documenting the work of Phase II was presented at the 2004 Emissions Inventory Conference and is available at http://www.epa.gov/ttn/chief/conference/ei13/mobile/black.pdf.

INVESTIGATION OF CONSISTENCY BETWEEN AMBIENT MONITORING DATA AND MOBILE6.2 EMISSIONS PREDICTIONS FOR AIR TOXICS (AIR TOXICS MONITORING AND MODELING STUDY)

The purpose of this FHWA-funded study was to investigate the consistency between MSAT concentrations measured in ambient air and emissions predictions from the MOBILE6.2 model.Data from five urban monitoring sites was evaluated for the years 2000-2002: Atlanta, Dallas, Detroit, Michigan, East Providence, and Phoenix.The focus was on locations and time periods when emissions from on-road vehicles were expected to dominate, such as weekday mornings with rush-hour commute and limited photochemical reactions.Four MSAT were analyzed based on data availability: benzene, 1,3-butadiene, formaldehyde, and acetaldehyde.Overall, MOBILE6.2 emissions predictions for benzene were approximately as consistent with ambient data as emissions predictions for criteria pollutants and their precursors.Predictions for 1,3-butadiene were somewhat less in agreement.Results for aldehydes indicate that MOBILE6.2 may under predict emissions.Researchers believe some of the model sensitivities may explain differences between monitoring-based and emissions-based ratios such as use of default verses local data and inputs on benzene content of gasoline. Uncertainties with the results include the inability to completely exclude the influences of other emissions sources, background concentrations, pollutant transport and atmospheric chemistry.An unpublished final report was completed in May 2005.

KANSAS CITY PM CHARACTERIZATION STUDY (KANSAS CITY STUDY)

This study was initiated by EPA to conduct exhaust emissions testing on 480 light-duty, gasoline vehicles in the Kansas City Metropolitan Area (KCMA).Major goals of the study included characterizing PM emissions distributions of a sample of gasoline vehicles in Kansas City; characterize gaseous and PM toxics exhaust emissions; and characterize the fraction of high emitters in the fleet.In the process, sampling methodologies were evaluated.Overall, results from the study were used to populate databases for the MOVES emissions model.The FHWA was one of the research sponsors.This study is available on EPA's website at: http://www.epa.gov/otaq/emission-factors-research/420r08009.pdf

HEI SPECIAL REPORT #16

In November 2007, the Health Effects Institute (HEI) published Special Report #16:Mobile-Source Air Toxics:A Critical Review of the Literature on Exposure and Health Effects.This study was the result of a charge to the MSAT review panel to accomplish the following tasks:

- Use information from the peer-reviewed literature to summarize the health effects of exposure to the 21 MSATs defined by the EPA in 2001;
- Critically analyze the literature for a subset of priority MSATs selected by the panel; and
- Identify and summarize key gaps in existing research and unresolved questions about the priority MSAT.

The panel chose to review literature for acetaldehyde, acrolein, benzene, 1,3-butadiene, formaldehyde, naphthalene, and polycyclic organic matter (POM).Diesel exhaust was included but not reviewed in this study since it had been reviewed by HEI and EPA recently.In general, the panel concluded that the cancer health effects due to mobile sources are difficult to discern since the majority of quantitative assessments are derived from occupational cohorts with high concentration exposures and some cancer potency estimates are derived from animal models.The panel suggested that substantial improvements in analytical sensitively and specificity of biomarkers would provide better linkages between exposure and health effects.Noncancer endpoints were not a central focus of most research and therefore require further investigation.Subpopulation susceptibility also requires additional evaluation.The study is available from HEI's website at http://www.healtheffects.org/.The FHWA provided financial support to HEI's research work.

TRAFFIC-RELATED AIR POLLUTION

In May 2009, HEI released a preprint version of Special Report #17 investigating the health effects of traffic related air pollution.The goal of the research was to synthesize available information on the effects of traffic on health.Researchers looked at linkages between:(1) traffic emissions (at the tailpipe) with ambient air pollution in general, (2) concentrations of ambient pollutants with human exposure to pollutants from traffic, (3) exposure to pollutants from traffic with human-health effects and toxicologic data, and (4) toxicologic data with epidemiological associations.Challenges in making exposure assessments, such as quality and quantity of emissions data and models, were investigated as was the appropriateness of the use of the proximity model as an exposure-assessment model.Overall, researchers felt that there was "sufficient" evidence for causality for the exacerbation of asthma.Evidence was "suggestive but not sufficient" for other health outcomes such as cardiovascular mortality and others. Study authors also note that past epidemiologic studies may not provide an appropriate assessment of future health associations as vehicle emissions are decreasing overtime.The report is available from HEI's website at http://www.healtheffects.org/.The final version is expected by fall 2009. The FHWA provides financial support to HEI's research work.

THE NATIONAL NEAR ROADWAY MSAT STUDY

The FHWA, in conjunction with the EPA and a consortium of State departments of transportation, is studying the concentration and physical behavior of MSATs and mobile source PM 2.5 at up to three sites in the United States.To leverage resources for this effort, the Transportation Pooled Fund Program 1124, Mobile Source Air Toxics (MSAT) From Major Highways was created to fund this research.The study criteria dictate that each study site be open to traffic and have 150,000 Annual Average Daily Traffic or more.This study is intended to provide knowledge about the dispersion of MSAT emissions with the ultimate goal of enabling more informed transportation and environmental decisions at the project-level.More information is available at http://www.fhwa.dot.gov/environment/air_quality/air_toxics/research/near_road_s
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1 The information provided here is an update to research work discussed in the 2006 release of this interim guidance. The current title of each research activity is followed by the title used to describe the activity previously.
2 Available at http://www.fhwa.dot.gov/environment/air_quality/air_toxics/research/workplan/inc

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Updated: 07/06/2011

APPENDIX E

Emissions Modeling Outputs

- Roadway Construction Model
- CT-EMFAC

Road Construction Emissions Model, Version 6.3.2

Emission Estimates for -> 57/60 Confluence Project Project Phases (English Units)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	CO2 (lbs/day)
Grubbing/Land Clearing	5.5	22.8	35.3	51.7	1.7	50.0	12.0	1.6	10.4	4,662.7
Grading/Excavation	5.8	26.8	36.6	52.0	2.0	50.0	12.2	1.8	10.4	5,215.5
Drainage/Utilities/Sub-Grade	4.9	21.5	29.4	51.6	1.6	50.0	11.9	1.5	10.4	4,435.6
Paving	3.8	17.2	18.4	1.5	1.5	-	1.4	1.4	-	2,501.9
Maximum (pounds/day)	5.8	26.8	36.6	52.0	2.0	50.0	12.2	1.8	10.4	5,215.5
Total (tons/construction project)	2.1	9.4	12.7	17.5	0.7	16.8	4.1	0.6	3.5	1,852.9

Notes: Project Start Year -> 2014
Project Length (months) -> 36
Total Project Area (acres) -> 100
Maximum Area Disturbed/Day (acres) -> 5
Total Soil Imported/Exported (yd^3/day)-> 0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.

Emission Estimates for -> 57/60 Confluence Project Project Phases (Metric Units)	ROG (kgs/day)	CO (kgs/day)	NOx (kgs/day)	Total PM10 (kgs/day)	Exhaust PM10 (kgs/day)	Fugitive Dust PM10 (kgs/day)	Total PM2.5 (kgs/day)	Exhaust PM2.5 (kgs/day)	Fugitive Dust PM2.5 (kgs/day)	CO2 (kgs/day)
Grubbing/Land Clearing	2.5	10.4	16.0	23.5	0.8	22.7	5.4	0.7	4.7	2,119.4
Grading/Excavation	2.6	12.2	16.6	23.6	0.9	22.7	5.5	0.8	4.7	2,370.7
Drainage/Utilities/Sub-Grade	2.2	9.8	13.4	23.5	0.7	22.7	5.4	0.7	4.7	2,016.2
Paving	1.7	7.8	8.4	0.7	0.7	-	0.6	0.6	-	1,137.2
Maximum (kilograms/day)	2.6	12.2	16.6	23.6	0.9	22.7	5.5	0.8	4.7	2,370.7
Total (megagrams/construction project)	1.9	8.5	11.6	15.9	0.6	15.3	3.8	0.6	3.2	1,680.6

Notes: Project Start Year -> 2014
Project Length (months) -> 36
Total Project Area (hectares) -> 40
Maximum Area Disturbed/Day (hectares) -> 2
Total Soil Imported/Exported (meters^3/day)-> 0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sume of exhaust and fugitive dust emissions shown in columns K and L.

Road Construction Emissions Model **Version 6.3.2**

Data Entry Worksheet

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a
yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells C10 through C25.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

Input Type		
Project Name	57/60 Confluence Project	
Construction Start Year	2014	Enter a Year between 2005 and 2025 (inclusive)
Project Type	2	1 New Road Construction 2 Road Widening 3 Bridge/Overpass Construction
Project Construction Time	36.0	months
Predominant Soil/Site Type: Enter 1, 2, or 3	1	1. Sand Gravel 2. Weathered Rock-Earth 3. Blasted Rock
Project Length	3	miles
Total Project Area	100.0	acres
Maximum Area Disturbed/Day	5.0	acres
Water Trucks Used?	1	1. Yes 2. No
Soil Imported	0.0	yd^3/day
Soil Exported	0.0	yd^3/day
Average Truck Capacity	16.0	yd^3 (assume 20 if unknown)

Construction Periods	User Override of Construction Months	Program Calculated Months
Grubbing/Land Clearing		3.60
Grading/Excavation		14.40
Drainage/Utilities/Sub-Grade		12.60
Paving		5.40
Totals	0.00	36.00

Soil Hauling Emissions

User Input	User Override of Soil Hauling Defaults	Default Values	
Miles/round trip		30	
Round trips/day		0	
Vehicle miles traveled/day (calculated)			0

Hauling Emissions	**ROG**	**NOx**	**CO**	**PM10**	**PM2.5**	**CO2**
Emission rate (grams/mile)	0.73	8.62	4.51	0.34	0.28	1882.37
Emission rate (grams/trip)	9.37	7.22	152.15	0.01	0.01	184.75
Pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
Tons per contruction period	0.00	0.00	0.00	0.00	0.00	0.00

Worker Commute Emissions

	User Override of Worker Commute Default Values	Default Values
Miles/ one-way trip		20
One-way trips/day		2
No. of employees: Grubbing/Land Clearing		10
No. of employees: Grading/Excavation		13
No. of employees: Drainage/Utilities/Sub-Grade		13
No. of employees: Paving		13

	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.104	0.189	1.990	0.033	0.018	426.680
Emission rate - Grading/Excavation (grams/mile)	0.100	0.181	1.910	0.033	0.018	426.588
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.089	0.160	1.714	0.033	0.018	426.366
Emission rate - Paving (grams/mile)	0.084	0.152	1.636	0.033	0.018	426.280
Emission rate - Grubbing/Land Clearing (grams/trip)	0.687	0.289	6.716	0.140	0.013	193.100
Emission rate - Grading/Excavation (grams/trip)	0.664	0.279	6.486	0.140	0.013	193.238
Emission rate - Draining/Utilities/Sub-Grade (gr/trip)	0.605	0.252	5.903	0.140	0.013	193.603
Emission rate - Paving (grams/trip)	0.581	0.241	5.666	0.140	0.013	193.760
Pounds per day - Grubbing/Land Clearing	0.152	0.192	2.345	0.041	0.017	392.943
Tons per const. Period - Grub/Land Clear	0.006	0.008	0.093	0.002	0.001	15.561
Pounds per day - Grading/Excavation	0.146	0.184	2.255	0.041	0.017	392.874
Tons per const. Period - Grading/Excavation	0.023	0.029	0.357	0.007	0.003	62.231
Pounds per day - Drainage/Utilities/Sub-Grade	0.131	0.163	2.030	0.041	0.017	392.710
Tons per const. Period - Drain/Util/Sub-Grade	0.018	0.023	0.281	0.006	0.002	54.430
Pounds per day - Paving	0.144	0.155	1.941	0.041	0.017	486.543
Tons per const. Period - Paving	0.009	0.009	0.115	0.002	0.001	28.901
tons per construction period	0.056	0.069	0.847	0.016	0.007	161.122

Water Truck Emissions	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Miles Traveled/Day	Default Values Miles Traveled/Day		
Grubbing/Land Clearing - Exhaust	4.00	1		40		
Grading/Excavation - Exhaust	4.00	1		40		
Drainage/Utilities/Subgrade	4.00	1		40		
	ROG	**NOx**	**CO**	**PM10**	**PM2.5**	**CO2**
Emission rate - Grubbing/Land Clearing (grams/mile)	0.76	9.04	4.74	0.36	0.29	1880.47
Emission rate - Grading/Excavation (grams/mile)	0.73	8.62	4.51	0.34	0.28	1882.37
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.65	7.55	3.90	0.30	0.24	1887.34
Pounds per day - Grubbing/Land Clearing	0.27	3.19	1.67	0.13	0.10	662.72
Tons per const. Period - Grub/Land Clear	0.04	0.50	0.26	0.02	0.02	104.97
Pound per day - Grading/Excavation	0.26	3.04	1.59	0.12	0.10	663.39
Tons per const. Period - Grading/Excavation	0.04	0.48	0.25	0.02	0.02	105.08
Pound per day - Drainage/Utilities/Subgrade	0.23	2.66	1.38	0.11	0.08	665.14
Tons per const. Period - Drainage/Utilities/Subgrade	0.03	0.37	0.19	0.01	0.01	92.19

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing		5	50.0	2.0	10.4	0.4
Fugitive Dust - Grading/Excavation		5	50.0	7.9	10.4	1.6
Fugitive Dust - Drainage/Utilities/Subgrade		5	50.0	6.9	10.4	1.4

Off-Road Equipment Emissions

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
	1	Rubber Tired Dozers	1.44	6.24	12.03	0.50	0.46	1245.79
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
	1	Scrapers	1.53	5.72	13.21	0.51	0.47	1623.76
	6	Signal Boards	2.12	6.80	6.67	0.55	0.51	737.45
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grubbing/Land Clearing	pounds per day	5.1	18.8	31.9	1.6	1.4	3607.0
	Grubbing/Land Clearing	tons per phase	0.2	0.7	1.3	0.1	0.1	142.8

Grading/Excavation Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
	0	Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	1	Excavators	0.54	3.25	3.88	0.21	0.20	547.36
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
	1	Graders	0.71	3.83	5.29	0.29	0.27	647.87
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
	1	Other Construction Equipment	0.16	0.93	1.13	0.09	0.08	143.89
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
	1	Rubber Tired Loaders	0.49	2.70	3.71	0.20	0.19	458.86
	1	Scrapers	1.50	5.59	12.78	0.49	0.45	1623.76
	6	Signal Boards	2.03	6.71	6.57	0.53	0.49	737.45
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation	pounds per day	5.4	23.0	33.4	1.8	1.7	4159.2
	Grading	tons per phase	0.9	3.6	5.3	0.3	0.3	658.8

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
	1	Graders	0.66	3.82	4.75	0.26	0.24	647.87
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	1	Plate Compactors	0.02	0.09	0.11	0.00	0.00	14.83
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
	1	Scrapers	1.42	5.24	11.68	0.45	0.41	1623.76
	6	Signal Boards	1.80	6.49	6.29	0.47	0.43	737.45
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
	1	Trenchers	0.61	2.50	3.74	0.31	0.29	353.84
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage	pounds per day	4.5	18.1	26.6	1.5	1.4	3377.7
	Drainage	tons per phase	0.6	2.5	3.7	0.2	0.2	468.2

Paving Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	CO2 pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
	1	Pavers	0.65	2.75	3.93	0.33	0.30	386.18
	1	Paving Equipment	0.49	2.07	2.96	0.25	0.23	291.96
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
	2	Rollers	0.81	4.04	5.21	0.42	0.39	599.72
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
	6	Signal Boards	1.70	6.39	6.18	0.45	0.41	737.45
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Paving	pounds per day	3.7	15.3	18.3	1.5	1.3	2015.3
	Paving	tons per phase	0.2	0.9	1.1	0.1	0.1	119.7
Total Emissions all Phases (tons per construction period) =>			1.9	7.8	11.3	0.6	0.6	1389.5

Equipment		Default Values Horsepower		Default Values Load Factor		Default Values Hours/day
Aerial Lifts		60		0.46		8
Air Compressors		106		0.48		8
Bore/Drill Rigs		291		0.75		8
Cement and Mortar Mixers		10		0.56		8
Concrete/Industrial Saws		19		0.73		8
Cranes		399		0.43		8
Crushing/Proc. Equipment		142		0.78		8
Excavators		168		0.57		8
Forklifts		145		0.30		8
Generator Sets		549		0.74		8
Graders		174		0.61		8
Off-Highway Tractors		267		0.65		8
Off-Highway Trucks		479		0.57		8
Other Construction Equipment		75		0.62		8
Other General Industrial Equipment		238		0.51		8
Other Material Handling Equipment		191		0.59		8
Pavers		100		0.62		8
Paving Equipment		104		0.53		8
Plate Compactors		8		0.43		8
Pressure Washers		1		0.60		8
Pumps		53		0.74		8
Rollers		95		0.56		8
Rough Terrain Forklifts		93		0.60		8
Rubber Tired Dozers		357		0.59		8
Rubber Tired Loaders		157		0.54		8
Scrapers		313		0.72		8
Signal Boards		20		0.78		8
Skid Steer Loaders		44		0.55		8
Surfacing Equipment		362		0.45		8
Sweepers/Scrubbers		91		0.68		8
Tractors/Loaders/Backhoes		108		0.55		8
Trenchers		63		0.75		8
Welders		45		0.45		8

VMT Distribution by Speed by Segment

57/60 2009 Existing

Speed Bin ID	Speed Range	Entire Corridor Tot VMT	Tot %	PK VMT	PK %	OP VMT	OP %	Segment1 PK %	Segment1 OP %	Segment2 PK %	Segment2 OP %
1	<5 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
2	5 mph ~ 10 mph	2814	0.08	2814	0.15	0	0.00	0.15	0.00		
3	10 mph ~ 15 mph	3232	0.09	3232	0.17	0	0.00	0.17	0.00		
4	15 mph ~ 20 mph	50014	1.38	46377	2.48	3637	0.21	2.48	0.21		
5	20 mph ~ 25 mph	128451	3.56	106642	5.70	21809	1.25	5.70	1.25		
6	25 mph ~ 30 mph	430133	11.91	368227	19.70	61906	3.55	19.70	3.55		
7	30 mph ~ 35 mph	523428	14.49	371147	19.85	152281	8.74	19.85	8.74		
8	35 mph ~ 40 mph	393448	10.89	159467	8.53	233981	13.43	8.53	13.43		
9	40 mph ~ 45 mph	152236	4.22	19543	1.05	132693	7.62	1.05	7.62		
10	45 mph ~ 50 mph	33901	0.94	24463	1.31	9438	0.54	1.31	0.54		
11	50 mph ~ 55 mph	144050	3.99	62650	3.35	81400	4.67	3.35	4.67		
12	55 mph ~ 60 mph	194758	5.39	45646	2.44	149112	8.56	2.44	8.56		
13	60 mph ~ 65 mph	1554868	43.06	659186	35.26	895682	51.42	35.26	51.42		
14	65 mph ~ 70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
15	>70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
	Total	3611333	100	1869394	100	1741939	100	1869394	1741939		

Scenario: 2009 Existing
Geographic Area: Los Angeles (SC)
Analysis Year: 2009
Season: Annual
Truck %
PK: 8 %
OP: 8 %

VMT Distribution by Speed by Segment

57/60 2017 No-build

		Entire Corridor						Segment1		Segment2	
Speed Bin ID	**Speed Range**	**Tot VMT**	**Tot %**	**PK VMT**	**PK %**	**OP VMT**	**OP %**	**PK %**	**OP %**	**PK %**	**OP %**
1	<5 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
2	5 mph ~ 10 mph	2522	0.07	2522	0.13	0	0.00	0.13	0.00		
3	10 mph ~ 15 mph	21568	0.57	21568	1.08	0	0.00	1.08	0.00		
4	15 mph ~ 20 mph	296079	7.80	150887	7.55	145192	8.08	7.55	8.08		
5	20 mph ~ 25 mph	152637	4.02	126771	6.34	25866	1.44	6.34	1.44		
6	25 mph ~ 30 mph	536084	14.12	448362	22.43	87722	4.88	22.43	4.88		
7	30 mph ~ 35 mph	479146	12.62	283481	14.18	195665	10.88	14.18	10.88		
8	35 mph ~ 40 mph	608108	16.02	197935	9.90	410173	22.82	9.90	22.82		
9	40 mph ~ 45 mph	117037	3.08	10455	0.52	106582	5.93	0.52	5.93		
10	45 mph ~ 50 mph	281250	7.41	142576	7.13	138674	7.71	7.13	7.71		
11	50 mph ~ 55 mph	66041	1.74	32471	1.62	33570	1.87	1.62	1.87		
12	55 mph ~ 60 mph	15610	0.41	7880	0.39	7730	0.43	0.39	0.43		
13	60 mph ~ 65 mph	1220114	32.14	573658	28.70	646456	35.96	28.70	35.96		
14	65 mph ~ 70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
15	>70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
	Total	3796196	100	1998566	100	1797630	100	1998566	1797630		

Scenario:	2017 No-build	
Geographic Area:	Los Angeles (SC)	
Analysis Year:	2017	
Season:	Annual	
Truck %		
PK:	8	%
OP:	8	%

VMT Distribution by Speed by Segment

57/60 2017 Alternative 2

		Entire Corridor						Segment1		Segment2	
Speed Bin ID	**Speed Range**	**Tot VMT**	**Tot %**	**PK VMT**	**PK %**	**OP VMT**	**OP %**	**PK %**	**OP %**	**PK %**	**OP %**
1	**<5 mph**	0	0.00	0	0.00	0	0.00	0.00	0.00		
2	**5 mph ~ 10 mph**	4747	0.12	4747	0.23	0	0.00	0.23	0.00		
3	**10 mph ~ 15 mph**	27623	0.73	27623	1.35	0	0.00	1.35	0.00		
4	**15 mph ~ 20 mph**	37549	0.99	33557	1.64	3992	0.23	1.64	0.23		
5	**20 mph ~ 25 mph**	145708	3.83	121544	5.95	24164	1.38	5.95	1.38		
6	**25 mph ~ 30 mph**	489703	12.88	416178	20.36	73525	4.19	20.36	4.19		
7	**30 mph ~ 35 mph**	430911	11.34	281204	13.76	149707	8.52	13.76	8.52		
8	**35 mph ~ 40 mph**	492768	12.96	179847	8.80	312921	17.81	8.80	17.81		
9	**40 mph ~ 45 mph**	159589	4.20	12168	0.60	147421	8.39	0.60	8.39		
10	**45 mph ~ 50 mph**	71546	1.88	53187	2.60	18359	1.05	2.60	1.05		
11	**50 mph ~ 55 mph**	0	0.00	0	0.00	0	0.00	0.00	0.00		
12	**55 mph ~ 60 mph**	178495	4.70	9212	0.45	169283	9.64	0.45	9.64		
13	**60 mph ~ 65 mph**	1762333	46.37	904983	44.27	857350	48.80	44.27	48.80		
14	**65 mph ~ 70 mph**	0	0.00	0	0.00	0	0.00	0.00	0.00		
15	**>70 mph**	0	0.00	0	0.00	0	0.00	0.00	0.00		
	Total	3800972	100	2044250	100	1756722	100	2044250	1756722		

Scenario:	2017 Alt 2	
Geographic Area:	Los Angeles (SC)	
Analysis Year:	2017	
Season:	Annual	
Truck %		
PK:	8	%
OP:	8	%

VMT Distribution by Speed by Segment

57/60 2037 No-build

Speed Bin ID	Speed Range	Entire Corridor Tot VMT	Tot %	PK VMT	PK %	OP VMT	OP %	Segment1 PK %	Segment1 OP %	Segment2 PK %	Segment2 OP %
1	<5 mph	6039	0.14	6039	0.26	0	0.00	0.26	0.00		
2	5 mph ~ 10 mph	8747	0.21	8747	0.38	0	0.00	0.38	0.00		
3	10 mph ~ 15 mph	59480	1.41	55454	2.42	4026	0.21	2.42	0.21		
4	15 mph ~ 20 mph	194127	4.59	159645	6.96	34482	1.78	6.96	1.78		
5	20 mph ~ 25 mph	346698	8.19	295064	12.86	51634	2.67	12.86	2.67		
6	25 mph ~ 30 mph	522314	12.35	447627	19.51	74687	3.86	19.51	3.86		
7	30 mph ~ 35 mph	627383	14.83	362647	15.80	264736	13.67	15.80	13.67		
8	35 mph ~ 40 mph	721153	17.04	146199	6.37	574954	29.69	6.37	29.69		
9	40 mph ~ 45 mph	279234	6.60	150401	6.55	128833	6.65	6.55	6.65		
10	45 mph ~ 50 mph	97595	2.31	97595	4.25	0	0.00	4.25	0.00		
11	50 mph ~ 55 mph	92762	2.19	10695	0.47	82067	4.24	0.47	4.24		
12	55 mph ~ 60 mph	53008	1.25	53008	2.31	0	0.00	2.31	0.00		
13	60 mph ~ 65 mph	1222417	28.89	501568	21.86	720849	37.23	21.86	37.23		
14	65 mph ~ 70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
15	>70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
	Total	4230957	100	2294689	100	1936268	100	2294689	1936268		

Scenario: 2037 No-build
Geographic Area: Los Angeles (SC)
Analysis Year: 2037
Season: Annual
Truck %
PK: 8 %
OP: 8 %

VMT Distribution by Speed by Segment

57/60 2037 Alternative 2

		Entire Corridor						Segment1		Segment2	
Speed Bin ID	**Speed Range**	**Tot VMT**	**Tot %**	**PK VMT**	**PK %**	**OP VMT**	**OP %**	**PK %**	**OP %**	**PK %**	**OP %**
1	<5 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
2	5 mph ~ 10 mph	6203	0.15	6203	0.27	0	0.00	0.27	0.00		
3	10 mph ~ 15 mph	43149	1.02	39115	1.68	4034	0.21	1.68	0.21		
4	15 mph ~ 20 mph	92030	2.18	50525	2.16	41505	2.20	2.16	2.20		
5	20 mph ~ 25 mph	257975	6.11	227367	9.74	30608	1.62	9.74	1.62		
6	25 mph ~ 30 mph	541225	12.81	437396	18.74	103829	5.49	18.74	5.49		
7	30 mph ~ 35 mph	404674	9.58	203107	8.70	201567	10.66	8.70	10.66		
8	35 mph ~ 40 mph	549292	13.00	202994	8.70	346298	18.32	8.70	18.32		
9	40 mph ~ 45 mph	112683	2.67	14247	0.61	98436	5.21	0.61	5.21		
10	45 mph ~ 50 mph	63553	1.50	63553	2.72	0	0.00	2.72	0.00		
11	50 mph ~ 55 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
12	55 mph ~ 60 mph	325988	7.72	231840	9.93	94148	4.98	9.93	4.98		
13	60 mph ~ 65 mph	1827673	43.26	857489	36.74	970184	51.32	36.74	51.32		
14	65 mph ~ 70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
15	>70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
	Total	4224445	100	2333836	100	1890609	100	2333836	1890609		

Scenario:	2037 Alt 2
Geographic Area:	Los Angeles (SC)
Analysis Year:	2037
Season:	Annual
Truck %	
PK:	8 %
OP:	8 %

VMT Distribution by Speed by Segment

57/60 2009 Existing

		Entire Corridor						Segment1		Segment2	
Speed Bin ID	**Speed Range**	**Tot VMT**	**Tot %**	**PK VMT**	**PK %**	**OP VMT**	**OP %**	**PK %**	**OP %**	**PK %**	**OP %**
1	**<5 mph**	0	0.00	0	0.00	0	0.00	0.00	0.00		
2	**5 mph ~ 10 mph**	2814	0.08	2814	0.15	0	0.00	0.15	0.00		
3	**10 mph ~ 15 mph**	3232	0.09	3232	0.17	0	0.00	0.17	0.00		
4	**15 mph ~ 20 mph**	50014	1.38	46377	2.48	3637	0.21	2.48	0.21		
5	**20 mph ~ 25 mph**	128451	3.56	106642	5.70	21809	1.25	5.70	1.25		
6	**25 mph ~ 30 mph**	430133	11.91	368227	19.70	61906	3.55	19.70	3.55		
7	**30 mph ~ 35 mph**	523428	14.49	371147	19.85	152281	8.74	19.85	8.74		
8	**35 mph ~ 40 mph**	393448	10.89	159467	8.53	233981	13.43	8.53	13.43		
9	**40 mph ~ 45 mph**	152236	4.22	19543	1.05	132693	7.62	1.05	7.62		
10	**45 mph ~ 50 mph**	33901	0.94	24463	1.31	9438	0.54	1.31	0.54		
11	**50 mph ~ 55 mph**	144050	3.99	62650	3.35	81400	4.67	3.35	4.67		
12	**55 mph ~ 60 mph**	194758	5.39	45646	2.44	149112	8.56	2.44	8.56		
13	**60 mph ~ 65 mph**	1554868	43.06	659186	35.26	895682	51.42	35.26	51.42		
14	**65 mph ~ 70 mph**	0	0.00	0	0.00	0	0.00	0.00	0.00		
15	**>70 mph**	0	0.00	0	0.00	0	0.00	0.00	0.00		
	Total	3611333	100	1869394	100	1741939	100	1869394	1741939		

Scenario:	2009 Existing	
Geographic Area:	Los Angeles (SC)	
Analysis Year:	2009	
Season:	Annual	
Truck %		
PK:	8	%
OP:	8	%

VMT Distribution by Speed by Segment

57/60 2017 No-build

Speed Bin ID	Speed Range	Entire Corridor Tot VMT	Tot %	PK VMT	PK %	OP VMT	OP %	Segment1 PK %	Segment1 OP %	Segment2 PK %	Segment2 OP %
1	<5 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
2	5 mph ~ 10 mph	2522	0.07	2522	0.13	0	0.00	0.13	0.00		
3	10 mph ~ 15 mph	21568	0.57	21568	1.08	0	0.00	1.08	0.00		
4	15 mph ~ 20 mph	296079	7.80	150887	7.55	145192	8.08	7.55	8.08		
5	20 mph ~ 25 mph	152637	4.02	126771	6.34	25866	1.44	6.34	1.44		
6	25 mph ~ 30 mph	536084	14.12	448362	22.43	87722	4.88	22.43	4.88		
7	30 mph ~ 35 mph	479146	12.62	283481	14.18	195665	10.88	14.18	10.88		
8	35 mph ~ 40 mph	608108	16.02	197935	9.90	410173	22.82	9.90	22.82		
9	40 mph ~ 45 mph	117037	3.08	10455	0.52	106582	5.93	0.52	5.93		
10	45 mph ~ 50 mph	281250	7.41	142576	7.13	138674	7.71	7.13	7.71		
11	50 mph ~ 55 mph	66041	1.74	32471	1.62	33570	1.87	1.62	1.87		
12	55 mph ~ 60 mph	15610	0.41	7880	0.39	7730	0.43	0.39	0.43		
13	60 mph ~ 65 mph	1220114	32.14	573658	28.70	646456	35.96	28.70	35.96		
14	65 mph ~ 70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
15	>70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
	Total	3796196	100	1998566	100	1797630	100	1998566	1797630		

Scenario: 2017 No-build
Geographic Area: Los Angeles (SC)
Analysis Year: 2017
Season: Annual
Truck %
PK: 8 %
OP: 8 %

VMT Distribution by Speed by Segment

57/60 2017 Alternative 3

		Entire Corridor						Segment1		Segment2	
Speed Bin ID	Speed Range	Tot VMT	Tot %	PK VMT	PK %	OP VMT	OP %	PK %	OP %	PK %	OP %
1	<5 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
2	5 mph ~ 10 mph	2511	0.07	2511	0.12	0	0.00	0.12	0.00		
3	10 mph ~ 15 mph	22489	0.59	22489	1.10	0	0.00	1.10	0.00		
4	15 mph ~ 20 mph	35783	0.94	32010	1.56	3773	0.21	1.56	0.21		
5	20 mph ~ 25 mph	150166	3.95	125782	6.15	24384	1.39	6.15	1.39		
6	25 mph ~ 30 mph	495827	13.04	422302	20.64	73525	4.18	20.64	4.18		
7	30 mph ~ 35 mph	382121	10.05	231124	11.30	150997	8.59	11.30	8.59		
8	35 mph ~ 40 mph	341358	8.97	89865	4.39	251493	14.31	4.39	14.31		
9	40 mph ~ 45 mph	200372	5.27	102150	4.99	98222	5.59	4.99	5.59		
10	45 mph ~ 50 mph	103994	2.73	53187	2.60	50807	2.89	2.60	2.89		
11	50 mph ~ 55 mph	32452	0.85	0	0.00	32452	1.85	0.00	1.85		
12	55 mph ~ 60 mph	176535	4.64	0	0.00	176535	10.04	0.00	10.04		
13	60 mph ~ 65 mph	1860101	48.90	964275	47.14	895826	50.96	47.14	50.96		
14	65 mph ~ 70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
15	>70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
	Total	3803709	100	2045695	100	1758014	100	2045695	1758014		

Scenario:	2017 Alt 2	
Geographic Area:	Los Angeles (SC)	
Analysis Year:	2017	
Season:	Annual	
Truck %		
PK:	8	%
OP:	8	%

VMT Distribution by Speed by Segment

57/60 2037 No-build

		Entire Corridor						Segment1		Segment2	
Speed Bin ID	**Speed Range**	**Tot VMT**	**Tot %**	**PK VMT**	**PK %**	**OP VMT**	**OP %**	**PK %**	**OP %**	**PK %**	**OP %**
1	<5 mph	6039	0.14	6039	0.26	0	0.00	0.26	0.00		
2	5 mph ~ 10 mph	8747	0.21	8747	0.38	0	0.00	0.38	0.00		
3	10 mph ~ 15 mph	59480	1.41	55454	2.42	4026	0.21	2.42	0.21		
4	15 mph ~ 20 mph	194127	4.59	159645	6.96	34482	1.78	6.96	1.78		
5	20 mph ~ 25 mph	346698	8.19	295064	12.86	51634	2.67	12.86	2.67		
6	25 mph ~ 30 mph	522314	12.35	447627	19.51	74687	3.86	19.51	3.86		
7	30 mph ~ 35 mph	627383	14.83	362647	15.80	264736	13.67	15.80	13.67		
8	35 mph ~ 40 mph	721153	17.04	146199	6.37	574954	29.69	6.37	29.69		
9	40 mph ~ 45 mph	279234	6.60	150401	6.55	128833	6.65	6.55	6.65		
10	45 mph ~ 50 mph	97595	2.31	97595	4.25	0	0.00	4.25	0.00		
11	50 mph ~ 55 mph	92762	2.19	10695	0.47	82067	4.24	0.47	4.24		
12	55 mph ~ 60 mph	53008	1.25	53008	2.31	0	0.00	2.31	0.00		
13	60 mph ~ 65 mph	1222417	28.89	501568	21.86	720849	37.23	21.86	37.23		
14	65 mph ~ 70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
15	>70 mph	0	0.00	0	0.00	0	0.00	0.00	0.00		
	Total	4230957	100	2294689	100	1936268	100	2294689	1936268		

Scenario:	2037 No-build
Geographic Area:	Los Angeles (SC)
Analysis Year:	2037
Season:	Annual
Truck %	
PK:	8 %
OP:	8 %

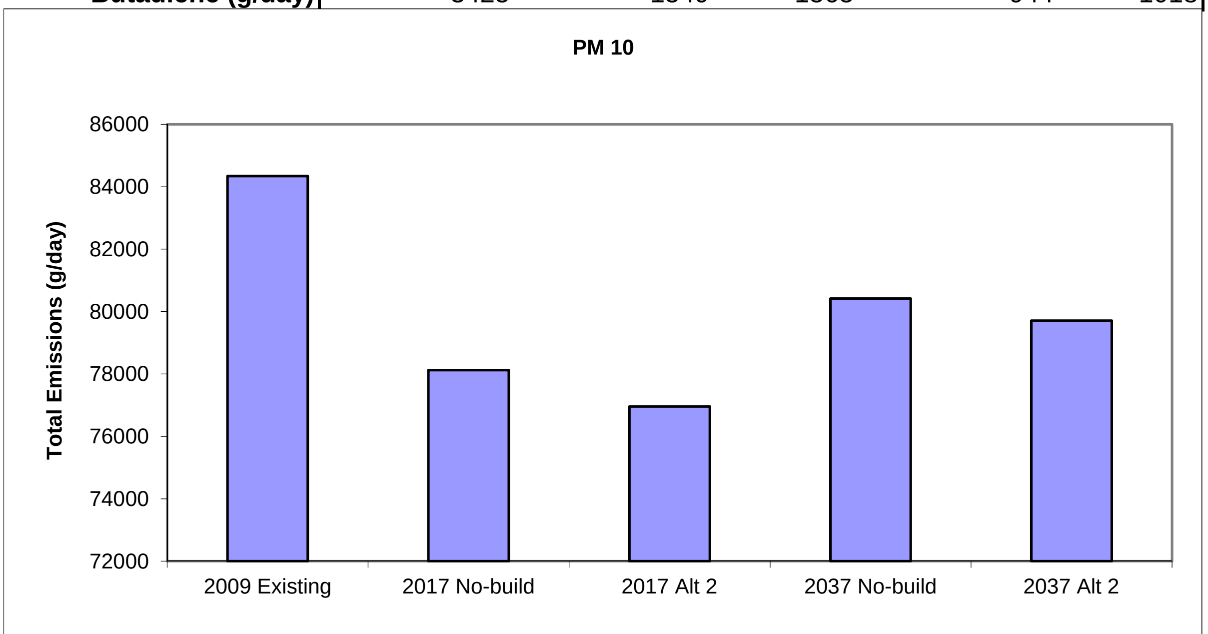
VMT Distribution by Speed by Segment

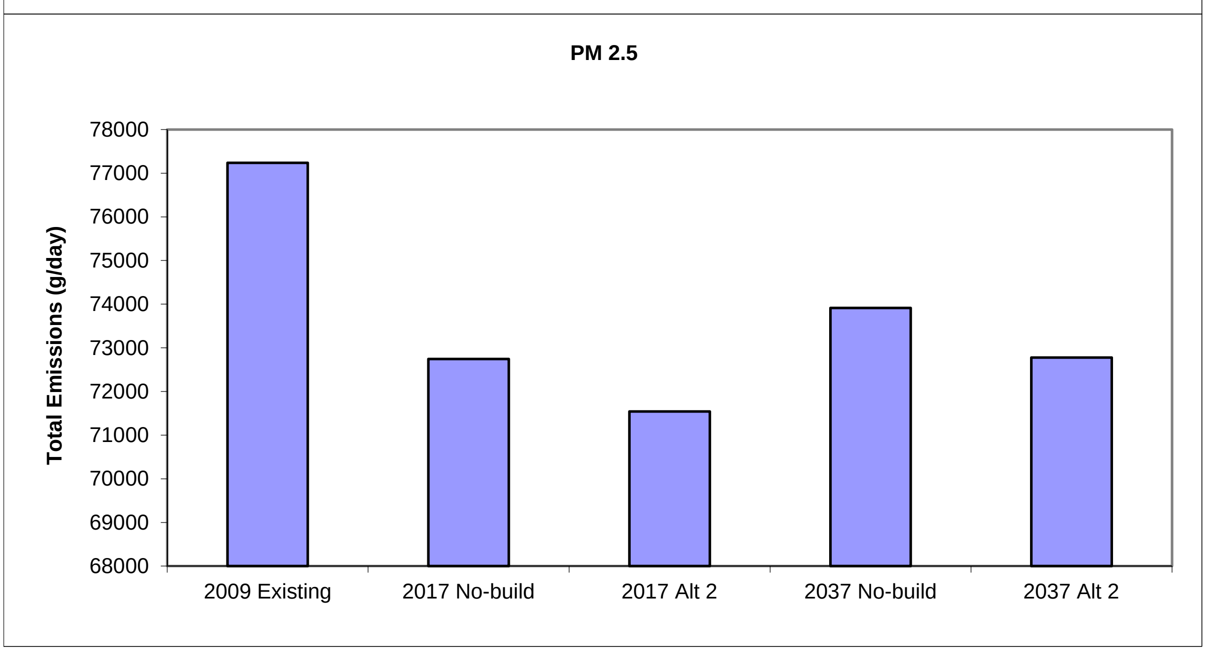
57/60 2037 Alternative 3

		Entire Corridor						Segment1		Segment2	
Speed Bin ID	**Speed Range**	**Tot VMT**	**Tot %**	**PK VMT**	**PK %**	**OP VMT**	**OP %**	**PK %**	**OP %**	**PK %**	**OP %**
1	**<5 mph**	0	0.00	0	0.00	0	0.00	0.00	0.00		
2	**5 mph ~ 10 mph**	4521	0.11	4521	0.19	0	0.00	0.19	0.00		
3	**10 mph ~ 15 mph**	37543	0.89	33509	1.43	4034	0.21	1.43	0.21		
4	**15 mph ~ 20 mph**	69728	1.65	59534	2.55	10194	0.54	2.55	0.54		
5	**20 mph ~ 25 mph**	307607	7.27	222194	9.51	85413	4.51	9.51	4.51		
6	**25 mph ~ 30 mph**	562695	13.30	443609	18.99	119086	6.29	18.99	6.29		
7	**30 mph ~ 35 mph**	451235	10.67	203107	8.69	248128	13.10	8.69	13.10		
8	**35 mph ~ 40 mph**	467955	11.06	202994	8.69	264961	13.99	8.69	13.99		
9	**40 mph ~ 45 mph**	111738	2.64	14247	0.61	97491	5.15	0.61	5.15		
10	**45 mph ~ 50 mph**	63553	1.50	63553	2.72	0	0.00	2.72	0.00		
11	**50 mph ~ 55 mph**	0	0.00	0	0.00	0	0.00	0.00	0.00		
12	**55 mph ~ 60 mph**	596110	14.09	341243	14.60	254867	13.46	14.60	13.46		
13	**60 mph ~ 65 mph**	1557552	36.82	748087	32.02	809465	42.75	32.02	42.75		
14	**65 mph ~ 70 mph**	0	0.00	0	0.00	0	0.00	0.00	0.00		
15	**>70 mph**	0	0.00	0	0.00	0	0.00	0.00	0.00		
	Total	4230237	100	2336598	100	1893639	100	2336598	1893639		

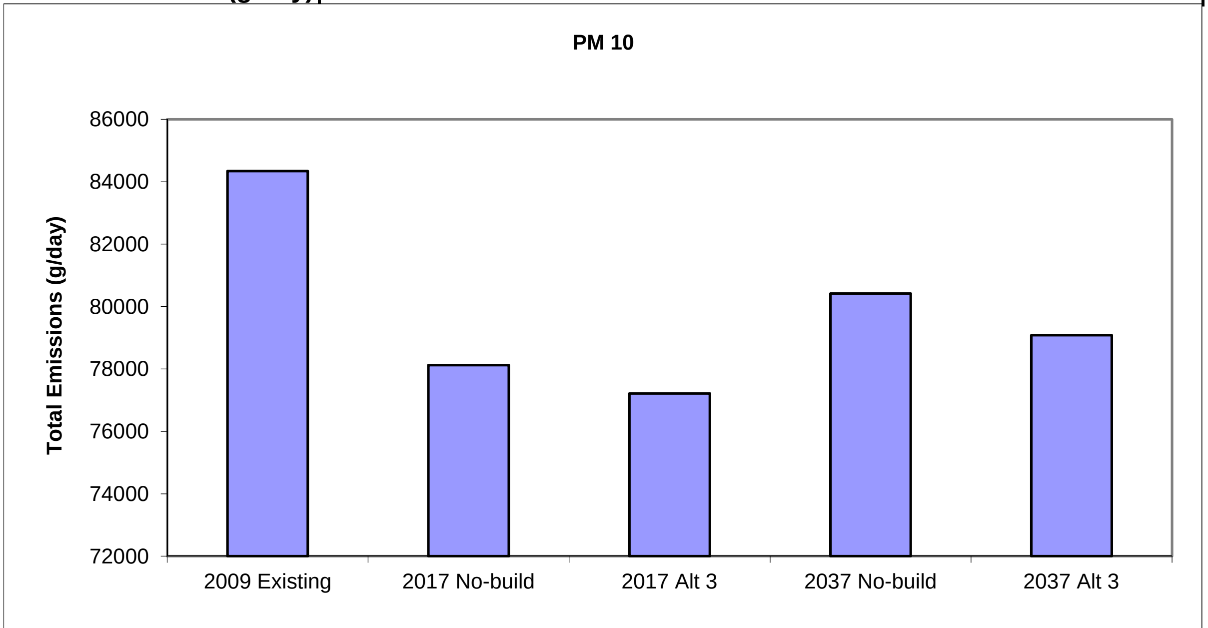
Scenario:	2037 Alt 2	
Geographic Area:	Los Angeles (SC)	
Analysis Year:	2037	
Season:	Annual	
Truck %		
PK:	8	%
OP:	8	%

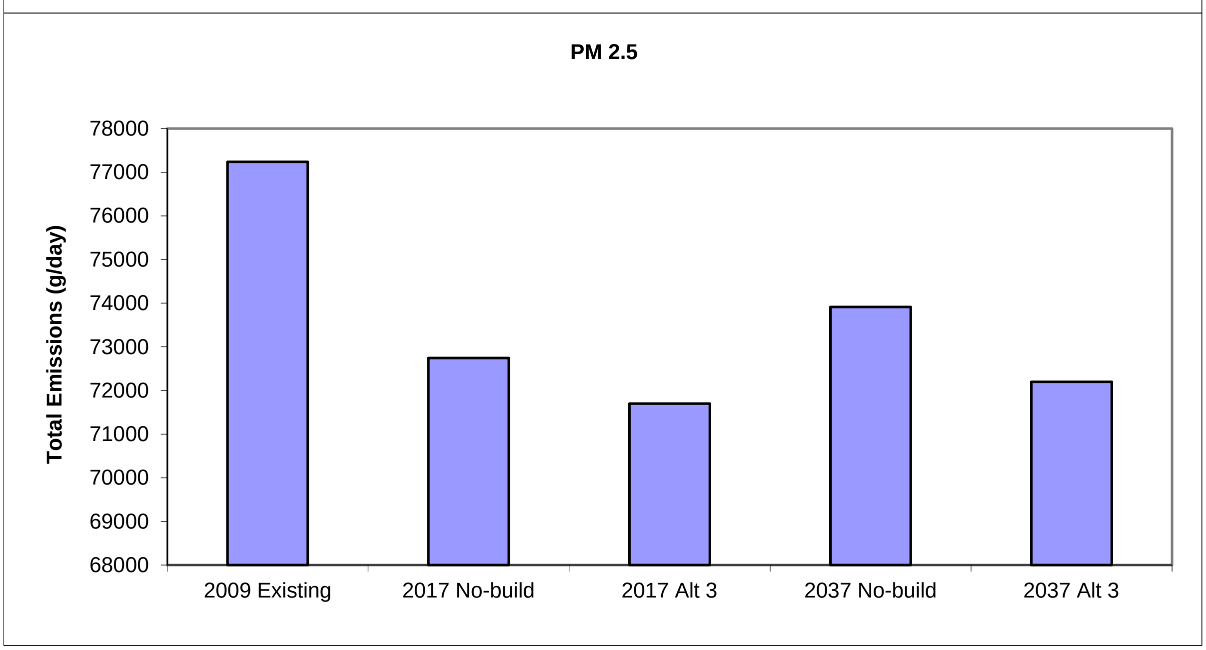
Total Emissions	2009 Existing	2017 No-build	2017 Alt 2	2037 No-build	2037 Alt 2
TOG (g/day)	835050	474916	453592	280644	275519
CO (g/day)	11477532	6252182	6101027	3188474	3147404
NOx (g/day)	2502284	1311922	1362969	493089	505539
SOx (g/day)	14897	15499	15597	17496	17726
CO2 (ton/day)	1694	1785	1800	1997	2029
PM10 (g/day)	84344	78125	76958	80419	79711
PM2.5 (g/day)	77239	72744	71543	73913	72778
Diesel PM (g/day)	40395	22810	23525	11277	11686
DEOG (g/day)	67128	42059	40341	22182	20164
Benzene (g/day)	17841	8873	8713	5422	5578
Acrolein (g/day)	768	342	346	209	227
Acetaldehyde (g/day)	7466	4213	4123	2312	2244
Formaldehyde (g/day)	20291	10840	10673	6066	6042
Butadiene (g/day)	3425	1549	1565	944	1018





Total Emissions	2009 Existing	2017 No-build	2017 Alt 3	2037 No-build	2037 Alt 3
TOG (g/day)	835050	474916	451619	280644	273962
CO (g/day)	11477532	6252182	6083049	3188474	3139849
NOx (g/day)	2502284	1311922	1374944	493089	502870
SOx (g/day)	14897	15499	15687	17496	17450
CO2 (ton/day)	1694	1785	1809	1997	2017
PM10 (g/day)	84344	78125	77216	80419	79081
PM2.5 (g/day)	77239	72744	71699	73913	72199
Diesel PM (g/day)	40395	22810	23749	11277	11624
DEOG (g/day)	67128	42059	40074	22182	20209
Benzene (g/day)	17841	8873	8721	5422	5514
Acrolein (g/day)	768	342	348	209	223
Acetaldehyde (g/day)	7466	4213	4114	2312	2233
Formaldehyde (g/day)	20291	10840	10670	6066	5994
Butadiene (g/day)	3425	1549	1575	944	1002





APPENDIX F

Traffic Data

- ADT Volumes by Roadway Segment
- VMT by 5-mph Speed Bin

Table F- 1 - Average Daily Traffic Volumes
Year 2017

Index	Link	Average Daily Traffic			
		Existing	ALT 1	ALT 2	ALT 3A
Arterial Links					
	Grand Ave SB north of SR-60 WB on/off Ramp	13,700	17,700	19,500	19,500
	Grand Ave SB btwn SR-60 WB Off-Ramp and WB On-Ramp	13,300	20,300	20,300	20,300
	Grand Ave SB btwn SR-60 WB On-Ramp & EB Slip Ramps	13,300	19,000	17,500	17,500
	Grand Ave SB Btwn SR-60 EB Slip On-Ramp & EB Loop On-Ramp	12,900	17,500	17,500	17,500
	Grand Ave SB btwn SR-60 EB Ramps and Golden Springs Rd	12,900	14,100	15,300	15,300
	Grand Ave SB btwn Golden Springs Rd and Chardonay Dr.	12,000	13,200	13,700	13,700
	Grand Ave NB north of SR-60 WB on/off Ramp	16,100	19,900	21,300	21,300
	Grand Ave NB btwn SR-60 EB and WB Ramps	14,800	18,600	19,200	19,200
	Grand Ave NB btwn Golden Springs Rd & SR-60 EB Ramps	14,700	17,700	18,000	18,000
	Grand Ave NB btwn Golden Springs Rd and Chardonay Dr.	13,100	15,300	15,700	15,700
	Golden Springs Rd EB btwn Grand Ave and Lavender Dr.	13,400	14,900	14,300	14,300
	Golden Springs Rd EB btwn Grand Ave and Racquet Club Dr.	8,000	9,000	8,900	8,900
	Golden Springs Rd WB btwn Grand Ave and Lavender Dr.	10,700	12,800	12,500	12,500
	Golden Springs Rd WB btwn Grand Ave and Racquet Club Dr.	8,800	10,400	9,800	9,800
SR-57 Freeway Links					
67	SR-57 NB south of Brea Canyon Rd On-Ramp	56,028	59,000	59,300	59,300
167/165	SR-57 NB btwn Brea Canyon Rd On-Ramp & Diamond Bar Blvd On-Ramp	59,928	62,500	62,600	62,600
168/166/171	SR-57 NB btwn Diamond Bar Blvd On-Ramp & Pathfinder Rd On-Ramp	64,400	65,000	65,100	65,100
7/132	SR-57 NB btwn Pathfinder Rd On-Ramp & SR-60 WB Off-Ramp	60,700	64,000	64,400	64,400
27	SR-57 NB btwn SR-60 WB Off-Ramp & SR-60 EB Merge	52,500	53,400	54,700	54,700
122	SR-57 NB btwn SR-60 EB Split & Temple Ave Off-Ramp	50,500	54,400	57,200	57,200
3	SR-57 SB btwn Temple Ave On-Ramp & SR-60 WB Merge	55,300	57,900	60,300	60,300
23	SR-57 SB btwn SR-60 WB Split & SR-57 SB On-Ramp from SR-60 EB	65,100	67,500	67,600	67,600
6	SR-57 SB btwn SR-57 On-Ramp from SR-60 EB & Pathfinder Rd Off-Ramp	58,800	63,100	63,300	63,300
66	SR-57 SB btwn Pathfinder Rd Off-Ramp & Diamond Bar Off-Ramp	74,646	77,400	76,200	76,200

Note: Freeway Ramp & Arterial ADT = 10 x Peak Hour; Freeway Mainline ADT = 11.9 x Peak Hour

ADT volumes are based on the regional traffic model. Project alternatives are not sufficiently different to result in regional differences in ADT volumes. Changes in link speeds were calculated at the local level based on a microsimulation model.

J:\2011\JB13048 COI-DB SR57SR60 PA ED\Analysis\Calculations\[2017_2037_ADT_Calculations_Sept2011_REV_Dec2011.xls]2017 ADT

Table F - 1 - Average Daily Traffic Volumes (Cont'd)
Year 2017

Index	Link	Average Daily Traffic			
		Existing	ALT 1	ALT 2	ALT 3A
SR-60 Freeway Links					
8	SR-60 EB west of Fullerton Rd On-Ramp	65,300	67,202	67,202	67,202
22/153	SR-60 EB btwn Fullerton Rd Off-Ramp & On-Ramp	64,100	67,818	68,188	68,188
154/155	SR-60 EB btwn Fullerton Rd On-Ramp & Nogales St Off-Ramp	67,000	71,500	71,676	71,676
156/157	SR-60 EB btwn Nogales St Off-Ramp & On-Ramp	69,900	74,400	74,767	74,767
158/159	SR-60 EB btwn Nogales St On-Ramp & Fairway Dr Off-Ramp	64,800	71,100	71,452	71,452
160/161	SR-60 EB btwn Fairway Dr Off-Ramp & On-Ramp	60,900	67,900	68,227	68,227
162/163	SR-60 EB btwn Fairway Dr On-Ramp & Brea Canyon Rd On-Ramp	65,900	72,500	74,725	74,725
9	SR-60 EB btwn Brea Canyon Rd On-Ramp & SR-57 SB Off-Ramp	67,000	78,500	80,538	80,538
10/150	SR-60 EB btwn SR-57 SB Off-Ramp & SR-57 NB Merge	62,600	67,300	69,000	69,000
1	SR-60 EB btwn SR-57 NB Merge & Grand Ave Off-Ramp	115,100	120,500	123,500	123,500
2	SR-60 EB btwn Grand Ave Off-Ramp & Grand Ave On-Ramp	107,900	112,100	116,100	116,100
146/148/134	SR-60 EB btwn Grand Ave On-Ramp & SR-57 NB Split	116,500	122,600	127,600	127,600
15	SR-60 EB btwn SR-57 NB Split & Diamond Bar Blvd On-Ramp	60,000	64,600	63,800	63,800
57	SR-60 EB btwn Diamond Bar Blvd On-Ramp & Philips Ranch Rd Off-Ramp	69,700	73,400	75,400	75,400
16	SR-60 WB btwn Philips Ranch Rd On-Ramp & Diamond Bar Blvd On-Ramp	60,900	65,700	66,200	66,200
147/164	SR-60 WB btwn Diamond Bar Blvd On-Ramp & SR-57 SB Merge	65,100	67,600	68,300	68,300
141	SR-60 WB btwn SR-57 SB Merge & Grand Ave Off-Ramp	109,500	118,000	121,300	121,300
4/143	SR-60 WB btwn Grand Ave Off-Ramp & Grand Ave On-Ramp	118,900	119,600	121,700	121,700
5/11	SR-60 WB btwn Grand Ave On-Ramp & SR-57 SB Split	53,700	57,400	59,900	59,900
12	SR-60 WB btwn SR-57 SB Split & Brea Canyon Rd Off-Ramp	59,800	63,800	65,500	65,500
SR-60 Ramp Links					
	SR-60 WB Loop On-Ramp at Grand Avenue	7,800	3,800	4,900	4,900
	SR-60 WB Slip On-Ramp at Grand Avenue	N/A	3,700	5,300	5,300
	SR-60 WB Off Ramp at Grand Avenue	9,100	10,400	11,400	11,400
	SR-60 EB Off Ramp at Grand Avenue	6,000	7,100	8,000	8,000
	SR-60 EB Slip On Ramp at Grand Avenue	7,200	8,700	9,700	5,000
	SR-60 EB Loop On Ramp at Grand Avenue	N/A	N/A	N/A	4,800

Note: Freeway Ramp & Arterial ADT = 10 x Peak Hour; Freeway Mainline ADT = 11.9 x Peak Hour

ADT volumes are based on the regional traffic model. Project alternatives are not sufficiently different to result in regional differences in ADT volumes. Changes in link speeds were calculated at the local level based on a microsimulation model.

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Table F -2 - Average Daily Traffic Volumes
Year 2037

Index	Link	Average Daily Traffic			
		Existing	ALT 1	ALT 2	ALT 3A
Arterial Links					
	Grand Ave SB north of SR-60 WB on/off Ramp	13,700	26,500	32,300	32,300
	Grand Ave SB btwn SR-60 WB Off-Ramp and WB On-Ramp	13,300	35,800	35,800	35,800
	Grand Ave SB btwn SR-60 WB On-Ramp & EB Slip On-Ramp	13,300	31,500	26,700	26,700
	Grand Ave SB Btwn SR-60 EB Slip On-Ramp & EB Loop On-Ramp	13,300	26,700	18,100	26,700
	Grand Ave SB btwn SR-60 EB Ramps and Golden Springs Rd	12,900	16,700	20,600	20,600
	Grand Ave SB btwn Golden Springs Rd and Chardonay Dr.	12,000	16,000	17,500	17,500
	Grand Ave NB north of SR-60 WB on/off Ramp	16,100	28,500	33,000	33,000
	Grand Ave NB btwn SR-60 EB and WB Ramps	14,800	27,100	29,000	29,000
	Grand Ave NB btwn Golden Springs Rd & SR-60 EB Ramps	14,700	24,300	25,400	25,400
	Grand Ave NB btwn Golden Springs Rd and Chardonay Dr.	13,100	20,300	21,600	21,600
	Golden Springs Rd EB btwn Grand Ave and Lavender Dr.	13,400	18,000	16,300	16,300
	Golden Springs Rd EB btwn Grand Ave and Racquet Club Dr.	8,000	11,400	11,000	11,000
	Golden Springs Rd WB btwn Grand Ave and Lavender Dr.	10,700	17,500	16,700	16,700
	Golden Springs Rd WB btwn Grand Ave and Racquet Club Dr.	8,800	14,100	12,200	12,200
SR-57 Freeway Links					
67	SR-57 NB south of Brea Canyon Rd On-Ramp	56,028	65,500	66,600	66,600
167/165	SR-57 NB btwn Brea Canyon Rd On-Ramp & Diamond Bar Blvd On-Ramp	59,928	68,100	68,400	68,400
168/166/171	SR-57 NB btwn Diamond Bar Blvd On-Ramp & Pathfinder Rd On-Ramp	64,400	66,300	66,600	66,600
7/132	SR-57 NB btwn Pathfinder Rd On-Ramp & SR-60 WB Off-Ramp	60,700	71,400	72,600	72,600
27	SR-57 NB btwn SR-60 WB Off-Ramp & SR-60 EB Merge	52,500	55,300	59,500	59,500
122	SR-57 NB btwn SR-60 EB Split & Temple Ave Off-Ramp	50,500	63,100	72,000	72,000
3	SR-57 SB btwn Temple Ave On-Ramp & SR-60 WB Merge	55,300	63,700	71,200	71,200
23	SR-57 SB btwn SR-60 WB Split & SR-57 SB On-Ramp from SR-60 EB	65,100	72,600	73,200	73,200
6	SR-57 SB btwn SR-57 On-Ramp from SR-60 EB & Pathfinder Rd Off-Ramp	58,800	72,600	73,200	73,200
66	SR-57 SB btwn Pathfinder Rd Off-Ramp & Diamond Bar Off-Ramp	74,646	83,600	79,700	79,700

Note: Freeway Ramp & Arterial ADT = 10 x Peak Hour; Freeway Mainline ADT = 11.9 x Peak Hour

ADT volumes are based on the regional traffic model. Project alternatives are not sufficiently different to result in regional differences in ADT volumes. Changes in link speeds were calculated at the local level based on a microsimulation model.

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Table F - 2 - Average Daily Traffic Volumes (Cont'd)
Year 2037

Index	Link	Average Daily Traffic			
		Existing	ALT 1	ALT 2	ALT 3A
SR-60 Freeway Links					
8	SR-60 EB west of Fullerton Rd On-Ramp	65,300	71,400	71,400	71,400
22/153	SR-60 EB btwn Fullerton Rd Off-Ramp & On-Ramp	64,100	76,200	77,400	77,400
154/155	SR-60 EB btwn Fullerton Rd On-Ramp & Nogales St Off-Ramp	67,000	81,500	82,100	82,100
156/157	SR-60 EB btwn Nogales St Off-Ramp & On-Ramp	69,900	84,500	85,700	85,700
158/159	SR-60 EB btwn Nogales St On-Ramp & Fairway Dr Off-Ramp	64,800	85,100	86,300	86,300
160/161	SR-60 EB btwn Fairway Dr Off-Ramp & On-Ramp	60,900	83,300	84,500	84,500
162/163	SR-60 EB btwn Fairway Dr On-Ramp & Brea Canyon Rd On-Ramp	65,900	87,200	94,400	94,400
9	SR-60 EB btwn Brea Canyon Rd On-Ramp & SR-57 SB Off-Ramp	67,000	104,100	110,700	110,700
10/150	SR-60 EB btwn SR-57 SB Off-Ramp & SR-57 NB Merge	62,600	77,900	83,300	83,300
1	SR-60 EB btwn SR-57 NB Merge & Grand Ave Off-Ramp	115,100	132,700	142,200	142,200
2	SR-60 EB btwn Grand Ave Off-Ramp & Grand Ave On-Ramp	107,900	121,400	134,500	134,500
146/148/134	SR-60 EB btwn Grand Ave On-Ramp & SR-57 NB Split	116,500	136,300	152,300	152,300
15	SR-60 EB btwn SR-57 NB Split & Diamond Bar Blvd On-Ramp	60,000	74,700	72,300	72,300
57	SR-60 EB btwn Diamond Bar Blvd On-Ramp & Philips Ranch Rd Off-Ramp	69,700	81,500	88,100	88,100
16	SR-60 WB btwn Philips Ranch Rd On-Ramp & Diamond Bar Blvd On-Ramp	60,900	76,500	77,900	77,900
147/164	SR-60 WB btwn Diamond Bar Blvd On-Ramp & SR-57 SB Merge	65,100	73,200	75,600	75,600
141	SR-60 WB btwn SR-57 SB Merge & Grand Ave Off-Ramp	109,500	136,900	147,600	147,600
4/143	SR-60 WB btwn Grand Ave Off-Ramp & Grand Ave On-Ramp	118,900	121,400	127,900	127,900
5/11	SR-60 WB btwn Grand Ave On-Ramp & SR-57 SB Split	53,700	65,500	73,800	73,800
12	SR-60 WB btwn SR-57 SB Split & Brea Canyon Rd Off-Ramp	59,800	72,600	77,900	77,900
SR-60 Ramp Links					
	SR-60 WB Loop On-Ramp at Grand Avenue	7,800	4,700	6,700	6,700
	SR-60 WB Slip On-Ramp at Grand Avenue	N/A	9,500	9,100	9,100
	SR-60 WB Off Ramp at Grand Avenue	9,100	13,200	16,300	16,300
	SR-60 EB Off Ramp at Grand Avenue	6,000	9,500	12,700	12,700
	SR-60 EB Slip On Ramp at Grand Avenue	7,200	12,200	15,300	6,600
	SR-60 EB Loop On Ramp at Grand Avenue	N/A	N/A	N/A	8,700

Note: Freeway Ramp & Arterial ADT = 10 x Peak Hour; Freeway Mainline ADT = 11.9 x Peak Hour

ADT volumes are based on the regional traffic model. Project alternatives are not sufficiently different to result in regional differences in ADT volumes. Changes in link speeds were calculated at the local level based on a microsimulation model.

J:\2011\JB13048 COI-DB SR57SR60 PA ED\Analysis\Calculations\[2017_2037_ADT_Calculations_Sept2011_REV_Dec2011.xls]2037 ADT

Table E-1

Freeway VMT by Speed Bin - Peak															
Speed Bin Name	VMT Speed Bins Actual	Existing (2009)		2017 No Project		2017 Alternative 2		2017 Alternative 3		2037 No Project		2037 Alternative 2		2037 Alternative 3	
		VMT	%	VMT	%	VMT	%	VMT	%	VMT	%	VMT	%	VMT	%
5	0.0 - 4.99	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
10	5.0 - 9.99	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
15	10.0 - 14.99	0	0.0%	0	0.0%	0	0.0%	0	0.0%	20,816	1.6%	0	0.0%	0	0.0%
20	15.0 - 19.99	0	0.0%	109,571	9.9%	0	0.0%	0	0.0%	98,073	7.7%	0	0.0%	0	0.0%
25	20.0 - 24.99	0	0.0%	0	0.0%	0	0.0%	0	0.0%	24,456	1.9%	0	0.0%	0	0.0%
30	25.0 - 29.99	0	0.0%	19,907	1.8%	0	0.0%	0	0.0%	52,899	4.2%	0	0.0%	0	0.0%
35	30.0 - 34.99	118,111	11.3%	47,587	4.3%	50,080	4.3%	0	0.0%	130,942	10.3%	0	0.0%	0	0.0%
40	35.0 - 39.99	116,423	11.1%	167,172	15.0%	139,343	11.9%	49,361	4.2%	133,962	10.5%	164,458	12.4%	164,458	12.4%
45	40.0 - 44.99	19,543	1.9%	10,455	0.9%	12,168	1.0%	102,150	8.7%	150,401	11.8%	14,247	1.1%	14,247	1.1%
50	45.0 - 49.99	24,463	2.3%	142,576	12.8%	53,187	4.5%	53,187	4.5%	97,595	7.7%	63,553	4.8%	63,553	4.8%
55	50.0 - 54.99	62,650	6.0%	32,471	2.9%	0	0.0%	0	0.0%	10,695	0.8%	0	0.0%	0	0.0%
60	55.0 - 59.99	45,646	4.4%	7,880	0.7%	9,212	0.8%	0	0.0%	53,008	4.2%	231,840	17.4%	341,243	25.6%
65	60.0 - 64.99	659,186	63.0%	573,658	51.6%	904,983	77.4%	964,275	82.5%	501,568	39.4%	857,489	64.4%	748,087	56.2%
70	65.0 - 69.99	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
75	70.0 - 74.99	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	Total	1,046,022	100.0%	1,111,277	100.0%	1,168,973	100.0%	1,168,973	100.0%	1,274,415	100.0%	1,331,587	100.0%	1,331,588	100.0%
	Verify Total	1,046,022		1,111,277		1,168,974		1,168,974		1,274,416		1,331,587		1,331,587	

Freeway VMT by Speed Bin - Off Peak															
Speed Bin Name	VMT Speed Bins Actual	Existing (2009)		2017 No Project		2017 Alternative 2		2017 Alternative 3		2037 No Project		2037 Alternative 2		2037 Alternative 3	
		VMT	%	VMT	%	VMT	%	VMT	%	VMT	%	VMT	%	VMT	%
5	0.0 - 4.99	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
10	5.0 - 9.99	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
15	10.0 - 14.99	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
20	15.0 - 19.99	0	0.0%	140,636	11.7%	0	0.0%	0	0.0%	33,947	2.7%	39,749	3.2%	8,438	0.7%
25	20.0 - 24.99	0	0.0%	0	0.0%	0	0.0%	0	0.0%	19,577	1.5%	0	0.0%	54,805	4.5%
30	25.0 - 29.99	0	0.0%	20,675	1.7%	10,576	0.9%	10,576	0.9%	0	0.0%	33,103	2.7%	48,019	3.9%
35	30.0 - 34.99	0	0.0%	46,812	3.9%	0	0.0%	0	0.0%	73,220	5.8%	5,852	0.5%	48,778	4.0%
40	35.0 - 39.99	0	0.0%	157,541	13.1%	61,428	5.3%	0	0.0%	301,379	23.8%	81,337	6.6%	0	0.0%
45	40.0 - 44.99	41,263	3.5%	9,234	0.8%	49,199	4.2%	0	0.0%	33,072	2.6%	0	0.0%	0	0.0%
50	45.0 - 49.99	8,758	0.7%	138,674	11.5%	18,359	1.6%	50,807	4.4%	0	0.0%	0	0.0%	0	0.0%
55	50.0 - 54.99	81,400	6.9%	33,570	2.8%	0	0.0%	32,452	2.8%	82,067	6.5%	0	0.0%	0	0.0%
60	55.0 - 59.99	149,112	12.7%	7,730	0.6%	169,283	14.5%	176,535	15.1%	0	0.0%	94,148	7.7%	254,867	20.8%
65	60.0 - 64.99	895,682	76.1%	646,456	53.8%	857,350	73.5%	895,826	76.8%	720,849	57.0%	970,184	79.2%	809,465	66.1%
70	65.0 - 69.99	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
75	70.0 - 74.99	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	Total	1,176,215	100.0%	1,201,328	100.0%	1,166,195	100.0%	1,166,196	100.0%	1,264,111	100.0%	1,224,373	100.0%	1,224,372	100.0%
	Verify Total	1,176,214		1,201,328		1,166,196		1,166,196		1,264,112		1,224,373		1,224,373	

2011\JB13048 COI-DB SR57SR60 PA ED\Analysis\Calculations\[Freeway_VMT_Summary_Table_Nov2011.xls]Freeway VMT Summary Table

Table E-1

Table E-2

Speed Bin Name	VMT Speed Bins Actual	Existing (2009)		2017 No Project		2017 Alternative 2		2017 Alternative 3		2037 No Project		2037 Alternative 2		2037 Alternative 3	
Arterial VMT by Speed Bin - Peak															
		VMT	%	VMT	%	VMT	%	VMT	%	VMT	%	VMT	%	VMT	%
5	0.0 - 4.99	0	0.0%	0	0.0%	0	0.0%	0	0.0%	6,039	0.6%	0	0.0%	0	0.0%
10	5.0 - 9.99	2,814	0.3%	2,522	0.3%	4,747	0.5%	2,511	0.3%	8,747	0.9%	6,203	0.6%	4,521	0.4%
15	10.0 - 14.99	3,232	0.4%	21,568	2.4%	27,623	3.2%	22,489	2.6%	34,638	3.4%	39,115	3.9%	33,509	3.3%
20	15.0 - 19.99	46,377	5.6%	41,316	4.7%	33,557	3.8%	32,010	3.7%	61,572	6.0%	50,525	5.0%	59,534	5.9%
25	20.0 - 24.99	106,642	13.0%	126,771	14.3%	121,544	13.9%	125,782	14.3%	270,608	26.5%	227,367	22.7%	222,194	22.1%
30	25.0 - 29.99	368,227	44.7%	428,455	48.3%	416,178	47.5%	422,302	48.2%	394,728	38.7%	437,396	43.6%	443,609	44.1%
35	30.0 - 34.99	253,036	30.7%	235,894	26.6%	231,124	26.4%	231,124	26.4%	231,705	22.7%	203,107	20.3%	203,107	20.2%
40	35.0 - 39.99	43,044	5.2%	30,763	3.5%	40,504	4.6%	40,504	4.6%	12,237	1.2%	38,536	3.8%	38,536	3.8%
45	40.0 - 44.99	0	0.0%	0	0.0%		0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
50	45.0 - 49.99	0	0.0%	0	0.0%		0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
55	50.0 - 54.99	0	0.0%	0	0.0%		0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
60	55.0 - 59.99	0	0.0%	0	0.0%		0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
65	60.0 - 64.99	0	0.0%	0	0.0%		0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
70	65.0 - 69.99	0	0.0%	0	0.0%		0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
75	70.0 - 74.99	0	0.0%	0	0.0%		0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	Total	823,372	100.0%	887,290	100.0%	875,276	100.0%	876,722	100.0%	1,020,273	100.0%	1,002,249	100.0%	1,005,010	100.0%
	Verify Total	823,372		887,290		875,276		876,722		1,020,273		1,002,249		1,005,010	

Speed Bin Name	VMT Speed Bins Actual	Existing (2009)		2017 No Project		2017 Alternative 2		2017 Alternative 3		2037 No Project		2037 Alternative 2		2037 Alternative 3	
Arterial VMT by Speed Bin - Off Peak															
		VMT	%	VMT	%	VMT	%	VMT	%	VMT	%	VMT	%	VMT	%
5	0.0 - 4.99	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
10	5.0 - 9.99	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
15	10.0 - 14.99	0	0.0%	0	0.0%	0	0.0%	0	0.0%	4,026	0.6%	4,034	0.6%	4,034	0.6%
20	15.0 - 19.99	3,637	0.6%	4,556	0.8%	3,992	0.7%	3,773	0.6%	535	0.1%	1,756	0.3%	1,756	0.3%
25	20.0 - 24.99	21,809	3.9%	25,866	4.3%	24,164	4.1%	24,384	4.1%	32,057	4.8%	30,608	4.6%	30,608	4.6%
30	25.0 - 29.99	61,906	10.9%	67,047	11.2%	62,949	10.7%	62,949	10.6%	74,687	11.1%	70,726	10.6%	71,067	10.6%
35	30.0 - 34.99	152,281	26.9%	148,853	25.0%	149,707	25.4%	150,997	25.5%	191,516	28.5%	195,715	29.4%	199,350	29.8%
40	35.0 - 39.99	233,981	41.4%	252,632	42.4%	251,493	42.6%	251,493	42.5%	273,575	40.7%	264,961	39.8%	264,961	39.6%
45	40.0 - 44.99	91,430	16.2%	97,348	16.3%	98,222	16.6%	98,222	16.6%	95,761	14.2%	98,436	14.8%	97,491	14.6%
50	45.0 - 49.99	680	0.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
55	50.0 - 54.99	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
60	55.0 - 59.99	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
65	60.0 - 64.99	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
70	65.0 - 69.99	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
75	70.0 - 74.99	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	Total	565,724	100.0%	596,302	100.0%	590,527	100.0%	591,817	100.0%	672,157	100.0%	666,237	100.0%	669,267	100.0%
	Verify Total	565,724		596,302		590,527		591,817		672,157		666,237		669,267	

C:\Documents and Settings\mzhou\Local Settings\Temporary Internet Files\OLK7A\[Arterial_VMT_Summary_Table_Nov2011.xls]Arterial VMT Summary Table