

Deleted: AIR QUALITY TECHNICAL
ADDENDUM

Formatted: Subscript

Formatted: Subscript

PM_{2.5} AND PM₁₀ ANALYSIS

**STATE ROUTE 55 (SR-55) IMPROVEMENT PROJECT BETWEEN
INTERSTATE 405 (I-405) AND INTERSTATE 5 (I-5)**

ORANGE COUNTY, CALIFORNIA

12-ORA-55 PM 6.4/10.3

EA: 0J3400

Deleted: PM_{2.5} AND PM₁₀ ANALYSIS

Submitted to:

State of California
Department of Transportation, District 12
3347 Michelson Drive, Suite 100
Irvine, California 92612

Deleted: 2

November 2013

TABLE OF CONTENTS

<u>INTRODUCTION</u>	<u>1</u>
<u>PROJECT LOCATION AND DESCRIPTION</u>	<u>1</u>
<u>ALTERNATIVES</u>	<u>1</u>
<u>NO BUILD ALTERNATIVE</u>	<u>3</u>
<u>ALTERNATIVE 1 (ADDITIONAL AUXILIARY LANES)</u>	<u>3</u>
<u>ALTERNATIVE 2 (ONE NEW GENERAL PURPOSE LANE)</u>	<u>3</u>
<u>ALTERNATIVE 3 (ONE NEW GENERAL PURPOSE AND ADDITIONAL</u> <u>AUXILIARY LANES)</u>	<u>3</u>
<u>ALTERNATIVE 4 (ONE NEW HOV AND ADDITIONAL AUXILIARY LANES)</u>	<u>4</u>
<u>PURPOSE AND NEED</u>	<u>4</u>
<u>PM_{2.5} AND PM₁₀ HOT-SPOT METHODOLOGY</u>	<u>5</u>
<u>NATIONAL AMBIENT AIR QUALITY STANDARDS</u>	<u>5</u>
<u>PM_{2.5} AND PM₁₀ HOT-SPOT ANALYSIS</u>	<u>6</u>
<u>PROJECTS OF AIR QUALITY CONCERN</u>	<u>6</u>
<u>TYPES OF EMISSIONS CONSIDERED</u>	<u>7</u>
<u>ANALYSIS METHOD</u>	<u>8</u>
<u>DATA CONSIDERED</u>	<u>8</u>
<u>TRAFFIC CHANGES DUE TO THE PROPOSED PROJECT</u>	<u>10</u>
<u>DAILY VEHICLE EMISSION CHANGES DUE TO THE PROPOSED PROJECT</u>	<u>10</u>
<u>CONCLUSION</u>	<u>15</u>
<u>REFERENCES</u>	<u>16</u>

APPENDIX

PM-A: PM_{2.5} AND PM₁₀ EMISSIONS METHODOLOGY

Deleted: INTRODUCTION . 1¶
PROJECT LOCATION AND DESCRIPTION . 1¶
ALTERNATIVE 1 . 3¶
ALTERNATIVE 2 . 3¶
ALTERNATIVE 3 . 3¶
ALTERNATIVE 4 . 3¶
NO BUILD ALTERNATIVE . 3¶
PURPOSE AND NEED . 3¶
PM_{2.5} AND PM₁₀ HOT-SPOT METHODOLOGY . 4¶
NATIONAL AMBIENT AIR QUALITY
STANDARDS . 4¶
PM_{2.5} AND PM₁₀ HOT-SPOT ANALYSIS . 5¶
PROJECTS OF AIR QUALITY CONCERN . 5¶
TYPES OF EMISSIONS CONSIDERED . 6¶
ANALYSIS METHOD . 7¶
DATA CONSIDERED . 7¶
TRAFFIC CHANGES DUE TO THE PROPOSED
PROJECT . 9¶
DAILY VEHICLE EMISSION CHANGES DUE
TO THE PROPOSED PROJECT . 9¶
CONCLUSION . 13¶
REFERENCES . 14¶

Deleted: 2

Deleted: «11/09/12»

FIGURES AND TABLES

FIGURES

Figure 1: Project Location 2

TABLES

Table A: Ambient PM_{2.5} Monitoring Data (µg/m³) 9
Table B: Ambient PM₁₀ Monitoring Data (µg/m³) 10
Table C: 2020 SR-55 Traffic Volumes 11
Table D: 2040 SR-55 Traffic Volumes 11
Table E: 2020 Change in SR-55 Traffic Volumes 12
Table F: Change in 2040 SR-55 Traffic Volumes 12
Table G: 2020 PM_{2.5} Emissions (lbs/day) 13
Table H: 2020 PM₁₀ Emissions (lbs/day) 13
Table I: 2040 PM_{2.5} Emissions (lbs/day) 14
Table J: 2040 PM₁₀ Emissions (lbs/day) 14

Deleted: Table A: Ambient PM_{2.5} Monitoring Data . 8¶
Table B: Ambient PM₁₀ Monitoring Data . 9¶
Table C: 2020 SR-55 Traffic Volumes . 10¶
Table D: 2040 SR-55 Traffic Volumes . 10¶
Table E: 2020 Change in SR-55 Traffic Volumes . 11¶
Table F: Change in 2040 SR-55 Traffic Volumes . 11¶
Table G: 2020 PM_{2.5} Emissions . 12¶
Table H: 2020 PM₁₀ Emissions . 12¶
Table I: 2040 PM_{2.5} Emissions . 12¶
Table J: 2040 PM₁₀ Emissions . 12¶

Deleted: 2

Deleted: «11/09/12»

Deleted: AIR QUALITY TECHNICAL
ADDENDUM**Deleted:** 2

INTRODUCTION

LSA Associates, Inc. (LSA) prepared this PM_{2.5}¹ and PM₁₀² Hot-Spot Analysis Air Quality Technical Addendum for the State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5) according to the conformity regulations (40 Code of Federal Regulations (CFR) 93.116 and 123 as of January 10, 2012) and the United States Environmental Protection Agency (EPA) guidance for PM³ hotspot analysis of 2006 and 2010.

This PM_{2.5} and PM₁₀ analysis addresses the construction of the SR-55 Improvement Project, including the following components identified in the Regional Transportation Plan (RTP) and the Federal Transportation Improvement Program (FTIP): Project ID: ORA100511, Description: SR-55 widening between I-405 and I-5 – Add one mixed flow lane in each direction and fix chokepoints from I-405 to I-5, add one auxiliary lane in each direction between select on/off ramps and noncapacity operational improvements through project limits.

Deleted: SR-55 widening between I-405 and I-5.
Add one lane in both directions.

PROJECT LOCATION AND DESCRIPTION

The California Department of Transportation (Caltrans) District 12, in cooperation with the Orange County Transportation Authority (OCTA), proposes to widen SR-55 in both directions from just north of the I-405/SR-55 interchange to just south of the I-5/SR-55 interchange between Post Miles (PM) 6.4 and 10.3. The project area is located in the Cities of Santa Ana, Tustin, and Irvine in Orange County, California (Figure 1). SR-55 currently has four general-purpose lanes and one high-occupancy vehicle (HOV) lane in each direction on the project segment of SR-55, with auxiliary lanes between ramps at various locations.

SR-55 begins in Newport Beach west of SR-1 (PM 0.2) and ends at State Route 91 (SR-91) in the City of Anaheim (PM 17.876). SR-55 is a major link to other freeway systems within Orange County by providing access between central Orange County and the coastal region. SR-55 is one of the most congested freeway systems in Orange County and currently operates at unacceptable levels of service (LOS) during peak periods. The demand in the future is anticipated to increase traffic volumes by approximately 20 percent, consequently increasing a.m. and p.m. peak period delays. The purpose of the proposed project is to provide congestion relief, improve traffic flow, and increase mobility on SR-55.

ALTERNATIVES

A total of five alternatives are under consideration. A Preferred Alternative will be selected by the Project Development Team (PDT) after the public meeting and public circulation period of the Draft Environmental Document are complete. A brief description of each alternative is provided below.

¹ Particulate matter less than 2.5 microns in diameter.

² Particulate matter less than 10 microns in diameter.

³ Particulate matter

Deleted: 2012**Deleted:** «11/09/12»

Deleted: AIR QUALITY TECHNICAL
ADDENDUM

Deleted: 2

Figure 1: Project Location

Deleted: 2012

Deleted: «11/09/12»

Deleted: AIR QUALITY TECHNICAL
ADDENDUM

Deleted: 2

No Build Alternative

This alternative maintains existing conditions and proposes no changes or improvements to SR-55 between the project limits.

Alternative 1 (Additional Auxiliary Lanes)

Alternative 1 proposes a new auxiliary lane in the northbound direction by widening to the outside at two locations: between the MacArthur Boulevard and Dyer Road interchanges and between the Dyer Road and Edinger Avenue interchanges.

In the southbound direction, an additional general-purpose lane would extend through McFadden Avenue, Edinger Avenue, and would end at the East Dyer Road off-ramp. A new auxiliary lane would be constructed adjacent to the new general-purpose lane between the McFadden Avenue and Edinger Avenue interchanges by widening to the outside. Additionally, the transition length for merging between the existing southbound HOV lane on SR-55 and the southbound I-5/SR-55 Connector HOV lane would be extended past Edinger Avenue.

Alternative 2 (One New General Purpose Lane)

Alternative 2 proposes to add one general-purpose lane in both the northbound and southbound directions by widening to the outside.

In the northbound direction, a new auxiliary lane would be constructed adjacent to the new general-purpose lane at two locations: between the northbound I-405 Connector and the MacArthur Boulevard interchange and between the Edinger Avenue and McFadden Avenue interchanges.

In the southbound direction, a new auxiliary lane would be constructed adjacent to the new general-purpose lane between the McFadden Avenue and Edinger Avenue interchanges. Additionally, the transition length for merging between the existing southbound HOV lane on SR-55 and the southbound I-5/SR-55 Connector HOV lane would be extended past Edinger Avenue.

Alternative 3 (One New General Purpose and Additional Auxiliary Lanes)

Alternative 3 proposes to add one general-purpose lane in both the northbound and southbound directions by widening to the outside.

In the northbound direction, a new auxiliary lane would be constructed adjacent to the new general-purpose lane at four locations: between the northbound I-405 Connector and the MacArthur Boulevard interchange, between the MacArthur Boulevard and Dyer Road interchanges, between the Dyer Road and Edinger Avenue interchanges, and between the Edinger Avenue and McFadden Avenue interchanges. Also, this alternative proposes to restrict the northbound McFadden Avenue on-ramp to the northbound I-5 connector only. As a result, access from the northbound McFadden Avenue on-ramp to northbound SR-55 and southbound I-5 would be eliminated.

Deleted: 2012

Deleted: «11/09/12»

Deleted: AIR QUALITY TECHNICAL
ADDENDUM

Deleted: 2

In the southbound direction, new auxiliary lanes would be constructed adjacent to the new general-purpose lane at three locations: between the McFadden Avenue and Edinger Avenue interchanges, between the Edinger Avenue and Dyer Road interchanges, and between the Dyer Road and MacArthur Boulevard interchanges. Additionally, the transition length for merging between the existing southbound HOV lane on SR-55 and the southbound I-5/SR-55 Connector HOV lane would be extended past Edinger Avenue.

Alternative 4 (One New HOV and Additional Auxiliary Lanes)

Alternative 4 proposes to add a second HOV lane in each direction between the MacArthur Boulevard and the McFadden Avenue interchanges by widening to the outside. This would provide two HOV lanes in each direction between the I-405 and I-5 HOV Direct connectors.

In the northbound direction, a new auxiliary lane would be constructed adjacent to the outside widening at two locations: between the MacArthur Boulevard and Dyer Road interchanges and between the Dyer Road and Edinger Avenue interchanges. Also, this alternative proposes to restrict the northbound McFadden Avenue on-ramp to the northbound I-5 connector only. As a result, access from the northbound McFadden Avenue on-ramp to northbound SR-55 and southbound I-5 would be eliminated.

In the southbound direction, an additional general-purpose lane adjacent to the outside widening would extend through McFadden Avenue, Edinger Avenue, and would end at the East Dyer Road off-ramp. A new auxiliary lane would be constructed adjacent to the new general-purpose lane between the McFadden Avenue and Edinger Avenue interchanges.

Purpose and Need

Purpose. The purpose of this project is to reduce traffic congestion and improve mobility and traffic operations in the study area. The project objectives are:

1. Improve mobility and reduce congestion
2. Improve traffic operations
3. Increase capacity

Need. SR-55 is a highly congested corridor in Orange County. One of the top bottlenecks in the County is on northbound SR-55 at Dyer Road as identified in the 2009 Mobility Performance Report (Caltrans 2011). There is heavy congestion on SR-55 during peak periods, especially on southbound SR-55 north of Edinger Avenue in the a.m. peak period and on the entire project segment of northbound SR-55 in the p.m. peak period. During peak periods, those segments of SR-55 currently operate at LOS E or F with an average travel speed of less than 20 miles per hour (MPH).

The key issues contributing to the poor operating conditions on the project segment of SR-55 during peak periods are:

Deleted: 2012

Deleted: «11/09/12»

Deleted: AIR QUALITY TECHNICAL
ADDENDUM

Deleted: 2

1. Limited available general-purpose lane capacity on SR-55 during peak periods
2. Inadequate merging distances on SR-55 as a result of closely spaced on- and off-ramps along the freeway mainline
3. Non-standard lane and shoulder widths at some locations along the project segment of SR-55

PM_{2.5} AND PM₁₀ HOT-SPOT METHODOLOGY

The new Final Rule establishes the transportation conformity criteria and procedures for determining which transportation projects must be analyzed for local air quality impacts in PM_{2.5} and PM₁₀ nonattainment and maintenance areas. The proposed project is in the South Coast Air Basin (Basin), which has been designated as a Federal nonattainment area for PM_{2.5} and attainment/maintenance for PM₁₀; therefore, a hot-spot analysis is required.

A hot-spot analysis is defined in 40 CFR 93.101 as an estimation of likely future localized pollutant concentrations and a comparison of those concentrations to the relevant air quality standards. A hot-spot analysis assesses the air quality impacts on 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 Clean Air Act (CAA) conformity requirements to support State and local air quality goals with respect to potential localized air quality impacts. When a hot-spot analysis is required, it is included within the project-level conformity determination that is made by the Federal Highway Administration (FHWA) or the Federal Transit Administration (FTA).

Section 176(c)(1)(B) of the CAA is the statutory criterion that must be met by all projects in nonattainment and maintenance areas that are subject to transportation conformity. Section 176(c)(1)(B) states that federally supported transportation projects must not “cause or contribute to any new violation of any standard in any area; increase the frequency or severity of any existing violation of any standard in any area; or delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.”

National Ambient Air Quality Standards

PM_{2.5} nonattainment and maintenance areas are required to attain and maintain two national ambient air quality standards (NAAQS):

- **24-hour Standard:** 35 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$).
- **Annual Standard:** 15.0 $\mu\text{g}/\text{m}^3$

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

Deleted: 2012

Deleted: «11/09/12»

Deleted: AIR QUALITY TECHNICAL
ADDENDUM

Deleted: 2

PM₁₀ nonattainment and maintenance areas are required to attain the following standard:

- **24-hour Standard:** 150 µg/m³

The 24-hour PM₁₀ standard is attained when the average number of exceedances in the previous 3 calendar years is less than or equal to 1.0. An exceedance occurs when a 24-hour concentration of 155 µg/m³ or greater is measured at a site. The annual PM₁₀ standard of 50 µg/m³ is no longer used for determining the Federal attainment status. The interagency consultation process should be used to discuss how the qualitative PM₁₀ hot-spot analysis meets statutory and regulatory requirements for the PM₁₀ standards, depending on the factors that are evaluated for a given project.

To meet statutory requirements, the 2006 Final Rule requires PM_{2.5} and PM₁₀ hot-spot analyses to be conducted for Projects of Air Quality Concern (POAQC). The Final Rule states that projects not identified in 40 CFR 93.123(b)(1) as POAQC have met statutory requirements without any further hot-spot analyses (40 CFR 93.116[a]).

PM_{2.5} AND PM₁₀ HOT-SPOT ANALYSIS

Projects of Air Quality Concern

The first step in the hot-spot analysis is to determine whether a project meets the standard for a POAQC. The EPA specified in 40 CFR 93.123(b)(1) of the 2006 Final Rule that POAQC are certain highway and transit projects that involve significant levels of diesel vehicle traffic, or any other project that is identified in the PM_{2.5} and PM₁₀ State Implementation Plan (SIP) as a localized air quality concern. The 2006 Final Rule defines the POAQC that require a PM_{2.5} and PM₁₀ hot-spot analysis in 40 CFR 93.123(b)(1) 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 LOS (LOS) D, E, or F with a significant number of diesel vehicles, or those that will change to LOS 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; or
- v. Projects in or affecting locations, areas, or categories of sites that are identified in the PM_{2.5} and PM₁₀ applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

Deleted: 2012

Deleted: «11/09/12»

Deleted: AIR QUALITY TECHNICAL
ADDENDUM

Deleted: 2

A PM Conformity Hot Spot Analysis for the SR-55 Improvement Project was presented to the Southern California Association of Governments' (SCAG) Transportation Conformity Working Group (TCWG) on June 26, 2012. The TCWG determined that the proposed project would meet Criteria (i) because it would expand an existing freeway with existing and future high truck volumes. As the proposed project meets one of the five criteria listed above, it is considered to be a POAQC, and a qualitative project-level PM_{2.5} and PM₁₀ hot-spot analysis has been conducted to assess whether the project would cause or contribute to any new localized PM_{2.5} or PM₁₀ violations, increase the frequency or severity of any existing violations, or delay timely attainment of the PM_{2.5} and PM₁₀ NAAQS.

Types of Emissions Considered

In accordance with the EPA/FHWA Guidance, this hot-spot analysis is based on directly emitted and reentrained PM_{2.5} and PM₁₀ emissions. Tailpipe, brake wear, tire wear, and road dust PM_{2.5} and PM₁₀ emissions were considered in this hot-spot analysis.

Vehicles cause dust from paved and unpaved roads to be reentrained, or resuspended, in the atmosphere. According to the 2006 Final Rule, road dust emissions are to be considered for PM₁₀ hot-spot analyses. For PM_{2.5}, road dust emissions are only to be considered in hot-spot analyses if the EPA or the State air agency has made a finding that such emissions are a significant contributor to the PM_{2.5} air quality problem (40 CFR 93.102(b)(3)). The South Coast Air Quality Management District's (SCAQMD) 2007 Air Quality Management Plan (AQMP) identified reentrained road dust as a significant source of PM_{2.5} in the area's emission budget. In addition, the EPA has published guidance on the use of AP-42 for reentrained road dust for State Implementation Plan (SIP) development and conformity (January 2011); therefore, reentrained PM_{2.5} is considered in this analysis.

Secondary particles formed through PM_{2.5} 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 PM_{2.5} and PM₁₀ are considered part of the regional emission analysis prepared for the conforming RTP and FTIP.

According to the project schedule, construction will begin in mid-2017 and be completed by mid-2020. Because construction will last 3 years, it does not meet the conformity rule's criterion of 5 years or longer for requiring inclusion of construction emissions in regional and project-level conformity analysis (40 CFR 93.123(c)(5)). Therefore, construction-related emissions may be considered temporary; and any construction-related PM_{2.5} and PM₁₀ emissions due to this project were not included in this hot-spot analysis. This project will comply with the SCAQMD Fugitive Dust Rules for fugitive dust during construction of this project. In addition, per Transportation Conformity Rule 93.117, the project will be required to comply with any PM_{2.5} and PM₁₀ control measures in the SIP. Excavation, transportation, placement, and handling of excavated soils will result in no visible dust migration. A water truck or tank will be available within the project limits at all times to suppress and control the migration of fugitive dust from earthwork operations.

Deleted: 2012

Deleted: «11/09/12»

Deleted: AIR QUALITY TECHNICAL
ADDENDUM

Deleted: 2

Analysis Method

This analysis has been prepared according to the 2006 EPA Qualitative Hot Spot Guidance, which estimates the likely effect of a project on localized pollutant concentrations based on emission analysis. According to hot-spot methodology, estimates of future localized PM_{2.5} and PM₁₀ pollutant concentrations need to be determined. This analysis establishes that the local air quality is consistent with the 2007 AQMP by comparing the locally monitored PM_{2.5} and PM₁₀ concentrations to the AQMP's projections. Additionally, the impacts of the project on the regional PM_{2.5} and PM₁₀ emissions and the likelihood of these impacts interacting with the ambient PM_{2.5} and PM₁₀ levels to cause hot spots are discussed.

The California Air Resources Board's (ARB) EMFAC2007 Version 2.3 (EMFAC) was used to develop emission factors for the various criteria pollutants.¹ Ordinarily, the opening year (highest emission factors) and horizon year (highest traffic volume) are the most likely to have the highest emissions. Therefore, the EMFAC model was run for both the opening year 2020 and build-out year 2040. EMFAC has a variety of user options that allow the user to analyze on-road emissions under different conditions. For the SR-55 Improvement Project, the following options were used:

- Operation Parameters
 - Geographic area chosen: Orange County.
 - Calendar Year: 2020 and 2040 analysis year for the No Build Alternative and Alternatives 1, 2, 3, and 4.
 - Season: Annual average season was used, which represents an average of all monthly inventories.
- Modes
 - The model was run in the "EMFAC" mode to generate emission factors in grams of pollutant emitted per vehicle activity (grams per vehicle mile travelled [VMT] and grams/hour).

Reentrained Dust. EMFAC2007 does not estimate road dust emissions; therefore, the emission rates listed in Section 13.2.1 of EPA's January 2011 AP-42 were used to calculate the road dust PM_{2.5} and PM₁₀ emissions.

Data Considered

The closest air monitoring station to the project area that monitors particulate matter is the Anaheim Station, located at 1630 West Pampas. This station monitors PM_{2.5} and PM₁₀ concentrations. This monitoring station is located approximately 1,700 feet upwind from I-5 approximately 9 miles northwest of the project area. The segment of I-5 closest to the monitoring station has an existing (2011) average daily traffic (ADT) volume of 256,000 and a daily truck volume of 15,900. Between I-405 and I-5, the existing ADT along SR-55 ranges from 154,000 to 287,000, with an average daily

¹ EMFAC2011 was released by ARB on September 19, 2011. However, the EPA has not yet completed its review of EMFAC2011 and made it available for conformity use.

Deleted: 2012

Deleted: «11/09/12»

Deleted: AIR QUALITY TECHNICAL
ADDENDUM

Deleted: 2

truck volume of 8,900 to 16,600. Therefore, the air quality concentrations monitored at the Anaheim Station are representative of the conditions within the project area.

Trends in Baseline PM_{2.5} Concentrations. The monitored PM_{2.5} concentrations at the Anaheim station are shown in Table A. This data show that the Federal 24-hour PM_{2.5} air quality standard

Table A: Ambient PM_{2.5} Monitoring Data (µg/m³)

	2007	2008	2009	2010	2011	2012
Anaheim – West Pampas Lane Air Quality Monitoring Station						
3-year average 98th percentile	41.7	38.2	36.6	30.1	29.0	26.7
Exceeds Federal 24-hour standard (35 µg/m ³)?	Yes	Yes	Yes	No	No	No
3-year National annual average	14.3	14.0	13.3	12.1	11.2	10.8
Exceeds Federal annual average standard (15 µg/m ³)?	No	No	No	No	No	No

Source: ARB Web site: <http://www.arb.ca.gov/adam/>, October 2013.
µg/m³ = micrograms per cubic meter

Deleted: August 2012

(35 µg/m³) has been exceeded in 3 out of the past 6 years. The annual average PM_{2.5} NAAQS (15 µg/m³) has not been exceeded in the past 6 years.

Deleted: 4

Deleted: was exceeded in 2006

Projected 24-Hour Concentrations. The levels of PM_{2.5} in the project vicinity exceeded the Federal 24-hour standard between 2007 and 2009. The Federal 24-hour standard was not exceeded between 2010 and 2012. Using various methodologies, the 2007 AQMP estimated the 2015 24-hour PM_{2.5} concentrations. Table V-2-16 in the 2007 AQMP estimates that the 24-hour PM_{2.5} concentration in Anaheim will range from 34.6 to 42.8 µg/m³ in 2015. However, based on the data in Table A, the concentrations measured between 2010 and 2012 range from 30.1 to 26.7 µg/m³. Therefore, it is estimated that the 24-hour PM_{2.5} level would be 30.0 µg/m³, 14 percent below the Federal standard.

Deleted: 2005

Deleted: in 2010 or 2011

Deleted: in

Deleted: 2011

Deleted: 29

Deleted: 0

Deleted: While t

Deleted: above

Projected Annual Concentrations. The current levels of PM_{2.5} in the project vicinity are generally below the Federal annual standard. In addition, indications are that levels in the future will continue to decrease. Table V-2-15c in the 2007 AQMP estimates that the annual PM_{2.5} concentration in Anaheim will be 12.3 µg/m³ in 2014, which is approximately 18 percent below the Federal standard.

Trends in Baseline PM₁₀ Concentrations. The PM₁₀ concentrations monitored at the Anaheim station are shown in Table B. With the exception of 2007, the Federal 24-hour PM₁₀ air quality standard (150 µg/m³) was not exceeded in the past 6 years.

Deleted: between 2006 and 2011

Deleted: 2012

Deleted: «11/09/12»

Deleted: AIR QUALITY TECHNICAL
ADDENDUM

Deleted: 2

Table B: Ambient PM₁₀ Monitoring Data (µg/m³)

	2007	2008	2009	2010	2011	2012
Anaheim – West Pampas Lane Air Quality Monitoring Station						
First Highest	489.0	111.5	97.4	43.0	53.0	48.0
Second Highest	75.0	93.8	75.4	42.0	51.0	36.0
Third Highest	69.0	80.9	59.3	39.0	50.0	36.0
Fourth Highest	63.0	80.6	57.6	36.0	42.0	35.0
No. of days above National 24-hour standard (150 µg/m ³)	1	0	0	0	0	0

Source: ARB Web site: <http://www.arb.ca.gov/adam/>, October 2013.
µg/m³ = micrograms per cubic meter

Deleted: August 2012

The 2007 AQMP (SCAQMD) reports that since the Federal annual PM₁₀ standard has been revoked, the Basin is expected to be declared in attainment for the 24-hour Federal PM₁₀ standard since 2000. Table V-3-1 in the 2007 AQMP lists the projected 24-hour PM₁₀ concentrations at various stations within the Basin. It is estimated that the 24-hour concentration in Anaheim will be 68 µg/m³ by 2015, 45 percent of the Federal standard.

Traffic Changes Due to the Proposed Project

The proposed project is a highway expansion project. Based on the Traffic Operations Report (Fehr and Peers, October 2013), the proposed project would increase the traffic volumes along SR-55. Tables C and D list the ADT and truck ADT volumes along SR-55 for the 2020 and 2040 conditions, respectively. Tables E and F list the change in ADT and truck ADT for each build alternative for the 2020 and 2040 conditions, respectively. The largest increase in ADT due to the proposed project is 19,745 vehicles per day. The largest increase in truck ADT due to the proposed project is 1,145 ADT. Therefore, a vehicle emission analysis was prepared to determine the proposed project's effect on the region attaining the Federal PM_{2.5} and PM₁₀ air quality standards.

Deleted: July 2012

Deleted: increase

Deleted: 8,400

Deleted: 065

Daily Vehicle Emission Changes Due to the Proposed Project

A supplemental traffic analysis (Fehr and Peers, October 2013) calculated the daily VMT and daily vehicle hours traveled (VHT) for all of the vehicle trips within the project area. The focused study area for the VMT/VHT analysis covers the project limit (SR-55 corridor between I-5 and I-405) plus a 2-mile buffer outside of the project limit, which is generally surrounded by 17th Street to the north, State Route 73 (SR-73) to the south, Jamboree Road to the east, and Bristol Street/Flower Street/Main Street to the west. This traffic data, in conjunction with the EMFAC2007 emission model, was used to calculate the PM_{2.5} and PM₁₀ exhaust, tire wear, and brake wear emissions for each of the project alternatives. EMFAC2007 does not estimate road dust emissions; therefore, the emission rates listed in Section 13.2.1 of EPA's AP-42 were used to calculate the road dust PM_{2.5} and PM₁₀ emissions. The PM_{2.5} emissions are presented in Tables G and I for the 2020 and 2040 conditions, respectively. The PM₁₀ emissions are presented in Tables H and J for the 2020 and 2040 conditions, respectively. As shown, implementation of the proposed project would have a very small impact on the regional PM_{2.5} and PM₁₀ emissions. The project alternatives would increase the PM_{2.5} emissions by 0.07 to 0.46

Deleted: November 2012

Deleted: 39

Deleted: 2012

Deleted: «11/09/12»

Deleted: AIR QUALITY TECHNICAL ADDENDUM

Deleted: 2

Table C: 2020 SR-55 Traffic Volumes

Segment	No Build		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	ADT	Truck ADT	ADT	Truck ADT	ADT	Truck ADT	ADT	Truck ADT	ADT	Truck ADT
South of I-405	173,900	10,086	174,185	10,103	174,810	10,139	174,950	10,147	174,220	10,105
Between I-405 and Main Street	253,435	14,699	254,715	14,773	257,390	14,929	258,275	14,980	254,925	14,786
Between Main Street and Dyer Road	265,645	15,407	267,105	15,492	269,670	15,641	271,015	15,719	268,010	15,545
Between Dyer Road and Edinger Avenue	279,200	16,194	281,450	16,324	283,875	16,465	286,035	16,590	283,050	16,417
Between Edinger Avenue and McFadden Avenue	291,205	16,890	293,350	17,014	295,440	17,136	297,555	17,258	295,020	17,111
Between McFadden Avenue and I-5	256,880	14,899	258,395	14,987	260,325	15,099	256,980	14,905	255,045	14,793
North of Irvine Boulevard/4 th Street	223,435	12,959	223,885	12,985	224,210	13,004	224,070	12,996	223,825	12,982

Source: LSA Associates, Inc. and Fehr & Peers (October 2013).

ADT = average daily trips
I-405 = Interstate 405
I-5 = Interstate 5
SR-55 = State Route 55

Deleted: July 2012

Table D: 2040 SR-55 Traffic Volumes

Segment	No Build		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	ADT	Truck ADT	ADT	Truck ADT	ADT	Truck ADT	ADT	Truck ADT	ADT	Truck ADT
South of I-405	187,145	10,854	188,015	10,905	190,175	11,030	190,475	11,048	188,195	10,915
Between I-405 and Main Street	266,010	15,429	270,060	15,663	278,490	16,152	281,260	16,313	270,810	15,707
Between Main Street and Dyer Road	281,290	16,315	285,845	16,579	293,885	17,045	297,600	17,261	288,275	16,720
Between Dyer Road and Edinger Avenue	292,890	16,988	299,810	17,389	307,170	17,816	312,635	18,133	303,540	17,605
Between Edinger Avenue and McFadden Avenue	303,130	17,582	309,455	17,948	317,150	18,395	321,475	18,646	313,890	18,206
Between McFadden Avenue and I-5	280,540	16,271	285,470	16,557	291,440	16,904	287,025	16,647	282,240	16,370
North of Irvine Boulevard/4 th Street	259,230	15,035	260,065	15,084	262,420	15,220	262,025	15,197	260,170	15,090

Source: LSA Associates, Inc. and Fehr & Peers (October 2013).

ADT = average daily trips
I-405 = Interstate 405
I-5 = Interstate 5
SR-55 = State Route 55

Deleted: July 2012

Formatted Table

Deleted: 2012

Deleted: «11/09/12»

Deleted: AIR QUALITY TECHNICAL
ADDENDUM

Deleted: 2

Table E: 2020 Change in SR-55 Traffic Volumes

Segment	Alternative 1 – No Build		Alternative 2 – No Build		Alternative 3 – No Build		Alternative 4 – No Build	
	ADT	Truck ADT	ADT	Truck ADT	ADT	Truck ADT	ADT	Truck ADT
South of I-405	285	17	910	53	1,050	61	320	19
Between I-405 and Main Street	1,280	74	3,955	229	4,840	281	1,490	86
Between Main Street and Dyer Road	1,460	85	4,025	233	5,370	312	2,365	138
Between Dyer Road and Edinger Avenue	2,250	131	4,675	271	6,835	396	3,850	223
Between Edinger Avenue and McFadden Avenue	2,145	124	4,235	246	6,350	368	3,815	221
Between McFadden Avenue and I-5	1,515	88	3,445	200	100	6	-1,835	-106
North of Irvine Boulevard/4 th Street	450	26	775	45	635	37	390	23

Source: LSA Associates, Inc. and Fehr & Peers (October 2013).

ADT = average daily trips

I-405 = Interstate 405

I-5 = Interstate 5

SR-55 = State Route 55

Formatted Table

Deleted: July 2012

Table F: Change in 2040 SR-55 Traffic Volumes

Segment	Alternative 1 – No Build		Alternative 2 – No Build		Alternative 3 – No Build		Alternative 4 – No Build	
	ADT	Truck ADT	ADT	Truck ADT	ADT	Truck ADT	ADT	Truck ADT
South of I-405	870	50	3,030	176	3,330	193	1,050	61
Between I-405 and Main Street	4,050	235	12,480	724	15,250	885	4,800	278
Between Main Street and Dyer Road	4,555	264	12,595	731	16,310	946	6,985	405
Between Dyer Road and Edinger Avenue	6,920	401	14,280	828	19,745	1,145	10,650	617
Between Edinger Avenue and McFadden Avenue	6,325	367	14,020	813	18,345	1,064	10,760	624
Between McFadden Avenue and I-5	4,930	286	10,900	632	6,485	376	1,700	99
North of Irvine Boulevard/4 th Street	835	48	3,190	185	2,798	162	940	55

Source: LSA Associates, Inc. and Fehr & Peers (October 2013).

ADT = average daily trips

I-405 = Interstate 405

I-5 = Interstate 5

SR-55 = State Route 55

Deleted: July 2012

Deleted: 2012

Deleted: «11/09/12»

Deleted: AIR QUALITY TECHNICAL
ADDENDUM

Deleted: 2

Table G: 2020 PM_{2.5} Emissions (lbs/day)

Source	2020				
	No Build	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Exhaust	445.6	445.6	447.1	448.1	446.8
Reentrained	617.5	618.2	619.3	619.9	618.8
Total	1,063.1	1,063.8	1,066.4	1068.0	1,065.6
% Change	-	0.07	0.31	0.46	0.24

Source: LSA Associates, Inc., [October 2013](#)

lbs/day = pounds per day

PM_{2.5} = particulate matter less than 2.5 microns in diameter

Deleted: November 2012

Table H: 2020 PM₁₀ Emissions (lbs/day)

Source	2020				
	No Build	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Exhaust	739.6	740.1	742.1	743.5	741.4
Reentrained	2,470.1	2,472.8	2,477.0	2,479.4	2,475.2
Total	3,209.7	3,212.9	3,219.2	3,222.9	3,216.6
% Change	-	0.10	0.29	0.41	0.21

Source: LSA Associates, Inc., [October 2013](#)

lbs/day = pounds per day

PM₁₀ = particulate matter less than 10 microns in diameter

Deleted: November 2012

Deleted: 2012

Deleted: «11/09/12»

Deleted: AIR QUALITY TECHNICAL
 ADDENDUM

Deleted: 2

Table I: 2040 PM_{2.5} Emissions (lbs/day)

Source	2040				
	No Build	Alternative 1	Alternative 2	Alternative 3 – McFadden Limited Access	Alternative 4 – McFadden Limited Access
Exhaust	496.7	497.7	501.1	503.1	499.5
Reentrained	683.0	684.5	687.0	688.4	685.9
Total	1,179.7	1,182.2	1,188.0	1,191.5	1,185.4
% Change	-	0.21	0.71	1.00	0.48

Source: LSA Associates, Inc., October 2013.
 lbs/day = pounds per day
 PM_{2.5} = particulate matter less than 2.5 microns in diameter

Deleted: November 2012

Table J: 2040 PM₁₀ Emissions (lbs/day)

Source	2040				
	No Build	Alternative 1	Alternative 2	Alternative 3 – McFadden Limited Access	Alternative 4 – McFadden Limited Access
Exhaust	829.0	830.2	834.9	838.0	833.3
Reentrained	2,731.8	2,737.9	2,747.9	2,753.6	2,743.6
Total	3,560.9	3,568.1	3,582.7	3,591.6	3,576.9
% Change	-	0.20	0.61	0.86	0.45

Source: LSA Associates, Inc., October 2013.
 lbs/day = pounds per day
 PM₁₀ = particulate matter less than 10 microns in diameter

Deleted: November 2012

Deleted: 2012

Deleted: «11/09/12»

Deleted: AIR QUALITY TECHNICAL
ADDENDUM

Deleted: 2

percent (0.8 to 4.9 pounds per day [lbs/day]) in 2020 and by 0.21 to 1.00 percent (2.4 to 11.8 lbs/day) in 2040 when compared to the No Build conditions. The project alternatives would increase the PM₁₀ emissions by 0.10 to 0.41 percent (3.2 to 13.2 lbs/day) in 2020 and by 0.20 to 0.86 percent (7.2 to 30.8 lbs/day) in 2040 when compared to the No Build conditions. The results of the modeling are included in Appendix PM-A.

Deleted: 1

Deleted: 0.85

Deleted: 10

Deleted: 0

Deleted: 37

Deleted: 1.9

Deleted: 79

Deleted: 28.1

CONCLUSION

Transportation conformity is required under Section 176(c) of the CAA to ensure that Federally supported highway and transit project activities are consistent with the purpose of the SIP. Conformity for the purpose of the SIP means that transportation activities will not cause new air quality violations, worsen existing violations, or delay timely attainment of the relevant NAAQS. As required by the 2006 Final Rule, this qualitative PM_{2.5} and PM₁₀ hot-spot analysis demonstrates that this project meets the CAA conformity requirements to support State and local air quality goals with respect to potential localized air quality impacts.

It is not expected that changes to PM_{2.5} and PM₁₀ emissions levels associated with the proposed project would result in new violations of the Federal air quality standards for the following reasons:

- Based on the projected PM_{2.5} concentrations listed in the 2007 AQMP, without the proposed project, the 24-hour PM_{2.5} concentrations within the project area would be reduced to 14 percent below the Federal standard by 2015.
- Based on the projected PM_{2.5} concentrations listed in the 2007 AQMP, without the proposed project, the annual average PM_{2.5} concentrations within the project area would be reduced to 18 percent below the Federal standard by 2014.
- With the exception of 2007, the ambient PM₁₀ concentrations have not exceeded the 24-hour or annual Federal standard.
- Based on the projected PM₁₀ concentrations listed in the 2007 AQMP, without the proposed project, the 24-hour PM₁₀ concentrations would be 55 percent below the Federal standard by 2015.
- When compared to the No Build conditions, the largest increase in regional PM_{2.5} and PM₁₀ emissions is 1.00 percent.

Deleted: 0.85

For these reasons, future new or worsened PM_{2.5} and PM₁₀ violations of any standards are not anticipated; therefore, the project meets the conformity hot-spot requirements in 40 CFR 93-116 and 93-123 for both PM_{2.5} and PM₁₀.

Deleted: 2012

Deleted: «11/09/12»

Deleted: AIR QUALITY TECHNICAL
ADDENDUM

Deleted: 2

REFERENCES

South Coast Air Quality Management District, Air Quality Management Plan, 2007.

Fehr and Peers, Supplemental Traffic Analysis, October 2013.

Deleted: November 2012

———. Traffic Operations Report, July 2012.

United States Environmental Protection Agency (EPA). Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I, Section 13.2.1, January 2011.

———. 2006a. "Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in PM_{2.5} and PM₁₀ Nonattainment and Maintenance Areas" (EPA 420-B-06-902, March 2006).

———. 2006b. Final Revisions to the National Ambient Air Quality Standards for Particulate Pollution (Particulate Matter). EPA website: www.epa.gov/oar/particulatepollution/naqsrev2006.html, accessed on March 19, 2007.

Deleted: 2012

Deleted: «11/09/12»

Deleted: AIR QUALITY TECHNICAL
ADDENDUM

Deleted: 2

APPENDIX PM-A

PM_{2.5} AND PM₁₀ EMISSIONS METHODOLOGY

Deleted: 2012

Deleted: «11/09/12»