Chapter 3 Changes to Environmental Impacts of the Project

This Draft Supplemental EIR/Environmental Reevaluation (DSEIR/ER) is being prepared to evaluate the potential environmental impacts associated with the HOT lanes. As indicated before, the project area's social, economic and environmental setting remains essentially the same as when the Final EIR/FONSI was approved. In addition, the environmental circumstances have not changed since the approval. In evaluating potential additional impacts, the same environmental baseline condition previously used in the approved September 2009 Final EIR/FONSI is assumed to be in place, unless otherwise stated.

Based on the review of the affected environmental conditions and the proposed scope change, resources with potential changes in project effects or impacts were identified and analyzed. Consequently, only those resources are being discussed in this DSEIR/ER. The remaining technical sections of the Final EIR/FONSI are not included, as they have not been modified as the result of the change in scope. In other words, the proposed changes to the project discussed in Chapter 2 would have no effect on those resources and would not result in a substantial change from the analysis, consideration, and findings within the Final EIR/FONSI.

The following resources were analyzed for potential additional impacts:

- Traffic
- Air Quality
- Noise

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3.1 Traffic

The information in this section is based on the I-5 High-Occupancy Toll Lane Project Traffic Technical Report (LSA Associates, Inc., January 2013). This traffic report updates the findings of the previous traffic analysis (I-5 PA&ED HOV & Truck Lanes – SR-14 to Parker Road, Austin Foust Associates, Inc. dated October 2007 and Supplemental Traffic Data report dated May 2008).

Study Area:

For the traffic analysis, the study area is the Interstate 5 (I-5) corridor from San Fernando Road on the south to Lake Hughes Road on the north, which extends one interchange south and north of the limits of the proposed improvement (State Route 14 [SR-14] to south of Parker Road). The project location is shown in Figure 3.1.1. Within the study area, I-5 currently provides generally four mixed-flow lanes in each direction, with the exception of three mixed-flow lanes in each direction at the I-5/ SR-14 interchange. Two truck lanes are separated from the mainline freeway south of the Weldon Canyon Overcrossing. This truck bypass route begins/ends just north of the I-5/SR-14 interchange. As discussed in Chapter 1, the extension of these truck lanes are currently in construction. The terrain of this area varies between flat (0 percent) and up to a 5 percent grade.

Ten freeway mainline segments on the northbound and eleven on the southbound I-5 have been identified for analysis to determine the operational improvement or impact of the HOT Lanes. These locations are consistent with the traffic analysis in the Final EIR/FONSI. The following basic freeway segments were analyzed:

Northbound

I-5 between SR-14 and Truck Bypass
I-5 between Truck Bypass to Calgrove Boulevard
I-5 between Calgrove Boulevard and Pico Canyon Road/Lyons Avenue
I-5 between Pico Canyon Road/Lyons Avenue and McBean Parkway
I-5 between McBean Parkway and Valencia Boulevard
I-5 between Valencia Boulevard and Magic Mountain Parkway
I-5 between Magic Mountain Parkway and Newhall Ranch Road (SR-126)
I-5 between Newhall Ranch Road and Hasley Canyon Road
I-5 between Hasley Canyon Road and Parker Road
I-5 between Parker Road and Lake Hughes

Figure 3.1.1 Project Location

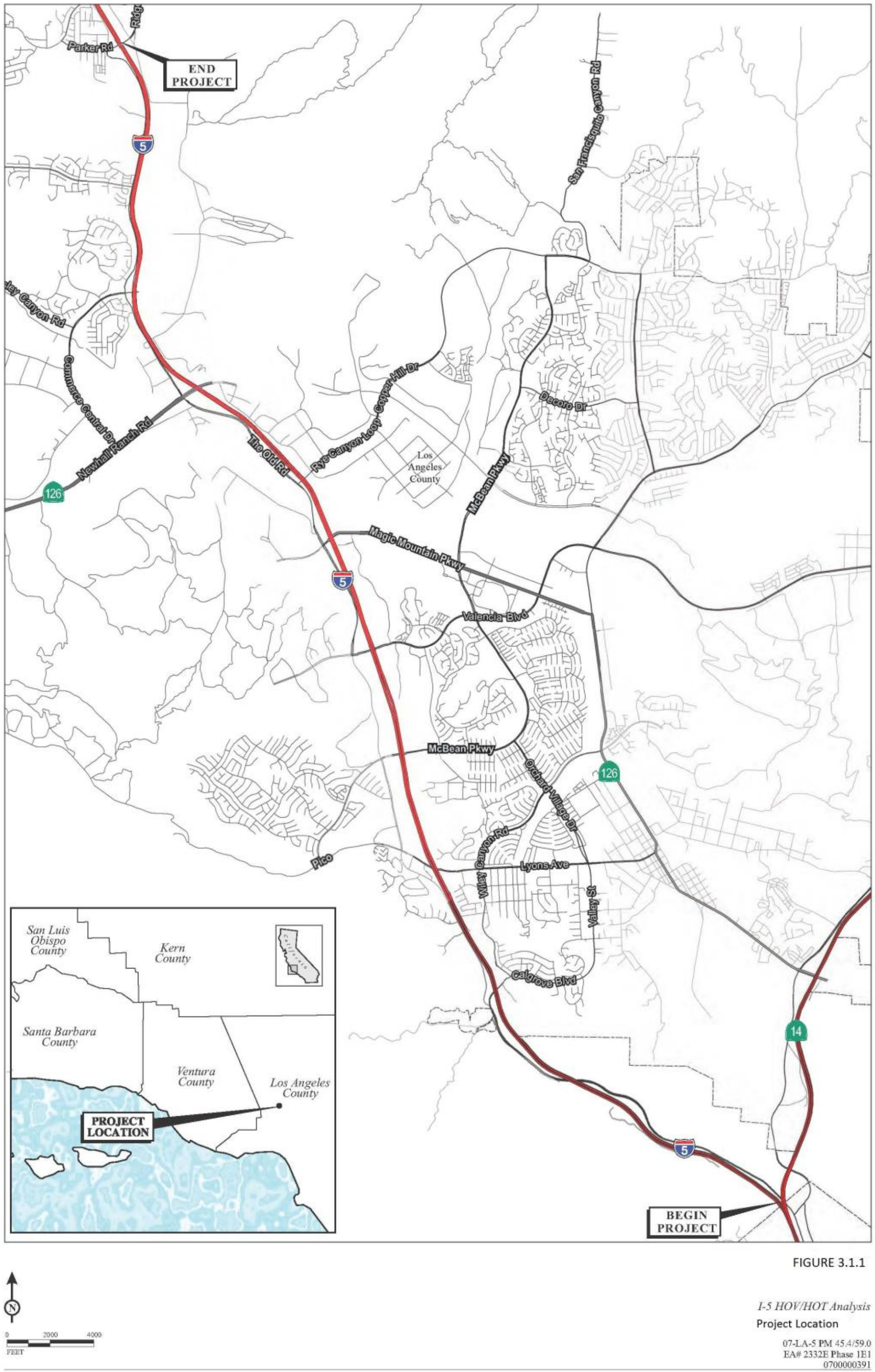


FIGURE 3.1.1

I-5 HOV/HOT Analysis
Project Location

07-LA-5 PM 45.4/59.0
EA# 2332E Phase 1E1
0700000391

I:\CDT0903I\G\Project Study Area.cdr (10/16/12)

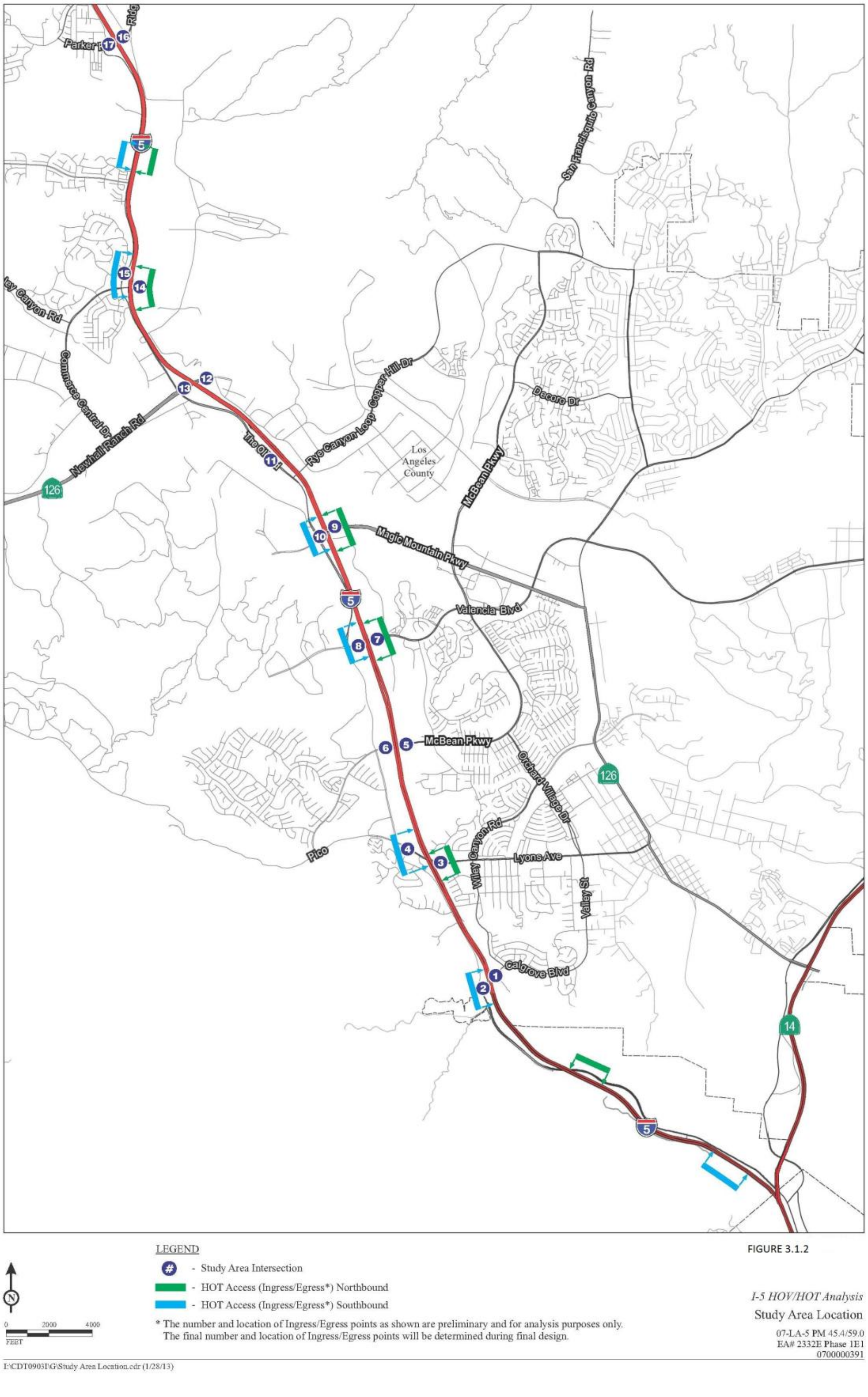
Southbound

I-5 between Lake Hughes and Parker Road
I-5 between Parker Road and Hasley Canyon Road
I-5 between Hasley Canyon Road and Newhall Ranch Road (SR-126)
I-5 between Newhall Ranch Road and Rye Canyon Road
I-5 between Rye Canyon Road and Magic Mountain Parkway
I-5 between Magic Mountain Parkway and Valencia Boulevard
I-5 between Valencia Boulevard and McBean Parkway
I-5 between McBean Parkway and Pico Canyon Road
I-5 between Pico Canyon Road and Calgrove Boulevard
I-5 between Calgrove Boulevard and Truck Bypass
I-5 between Truck Bypass and SR-14

The following ramp intersections in the study area were analyzed. Figure 3.1.2 shows the study area intersection locations.

1. I-5 Northbound Ramps/Calgrove Boulevard
2. I-5 Southbound Ramps/Calgrove Boulevard
3. I-5 Northbound Ramps/Pico Canyon Road & Lyons Avenue
4. I-5 Southbound Ramps/Pico Canyon Road & Lyons Avenue
5. I-5 Northbound Ramps/McBean Parkway
6. I-5 Southbound Ramps/McBean Parkway
7. I-5 Northbound Ramps/Valencia Boulevard
8. I-5 Southbound Ramps/Valencia Boulevard
9. I-5 Northbound Ramps/Magic Mountain Parkway
10. I-5 Southbound Ramps/Magic Mountain Parkway
11. I-5 Southbound Ramps/Rye Canyon Road
12. I-5 Northbound Ramps/Newhall Ranch Road (SR-126)
13. I-5 Southbound Ramps/Newhall Ranch Road (SR-126)
14. I-5 Northbound Ramps/Hasley Canyon Road
15. I-5 Southbound Ramps/Hasley Canyon Road
16. I-5 Northbound Ramps/Parker Road
17. I-5 Southbound Ramps/Parker Road

Figure 3.1.2 Study Area Location



I:\CDT0903\G\Study Area Location.cdr (1/28/13)

3.1.1 Existing Conditions

3.1.1.1 Basic Freeway Segments

The existing (2010) a.m. and p.m. peak-hour traffic volumes, average daily traffic (ADT), and percentage of trucks on I-5 within the project limits are shown in Table 3.1.A. The peak hour is the hour during the peak period when traffic congestion is greatest. The a.m. peak period is from 6:00 a.m. to 9:00 a.m. and the p.m. peak period is from 3:00 p.m. to 7:00 p.m. It should be noted that locations that indicate 0 percent trucks are those which include a separate truck bypass lane.

Future-year traffic forecasts have been developed from the Southern California Association of Governments (SCAG) regional traffic model.

The quality and density of traffic flow in the I-5 study area can be defined in terms of level of service (LOS) from A to F. LOS describes the efficiency of traffic flow, as well as how such conditions are perceived by those persons traveling in the traffic stream, and accounts for variables such as speed and travel time, freedom to maneuver, traffic interruptions, traveler comfort and convenience, and safety. LOS ranges from LOS A (free traffic flow with low volumes and high speeds, resulting in low densities) to LOS F (traffic volumes exceeding capacity and resulting in forced flow operations at low speeds, resulting in high densities). Table 3.1.B is a graphic depiction of relative levels of congestion and speed associated with each LOS.

The measure used to provide an estimate of LOS for basic freeway segments is density, where density is calculated from the average vehicle flow rate per lane and the average speed. LOS A represents a freeway segment with density less than or equal to 11 passenger cars per mile per lane (pc/mi/ln). LOS F represents a freeway segment with density greater than 45 pc/mi/ln.

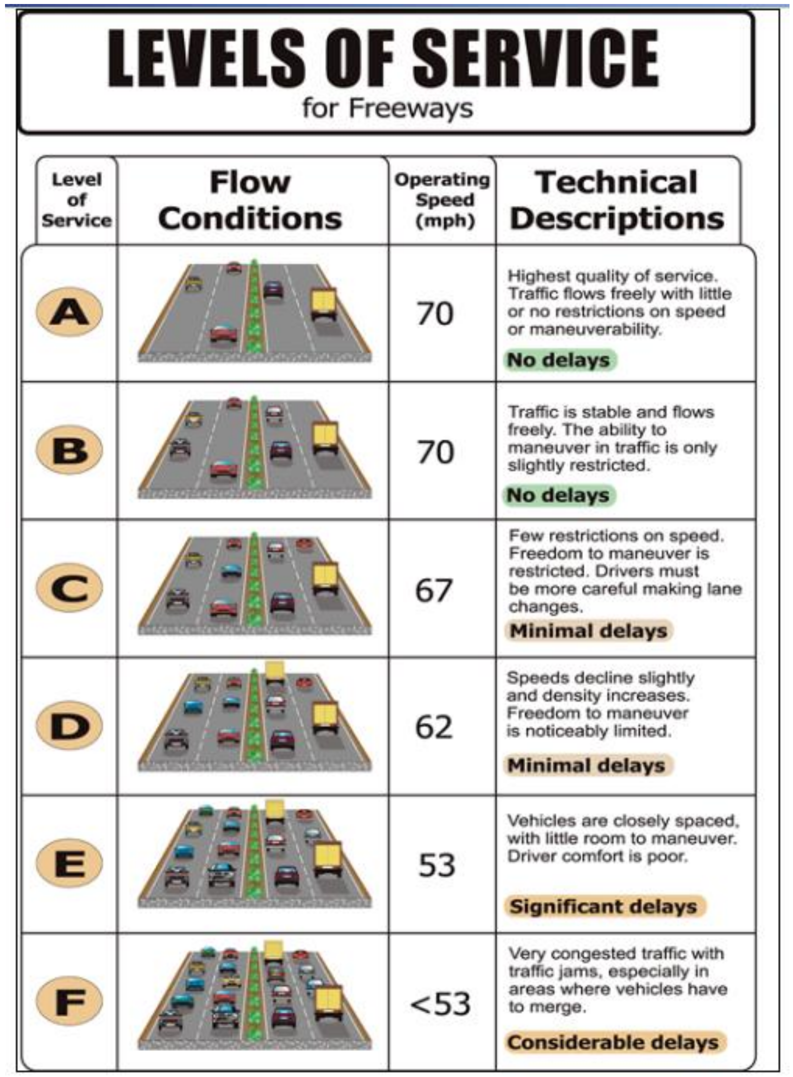
Table 3.1.C presents the results of the I-5 mainline LOS analysis. As this table indicates, six segments in the a.m. peak hour and seven segments in the p.m. peak hour are currently operating at LOS E or F.

Table 3.1.A Existing Freeway Mainline Volumes

I-5 Basic Segment	AM Peak Hour		PM Peak Hour		Truck %	ADT	
	SB	NB	SB	NB		SB	NB
North of Parker Road	4,451	4,039	3,914	4,186	24%	37,500	37,500
Between Parker Road and Hasley Canyon Road	5,467	4,129	4,260	5,240	19%	46,500	46,500
Between Hasley Canyon Road and SR -126	6,168	4,274	4,589	5,811	17%	54,000	54,000
Between SR -126 and Rye Canyon Road	6,084	4,847	4,801	6,199	15%	61,000	61,000
Between Rye Canyon Road and Magic Mountain Parkway	6,419	4,560	5,779	6,021	14%	66,500	66,500
Between Magic Mountain Parkway and Valencia Boulevard	6,438	5,426	6,200	6,700	12%	73,500	73,500
Between Valencia Boulevard and McBean Parkway	7,625	6,295	6,871	7,929	11%	85,000	85,000
Between McBean Parkway and Lyons Ave./Pico Canyon Road	7,959	6,743	7,219	8,381	10%	91,000	91,000
Between Lyons Ave./Pico Canyon Road and Calgrove Bouleva	9,430	6,938	7,351	9,249	9%	98,000	98,000
Between Truck Bypass and Calgrove Boulevard	9,735	6,661	7,413	9,087	9%	98,500	98,500
Between SR-14 and Truck Bypass	8,833	6,044	6,726	8,245	0%	98,500	98,500

Source: LSA Associates, Inc.
SB-Southbound
NB-Northbound

Table 3.1.B LOS Thresholds for a Basic Freeway Segment



LEVELS OF SERVICE
for Freeways

Level of Service	Flow Conditions	Operating Speed (mph)	Technical Descriptions
A		70	Highest quality of service. Traffic flows freely with little or no restrictions on speed or maneuverability. **No delays**
B		70	Traffic is stable and flows freely. The ability to maneuver in traffic is only slightly restricted. **No delays**
C		67	Few restrictions on speed. Freedom to maneuver is restricted. Drivers must be more careful making lane changes. **Minimal delays**
D		62	Speeds decline slightly and density increases. Freedom to maneuver is noticeably limited. **Minimal delays**
E		53	Vehicles are closely spaced, with little room to maneuver. Driver comfort is poor. **Significant delays**
F		<53	Very congested traffic with traffic jams, especially in areas where vehicles have to merge. **Considerable delays**

Table 3.1.C Existing Freeway Mainline Peak Hour Level of Service Summary

Direction	Basic Segment	Existing					
		AM			PM		
		Speed (mph)	Density	LOS	Speed (mph)	Density	LOS
Northbound	SR-14 to Truck Bypass	59.2	37.7	E	<52.2	>45	F
	Truck Bypass to Calgrove Boulevard	66.1	29.2	D	<52.2	>45	F
	Calgrove Boulevard to Pico Canyon Road/Lyons Avenue	64.7	31.0	D	<52.2	>45	F
	Pico Canyon Road/Lyon Avenue to McBean Parkway	63.7	32.2	D	<52.2	>45	F
	McBean Parkway to Valencia Boulevard	67.4	27.3	D	56.4	41.1	E
	Valencia Boulevard to Magic Mountain Parkway	69.5	22.9	C	65.5	30.0	D
	Magic Mountain Parkway to Newhall Ranch Road (SR-126)	69.9	20.6	C	67.3	27.4	D
	Newhall Ranch Road (SR-126) to Hasley Canyon Road	70.0	18.4	C	68.4	25.5	C
	Hasley Canyon Road to Parker Road	70.0	17.9	B	69.5	22.9	C
	Parker Road to Lake Hughes	70.0	17.9	B	70.0	18.6	C
Southbound	Lake Hughes to Parker Road	70.0	19.7	C	70.0	17.3	B
	Parker Road to Hasley Canyon Road	69.1	24.0	C	70.0	18.5	C
	Hasley Canyon Road to Newhall Ranch Road (SR-126)	67.2	27.6	D	70.0	19.7	C
	Newhall Ranch Road (SR-126) to Rye Canyon Road	67.7	26.8	D	69.9	20.4	C
	Rye Canyon Road to Magic Mountain Parkway	66.5	28.6	D	68.7	24.9	C
	Magic Mountain Parkway to Valencia Boulevard	64.9	30.8	D	66.2	29.1	D
	Valencia Boulevard to McBean Parkway	<52.2	>45	F	60.2	36.5	E
	McBean Parkway to Pico Canyon Road/Lyon Avenue	56.5	41.0	E	62.7	33.5	D
	Pico Canyon Road/Lyon Avenue to Calgrove Boulevard	<52.2	>45	F	62.0	34.3	D
	Calgrove Boulevard to Truck Bypass Route	<52.2	>45	F	<52.2	>45	F
	Truck Bypass Route to SR-14	<52.2	>45	F	67.1	27.8	D

Source: LSA Associates, Inc.
Mph: miles-per-hour
Density: pc/mi/ln = passenger cars per mile per lane
▢ - LOS E or F

3.1.1.2 Intersections

LOS for signalized intersections is defined in terms of control delay. Control delay is a component of delay that results when a control signal causes a lane group to reduce speed or to stop; it is measured by comparison with the uncontrolled condition. Control delay includes initial acceleration delay, queue move-up time, stopped delay, and final acceleration delay. For the unsignalized intersections, the LOS is presented in terms of average approach delay of the minor street (in seconds per vehicle).

Peak-hour intersection counts were conducted at the 17 locations in August 2012. Figure 3.1.3 illustrates the existing peak-hour volumes. Table 3.1.D presents the results of the intersection LOS analysis. As Table C indicates, there are no ramp intersections that are currently operating at LOS E or F.

Table 3.1.D Existing Intersection Peak Hour Level of Service Summary

Intersection		Existing			
		AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS
1	I-5 NB Ramps/ Calgrove Blvd.[1]	12.1	B	29.7	D
2	I-5 SB Ramps/ Calgrove Blvd.[1]	15.1	C	16.2	C
3	I-5 NB Ramps/ Pico Canyon Rd. & Lyons A	8.6	A	13.8	B
4	I-5 SB Ramps/ Pico Canyon Rd. & Lyons A	5.7	A	9.0	A
5	I-5 NB Ramps/ McBean Pkwy.	4.9	A	8.5	A
6	I-5 SB Ramps/ McBean Pkwy.	4.0	A	6.3	A
7	I-5 NB Ramps/ Valencia Blvd.	9.4	A	10.2	B
8	I-5 SB Ramps/ Valencia Blvd.	6.4	A	11.3	B
9	I-5 NB Ramps/ Magic Mtn Pkwy.	11.9	B	12.0	B
10	I-5 SB Ramps/ Magic Mtn Pkwy.	8.3	A	9.1	A
11	I-5 SB Ramps/ Rye Canyon Rd.	12.7	B	14.5	B
12	I-5 NB Ramps/ Newhall Ranch Rd (SR-126	13.5	B	13.4	B
13	I-5 SB Ramps/ Newhall Ranch Rd (SR-126	7.9	A	7.8	A
14	I-5 NB Ramps/Hasley Canyon Rd.[2]	5.3	A	14.2	B
15	I-5 SB Ramps/Hasley Canyon Rd.	34.0	C	32.4	C
16	I-5 NB Ramps/Parker Rd.[1]	11.2	B	14.2	B
17	I-5 SB Ramps/Parker Rd.[1]	31.2	D	30.7	D

Source: LSA Associates, Inc.
1 Unsignalized Intersections
2 Roundabout Intersection
Delay: seconds per vehicle

Figure 3.1.3 Existing Ramp Intersections Peak Hour Volumes

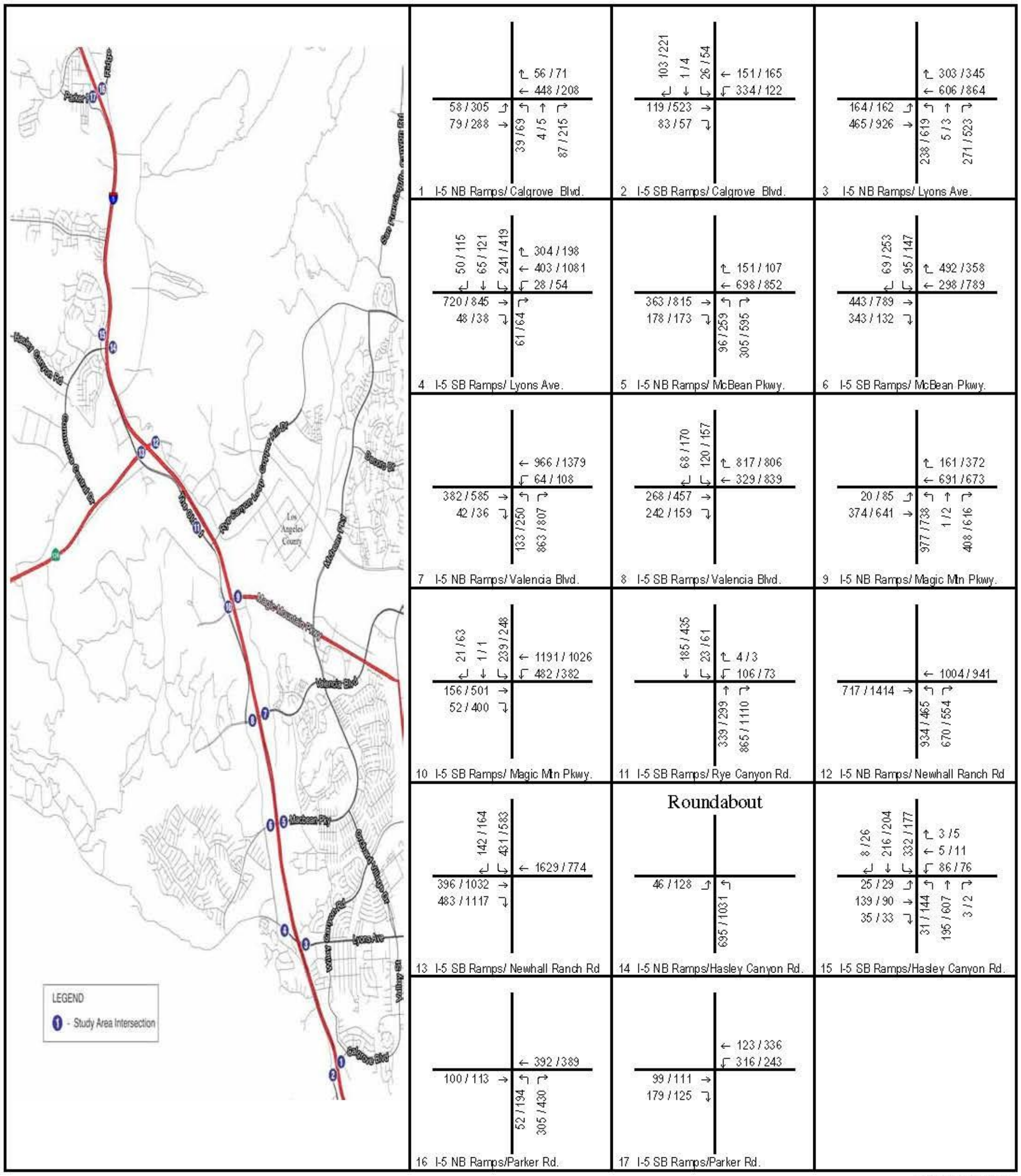


FIGURE 3

I-5/HOT Lanes Traffic Study

Existing Ramp Intersections Peak Hour Volumes

07-LA-5 PM 45.4/59.0

EA#2332E Phase 1E1

0700000391

123 / 456 AM / PM Peak Hour Volume

P:\CDT0903I HOT Lanes Traffic\xls\Graphics\Existing.xls (10/17/2012)

3.1.2 Opening Year (2018) Conditions

Caltrans has identified 2018 as the projected opening year of the HOT lane. As such, the following analysis for the No Build and HOT lane conditions correspond to this project opening year condition.

For the No build conditions, the existing numbers of mixed-flow lanes (four in each direction) are assumed. In addition, the existing truck lanes (SR-14 to south of Calgrove Boulevard both northbound and southbound) and approved truck lanes currently under construction (south of Calgrove Boulevard to Calgrove Boulevard northbound, and south of Calgrove Boulevard to Pico Canyon Road southbound) are included in the No Build analysis.

3.1.2.1 Basic Freeway Segments

2018 No Build. The 2018 daily, a.m., and p.m. peak-hour traffic volumes and truck percentages along the I-5 mainline for the No Build conditions are presented in Table 3.1.E. It should be noted that locations that indicate 0 percent trucks are those which include a separate truck bypass lane. Table 3.1.F presents the results of the I-5 mainline LOS analysis. As Table 3.1.F indicates, 11 segments in the a.m. peak hour and 11 segments in the p.m. peak hour are forecast to operate at LOS E or F in the 2018 No Build conditions.

2018 HOT Lane Alternative. The 2018 daily, a.m., and p.m. peak-hour traffic volumes and truck percentages along the I-5 mainline for the HOT lane alternative are presented in Table 3.1.G. Table 3.1.H presents the results of the I-5 mainline LOS analysis. As Table 3.1.H indicates, four segments in the a.m. peak hour and five segments in the p.m. peak hour are forecast to operate at LOS E or F under the 2018 HOT Lane alternative. As shown in the table, this presents an improvement as compared to the No Build conditions.

Table 3.1.E Year 2018 No Build Freeway Mainline Volumes

I-5 Basic Segment	AM Peak Hour				PM Peak Hour				ADT	
	Southbound		Northbound		Southbound		Northbound			
	Volume	Truck %	Volume	Truck %	Volume	Truck %	Volume	Truck %	SB	NB
North of Parker Road	7,065	11%	4,079	18%	4,565	12%	6,183	10%	63,024	61,229
Between Parker Road and Hasley Canyon Road	7,794	11%	4,553	18%	5,183	12%	6,965	10%	72,267	70,452
Between Hasley Canyon Road and SR -126	8,041	10%	4,425	17%	5,223	12%	7,244	9%	74,161	72,137
Between SR -126 and Rye Canyon Road	7,901	10%	4,535	17%	5,451	11%	7,086	9%	76,176	75,643
Between Rye Canyon Road and Magic Mountain Parkway	7,951	10%	4,535	16%	6,187	11%	7,086	9%	81,966	75,643
Between Magic Mountain Parkway and Valencia Boulevard	7,808	11%	5,496	16%	6,541	11%	7,461	9%	85,752	82,816
Between Valencia Boulevard and McBean Parkway	8,773	10%	6,469	13%	7,336	9%	8,585	8%	96,100	94,953
Between McBean Parkway and Lyons Ave./Pico Canyon Road	9,430	8%	6,761	11%	7,620	8%	8,851	7%	99,734	97,038
Between Lyons Ave./Pico Canyon Road and Calgrove Boulevar	10,184	0%	7,341	11%	7,774	0%	10,074	6%	111,418	109,145
Between Truck Bypass and Calgrove Boulevard	10,785	0%	6,552	0%	7,941	0%	9,746	0%	114,712	107,779
Between SR-14 and Truck Bypass	10,785	0%	6,552	0%	7,941	0%	9,746	0%	114,712	107,779

Source: LSA Associates, Inc.
SB-Southbound
NB-Northbound

Table 3.1.F Year 2018 No Build Freeway Mainline Peak Hour Level of Service Summary

Direction	Basic Segment	2018 No Build					
		AM			PM		
		Speed (mph)	Density	LOS	Speed (mph)	Density	LOS
Northbound	SR-14 to Truck Bypass	<52.2	>45	F	<52.2	>45	F
	Truck Bypass to Calgrove Boulevard	67.7	26.8	D	<52.2	>45	F
	Calgrove Boulevard to Pico Canyon Road/Lyons Avenue	61.6	34.8	D	<52.2	>45	F
	Pico Canyon Road/Lyon Avenue to McBean Parkway	63.2	32.9	D	<52.2	>45	F
	McBean Parkway to Valencia Boulevard	66.4	28.7	D	<52.2	>45	F
	Valencia Boulevard to Magic Mountain Parkway	69.2	23.8	C	61.2	35.3	E
	Magic Mountain Parkway to Newhall Ranch Road (SR-126)	70.0	19.4	C	63.8	32.1	D
	Newhall Ranch Road (SR-126) to Hasley Canyon Road	70.0	19.0	C	62.8	33.4	D
	Hasley Canyon Road to Parker Road	70.0	19.6	C	64.3	31.5	D
	Parker Road to Lake Hughes	70.0	17.6	B	67.9	26.5	D
Southbound	Lake Hughes to Parker Road	63.5	32.5	D	70.0	19.1	C
	Parker Road to Hasley Canyon Road	57.7	39.5	E	69.7	21.8	C
	Hasley Canyon Road to Newhall Ranch Road (SR-126)	55.6	42.0	E	69.7	22.0	C
	Newhall Ranch Road (SR-126) to Rye Canyon Road	57.1	40.3	E	69.5	22.9	C
	Rye Canyon Road to Magic Mountain Parkway	56.5	40.9	E	67.8	26.7	D
	Magic Mountain Parkway to Valencia Boulevard	56.2	41.3	E	64.6	31.1	D
	Valencia Boulevard to McBean Parkway	<52.2	>45	F	56.8	40.6	E
	McBean Parkway to Pico Canyon Road/Lyon Avenue	<52.2	>45	F	60.3	36.4	E
	Pico Canyon Road/Lyon Avenue to Calgrove Boulevard	<52.2	>45	F	61.4	35.1	E
	Calgrove Boulevard to Truck Bypass Route	<52.2	>45	F	60.1	36.6	E
	Truck Bypass Route to SR-14	<52.2	>45	F	<52.2	>45	F

Source: LSA Associates, Inc.
Mph: miles-per-hour
Density: pc/mi/ln = passenger cars per mile per lane
▢ - LOS E or F

Table 3.1.G Year 2018 HOT Freeway Mainline Volumes

I-5 Basic Segment	AM Peak Hour				PM Peak Hour				ADT	
	Southbound		Northbound		Southbound		Northbound			
	Volume	Truck %	Volume	Truck %	Volume	Truck %	Volume	Truck %	SB	NB
North of Parker Road	7,080	15%	4,165	23%	4,589	17%	6,310	14%	63,150	61,912
Between Parker Road and Hasley Canyon Road	6,416	15%	4,356	23%	4,877	17%	6,170	14%	72,463	71,191
Between Hasley Canyon Road and SR -126	6,693	15%	4,216	22%	4,917	16%	6,428	13%	74,440	72,769
Between SR -126 and Rye Canyon Road	6,597	14%	4,207	21%	5,183	15%	5,537	12%	76,195	76,704
Between Rye Canyon Road and Magic Mountain Parkway	6,462	14%	4,207	20%	5,293	14%	5,537	12%	83,459	76,704
Between Magic Mountain Parkway and Valencia Boulevard	6,589	15%	5,181	20%	5,614	14%	6,194	12%	87,669	84,958
Between Valencia Boulevard and McBean Parkway	7,778	13%	6,199	15%	6,511	11%	7,555	11%	98,993	98,275
Between McBean Parkway and Lyons Ave./Pico Canyon Road	8,490	11%	6,524	14%	6,753	10%	7,835	9%	103,126	100,504
Between Lyons Ave./Pico Canyon Road and Calgrove Boulevard	9,038	0%	7,389	12%	6,762	0%	9,111	8%	113,795	113,912
Between Truck Bypass and Calgrove Boulevard	9,377	0%	6,303	0%	6,976	0%	8,570	0%	116,498	111,334
Between SR-14 and Truck Bypass	9,377	0%	6,303	0%	6,976	0%	8,570	0%	116,498	111,334

Source: LSA Associates, Inc.
SB-Southbound
NB-Northbound

Table 3.1.H Year 2018 No Build and 2018 HOT Freeway Mainline Peak Hour Level of Service Summary Comparison

Direction	Basic Segment	2018 No Build						Year 2018 HOT					
		AM			PM			AM			PM		
		Speed (mph)	Density	LOS	Speed (mph)	Density	LOS	Speed (mph)	Density	LOS	Speed (mph)	Density	LOS
Northbound	SR-14 to Truck Bypass	<52.2	>45	F	<52.2	>45	F	68.4	25.5	C	54.3	43.7	E
	Truck Bypass to Calgrove Boulevard	67.7	26.8	D	<52.2	>45	F	68.4	25.5	C	54.3	43.7	E
	Calgrove Boulevard to Pico Canyon Road/Lyons Avenue	61.6	34.8	D	<52.2	>45	F	68.5	25.3	C	62.7	33.5	D
	Pico Canyon Road/Lyon Avenue to McBean Parkway	63.2	32.9	D	<52.2	>45	F	63.6	32.4	D	54.6	43.3	E
	McBean Parkway to Valencia Boulevard	66.4	28.7	D	<52.2	>45	F	67.3	27.4	D	59.9	36.9	E
	Valencia Boulevard to Magic Mountain Parkway	69.2	23.8	C	61.2	35.3	E	70.0	18.0	C	69.9	20.8	C
	Magic Mountain Parkway to Newhall Ranch Road (SR-126)	70.0	19.4	C	63.8	32.1	D	70.0	18.4	C	69.3	23.5	C
	Newhall Ranch Road (SR-126) to Hasley Canyon Road	70.0	19.0	C	62.8	33.4	D	70.0	18.5	C	66.6	28.5	D
	Hasley Canyon Road to Parker Road	70.0	19.6	C	64.3	31.5	D	70.0	19.2	C	67.5	27.1	D
	Parker Road to Lake Hughes	70.0	17.6	B	67.9	26.5	D	70.0	18.4	C	67.0	27.9	D
Southbound	Lake Hughes to Parker Road	63.5	32.5	D	70.0	19.1	C	62.5	33.7	D	70.0	19.7	C
	Parker Road to Hasley Canyon Road	57.7	39.5	E	69.7	21.8	C	66.4	28.8	D	69.9	21.0	C
	Hasley Canyon Road to Newhall Ranch Road (SR-126)	55.6	42.0	E	69.7	22.0	C	65.0	30.7	D	69.9	21.0	C
	Newhall Ranch Road (SR-126) to Rye Canyon Road	57.1	40.3	E	69.5	22.9	C	69.6	22.5	C	70.0	17.6	B
	Rye Canyon Road to Magic Mountain Parkway	56.5	40.9	E	67.8	26.7	D	69.7	22.0	C	70.0	17.9	B
	Magic Mountain Parkway to Valencia Boulevard	56.2	41.3	E	64.6	31.1	D	62.7	33.5	D	68.1	26.0	D
	Valencia Boulevard to McBean Parkway	<52.2	>45	F	56.8	40.6	E	65.0	30.7	D	69.1	24.1	C
	McBean Parkway to Pico Canyon Road/Lyon Avenue	<52.2	>45	F	60.3	36.4	E	<52.2	>45	F	65.5	30.0	D
	Pico Canyon Road/Lyon Avenue to Calgrove Boulevard	<52.2	>45	F	61.4	35.1	E	<52.2	>45	F	66.9	28.0	D
	Calgrove Boulevard to Truck Bypass Route	<52.2	>45	F	60.1	36.6	E	<52.2	>45	F	66.1	29.2	D
	Truck Bypass Route to SR-14	<52.2	>45	F	<52.2	>45	F	<52.2	>45	F	<52.2	>45	F

Source: LSA Associates, Inc.
Mph: miles-per-hour
Density: pc/mi/ln = passenger cars per mile per lane
▢ - LOS E or F

3.1.2.2 Intersections

2018 No Build. The 2018 a.m. and p.m. peak-hour traffic volumes for the ramp intersection locations are illustrated in Figure 3.1.4. Table 3.1.I presents the results of the intersection LOS analysis. As Table 3.1.I indicates, there are no intersections forecast to operate at LOS E or F in the a.m. peak hour, and three intersections are forecast to operate at LOS E or F in the p.m. peak hour for the 2018 No Build condition.

2018 HOT Lane Alternative. The 2018 a.m. and p.m. peak-hour traffic volumes for the ramp intersection locations in the HOT lane alternative are illustrated in Figure 3.1.5. Table 3.1.J presents the results of the intersection LOS analysis. As Table 3.1.J indicates, there are no intersections forecast to operate at LOS E or F in the a.m. peak hour, and three intersections are forecast to operate at LOS E or F in the p.m. peak hour for the 2018 HOT lane alternative. As shown in the table, there is no change in number of LOS E or F locations between the HOT alternative and the No Build condition.

Figure 3.1.4 Year 2018 No Build Ramp Intersections Peak Hour Volumes

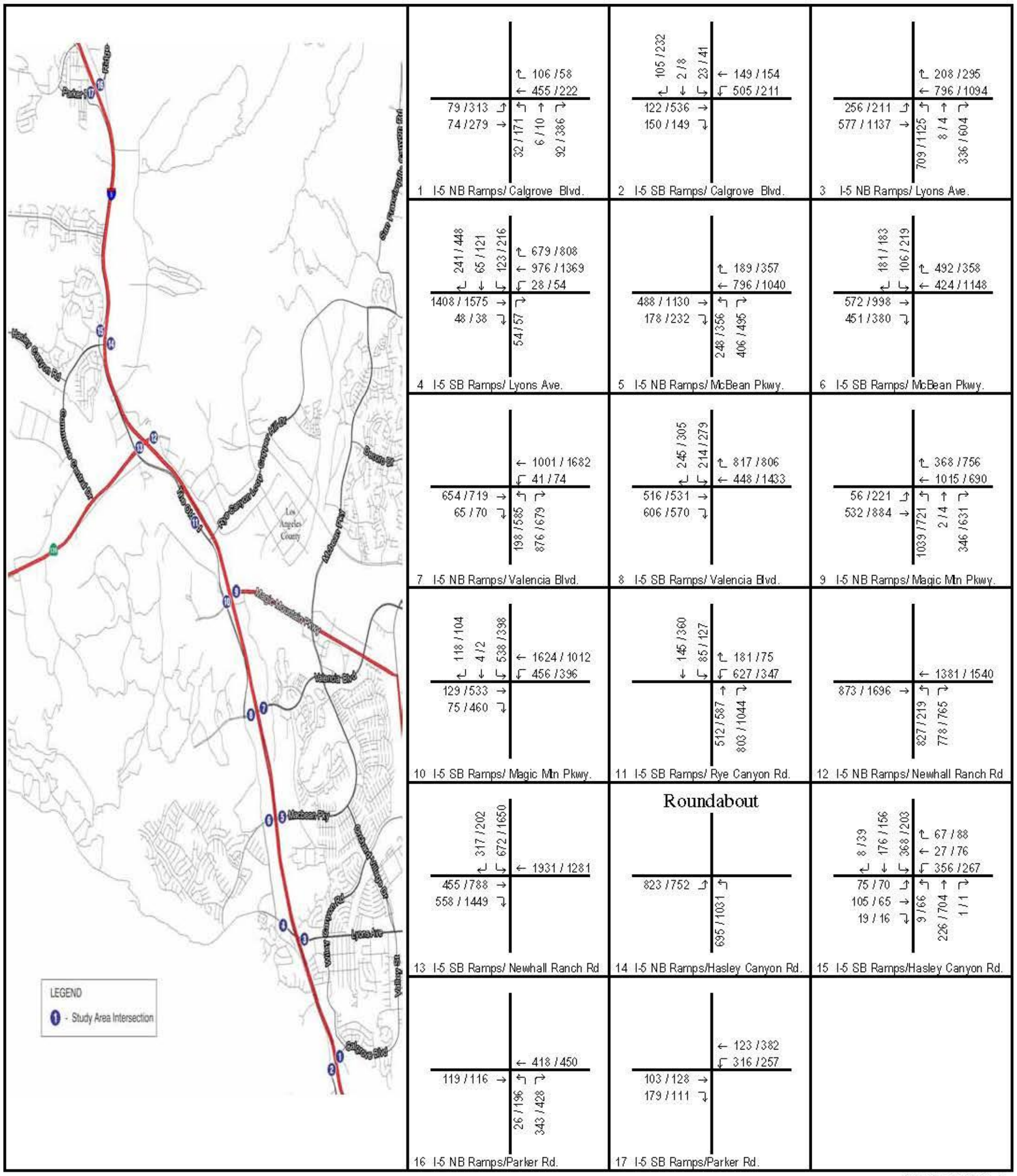


FIGURE 4

I-5/HOT Lanes Traffic Study

Year 2018 No Build Ramp Intersections Peak Hour Volumes

123 / 456 AM / PM Peak Hour Volume

07-LA-5 PM 45.4/59.0
EA#2332E Phase 1E1
0700000391

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Table 3.1.I Year 2018 No Build Intersection Peak Hour Level of Service Summary

	Intersection	2018 No Build			
		AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS
1	I-5 NB Ramps/ Calgrove Blvd.[1]	12.3	B	140.0	F
2	I-5 SB Ramps/ Calgrove Blvd.[1]	28.9	D	22.2	C
3	I-5 NB Ramps/ Pico Canyon Rd. & Lyons Ave	17.4	B	39.9	D
4	I-5 SB Ramps/ Pico Canyon Rd. & Lyons Ave	6.7	A	13.9	B
5	I-5 NB Ramps/ McBean Pkwy.	6.4	A	9.1	A
6	I-5 SB Ramps/ McBean Pkwy.	4.8	A	7.6	A
7	I-5 NB Ramps/ Valencia Blvd.	10.6	B	11.0	B
8	I-5 SB Ramps/ Valencia Blvd.	10.6	B	22.0	C
9	I-5 NB Ramps/ Magic Mtn Pkwy.	15.5	B	14.8	B
10	I-5 SB Ramps/ Magic Mtn Pkwy.	11.3	B	12.4	B
11	I-5 SB Ramps/ Rye Canyon Rd.	21.9	C	22.7	C
12	I-5 NB Ramps/ Newhall Ranch Rd (SR-126)	23.4	C	29.6	C
13	I-5 SB Ramps/ Newhall Ranch Rd (SR-126)	10.9	B	20.5	C
14	I-5 NB Ramps/Hasley Canyon Rd.[2]	12.3	B	140.8	F
15	I-5 SB Ramps/Hasley Canyon Rd.	39.6	D	27.4	C
16	I-5 NB Ramps/Parker Rd.[1]	11.7	B	15	B
17	I-5 SB Ramps/Parker Rd.[1]	31.8	D	41.1	E

Source: LSA Associates, Inc.
1 Unsignalized Intersections
2 Roundabout Intersection
Delay: seconds per vehicle
▭ - LOS E or F

Figure 3.1.5 Year 2018 HOT Ramp Intersections Peak Hour Volumes

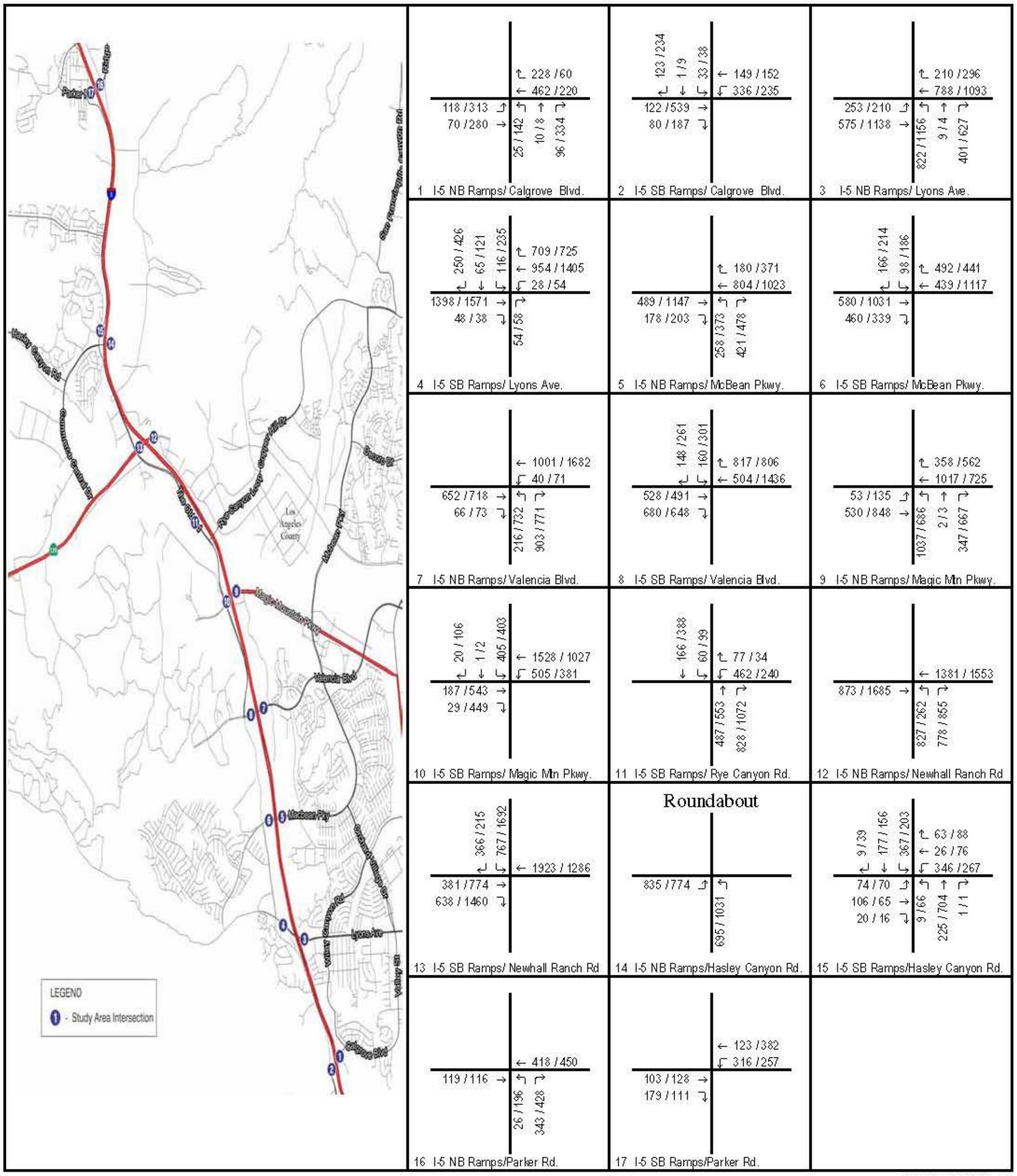

FIGURE 5

I-5/HOT Lanes Traffic Study

Year 2018 HOV/HOT Ramp Intersections Peak Hour Volumes

123 / 456 AM / PM Peak Hour Volume

07-LA-5 PM 45.4/59.0

EA#2332E Phase 1E1

0700000391

P:\CDT0903I HOT Lanes Traffic\xls\Graphics\2018 Vol.xls (10/17/2012)

Table 3.1.J Year 2018 No Build and 2018 HOT Intersection Peak Hour Level of Service Summary Comparison

Intersection		2018 No Build				2018 HOT			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	I-5 NB Ramps/ Calgrove Blvd.[1]	12.3	B	140.0	F	13.9	B	99.3	F
2	I-5 SB Ramps/ Calgrove Blvd.[1]	28.9	D	22.2	C	16.0	C	25.7	D
3	I-5 NB Ramps/ Pico Canyon Rd. & Lyons Ave	17.4	B	39.9	D	18.9	B	37.5	D
4	I-5 SB Ramps/ Pico Canyon Rd. & Lyons Ave	6.7	A	13.9	B	6.8	A	13.1	B
5	I-5 NB Ramps/ McBean Pkwy.	6.4	A	9.1	A	6.5	A	8.8	A
6	I-5 SB Ramps/ McBean Pkwy.	4.8	A	7.6	A	4.7	A	6.9	A
7	I-5 NB Ramps/ Valencia Blvd.	10.6	B	11.0	B	10.9	B	12.1	B
8	I-5 SB Ramps/ Valencia Blvd.	10.6	B	22.0	C	10.5	B	22.4	C
9	I-5 NB Ramps/ Magic Mtn Pkwy.	15.5	B	14.8	B	15.4	B	13.1	B
10	I-5 SB Ramps/ Magic Mtn Pkwy.	11.3	B	12.4	B	9.8	A	11.9	B
11	I-5 SB Ramps/ Rye Canyon Rd.	21.9	C	22.7	C	17.7	B	19.1	B
12	I-5 NB Ramps/ Newhall Ranch Rd (SR-126)	23.4	C	29.6	C	23.4	C	44.5	D
13	I-5 SB Ramps/ Newhall Ranch Rd (SR-126)	10.9	B	20.5	C	12.2	B	22.1	C
14	I-5 NB Ramps/Hasley Canyon Rd.[2]	12.3	B	140.8	F	12.9	B	148.1	F
15	I-5 SB Ramps/Hasley Canyon Rd.	39.6	D	27.4	C	38.7	D	27.4	C
16	I-5 NB Ramps/Parker Rd.[1]	11.7	B	15	B	11.7	B	15.0	B
17	I-5 SB Ramps/Parker Rd.[1]	31.8	D	41.1	E	31.8	D	41.1	E

Source: LSA Associates, Inc.
1 Unsignalized Intersections
2 Roundabout Intersection
Delay: seconds per vehicle
(shaded) - LOS E or F

3.1.3 Design Year (2035) Conditions

Caltrans has identified 2035 as the 20-year design year of the HOT lane. This year corresponds to the regional traffic modeling buildout year developed by SCAG. As such, the following analysis for the No Build condition and HOT lane alternative corresponds to this design year condition.

3.1.3.1 Basic Freeway Segments

2035 No Build. The 2035 daily, a.m., and p.m. peak-hour traffic volumes and truck percentages along the I-5 mainline for the No Build condition are presented in Table 3.1.K. It should be noted that locations that indicate 0 percent trucks are those that include a separate truck bypass lane. Table 3.1.L presents the results of the I-5 mainline LOS analysis. As Table 3.1.L indicates, 15 segments in the a.m. peak hour and 16 segments in the p.m. peak hour are forecast to operate at LOS E or F in the 2035 No Build condition.

2035 HOT Lane Alternative. The 2035 daily, a.m., and p.m. peak-hour traffic volumes and truck percentages along the I-5 mainline for the HOT lane alternative are presented in Table 3.1.M. Table 3.1.N presents the results of the I-5 mainline LOS analysis. As Table 3.1.N indicates, 10 segments in the a.m. peak hour and 8 segments in the p.m. peak hour are forecast to operate at LOS E or F in the 2035 HOT Lane Alternative. As shown in the table, this presents an improvement as compared to the No Build condition.

Table 3.1.K Year 2035 No Build Freeway Mainline Volumes

I-5 Basic Segment	AM Peak Hour				PM Peak Hour				ADT	
	Southbound		Northbound		Southbound		Northbound			
	Volume	Truck %	Volume	Truck %	Volume	Truck %	Volume	Truck %	SB	NB
North of Parker Road	8,544	17%	5,510	25%	5,246	21%	8,263	14%	76,255	81,762
Between Parker Road and Hasley Canyon Road	9,134	17%	5,864	25%	5,703	21%	8,910	14%	84,441	90,263
Between Hasley Canyon Road and SR -126	8,817	17%	5,677	24%	5,658	20%	8,695	14%	84,079	88,997
Between SR -126 and Rye Canyon Road	8,503	17%	5,863	22%	6,113	19%	8,271	13%	85,680	92,088
Between Rye Canyon Road and Magic Mountain Parkway	8,455	17%	5,863	21%	6,771	17%	8,271	13%	91,397	92,088
Between Magic Mountain Parkway and Valencia Boulevard	8,273	18%	6,862	21%	7,095	17%	8,407	14%	95,540	98,998
Between Valencia Boulevard and McBean Parkway	9,244	16%	7,642	18%	7,842	14%	9,420	12%	105,715	110,003
Between McBean Parkway and Lyons Ave./Pico Canyon Road	9,984	14%	7,710	16%	8,035	13%	9,694	11%	108,199	110,770
Between Lyons Ave./Pico Canyon Road and Calgrove Boulevard	10,393	0%	8,263	15%	7,965	0%	11,102	10%	123,550	125,426
Between Truck Bypass and Calgrove Boulevard	11,331	0%	7,038	0%	8,155	0%	10,404	0%	127,435	123,852
Between SR-14 and Truck Bypass	11,331	0%	7,038	0%	8,155	0%	10,404	0%	127,435	123,852

Source: LSA Associates, Inc.
SB-Southbound
NB-Northbound

Table 3.1.L Year 2035 No Build Freeway Mainline Peak Hour Level of Service Summary

Direction	Basic Segment	2035 No Build					
		AM			PM		
		Speed (mph)	Density	LOS	Speed (mph)	Density	LOS
Northbound	SR-14 to Truck Bypass	<52.2	>45	F	<52.2	>45	F
	Truck Bypass to Calgrove Boulevard	65.8	29.7	D	<52.2	>45	F
	Calgrove Boulevard to Pico Canyon Road/Lyons Avenue	<52.2	>45	F	<52.2	>45	F
	Pico Canyon Road/Lyon Avenue to McBean Parkway	<52.2	>45	F	<52.2	>45	F
	McBean Parkway to Valencia Boulevard	56.8	40.6	E	<52.2	>45	F
	Valencia Boulevard to Magic Mountain Parkway	62.7	33.5	D	<52.2	>45	F
	Magic Mountain Parkway to Newhall Ranch Road (SR-126)	67.8	26.6	D	<52.2	>45	F
	Newhall Ranch Road (SR-126) to Hasley Canyon Road	68.3	25.8	C	<52.2	>45	F
	Hasley Canyon Road to Parker Road	67.5	27.1	D	<52.2	>45	F
	Parker Road to Lake Hughes	68.7	25.0	C	<52.2	>45	F
Southbound	Lake Hughes to Parker Road	<52.2	>45	F	69.4	23.1	C
	Parker Road to Hasley Canyon Road	<52.2	>45	F	68.4	25.5	C
	Hasley Canyon Road to Newhall Ranch Road (SR-126)	<52.2	>45	F	68.6	25.1	C
	Newhall Ranch Road (SR-126) to Rye Canyon Road	<52.2	>45	F	67.2	27.6	D
	Rye Canyon Road to Magic Mountain Parkway	<52.2	>45	F	64.2	31.7	D
	Magic Mountain Parkway to Valencia Boulevard	<52.2	>45	F	57.0	40.3	E
	Valencia Boulevard to McBean Parkway	<52.2	>45	F	<52.2	>45	F
	McBean Parkway to Pico Canyon Road/Lyon Avenue	<52.2	>45	F	54.5	43.5	E
	Pico Canyon Road/Lyon Avenue to Calgrove Boulevard	<52.2	>45	F	59.9	36.8	E
	Calgrove Boulevard to Truck Bypass Route	<52.2	>45	F	58.3	38.7	E
	Truck Bypass Route to SR-14	<52.2	>45	F	<52.2	>45	F

Source: LSA Associates, Inc.
Mph: miles-per-hour
Density: pc/mi/ln = passenger cars per mile per lane
▢ - LOS E or F

Table 3.1.M Year 2035 HOT Freeway Mainline Volumes

I-5 Basic Segment	AM Peak Hour				PM Peak Hour				ADT	
	Southbound		Northbound		Southbound		Northbound			
	Volume	Truck %	Volume	Truck %	Volume	Truck %	Volume	Truck %	SB	NB
North of Parker Road	8,548	23%	5,511	27%	5,247	24%	8,318	20%	76,267	82,015
Between Parker Road and Hasley Canyon Road	7,433	23%	5,514	27%	5,345	24%	7,272	20%	84,562	90,653
Between Hasley Canyon Road and SR -126	7,225	23%	5,326	26%	5,348	23%	7,040	19%	84,702	89,314
Between SR -126 and Rye Canyon Road	7,003	22%	4,757	25%	5,784	21%	6,676	19%	86,440	92,744
Between Rye Canyon Road and Magic Mountain Parkway	7,012	24%	4,757	23%	5,613	20%	6,676	18%	92,602	92,744
Between Magic Mountain Parkway and Valencia Boulevard	6,945	21%	5,764	23%	5,945	19%	7,211	19%	97,053	101,220
Between Valencia Boulevard and McBean Parkway	8,266	17%	6,618	19%	6,831	16%	8,516	16%	108,606	113,552
Between McBean Parkway and Lyons Ave./Pico Canyon Road	9,244	15%	6,695	17%	6,903	15%	8,865	14%	111,723	114,564
Between Lyons Ave./Pico Canyon Road and Calgrove Boulevard	9,312	0%	7,002	16%	6,919	0%	10,299	12%	126,833	129,352
Between Truck Bypass and Calgrove Boulevard	9,938	0%	5,873	0%	7,059	0%	9,424	0%	129,432	127,585
Between SR-14 and Truck Bypass	9,938	0%	5,873	0%	7,059	0%	9,424	0%	129,432	127,585

Source: LSA Associates, Inc.
SB-Southbound
NB-Northbound

Table 3.1.N Year 2035 No Build and 2035 HOT Freeway Mainline Peak Hour Level of Service Summary Comparison

Direction	Basic Segment	2035 No Build						2035 HOT					
		AM			PM			AM			PM		
		Speed (mph)	Density	LOS	Speed (mph)	Density	LOS	Speed (mph)	Density	LOS	Speed (mph)	Density	LOS
Northbound	SR-14 to Truck Bypass	<52.2	>45	F	<52.2	>45	F	69.3	23.5	C	<52.2	>45	F
	Truck Bypass to Calgrove Boulevard	65.8	29.7	D	<52.2	>45	F	69.3	23.5	C	<52.2	>45	F
	Calgrove Boulevard to Pico Canyon Road/Lyons Avenue	<52.2	>45	F	<52.2	>45	F	69.0	24.3	C	<52.2	>45	F
	Pico Canyon Road/Lyon Avenue to McBean Parkway	<52.2	>45	F	<52.2	>45	F	60.9	35.6	E	<52.2	>45	F
	McBean Parkway to Valencia Boulevard	56.8	40.6	E	<52.2	>45	F	64.7	31.0	D	<52.2	>45	F
	Valencia Boulevard to Magic Mountain Parkway	62.7	33.5	D	<52.2	>45	F	69.9	20.4	C	68.4	25.6	C
	Magic Mountain Parkway to Newhall Ranch Road (SR-126)	67.8	26.6	D	<52.2	>45	F	69.8	21.2	C	64.4	31.5	D
	Newhall Ranch Road (SR-126) to Hasley Canyon Road	68.3	25.8	C	<52.2	>45	F	69.1	24.0	C	61.9	34.5	D
	Hasley Canyon Road to Parker Road	67.5	27.1	D	<52.2	>45	F	68.7	25.0	C	59.6	37.2	E
	Parker Road to Lake Hughes	68.7	25.0	C	<52.2	>45	F	68.7	25.0	C	<52.2	>45	F
Southbound	Lake Hughes to Parker Road	<52.2	>45	F	69.4	23.1	C	<52.2	>45	F	69.3	23.5	C
	Parker Road to Hasley Canyon Road	<52.2	>45	F	68.4	25.5	C	57.1	40.2	E	69.1	24.0	C
	Hasley Canyon Road to Newhall Ranch Road (SR-126)	<52.2	>45	F	68.6	25.1	C	59.2	37.7	E	69.1	23.9	C
	Newhall Ranch Road (SR-126) to Rye Canyon Road	<52.2	>45	F	67.2	27.6	D	68.6	25.1	C	70.0	20.2	C
	Rye Canyon Road to Magic Mountain Parkway	<52.2	>45	F	64.2	31.7	D	68.8	25.1	C	70.0	19.5	C
	Magic Mountain Parkway to Valencia Boulevard	<52.2	>45	F	57.0	40.3	E	53.9	44.3	E	65.6	29.9	D
	Valencia Boulevard to McBean Parkway	<52.2	>45	F	<52.2	>45	F	59.6	37.2	E	68.3	25.7	C
	McBean Parkway to Pico Canyon Road/Lyon Avenue	<52.2	>45	F	54.5	43.5	E	<52.2	>45	F	63.7	32.3	D
	Pico Canyon Road/Lyon Avenue to Calgrove Boulevard	<52.2	>45	F	59.9	36.8	E	<52.2	>45	F	66.4	28.8	D
	Calgrove Boulevard to Truck Bypass Route	<52.2	>45	F	58.3	38.7	E	<52.2	>45	F	65.7	29.8	D
	Truck Bypass Route to SR-14	<52.2	>45	F	<52.2	>45	F	<52.2	>45	F	<52.2	>45	F

Source: LSA Associates, Inc.
Mph: miles-per-hour
Density: pc/mi/ln = passenger cars per mile per lane
▢ - LOS E or F

3.1.3.2 Intersections

2035 No Build. The 2035 a.m. and p.m. peak-hour traffic volumes for the ramp intersection locations are illustrated in Figure 3.1.6. Table 3.1.O presents the results of the intersection LOS analysis. As Table 3.1.O indicates, two intersections in the a.m. peak hour and three intersections in the p.m. peak hour are forecast to operate at LOS E or F in the 2035 No Build condition.

2035 HOT Lane Alternative. The 2035 a.m. and p.m. peak-hour traffic volumes for the ramp intersection locations in the HOT lane alternative are illustrated in Figure 3.1.7. Table 3.1.P presents the results of the intersection LOS analysis. As Table 3.1.P indicates, one intersection in the a.m. peak hour and three intersections in the p.m. peak hour are forecast to operate at LOS E or F in the 2035 HOT Lane Alternative. As shown in the table, this presents an improvement as compared to the No Build alternative. It should be noted that the traffic volume at the intersection of the I-5 southbound ramps/Calgrove Boulevard (at the southern end of the project) is reduced with implementation of the HOT lane. This is due to a shift in southbound vehicles that access the freeway on the northern end of the project rather than the southern end.

Figure 3.1.6 Year 2035 No Build Ramp Intersections Peak Hour Volumes

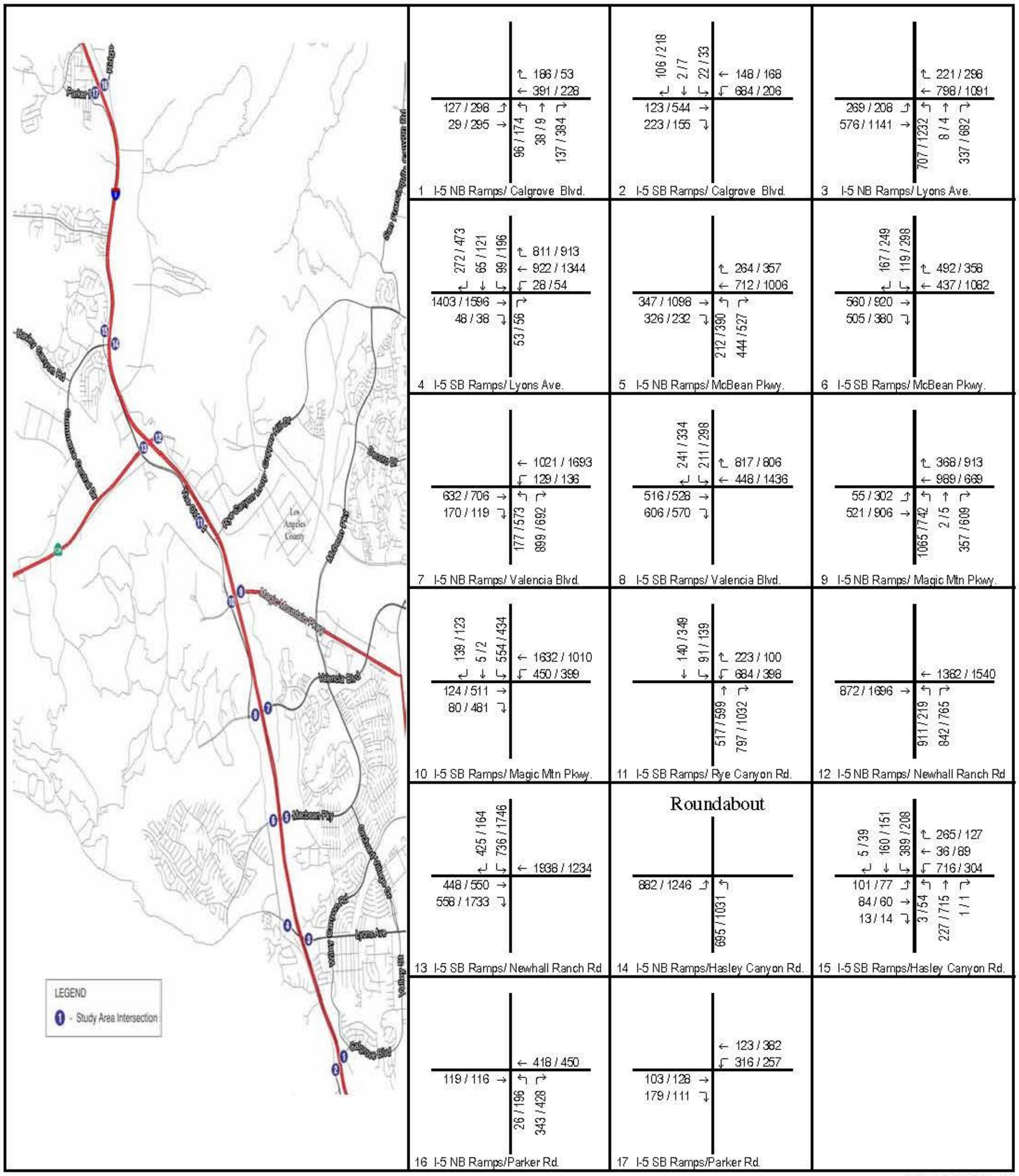

FIGURE 6

I-5/HOT Lanes Traffic Study

Year 2035 No Build Ramp Intersections Peak Hour Volumes

123 / 456 AM / PM Peak Hour Volume

07-LA-5 PM 45.4/59.0

EA#2332E Phase 1E1

0700000391

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Table 3.1.O Year 2035 No Build Intersection Peak Hour Level of Service Summary

	Intersection	2035 No Build			
		AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS
1	I-5 NB Ramps/ Calgrove Blvd.[1]	23.6	C	136.4	F
2	I-5 SB Ramps/ Calgrove Blvd.[1]	109.8	F	19.6	C
3	I-5 NB Ramps/ Pico Canyon Rd. & Lyons Ave	17.8	B	43.8	D
4	I-5 SB Ramps/ Pico Canyon Rd. & Lyons Ave	7.6	A	14.9	B
5	I-5 NB Ramps/ McBean Pkwy.	6.2	A	9.7	A
6	I-5 SB Ramps/ McBean Pkwy.	4.9	A	8.8	A
7	I-5 NB Ramps/ Valencia Blvd.	11.7	B	11.3	B
8	I-5 SB Ramps/ Valencia Blvd.	10.5	B	22.5	C
9	I-5 NB Ramps/ Magic Mtn Pkwy.	15.6	B	16.0	B
10	I-5 SB Ramps/ Magic Mtn Pkwy.	11.5	B	12.9	B
11	I-5 SB Ramps/ Rye Canyon Rd.	24.9	C	24.3	C
12	I-5 NB Ramps/ Newhall Ranch Rd (SR-126)	27.9	C	29.6	C
13	I-5 SB Ramps/ Newhall Ranch Rd (SR-126)	11.7	B	23.6	C
14	I-5 NB Ramps/Hasley Canyon Rd.[2]	15.5	C	313.5	F
15	I-5 SB Ramps/Hasley Canyon Rd.	66.5	E	29.8	C
16	I-5 NB Ramps/Parker Rd.[1]	11.7	B	15.0	B
17	I-5 SB Ramps/Parker Rd.[1]	31.8	D	41.1	E

Source: LSA Associates, Inc.
1 Unsignalized Intersections
2 Roundabout Intersection
Delay: seconds per vehicle
(shaded) - LOS E or F

Figure 3.1.7 Year 2035 HOT Ramp Intersections Peak Hour Volumes

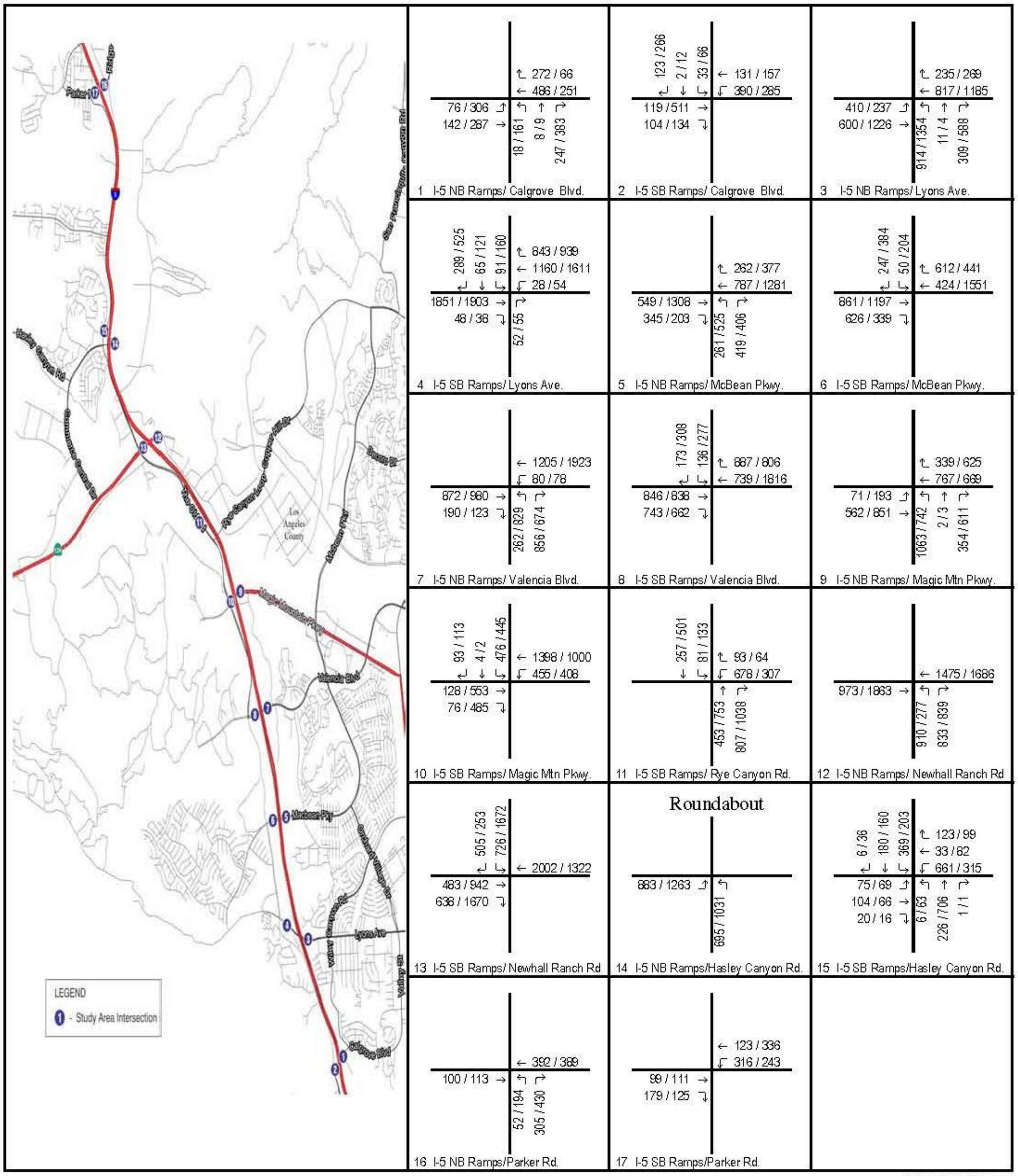

FIGURE 7

I-5/HOT Lanes Traffic Study

Year 2035 HOV/HOT Ramp Intersections Peak Hour Volumes

123 / 456 AM / PM Peak Hour Volume

07-LA-5 PM 45.4/59.0

EA#2332E Phase 1E1

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Table 3.1.P Year 2035 No Build and 2035 HOT Intersection Peak-Hour Level of Service Summary Comparison

	Intersection	2035 No Build				2035 HOT			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	I-5 NB Ramps/ Calgrove Blvd.[1]	23.6	C	136.4	F	12.2	B	134.1	F
2	I-5 SB Ramps/ Calgrove Blvd.[1]	109.8	F	19.6	C	19.1	C	67.5	F
3	I-5 NB Ramps/ Pico Canyon Rd. & Lyons Ave	17.8	B	43.8	D	32.5	C	51.5	D
4	I-5 SB Ramps/ Pico Canyon Rd. & Lyons Ave	7.6	A	14.9	B	9.3	A	22.4	C
5	I-5 NB Ramps/ McBean Pkwy.	6.2	A	9.7	A	6.5	A	10.6	B
6	I-5 SB Ramps/ McBean Pkwy.	4.9	A	8.8	A	4.9	A	13.2	B
7	I-5 NB Ramps/ Valencia Blvd.	11.7	B	11.3	B	11.7	B	13.1	B
8	I-5 SB Ramps/ Valencia Blvd.	10.5	B	22.5	C	12.7	B	38.2	D
9	I-5 NB Ramps/ Magic Mtn Pkwy.	15.6	B	16.0	B	14.8	B	14.5	B
10	I-5 SB Ramps/ Magic Mtn Pkwy.	11.5	B	12.9	B	10.2	B	13.8	B
11	I-5 SB Ramps/ Rye Canyon Rd.	24.9	C	24.3	C	23.9	C	20.4	C
12	I-5 NB Ramps/ Newhall Ranch Rd (SR-126)	27.9	C	29.6	C	29.3	C	43.7	D
13	I-5 SB Ramps/ Newhall Ranch Rd (SR-126)	11.7	B	23.6	C	12.2	B	22.0	C
14	I-5 NB Ramps/Hasley Canyon Rd.[2]	15.5	C	313.5	F	15.5	C	319.4	F
15	I-5 SB Ramps/Hasley Canyon Rd.	66.5	E	29.8	C	67.9	E	29.5	C
16	I-5 NB Ramps/Parker Rd.[1]	11.7	B	15	B	11.2	B	14.2	B
17	I-5 SB Ramps/Parker Rd.[1]	31.8	D	41.1	E	31.2	D	30.7	D

Source: LSA Associates, Inc.
1 Unsignalized Intersections
2 Roundabout Intersection
Delay: seconds per vehicle
▢ - LOS E or F

3.1.4 Environmental Consequences

The proposed HOT lanes would not generate traffic. It is intended to facilitate the redistribution of existing and future traffic demand based on full build-out of land uses allowed by the City of Santa Clarita and County of Los Angeles.

The implementation of the HOT lanes would improve the mainline LOS along I-5 between SR-14 and Parker Road compared to the No Build condition. There would be fewer intersections that operate at LOS E or F with the HOT lanes as compared to the No Build in 2035. The HOT Lane project would reduce congestion and delay and provide a beneficial impact to travel time in the project corridor by removing vehicles from the mixed-flow lanes into the HOT lane and reducing the interaction of trucks and passenger vehicles.

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3.2 Air Quality

The analysis of impacts of the proposed HOT lane project to air quality is based on the *Hot Spot Analysis for PM2.5 and PM10* (Caltrans, November 2012), *CO Analysis* (Caltrans, January 2013), *MSAT Analysis* (Caltrans, January 2013) and *Analysis for Greenhouse Gas and Other Pollutants* (Caltrans, January 2013). These reports update the findings of the *Air Quality Analysis* (LSA Associates, Inc., September 2008), which was completed for the Final EIR/FONSI.

3.2.1 Regulatory Setting

The Federal Clean Air Act (FCAA), as amended in 1990, is the federal law that governs air quality while the California Clean Air Act of 1988 is its companion state law. These laws, and related regulations by the United States Environmental Protection Agency (U.S. EPA) and the California Air Resources Board (ARB), set standards for the quantity of pollutants that can be in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). NAAQS and state ambient air quality standards have been established for six transportation-related criteria pollutants that have been linked to potential health concerns. The criteria pollutants are: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM), broken down for regulatory purposes into particles of 10 micrometers or smaller—(PM_{10}) and particles of 2.5 micrometers and smaller—($PM_{2.5}$), lead (Pb), and sulfur dioxide (SO_2). In addition, state standards exist for visibility reducing particles, sulfates, hydrogen sulfide (H_2S), and vinyl chloride. The NAAQS and state standards are set at a level that protects public health with a margin of safety, and are subject to periodic review and revision. Both state and federal regulatory schemes also cover toxic air contaminants (air toxics). Some criteria pollutants are also air toxics or may include certain air toxics within their general definition.

Federal and state air quality standards and regulations provide the basic scheme for project-level air quality analysis under the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). In addition to this type of environmental analysis, a parallel "Conformity" requirement under the FCAA also applies.

The Federal Clean Air Act Section 176(c) prohibits the U.S. Department of Transportation (USDOT) and other federal agencies from funding, authorizing, or approving plans, programs or projects that are not first found to conform to State Implementation Plan (SIP) for achieving the goals of Clean Air Act requirements related to the NAAQS. “Transportation Conformity” takes place on two levels: the regional—or, planning and programming level—and the project level. The proposed project must conform at both levels to be approved. Conformity requirements apply only in nonattainment and “maintenance” (former nonattainment) areas for the NAAQS, and only for the specific NAAQS that are or were violated. U.S. EPA regulations at 40 Code of Federal Regulations (CFR) 93 govern the conformity process.

Regional conformity is concerned with how well the regional transportation system supports plans for attaining the standards set for carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), and in some areas sulfur dioxide (SO_2). California has attainment or maintenance areas for all of these transportation-related “criteria pollutants” except SO_2, and also has a nonattainment area for lead (Pb). However, lead is not currently required by the FCAA to be covered in transportation conformity analysis. Regional conformity is based on Regional Transportation Plans (RTPs) and Federal Transportation Improvement Programs (TIPs) that include all of the transportation projects planned for a region over a period of at least 20 years (for the RTP), and 4 years (for the TIP). RTP and TIP conformity is based on use of travel demand and air quality models to determine whether or not the implementation of those projects would conform to emission budgets or other tests showing that requirements of the Clean Air Act and the SIP are met. If the conformity analysis is successful, the Metropolitan Planning Organization (MPO), Federal Highway Administration (FHWA), and Federal Transit Administration (FTA), make the determinations that the RTP and TIP are in conformity with the SIP for achieving the goals of the Clean Air Act. Otherwise, the projects in the RTP and/or TIP must be modified until conformity is attained. If the design concept, scope, and “open-to-traffic” schedule of a proposed transportation project are the same as described in the RTP and the TIP, 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 (PM_{10} or $PM_{2.5}$). A region is “nonattainment” if one or more of the monitoring stations in the region measures violation of the relevant standard, and U.S. EPA officially designates the area nonattainment. Areas that were previously designated as nonattainment areas but subsequently meet the standard may be officially redesignated to attainment by U.S. EPA, and are then 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 procedural and documentation standards for projects that require a "hot spot" analysis. In general, projects must not cause the "hot spot" related standard to be violated, and must not cause any increase in the number and severity of violations in nonattainment areas. 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.

3.2.2 Affected Environment

The project area is located in the Santa Clarita region of Los Angeles County, an area within the South Coast Air Basin (Basin) that includes Orange County and the nondesert portions of Los Angeles, Riverside, and San Bernardino Counties. Air quality regulation in the Basin is administered by the South Coast Air Quality Management District (SCAQMD), a regional agency created for the Basin.

3.2.2.1 Climatic Conditions

The climatic and meteorological conditions in the study area remain the same as were described in Chapter 2.14 of the Final EIR/FONSI for the I-5 HOV and Truck Lanes project.

3.2.2.2 Criteria Pollutants

The NAAQS have been established for six major pollutants, termed "criteria" pollutants. Criteria pollutants are defined as those pollutants for which the federal and State governments have established ambient air quality standards, or criteria, for outdoor concentrations in order to protect public health. In California, the State has implemented air quality standards or criteria for the six pollutants known as the California Ambient Air Quality Standards (CAAQS). Table 3.2.A delineates the NAAQS and CAAQS for the criteria pollutants and summarizes their health effects and sources.

Table 3.2.A: Ambient Air Quality Standards

STATE AND FEDERAL CRITERIA AIR POLLUTANT STANDARDS, EFFECTS, AND SOURCES						
Pollutant	**Averaging Time**	**State [9] Standard**	**Federal [9] Standard**	**Principal Health and Atmospheric Effects**	**Typical Sources**	**Attainment Status**
Ozone (O_3) [2]	1 hour 8 hours 8 hours (conformity process [5])	0.09 ppm 0.070 ppm ---	--- [4] 0.075 ppm [6] 0.08 ppm (4th highest in 3 years)	High concentrations irritate lungs. Long-term exposure may cause lung tissue damage and cancer. Long-term exposure damages plant materials and reduces crop productivity. Precursor organic compounds include many known toxic air contaminants. Biogenic VOC may also contribute.	Low-altitude ozone is almost entirely formed from reactive organic gases/volatile organic compounds (ROG or VOC) and nitrogen oxides (NOx) in the presence of sunlight and heat. Major sources include motor vehicles and other mobile sources, solvent evaporation, and industrial and other combustion processes.	Federal: Nonattainment-Extreme State: Nonattainment
Carbon Monoxide (CO)	1 hour 8 hours 8 hours (Lake Tahoe)	20 ppm 9.0 ppm [1] 6 ppm	35 ppm 9 ppm ---	CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen. CO also is a minor precursor for photochemical ozone.	Combustion sources, especially gasoline-powered engines and motor vehicles. CO is the traditional signature pollutant for on-road mobile sources at the local and neighborhood scale.	Federal: Attainment-Maintenance State: Attainment
Respirable Particulate Matter (PM_{10}) [2]	24 hours Annual	50 µg/m³ 20 µg/m³	150 µg/m³ --- [2]	Irritates eyes and respiratory tract. Decreases lung capacity. Associated with increased cancer and mortality. Contributes to haze and reduced visibility. Includes some toxic air contaminants. Many aerosol and solid compounds are part of PM_{10}.	Dust- and fume-producing industrial and agricultural operations; combustion smoke; atmospheric chemical reactions; construction and other dust-producing activities; unpaved road dust and re-entrained paved road dust; natural sources (wind-blown dust, ocean spray).	Federal: Nonattainment-Serious State: Nonattainment
Fine Particulate Matter ($PM_{2.5}$) [2]	24 hours Annual 24 hours (conformity process [5])	--- 12 µg/m³ ---	35 µg/m³ 15.0 µg/m³ 65 µg/m³ (4th highest in 3 years)	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and produces surface soiling. Most diesel exhaust particulate matter – a toxic air contaminant – is in the $PM_{2.5}$ size range. Many aerosol and solid compounds are part of $PM_{2.5}$.	Combustion including motor vehicles, other mobile sources, and industrial activities; residential and agricultural burning; also formed through atmospheric chemical (including photochemical) reactions involving other pollutants including NOx, sulfur oxides (SOx), ammonia, and ROG.	Federal: Nonattainment State: Nonattainment
Nitrogen Dioxide (NO_2)	1 hour Annual	0.18 ppm 0.030 ppm	0.100 ppm [7] (98th percentile over 3 years) 0.053 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. Contributes to acid rain. Part of the "NOx" group of ozone precursors.	Motor vehicles and other mobile sources; refineries; industrial operations.	Federal: Attainment-Unclassified State: Nonattainment
Sulfur Dioxide (SO_2)	1 hour	0.25 ppm	0.075 ppm [8] (98th percentile over 3	Irritates respiratory tract; injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, steel. Contributes to acid	Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing; some natural	Federal: Attainment State: Attainment

STATE AND FEDERAL CRITERIA AIR POLLUTANT STANDARDS, EFFECTS, AND SOURCES						
Pollutant	**Averaging Time**	**State [9] Standard**	**Federal [9] Standard**	**Principal Health and Atmospheric Effects**	**Typical Sources**	**Attainment Status**
	3 hours 24 hours Annual	--- 0.04 ppm ---	years) 0.5 ppm 0.14 ppm 0.030 ppm	rain. Limits visibility.	sources like active volcanoes. Limited contribution possible from heavy-duty diesel vehicles if ultra-low sulfur fuel not used.	
Lead (Pb)[3]	Monthly Quarterly Rolling 3-month average	1.5 µg/m³ --- ---	--- 1.5 µg/m³ 0.15 µg/m³	Disturbs gastrointestinal system. Causes anemia, kidney disease, and neuromuscular and neurological dysfunction. Also a toxic air contaminant and water pollutant.	Lead-based industrial processes like battery production and smelters. Lead paint, leaded gasoline. Aerially deposited lead from gasoline may exist in soils along major roads.	Federal: Nonattainment State: Nonattainment
Sulfate	24 hours	25 µg/m³	---	Premature mortality and respiratory effects. Contributes to acid rain. Some toxic air contaminants attach to sulfate aerosol particles.	Industrial processes, refineries and oil fields, mines, natural sources like volcanic areas, salt-covered dry lakes, and large sulfide rock areas.	State Only: Attainment
Hydrogen Sulfide (H_2S)	1 hour	0.03 ppm	---	Colorless, flammable, poisonous. Respiratory irritant. Neurological damage and premature death. Headache, nausea.	Industrial processes such as: refineries and oil fields, asphalt plants, livestock operations, sewage treatment plants, and mines. Some natural sources like volcanic areas and hot springs.	State Only: Unclassified
Visibility Reducing Particles (VRP)	8 hours	Visibility of 10 miles or more (Tahoe: 30 miles) at relative humidity less than 70%	---	Reduces visibility. Produces haze. NOTE: not related to the Regional Haze program under the Federal Clean Air Act, which is oriented primarily toward visibility issues in National Parks and other "Class I" areas.	See particulate matter above.	State Only: Unclassified
Vinyl Chloride[3]	24 hours	0.01 ppm	---	Neurological effects, liver damage, cancer. Also considered a toxic air contaminant.	Industrial processes	State Only: Unclassified

Source: California Air Resources Board (June 7, 2012). http://www.arb.ca.gov/research/aaqs/aaqs2.pdf

Notes: ppm = parts per million; µg/m³ = micrograms per cubic meter; ppb=parts per billion (thousand million)

See footnotes on next page.

Footnotes:

1 Rounding to an integer value is not allowed for the State 8-hour CO standard. Violation occurs at or above 9.05 ppm. Violation of the Federal standard occurs at 9.5 ppm due to integer rounding.

2 Annual PM_{10} NAAQS revoked October 2006; was 50 $\mu g/m^3$. 24-hr. $PM_{2.5}$ NAAQS tightened October 2006; was 65 $\mu g/m^3$. In 9/09 EPA began reconsidering the $PM_{2.5}$ NAAQS; the 2006 action was partially vacated by a court decision.

3 The ARB has identified vinyl chloride and the particulate matter fraction of diesel exhaust as toxic air contaminants. Diesel exhaust particulate matter is part of PM_{10} and, in larger proportion, $PM_{2.5}$. Both the ARB and U.S. EPA have identified lead and various organic compounds that are precursors to ozone and $PM_{2.5}$ as toxic air contaminants. There are no exposure criteria for adverse health effect due to toxic air contaminants, and control requirements may apply at ambient concentrations below any criteria levels specified above for these pollutants or the general categories of pollutants to which they belong. Lead NAAQS are not required to be considered in Transportation Conformity analysis.

4 Prior to 6/2005, the 1-hour NAAQS was 0.12 ppm. The 1-hour NAAQS is still used only in 8-hour ozone early action compact areas, of which there are none in California. However, emission budgets for 1-hour ozone may still be in use in some areas where 8-hour ozone emission budgets have not been developed.

5 The 65 $\mu g/m^3$ $PM_{2.5}$ (24-hr) NAAQS was not revoked when the 35 $\mu g/m^3$ NAAQS was promulgated in 2006. Conformity requirements apply for all NAAQS, including revoked NAAQS, until emission budgets for the newer NAAQS are found adequate or SIP amendments for the newer NAAQS are completed.

6 As of 9/16/09, U.S. EPA is reconsidering the 2008 8-hour ozone NAAQS (0.075 ppm); U.S. EPA is expected to tighten the primary NAAQS to somewhere in the range of 60-70 ppb and to add a secondary NAAQS. U.S. EPA plans to finalize reconsideration and promulgate a revised standard by August 2010.

7 Final 1-hour NO_2 NAAQS published in the Federal Register on 2/9/2010, effective 3/9/2010. Initial nonattainment area designations should occur in 2012 with conformity requirements effective in 2013. Project-level hot spot analysis requirements, while not yet required for conformity purposes, are expected.

8 U.S. EPA finalized a 1-hour SO_2 standard of 75 ppb in June 2010.

9 State standards are "not to exceed" unless stated otherwise. Federal standards are "not to exceed more than once a year" or as noted above.

3.2.3 Environmental Consequences

Caltrans has developed Protocols for assessing air pollutant emissions for transportation projects and the conformity requirements that apply to the proposed project within a basin that has a "nonattainment" or an "attainment/maintenance" status. These procedures and guidelines comply with the 1990 CAA Amendments, federal conformity rules, state and local adoptions of federal conformity rules, and NEPA and CEQA 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 satisfy the conformity requirements.

3.2.3.1 Regional Air Quality Conformity

The project is identified in the latest conforming 2012 Regional Transportation Plan (RTP) and in the 2011 Federal Transportation Improvement Program (FTIP) with Amendments as LA0G440 with the following description:

Route 005: PHASE 2,CONSTRUCT HOV/HOT, TRUCK & AUX LANES (EA 2332C, PPNO 3189A & EA 2332E PPNO 3189B), SAFTETEA-LU#465. PE & RW$ ARE PROGRAMMED FOR EA 2332E ONLY.

The 2012 RTP was adopted by Southern California Association of Governments (SCAG) on April 4, 2012; and was found to conform by the FHWA on June 4, 2012. The 2013 FTIP was adopted by SCAG on September 19, 2012; and approved by the FTA/FHWA on December 14, 2012. The project is in the process of being amended in the latest RTP to revise the scope from HOV to HOT.

The proposed project (addition of high occupancy lanes) is identified as a Transportation Control Measure (TCM) and its timely implementation is a crucial element in reducing air pollutant emissions from roadway transportation sources.

3.2.3.2 Project Level Air Quality Conformity

Effective July 1, 2007 FHWA has assigned, and the Department has assumed, all the United States Department of Transportation (USDOT) Secretary's responsibilities under NEPA, also known as NEPA Delegation (6004 MOU and 6005). Air quality conformity determinations are excluded from the Pilot Program by statute 23 USC 327(a)(2)(b). As such, conformity determinations, both regional conformity and project-level conformity, will remain the responsibility of FHWA California Division for all projects assumed under the assignment.

Under NEPA Assignment, public involvement is required regarding the project-level conformity analysis for projects with an environmental document. This will be done as part of the environmental document public circulation process. Response to public comments addressing the conformity analysis will be documented in the submittal to FHWA after the circulation period.

3.2.3.3 Temporary Impacts

During construction, short-term degradation of air quality may occur due to the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and various other activities related to construction. Emissions from construction equipment also are anticipated and would include carbon monoxide (CO), nitrogen oxides (NOx), volatile organic compounds (VOCs), directly-emitted particulate matter (PM_{10} and $PM_{2.5}$), and toxic air contaminants such as diesel exhaust particulate matter. Ozone is a regional pollutant that is derived from NOx and VOCs in the presence of sunlight and heat.

Site preparation and roadway construction typically involves clearing, cut-and-fill activities, grading, removing or improving existing roadways, building bridges, 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. These activities could temporarily generate enough PM_{10}, $PM_{2.5}$, and small amounts of CO, SO_2, NOx, and VOCs to be of concern. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site could deposit mud on local streets, which could be an additional source of airborne dust after it dries. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} 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 over greater distances from the construction site.

Construction activities for large development projects are estimated by the U.S. EPA to add 1.2 tons of fugitive dust per acre of soil disturbed per month of activity. If water or other soil stabilizers are used to control dust, the emissions can be reduced by up to 50 percent. Caltrans' Standard Specifications (Section 14-9.02) pertaining to dust minimization requirements requires use of water or dust palliative compounds and will reduce potential fugitive dust emissions during construction.

In addition to dust-related PM_{10} emissions, heavy-duty trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO_2, NOx, VOCs and some soot particulate (PM_{10} and $PM_{2.5}$) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while those 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 parts per million (ppm) or more of sulfur, whereas on-road diesel is restricted to less than 15 ppm of sulfur. However, under California law and ARB regulations, off-road diesel fuel used in California must meet the same sulfur and other standards as on-road diesel fuel (not more than 15 ppm), so SO_2-related issues due to diesel exhaust will be minimal. Some phases of construction, particularly asphalt paving, would result in short-term odors in the immediate area of each paving site(s). Such odors would be quickly dispersed below detectable thresholds as distance from the site(s) increases.

According to the project schedules, the construction will not last more than 5 years. Construction-related emissions due to this project are considered temporary as defined in 40 CFR 93.123(c)(5). This project will comply with the SCAQMD Fugitive Dust Rules (Rule 403) for any fugitive dusts emitted during the construction. Excavation, transportation, placement, and handling of excavated soils shall 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 dusts from earthwork operations. The project is required to comply with any state, federal, and/or local rules and regulations developed as a result of implementing control and mitigation measures proposed as part of their respective SIPs.

Implementation of the following measures, some of which may also be required for other purposes such as storm water 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 14-9-01 specifically 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 CA 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 to existing communities.
- Locate equipment and materials storage sites as far away from residential and park uses as practical. Keep construction areas clean and orderly.
- Near sensitive air receptors, establish Environmentally Sensitive Areas (ESAs) or their equivalent within which construction activities involving the 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 emission of dust (particulate matter) during transportation.
- Promptly and regularly remove dust and mud that are deposited on paved, public roads due to 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 and may need to use controls such as dampened straw.

Naturally Occurring Asbestos (NOA)

Asbestos is a term used for several types of naturally occurring fibrous minerals that are a human health hazard when airborne. The most common type of asbestos is chrysotile, but other types such as tremolite and actinolite are also found in California. Asbestos is classified as a known human carcinogen by state, federal, and international agencies and was identified as a toxic air contaminant by the CARB in

1986. All types of asbestos are hazardous and may cause lung disease and cancer. Asbestos can be released from serpentinite and ultramafic rocks when the rock is broken or crushed. Asbestos may be released to the atmosphere due to vehicular traffic on unpaved roads, during grading for development projects, and at quarry operations. Natural weathering and erosion processes can act on asbestos bearing rock and make it easier for asbestos fibers to become airborne if such rock is disturbed.

The California Department of Conservation, Division of Mines and Geology have developed a map of the state showing the general location of ultramafic rock in the state. Los Angeles County is one of the Counties identified as one of the Counties containing serpentinite and ultramafic rock. However, only the Catalina Island portion of Los Angeles County has been found to contain such rock; hence, it is not found in the project area. Therefore, no potential impacts from naturally occurring asbestos during project construction would occur.

3.2.3.4 Permanent Impacts

The following sections discuss the updated air quality analysis completed for this Supplemental due to the change in project scope.

Carbon Monoxide

Carbon Monoxide is emitted directly from vehicles and is a major issue at the project level. Analysis for CO is based on the Caltrans/University of California Davis (UCD) CO Protocol, which includes both a screening procedure and a quantitative analysis method. A screening analysis was conducted to determine whether the project would result in any CO hot spots. Based on the screening analysis the proposed project is anticipated to increase delays at a number of intersections.

Section 4.7.2 of the CO Protocol recommends selecting one of the worst-case locations in the region where attainment has been demonstrated and comparing it to the “build” scenario of the project with a similar configuration. Among the 17 intersections that were analyzed, the I-5 Southbound Ramps and Lyons Avenue intersection was selected for its configuration similar to the intersection in the attainment plan. The I-5 Southbound Ramps and Lyons Avenue intersection was evaluated to likely worsen air quality based on Section 4.7.1 of the CO Protocol; and resulted in increase in its peak-hourly volumes when compared to those for the no-build conditions. The intersection of Wilshire Boulevard and Veteran Avenue from the 2003 Air Quality Management Plan (AQMP) was selected for comparison with the intersection of I-5 Southbound Ramps and Lyons Avenue to evaluate whether the project would be suspected of resulting in higher CO concentrations, based on criteria set forth in the CO Protocol.

As the result of the comparison analysis, all of the criteria were satisfied for the I-5 Southbound Ramps and Lyons Avenue intersection under the HOT lane conditions. According to the CO Protocol, when all the criteria are satisfied, there is no reason to expect higher concentrations at the project intersection than at the Wilshire Boulevard and Veteran Avenue intersection where attainment has been demonstrated. The evaluation of CO hot-spot for the project is thus satisfactory and no further analysis, such as modeling, is deemed necessary.

Particulate Matter (PM_{10} and $PM_{2.5}$)

Particulate Matter (PM_{10} and $PM_{2.5}$) refers to airborne particles that are less than 10 microns in diameter (PM_{10}) and less than 2.5 microns in diameter ($PM_{2.5}$). Particulate matter is both a regional and project-level issue. Particulate matter is both directly emitted and, especially for $PM_{2.5}$, a result of secondary formation based on nitrogen oxides (NOx), volatile organic compounds (VOC), sulfates (SOx), and ammonia (NH3). As with ozone, secondary pollution forms some distance away from the precursor emission sources, and up to several hours later. Regional PM is primarily a winter nighttime product, since cool, damp, stable weather is needed to support the chemical reactions that produce it. Directly-emitted PM_{10} and $PM_{2.5}$ has been determined to be a conformity issue in California.

A Qualitative $PM_{2.5}$ and PM_{10} hot-spot analysis (Caltrans, November 2012) was conducted based on the *Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* jointly published by EPA and FHWA. The $PM_{2.5}$ and PM_{10} hot-spot analysis was submitted at the Transportation Conformity Working Group (TCWG) on November 27, 2012. It was concurred by the TCWG that the hot-spot analysis was acceptable for NEPA circulation.

An ambient air monitoring station (Santa Clarita – Placerita station) within the SCAQMD network is located approximately 2 mile northeast of the I-5 and approximately 1.8 mile northwest from SR-14. Although the Santa Clarita – Placerita station is located relatively close to the proposed project, it does not monitor $PM_{2.5}$. Ambient $PM_{2.5}$ data were therefore obtained from the Burbank monitoring station, and were reviewed to establish the current ambient background level within the project limits and to help evaluate future localized pollutant concentrations as affected by the proposed projects. Figure 3.2.1 illustrates the proximity of this monitoring station to the freeway and to the proposed project.

Table 3.2.B summarizes ambient $PM_{2.5}$ and PM_{10} data monitored at the Burbank and Santa Clarita – Placerita monitoring stations; and provides a comparison between the levels of ambient PM_{10} concentrations at both monitoring stations. As noted in the table, ambient PM_{10} concentrations were measured higher at the Burbank monitoring station than at the Santa Clarita – Placerita station for most of the last 6-year period. Based on the comparison of the traffic volumes, land uses, and the proximity to the freeway, the ambient concentration data measured at the Burbank monitoring station are thus deemed representative for comparison to the proposed project.

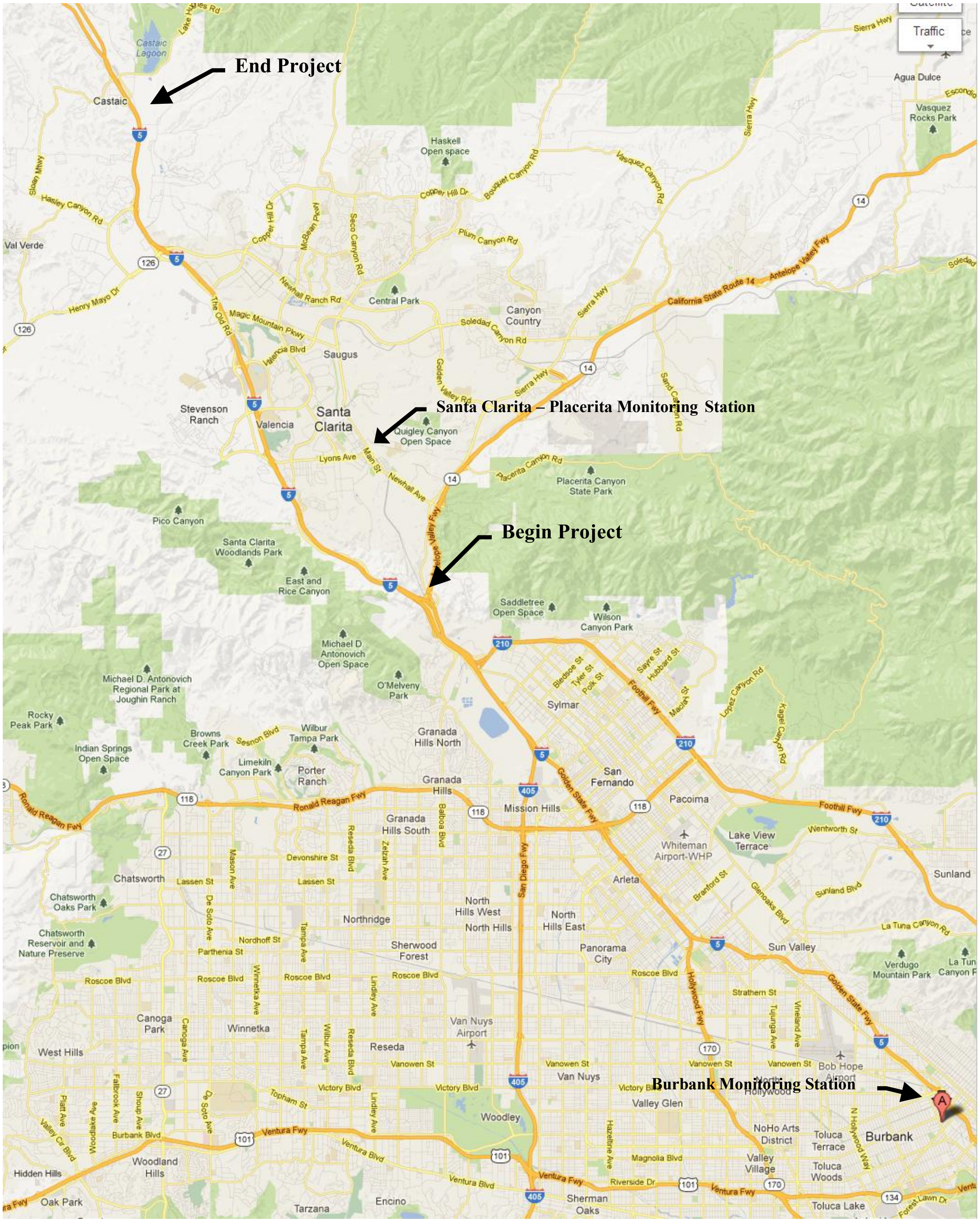
Table 3.2.B Ambient $PM_{2.5}$ and PM_{10} Monitoring Data at Santa Clarita – Placerita and Burbank Stations

(Measurements in μg/m³)	2006	2007	2008	2009	2010	2011
$PM_{2.5}$ 24-hour average[a]	43	50	35	34	32	34
$PM_{2.5}$ annual average[a]	16.5	16.9	13.9	14.3	12.4	13.2
PM_{10} 24-hour average (First Max)[a]	71	109	66	80	51	61
PM_{10} 24-hour average (First Max)[b]	53	131	91	56	40	45

Source: Qualitative $PM_{2.5}$ and PM_{10} Hot-Spot Analysis (Caltrans, November 2012)
Note: [a] measured at the Burbank monitoring station
[b] measured at the Santa Clarita – Placerita station

In accordance with the March 2006 Guidance, the hot-spot analysis was based on directly emitted $PM_{2.5}$ and PM_{10} emissions and has considered tailpipe, brake wear, and tire wear $PM_{2.5}$ and PM_{10} emissions. Precursors of particulate matter and secondary particles were not considered, but they are considered as part of the regional emission analysis prepared for the conforming RTP and TIP. Vehicles cause dust from paved and unpaved roads to be re-entrained, or re-suspended, in the atmosphere. The re-entrained $PM_{2.5}$ road dust has also been considered in the analysis.

Figure 3.2.1 Location of Air Monitoring Stations and Project Limits



Source: Qualitative $PM_{2.5}$ and PM_{10} Hot-Spot Analysis (Caltrans, November 2012)

Direct and re-entrained $PM_{2.5}$ and PM_{10} emissions are estimated using the current and future traffic data obtained for 9 individual segments along the I-5 corridor within the project limits. Another set of direct and re-entrained $PM_{2.5}$ and PM_{10} emissions are estimated based on the current and future traffic data obtained for the surrounding area illustrated in Figure 3.2.2. A summary of direct and re-entrained $PM_{2.5}$ and PM_{10} emissions data along the I-5 corridor as well as for within the surrounding area is presented in Table 3.2.C.

Table 3.2.C Summary of the current and future PM10 and PM2.5 emissions estimate

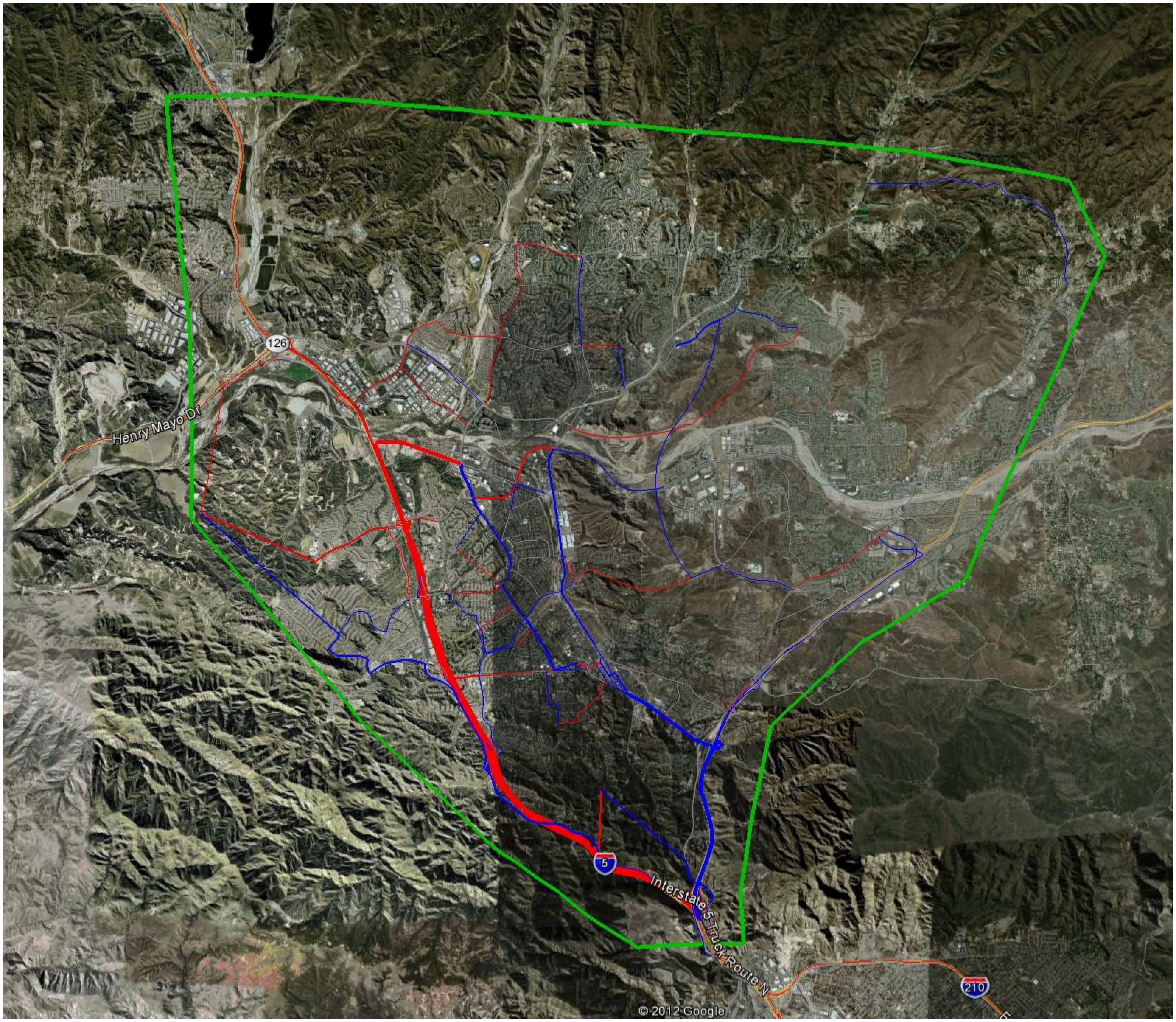
Emissions in lb/day		Project Corridor				Surrounding Area			
		PM_{10}		$PM_{2.5}$		PM_{10}		$PM_{2.5}$	
		Direct	Re-ent	Direct	Re-ent	Direct	Re-ent	Direct	Re-ent
2010	**Current**	241.6	325.1	167.1	81.3	726.1	2,331.3	481.4	582.8
2018	**No-Build**	233.7	376.4	153.8	94.1	687.6	2,650.2	434.6	662.6
	HOT	240.0	383.6	158.3	95.9	696.3	2,636.3	438.7	659.1
2035	**No-Build**	271.7	434.1	176.4	108.5	737.2	2,982.8	447.9	745.7
	HOT	265.3	441.4	168.6	110.3	733.2	2,961.9	446.8	740.5

Source: Qualitative $PM_{2.5}$ and PM_{10} Hot-Spot Analysis (Caltrans, November 2012)

A summary of $PM_{2.5}$ and PM_{10} emissions in Table 3.2.C indicates that the implementation of the project alternatives would result in increase in $PM_{2.5}$ and PM_{10} emissions along the proposed I-5 corridor when compared to the No-Build scenario. Traffic volumes are projected to increase by about 2% when the HOT lanes are added. It should be noted also that the project proposes to improve speeds along the I-5 corridor and to increase person-carrying efficiency with the proposed high occupancy lanes.

The effect of implementing the project is better captured in the emissions estimate from within the surrounding, but localized, areas illustrated in Figure 3.2.2. Overall average traffic volumes along the I-5 project corridor are projected to increase with the implementation of the proposed project. In addition, implementation of the project would result in slight increase in the overall Vehicle Miles Traveled (VMT) within the surrounding area. VMT is the number of miles traveled nationally by vehicles for a period of 1 year. Despite the increase in the overall VMTs,

Figure 3.2.2 Limits of surrounding area



implementation of the project would result in lowering emissions of combined $PM_{2.5}$ and PM_{10} in the surrounding area when compared to the No-Build. This decrease in the PM emissions in the surrounding area is anticipated because the HOT lane project proposes to improve operations to facilitate the movement of people, freight, and goods, reduce congestion along the I-5 corridor and affect traffic distribution in the surrounding area.

Historical meteorology and climate data support that the regional and local meteorological and climatic conditions have been relatively consistent within the last 30 years and likely consistency is anticipated through the horizon year of 2035. In addition, no significant changes are anticipated in the current general terrain and geographic locations of the projects in relation to the coastal SCAB areas.

Based on the traffic data presented, the current average daily traffic and truck volumes along the I-5 near the Burbank monitoring station are comparable to those forecast along the proposed I-5 corridor within the project limits. Based on the recent data at the Burbank monitoring station, there is a generally declining and stabilizing trend of ambient $PM_{2.5}$ concentrations. In addition, PM_{10} concentrations monitored at the Burbank and Santa Clarita – Placerita stations have all been well below the federal standard. Based on the Final 2007 AQMP and in the Draft 2012 AQMP, further decrease in $PM_{2.5}$ and PM_{10} emissions is expected to continue in future years so that attainment of the federal 24-hour $PM_{2.5}$ standard is anticipated by 2014 with feasible control programs.

Federal regulations and the State's Diesel Risk Reduction Plan require future diesel vehicles to have substantially cleaner engines and to use fuels with lower sulfur contents. Many federal and state regulations, such as CARB's Truck and Bus Regulations, require that emissions from heavy duty trucks be reduced in future years. These federal and state requirements would help further reduce $PM_{2.5}$ and PM_{10} emissions in the future by essentially lowering per-vehicle emissions for each of the diesel vehicles.

In conclusion, the historical meteorology and climate data, ambient concentrations and their declining trends, and the Federal regulations and the State's Plan and Regulations, support the assertion that the projects will not cause new air quality violations, worsen existing violations, or delay timely attainment of the relevant NAAQS. Activities of the HOT lane project should, therefore, be considered consistent with the purpose of the SIP and concurrence from FHWA that the project conforms to the requirements of the CAA is expected.

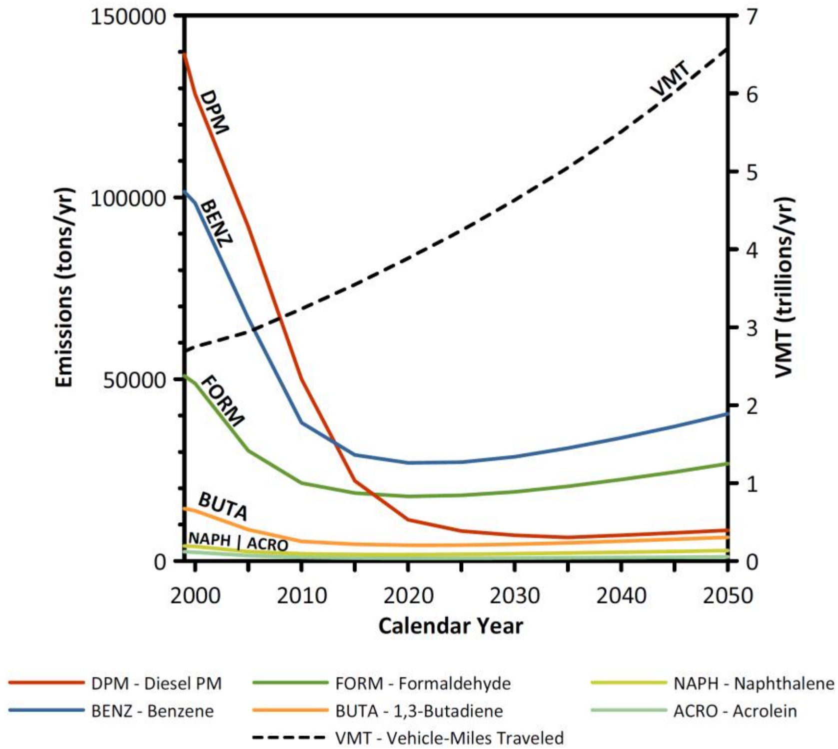
Mobile Source Air Toxics

Pollutants are generated by a wide variety of sources and enter the air, water, and soil through different media. Toxic air pollutants are those that are known to cause or suspected of causing cancer or other serious health ailments.

The Clean Air Act (CAA) Amendments of 1990 listed 188 air toxics and addressed the need to control toxic emissions from transportation. In 2001, EPA issued its first Mobile Source Air Toxics Rule, which identified 21 mobile source air toxic (MSAT) compounds as being hazardous air pollutants that required regulation. EPA issued a second MSAT Rule in February 2007, which identified seven compounds with significant contributions from mobile sources. These are acrolein, benzene, 1,3-butidiene, Diesel Particulate Matters (DPM) plus Diesel Exhaust Organic Gases (DEOG), formaldehyde, naphthalene, and polycyclic organic matter (POM). While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules.

The 2007 EPA 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 or VMT increases by 145 percent as assumed, a combined reduction of 72 percent in the total annual emission rate for the priority MSAT is projected from 1999 to 2050, as shown in Figure 3.2.3.

Figure 3.2.3 National MSAT Emission Trends 1999 – 2050 For Vehicles Operating On Roadways Using EPA's Mobile6.2 Model



Note: (1) Annual emissions of polycyclic organic matter are projected to be 561 tons/yr for 1999, decreasing to 373 tons/yr for 2050.
(2) Trends for specific locations may be different, depending on locally derived information representing vehicle-miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors

Source: FHWA Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents

Unlike the criteria pollutants, toxics do not have National Ambient Air Quality Standards (NAAQS) making evaluation of their impacts more subjective. Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. Because of these limitations, a reliable quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the project level. Therefore, it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human environment."

Incomplete or Unavailable Information for Project Specific MSAT 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, https://www.epa.gov/iris/). 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.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

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 an “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 deemed 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.

Relevance of Unavailable Or Incomplete Information To Evaluating Reasonably Foreseeable Significant Adverse Impacts On The Environment, And Evaluation Of Impacts Based Upon Theoretical Approaches Or Research Methods Generally Accepted In The Scientific Community

Because of the uncertainties outlined above, a reliable quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the project level. While available tools do allow us to reasonably predict relative emissions changes between alternatives for larger projects, the amount of MSAT emissions from each of the project alternatives and MSAT concentrations or exposures created by each of the project alternatives cannot be predicted with enough accuracy to be useful in estimating health impacts. As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects. Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human environment."

MSAT Emissions Analysis

Based on a review of the traffic data, proposed scope, and settings, this project is anticipated to have meaningful differences in MSAT emissions among project alternatives. In accordance with the FHWA Interim Guidance published on September 30, 2009, the project therefore requires a quantitative analysis in an effort to: 1) evaluate the levels of emissions for the priority MSATs for the project alternatives for the current, opening, and horizon years; and 2) utilize its result as a basis for comparison and differentiate among the project alternatives.

Although an emissions analysis cannot identify and measure health impacts from MSATs, it can provide a basis for identifying and comparing the potential differences in MSAT emissions from various alternatives as well as difference in various project milestone years.

For the purposes of the emissions analysis, the total project length was divided into 9 segments along the I-5 corridor within the project limits. The travel activity data required in estimating MSAT emissions include truck percentages, speeds, and vehicle miles traveled (VMT) along each of the segments during peak and off-peak periods. The MSAT analyses are performed for the current year conditions as well as for the No-Build and Build Alternative (proposed HOT lane) in the future years of 2018 (opening year) and 2035 (horizon year). Results of the No-Build Alternative are compared to those of the Build Alternative in the future years of 2018 and 2035. Results of the MSAT emissions for the future years are compared to those for the baseline year as well.

In general, the proposed project was estimated to result in higher emissions when compared to the No-Build Alternative in 2018 and 2035. Emissions of certain priority MSATs such as DEOG, Benzene, and Formaldehyde, show a decrease with the project in certain segments in the opening and horizon years. It should be noted though that most emissions of MSAT priority pollutants under the proposed project in 2018 or 2035 would be less than the existing conditions.

In summary, while the proposed project would result in a small increase in localized MSAT emissions in 2018 and 2035 compared to the No Build scenario, the EPA's vehicle and fuel regulations, coupled with fleet turnover, would cause substantial reductions over time that would cause regionwide MSAT levels to be substantially lower than they are today.

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3.3 Noise

The analysis of noise impacts of the proposed HOT Lane Project (project) is based on the Noise Study Report (LSA Associates, Inc., January 2013). This Noise Study Report (NSR) was prepared in order to update the August 2008 Noise Impact Analysis for the I-5 HOV/Truck Lanes-SR-14 to Parker Road Project and the June 2009 I-5 HOV/Truck Lanes Project – Noise Study Report Addendum.

The previous noise analysis and addendum for the I-5 HOV/Truck Lanes project were prepared according to the 2006 Traffic Noise Analysis Protocol, which has been updated since the completion of the environmental document. If a project is modified such that a NEPA reevaluation and new noise study are required, the Protocol and regulation in place at that time must be used. As such, the NSR for the HOT Lane Project was conducted according to the 2001 Protocol.

3.3.1 Regulatory Setting

The National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) provide the broad basis for analyzing and abating highway traffic noise effects. The intent of these laws is to promote the general welfare and to foster a healthy environment. The requirements for noise analysis and consideration of noise abatement and/or mitigation, however, differ between NEPA and CEQA.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) requires a strictly baseline versus build analysis to assess whether a proposed project will have a noise impact. If a proposed project is determined to have a significant noise impact under CEQA, then CEQA dictates that mitigation measures must be incorporated into the project unless such measures are not feasible. The rest of this section will focus on the NEPA-23 Code of Federal Regulations (CFR) 772 noise analysis; please see Chapter 4 of this document for further information on noise analysis under CEQA.

National Environmental Policy Act and 23 CFR 772

For highway transportation projects with the Federal Highway Administration (FHWA) (and Caltrans, as assigned) involvement, the Federal-Aid Highway Act of 1970 and the associated implementing regulations (23 Code of Federal Regulations [CFR] 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project. The regulations contain noise abatement criteria (NAC) that are used to determine when a noise impact would occur. The NAC differ depending on the type of land use under analysis. For example, the NAC for residences (67 dBA) is lower than the NAC for commercial areas (72 dBA). Table 3.3.A lists the noise abatement criteria for use in the NEPA-23 CFR 772 analysis.

Table 3.3.A Activity Categories and Noise Abatement Criteria

Activity Category	NAC, Hourly A- Weighted Noise Level, Leq(h)	Description of activity category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[1]	67 (Exterior)	Residential.
C[1]	67 (Exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A–D or F.
F	No NAC—reporting only	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical, etc.), and warehousing.
G	No NAC—reporting only	Undeveloped lands that are not permitted.

[1] Includes undeveloped lands permitted for this activity category.

Table 3.3.B lists the noise levels of common activities to enable readers to compare the actual and predicted highway noise-levels discussed in this section with common activities.

Table 3.3.B Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock Band
Jet Fly-over at 300m (1000 ft)		
	100	
Gas Lawn Mower at 1 m (3 ft)		
	90	
Diesel Truck at 15 m (50 ft), at 80 km (50 mph)		Food Blender at 1 m (3 ft)
	80	Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime		
Gas Lawn Mower, 30 m (100 ft)	70	Vacuum Cleaner at 3 m (10 ft)
Commercial Area		Normal Speech at 1 m (3 ft)
Heavy Traffic at 90 m (300 ft)	60	
		Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime		
		Library
Quiet Rural Nighttime	30	Bedroom at Night, Concert Hall (Background)
	20	Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

In accordance with the Department's *Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects, May 2011*, a noise impact occurs when the future noise level with the project results in a substantial increase in noise level (defined as a 12 dBA or more increase) or when the future noise level with the project approaches or exceeds the NAC. Approaching the NAC is defined as coming within 1 dBA of the NAC.

If it is determined that the project will have noise impacts, then potential abatement measures must be considered. Noise abatement measures that are determined to be reasonable and feasible at the time of final design are incorporated into the project plans and specifications. This document discusses noise abatement measures that would likely be incorporated in the project.

The Caltrans *Traffic Noise Analysis Protocol* sets forth the criteria for determining when an abatement measure is reasonable and feasible. Feasibility of noise abatement is basically an engineering concern. A minimum 7 dBA reduction in the future noise level must be achieved for an abatement measure to be considered feasible. Other considerations include topography, access requirements, other noise sources, and safety considerations. The reasonableness determination is basically a cost-benefit analysis. Factors used in determining whether a proposed noise abatement measure is reasonable include: residents acceptance and the cost per benefited residence.

3.3.2 Existing Noise Levels

Existing land uses in the vicinity of the project site include single- and multifamily residences, a mobile home park, two schools, a childcare/learning center, a church, a sports park, a trail, hotels, golf courses, vacant land, office, industrial, commercial, and recreational uses. In addition, two planned residential developments and one planned commercial development are located within the project area.

A total of 7 long-term and 101 short-term noise level measurements were conducted at representative locations to document the existing noise environment. The 101 short-term measurements include those that were conducted under the 2008 Noise Impact Analysis and the 2009 Noise Study Report Addendum, and were used to calibrate the noise model because the existing conditions remain the same. To predict the noise levels at all 352 modeled receptors in the project area, 68 of the short-term noise level measurements were used to calibrate the noise prediction model with concurrent traffic counts. The remaining 33 short-term locations were not calibrated because those locations were conducted for reporting purposes.

In addition to short-term noise level measurements, seven long-term noise measurements and 16 background noise level measurements were conducted. A total of six locations representing schools and places of worship located within the project area were evaluated for interior noise impacts.

Of the 352 receptor locations, 75 receptors currently approach or exceed the 67 dBA L_{eq} NAC under Activity Categories B or C land uses. The existing worst-hour noise levels are shown in Table A-1 in Appendix A.

3.3.3 Future Noise Levels

The future traffic noise levels were modeled using either the peak-hour traffic volumes provided in the traffic study prepared by LSA Associates, Inc. (LSA) (October 2012) or the worst-case traffic operations, whichever is lower. The worst-case traffic condition is assumed to be Level of Service (LOS) C/D, which corresponds to 1,950 vehicles per lane per hour (vplph) on the highway mainline and HOT lanes, 1,000 vplph on ramps, and 1,020 vplph on truck-climbing lanes. The worst-case volume for the truck-climbing lanes was determined based on the maximum capacity of 1,200 vehicles per hour (vph) at LOS C/D. The volume to capacity ratio for a highway that corresponds to LOS C/D is approximately 85 percent of the roadway capacity.

The future noise levels for the No Build and the HOT Lane conditions are shown in Table A-1 in Appendix A.

3.3.4 Noise Impacts

The modeled future traffic noise levels for the project were compared to the modeled existing noise levels (after calibration) to determine whether a substantial noise increase would occur. Also, the modeled future noise levels for the project were compared to the NAC under Activity Categories B, C, D, and E to determine whether a traffic noise impact would occur. Traffic noise impacts result from one or more of the following occurrences: (1) an increase of 12 A-weighted decibels (dBA) or more over existing noise levels, or (2) predicted noise levels that approach or exceed the Noise Abatement Criteria (NAC).

No substantial noise level increase of 12 dBA or more from the corresponding existing noise level would result from operation of the completed HOT Lane project. Of the 352 receptor locations that were modeled in the project area, 90 receptors would be or would continue to approach or exceed the NAC under the HOT lane conditions.

Six locations were evaluated for potential long-term interior noise impacts associated with project operations. The predicted future interior noise levels at all six locations would not approach or exceed the 52 dBA L_{eq}(h) NAC under Activity Category D(52) for the project. Therefore, no noise abatement measures are required for schools and places of worship located within the project area.

3.3.5 Noise Abatement Analysis

In accordance with 23 CFR 772, noise abatement is considered where noise impacts are predicted in areas of frequent human use that would benefit from a lowered noise level. Potential noise abatement measures identified in the Protocol include the following:

- Avoiding the impact by using design alternatives, such as altering the horizontal and vertical alignment of the project
- Constructing sound barriers
- Acquiring property to serve as a buffer zone
- Using traffic management measures to regulate types of vehicles and speeds
- Noise insulation of Activity Category D land use facilities listed in Table 3.3.A

All of these abatement options have been considered. However, because of the configuration and location of the project, abatement in the form of sound barriers is the only abatement that is considered to be feasible.

Feasibility

A minimum noise reduction of 5 dBA must be achieved at the impacted receivers in order for the proposed noise abatement measure to be considered feasible. The feasibility criterion is not necessarily a noise abatement design goal. Greater noise reductions are encouraged if they can be reasonably achieved. The following elements may restrict feasibility:

- Topography
- Access requirements for driveways, ramps, etc.
- Presence of local streets and underground utilities
- Other noise sources in the area
- Safety considerations

Sound barriers were considered to shield receptors along I-5 from SR-14 to Parker Road, where receptors would continue to be exposed to traffic noise levels approaching or exceeding the noise abatement criteria (NAC). At each location sound barrier heights were evaluated from 6 ft to 16 ft at 2 ft increments. If the barriers are capable of reducing noise level by 5dBA or more at 16 ft height, sound barrier were analyzed up to 22 ft to meet the 7dBA reduction goal. Appendix B maps L-1 to L-15 show the locations of the acoustically feasible sound barriers. Table A-2 in Appendix A summarizes the locations of the acoustically feasible sound barriers along with their heights, approximate lengths, highest noise reduction and and estimated number of benefited residences.

Reasonableness

The overall reasonableness of the noise abatement is determined by the following factors:

- The noise reduction design goal
- The cost of noise abatement
- The viewpoints of benefited receptors (including property owners and residents of the benefited receptors)

Title 23, Part 722 of the Federal regulation Code (23CFR722) requires that an acoustical design goal be applied to all noise abatement. Caltrans' acoustical design goal is that a barrier must be predicted to provide at least 7 dB of noise reduction at one or more benefited receptors. This design goal applies to any receptor and is not limited to impacted receptors.

Cost considerations for determining noise abatement reasonableness are evaluated by comparing reasonableness allowances and projected abatement costs. Cost considerations in the reasonableness determination of noise abatement are based on a 2011 allowance per benefited receptor of $55,000. A benefited receptor is a dwelling unit that is predicted to receive a noise reduction of at least 5 dBA from the proposed noise abatement measure. A receptor can be a benefited receptor even if it is not subject to a traffic noise impact. The cost calculations of the noise abatement measure must include all items appropriate and necessary for the construction of the noise abatement measure. Examples of cost items that should be included in estimating the construction cost of a noise abatement measure are traffic control, drainage modification, retaining walls, landscaping for graffiti abatement, and right-of-way costs. Only those costs directly related to the construction of the noise abatement should be included in the noise abatement construction estimate.

Noise barriers that are determined to be reasonable based on the noise reduction goal and cost will be subject to the approval of benefited receptors to meet the requirements of the three reasonableness factors listed above.

3.3.6 Recommended Sound Barriers

The Noise Abatement Decision Report (NADR) evaluates noise abatement measures in the form of sound barriers when traffic noise impacts are identified. Noise abatement will only be considered if constructing the abatement is feasible and reasonable.

According to the NADR (Caltrans, February 2013), the following sound barriers have been recommended for construction pending approval by the benefited receptors:

Sound Barrier No.	Station Limits	R/W	Recommended Height (ft)
2-2	2782+35 to 2787+68	Private	8
2-3	2778+50 to 2782+10	Private	10
2-4	2770+90 to 2775+20	Private	10
2-5	2675+70 to 2691+09	State	16
2-8	2766+65 to 2812+10	State	20
3-6	3012+00 to 3014+25	Private	6
3-10a	3010+25 to 3036+70	State	16

The results of the reasonableness analysis for all feasible sound barriers are shown in Appendix A, Table A-3. The recommended sound barriers are shown in Appendix B, Maps K-1 to K-4.

The preliminary noise abatement decision presented in this report is based on preliminary project alignments and profiles, which may be subject to change. As such, the physical characteristics of noise abatement described herein also may be subject to change. If pertinent parameters change substantially during the final project design, the preliminary noise abatement decision may be changed or eliminated from the final project design. A final decision to construct noise abatement will be made upon completion of the project design.

For proposed barrier locations outside of Caltrans right of way, all (100 percent) of the affected property owners must be supportive of the proposed barrier, the location, and the material to be used for construction. Additionally, a permanent easement must be secured for all (100 percent) of the affected properties to construct and maintain the barrier. During the final project design, soundwall survey letters will be sent to all the affected property owners to determine and document whether or not they want the proposed sound barriers.

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