AIR QUALITY STUDY

STATE ROUTE 91 CORRIDOR IMPROVEMENT PROJECT

$PM_{2.5}$ AND PM_{10} ANALYSES

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INTRODUCTION

LSA Associates, Inc. (LSA) prepared this $PM_{2.5}$[1] and PM_{10}[2] hot-spot analysis for the State Route 91 (SR-91) Corridor Improvement Project (CIP) in response to the United States Environmental Protection Agency (EPA) releasing new $PM_{2.5}$ and PM_{10} hot-spot analysis requirements in its March 10, 2006, final transportation conformity rule (71 FR 12468) (Final Rule). The 2006 Final Rule supersedes the Federal Highway Administration's (FHWA) September 12, 2001, "Guidance for Qualitative Project-Level Hotspot Analysis in PM_{10} Nonattainment and Maintenance Areas." This analysis was conducted following the procedures and methodology provided in the "Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas" (EPA/FHWA Guidance) (EPA, 2006a).

This $PM_{2.5}$ and PM_{10} analysis addresses the construction of the proposed project, including the following components identified in the Regional Transportation Plan (RTP) and the Regional Transportation Improvement Program (RTIP): Project ID: RIV071250; Description: SR-91 – Construct one mixed-flow lane and one auxiliary lane in each direction at various locations (State Route 241 [SR-241] to Pierce Street)(Orange County post mile [PM] 14.40 – 18.90), Collector-Distributor [CD] system (2 and 3 lanes from Lincoln Avenue to Interstate 15 [I-15]), one high occupancy toll [HOT] lane and convert high occupancy vehicle [HOV] lane to HOT lane in each direction (Orange County line to I-15); I-15 – construct HOV/HOT median direct connector junction SR-91/I-15 from northbound I-15 to westbound SR-91 and eastbound SR-91 to southbound I-15, construct 2 HOT lanes in each direction from SR-91 to Cajalco Road (I-15 PM 36.80 to 42.88).

PROJECT LOCATION AND DESCRIPTION

The SR-91 CIP is located in Orange and Riverside Counties along the SR-91 corridor and includes connections to I-15 in Riverside County. The western project limits of SR-91 are located at the SR-91/State Route 241 (SR-241) interchange in the eastern part of the City of Anaheim in northeastern Orange County. The eastern project limits of SR-91 extend to Pierce Street in the City of Riverside, which is located just east of the City of Corona. The project limits along SR-91 span approximately 14 miles (mi). Refer to Figure 1 for the project vicinity. Refer to Figure 2 for the project location.

The study area along I-15 begins at Cajalco Road, which is located approximately 5 mi south of SR-91 in the City of Corona. The study area extends north to Hidden Valley Parkway, which is located approximately 1 mi north of SR-91 in the City of Corona. The study area will extend roughly 2 mi beyond the proposed project limits for SR-91 and I-15 to allow for the placement of advanced signage for express lane access and construction areas within the existing State right-of-way. Advance signage areas are shown on Figure 2.

In addition to a No Build Alternative, two Build Alternatives have been proposed. The Build Alternatives are: Alternative 1 (referred to as the Add General-Purpose Lanes [GP Lanes] Alternative) and Alternative 2 (referred to as the Add General-Purpose Lanes and Extend Express Lanes [GP + Express Lanes] Alternative).

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1 Particulate matter less than 2.5 microns in diameter.

2 Particulate matter less than 10 microns in diameter.

Figure 1: Project Vicinity

Figure 2: Project Location

Alternative 1 – Add General-Purpose Lanes

The GP Lanes Alternative would construct one general-purpose lane in each direction on SR-91 from the SR-91/SR-241 interchange in the City of Anaheim to Pierce Street in the City of Riverside. This alternative would keep the existing HOV lanes on SR-91 between the Orange/Riverside County line and Pierce Street in the City of Riverside. Alternative 1 would also construct one HOV lane on I-15 in each direction from Ontario Avenue in the City of Corona to a proposed I-15/SR-91 HOV lane direct connector. The HOV direct connectors would provide freeway access from northbound I-15 to westbound SR-91 and from eastbound SR-91 to southbound I-15. The HOV direct connectors would allow vehicles in the HOV lanes to transition directly from freeway to freeway, which would eliminate the existing transitions within the general-purpose lanes.

If Alternative 1 were selected, the existing 3 mi Orange County segment of the SR-91 express lanes, which is currently operating as an Express Lanes toll facility, would continue to serve this function.

Alternative 2 – Add General –Purpose Lances and Extend Express Lanes

The GP + Express Lanes Alternative would construct one general-purpose lane in each direction on SR-91 from the SR-91/SR-241 interchange in the City of Anaheim to Pierce Street in the City of Riverside. This Alternative would extend the existing express lanes in Orange County to the east from the Orange/Riverside County Line to I-15 in the City of Corona. The existing HOV lanes would be converted to express lanes, and one additional express lane in each direction would be constructed. Under Alternative 2, the eastbound SR-91 express lane would extend to McKinley Street and then transition back to HOV lanes at Pierce Street.

An express lane in each direction would also be constructed on I-15 from Cajalco Road to Hidden Valley Parkway. Express lane direct connectors between I-15 and SR-91 would provide access from northbound I-15 to westbound SR-91 and from eastbound SR-91 to southbound I-15. Additionally, express lane direct connectors are proposed from eastbound SR-91 to northbound I-15 and from southbound I-15 to westbound SR-91. The direct connectors would allow the express lane drivers to turn from the express lanes on one corridor into a similar lane on another corridor. This would eliminate the transition of express lane traffic from freeway to freeway via the general-purpose lanes.

$PM_{2.5}$ AND PM_{10} 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 PM_{10} 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 PM_{10}; therefore, a hot-spot analysis for the proposed project is required.

A hot-spot analysis is defined in the Code of Federal Regulations (CFR) (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 the federal 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 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."

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

A. Comparison to another location with similar characteristics

B. Air quality studies for the proposed project location

This analysis uses a combined approach to demonstrate that the proposed SR-91 CIP would not result in a new or worsened $PM_{2.5}$ or PM_{10} violation. Method A was used to establish that under the no build condition the proposed project area will meet the national ambient air quality standards (NAAQS). Method B was used to demonstrate that the proposed project would not delay attainment of the NAAQS.

Ambient Air Quality Standards

$PM_{2.5}$ nonattainment and maintenance areas are required to attain and maintain two NAAQS:

- **24-hour Standard:** 65 micrograms per cubic meter ($\mu g/m^3$). Based on 2004–2006 monitored data, the EPA tightened the $PM_{2.5}$ 24-hour standard from 65 to 35 $\mu g/m^3$, effective December 2006. New area designations will become effective in early 2010 (EPA, 2006). Therefore, the current standard for conformity purposes is 65 $\mu g/m^3$.
- **Annual Standard:** 15.0 $\mu g/m^3$

The current 24-hour standard is based on a three-year average of the 98th percentile of 24-hour $PM_{2.5}$ concentrations. The current annual standard is based on a three-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.

PM_{10} nonattainment and maintenance areas are required to attain the following standard:

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

The 24-hour PM_{10} standard is attained when the average number of exceedances in the previous three calendar years is less than or equal to 1.0. An exceedance occurs when a 24-hour concentration of 155 $\mu g/m^3$ or greater is measured at a site. The annual PM_{10} standard of 50 $\mu g/m^3$ is no longer used for determining the federal attainment status. The interagency consultation process should be used to discuss how the qualitative PM_{10} hot-spot analysis meets statutory and regulatory requirements for the PM_{10} 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 PM_{10} hot-spot analyses to be performed 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 PM_{10} 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 PM_{10} State Implementation Plan (SIP) as a localized air quality concern. The 2006 Final Rule defines the POAQC that require a $PM_{2.5}$ and PM_{10} 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 level of service (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 PM_{10} applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

The proposed project would meet the criteria in Items i and ii above, because it would expand an existing facility and affect local intersections with a significant number of diesel vehicles. Therefore, this project is considered to be a POAQC, and a qualitative project-level $PM_{2.5}$ and PM_{10} hot-spot analysis was conducted to assess whether the project would cause or contribute to any new localized $PM_{2.5}$ or PM_{10} violations, increase the frequency or severity of any existing violations, or delay timely attainment of the $PM_{2.5}$ and PM_{10} AAQS.

Types of Emissions Considered

In accordance with the EPA/FHWA Guidance, this hot-spot analysis is based on directly emitted and re-entrained $PM_{2.5}$ and PM_{10} emissions. Tailpipe, brake wear, tire wear, and road dust $PM_{2.5}$ and PM_{10} emissions were considered in this hot-spot analysis.

Vehicles cause dust from paved and unpaved roads to be re-entrained, or resuspended, in the atmosphere. According to the 2006 Final Rule, road dust emissions are to be considered for PM_{10} 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 EPA has published a guidance on the use of AP-42 for re-entrained road dust for SIP development and conformity (August 2007); therefore, re-entrained $PM_{2.5}$ is considered in this analysis.

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

According to the project schedule, no phase of construction would last more than five years, and construction-related emissions may be considered temporary; therefore, any construction-related $PM_{2.5}$ and PM_{10} emissions due to this project were not included in this hot-spot analysis. This project will comply with the applicable South Coast Air Quality Management District (SCAQMD) Fugitive Dust Rules for the control of fugitive dust during construction of this project. In addition, per Transportation Conformity Rule 93.117, the project will be required to comply with any applicable $PM_{2.5}$ and PM_{10} 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.

Analysis Method

According to the hot-spot methodology, estimates of future localized $PM_{2.5}$ and PM_{10} pollutant concentrations need to be determined. This analysis makes those estimates by extrapolating present $PM_{2.5}$ and PM_{10} pollutant concentrations from air quality data measured at monitoring stations in the vicinity of the proposed project. The data from these stations are combined with projections from the 2003 and 2007 Air Quality Management Plans (AQMP) prepared by the SCAQMD and examined for trends in order to predict future conditions in the project vicinity. Additionally, the impacts of the project and the likelihood of these impacts interacting with the ambient $PM_{2.5}$ and PM_{10} levels to cause hot spots are discussed.

Data Considered

The closest air quality monitoring station to the proposed project within the County of Riverside is the Norco station. This station is located within 4000 feet of I-15. However, this station only monitors PM_{10} concentrations. The monitoring station closest to the project area that currently monitors $PM_{2.5}$

concentrations is the 1630 West Pampas Lane, Anaheim Station. This station is approximately 1,200 feet from Interstate 5 (I-5) and 1.3 miles from SR-91. The project location relative to these monitoring stations is shown in Figure 3.

The existing truck volumes along I-5 and SR-91 in the vicinity of the Anaheim monitoring station are 26,000 and 19,900 daily trips, respectively. The existing truck volume along I-15 in the vicinity of the Norco Station is 18,000 daily trips. These volumes are higher than the 16,500 to 18,000 daily truck trips along SR-91 and I-15, respectively, in the project area. The total vehicle trips along I-5, I-15, and SR-91 in the vicinity of these monitoring stations vary from 200,000 to 285,000, similar to or greater than the 200,000 to 272,000 existing daily trips along SR-91 and I-15, respectively, in the project area. Therefore, the air quality concentrations monitored at these stations are representative of the existing conditions in 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. These data show that, within the past five years, the federal 24-hour $PM_{2.5}$ AAQS (65 µg/m^3) was not exceeded. The annual average $PM_{2.5}$ AAQS (15 µg/m^3) at this station was exceeded in four of the five years; however, the concentrations have been decreasing steadily overtime.

Table A: Ambient $PM_{2.5}$ Monitoring Data (µg/m^3)

	2003	2004	2005	2006	2007
Anaheim Air Quality Monitoring Station					
3-year average 98th percentile	55.8	52.3	49.3	45.7	44.7
Exceeds federal 24-hour standard (65 µg/m^3)?	No	No	No	No	No
3-year National annual average	20.43	17.63	16.33	15.21	14.35
Exceeds federal annual average standard (15 µg/m^3)?	Yes	Yes	Yes	Yes	No

Source: EPA Web site: http://www.epa.gov/air/data/monvals.html?st~CA~California, March 2009.

Projected 24-hour Concentrations. The levels of $PM_{2.5}$ in the project vicinity are below the current federal 24-hour standard. Table V-2-16 in the 2007 AQMP estimates that the 24-hour $PM_{2.5}$ concentration at the Anaheim station will be 42.8 µg/m^3 in 2015. This concentration would not exceed the current federal 24-hour standard of 65 µg/m^3.

Projected Annual Concentrations. While the current levels of $PM_{2.5}$ in the project vicinity are generally above the federal annual standard, indications are that levels in the future will continue to decrease. As shown in Table V-2-15c in the 2007 AQMP, the annual $PM_{2.5}$ concentration, with the California Air Resources Board's (ARB) emission reduction plan and the SCAQMD's emission reduction overlay, at the Anaheim Station is projected to be 12.3 µg/m^3 in 2014. This concentration would not exceed the federal annual standard of 15 µg/m^3.

Figure 3: SCAQMD Monitoring Stations

Trends in Baseline PM_{10} Concentrations. The monitored PM_{10} concentrations at the Norco Station, shown in Table B, indicate that the federal 24-hour PM_{10} AAQS (150 µg/m^3) was exceeded once in 2007.

Table B: Ambient PM_{10} Monitoring Data (µg/m^3)

	2003	2004	2005	2006	2007
Norco Air Quality Monitoring Station					
First Highest	116	76	79	74	332
Second Highest	79	72	64	71	93
Third Highest	68	72	59	67	92
Fourth Highest	67	70	57	66	87
No. of days above national 24-hour standard (150 µg/m^3)	0	0	0	0	1

Source: ARB Web site: http://www.arb.ca.gov/adam/welcome.html, July 2009.

The 2007 AQMP reports that since the federal annual PM_{10} standard has been revoked, the Basin is expected to be declared in attainment for the 24-hour federal PM_{10} standard since 2000. Table V-3-1 in the 2007 AQMP lists the projected 24-hour PM_{10} concentrations at various stations within the Basin. It is estimated that the 24-hour concentration at the Anaheim Station (the closest station to the project area listed in the AQMP) will be 78 µg/m^3 by 2015, 52 percent of the federal standard.

Transportation and Traffic Conditions

Existing, interim (2015), and future (2035) no build average daily traffic (ADT) volumes and average daily truck volumes for SR-91 and I-15 in the project area are shown in Table C. The table indicates that SR-91 and I-15 each currently experience more than 10,000 trucks annual average daily traffic (AADT).

Table C: Existing and No Build Average Daily Traffic Volumes (Truck Average Daily Volumes)

Roadway Link	Existing (2007)	2015 No Build	2035 No Build
SR-91 from SR-241 to SR-71	280,000 (15,500)	320,000 (17,500)	325,000 (18,900)
SR-91 from SR-71 to I-15	272,000 (14,500)	306,000 (16,800)	306,000 (16,800)
SR-91 east of I-15	224,000 (16,300)	239,000 (18,400)	273,000 (21,800)
I-15 north of SR-91	171,000 (17,900)	198,000 (23,000)	320,000 (31,600)
I-15 south of SR-91	201,000 (10,300)	243,000 (13,500)	337,000 (20,500)

Source: PB, July 2009.

Table D summarizes the existing level of service (LOS) for the intersections along SR-91 and I-15 in the project area. As shown, the LOS currently vary from LOS A to LOS F.

Table D: Existing Intersection LOS

	Intersection	A.M. Peak Hour		P.M. Peak Hour	
		Delay	LOS	Delay	LOS
1.	Green River Rd/SR-91 WB Ramps	170.8	F	12.0	B
2.	Green River Rd/SR-91 EB Ramps	11.8	B	14.6	B
3.	Auto Center Dr/SR-91 WB Ramps	34.9	C	13.6	B
4.	Maple St/Pomona Dr	9.3	A	9.6	A
5.	6th St/SR-91 EB Ramps	21.9	C	137.4	F
6.	Paseo Grande/6th St	28.1	C	47.2	D
7.	SR-91 WB Ramps/Pomona Rd	224.9	F	36.5	D
8.	Lincoln Ave/SR-91 EB Ramps	22.1	C	243.1	F
9.	Main St/Grand Blvd	23.9	C	28.7	C
10.	Main St/SR-91 WB Ramps	36.1	D	40.1	D
11.	Main St/3rd St	24.9	C	39.7	D
12.	McKinley St/Griffin Way	36.7	D	175.9	F
13.	McKinley St/Sampson Ave	28.7	C	93.8	F
14.	Pierce St/Magnolia Ave	32.2	C	105.2	F
15.	Hamner Ave/Hidden Valley Pkwy	63.0	E	143.0	F
16.	Rimpau Ave/Magnolia Ave	98.7	F	94.9	F
17.	El Sobrante/Magnolia Ave	168.0	F	65.4	E
18.	I-15 SB Ramps/Magnolia Ave	63.4	E	64.3	E
19.	I-15 SB Ramps/Ontario Ave	35.6	D	29.1	A
20.	Bedford Canyon/Cajalco Road	11.4	B	73.3	E

Source: PB, July 2009.
Delay = Stopped time delay at intersection in seconds
LOS = Level of service

Traffic Changes Due to the Proposed Project

The proposed project is a highway improvement project that will increase the capacity of SR-91 and I-15. Based on the Traffic Study (PB, July 2009), the proposed project would increase peak hour and daily traffic volumes on SR-91 and I-15. The future traffic volumes for 2015 and 2035 are shown in Tables E and F, respectively. The with project reduction in traffic along SR-91 east of I-15 is due to the proposed HOV connectors that would separate traffic from SR-91 until after McKinley Street where traffic volumes are lower.

Tables G, H, I, and J show the 2015 and 2035 LOS in the project area for the a.m. and p.m. peak hours. As shown, the proposed project would worsen the LOS at various intersections along the project alignment.

Table E: 2015 Highway Traffic Volumes

Roadway Link	No Build		Build Alternative 1		Build Alternative 2	
	ADT	Truck ADT	ADT	Truck ADT	ADT	Truck ADT
SR-91 from SR-241 to SR-71	320,300	17,500	329,600	18,100	333,500	18,300
SR-91 from SR-71 to I-15	305,900	16,400	310,400	16,800	327,300	17,700
SR-91 east of I-15	243,300	18,400	235,400	18,100	238,900	18,400
I-15 north of SR-91	201,500	23,000	208,400	24,200	209,600	24,300
I-15 south of SR-91	242,700	13,500	248,800	13,900	251,800	14,100

Source: PB, July 2009.
ADT = average daily traffic
N/A = not applicable

Table F: 2035 Highway Traffic Volumes

Roadway Link	No Build		Build Alternative 1		Build Alternative 2	
	ADT	Truck ADT	ADT	Truck ADT	ADT	Truck ADT
SR-91 from SR-241 to SR-71	325,200	18,900	334,800	19,400	361,900	21,000
SR-91 from SR-71 to I-15	305,900	16,800	307,000	16,900	344,700	19,000
SR-91 east of I-15	273,200	21,900	267,400	21,400	282,200	22,600
I-15 north of SR-91	319,800	31,700	333,000	33,000	334,900	33,200
I-15 south of SR-91	336,900	20,600	348,000	21,200	353,200	21,600

Source: PB, July 2009.
ADT = average daily traffic
N/A = not applicable

Table G: 2015 A.M. Intersection LOS

	Intersection	No Build		Build Alternative 1		Build Alternative 2	
		Delay	LOS	Delay	LOS	Delay	LOS
1.	Green River Rd/SR-91 WB Ramps	89.4	F	39.9	D	60.9	E
2.	Green River Rd/SR-91 EB Ramps	31.2	C	30.8	C	32.2	C
3.	Auto Center Dr/SR-91 WB Ramps	31.7	C	33.1	C	38.3	D
4.	Maple St/Pomona Dr	31.4	C	42.1	D	69.7	E
5.	6th St/SR-91 EB Ramps	21.1	C	20.5	C	24.4	C
6.	Paseo Grande/6th St	34.3	C	32.7	C	31.1	C
7.	SR-91 WB Ramps/Pomona Rd	40.0	D	72.5	E	67.5	E
8.	Lincoln Ave/SR-91 EB Ramps	24.8	C	100.0	F	91.1	F
9.	Main St/Grand Blvd	32.6	C	31.0	C	30.5	C
10.	Main St/SR-91 WB Ramps	27.9	C	18.2	B	20.1	C
11.	Main St/3rd St	56.9	E	68.0	E	68.5	E
12.	McKinley St/Griffin Way	27.9	C	28.8	C	31.7	C
13.	McKinley St/Sampson Ave	33.5	C	26.4	C	25.4	C
14.	Pierce St/Magnolia Ave	35.4	D	32.7	C	32.5	C
15.	Hamner Ave/Hidden Valley Pkwy	46.5	D	47.7	D	46.2	D
16.	Rimpau Ave/Magnolia Ave	54.6	D	55.0	D	55.4	E
17.	El Sobrante/Magnolia Ave	72.9	E	70.2	E	71.5	E
18.	I-15 SB Ramps/Magnolia Ave	45.1	D	47.5	D	45.1	D
19.	I-15 SB Ramps/Ontario Ave	78.9	E	91.3	F	75.2	E
20.	Bedford Canyon/Cajalco Road	45.3	D	43.1	D	50.6	D

Source: PB, July 2009.
Delay = Stopped time delay at intersection in seconds
LOS = Level of service

Table H: 2015 P.M. Intersection LOS

	Intersection	No Build		Build Alternative 1		Build Alternative 2	
		Delay	LOS	Delay	LOS	Delay	LOS
1.	Green River Rd/SR-91 WB Ramps	30.6	C	31.5	C	27.7	C
2.	Green River Rd/SR-91 EB Ramps	96.2	F	104.7	F	129.6	F
3.	Auto Center Dr/SR-91 WB Ramps	18.6	B	18.0	B	17.4	B
4.	Maple St/Pomona Dr	40.2	D	38.6	D	36.8	D
5.	6th St/SR-91 EB Ramps	85.0	F	35.1	D	36.9	D
6.	Paseo Grande/6th St	43.7	D	48.7	D	60.5	E
7.	SR-91 WB Ramps/Pomona Rd	40.0	D	25.8	C	27.1	C
8.	Lincoln Ave/SR-91 EB Ramps	146.1	F	98.4	F	107.4	F
9.	Main St/Grand Blvd	86.1	F	86.3	F	84.6	F
10.	Main St/SR-91 WB Ramps	81.0	F	63.8	E	64.1	E
11.	Main St/3rd St	42.4	D	60.9	E	59.6	E
12.	McKinley St/Griffin Way	52.3	D	56.1	E	73.1	E
13.	McKinley St/Sampson Ave	42.3	D	43.7	D	50.0	D
14.	Pierce St/Magnolia Ave	94.7	F	93.1	F	87.5	F
15.	Hamner Ave/Hidden Valley Pkwy	85.0	F	99.1	F	93.0	F
16.	Rimpau Ave/Magnolia Ave	50.1	D	52.6	D	49.4	D
17.	El Sobrante/Magnolia Ave	28.3	C	28.7	C	26.8	C
18.	I-15 SB Ramps/Magnolia Ave	85.1	F	89.3	F	90.4	F
19.	I-15 SB Ramps/Ontario Ave	37.7	D	37.3	D	36.0	D
20.	Bedford Canyon/Cajalco Road	58.0	E	59.0	E	58.7	E

Source: PB, July 2009.
Delay = Stopped time delay at intersection in seconds
LOS = Level of service

Table I: 2035 A.M. Intersection LOS

	Intersection	No Build		Build Alternative 1		Build Alternative 2	
		Delay	LOS	Delay	LOS	Delay	LOS
1.	Green River Rd/SR-91 WB Ramps	84.9	F	73.9	E	79.1	E
2.	Green River Rd/SR-91 EB Ramps	42.6	D	39.1	D	41.5	D
3.	Auto Center Dr/SR-91 WB Ramps	82.0	F	64.4	E	59.4	E
4.	Maple St/Pomona Dr	79.2	E	67.1	E	79.6	E
5.	6th St/SR-91 EB Ramps	24.4	C	28.3	C	23.8	C
6.	Paseo Grande/6th St	38.0	D	38.3	D	36.1	D
7.	SR-91 WB Ramps/Pomona Rd	40.5	D	97.3	F	82.8	F
8.	Lincoln Ave/SR-91 EB Ramps	36.1	D	181.1	F	167.6	F
9.	Main St/Grand Blvd	36.0	D	41.9	D	38.8	D
10.	Main St/SR-91 WB Ramps	25.2	C	42.8	D	17.4	B
11.	Main St/3rd St	61.9	E	79.0	E	36.3	D
12.	McKinley St/Griffin Way	33.8	C	31.3	C	33.1	C
13.	McKinley St/Sampson Ave	43.5	D	46.0	D	40.4	D
14.	Pierce St/Magnolia Ave	58.1	E	46.4	D	49.6	D
15.	Hamner Ave/Hidden Valley Pkwy	191.9	F	187.7	F	175.4	F
16.	Rimpau Ave/Magnolia Ave	133.0	F	115.9	F	117.0	F
17.	El Sobrante/Magnolia Ave	160.7	F	163.4	F	156.7	F
18.	I-15 SB Ramps/Magnolia Ave	111.5	F	114.7	F	106.7	F
19.	I-15 SB Ramps/Ontario Ave	75.2	E	59.7	E	58.1	E
20.	Bedford Canyon/Cajalco Road	28.0	C	27.5	C	28.0	C

Source: PB, July 2009.
Delay = Stopped time delay at intersection in seconds
LOS = Level of service

Table J: 2035 P.M. Intersection LOS

	Intersection	No Build		Build Alternative 1		Build Alternative 2	
		Delay	LOS	Delay	LOS	Delay	LOS
1.	Green River Rd/SR-91 WB Ramps	29.8	C	31.8	C	32.0	C
2.	Green River Rd/SR-91 EB Ramps	158.4	F	163.3	F	144.8	F
3.	Auto Center Dr/SR-91 WB Ramps	19.7	B	22.4	C	14.3	B
4.	Maple St/Pomona Dr	49.9	D	22.7	C	45.8	D
5.	6th St/SR-91 EB Ramps	97.2	F	36.0	D	38.4	D
6.	Paseo Grande/6th St	65.2	E	47.2	D	56.0	E
7.	SR-91 WB Ramps/Pomona Rd	30.2	C	30.6	C	32.7	C
8.	Lincoln Ave/SR-91 EB Ramps	68.3	E	123.1	F	133.5	F
9.	Main St/Grand Blvd	124.3	F	97.0	F	152.7	F
10.	Main St/SR-91 WB Ramps	141.3	F	119.2	F	37.8	D
11.	Main St/3rd St	68.8	E	109.2	F	75.3	E
12.	McKinley St/Griffin Way	69.1	E	72.5	E	71.4	E
13.	McKinley St/Sampson Ave	60.5	E	71.3	E	72.4	E
14.	Pierce St/Magnolia Ave	183.3	F	141.1	F	136.4	F
15.	Hamner Ave/Hidden Valley Pkwy	178.6	F	189.8	F	184.6	F
16.	Rimpau Ave/Magnolia Ave	91.4	F	83.1	F	81.2	F
17.	El Sobrante/Magnolia Ave	202.8	F	141.5	F	141.7	F
18.	I-15 SB Ramps/Magnolia Ave	156.4	F	141.7	F	140.3	F
19.	I-15 SB Ramps/Ontario Ave	37.7	D	35.1	D	35.2	D
20.	Bedford Canyon/Cajalco Road	208.7	F	185.3	F	211.0	F

Source: PB, July 2009.
Delay = Stopped time delay at intersection in seconds
LOS = Level of service

Daily Vehicle Emission Changes Due to the Proposed Project

The traffic study (PB, July 2009) calculated the daily vehicle miles traveled (VMT), daily vehicle hours traveled (VHT), and daily vehicle delay for all the vehicle trips along the SR-91 corridor and within the project region. This traffic data, in conjunction with the EMFAC2007 emission model, was used to calculate the $PM_{2.5}$ and PM_{10} 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 PM_{10} emissions under each alternative. The exhaust and dust emissions generated along the SR-91 corridor are listed in Tables K and L for $PM_{2.5}$ and PM_{10}, respectively. The exhaust and dust emissions generated within the RCTC region are listed in Tables M and N for $PM_{2.5}$ and PM_{10}, respectively. The results of the modeling are provided in Attachment A. As shown in Tables K and L, implementation of both project alternatives would result in a net increase in $PM_{2.5}$ and PM_{10} emissions in 2015 and 2035 along the SR-91 corridor. However, by 2015 the project region is expected to be 18 percent below the 24-hour $PM_{2.5}$ standard, 34 percent below the annual $PM_{2.5}$ standard, and 48 percent below the annual PM_{10} standard. Therefore, the 0.3 to 1.4 percent increase in PM emissions along SR-91 would not delay the attainment of the $PM_{2.5}$ or PM_{10} air quality standards within the Basin. In addition, as shown in Tables M and N, implementation of both build alternatives would result in a net decrease in regional $PM_{2.5}$ and PM_{10} emissions in 2015 and 2035.

Table K: Daily $PM_{2.5}$ Emissions along SR-91 Corridor (pounds per day)

Traffic Condition	Exhaust Emissions	Vehicle Delay	Tire Wear	Brake Wear	Road Dust	Total	Change from No Build
Existing	1,121	40	64	128	4,493	5,845	-
2015 No Build	797	59	79	159	5,582	6,666	-
2015 Alt 1	775	54	80	162	5,673	6,744	78 (+1.2%)
2015 Alt 2	760	51	80	161	5,671	6,724	58 (+0.9%)
2035 No Build	848	48	97	196	6,870	8,059	-
2035 Alt 1	828	45	98	197	6,913	8,080	21 (+0.3%)
2035 Alt 2	813	43	98	197	6,936	8,088	29 (+0.4%)

Source: LSA Associates, Inc., August 2009.

Table L: Daily PM_{10} Emissions along SR-91 Corridor (pounds per day)

Traffic Condition	Exhaust Emissions	Vehicle Delay	Tire Wear	Brake Wear	Road Dust	Total	Change from No Build
Existing	1,218	33	254	330	9,848	11,682	-
2015 No Build	1,057	49	315	409	12,234	14,065	-
2015 Alt 1	1,040	45	320	416	12,434	14,255	190 (+1.4%)
2015 Alt 2	1,019	42	320	416	12,430	14,228	163 (+1.2%)
2035 No Build	915	53	388	504	15,058	16,918	-
2035 Alt 1	894	50	390	507	15,151	16,992	74 (+0.4%)
2035 Alt 2	878	48	391	509	15,202	17,028	110 (+0.7%)

Source: LSA Associates, Inc., August 2009.

Table M: Daily $PM_{2.5}$ Emissions in Project Region (pounds per day)

Traffic Condition	Exhaust Emissions	Vehicle Delay	Tire Wear	Brake Wear	Road Dust	Total	Change from No Build
Existing	40,918	1,003	2,278	4,580	160,832	209,610	-
2015 No Build	26,381	1,454	2,668	5,362	188,324	224,190	-
2015 Alt 1	26,367	1,454	2,666	5,359	188,193	224,038	-152 (-0.1%)
2015 Alt 2	26,336	1,449	2,665	5,357	188,146	223,953	-237 (-0.1%)
2035 No Build	28,262	1,342	3,130	6,292	220,959	259,984	-
2035 Alt 1	28,152	1,329	3,128	6,287	220,803	259,699	-285 (-0.1%)
2035 Alt 2	28,164	1,330	3,129	6,289	220,866	259,778	-206 (-0.1%)

Source: LSA Associates, Inc., August 2009.

Table N: Daily PM_{10} Emissions in Project Region (pounds per day)

Traffic Condition	Exhaust Emissions	Vehicle Delay	Tire Wear	Brake Wear	Road Dust	Total	Change from No Build
Existing	44,493	834	9,078	11,796	352,508	418,709	-
2015 No Build	35,406	1,209	10,630	13,812	412,766	473,823	-
2015 Alt 1	35,387	1,209	10,623	13,802	412,477	473,498	-325 (-0.1%)
2015 Alt 2	35,345	1,205	10,620	13,799	412,374	473,343	-480 (-0.1%)
2035 No Build	30,483	1,492	12,472	16,206	484,294	544,947	-
2035 Alt 1	30,366	1,478	12,463	16,194	483,952	544,454	-493 (-0.1%)
2035 Alt 2	30,379	1,479	12,467	16,199	484,090	544,614	-333 (-0.1%)

Source: LSA Associates, Inc., August 2009.

CONCLUSION

Transportation conformity is required under Section 176(c) of the federal CAA to ensure that federally supported highway and transit project activities are consistent with the purpose of the SIP. Conformity to 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 AAQS. As required by the 2006 Final Rule, this qualitative $PM_{2.5}$ and PM_{10} 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 PM_{10} emissions levels associated with the proposed SR-91 CIP build alternatives would result in new violations of the NAAQS for the following reasons:

- The traffic volumes in the vicinity of the Norco and Anaheim air quality monitoring station are consistent with the existing traffic volumes along I-15 and SR-91.
- The ambient PM_{10} concentrations at the Norco station exceeded the 24-hour federal standard once within the past five years and is projected to be 52 percent of the NAAQS by 2015.
- Based on the local monitoring data and the 2007 AQMP, the 24-hour and annual average $PM_{2.5}$ concentrations in the project area would be reduced to below the federal 24-hour and annual NAAQS by 2015.
- The 0.3 to 1.2 percent increase in $PM_{2.5}$ emissions along the SR-91 corridor would not result in a new exceedances of the NAAQS.
- The 0.4 to 1.4 percent increase in PM_{10} emissions along the SR-91 corridor would not result in a new exceedances of the NAAQS.
- Both build alternatives would result in a net decrease in $PM_{2.5}$ emissions within the Basin.
- Both build alternatives would result in a net decrease in PM_{10} emissions within the Basin.

For these reasons, future new or worsened $PM_{2.5}$ and PM_{10} violations of any standards are not anticipated; therefore, the proposed SR-91 CIP meets the conformity hot-spot requirements in 40 CFR 93-116 and 93-123 for both $PM_{2.5}$ and PM_{10}.

REFERENCES

United States Environmental Protection Agency. 2006. “Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas” (EPA 420-B-06-902, March 2006).

United States Environmental Protection Agency. 2006. Final Revisions to the National Ambient Air Quality Standards for Particulate Pollution (Particulate Matter). EPA Web site: www.epa.gov/oar/particulatepollution/naaqsrev2006.html, accessed on March 19, 2007.

State Route 91 Corridor Improvement Project Traffic Study, (Parsons Brinckerhoff, July 2009).

ATTACHMENT A

$PM_{2.5}$ AND PM_{10} EMISSION CALCULATIONS