07-LA-101 PM 33.0/34.4
EA257200
HE-11
Project ID: 0700001840

FACT SHEET
EXCEPTIONS TO MANDATORY DESIGN STANDARDS

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1. PROPOSED PROJECT AND NONSTANDARD FEATURES

A. PROJECT DESCRIPTION

The California Department of Transportation (Caltrans) and The City of Agoura Hills (City), propose to construct improvements at the US 101/Palo Comado Canyon Road interchange (PM 33.0/34.4), in Los Angeles County within the City of Agoura Hills (see Vicinity Map, **Figure 1**). The project would include widening the Palo Comado Canyon Road and Palo Comado Canyon Road Overcrossing over US 101 and modification of the interchange ramps in order to improve traffic circulation, safety, and bicycle/pedestrian access.

Total cost is estimated at $22.5 million dollars which includes $17.4 million for capital outlay costs. The project is proposed to be funded by Measure R funds. The Southern California Association of Governments (SCAG) included the project in Addendum #3 to their 2008 Regional Transportation Plan (RTP) and Draft Amendment #08-34 to the 2008 Regional Transportation Improvement Program (RTIP).

The Project Report presents two alternatives, the No Build Alternative and the Build Alternative.

No Build Alternative
The No Build Alternative would maintain the existing configuration of the US 101/Palo Comado Canyon Road Interchange, and the Palo Comado Canyon Overcrossing above US 101 would remain as a two-lane facility with a sidewalk on the west side.

Build Alternative
The Build Alternative would include widening the entire length of Palo Comado Canyon Road, between Driver Avenue to the north and Chesebro Road to the south; from two to four lanes (see **Figure 2**). Within these limits, the Palo Comado Canyon Road Overcrossing would be widened from one lane in each direction to provide two lanes in each direction, along with a dedicated left turn lane, for a total of five striped lanes. A Class II bike lane and six-foot sidewalk would be provided on both sides of the overcrossing.

The Build Alternative would maintain the existing layout of the interchange ramps; however, the northbound on- and off-ramps would be slightly re-configured, with an additional lane being provided on the northbound off-ramp at the Palo Comado Canyon Road intersection. The intersection of the northbound ramps and Palo Comado Road would be signalized; the remaining intersections would remain un-signalized.

Existing utilities would be protected in place during construction. Overhead electric and telephone lines would need to be relocated in some areas to accommodate the build alternative, and portions of the street light systems will be relocated along Palo Comado Canyon Road. The existing storm drain systems would remain in place. New inlets would be installed along the modified northbound off-ramp, as well as the northbound on-ramp. A new inlet system would be added to accommodate the widening of Palo Comado Canyon Road south of the bridge.

B. EXISTING HIGHWAY

The US 101/Palo Comado Canyon Road Overcrossing structure (Bridge # 1678) was built in 1963. It provides one 12-foot lane and 4-foot shoulder in each direction. A 5-foot sidewalk is provided on the west side of the overcrossing. The minimum vertical clearance is 15.14 feet, which is located in the northeast corner of the structure over the northbound US 101 number four lane. The interchange is configured with tight diamond (L-1) ramps on the northbound side and hook ramps (L-6) on the southbound side.

The southbound hook ramps connect with Dorothy Drive and Chesebro Road at a four-point intersection south of US 101. A short section of Chesebro Road directly opposite the hook ramps provides access from the ramps to Palo Comado Canyon Road. The southbound off-ramp is a one-lane exit that widens to 2 lanes at its termini. The southbound on-ramp is a one-lane ramp throughout. The ramps provide 12-foot lanes with 4-foot left shoulder and 8-foot right shoulder.

The northbound ramps connect directly to Palo Comado Road. The northbound on-ramp has 2 lanes starting from the Palo Comado Road intersection at a 2% superelevation and tapers to a 1-lane on-ramp before joining the freeway. The northbound off-ramp begins as 1 lane and widens to 2 lanes at its termini. The ramps provide 12-foot lanes with 4-foot left shoulder and 8-foot right shoulder.

The interchange does not currently have any signalized intersections. Palo Comado Canyon Road is a free-flowing street from Agoura Road in the south to Driver Avenue in the north, where the intersection is four-way stop-controlled. The Canwood Street/Palo Comado Canyon Road Intersection and Dorothy Drive/Palo Comado Canyon Road Intersection, both south of the freeway, and the US 101 northbound off-ramp intersection with Palo Comado Road, are all one-way stop-controlled. The intersection of Dorothy Drive, Chesebro Road, and the southbound hook ramps are four-way stop-controlled.

C. SAFETY IMPROVEMENTS

Multiple safety improvements are to be implemented for this project, including, but not limited to, the following items: Increased horizontal sight distance at the intersection of the northbound off-ramp and Palo Comado Canyon Road was achieved by realigning the northbound off-ramp to intersect Palo Comado Canyon Road closer to a 90 degree angle, widening the bridge and adding one more foot to the south side sidewalk for a total of 6 feet wide on the bridge over US 101. The proposed design also realigns the northbound on-ramp with the northbound off-ramp to provide better connectivity and improve safety. Adding sidewalks, curb ramps, and bicycle lanes to provide safe access facilities through the interchange will largely improve the pedestrian and bicycle mobility. Signalizing the intersection and channelization would also contribute to operational efficiency and safety. These improvements will provide safer driving conditions for the traveling public.

D. TOTAL PROJECT COST

The estimated total capital costs for both alternatives are listed below.

Table 1: *Total Cost*

Cost Component	No Build Alternative Cost*	Build Alternative Cost*
Roadway	$0	$13,504,000
Structures	$0	$3,190,000
Right-of-Way	$0	$706,000
Total Capital Cost	$0	$17,400,000

*All Costs shown in 2011 Dollars

2. FEATURES REQUIRING AN EXCEPTION

A. Design Exception Feature M1:

Nonstandard Feature

The project proposes the following vertical clearance at the overcrossing:

Table 2 Vertical Clearance			
Figure 2	**Location**	**Existing/Proposed Vertical Clearance (ft)**	**Standard Vertical Clearance (ft)**
Build Alternative	Northern edge of NB travel lanes	15.14	16.5

Standard for Which Exception is Requested

Highway Design Manual, Section 309.2(1)(a) – Freeways and Expressways, all construction except overlay projects – **16 feet 6 inches shall be the minimum vertical clearance over the roadbed of the State facility (e.g. main lanes, shoulders, ramps, collector-distributor roads, speed change lanes, etc.).**

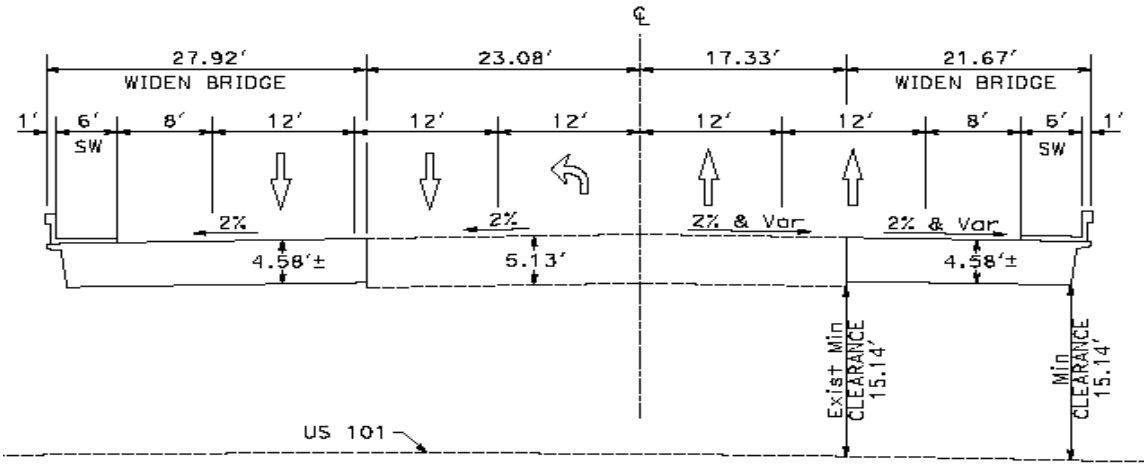
Reasons For Requesting Exception

Located on a constrained site, this is basically a bridge widening project along with local facility improvements. The proposed bridge widening will not decrease the existing vertical clearance. Based on review of bridge inspection and maintenance records and preliminary seismic review, replacement is not warranted at this time. Recommendations from the Division of Engineering Services have been incorporated into the proposed structure design and the Advanced Planning Study has been approved. In order to improve the existing vertical clearance to the standard 16.5 feet, the bridge would have to be replaced or US 101 profile under the bridge would have to be lowered or replaced. These options are not part of

this bridge widening project. Replacing the bridge requires realignment of the Palo Comado Canyon Road for staging purposes and major reconstruction of the ramps. It would cause significant ramp closures and delay during construction due to stage construction activities. Significant right-of-way acquisition and additional utility relocations would also be required with replacement of the bridge structure due to the enlarged footprint. It would result in Palo Comado Canyon Road going substantially outside the existing right-of-way and encroaching into private properties and businesses which would need to be relocated. In addition, various local streets would need to be reconstructed. Lowering the profile of US 101 under the bridge would also cause a significant increase in the construction cost of the interchange improvements. The option of lowering the mainline profile of the NB lanes is considered feasible and is not constrained by the proposed bridge widening. This option will allow Caltrans the ability to consider providing additional clearance within this section of the US 101 corridor, when and if the numerous other vertical constraints are removed or reconstructed.

Based on inventory of the US 101 corridor bridges, many existing bridges have non-standard vertical clearance. Between I-405 and SR-126, on US 101, there are a total of 6 structures with 15' or less vertical clearance and 9 structures that have less than 15.5' vertical clearance. Selected bridge clearances west of Palo Comado Canyon Road include Borchard Avenue at 13.5', Route 23/101 Separation at 15.1', Reyes Adobe at 15.5' and Kanan Road at 15.2'; and to the east include Lost Hills at 15.5', Las Virgenes and Calabasas Parkway at 15.4', and Encino Avenue and Louise Avenue at 14.8'. Similar to the other bridges within this US 101 Corridor, the Palo Comado Canyon Road bridge clearance is marked on the structure which is visible to motorists. Standard signage exists throughout the corridor. Currently, there are no additional special vertical clearance warning signs erected. Based on structure maintenance and investigation records, the bridge was hit three times in the westbound direction by high vehicle loads within the last decade, all prior to 2006. Repair to the exterior girders was completed in 2006. There have been no incidents in the last five years.

The proposed widening is designed to maintain the same vertical clearance and to not worsen the existing condition. The exterior girders of the proposed widening will be set to maintain or exceed the existing vertical clearance on the structure. A shallower structure depth will be used in order to account for the cross-slope effect due to widening. Based on field surveys performed for this project, the 4.58 foot shallower I-girders shown below provide adequate tolerance for adjustments during final design to maintain the existing vertical clearance.



Added Cost to Make Standard

Replacing the bridge to meet minimum vertical clearance standards would cause a significant increase in the construction cost of the project. It would result in Palo Comado Canyon Road going substantially outside the right-of-way and encroaching into private properties and businesses which would need to be relocated. Not only would the cost of the bridge significantly increase, the cost associated with reconstructing Palo Comado Canyon Road and ramp connections, local street connections, and acquiring right-of-way would greatly increase the total cost of the project. The additional cost to make these features standard would be in excess of $18 million. See Table 2-1.

Table 2-1 Feature M1
Additional Cost to Make Standard

Cost Component	Opinion of Probable Construction Cost*
Roadway	$10,000,000
Structures	$4,000,000
Right-of-Way	$4,000,000
Total Capital Cost	$18,000,000

*All Costs shown in 2011 Dollars

B. Design Exception Feature M2:

Nonstandard Feature

The project proposes the following superelevation rate:

Table 3
Superelevation Rate

Figure 2	Alignment	Existing/Proposed Superelevation Rate "e"	Standard Superelevation Rate "e"	Proposed Radius (ft)
Build Alternative	NB On-Ramp	2%	10%	850

The 2% superelevated portion of the ramp is between stations 333+12.00 and 334+22.28. The full transition area is within approximate stations 332+75 and 334+50.

Standard for Which Exception is Requested

Highway Design Manual, Index 202.2 and Table 202.2 – Standards for Superelevation, "**Based on an e_{max} selected by the designer for one of the conditions, superelevation rates from Table 202.2 shall be used within the given range of curve radii. If less than standard superelevation rates are approved (see Index 82.1), Figure 202.2 shall be used to determine superelevation based on the curve radius and maximum comfortable speed**."

Reasons For Requesting Exception

Given the geometric configuration of the existing diamond ramp connection at the overcrossing, a standard 10% superelevation is not attainable at the curve location without reconstructing the ramp. In addition, it is not possible to use longer radii due to the proximity of the next horizontal curve and transition needs. As is the case with similar existing interchanges, the existing ramp superelevation is controlled by the local street overcrossing profile, in this case Palo Comado Canyon Road. Even though the ramp terminates at the intersection, the proposed superelevation rate is designed to meet the comfortable speed of 45 mph for 850-foot radius, as required in Figure 202.2 of the *HDM*. In addition, the proposed transition complies with *HDM* Index 202.5(3) of 6% per 100 feet for restricted situations and other elements of HDM Index 202.2. Based on the design requirements of 50 mph at the inlet nose and 25 mph at the ramp termini, the expected design speed for this ramp would be 35 mph to 40 mph. There is no evidence of any accidents being attributed to the existing nonstandard superelevation rate.

Added Cost to Make Standard

The cost associated with making the superelevation standard would require reconfiguration of the ramp intersection at the overcrossing and the entire ramp. The additional cost to make this feature standard would be in excess of $0.5 million. See Table 3-1.

Table 3-1 Feature M2
Additional Cost to Make Standard

Cost Component	Opinion of Probable Construction Cost*
Roadway	$500,000
Structures	$0
Right-of-Way	$0
Total Capital Cost	$500,000

*All Costs shown in 2011 Dollars

3. TRAFFIC DATA

The traffic study was completed to evaluate the current and future traffic operations and identify the specific improvements to the US 101 Freeway interchange (US 101 Northbound Ramps) with Palo Comado Canyon Road in the City of Agoura Hills. Weekday AM and PM peak period intersection turning movement counts, average daily traffic (ADT), and vehicle classification counts were collected in November 2009 and May 2010. Five intersections were analyzed for existing (2010), opening year (2015), and forecast year (2035) as presented in Table 3-1 and 3-2 below.

Table 3-1 presents the LOS at the study intersections for Existing (2010), Opening (2015), and Horizon (2035) year scenarios for the no-build alternative.

Table 3-1: Intersection LOS Summary – No Build Alternative

No.	Intersection	Intersection Control	Existing				2015 Baseline				2035 Baseline			
			AM		PM		AM		PM		AM		PM	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	Driver @ Chesebro	All-way Stop	50.9	F	36.5	E	61.2	F	44.9	E	128.1	F	99.3	F
2	Palo Comado @101 NB Ramps	Two-way stop (stop sign on ramp)	33.3	D	37.6	E	52.3	F	69.1	F	290.3	F	105.4	F
3	Dorothy Dr @ SB Ramps	All-way stop	19.1	C	12.6	B	22.1	C	13.4	B	41.7	E	26.3	D
4	Palo Comado @Chesebro	Two-way stop (stop signs on Chesebro)	17.6	C	19.0	C	19.0	C	19.8	C	34.9	D	31.7	D
5	Agoura @ Chesebro	All-way Stop	9.1	A	11.5	B	9.3	A	12.0	B	13.2	B	26.3	D

Note: Delay refers to the average delay for the entire intersection. At a two-way stop, delay refers to the worst approach delay.

Table 3-1 indicates that all study intersections currently operate at LOS C or better in both the AM and PM peak periods with the exception of Driver Avenue at Chesebro Road and Palo Comado Canyon Road at US 101 NB Ramps that operate at LOS D, E, or F in both the AM and PM peak hours.

For 2015 Baseline, all study intersections would continue to operate at an LOS C or better in both the AM and PM peak period with the exception of Driver Avenue at Chesebro Road and Palo Comado Canyon Road at US 101 NB Ramps that operate at LOS E or worse in both the AM and PM peak hours.

For 2035 Baseline, all the study intersections would operate at LOS D or worse with the exception of Agoura Road at Chesebro Road (LOS B in the AM peak period).

Table 3-2 presents the LOS at the study intersections for the Opening (2015) and Horizon (2035) year scenarios for the build alternative.

Table 3-2: Intersection LOS Summary –Build Alternative

No.	Intersection	Intersection Control	2015				2035			
			AM		PM		AM		PM	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	Driver @ Chesebro	All-way Stop	61.2	F	44.9	E	128.1	F	99.3	F
2	Palo Comado @101 NB Ramps	Traffic Signal	7.6	A	8.0	A	9.8	A	11.5	B
3	Dorothy Dr @ SB Ramps	All-way stop	22.1	C	13.4	B	26.0	D	24.3	C
4	Palo Comado @Chesebro	Two-way stop (stop signs on Chesebro)	19.0	C	19.8	C	34.9	D	31.7	D
5	Agoura @ Chesebro	All-way Stop	9.3	A	12.0	B	13.2	B	26.3	D

Note: Delay refers to the average delay for the entire intersection. At a two-way stop, delay refers to the worst approach delay.

Table 3-2 indicates that for year 2015 the proposed improvements would improve the LOS at the intersection of Palo Comado Canyon Road at 101 NB Ramps from LOS F to LOS A for both the AM and PM peak period. The remaining intersections would continue to operate at LOS C or better during both AM and PM peak periods with the exception of Driver Avenue and Chesebro Road which continues to operate at LOS F in the AM peak period and LOS E in the PM peak period.

Table 3-2 also indicates that for year 2035 the proposed improvements would improve the LOS at the intersection of Palo Comado Canyon Road at 101 NB Ramps from LOS F to LOS A for the AM peak period and LOS F to B for the PM peak period. The remaining intersections would continue to operate at LOS D or worse during both AM and PM peak periods, except the intersection of Agoura Road at Chesebro Road that operates at LOS B during the AM peak period.

Queuing Analysis

Caltrans requested that a queuing analysis be completed for the westbound direction at the intersection of Palo Comado Canyon Road and US 101 NB Off-Ramp. Queue lengths were determined based upon a queuing analysis for the westbound direction. Table 3-3 presents

the queue lengths in feet for each forecast year with and without the proposed improvements.

Table 3-3: 95th Percentile Queue Lengths (feet) for NB Off-Ramp at Palo Comado Canyon Road

	Existing AM (stop sign)	Existing PM (stop sign)	2015 Base AM (stop sign)	2015 Base PM (stop sign)	2015 W/ improvements AM (traffic signal)	2015 W/ improvements PM (traffic signal)	2035 Base AM (stop sign)	2035 Base PM (stop sign)	2035 W/ Improvements AM (traffic signal)	2035 W/ Improvements PM (traffic signal)
Left	238	419	232	235	46	58	698	439	70	66
Through	153	691	135	367	47	60	251	789	71	66
Right	153	691	135	367	57	82	251	789	136	236

Table 3-3 indicates that the queue lengths are expected to be significantly reduced with the proposed improvements to the Palo Comado Canyon Road interchange.

Roadway Analysis

A roadway segment LOS analysis was completed for Palo Comado Canyon Road overpass based upon the HCM methodology. Based upon the definitions provided in the HCM, Palo Comado Canyon Road is considered to be a Class II suburban minor arterial. Existing volumes were obtained from the ADT data collected in 2010. To obtain the future 2015 and 2035 anticipated traffic volumes, a regional growth factor of 0.75% per year was applied to the existing (2010) traffic volumes to account for the general area wide and regional growth and development. Table 3-4 presents the service volumes (vehicle/hour) for AM and PM peak periods for Palo Comado Canyon Road for Existing Conditions (2010), Opening Year Conditions (2015), and Build-out Conditions (2035) and the corresponding LOS for one lane and two lanes in each direction.

Table 3-4: Palo Comado Canyon Road Service Volumes (veh/hr)

	Peak Period	Service Volumes (vph)	LOS with 1 lane	LOS with 2 lanes
Existing (2010)	AM	1,013	F	N/A
	PM	936	F	N/A
Opening Year (2015)	AM	1,051	F	C or better
	PM	971	F	C or better
Buildout Year (2035)	AM	1,203	F	C or better
	PM	1,112	F	C or better

N/A - not applicable

Table 3-4 indicates that Palo Comado Canyon Road currently operates at LOS F or worse during both AM and PM peak hours under existing conditions. The widening of the Palo Comado Canyon Road overpass from two to four lanes would improve the operation to LOS C or better during both AM and PM peak hours under opening year (2015) and build-out (2035) year conditions.

Freeway Mainline and Ramp Analysis

Freeway mainline and ramp analysis for US-101 was conducted using the HCS+ software. Freeway analysis results are expressed in terms of density, which measures the number of passenger cars per lane mile (pc/mi/ln) on the freeway mainline. Analysis results for Existing (2010), Opening Year (2015), and Buildout Year (2035) conditions are summarized in Table 3-5.

Table 3-5: Freeway Mainline Operations for 101 Freeway

Existing (2010)				Opening Year (2015)				Buildout Year (2035)			
Northbound		Southbound		Northbound		Southbound		Northbound		Southbound	
Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS
30.3	D	29.8	D	31.9	D	31.2	D	40.4	E	39.2	E

Table 3-5 indicates that the freeway segment would operate at LOS D or worse in both northbound and southbound directions for all scenarios. Ramp operations were similar to the freeway analysis. The northbound and southbound on- and off -ramps at this interchange currently have auxiliary lanes that provide additional storage for vehicles and also facilitate better operations at the merge and diverge areas in the vicinity of the interchange.

4. TRAFFIC ACCIDENT ANALYSIS

Accident data based on Caltrans Transportation Systems Network Traffic Accident Surveillance and Analysis System (TSN TASAS) for the three-year period ending December 31, 2009 shows that the total rate of accidents at the Palo Comado Canyon Road interchange is generally lower than the statewide average. There are three exceptions to this: the northbound off-ramp total accident rate is 50% higher than the statewide average and 71% higher than the statewide average for fatality plus injury; and for the southbound on-ramp the accident rate is 29% higher than the statewide average for fatality plus injury. A main reason for the higher accident rates on the existing northbound off-ramp is due to inadequate stopping sight distance at the intersection with Palo Comado Canyon Road. Another reason is vehicles tend to queue up due to the stop controlled intersection and reducing the available stopping distances between vehicles. The build alternative provides standard stopping sight distance and reduces the queue lengths for better spacing of vehicles. Based on TSN TASAS, speeding caused both accidents on the southbound on-ramp with no other apparent reason. The TSN TASAS data is summarized in **Table 4**.

Table 4: Accident Rates for US 101/Palo Comado Canyon Road Interchange (On-/Off-Ramps)

Location	Segment Actual Accident Rate*			Statewide Average Accident Rate*		
US 101/Palo Comado Canyon Road Interchange	Fatalities	Fatalities & Injuries	Total	Fatalities	Fatalities & Injuries	Total
Northbound Off Ramp	0.000	0.72	1.81	0.004	0.42	1.2
Northbound On Ramp	0.000	0.00	0.00	0.002	0.26	0.75
Southbound Off Ramp	0.000	0.00	0.35	0.004	0.28	0.95
Southbound On Ramp	0.000	0.18	0.35	0.002	0.14	0.45

* Accident rates per million vehicle miles traveled

The primary collision factor for the northbound off-ramp accidents is failure to yield which accounts for 50% of the accidents. The location of the accidents for this off-ramp are clustered around the ramp intersection and ramp area preceding the intersection, which account for 70% and 20% of the accidents, respectively. A total of 13 accidents occurred at the interchange, with zero fatalities and five injuries. Ten of the total 13 accidents and four of the five injuries occurred on the northbound off-ramp.

The primary collision factor for the accidents that occurred on the southbound on-ramp was speeding. The primary collision factor for the accidents that occurred on the southbound off-ramp was influence of alcohol. Reduced queue lengths for the northbound off-ramp will result in reduced delay at the intersection. This will not affect the southbound on-ramp and off-ramp.

With the exception of the northbound off-ramp, there does not appear to be any existing geometric design elements contributing to the higher than average accident rates. The existing bridge contributes to non-standard stopping sight distance at the northbound off-ramp intersection. The Build Alternative is expected to improve operations at the northbound off-ramp by providing standard stopping sight distance and signalizing the intersection. Sight distance will be improved by modifying the northbound off-ramp its geometry and widening the bridge.

The proposed improvements are not anticipated to contribute to an increase in accidents. Additional lanes for through and turning movements would be provided to accommodate the increased traffic. Signalized intersections in the Build Alternative would be provided to improve yielding right-of-way control. Although nonstandard intersection spacing would remain as documented in an advisory design exception fact sheet, the improvements under the Build Alternative would increase the spacing between intersections and traffic operations would be enhanced.

5. INCREMENTAL IMPROVEMENTS

There are no additional practical incremental improvements that would address the project purpose and need.

6. FUTURE CONSTRUCTION

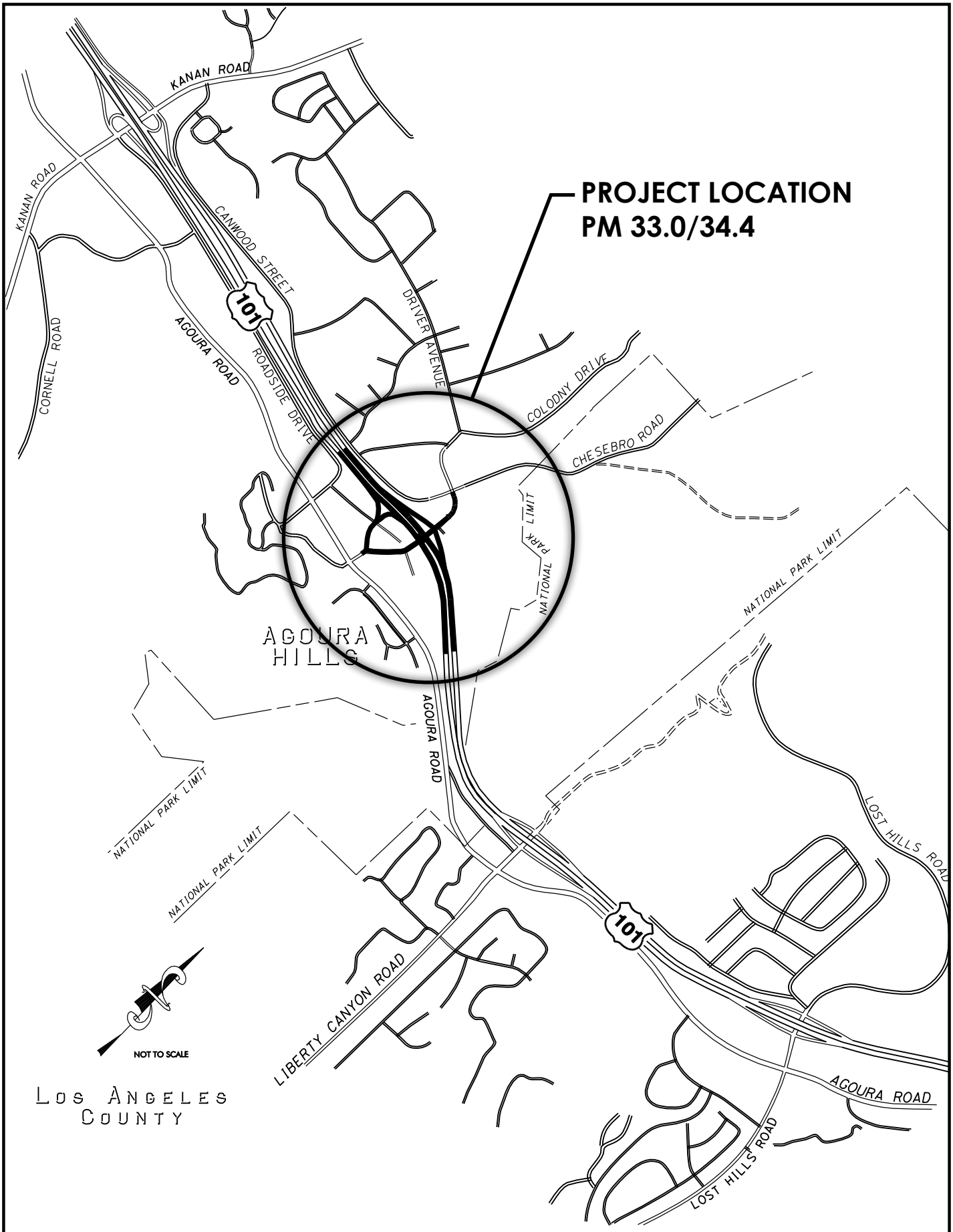
No projects have been identified that preclude the project improvements identified within this document.

7. PROJECT REVIEWS/CONCURRENCE

List of Reviewers		
Reviewer	**Title**	**Date**
JD Bamfield	HQ Design Reviewer	08/22/2012
OC Lee	Sr. Transportation Engineer Office of Design C	08/28/2012

8. ATTACHMENTS

Figure 1 - Vicinity Map
TASAS Table B
Figure 2 – Build Alternative



PROJECT LOCATION MAP

California Department of Transportation
Table B - Selective Accident Rate Calculation

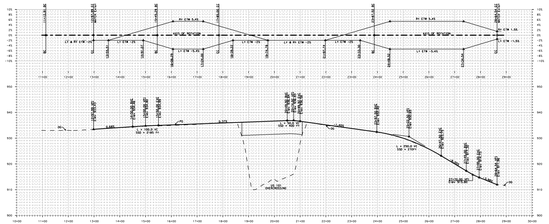
Location Description	Rate Group (RUS)	No. of Accidents / Significance							Pers Kld Inj	ADT Main X-St	Total MV+ or MVM	Accident Rates Actual		Accident Rates Average			
		Tot	Fat	Inj	F+I	Multi Veh	Wet	Dark				Fat	F+I	Tot	Fat	F+I	Tot
07 LA 101 033.618 101/NB OFF TO CHEESEBRO RD	R 10	10	0	4	4	8	0	3	0	5.1	5.54 +	0.000	.72	1.81	0.004	.42	1.20
0001-0001 2007-01-01 2009-12-31 *36 mo.*	U								4	.0							
07 LA 101 033.764 101/SB ON PALO COMADO CYN	R 32	2	0	1	1	2	1	1	0	5.2	5.70 +	0.000	.18	.35	0.002	.14	.45
0001-0002 2007-01-01 2009-12-31 *36 mo.*	U								1	.0							
07 LA 101 033.798 101/NB ON FR CHEESEBRO RD	R 12	0	0	0	0	0	0	0	0	2.8	3.11 +	0.000	.00	.00	0.002	.26	.75
0001-0003 2007-01-01 2009-12-31 *36 mo.*	U								0	.0							
07 LA 101 033.893 101/SB OFF TO CHEESEBRO RD	R 26	1	0	0	0	0	0	1	0	2.6	2.87 +	0.000	.00	.35	0.004	.28	.95
0001-0004 2007-01-01 2009-12-31 *36 mo.*	U								0	.0							

Accident Rates expressed as: **# of accidents / Million vehicle miles**

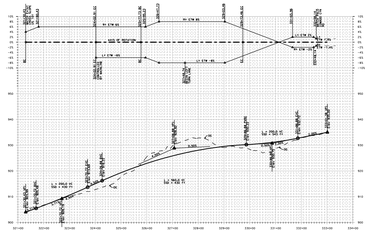
+ denotes that **Million Vehicles** (MV) used in accident rates instead (for intersections and ramps).

For Ramps RUS only considers R(Rural) U(Urban)

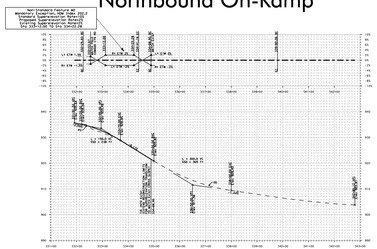
Palo Comado Canyon Road

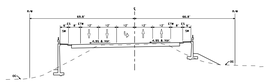


Northbound Off-Ramp

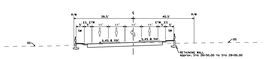


Northbound On-Ramp

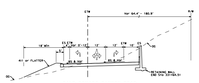




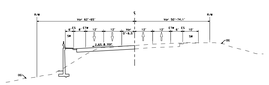
PALO COMADO CANYON ROAD
Sta 17+40.00 TO Sta 19+74.00



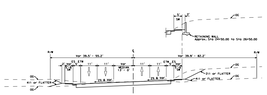
PALO COMADO CANYON ROAD
NORTHBOUND OFF-RAMP
Sta 36+00.00 TO Sta 36+58.37



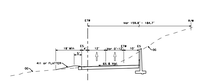
PALO COMADO CANYON ROAD
NORTHBOUND OFF-RAMP
Sta 38+18.74 TO Sta 38+96.74



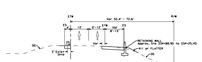
PALO COMADO CANYON ROAD
Sta 19+15.00 TO Sta 19+40.00



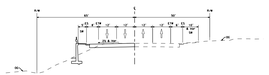
PALO COMADO CANYON ROAD
Sta 21+00.00 TO Sta 22+00.00



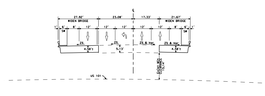
PALO COMADO CANYON ROAD
NORTHBOUND OFF-RAMP
Sta 38+58.00 TO Sta 39+18.74



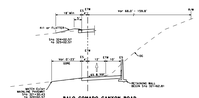
PALO COMADO CANYON ROAD
NORTHBOUND ON-RAMP
Sta 50+46.58 TO Sta 50+95.00



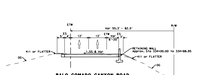
PALO COMADO CANYON ROAD
Sta 19+97.00 TO Sta 20+15.00



PALO COMADO CANYON ROAD OVERCROSSING
Sta 20+72.00 TO Sta 21+00.00



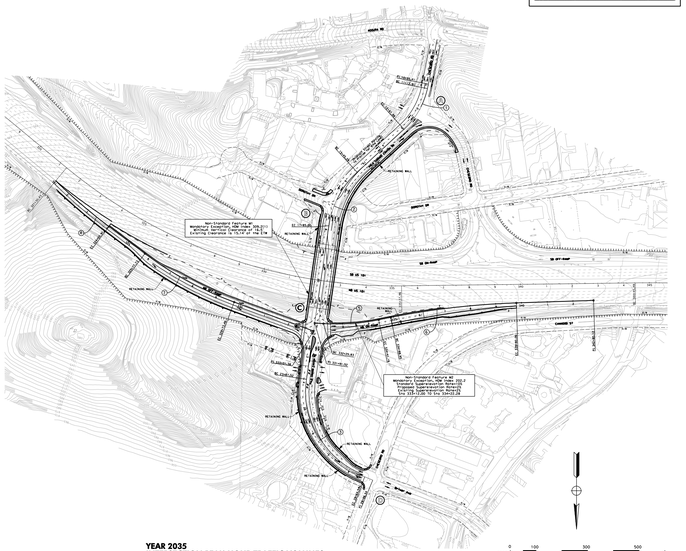
PALO COMADO CANYON ROAD
NORTHBOUND OFF-RAMP
Sta 39+00.00 TO Sta 39+20.27

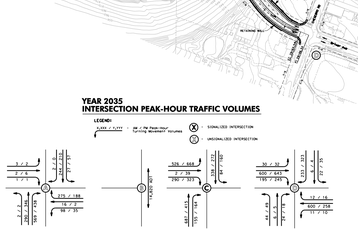


PALO COMADO CANYON ROAD
NORTHBOUND ON-RAMP
Sta 50+46.58 TO Sta 50+69.85

Palo Comado Canyon Road | Northbound Off-Ramp | Northbound On-Ramp

CURVE DATA TABLE				
No.	D	R	T	L
C1	3°00'00.00"	1910.080'	50.00	100.00
C2	3°00'00.00"	1910.080'	50.00	100.00
C3	3°00'00.00"	1910.080'	50.00	100.00
C4	3°00'00.00"	1910.080'	50.00	100.00
C5	3°00'00.00"	1910.080'	50.00	100.00
C6	3°00'00.00"	1910.080'	50.00	100.00
C7	3°00'00.00"	1910.080'	50.00	100.00
C8	3°00'00.00"	1910.080'	50.00	100.00
C9	3°00'00.00"	1910.080'	50.00	100.00
C10	3°00'00.00"	1910.080'	50.00	100.00
C11	3°00'00.00"	1910.080'	50.00	100.00
C12	3°00'00.00"	1910.080'	50.00	100.00
C13	3°00'00.00"	1910.080'	50.00	100.00
C14	3°00'00.00"	1910.080'	50.00	100.00
C15	3°00'00.00"	1910.080'	50.00	100.00
C16	3°00'00.00"	1910.080'	50.00	100.00
C17	3°00'00.00"	1910.080'	50.00	100.00
C18	3°00'00.00"	1910.080'	50.00	100.00
C19	3°00'00.00"	1910.080'	50.00	100.00
C20	3°00'00.00"	1910.080'	50.00	100.00
C21	3°00'00.00"	1910.080'	50.00	100.00
C22	3°00'00.00"	1910.080'	50.00	100.00
C23	3°00'00.00"	1910.080'	50.00	100.00
C24	3°00'00.00"	1910.080'	50.00	100.00
C25	3°00'00.00"	1910.080'	50.00	100.00
C26	3°00'00.00"	1910.080'	50.00	100.00
C27	3°00'00.00"	1910.080'	50.00	100.00
C28	3°00'00.00"	1910.080'	50.00	100.00
C29	3°00'00.00"	1910.080'	50.00	100.00
C30	3°00'00.00"	1910.080'	50.00	100.00
C31	3°00'00.00"	1910.080'	50.00	100.00
C32	3°00'00.00"	1910.080'	50.00	100.00
C33	3°00'00.00"	1910.080'	50.00	100.00
C34	3°00'00.00"	1910.080'	50.00	100.00
C35	3°00'00.00"	1910.080'	50.00	100.00
C36	3°00'00.00"	1910.080'	50.00	100.00
C37	3°00'00.00"	1910.080'	50.00	100.00
C38	3°00'00.00"	1910.080'	50.00	100.00
C39	3°00'00.00"	1910.080'	50.00	100.00
C40	3°00'00.00"	1910.080'	50.00	100.00
C41	3°00'00.00"	1910.080'	50.00	100.00
C42	3°00'00.00"	1910.080'	50.00	100.00
C43	3°00'00.00"	1910.080'	50.00	100.00
C44	3°00'00.00"	1910.080'	50.00	100.00
C45	3°00'00.00"	1910.080'	50.00	100.00
C46	3°00'00.00"	1910.080'	50.00	100.00
C47	3°00'00.00"	1910.080'	50.00	100.00
C48	3°00'00.00"	1910.080'	50.00	100.00
C49	3°00'00.00"	1910.080'	50.00	100.00
C50	3°00'00.00"	1910.080'	50.00	100.00
C51	3°00'00.00"	1910.080'	50.00	100.00
C52	3°00'00.00"	1910.080'	50.00	100.00
C53	3°00'00.00"	1910.080'	50.00	100.00
C54	3°00'00.00"	1910.080'	50.00	100.00
C55	3°00'00.00"	1910.080'	50.00	100.00
C56	3°00'00.00"	1910.080'	50.00	100.00
C57	3°00'00.00"	1910.080'	50.00	100.00
C58	3°00'00.00"	1910.080'	50.00	100.00
C59	3°00'00.00"	1910.080'	50.00	100.00
C60	3°00'00.00"	1910.080'	50.00	100.00
C61	3°00'00.00"	1910.080'	50.00	100.00
C62	3°00'00.00"	1910.080'	50.00	100.00
C63	3°00'00.00"	1910.080'	50.00	100.00
C64	3°00'00.00"	1910.080'	50.00	100.00
C65	3°00'00.00"	1910.080'	50.00	100.00
C66	3°00'00.00"	1910.080'	50.00	100.00
C67	3°00'00.00"	1910.080'	50.00	100.00
C68	3°00'00.00"	1910.080'	50.00	100.00
C69	3°00'00.00"	1910.080'	50.00	100.00
C70	3°00'00.00"	1910.080'	50.00	100.00
C71	3°00'00.00"	1910.080'	50.00	100.00
C72	3°00'00.00"	1910.080'	50.00	100.00
C73	3°00'00.00"	1910.080'	50.00	100.00
C74	3°00'00.00"	1910.080'	50.00	100.00
C75	3°00'00.00"	1910.080'	50.00	100.00
C76	3°00'00.00"	1910.080'	50.00	100.00
C77	3°00'00.00"	1910.080'	50.00	100.00
C78	3°00'00.00"	1910.080'	50.00	100.00
C79	3°00'00.00"	1910.080'	50.00	100.00
C80	3°00'00.00"	1910.080'	50.00	100.00
C81	3°00'00.00"	1910.080'	50.00	100.00
C82	3°00'00.00"	1910.080'	50.00	100.00
C83	3°00'00.00"	1910.080'	50.00	100.00
C84	3°00'00.00"	1910.080'	50.00	100.00
C85	3°00'00.00"	1910.080'	50.00	100.00
C86	3°00'00.00"	1910.080'	50.00	100.00
C87	3°00'00.00"	1910.080'	50.00	100.00
C88	3°00'00.00"	1910.080'	50.00	100.00
C89	3°00'00.00"	1910.080'	50.00	100.00
C90	3°00'00.00"	1910.080'	50.00	100.00
C91	3°00'00.00"	1910.080'	50.00	100.00
C92	3°00'00.00"	1910.080'	50.00	100.00
C93	3°00'00.00"	1910.080'	50.00	100.00
C94	3°00'00.00"	1910.080'	50.00	100.00
C95	3°00'00.00"	1910.080'	50.00	100.00
C96	3°00'00.00"	1910.080'	50.00	100.00
C97	3°00'00.00"	1910.080'	50.00	100.00
C98	3°00'00.00"	1910.080'	50.00	100.00
C99	3°00'00.00"	1910.080'	50.00	100.00
C100	3°00'00.00"	1910.080'	50.00	100.00





YEAR 2035
INTERSECTION PEAK-HOUR TRAFFIC VOLUMES

LEGEND:
AAM / PM = Peak-Hour Turning Movement Volumes
- Ⓢ = SIGNALIZED INTERSECTION
- Ⓤ = UNSIGNALIZED INTERSECTION

Palo Comado Canyon Road/ US 101 Interchange Improvements

MANDATORY DESIGN EXCEPTION FACT SHEET - GEOMETRIC APPROVAL DRAWINGS

March 2011
Updated July 2012

FIGURE 2

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION