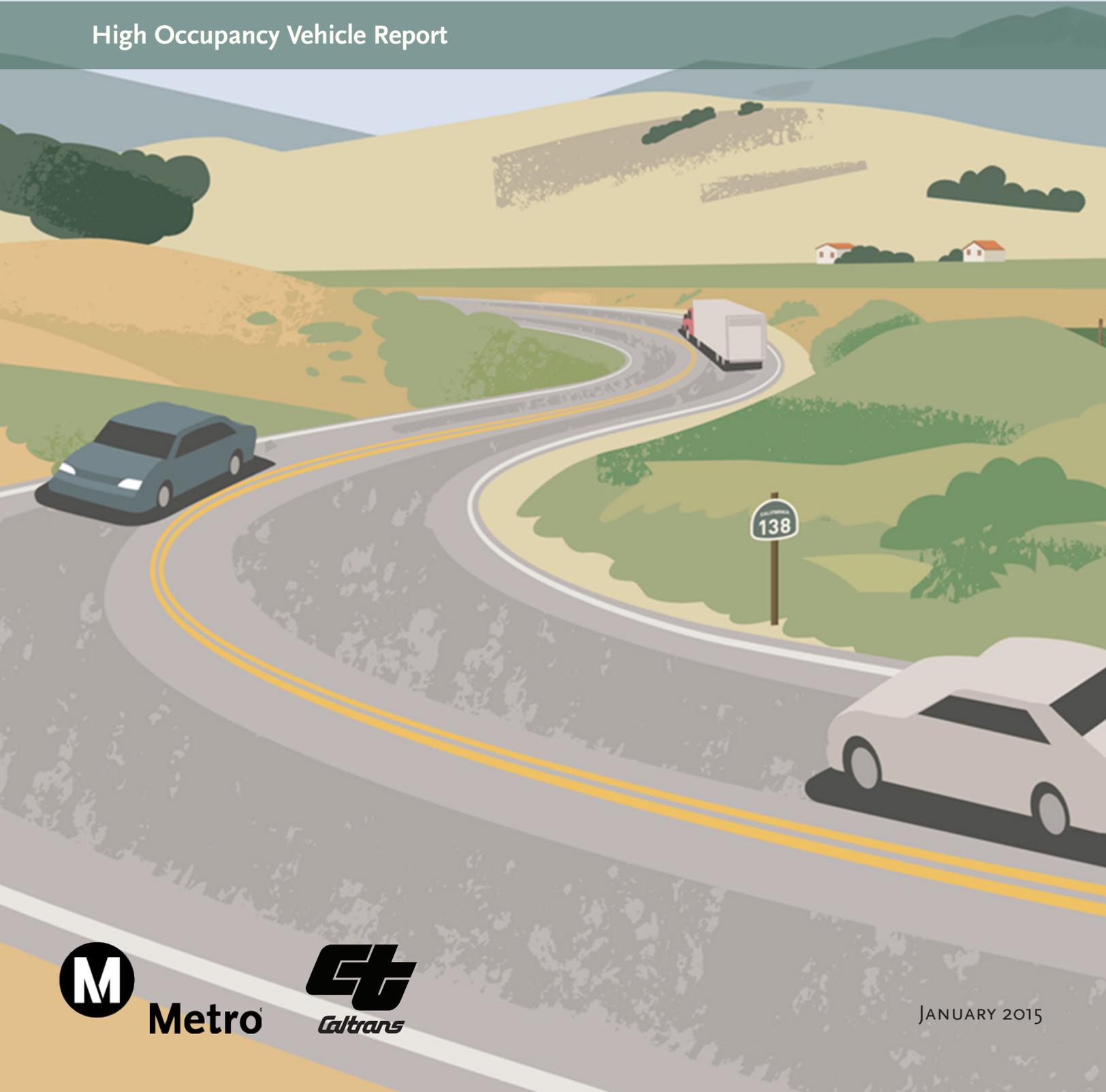


# Northwest 138 Corridor Improvement Project

High Occupancy Vehicle Report



**Metro**



JANUARY 2015



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# I Introduction

This High Occupancy Vehicle (HOV) report was prepared for the Northwest 138 Corridor Improvement Project. The report contains an overview of the proposed Build Alternatives along with a discussion of HOV facilities in the study area.

The Transportation Analysis Report for the Northwest 138 Corridor Improvement Project was submitted in January 2015. The purpose of this report was to analyze the proposed Build Alternatives and their effects on the highway transportation network. The report focused on a comparison of alternatives designed to improve future traffic operations and safety along the Northwest 138 corridor consistent with the purpose and need statement. Portions of the analysis results will also be used to comply with environmental impact analysis requirements for the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA).

## PROJECT DESCRIPTION

The California Department of Transportation (Caltrans), in cooperation with the Los Angeles County Metropolitan Transportation Authority (Metro), propose to widen and improve approximately 36.8 miles of State Route 138 (SR-138) between the Interstate 5 (I-5) interchange and the State Route 14 (SR-14) interchange.

The existing facility is a 2-lane highway that contributes to the local circulation network and provides an alternate route for east-west traffic in northwest (NW) Los Angeles County. The NW SR-138 Corridor Improvement Project (project) would widen SR-138 and provide operational and safety improvements. The project corridor spans east-west approximately 36.8 miles (Post Mile [PM] 0.0 to PM 36.8) in the NW portion of Los Angeles County, just south of the Kern County border.

This section describes the proposed action and the project alternatives that were developed to achieve the identified purpose and need of the project while avoiding or minimizing environmental impacts. The alternatives are the No Build Alternative, Alternative 1 (Freeway/Expressway) with or without a design option for a bypass around Antelope Acres, and Alternative 2 (Expressway/ Conventional Highway).

SR-138 is an undivided 2-lane highway that travels from I-5 around the south side of Quail Lake and east to SR-14. SR-138 is not a controlled-access facility; access and egress points include at-grade intersections with paved and unpaved roads and driveways. The existing roadway consists of two 12-foot lanes with variable shoulders ranging from 2- to 4-foot paved to 8 foot unpaved non-standard shoulders.

The purpose of the project is to improve mobility and operations in northwest Los Angeles County, enhance safety within the SR-138 Corridor based on future projected traffic conditions, and accommodate foreseeable increases in travel and goods movement within northern Los Angeles County.



The need for the proposed project is derived from foreseeable increases in travel demand that would exceed the current capacity of SR-138 and higher than average state-wide fatal accident rates at several locations.

## **ALTERNATIVES**

### NO- BUILD ALTERNATIVE

Implementation of the No-Build Alternative would maintain the existing configuration of SR-138 and would not result in improvements to the route. However, additional residential, commercial, and interregional development is anticipated to occur in Antelope Valley in the future. With Los Angeles to the southeast and Bakersfield to the northwest, this area is poised for large-scale growth, which is anticipated to result in increased traffic demands beyond the capacity of the existing system (Caltrans, 2008).

The No-Build Alternative would not accommodate the projected population growth or expected substantial increase in goods movement truck traffic in Northern Los Angeles County and the existing corridor would not be improved. As discussed in the Project Study Report/ Project Development Study (PSR/PDS), the existing SR-138 corridor is projected to degrade and operate consistently at a Level of Service (LOS) E and F for 2040 conditions (Caltrans, 2008). The No-Build Alternative could result in indirect impacts on air quality, mobility, safety, and the economy within Northern Los Angeles County. There would be increased maintenance costs to maintain the route without any other improvements.

### BUILD ALTERNATIVE 1 | Freeway - Expressway

Alternative 1 (Freeway/Expressway) would include a 6-lane freeway from the I-5 interchange connector ramps to County Road 300<sup>th</sup> Street West, and a 4-lane expressway from County Road 300<sup>th</sup> Street West to the SR-14 interchange generally following the existing alignment of SR-138. There would also be improvements to the I-5/SR-138 and SR-138/SR-14 freeway connections and structure over the SR-14. Study limits on I-5 are from PM 79.5 to PM 83.1 and on SR -14 the limits are from PM 73.4 to PM 74.4.

### BUILD ALTERNATIVE 1 WITH DESIGN OPTION | Antelope Acres Bypass

Antelope Acres Bypass. There is a design option with this alternative to include a bypass route around the Antelope Acres community. This option was developed to reduce the impacts to the existing residences of Antelope Acres due to the proposed four-lane expressway along the existing alignment of SR-138. The alignment would bypass the community to the north along West Avenue C and going from west to east, the alignment would begin to deviate from the existing SR-138 near 100<sup>th</sup> Street West and continue in a northeasterly direction towards West Avenue C. After paralleling West Avenue C for approximately one mile, the alignment would continue in a southeasterly direction back towards the existing SR-138, and eventually join the existing SR-138 near 70<sup>th</sup> Street West. The existing highway would be relinquished to the County as a local roadway between 100<sup>th</sup> Street West and 70<sup>th</sup> Street West, with additional speed reduction measures proposed to reduce cut-through traffic.

### BUILD ALTERNATIVE 2| Expressway – Conventional Highway

Alternative 2 (Expressway/Highway) would include a 6-lane freeway from the I-5 interchange connector ramps to Gorman Post Road, a 6-lane expressway from the Gorman Post Road interchange to County



Road 300th Street West, a 4-lane expressway from 300th Street West to County Road 240th Street West, and a 4-lane limited access Conventional Highway from County Road 240th Street West to the SR-14 interchange, generally following the existing alignment of SR-138. There would also be improvements to the I-5/SR-138 and SR-138/SR-14 freeway connections and the structure over the SR-14. The study limits on these connectors would be the same as Alternative 1; on I-5 from PM 79.5 to PM 83.1 and on SR -14 the limits are from PM 73.4 to PM 74.4.

For Alternative 1 (with or without the Antelope Acres Bypass design option), and Alternative 2, new over-crossings would also be considered at various intersections with local roads including 60th Street West, 90th Street West, 110<sup>th</sup> Street West, 170<sup>th</sup> Street West, 190<sup>th</sup> Street West, 210<sup>th</sup> Street West, and Three Points Road to enhance traffic safety and improve local vehicular, pedestrian and bicycle circulation.

Note on the Transportation System Management (TSM) Alternative:

The TSM Alternative was developed to strategize improvements to the facility without major changes to the overall capacity. This alternative had improvements to the vertical and horizontal roadway alignment in areas that are currently non-standard, shoulder widening, localized improvements at accident locations, intersection improvements, and additional lanes to improve safety and traffic flow at focused areas. Upgrades to signage and lighting were also evaluated to improve safety and operations.

A TSM Alternative was proposed originally as a result of agency and public input during circulation of the Notice of Intent (NOI)/Notice of Preparation (NOP) in 2013 and subsequent public meetings.

The TSM Alternative was studied and evaluated in all of the technical studies for the proposed project but the TSM Alternative was not recommended for further analysis and it was ultimately rejected from further study because it did not fully address the project’s purpose and need. For that reason, the TSM Alternative is included in this technical study analysis but not included in the project description seen above. Please refer to the NW SR-138 Draft EIR/EIS for more information on the TSM Alternative.

**Comparison of Alternatives**

Table 1 provides a comparison of No Build, Alternative 1 (Expressway), Alternative 2 (Freeway/Expressway), and the TSM Alternative.

<b>TABLE I – SUMMARY COMPARISON OF SR-138 ALTERNATIVES</b>				
<b>Design Feature</b>	<b>Alternative (No Build)</b>	<b>Alternative 1 (Freeway &amp; Expressway)</b>	<b>Alternative 2 (Expressway &amp; Limited Access Conventional Highway)</b>	<b>TSM Alternative<sup>1</sup></b>
<b>Type of Facility</b>	2-lane conventional highway	6-lane Freeway to 300 <sup>th</sup> Street West ; 4-lane Expressway to SR-14	6-lane Expressway to 300 <sup>th</sup> Street West; 4-lane Expressway to 240 <sup>th</sup> Street West/4 lane limited access conventional highway to SR-14	2-lane conventional highway with improvements (curve corrections, paved shoulders, passing lanes, intersection channelization)

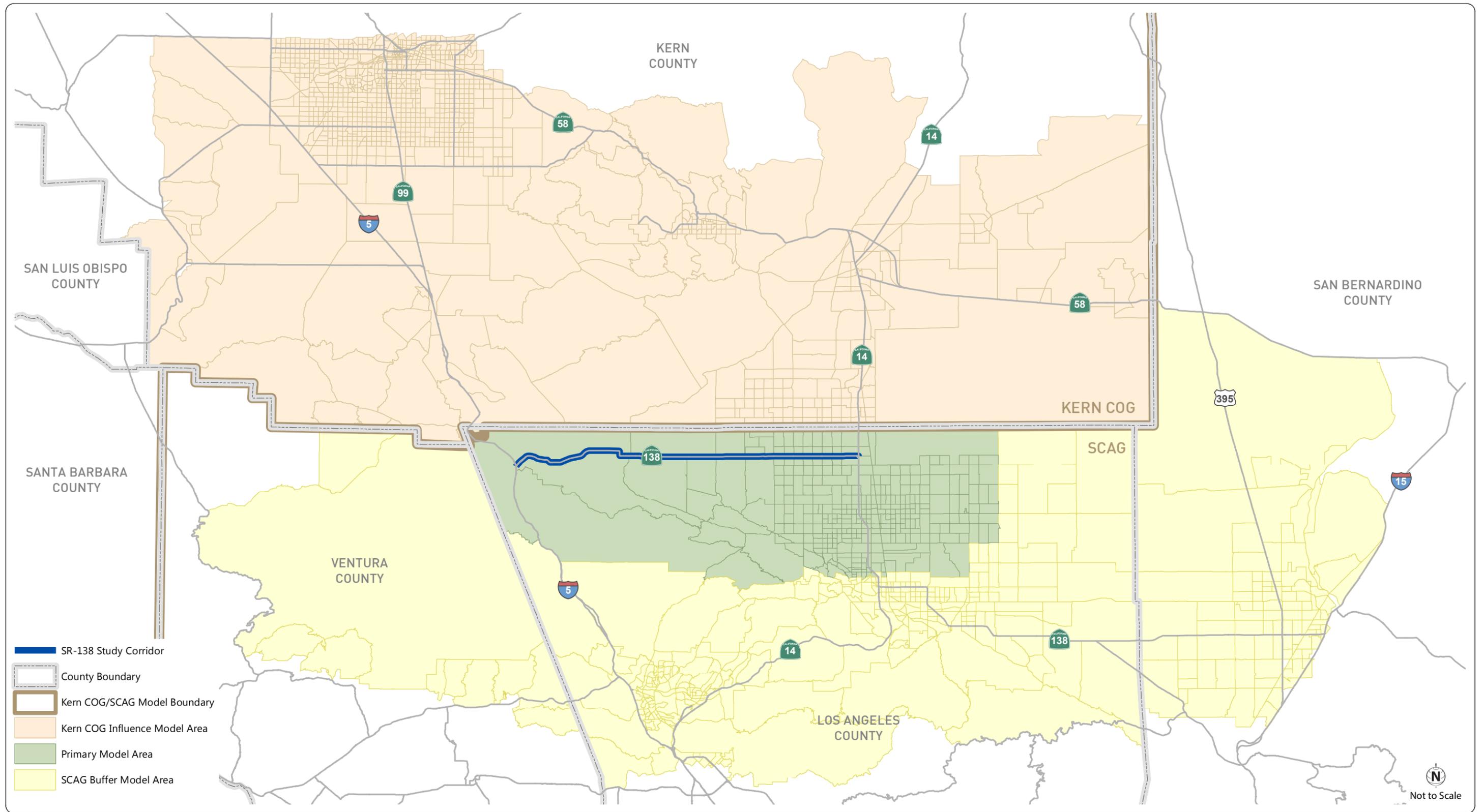
**TABLE I – SUMMARY COMPARISON OF SR-138 ALTERNATIVES**

<b>Design Feature</b>	<b>Alternative (No Build)</b>	<b>Alternative 1 (Freeway &amp; Expressway)</b>	<b>Alternative 2 (Expressway &amp; Limited Access Conventional Highway)</b>	<b>TSM Alternative<sup>1</sup></b>
<b>Access</b>	Multiple access location, driveways, field roads, county roads	Interchanges along Freeway; Median U-Turns, Displaced Left-Turns, Two-Way Stop Controlled, Roundabouts	Tight Diamond Interchange; Traffic Signals; Two-Way Stop Control; Roundabouts	TBD
<b>Median Widths</b>	N/A	Varies 22 to 86 feet	Varies 0 to 86 feet	N/A – TBD
<p>Note:</p> <p>1. The TSM Alternative was studied as part of the Transportation Analysis Report. However, this alternative has since been removed from further consideration because it does not meet the Project Objectives outlined in the Purpose &amp; Need.</p>				

At this time, the Project Development Team has not identified a preferred alternative.

## STUDY AREA

The study area is shown in Figure 1. For the purposes of reflecting regional travel demands, the northern portion of Los Angeles County and southern portion of Kern County were included as part of the study vicinity. However, the corridor analysis and operational improvements are focused on SR-138 from I-5 to SR-14.





## 2 Existing & Future Conditions

This chapter describes the existing and future conditions along the Northwest 138 corridor along with the Proposed Build Alternatives.

### EXISTING & PLANNED HOV FACILITIES

Figure 2 displays the planned HOV lanes within the project vicinity based on SCAG's 2012 Regional Transportation Plan (RTP). As shown, the following facilities are planned in the RTP:

- I-5 between Ridge Route Road and SR-14 – Construction of an HOV lane in each direction
- SR-14 between Avenue M and I-5 – Addition of a second HOV lane in each direction (a single HOV lane is already provided)

Neither the existing or planned HOV lanes on I-5 or SR-14 will extend to the north to connect with SR-138.

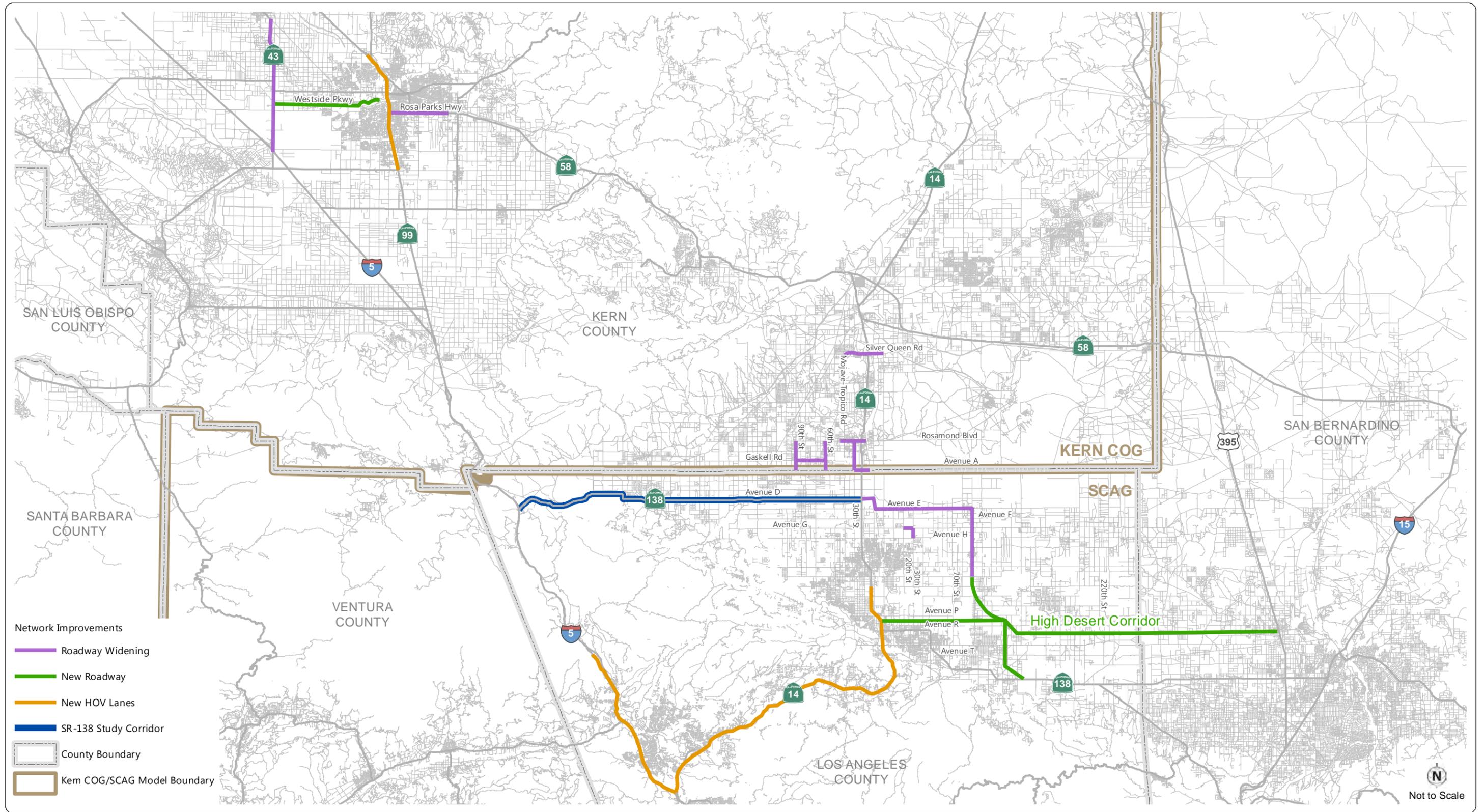
### TRAFFIC COUNTS & FUTURE FORECASTS

Existing traffic counts along SR-138 between I-5 and SR-14 were collected in August and December 2013. Existing traffic volumes range from approximately 4,500 vehicles per day on the western end of the corridor approaching I-5 to 3,800 vehicles per day on the eastern end approaching SR-14.

The North County Sub-Area Travel Demand Forecasting Model was developed for use in the Northwest 138 Corridor Improvement Project. The North County Sub-Area Model reflects the socioeconomic projections and transportation network improvements contained in the Southern California Association of Governments (SCAG) 2012 Regional Transportation Plan (RTP) and Kern Council of Governments (COG) RTP models. It also reflects local land use and roadway network details from the Enhanced Antelope Valley Transportation Analysis Model (EAVTAM). The *Northwest 138 Corridor Improvement Project - Final Model Development Report* was completed in May 2014.

The sub-area model includes the northern portion of the County, including the Cities of Lancaster, Palmdale and Santa Clarita. The sub-area model also includes the southern portion of Kern County as contained in the latest version of the Kern COG model. The model contains the existing and planned highway system within the project vicinity.

Growth within the study area is expected to greatly increase the demand for travel along SR-138. Traffic forecasts are expected to increase to approximately 67,000 vehicles per day on the western end of the corridor approaching I-5 and approximately 37,000 vehicles per day on the eastern end approaching SR-14.



### 3 HOV Evaluation

The need for HOV facilities along the corridor were evaluated with respect to future travel demand and traffic operations along the Northwest 138 corridor.

#### TRAVEL DEMAND

The North County Sub-Area model was used to develop travel demand forecasts under each Build Alternative based on the increase in capacity along the corridor. Both daily and peak hour traffic forecasts were obtained from the model to reflect Year 2035 traffic conditions based on planned improvements and growth in the study area. Traffic forecasts under Opening Year and Design Year conditions are presented below for each of the Project Alternatives.

#### *Opening Year Forecasts*

Since the sub-area model reflects Year 2035 conditions, the Opening Year 2020/2025 forecasts were developed using a calculated annual growth rate between existing volumes and the 2035 traffic forecasts. Table 2 displays the ADT forecasts under 2020/2025 Opening Year conditions. Forecasts for No Build and the TSM Alternative are the same as the TSM Alternative includes minor capacity improvements along SR-138 that are not expected to increase travel demand along the corridor beyond that expected under No Build conditions.

<b>ID</b>	<b>Location</b>	<b>2012 Subarea Model</b>	<b>2020 No Build/ TSM Alternative</b>	<b>2025 Alternative 1</b>	<b>2025 Alternative 2</b>
1	SR-138 East of I-5	4,500	13,900	35,200	34,300
2	SR-138 West of 300 <sup>th</sup> Street	4,500	11,200	32,900	31,900
3	SR-138 West of 245 <sup>th</sup> Street	4,000	9,100	26,500	25,700
4	SR-138 West of 190 <sup>th</sup> Street	3,500	7,100	23,400	22,400
5	SR-138 West of 110 <sup>th</sup> Street	3,700	7,500	22,400	21,300
6	SR-138 West of 60 <sup>th</sup> Street	3,800	7,400	20,800	19,200
7	SR-138 West of SR14	3,800	7,200	19,500	18,000

### Design Year Forecasts

The Design Year 2040 forecasts were developed using a calculated annual growth rate between existing volumes and the 2035 traffic forecasts, and extending the growth projections to Year 2040. Table 3 displays the ADT forecasts for the Project Alternatives under 2040 conditions.

TABLE 3 – 2040 DESIGN YEAR ADT FORECASTS					
ID	Location	2012 Subarea Model	2040 No Build/ TSM Alternative	2040 Alternative 1	2040 Alternative 2
1	SR-138 East of I-5	4,500	40,700	73,600	71,500
2	SR-138 West of 300 <sup>th</sup> Street	4,500	30,500	68,400	66,200
3	SR-138 West of 245 <sup>th</sup> Street	4,000	23,500	54,700	52,700
4	SR-138 West of 190 <sup>th</sup> Street	3,500	17,500	48,300	46,100
5	SR-138 West of 110 <sup>th</sup> Street	3,700	18,200	45,800	43,200
6	SR-138 West of 60 <sup>th</sup> Street	3,800	17,500	42,000	38,500
7	SR-138 West of SR14	3,800	17,100	39,100	35,700

### TRAFFIC OPERATIONS

As described in the *Transportation Analysis Report*, the traffic operations analysis for this study accounted for both intersection and highway operations. The intersection operations analyses were conducted using procedures and methodologies consistent with the Highway Capacity Manual (HCM) 2010 (Transportation Research Board, 2010) and the detailed LOS results can be found in the *Transportation Analysis Report*. Highway facilities were also analyzed using HCM 2010 procedures and methodologies.

Caltrans strives to have freeway facilities operate at a level of service between C and D. Therefore, LOS D was used as the threshold for freeway facilities analysis. Any future LOS on freeway facilities that are projected to operate at unacceptable LOS (worse than LOS D) needs to be mitigated. Per Caltrans guidance, an impact to freeway facilities would be considered significant if either of the following occurs:

- Project would cause the LOS of the freeway facilities to degrade from LOS D (or better) to LOS E or F
- Project would worsen operations at a facility that is already operating at an unacceptable LOS E or F

Based on the traffic forecasts described above, Opening Year and Design Year traffic operations were analyzed along the study corridor for each of the Build Alternatives and the results are presented below.

### Opening Year Operations

Table 4 presents the AM and PM peak hour LOS for the study mainline segments on eastbound and westbound SR-138 under 2020 and 2025 conditions. For all study segment locations, SR-138 would operate at LOS D or better under the No Build and TSM Alternatives. Under Alternatives 1 and 2, SR-138 would operate at LOS A or B at all study segment locations due to the additional lane capacity provided under both alternatives in the opening year. The capacity improvements would meet the near-term increase in travel demand along the corridor and improve operations from LOS C and D in the western portion of the corridor to LOS A or B, and from LOS B to C in the central and eastern portions of the corridor to LOS A or B.

TABLE 4 – SR-138 SEGMENT LOS – OPENING YEAR 2020/2025 CONDITIONS									
Segment	Direction	Existing		2020 No Build/ TSM		2025 Alternative 1		2025 Alternative 2	
		AM	PM	AM	PM	AM	PM	AM	PM
1- I-5 Connector to Gorman Post Road	EB	A	A	A	A	A	A	A	A
	WB	A	A	A	A	A	A	B	A
2-Gorman Post Road to Old Ridge Route	EB	A	B	C	C	A	A	A	A
	WB	A	B	C	C	A	A	A	A
3-Old Ridge Route to 300th Street	EB	A	B	C	D	A	A	A	A
	WB	A	B	C	D	A	A	B	A
4-280th Street to 270th Street	EB	A	B	B	C	A	A	A	A
	WB	A	B	B	C	A	B	A	A
5-Three Points Road to 245th Street	EB	A	B	B	C	A	A	A	A
	WB	A	B	B	C	B	B	B	A
6-230th Street to 190th Street	EB	A	B	B	C	A	A	A	A
	WB	A	B	B	C	B	B	A	A
7-190th Street to 130th Street	EB	B	C	B	C	A	A	A	A
	WB	B	C	B	C	B	A	B	A
8-130th Street to 80th Street	EB	B	B	B	C	A	A	A	A
	WB	B	B	B	C	A	A	A	A
9-80th Street to 30th Street	EB	B	B	C	C	A	A	A	A
	WB	B	B	C	C	A	A	A	A
10-30th Street to Route 14	EB	A	A	A	B	A	A	A	A
	WB	A	A	A	B	A	A	A	A

**Design Year Operations**

Table 5 shows the AM and PM peak hour LOS for the study freeway mainline segments on eastbound and westbound SR-138 under 2040 conditions. Under the No Build and TSM Alternatives, SR-138 would operate at LOS E or worse conditions between Gorman Post Road and 300<sup>th</sup> Street during AM and PM peak hours. For all other study segment locations, SR-138 would operate at LOS D or better under the No Build Alternative. Under Alternatives 1 and 2, SR-138 would operate at LOS C or better at all study segment locations due to the additional lane capacity.

<b>TABLE 5 – SR-138 SEGMENT LOS – DESIGN YEAR 2040 CONDITIONS</b>									
Segment	Direction	Existing		2040 No Build/ TSM		2040 Alternative 1		2040 Alternative 2	
		AM	PM	AM	PM	AM	PM	AM	PM
1- I-5 Connector to Gorman Post Road	EB	A	A	B	B	A	B	B	C
	WB			B	A	C	B	C	B
2-Gorman Post Road to Old Ridge Route	EB	A	B	E	E	B	B	B	B
	WB			B	B	C	B	C	B
3-Old Ridge Route to 300th Street	EB	A	B	E	E	B	B	B	C
	WB			C	B	C	B	C	B
4-280th Street to 270th Street	EB	A	B	D	D	B	B	B	B
	WB			C	C	C	C	C	C
5-Three Points Road to 245th Street	EB	A	B	D	D	C	B	C	B
	WB			C	C	C	C	C	C
6-230th Street to 190th Street	EB	A	B	D	D	B	B	B	B
	WB			C	C	C	C	C	C
7-190th Street to 130th Street	EB	B	C	C	D	B	B	B	B
	WB			C	C	C	C	C	C
8-130th Street to 80th Street	EB	B	B	D	D	B	B	B	B
	WB			B	B	B	B	B	B
9-80th Street to 30th Street	EB	B	B	D	D	B	B	A	A
	WB			B	B	B	B	B	B
10-30th Street to Route 14	EB	A	A	B	C	B	B	A	A
	WB			B	C	B	B	B	B



## HOV FACILITIES

Caltrans implements HOV lanes as a traffic management strategy to encourage carpooling and improve travel time reliability. Along congested corridors, increasing the person capacity of the transportation network results in a more efficient use of the system and can help to reduce congestion and travel delays.

The proposed Build Alternatives do not include the addition of an HOV lane along the Northwest 138 corridor. For an HOV facility to be effectively utilized, it must provide a travel time savings advantage compared to the adjacent mixed-flow lanes and connect to other HOV facilities. Consequently, HOV lanes have not been incorporated into the Build Alternatives for the following reasons:

- The two Build Alternatives that propose widening along the corridor (Alternatives 1 and 2) include a six lane segment from I-5 to 300<sup>th</sup> Street West and continue to the east to SR-14 as a four lane facility. Providing an HOV lane along the stretch of roadway between I-5 and 300<sup>th</sup> Street would result in a facility that only covers a portion of the study corridor (less than 30%) and would not provide the continuity needed to result in an effectively utilized HOV facility.
- Travel speeds along the corridor under Alternatives 1 and 2 are expected to be free-flow. As shown in the above tables, the roadway segments will operate at LOS C or better under both Opening Year and Design Year conditions. Therefore, a HOV lane would not provide a travel time savings compared to the adjacent mixed-flow lanes.
- Under the TSM Alternative, improvements are being proposed to improve operations and safety at key locations along the corridor. Since this alternative only includes spot widening treatments, HOV lanes are not being considered.
- Neither the existing or planned HOV lanes on I-5 or SR-14 will extend to the north to connect with SR-138. I-5 between Ridge Route Road and SR-14 will ultimately have an HOV lane constructed in each direction, and SR-14 will have a second HOV lane in each direction between I-5 and Avenue M. However, neither of these planned facilities will connect with the Northwest 138 corridor.

Given the projected travel demands and traffic operations under Opening Year and Design Year conditions, the Build Alternatives will accommodate the travel demand anticipated. To encourage carpooling, the Project Development Team is exploring right-of-way opportunities for Park & Ride facilities along Northwest 138 at both the western and eastern ends of the corridor.