EXXONMOBIL INTERIM TRUCKING PERMIT PROJECT
SANTA BARBARA COUNTY, CALIFORNIA

REVISED TRAFFIC AND CIRCULATION STUDY

January 18, 2018 **ATE #17092**

Prepared for:

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REVISED TRAFFIC AND CIRCULATION STUDY FOR THE EXXONMOBIL INTERIM TRUCKING PERMIT PROJECT, COUNTY OF SANTA BARBARA

Associated Transportation Engineers (ATE) has prepared the following traffic and circulation study for the ExxonMobil Interim Trucking Permit Project located in Santa Barbara County. It is understood that the traffic impact analyses will be incorporated in the environmental impact report being prepared for the project.

Associated Transportation Engineers

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INTRODUCTION

The following study contains an analysis of potential traffic and circulation impacts associated with the ExxonMobil Interim Trucking Permit (the "Project"). The report provides information relative to existing traffic conditions within the Project study area and evaluates the potential traffic impacts associated with the Project using Santa Barbara County, Caltrans, and Kern County impact criteria.

PROJECT DESCRIPTION

ExxonMobil is requesting an Interim Trucking Permit to truck processed crude from the Santa Ynez Unit (SYU) facility located in Las Flores Canyon (LFC) to markets until a transport pipeline becomes available. Because of the Plains 901 pipeline incident in May 2015, the pipeline was shut down and eliminated the only transportation option for transport of processed crude from the SYU facility to markets. The interim trucking program would cease once a pipeline is available for crude transportation from the LFC site to markets.

The interim trucking permit is proposed to allow transport of crude product via trucks from the LFC site located adjacent to US 101 about 12 miles west of the City of Goleta to the Phillips 66 Santa Maria Terminal near Santa Maria in Santa Barbara County or to the Plains Pentland Terminal in Kern County. Figure 1 illustrates the locations of the LFC site, the Phillips 66 site, and the Plains Pentland Terminal site. Figure 1 also shows the proposed truck routes.

The maximum number of loaded trucks would be limited to 70 per day. Truck transportation would occur seven days a week and 24-hours per day. All trucks entering and leaving the LFC facility would use the Refugio Road ramps at US 101. Trucks traveling to the Phillips 66 Terminal would exit US 101 at the Betteravia Road Interchange (I/C) and use Betteravia Road, Rosemary Road, and Battles Road to access the Phillips 66 Terminal. Trucks traveling to the Plains Pentland Terminal would exit US 101 at the SR 166 I/C and use SR 166 to Basic School Road to access the Plains Pentland Terminal.

TRAFFIC STUDY METHODOLOGIES

The following section reviews the key elements and methodologies used in the traffic and circulation study.

Traffic Scenarios

The traffic study assesses potential impacts generated by the Project for two options. Each option generates the same level of traffic on a daily basis (maximum number of trucks would be limited to 70 per day). Option 1 evaluates potential impacts assuming transport of crude product to the Phillips 66 Terminal in Santa Maria (see Figure 1). Option 2 evaluates potential impacts assuming transport of crude to the Plains Pentland Terminal in Kern County (see Figure 1).

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PROJECT SITE LOCATIONS / PROPOSED TRUCK ROUTES

FIGURE 1

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Study Facilities

The traffic study assesses potential impacts for the key roadway segments and intersections along the two truck route options. Table 1 lists the key roadway segments and intersections evaluated in the traffic study.

Table 1
Key Roadways and Intersections

Roadway Segments	Intersections
Option 1 – Truck to Phillips 66 Terminal	
Calle Real – east of Refugio Rd I/C	US 101 NB Ramps/Refugio Rd
US 101 – Refugio Rd I/C to Betteravia Rd I/C	US 101 SB Ramps/Refugio Rd
Betteravia Rd – east of US 101 I/C	US 101 NB Ramps/Betteravia Rd
Rosemary Rd – north of Betteravia Rd	US 101 SB Ramps/Betteravia Rd
Battles Rd – east of Rosemary Rd	
Option 2 – Truck to Plains Pentland Terminal	US 101 NB Ramps/Refugio Road
Calle Real – east of Refugio Rd I/C	US 101 SB Ramps/Refugio Road
US 101 – Refugio Rd I/C to SR 166 I/C	US 101 NB Ramps/SR 166
SR 166 – US 101 I/C to Basic School Rd	US 101 SB Ramps/SR 166
Basic School Rd – south of Plains Site	SR 166/Basic School Road

Level of Service Definitions and Evaluation Methods

Levels of Service (LOS) A through F are used to rate traffic operations, with LOS A indicating free flow operations and LOS F indicating congested operations (more detailed descriptions are included in the Technical Appendix for reference). Levels of service for Santa Barbara County and Kern County roads were evaluated using standard engineering roadway design capacities. Levels of service for the US 101 and SR 166 highway segments, as well as the intersections along the routes, were evaluated using the Caltrans recommended methods outlined in the Highway Capacity Manual.[1]

THRESHOLDS OF SIGNIFICANCE

Santa Barbara County

Most of the roadway segments along the Option 1 and Option 2 truck routes are within Santa Barbara County. Santa Barbara County considers LOS C as the minimum acceptable operating standard for the roadways and intersections. The County's thresholds of significance for traffic impacts were used to assess the Project's potential to generate traffic impacts to County facilities. The Santa Barbara County thresholds are listed below.

[1] Highway Capacity Manual, Transportation Research Board, 2016.

A. The addition of project traffic to an intersection increases the volume-to-capacity (V/C) ratio by the value provide below or sends at least 5, 10 or 15 trips to an intersection operating at LOS F, E, or D.

Intersection Level of Service (Including Project)	Increase in V/C or Trips Greater Than
LOS A	0.20
LOS B	0.15
LOS C	0.10
LOS D	15 Trips
LOS E	10 Trips
LOS F	5 Trips

B. Project access to a major road or arterial road would require a driveway that would create an unsafe situation or a new traffic signal or major revisions to an existing traffic signal.

C. Project adds traffic to a roadway that has design features (e.g., narrow width, road-side ditches, sharp curves, poor sight distance, inadequate pavement structure) or receives use which would be incompatible with substantial increases in traffic (e.g., rural roads with use by farm equipment, livestock, horseback riding, or residential roads with heavy pedestrian or recreational uses, etc.) that would become potential safety problems with the addition of project traffic or cumulative traffic. Exceedance of the roadways designated Circulation Element Capacity may indicate the potential for the occurrence of the above impacts.

The roadway impact threshold defines a significant roadway impact if a project would increase traffic volumes by more than 1.0 percent (either project-specific or project contribution to cumulative impacts) on a roadway that currently exceeds its Acceptable Capacity or is forecast to exceed its Acceptable Capacity under cumulative conditions.

D. Project traffic would utilize a substantial portion of an intersection's capacity where the intersection is currently operating at an acceptable level of service (A-C) but with cumulative traffic would degrade to or approach LOS D (V/C 0.81) or lower. Substantial is defined as a minimum change of 0.03 for intersections which would operate from 0.80 to 0.85, and a change of 0.02 for intersections which would operate from 0.86 to 0.90, and a change of 0.01 for intersections operating at anything lower.

Kern County

Basic School Road is located in Kern County. According to the Kern County Circulation Element of the General Plan, "All roads shall maintain Level of Service D or better as required by the County General Plan. If traffic resulting from a project exceeds current volume to capacity projections, mitigation is required if development causes roadways to fall below LOS D."

Caltrans

US 101 and SR 166 are State facilities that also fall under the jurisdiction of Caltrans. The Caltrans minimum standard for traffic operations is the cusp of LOS C/LOS D (LOS C or better is considered acceptable), with mitigation required for operations at LOS D, E and F.

PROJECT IMPACTS – OPTION 1 – TRUCK TO PHILLIPS 66 TERMINAL

Existing Street Network

The street network that serves Option 1 includes County roads and State highways. The following text provides a brief description of the street network for Option 1.

US 101 is a north-south freeway that traverses Santa Barbara County and beyond. US 101 contains 2 lanes in each direction between the US 101/Refugio Road I/C near the LFC site and the Santa Maria Way I/C in Santa Maria. US 101 contains 3 lanes in each direction between the Santa Maria Way I/C and the Betteravia Road I/C in Santa Maria.

Betteravia Road is a 4-lane arterial road between US 101 and Nicholson Avenue just east of US 101; and is a 2-lane arterial road between Nicholson Avenue and Rosemary Road. The 4-lane segment east of U.S. 101 serves a truck stop and service stations. The 2-lane segment to the east serves mostly agricultural uses.

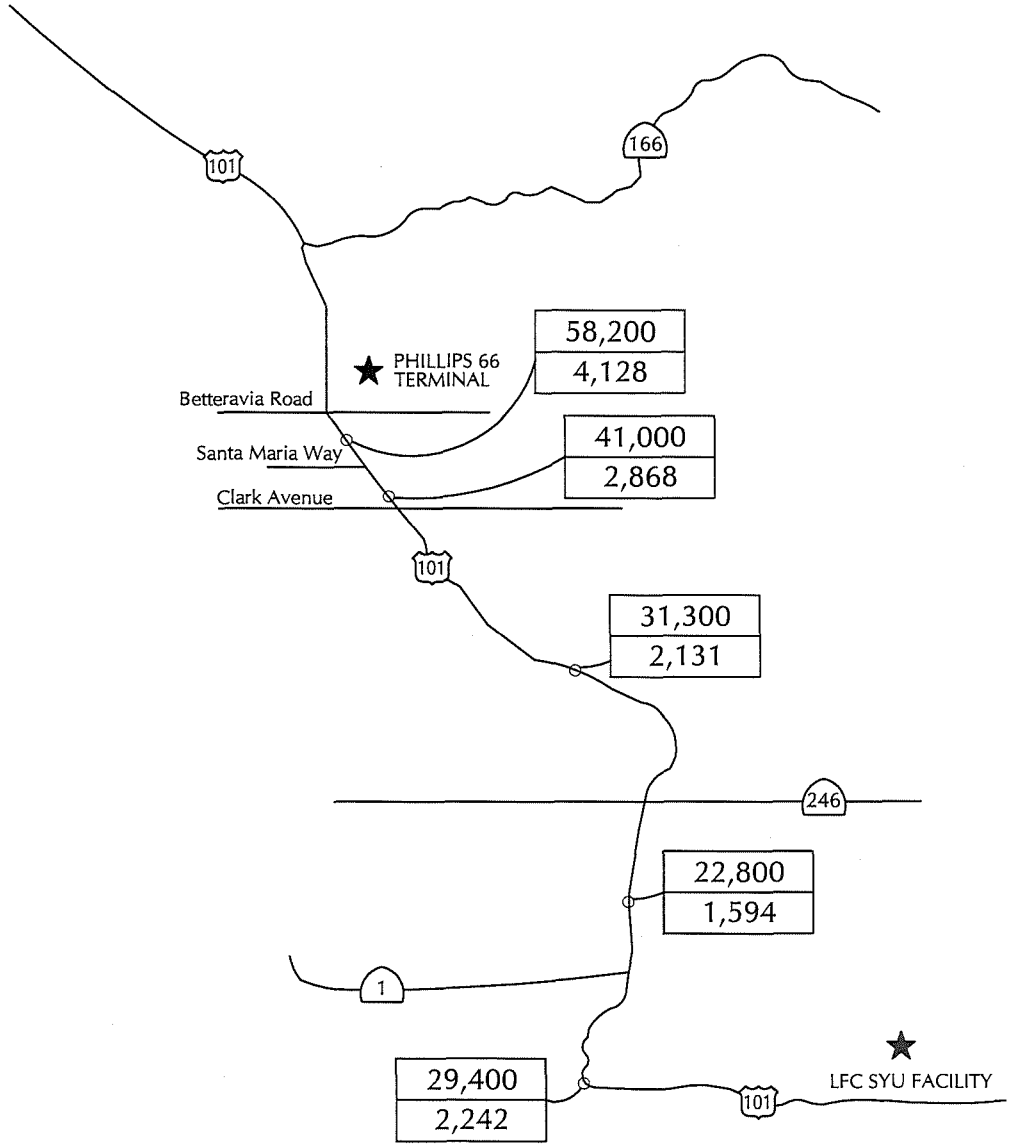
Rosemary Road is a 2-lane collector road that extends north of Betteravia Road that serves mostly agricultural uses.

Battles Road is a 2-lane collector road that extends west of Rosemary Road that serves mostly agricultural uses. The Phillips 66 Terminal is located on Battles Road.

Existing Traffic Operations

Figures 2a and 2b present the Existing traffic volumes for the key roadway segments and intersections along the Option 1 truck route. Traffic volumes were taken from monitoring data published by the Santa Barbara County Association of Governments (SBCAG),[2] Caltrans count data, new counts collected for this study, and existing data on file with ATE (see Technical Appendix for count data). The following section evaluates the Existing traffic volumes and levels of service for the key roadways and intersections along the Option 1 trucking route.

[2] Congestion Management Program, Santa Barbara County Association of Governments, 2016.



LEGEND

AADT
Peak Hour

N
NOT TO SCALE

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EXISTING TRAFFIC VOLUMES - TRUCK ROUTE OPTION 1

FIGURE 2a

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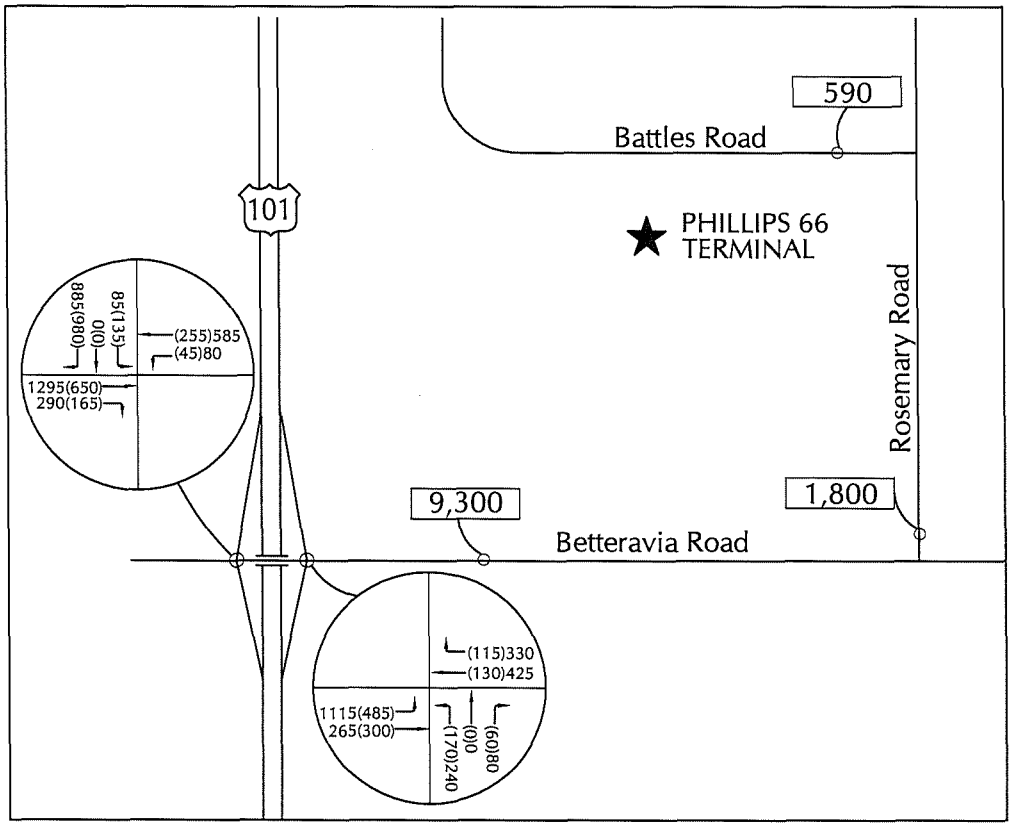

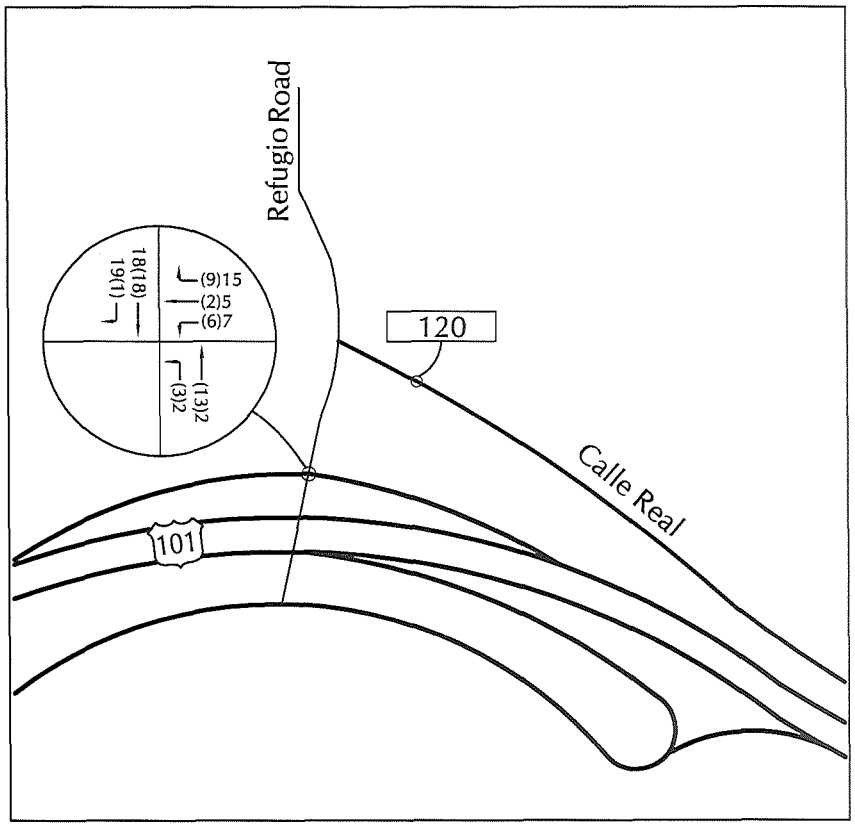

LEGEND

└(XX)XX - (A.M.)P.M. Peak Hour Volume

[X] - Average Daily Traffic Volume

N
NOT TO SCALE

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EXISTING TRAFFIC VOLUMES - TRUCK ROUTE OPTION 1

FIGURE 2b

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US 101. Table 2 lists the Existing traffic volumes and levels of service for the US 101 segments along the Option 1 truck route. Levels of service were calculated for the peak hour period using the operations methods outlined in the Highway Capacity Manual. As shown in Table 2, the US 101 segments along the Option 1 truck route currently operate at LOS A or LOS B, which meet the County and Caltrans LOS C standard.

Table 2
Existing Operations – US 101 – Option 1

US 101 Segment	Traffic Volumes			Highway Characteristics			Density / LOS(c)	
	AADT(a)	Peak Hour(b)						
		Northbound	Southbound	# Lanes	Terrain	Area	Northbound	Southbound
Refugio Road I/C to SR 1 I/C	29,400	1,515	727	4	Rolling	Rural	13.7/LOS B	6.6/LOS A
SR 1 I/C to SR 246 I/C	22,800	958	636	4	Rolling	Rural	9.2/LOS A	6.1/LOS A
SR 246 I/C to Clark Avenue I/C	31,300	1,173	958	4	Rolling	Rural	10.8/LOS A	8.8/LOS A
Clark Avenue I/C to Santa Maria Way I/C	41,000	1,545	1,323	4	Flat	Urban	12.8/LOS B	10.9 LOS A
Santa Maria Way I/C to Betteravia Road I/C	58,200	2,228	1,900	6	Flat	Urban	13.2/LOS B	11.3/LOS B

(a) AADT = Average Annual Daily Traffic volume.
(b) Peak Hour = Highest 1-hour period during the 24-hour period.
(c) LOS based on density. Density = passenger cars per mile per lane.

County Roadways. Table 3 lists the Existing roadway classifications, capacities, daily traffic volumes, and levels of service for the County roadways along the Option 1 truck route. As shown, the County roadway segments along the Option 1 truck route currently operate at LOS A, which indicates very good operations and meets the County's LOS C standard.

Table 3
Existing Operations – County Roadways – Option 1

County Roadway Segment	Classification	Average Daily Traffic		LOS
		Capacity	Volume	
Calle Real – east of Refugio Rd I/C	2-Lane Collector	11,800	120	LOS A
Betteravia Rd – east of US 101 I/C	4-Lane Arterial	39,900	9,300	LOS A
Rosemary Rd – north of Betteravia Rd	2-Lane Collector	11,800	1,800	LOS A
Battles Rd – east of Rosemary Rd	2-Lane Collector	11,800	590	LOS A

LOS based on standard engineering roadway design capacities.

Intersections. Table 4 presents the Existing AM and PM peak hour levels of service for the key intersections along the Option 1 truck route. Levels of service were calculated using the operations method outlined in the Highway Capacity Manual. As shown, most of the key intersections along

the Option 1 truck route currently operate at LOS C or better during the AM and PM peak hours, which meet the County and Caltrans LOS C standard. The US 101 SB Ramps/Betteravia Road intersection currently operates at LOS D during the AM peak hour and LOS F during the PM peak hour, which exceed the County and Caltrans LOS C standard. Caltrans, in cooperation with the City of Santa Maria, are studying improvement options to improve operates at the US 101/Betteravia Road I/C.

Table 4
Existing Operations – Intersections – Option 1

Intersection	Control	AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS
US 101 NB/Refugio Road	Stop Sign	8.5 Sec.	LOS A	8.7 Sec.	LOS A
US 101 SB/Refugio Road	Free Flow	0.0 Sec.	LOS A	0.0 Sec.	LOS A
US 101 NB/Betteravia Road	Signal	16.0 Sec.	LOS B	17.1 Sec.	LOS B
US 101 SB/Betteravia Road	Signal	**37.0 Sec.**	**LOS D**	**>80.0 Sec.**	**LOS F**

LOS based on average delay per vehicle in seconds.
Bolded values exceed LOS C standards.

Project Trip Generation

Table 5 shows the trip generation estimates developed for the Project. Trip generation estimates were calculated based on operational information provided by the applicant, including the number of new employees required at the LFC site plus the number of trucks per day for product exports. About 60 additional employees working from 6:00 AM to 6:00 PM are anticipated at the LFC site for the 70 truck exports per day requested under interim trucking permit. The 70 trucks per day equates to about 3 trucks per hour (70 trucks per day / 24 hours = 3 trucks per hour). Table 5 shows that the Project is forecast to generate 260 average daily trips, with 6 trips occurring during the AM peak hour and 6 trips occurring during the PM peak hour.

Table 5
Project Trip Generation

Component	Number Per Day	Shift	Trip Generation				
				AM Peak		PM Peak	
			ADT	In	Out	In	Out
Employees(a)	60	6:00 AM-6:00 PM	120	0	0	0	0
Trucks(b)	70	NA	140	3	3	3	3
Totals			**260**	**3**	**3**	**3**	**3**

(a) ADT = 1 inbound + 1 outbound trip per employee. AM and PM peak hour trips = 0 trips since employees would arrived and depart outside of the 7-9 AM and 4-6 PM peak commuter periods.
(b) ADT assumes 1 inbound + 1 outbound trip per truck. AM and PM peak hour trip generation assumes average of 3 trucks inbound and 3 trucks outbound per hour.

As required by County and Caltrans policies, the following impact analysis focuses on potential impacts during AM and PM peak commuter periods. The analysis evaluates potential impacts generated by trucks using the haul routes during the peak hour periods (3 inbound + 3 outbound trucks per hour). Since employees would arrived and depart outside of the 7-9 AM and 4-6 PM peak hours, employee trips are not included in the peak hour impact analysis. It is noted that about 60 employees currently work at the LFC site but about 125 employees worked at the LFC site prior to the pipeline incident in May 2015. Although the traffic generated by the 60 additional employees required for the interim trucking period would be "new" when compared to existing conditions, those employee trips would be within the traffic levels generated by the 125 workers that were employed prior to the pipeline incident in May 2015.

Trucks are larger and, more importantly, accelerate more slowly than passenger cars, and thus have a greater effect on traffic flow than passenger cars. Because of the size of the haul trucks, each truck is assumed as 2 "Passenger Car Equivalents" (PCEs) in the impact analysis, as recommended in the Highway Capacity Manual, since trucks are larger and have lower horsepower-to-weight ratio (and thus take up additional space and travel at slower speeds). Thus, the 3 inbound + 3 outbound trucks per hour equates to 6 inbound + 6 outbound PCEs per hour.

Existing + Project Impacts – US 101

Table 6 lists the Existing levels of service for the US 101 segments along the Option 1 truck route, the number of truck trips added to each segment (in PCEs), and the significance of Project-added traffic based on the County and Caltrans LOS C standard. As shown, the minor amount of Project traffic (6 northbound PCEs per hour + 6 southbound PCEs per hour) would not significantly impact the segments of US 101 between the LFC site and the Phillips 66 terminal.

Table 6
Existing + Project Impacts – US 101 – Option 1

US 101 Segment	Existing LOS		Project Added(a)		Significant Impact?
	Northbound	Southbound	Northbound	Southbound	
Refugio Road I/C to SR 1 I/C	LOS B	LOS A	6	6	NO
SR 1 I/C to SR 246 I/C	LOS A	LOS A	6	6	NO
SR 246 I/C to Clark Avenue I/C	LOS A	LOS A	6	6	NO
Clark Avenue I/C to Santa Maria Way I/C	LOS B	LOS A	6	6	NO
Santa Maria Way I/C to Betteravia Road I/C	LOS B	LOS B	6	6	NO

(a) Project Added = PCEs per hour (3 trucks per hour = 6 PCEs per hour).

Existing + Project Impacts – County Roadways

Table 7 lists the Existing traffic volumes and levels of service for the County roadway segments along the Option 1 truck route, the number of trips added to each segment by the Project, and the significance of Project-added traffic based on the County's LOS C standard. As shown in Table 7, traffic generated by the Project would not significantly impact the County roadway segments between the LFC site and the Phillips 66 terminal.

Table 7
Existing + Project Impacts – County Roadways – Option 1

County Roadway Segment	Existing ADT/LOS	Project Added ADT(a)	Existing + Project ADT/LOS	Significant Impact?
Calle Real – east of Refugio Rd I/C(b)	120/LOS A	340	460/LOS A	NO
Betteravia Rd – east of US 101 I/C	9,300/LOS A	280	9,580/LOS A	NO
Rosemary Rd – north of Betteravia Rd	1,800/LOS A	280	2,080/LOS A	NO
Battles Rd – east of Rosemary Rd	590/LOS A	280	870/LOS A	NO

(a) Project Added ADT assumes 2 PCEs per truck.

(b) Calle Real forecast assumes 50% of employee trips + 100% of truck trips.

The roadway analysis assumes that 50% of employee trips (60 ADT) would use Calle Real between the Refugio Road I/C and the Project site and 50% (60 ADT) would use Calle Real between the El Capitan Road I/C and the Project site. Field observations found that Calle Real between the El Capitan Road I/C and the Project site as well as the El Capitan Road I/C carry low volumes and operate at LOS A. These facilities would continue to operate at LOS A with Project traffic.

Existing + Project Impacts – Intersections

Tables 8 and 9 compare the Existing and Existing + Project levels of service for the key intersections along the Option 1 truck route; along with the number of trips added to each intersection by the Project and the significance of Project-added traffic based on the LOS C standard.

Table 8
Existing + Project Impacts – Intersections – AM Peak Hour – Option 1

Intersection	Delay / LOS		Project Added	
	Existing	Existing + Project	Trips	Significant Impact?
US 101 NB/Refugio Road	8.5 Sec./LOS A	8.5 Sec./LOS A	12	NO
US 101 SB/Refugio Road	0.0 Sec./LOS A	0.0 Sec./LOS A	6	NO
US 101 NB/Betteravia Road	16.0 Sec./LOS B	16.1 Sec./LOS B	12	NO
US 101 SB/Betteravia Road	**37.0 Sec./LOS D**	**37.1 Sec./LOS D**	6	NO

(a) Project Added Trips assumes 2 PCEs per trucks.

Bolded values exceed LOS C standards.

As shown in Table 8, Project traffic would not significantly impact the key intersections between the LFC site and the Phillips 66 terminal during the AM peak hour period. The US 101 SB Ramps/Betteravia Road intersection currently operates at LOS D during the AM peak hour and would operate at LOS D with Project traffic, which exceed the LOS C standard. The Project would add 6 trips (3 trucks = 6 PCEs) to the intersection during the PM peak hour, which is less than the County's significant impact threshold (impact threshold = 15 or more trips for intersections forecast to operate at LOS D).

Table 9
Existing + Project Impacts – Intersections – PM Peak Hour – Option 1

Intersection	Delay / LOS		Project Added	
	Existing	Existing + Project	Trips	Significant Impact?
US 101 NB/Refugio Road	8.7 Sec./LOS A	8.8 Sec./LOS A	12	NO
US 101 SB/Refugio Road	0.0 Sec./LOS A	0.0 Sec./LOS A	6	NO
US 101 NB/Betteravia Road	17.1 Sec./LOS B	17.1 Sec./LOS B	12	NO
US 101 SB/Betteravia Road	**>80 Sec./LOS F**	**>80 Sec./LOS F**	**6**	**YES**

(a) Project Added Trips assumes 2 PCEs per trucks.
Bolded values exceed LOS C standards.

As shown in Table 9, Project traffic would not significantly impact most of the key intersections between the LFC site and the Phillips 66 terminal during the PM peak hour period. The US 101 SB Ramps/Betteravia Road intersection currently operates at LOS F during the PM peak hour and would operate at LOS F with Project traffic, which exceeds the LOS C standard. The Project would add 6 trips (3 trucks = 6 PCEs) to the intersection during the PM peak hour, which exceeds the County's significant impact threshold (impact threshold = 5 or more trips for intersections forecast to operate at LOS F). The Mitigation Measures section of this report outlines options required to mitigate this potential impact.

Phillips 66 Terminal Capacity

The Phillips 66 station operates 24 hours/day, 7 days/week, including holidays and weekends. Peak hours at the station are from 7 AM to 4 PM daily and there is lighting for truck unloading at night. Phillips 66 has indicated that the station handled about 100 trucks per day before the pipeline shutdown and the station currently handles about 130 trucks per day. The facility is not limited by permits to a specific number of trucks it can receive. The single storage tank is limited to 21,859 barrels/day (approximately 145 truckloads/day) of oil throughput by the Santa Barbara County Air Pollution District (APCD) permit to operate. If the current 130 truck/day throughput is sustained, an additional 15 trucks/day could be accommodated under the existing APCD permit. Phillips 66 personnel indicated that some current deliveries could be backed out to make more room for the LFC trucks. Because the station is limited to a certain throughput (with or without the proposed Project), the Project would not change the potential traffic volumes to/from the station.

There are 5 truck unloading lanes within the Phillips 66 station, which typically accommodate inbound truck traffic throughout the day. However, queueing of trucks sometimes occurs on Battles Road for short periods when there are surges of inbound trucks adjacent to the station's entry point. Since the station is limited to a certain throughput (with or without the proposed Project), the Project would not change the potential for trucks queueing along Battles Road adjacent to the station's entry. Although unrelated to the Project, Phillips 66 is requesting a permit to add an additional lane to receive trucks to increase the on-site truck capacity and reduce the potential for queueing on Battle Road.

Battles Road is about 24 feet wide and paved between Rosemary Road and the Phillips 66 station; and a dirt road west of the Phillips 66 station. The segment between Rosemary Road and the Phillips 66 station is mostly used by traffic to/from the Phillips 66 station, with some minor use of the road for access to the adjacent agricultural lands. Traffic volumes between Rosemary Road and the Phillips 66 station are low – about 590 vehicles per day. The road is flat and straight, which provides good sight distances for road users. Given the existing conditions, trucks queued on Battles Road waiting to enter the station are safely passed by vehicles that maneuver around truck queues.

Accident Analysis

Accident histories were evaluated to determine the relative safety of the highway facilities along the proposed haul routes. Accident data was obtained from Caltrans for the most currently available three-year period, which is from August 1, 2012 through July 31, 2015 (see Caltrans accident data in the Technical Appendix).

It is important to note that Caltrans uses accident data as a screening tool to identify potential safety problems. The rate of accidents was calculated for each facility and then compared to California statewide averages for similar facilities to identify potential safety issues. By nature, accident rates experienced on a facility are often higher than the statewide average rate for similar facilities since the statewide averages are comprised of lower-than-average rates + higher-than-average rates (lower + higher = average). If the accident rate experienced on a facility is higher than the statewide average, the Caltrans significance test is performed to determine if the number of accidents that occurred on the facility is statistically significant. If the number of accidents experienced is statistically significant, more detailed safety investigations are performed to determine if there are accident patterns that can be corrected by changing design features of the facility (e.g. widen traffic lanes, widen roadway shoulders, change roadway curvatures, add signs, install traffic signals, etc.).

The following tables list the accident rates for the State facilities along the Option 1 truck route. The text following each table discusses the rate of accidents for each facility and the need for detailed safety investigations to identify correctable accident patterns.

Table 10
Accident Rates
US 101 – Refugio Rd I/C to Betteravia I/C

US 101 Segment	Accident Rate(a)	Statewide Average Rate(b)
Refugio Rd I/C to SR 246 I/C	0.60 per mvm	0.56 per mvm
SR 246 I/C to Clark Ave I/C	0.10 per mvm	0.54 per mvm
Clark Ave I/C to Betteravia Rd I/C	0.34 per mvm	0.43 per mvm

(a) Actual rate of accidents per million vehicle miles.
(b) California statewide average rate for similar facilities.

As shown in Table 10, the rate of accidents on US 101 between the Refugio Road I/C and the SR 246 I/C in Buellton is slightly higher than the California statewide average for similar facilities (Accident Rate = 0.60; Statewide Avenue Rate = 0.56). The rate of accidents on the US 101 segments between the SR 246 I/C and the Betteravia Road I/C are lower than the California statewide averages for similar facilities.

The Caltrans significance test was performed to determine if the number of accidents that occurred on US 101 between the Refugio Road I/C and the SR 246 I/C in Buellton is significant (a worksheet showing the Caltrans formula and the significance test is included in the Technical Appendix). The results show that the number of accidents required to be statistically significant is 387 accidents within the 3-year period. The number of accidents that occurred during the 3-year period was 362, which is less than the 387 accidents required to be statistical significant. Thus, further investigation is not warranted since the number of accidents that occurred is less than the Caltrans criteria for significance.

Table 11
Accident Rates
US 101/Refugio Road I/C

Ramp	Accident Rate(a)	Statewide Average Rate(b)
US 101 NB On-Ramp	3.70 per mv	0.53 per mv
US 101 NB Off-Ramp	0.00 per mv	1.04 per mv
US 101 SB On-Ramp	5.63 per mv	0.53 per mv
US 101 SB Off-Ramp	3.72 per mv	1.62 per mv

(a) Actual rate of accidents per million vehicles.
(b) California statewide average rate for similar facilities.

As shown in Table 11, the rate of accidents on several of the US 101 ramps at the Refugio Road I/C are higher than the California statewide average for similar facilities. Accident rates for low volume facilities are commonly higher than average since the rate of accidents is related to the number of vehicles using the facility. Caltrans procedures were used to test the significance of the number of accidents that occurred on the ramps with higher than average accident rates.

The US 101 northbound on-ramp has an accident rate of 3.70 accidents per million vehicles and the statewide average is 0.53 accidents per million vehicles. There was 1 accident on this ramp during the 3-year period. The Caltrans significance test shows that the number of accidents required to be statistically significant is 3 accidents within the 3-year period. Thus, the number of accidents that occurred is not statistically significant and further investigation is not warranted.

The US 101 southbound on-ramp has an accident rate of 5.63 accidents per million vehicles and the statewide average is 0.53 accidents per million vehicles. There were 2 accidents on this ramp during the 3-year period. The Caltrans significance test shows that the number of accidents required to be statistically significant is 3 accidents within the 3-year period. Thus, the number of accidents that occurred is not statistically significant and further investigation is not warranted.

The US 101 southbound off-ramp has an accident rate of 3.72 accidents per million vehicles and the statewide average is 1.63 accidents per million vehicles. There was 1 accident on this ramp during the 3-year period. The Caltrans significance test shows that the number of accidents required to be statistically significant is 4 accidents within the 3-year period. Thus, the number of accidents that occurred is not statistically significant and further investigation is not warranted.

Table 12
Accident Rates
US 101/Betteravia Road I/C

Ramp	Accident Rate(a)	Statewide Average Rate(b)
US 101 NB On-Ramp	0.54 per mv	0.63 per mv
US 101 NB Off-Ramp	0.90 per mv	1.01 per mv
US 101 SB On-Ramp	0.78 per mv	0.63 per mv
US 101 SB Off-Ramp	1.54 per mv	1.01 per mv

(a) Actual rate of accidents per million vehicles.
(b) California statewide average rate for similar facilities.

As shown in Table 12, the rate of accidents on the US 101 northbound on-ramp and off-ramp at the Betteravia Road I/C are lower than the California statewide averages for similar facilities. The rate of accidents on the US 101 southbound on-ramp and off-ramp are higher than the California statewide average for similar facilities.

The US 101 southbound on-ramp has an accident rate of 0.78 accidents per million vehicles and the statewide average is 0.63 accidents per million vehicles. There were 3 accidents on this ramp during the 3-year period. The Caltrans significance test shows that the number of accidents required to be statistically significant is 8 accidents within the 3-year period. Thus, the number of accidents that occurred is not statistically significant and further investigation is not warranted.

The US 101 southbound off-ramp has an accident rate of 1.54 accidents per million vehicles and the statewide average is 1.01 accidents per million vehicles. There were 16 accidents on this ramp during the 3-year period. The Caltrans significance test shows that the number of accidents required to be statistically significant is 21 accidents within the 3-year period. Thus, the number of accidents that occurred is not statistically significant and further investigation is not warranted.

PROJECT IMPACTS – OPTION 2 – TRUCK TO PLAINS PENTLAND TERMINAL

Existing Street Network

The street network that serves Option 2 includes County roads and State highways. The following text provides a brief description of the street network for Option 2.

US 101 is a north-south freeway that traverses Santa Barbara County and beyond. US 101 contains 2 lanes in each direction between the US 101/Refugio Road I/C near the LFC site and the Santa Maria Way I/C in Santa Maria. US 101 contains 3 lanes in each direction between the Santa Maria Way I/C and the SR 166 I/C in San Luis Obispo County.

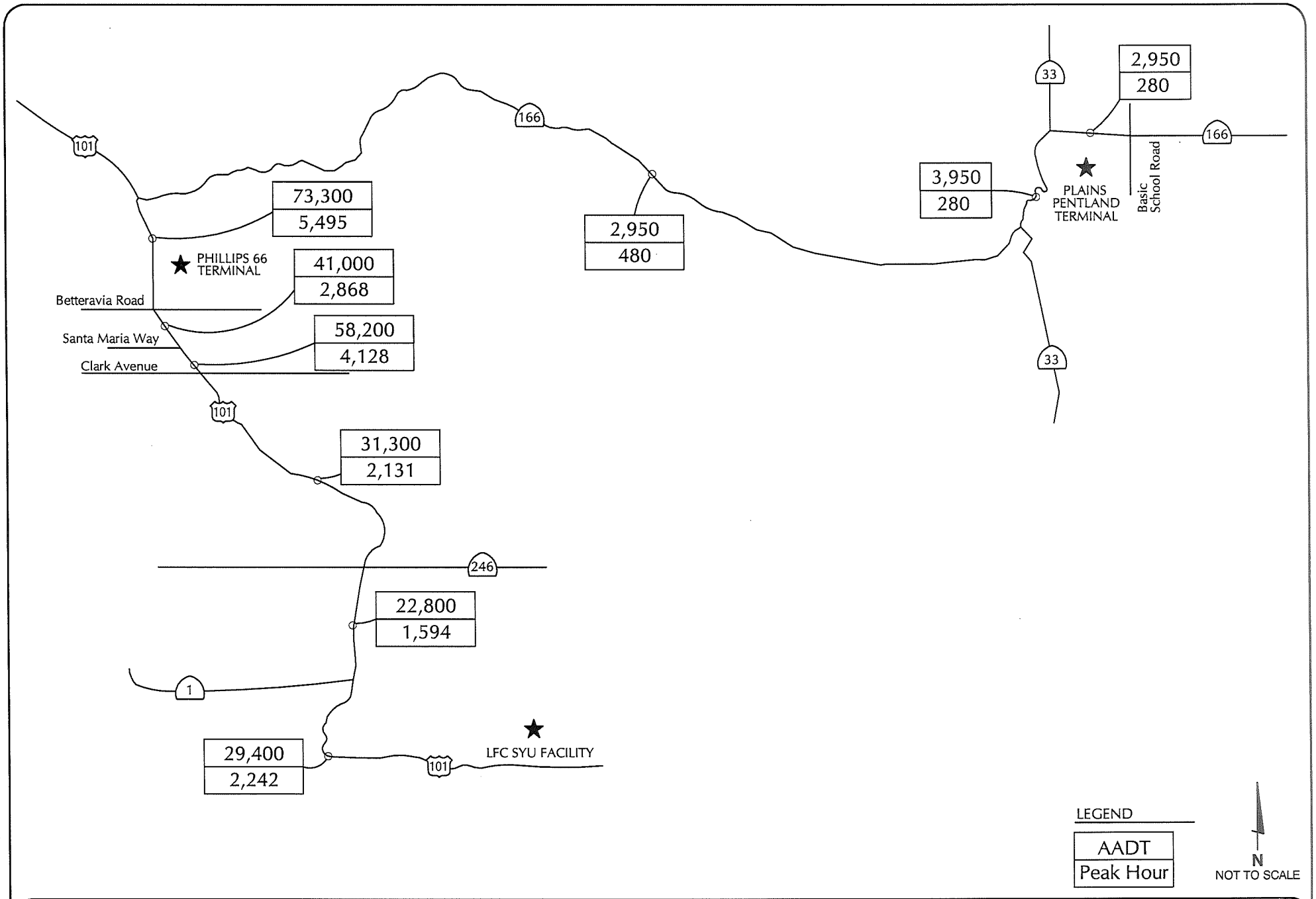
SR 166 is a 2-lane highway that extends between the US 101 in San Luis Obispo County and I5 in Kern County.

Basic School Road is a 2-lane collector road that extends north and south of SR 166 in Kern County. The Plains Pentland Terminal is located on Basic School Road just south of SR 166.

Existing Traffic Operations

Figures 3a and 3b present the Existing traffic volumes for the key roadway segments and intersections along the Option 2 truck route. Traffic volumes were taken from monitoring data published by the Santa Barbara County Association of Governments (SBCAG), Caltrans count data, new counts collected for this study, and existing data on file with ATE (see Technical Appendix for count data). The following section evaluates the Existing traffic volumes and levels of service for the key roadways and intersections along the Option 2 trucking route.

US 101. Table 13 lists the Existing traffic volumes and levels of service for the US 101 segments along the Option 2 truck route. As shown in Table 13, the US 101 segments along the Option 1 truck route currently operate at LOS A or LOS B, which meet the County and Caltrans LOS C standard.



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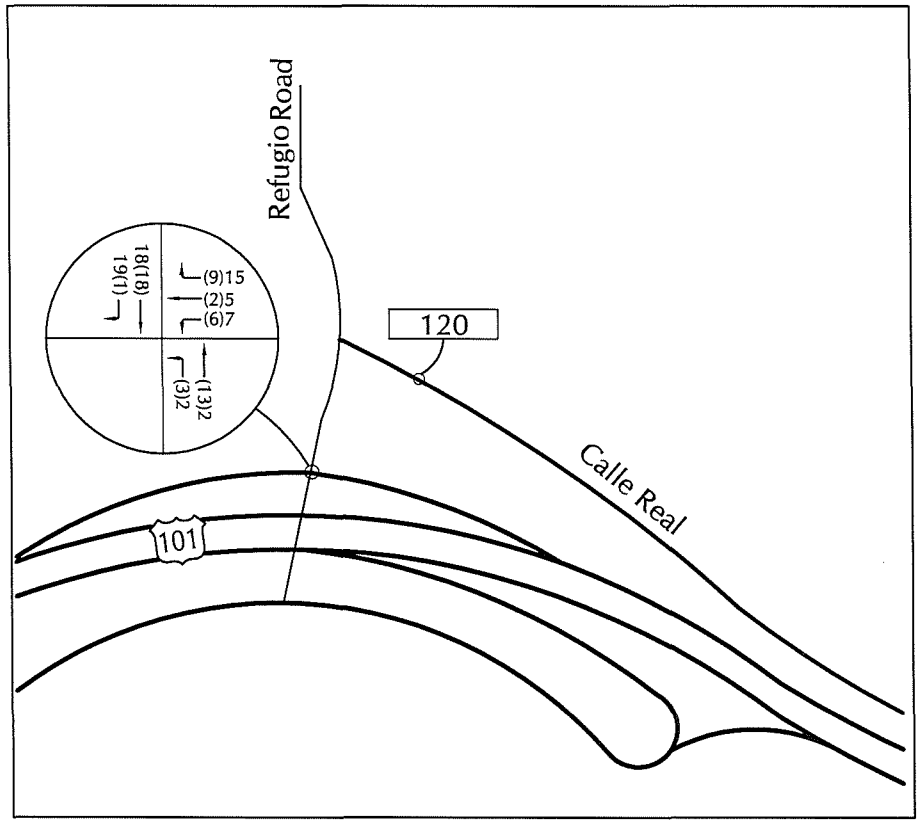
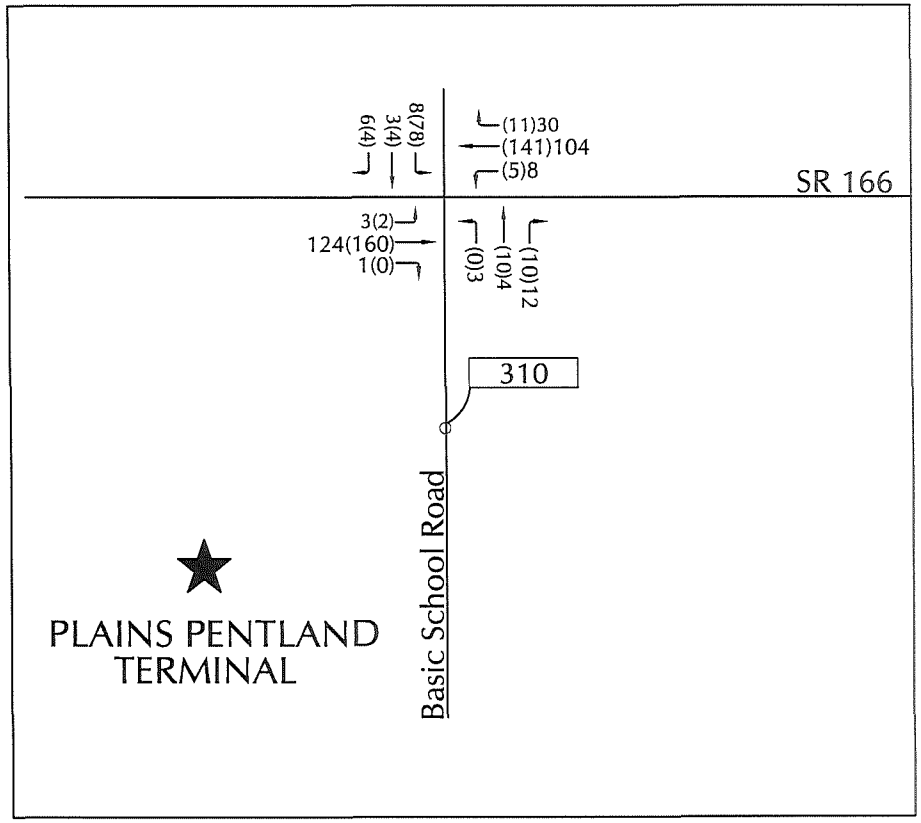
EXISTING TRAFFIC VOLUMES - TRUCK ROUTE OPTION 2

FIGURE 3a

EKM - ATE#17092





LEGEND

(XX)XX - (A.M.)P.M. Peak Hour Volume

X - Average Daily Traffic Volume

N
NOT TO SCALE

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EXISTING TRAFFIC VOLUMES - TRUCK ROUTE OPTION 2

FIGURE 3b

EKM - ATE#17092

Table 13
Existing Operations – US 101 – Option 2

US 101 Segment	Traffic Volumes			Highway Characteristics			Density / LOS(c)	
	AADT(a)	Peak Hour(b)						
		Northbound	Southbound	# Lanes	Terrain	Area	Northbound	Southbound
Refugio Road I/C to SR 1 I/C	29,400	1,515	727	4	Rolling	Rural	13.7/LOS B	6.6/LOS A
SR 1 I/C to SR 246 I/C	22,800	958	636	4	Rolling	Rural	9.2/LOS A	6.1/LOS A
SR 246 I/C to Clark Avenue I/C	31,300	1,173	958	4	Rolling	Rural	10.8/LOS A	8.8/LOS A
Clark Avenue I/C to Santa Maria Way I/C	41,000	1,545	1,323	4	Flat	Urban	12.8/LOS B	10.9 LOS A
Santa Maria Way I/C to Betteravia Road I/C	58,200	2,228	1,900	6	Flat	Urban	13.2/LOS B	11.3/LOS B
Betteravia Road I/C to SR 166 I/C	73,300	2,808	2,687	6	Flat	Urban	16.3/LOS B	15.6/LOS B

(a) AADT = Average Annual Daily Traffic volume.
(b) Peak Hour = Highest 1-hour period during the 24-hour period.
(c) LOS based on density. Density = passenger cars per mile per lane.

SR 166. Table 14 lists the Existing traffic volumes and levels of service for the SR 166 segments along the Option 2 truck route. SR 166 is a two-lane highway between US 101 and Basic School Road. Levels of service were calculated for SR 166 using the two-lane highway operations methods outlined in the Highway Capacity Manual. Levels of service are based on average travel speed and percent-time-spent-following (ability to pass). As shown in Table 14, the SR 166 segments along the Option 2 truck route currently operate at LOS B or LOS C, which meet the County and Caltrans LOS C standard.

Table 14
Existing Operations – SR 166 – Option 2

Highway Segment	Traffic Volumes		Highway Characteristics		LOS(a)		
	AADT	Peak Hour	# Lanes	Terrain	ATS	PTSF	LOS
US 101 I/C to SR 33 South Junction	2,950	480	2	Rolling	47.5 MPH	61.0%	LOS C
SR 33 South Junction to SR 33 North Junction	2,950	280	2	Rolling	49.3 MPH	48.3%	LOS C
SR 33 North Junction to Basic School Road	2,800	280	2	Flat	51.3 MPH	41.3%	LOS B

(a) LOS based on ATS (average travel speed) and PTSF (percent-time-spent-following).

County Roadways. Table 15 lists the Existing roadway classifications, capacities, daily traffic volumes, and levels of service for the County roadways along the Option 2 truck route. As shown, the County roadway segments along the Option 2 truck route currently operate at LOS A, which indicates very good operations and meet the LOS C standard.

Table 15
Existing Operations – County Roadways – Option 2

County Roadway Segment	Classification	Average Daily Traffic		LOS
		Capacity	Volume	
Calle Real – east of Refugio Rd I/C	2-Lane Collector	11,800	120	LOS A
Basic School Rd – south of SR 166	2-Lane Collector	11,800	310	LOS A

LOS based on standard engineering roadway design capacities.

Intersections. Table 16 presents the Existing AM and PM peak hour levels of service for the key intersections along the Option 2 truck route. As shown, all of the key intersections along the Option 2 truck route currently operate at LOS C or better during the AM and PM peak hours which meet the County and Caltrans LOS C standard.

Table 16
Existing Operations – Intersections – Option 2

Intersection	Control	AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS
US 101 NB/Refugio Road	Stop Sign	8.5 Sec.	LOS A	8.7 Sec.	LOS A
US 101 SB/Refugio Road	Free Flow	0.0 Sec.	LOS A	0.0 Sec.	LOS B
US 101 NB/SR 166	Signal	11.3 Sec.	LOS B	23.5 Sec.	LOS C
US 101 SB/SR 166	Signal	10.7 Sec.	LOS B	13.9 Sec.	LOS B
SR 166/Basic School Road	Stop Sign	11.9 Sec.	LOS B	9.8 Sec.	LOS A

LOS based on average delay per vehicle in seconds.

Project Trip Generation

The trip generation estimates for Option 1 and 2 are identical. As shown in Table 5, the Project is forecast to generate 260 average daily trips, with 6 trips occurring during the AM peak hour (3 inbound + 3 outbound trucks) and 6 trips occurring during the PM peak hour (3 inbound + 3 outbound trucks. As with Option 1, each truck is assumed as 2 PCEs.

Existing + Project Impacts – US 101

Table 17 lists the Existing levels of service for the US 101 segments along the Option 2 truck route, the number of truck trips added to each segment (in PCEs), and the significance of project-added traffic based on the County and Caltrans LOS C standards. As shown, the minor amount of Project traffic (6 northbound PCEs per hour + 6 southbound PCEs per hour) would not significantly impact the segments of US 101 between the LFC site in Santa Barbara County and the US 101/SR 166 I/C in San Luis Obispo County.

Table 17
Existing + Project Impacts – US 101 – Option 2

US 101 Segment	Existing LOS		Project Added(a)		Significant Impact?
	Northbound	Southbound	Northbound	Southbound	
Refugio Road I/C to SR 1 I/C	LOS B	LOS A	6	6	NO
SR 1 I/C to SR 246 I/C	LOS A	LOS A	6	6	NO
SR 246 I/C to Clark Avenue I/C	LOS A	LOS A	6	6	NO
Clark Avenue I/C to Santa Maria Way I/C	LOS B	LOS A	6	6	NO
Santa Maria Way I/C to SR 166 I/C	LOS B	LOS B	6	6	NO

(a) Project Added = PCEs per hour (3 trucks per hour = 6 PCEs per hour).

Existing + Project Impacts – SR 166

Table 18 lists the Existing levels of service for the SR 166 segments along the Option 2 truck route, the number of truck trips added to each segment (in PCEs), and the significance of project-added traffic based on the County and Caltrans LOS C standard. As shown, the minor amount of Project traffic (6 PCEs per hour in each direction) would not significantly impact the segments of SR 166 between the US 101/SR 166 I/C in San Luis Obispo County and Basic School Road in Kern County.

Table 18
Existing + Project Impacts – SR 166 – Option 2

Highway Segment	Existing LOS	Project Added(a)	
		Trips	Significant Impact?
US 101 I/C to SR 33 South Junction	LOS C	12	NO
SR 33 South Junction to SR 33 North Junction	LOS C	12	NO
SR 33 North Junction to Basic School Road	LOS B	12	NO

(a) Project Added = PCEs per hour (3 inbound + 3 outbound trucks per hour = 12 PCEs per hour).

Existing + Project Impacts – County Roadways

Table 19 lists the Existing traffic volumes and levels of service for the County roadway segments along the Option 1 truck route, the number of trips added to each segment by the Project, and the significance of project-added traffic based on County LOS C standards. As shown in Table 19, traffic generated by the Project would not significantly impact the County roadway segments between the LFC site and the Plains Pentland terminal.

Table 19
Existing + Project Impacts – County Roadways – Option 2

County Roadway Segment	Existing ADT/LOS	Project Added ADT(a)	Existing + Project ADT/LOS	Significant Impact?
Calle Real – east of Refugio Rd I/C(b)	120/LOS A	340	460/LOS A	NO
Basic School Rd – south of SR 166	310/LOS A	280	590/LOS A	NO

(a) Project Added ADT assumes 2 PCEs per truck.

(b) Calle Real forecast assumes 50% of employee trips + 100% of truck trips.

The roadway analysis assumes that 50% of employee trips (60 ADT) would use Calle Real between the Refugio Road I/C and the Project site and 50% (60 ADT) would use Calle Real between the El Capitan Road I/C and the Project site. Field observations found that Calle Real between the El Capitan Road I/C and the Project site as well as the El Capitan Road I/C carry low volumes and operate at LOS A. These facilities would continue to operate at LOS A with Project traffic.

Existing + Project Impacts – Intersections

Tables 20 and 21 present the Existing and Existing + Project levels of service for the key intersections along the Option 2 truck route, the number of trips added to each intersection by the Project, and the significance of project-added traffic based on the County and Caltrans LOS C standard. As shown, the minor amount of peak hour traffic generated by the Project would not significantly impact the key intersections between the LFC site and the Plains Pentland terminal.

Table 20
Existing + Project Impacts – Intersections – AM Peak Hour – Option 2

Intersection	Delay / LOS		Project Added	
	Existing	Existing + Project	Trips(a)	Significant Impact?
US 101 NB/Refugio Road	8.5 Sec./LOS A	8.5 Sec./LOS A	12	NO
US 101 SB/Refugio Road	0.0 Sec./LOS A	0.0 Sec./LOS A	6	NO
US 101 NB/SR 166	11.3 Sec./LOS B	11.4 Sec./LOS B	12	NO
US 101 SB/SR 166	10.7 Sec./LOS B	10.8 Sec./LOS B	6	NO
SR 166/Basic School Road	11.9 Sec./LOS B	11.9 Sec./LOS B	12	NO

(a) Project Added Trips assumes 2 PCEs per truck.

Table 21
Existing + Project Impacts – Intersections – PM Peak Hour – Option 2

Intersection	Delay / LOS		Project Added	
	Existing	Existing + Project	Trips(a)	Significant Impact?
US 101 NB/Refugio Road	8.7 Sec./LOS A	8.8 Sec./LOS A	12	NO
US 101 SB/Refugio Road	0.0 Sec./LOS A	0.0 Sec./LOS A	6	NO
US 101 NB/SR 166	23.5 Sec./LOS C	23.7 Sec./LOS C	12	NO
US 101 SB/SR 166	13.9 Sec./LOS B	14.0 Sec./LOS B	6	NO
SR 166/Basic School Road	9.8 Sec./LOS A	10.1 Sec./LOS B	12	NO

(a) Project Added Trips assumes 2 PCEs per truck.

Plains Pentland Terminal Capacity

The Plains Pentland station operates 24 hours/day, 7 days/week, including holidays and weekends. Peak hours at the station are from 7 AM to 4 PM daily and there is lighting for truck unloading at night. The facility currently handles approximately 100 trucks/day and is permitted to handle up to 210 trucks/day. Thus, the Plains Pentland station has the capacity to accommodate the 70 trucks per day from the LFC site.

Accident Analysis

The following tables list the accident rates for the State facilities along the Option 2 truck route for the three-year period from August 1, 2012 through July 31, 2015. The text following each table discuss the rate of accidents for each facility and the need for detailed safety investigations to identify correctable accident patterns.

Table 22
Accident Rates
US 101 – Refugio Rd I/C to SR 166 I/C

US 101 Segment	Accident Rate(a)	Statewide Average Rate(b)
Refugio Rd I/C to SR 246 I/C	0.60 per mvm	0.56 per mvm
SR 246 I/C to Clark Ave I/C	0.10 per mvm	0.54 per mvm
Clark Ave I/C to Betteravia Rd I/C	0.34 per mvm	0.43 per mvm
Betteravia Rd I/C to SB/SLO County Line(c)	0.78 per mvm	0.54 per mvm
SB/SLO County Line to SR 166 I/C(c)	0.80 per mvm	0.49 per mvm

(a) Actual rate of accidents per million vehicle miles.
(b) California statewide average rate for similar facilities.
(c) Caltrans accident data is segregated by county. Thus, two segments listed for US 101 between Betteravia Road I/C and SR 166 I/C.

As shown in Table 22, the rate of accidents on US 101 between the Refugio Road I/C and the SR 246 I/C in Buellton is higher than the California statewide average for similar facilities (Accident Rate = 0.60; Statewide Avenue Rate = 0.56). There were 362 accidents on this segment during the 3-year period. The Caltrans significance test shows that the number of accidents required to be statistically significant is 387 accidents within the 3-year period. Thus, the number of accidents that occurred is not statistically significant and further investigation is not warranted.

The rate of accidents on US 101 between the Betteravia Road I/C and the Santa Barbara County-San Luis Obispo County line is higher than the California statewide average for similar facilities (Accident Rate = 0.78; Statewide Avenue Rate = 0.54). There were 235 accidents on this 4.4-mile segment of US 101 during the 3-year period. The Caltrans significance test shows that the number of accidents required to be statistically significant is 197 accidents within the 3-year period. Thus, the number of accidents that occurred is statistically significant. This segment currently carries about 5,495 vehicles per hour during the peak hour period. The Project would add 6 trucks per hour to this segment during the peak hour period (3 northbound + 3 southbound). This traffic addition equates to an increase of about 1/10th of 1%, which is considered an insignificant impact.

It is important to note that the Caltrans accident data is for the period from August 1, 2012 through July 31, 2015, which is during the period when Caltrans was widening the Santa Maria River bridge overcrossing structure to a 6-lane bridge (was previously a 4-lane bridge). The construction project began in 2011 and was completed in mid-2014. The construction activities related to the bridge widening project could have affected the number of accident and the accident rates on this segment. It is recommended that the more current accident data be obtained from Caltrans at a later date to determine if the number of accidents is statistically significant and determine if there are correctable accident patterns.

The rate of accidents on US 101 between the Santa Barbara County-San Luis Obispo County line and the SR 166 I/C is also higher than the California statewide average for similar facilities (Accident Rate = 0.80; Statewide Avenue Rate = 0.49). There were 47 accidents on this 0.81-mile segment of US 101 during the 3-year period. The Caltrans significance test shows that the number of accidents required to be statistically significant is 44 accidents within the 3-year period. Thus, the number of accidents that occurred is statistically significant. This segment currently carries about 5,495 vehicles per hour during the peak hour period. The Project would add 6 trucks per hour to this segment during the peak hour period (3 northbound + 3 southbound). This traffic addition equates to an increase of about 1/10th of 1%, which is considered an insignificant impact.

As noted above, the Caltrans accident data is for the period when Caltrans was widening the Santa Maria River bridge overcrossing structure and the construction activities could have affected the number of accident and the accident rates on this segment. It is recommended that the more current accident data be obtained from Caltrans at a later date to determine if the number of accidents is statistically significant and determine if there are correctable accident patterns.

Table 23
Accident Rates
SR 166 – US 101 I/C to Basic School Road

SR 166 Segment(a)	Accident Rate(b)	Statewide Average Rate(c)
US 101 I/C to SR 33 South Junction	0.57 per mvm	0.73 per mvm
SR 33 South Junction to SLO/Kern County Line	0.66 per mvm	0.69 per mvm
SLO/Kern County Line to SR 33 North Junction	0.56 per mvm	1.01 per mvm
SR 33 North Junction to Basic School Road	0.65 per mvm	0.79 per mvm

(a) Caltrans accident data is segregated by county and route number. Thus, four segments listed for SR 166 between US 101 I/C and Basic School Road.
(b) Actual rate of accidents per million vehicle miles.
(c) California statewide average rate for similar facilities.

As shown in Table 23, the rate of accidents on SR 166 between US 101 and Basic School Road are lower than the California statewide averages for similar facilities.

Table 24
Accident Rates
US 101/Refugio Road I/C

Ramp	Accident Rate(a)	Statewide Average Rate(b)
US 101 NB On-Ramp	3.70 per mv	0.53 per mv
US 101 NB Off-Ramp	0.00 per mv	1.04 per mv
US 101 SB On-Ramp	5.63 per mv	0.53 per mv
US 101 SB Off-Ramp	3.72 per mv	1.62 per mv

(a) Actual rate of accidents per million vehicles.
(b) California statewide average rate for similar facilities.

As shown in Table 24, the rate of accidents on several of the US 101 ramps at the Refugio Road I/C are higher than the California statewide average for similar facilities. Accident rates for low volume facilities are commonly higher than average since the rate of accidents is related to the number of vehicles using the facility. Caltrans procedures were used to test the significance of the number of accidents that occurred on ramps with higher than average accident rates.

The US 101 northbound on-ramp has an accident rate of 3.70 accidents per million vehicles and the statewide average is 0.53 accidents per million vehicles. There was 1 accident on this ramp during the 3-year period. The Caltrans significance test shows that the number of accidents required to be statistically significant is 3 accidents within the 3-year period. Thus, the number of accidents that occurred is not statistically significant and further investigation is not warranted.

The US 101 southbound on-ramp has an accident rate of 5.63 accidents per million vehicles and the statewide average is 0.53 accidents per million vehicles. There were 2 accidents on this ramp during the 3-year period. The Caltrans significance test shows that the number of accidents required to be statistically significant is 3 accidents within the 3-year period. Thus, the number of accidents that occurred is not statistically significant and further investigation is not warranted.

The US 101 southbound off-ramp has an accident rate of 3.72 accidents per million vehicles and the statewide average is 1.63 accidents per million vehicles. There was 1 accident on this ramp during the 3-year period. The Caltrans significance test shows that the number of accidents required to be statistically significant is 4 accidents within the 3-year period. Thus, the number of accidents that occurred is not statistically significant and further investigation is not warranted.

Table 25
Accident Rates
US 101/SR 166 I/C

Ramp	Accident Rate(a)	Statewide Average Rate(b)
US 101 NB On-Ramp	0.00 per mv	0.54 per mv
US 101 NB Off-Ramp	0.29 per mv	0.76 per mv
US 101 SB On-Ramp	0.41 per mv	0.54 per mv
US 101 SB Off-Ramp	0.00 per mv	0.76 per mv

(a) Actual rate of accidents per million vehicles.
(b) California statewide average rate for similar facilities.

As shown in Table 25, the rate of accidents at the US 101/SR 166 I/C are lower than the California statewide averages for similar facilities.

Table 26
Accident Rates
SR 166/Basic School Road Intersection

Intersection	Accident Rate(a)	Statewide Average Rate(b)
SR 166/Basis School Road	0.84 per mv	0.16 per mv

(a) Actual rate of accidents per million vehicles.
(b) California statewide average rate for similar facilities.

As shown in Table 26, the rate of accidents at the SR 166/Basic School Road intersection is higher than the California statewide average for similar intersections (Accident Rate = 0.84; Statewide Avenue Rate = 0.16). There were 3 accidents at the intersection during the 3-year period. The Caltrans significance test shows that the number of accidents required to be statistically significant is 4 accidents within the 3-year period. Thus, the number of accidents that occurred is not statistically significant and further investigation is not warranted.

MITIGATION MEASURES

Option 1 – Truck to Phillips 66 Terminal

The impact analysis found that the Option 1 truck route has the potential to significantly impact the US 101 SB Ramps/Betteravia Road intersection. This intersection currently operates at LOS F during the PM peak hour and the Project would add 6 trips to the intersection during the PM peak hour (3 trucks = 6 PCEs), which exceeds the County's 5-trip threshold for intersections operating at LOS F. The following measure would mitigate this potential impact.

Limit Trucks During PM Peak Hour. Limiting trucks to/from the Phillips 66 site to 2 trucks per hour (2 trucks = 4 PCEs) during the PM peak commuter period (4-6 PM) would mitigate this impact by reducing the Project's traffic additions to less than 5 trips during the PM peak hour (2 trucks = 4 PCEs), which is below the County's 5-trip threshold for intersections that operate at LOS F.

Note: The City and Caltrans are currently studying an improvement project to address the existing deficiency at the US 101/Betteravia Road I/C. The improvements include widening the US 101 SB Off-Ramp to provide a second right-turn lane and installing two new eastbound thru lanes on Betteravia Road at the US 101 SB Ramps/Betteravia Road intersection. The traffic analysis prepared for the improvement project shows that the US 101 SB Ramps/Betteravia Road intersection is forecast to operate at LOS B during the PM peak hour with the improvement project, which would mitigate the Project's potential impact. The timing of the US 101/Betteravia Road Improvement Project is unknown since it is the preliminary planning stages.

Option 2 – Truck to Plains Pentland Terminal

The impact analysis found that the Option 2 truck route would not generated significant impacts based on adopted thresholds. Mitigation measures are therefore not required.

PROJECT ALTERNATIVE

The preceding analysis is based on a maximum of 70 truck trips per day and 3 trucks per hour. The applicant has indicated that production may fluctuate and the number of trucks per hour may also fluctuate. Although the 70 truck trips per day is the maximum per day anticipated for the program, the applicant has indicated a need to occasionally generate up to 7 trucks per hour due to fluctuations in production. Assuming 2 PCEs per truck, the 7 inbound + 7 outbound trucks per hour equates to 14 inbound PCEs and 14 outbound PCEs per hour.

For the Option 1 truck route, generating 7 trucks per hour (14 PCEs) would not significantly impact most of the roadways and intersections along the route. The 14 PCEs added to the US 101 SB Ramps/Betteravia Road intersection during the PM peak hour would be considered a significant impact since it would exceed the County's 5-trip threshold for intersections that operate at LOS F. The mitigation listed for Option 1 would be required to mitigate this potential impact (limit trucks to 2 per hour (4 PCEs) at the US 101 SB Ramps/Betteravia Road intersection during the 4-6 PM peak commuter period).

For the Option 2 truck route, generating 6 trucks per hour (12 PCEs) would not significantly impact any of the roadways and intersections along the route. The Project would increase traffic by about 2/10th of 1% on the segments of US 101 where the accident rates exceed the statewide average rates and the number of accidents are statistically significant (between the Betteravia Road I/C and the SR 166 I/C). Because the Project's traffic addition equates to a minor increase (about 2/10th of 1%), this potential impact would be insignificant. Nonetheless, it is recommended that more current accident data be obtained from Caltrans at a later date to determine if the number of accidents is statistically significant and determine if there are correctable accident patterns.

• • •

STUDY PARTICIPANTS AND REFERENCES

Associated Transportation Engineers

Scott A. Schell, AICP, PTP, Principal Transportation Planner
Richard L. Pool, PE, Principal Engineer
Dan Dawson, Supervising Transportation Planner
Erica Monson, Transportation Planner I

References

Congestion Management Program, Santa Barbara County Association of Governments, 2016.

Guide for the Preparation of Traffic Impact Studies, Caltrans, December 2002.

Highway Capacity Manual, Transportation Research Board, 2016.

http://traffic-counts.dot.ca.gov/2015all, 2015 Traffic Volumes Book, Caltrans, 2017.

TECHNICAL APPENDIX

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LEVEL OF SERVICE DEFINITIONS

STANDARD ENGINEERING ROADWAY DESIGN CAPACITIES

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LEVEL OF SERVICE CALCULATION WORKSHEETS

ACCIDENT DATA

LEVEL OF SERVICE DEFINITIONS

The ability of a roadway system to carry traffic is most often expressed in terms of "Levels of Service" (LOS). LOS A through F are used, with LOS A indicating very good operations and LOS F indicating poor operations. More complete level of service definitions for intersections are listed Table A.

Table A
Level of Service Definitions

LOS	Delay Range(a)		Definition
	Signalized Intersections	Unsignalized Intersections	
A	0.0 – 10.0	0.0 – 10.0	Conditions of free unobstructed flow, no delays and all signal phases sufficient in duration to clear all approaching vehicles.
B	10.1 – 20.0	10.1 – 15.0	Conditions of stable flow, very little delay, a few phases are unable to handle all approaching vehicles.
C	20.1 – 35.0	15.1 – 25.0	Conditions of stable flow, delays are low to moderate, full use of peak direction signal phases is experienced.
D	35.1 – 55.0	25.1 – 35.0	Conditions approaching unstable flow, delays are moderate to heavy, significant signal time deficiencies are experienced for short durations during the peak traffic period.
E	55.0 – 80.0	35.0 – 50.0	Conditions of unstable flow, delays are significant, signal phase timing is generally insufficient, congestion exists for extended duration throughout the peak period.
F	> 80.0	> 50.0	Conditions of forced flow, travel speeds are low and volumes are well above capacity. This condition is often caused when vehicles released by an upstream signal are unable to proceed because of back-ups from a downstream signal.

(a) Average delay per vehicle in seconds. Source: Highway Capacity Manual.

STANDARD ENGINEERING ROADWAY DESIGN CAPACITIES

Roadway Type	# Lanes	LOS A		LOS B		LOS C		LOS D		LOS E	
		Low	High	Low	High	Low	High	Low	High	Low	High
Arterial	2 Lanes	8,100	12,000	9,400	14,000	10,800	16,000	12,100	18,000	13,500	20,000
Arterial	4 Lanes	16,100	23,900	18,900	27,900	21,600	31,900	24,300	35,900	27,000	39,900
Major	2 Lanes	6,500	9,600	7,500	11,200	8,600	12,800	9,700	14,400	10,800	16,000
Major	4 Lanes	12,900	19,200	15,100	22,300	17,200	25,500	19,400	28,700	21,600	31,900
Collector	2 Lanes	4,600	7,100	5,400	8,200	6,200	9,400	6,900	10,600	7,700	11,800

The roadway capacities listed above are "rule of thumb." Some factors which affect these capacities are intersections (numbers and configuration), degrees of access control, roadway grades, design geometries (horizontal and vertical alignment standards), sight distance, level of truck and bus traffic and level of pedestrian and bicycle traffic.

TRAFFIC COUNT DATA

US 101 TRAFFIC VOLUMES
Source: SBCAG (2014) & Caltrans (2015)

2014 SBCAG(a)

US 101 Segment	2014 AADT	NB	SB	Total	Lanes	PHF	Terrain	% Trucks	% Bus	%RV	Base FFS	Lane Width	Shoulder Width	Int Density
El Cap-SR 1	29,500	1,520	730	2,250	4	0.88	Rolling	9%	1%	1%	75 MPH	12 Feet	6 Feet	0.13
Santa Rosa-SR 246	22,600	950	630	1,580	4	0.88	Rolling	12%	1%	1%	75 MPH	12 Feet	6 Feet	0.50
SR 154-SR 135	30,700	1,150	940	2,090	4	0.88	Rolling	10%	1%	1%	75 MPH	12 Feet	6 Feet	0.24
Clark-SM Way	40,600	1,530	1,310	2,840	4	0.90	Flat	7%	1%	1%	75 MPH	12 Feet	6 Feet	1.00
SM Way-Betteravia	47,800	1,830	1,560	3,390	6	0.90	Flat	7%	1%	1%	70 MPH	12 Feet	6 Feet	1.00
Betteravia-SR 166	67,100	2,570	2,460	5,030	6	0.90	Flat	5%	1%	1%	70 MPH	12 Feet	6 Feet	1.00

2015 Caltrans(b)

US 101 Segment	2015 AADT	NB	SB	Total	Lanes	PHF	Terrain	% Trucks	% Bus	%RV	Base FFS	Lane Width	Shoulder Width	Int Density
El Cap-SR 1	29,400	1,515	727	2,242	4	0.88	Rolling	9%	1%	1%	75 MPH	12 Feet	6 Feet	0.13
SR 1-SR 246	22,800	958	636	1,594	4	0.88	Rolling	12%	1%	1%	75 MPH	12 Feet	6 Feet	0.50
SR 246-Clark	31,300	1,173	958	2,131	4	0.88	Rolling	10%	1%	1%	75 MPH	12 Feet	6 Feet	0.24
Clark-SM Way	41,000	1,545	1,323	2,868	4	0.90	Flat	7%	1%	1%	75 MPH	12 Feet	6 Feet	1.00
SM Way-Betteravia	58,200	2,228	1,900	4,128	6	0.90	Flat	7%	1%	1%	70 MPH	12 Feet	6 Feet	1.00
Betteravia-SR 166	73,300	2,808	2,687	5,495	6	0.90	Flat	5%	1%	1%	70 MPH	12 Feet	6 Feet	1.00

(a) 2014 PM peak hour data only.
(b) 2015 AADT data from Caltrans. Other flows/attributes taken from SBCAG model.

2015 Traffic Volumes (for ALL vehicles on CA State Highways)

Return to Census Program or Jump to 2011 | 2012 | 2013 | 2014 | 2015

2015 Volumes Home View

Dist	Rte	CO		Post Mile	Description	Back Peak Hour	Back Peak Month	Back AADT	Ahead Peak Hour	Ahead Peak Month	Ahead AADT
05	101	SB		26.907	HOLLISTER AVENUE	3900	40000	35000	3900	37000	30800
05	101	SB		33.852	EL CAPITAN BEACH STATE PARK	3900	37000	30300	3900	32000	29400
05	101	SB	R	48.847	LAS CRUCES, JCT. RTE. 1 NORTHWEST	2800	32000	29200	2900	27000	23500
05	101	SB	R	56.463	SANTA ROSA ROAD	2900	27000	23500	2900	26000	22800
05	101	SB	R	57.117	BUELLTON, JCT. RTE. 246	2900	26000	22800	2600	25000	22000
05	101	SB	R	57.552	NORTH BUELLTON	2600	25000	22000	2700	28000	24600
05	101	SB		62.671	ZACA, JCT. RTE. 154 EAST	2700	28000	24600	3300	34000	31300
05	101	SB		70.921	LOS ALAMOS, JCT. RTE. 135 NORTHWEST	3300	34000	31300	3300	34000	29500
05	101	SB		82.183	SANTA MARIA, CLARK AVENUE	3300	34000	30400	4000	45000	41000
05	101	SB		84.336	SOUTH SANTA MARIA	5100	56000	52100	6100	66000	58200
05	101	SB		86.588	BETTERAVIA ROAD	6100	66000	58200	6800	76000	69100
05	101	SB		87.603	EAST STOWELL ROAD	6800	76000	69100	7300	80000	73300
05	101	SB		88.601	SANTA MARIA, JCT. RTE. 166 WEST	7300	80000	73300	6800	74000	68800
05	101	SB		89.693	SANTA MARIA, DONOVAN ROAD	6800	74000	68800	6400	69000	64400
05	101	SB		90.749	JCT. RTE. 135 SOUTH	6400	69000	64400	6700	76000	69400

2015 Traffic Volumes (for ALL vehicles on CA State Highways)

Return to Census Program or Jump to 2011 | 2012 | 2013 | 2014 | 2015

Dist	Rte	CO	Post Mile	Description	Back Peak Hour	Back Peak Month	Back AADT	Ahead Peak Hour	Ahead Peak Month	Ahead AADT
05	101	SB	87.603	EAST STOWELL ROAD	6800	76000	69100	7300	80000	73300
05	101	SB	88.601	SANTA MARIA, JCT. RTE. 166 WEST	7300	80000	73300	6800	74000	68800
05	101	SB	89.693	SANTA MARIA, DONOVAN ROAD	6800	74000	68800	6400	69000	64400
05	101	SB	90.749	JCT. RTE. 135 SOUTH	6400	69000	64400	6700	76000	69400
05	101	SB	90.988	SANTA BARBARA/SAN LUIS OBISPO COUNTY LINE	6700	76000	69400			
05	101	SLO	0	SANTA BARBARA/SAN LUIS OBISPO COUNTY LINE				6500	76000	69400
05	101	SLO	.813	JCT. RTE. 166 EAST	6500	76000	69400	5800	66000	58900
05	101	SLO	4.851	TEFFT STREET	5800	66000	58900	6100	66000	60800
05	101	SLO	7.851	LOS BERROS ROAD	6100	67000	61200	6100	66000	60500
05	101	SLO	12.521	ARROYO GRANDE, BRIDGE STREET	6100	66000	60500	5800	60000	54400
05	101	SLO	13.173	ARROYO GRANDE, JCT. RTE. 227 NORTH	6100	62000	57100	6500	65000	59600
05	101	SLO	13.747	ARROYO GRANDE, BRISCO ROAD	6500	65000	59600	7000	67000	62300
05	101	SLO	14.613	PISMO BEACH, OAK PARK ROAD	7100	67000	62300	7500	72000	65500
05	101	SLO	15.579	PISMO BEACH, PISMO OAKS	8200	72000	65500	10000	89000	80900
05	101	SLO	16.398	PISMO BEACH, SOUTH PISMO BEACH	9100	86000	78800	7000	67000	64400

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2015 Traffic Volumes (for ALL vehicles on CA State Highways)

2015 Volumes Home View

Return to Census Program or Jump to 2011 | 2012 | 2013 | 2014 | 2015

Dist	Rte	CO		Post Mile	Description	Back Peak Hour	Back Peak Month	Back AADT	Ahead Peak Hour	Ahead Peak Month	Ahead AADT
05	166	SB		8.927	SANTA MARIA, JCT. RTE. 101	2300	28000	23500	370	3450	2900
05	166	SLO		13.511	SUEY ROAD	350	2300	2150	380	4000	3800
05	166	SB	R	24.1	TEPESQUET ROAD	380	4700	4000	450	4100	3450
05	166	SLO	R	51.09	SAN LUIS OBISPO/SANTA BARBARA COUNTY LINE	390	3000	2550			
05	166	SB	R	51.09	SAN LUIS OBISPO/SANTA BARBARA COUNTY LINE				390	3000	2550
05	166	SB		64.3	PERKINS ROAD	350	3000	2550	480	3800	2950
05	166	SB		66.58	BELL ROAD	510	4000	3350	370	2200	1900
05	166	SB	R	70.141	SANTA BARBARA/SAN LUIS OBISPO COUNTY LINE	380	3700	3050			
05	166	SLO	R	70.141	SANTA BARBARA/SAN LUIS OBISPO COUNTY LINE				310	3600	3100
05	166	SLO		74.718	MARICOPA, JCT. RTE. 33	280	4600	3950			
05	166	SLO		74.719	BREAK IN ROUTE						
06	166	KER		.01	MARICOPA, JCT. RTE. 33				280	3250	2950
06	166	KER		2.96	PENTLAND ROAD	280	3250	2950	280	3100	2800
06	166	KER		14.86	OLD RIVER ROAD	1150	6900	5700	620	3900	3100
06	166	KER		22.797	JCT. RTE. 5	690	4500	3300	660	3850	2700

Prepared by NDS/ATD

VOLUME

Calle Real E/O Refugio Rd

Day: Thursday
Date: 11/16/2017

City: Goleta
Project #: CA17_8109_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	51	65	116

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			0		0		0		12:00			0		2		2	
00:15			0		0		0		12:15			0		1		1	
00:30			0		0		0		12:30			1		2		3	
00:45			0		0		0		12:45			1	2	3	8	4	10
01:00			0		0		0		13:00			0		1		1	
01:15			0		0		0		13:15			1		0		1	
01:30			0		0		0		13:30			0		1		1	
01:45			0		0		0		13:45			1	2	0	2	1	4
02:00			0		0		0		14:00			0		0		0	
02:15			0		0		0		14:15			1		0		1	
02:30			0		0		0		14:30			2		1		3	
02:45			0		0		0		14:45			1	4	0	1	1	5
03:00			0		0		0		15:00			0		2		2	
03:15			0		0		0		15:15			0		2		2	
03:30			0		0		0		15:30			2		3		5	
03:45			0		0		0		15:45			0	2	1	8	1	10
04:00			0		0		0		16:00			0		5		5	
04:15			0		0		0		16:15			0		1		1	
04:30			0		0		0		16:30			0		7		7	
04:45			0		0		0		16:45			1	1	1	14	2	15
05:00			3		0		3		17:00			0		0		0	
05:15			4		0		4		17:15			1		2		3	
05:30			6		1		7		17:30			0		8		8	
05:45			1	14	0	1	1	15	17:45			0	1	1	11	1	12
06:00			0		0		0		18:00			0		0		0	
06:15			1		0		1		18:15			0		0		0	
06:30			1		0		1		18:30			0		0		0	
06:45			2	4	3	3	5	7	18:45			0		0		0	
07:00			1		1		2		19:00			0		0		0	
07:15			1		0		1		19:15			0		2		2	
07:30			1		0		1		19:30			0		0		0	
07:45			2	5	0	1	2	6	19:45			0		1	3	1	3
08:00			2		0		2		20:00			0		0		0	
08:15			1		1		2		20:15			0		0		0	
08:30			0		0		0		20:30			0		0		0	
08:45			0	3	1	2	1	5	20:45			0		0		0	
09:00			0		0		0		21:00			0		1		1	
09:15			2		1		3		21:15			0		0		0	
09:30			1		0		1		21:30			0		0		0	
09:45			1	4	1	2	2	6	21:45			0		0	1	0	1
10:00			2		0		2		22:00			0		0		0	
10:15			1		1		2		22:15			0		0		0	
10:30			0		1		1		22:30			0		0		0	
10:45			4	7	2	4	6	11	22:45			0		0		0	
11:00			0		0		0		23:00			0		0		0	
11:15			1		1		2		23:15			0		1		1	
11:30			0		1		1		23:30			0		0		0	
11:45			1	2	1	3	2	5	23:45			0		0	1	0	1
TOTALS				39		16		55	TOTALS				12		49		61
SPLIT %				70.9%		29.1%		47.4%	SPLIT %				19.7%		80.3%		52.6%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	51	65	116

AM Peak Hour			05:00	11:45	05:00	PM Peak Hour			13:45	15:45	16:00
AM Pk Volume			14	6	15	PM Pk Volume			4	14	15
Pk Hr Factor			0.583	0.750	0.536	Pk Hr Factor			0.500	0.500	0.536
7 - 9 Volume	0	0	8	3	11	4 - 6 Volume	0	0	2	25	27
7 - 9 Peak Hour			07:15	08:00	07:30	4 - 6 Peak Hour			16:30	16:00	16:00
7 - 9 Pk Volume	0	0	6	2	7	4 - 6 Pk Volume	0	0	2	14	15
Pk Hr Factor	0.000	0.000	0.750	0.500	0.875	Pk Hr Factor	0.000	0.000	0.500	0.500	0.536

Prepared by NDS/ATD

VOLUME

Rosemary Rd N/O Betteravia Rd

Day: Thursday
Date: 11/16/2017

City: Santa Maria
Project #: CA17_8109_002

DAILY TOTALS	NB	SB	EB	WB	Total
	998	790	0	0	1,788

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	1		3						4		12:00	19		17						36	
00:15	2		4						6		12:15	6		14						20	
00:30	1		2						3		12:30	24		13						37	
00:45	0	4	2	11					2	15	12:45	20	69	11	55					31	124
01:00	4		1						5		13:00	17		18						35	
01:15	3		1						4		13:15	17		18						35	
01:30	1		0						1		13:30	17		9						26	
01:45	0	8	2	4					2	12	13:45	22	73	12	57					34	130
02:00	1		3						4		14:00	16		12						28	
02:15	1		1						2		14:15	34		15						49	
02:30	1		1						2		14:30	21		9						30	
02:45	2	5	0	5					2	10	14:45	18	89	15	51					33	140
03:00	1		0						1		15:00	38		25						63	
03:15	0		2						2		15:15	43		15						58	
03:30	1		0						1		15:30	32		15						47	
03:45	1	3	2	4					3	7	15:45	16	129	15	70					31	199
04:00	0		3						3		16:00	29		17						46	
04:15	0		6						6		16:15	35		13						48	
04:30	5		5						10		16:30	25		15						40	
04:45	2	7	4	18					6	25	16:45	26	115	16	61					42	176
05:00	1		2						3		17:00	19		17						36	
05:15	4		6						10		17:15	18		15						33	
05:30	4		13						17		17:30	8		7						15	
05:45	7	16	15	36					22	52	17:45	11	56	9	48					20	104
06:00	6		21						27		18:00	8		6						14	
06:15	10		22						32		18:15	14		6						20	
06:30	14		15						29		18:30	5		7						12	
06:45	12	42	12	70					24	112	18:45	12	39	5	24					17	63
07:00	9		13						22		19:00	3		5						8	
07:15	9		17						26		19:15	3		6						9	
07:30	10		11						21		19:30	9		2						11	
07:45	11	39	17	58					28	97	19:45	7	22	3	16					10	38
08:00	9		12						21		20:00	5		6						11	
08:15	12		13						25		20:15	8		3						11	
08:30	13		11						24		20:30	7		2						9	
08:45	11	45	10	46					21	91	20:45	4	24	4	15					8	39
09:00	19		15						34		21:00	2		4						6	
09:15	9		7						16		21:15	4		2						6	
09:30	8		4						12		21:30	2		2						4	
09:45	13	49	15	41					28	90	21:45	3	11	5	13					8	24
10:00	17		8						25		22:00	3		5						8	
10:15	10		6						16		22:15	3		2						5	
10:30	11		8						19		22:30	2		6						8	
10:45	18	56	6	28					24	84	22:45	3	11	2	15					5	26
11:00	21		7						28		23:00	1		3						4	
11:15	17		8						25		23:15	0		3						3	
11:30	24		10						34		23:30	2		2						4	
11:45	17	79	9	34					26	113	23:45	4	7	2	10					6	17
TOTALS		353		355						708	TOTALS		645		435						1080
SPLIT %		49.9%		50.1%						39.6%	SPLIT %		59.7%		40.3%						60.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	998	790	0	0	1,788

AM Peak Hour	10:45	05:45			11:15	PM Peak Hour	14:45	14:45			14:45
AM Pk Volume	80	73			121	PM Pk Volume	131	70			201
Pk Hr Factor	0.833	0.830			0.840	Pk Hr Factor	0.762	0.700			0.798
7 - 9 Volume	84	104	0	0	188	4 - 6 Volume	171	109	0	0	280
7 - 9 Peak Hour	07:45	07:00			07:45	4 - 6 Peak Hour	16:00	16:30			16:00
7 - 9 Pk Volume	45	58	0	0	98	4 - 6 Pk Volume	115	63	0	0	176
Pk Hr Factor	0.865	0.853	0.000	0.000	0.875	Pk Hr Factor	0.821	0.926	0.000	0.000	0.917

Prepared by NDS/ATD

VOLUME

Battles Rd W/O Rosemary Rd

Day: Thursday
Date: 11/16/2017

City: Santa Maria
Project #: CA17_8109_003

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	307	279	586

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			3		1		4		12:00			11		7		18	
00:15			1		2		3		12:15			2		5		7	
00:30			2		1		3		12:30			3		2		5	
00:45			4	10	0	4	4	14	12:45			4	20	2	16	6	36
01:00			1		3		4		13:00			9		8		17	
01:15			2		1		3		13:15			6		7		13	
01:30			2		1		3		13:30			1		2		3	
01:45			1	6	1	6	2	12	13:45			4	20	4	21	8	41
02:00			3		1		4		14:00			4		4		8	
02:15			1		1		2		14:15			6		7		13	
02:30			1		2		3		14:30			5		9		14	
02:45			0	5	3	7	3	12	14:45			7	22	3	23	10	45
03:00			1		1		2		15:00			10		10		20	
03:15			1		1		2		15:15			3		4		7	
03:30			0		2		2		15:30			8		4		12	
03:45			3	5	2	6	5	11	15:45			10	31	4	22	14	53
04:00			3		1		4		16:00			5		2		7	
04:15			2		0		2		16:15			4		9		13	
04:30			1		5		6		16:30			3		3		6	
04:45			3	9	5	11	8	20	16:45			2	14	2	16	4	30
05:00			1		2		3		17:00			13		0		13	
05:15			2		2		4		17:15			11		2		13	
05:30			2		2		4		17:30			0		0		0	
05:45			3	8	3	9	6	17	17:45			4	28	2	4	6	32
06:00			1		6		7		18:00			1		1		2	
06:15			2		6		8		18:15			2		1		3	
06:30			3		7		10		18:30			3		0		3	
06:45			2	8	5	24	7	32	18:45			2	8	2	4	4	12
07:00			2		3		5		19:00			2		0		2	
07:15			2		3		5		19:15			3		0		3	
07:30			3		6		9		19:30			1		1		2	
07:45			8	15	2	14	10	29	19:45			1	7	0	1	1	8
08:00			2		3		5		20:00			0		1		1	
08:15			4		4		8		20:15			2		6		8	
08:30			6		0		6		20:30			1		2		3	
08:45			3	15	2	9	5	24	20:45			0	3	3	12	3	15
09:00			7		7		14		21:00			1		3		4	
09:15			1		2		3		21:15			2		0		2	
09:30			2		2		4		21:30			2		1		3	
09:45			4	14	3	14	7	28	21:45			0	5	2	6	2	11
10:00			5		4		9		22:00			3		4		7	
10:15			3		4		7		22:15			3		2		5	
10:30			5		7		12		22:30			1		3		4	
10:45			5	18	5	20	10	38	22:45			1	8	1	10	2	18
11:00			6		3		9		23:00			1		1		2	
11:15			10		3		13		23:15			2		0		2	
11:30			4		4		8		23:30			2		2		4	
11:45			2	22	3	13	5	35	23:45			1	6	4	7	5	13
TOTALS				135		137		272	TOTALS				172		142		314
SPLIT %				49.6%		50.4%		46.4%	SPLIT %				54.8%		45.2%		53.6%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	307	279	586

AM Peak Hour			11:15	06:00	10:30	PM Peak Hour			15:00	14:15	14:15
AM Pk Volume			27	24	44	PM Pk Volume			31	29	57
Pk Hr Factor			0.614	0.857	0.846	Pk Hr Factor			0.775	0.725	0.713
7 - 9 Volume	0	0	30	23	53	4 - 6 Volume	0	0	42	20	62
7 - 9 Peak Hour			07:45	07:30	07:30	4 - 6 Peak Hour			16:30	16:00	16:15
7 - 9 Pk Volume	0	0	20	15	32	4 - 6 Pk Volume	0	0	29	16	36
Pk Hr Factor	0.000	0.000	0.625	0.625	0.800	Pk Hr Factor	0.000	0.000	0.558	0.444	0.692

Prepared by National Data & Surveying Services

Refugio Rd & US 101 NB Ramps

Peak Hour Turning Movement Count

ID: 17-08108-001
City: Santa Maria

Day: Thursday
Date: 11/16/2017

PEAK HOURS	COUNT PERIODS
08:00 AM - 09:00 AM	07:00 AM - 09:00 AM
NONE	NONE
04:00 PM - 05:00 PM	04:00 PM - 06:00 PM

Refugio Rd — SOUTHBOUND

AM	1	18	0	0	22	AM
NOON	0	0	0	0	0	NOON
PM	19	18	0	0	17	PM
	0	1	0	0		

US 101 NB Ramps — EASTBOUND

AM	NOON	PM	
6	0	26	
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
AM	NOON	PM	

US 101 NB Ramps — WESTBOUND

	PM	NOON	AM
0	15	0	9
1	5	0	2
0	7	0	6
0	0	0	0
	0	0	0
	PM	NOON	AM

CONTROL

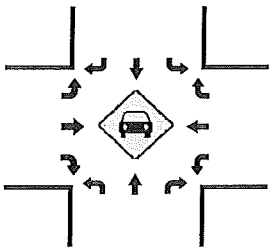
1-Way Stop(WB)

TEV	52	0	68
	AM	NOON	PM
PHF	0.81		0.65

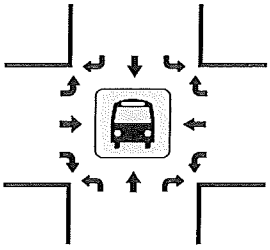
Refugio Rd — NORTHBOUND

	0	0	1	0		
PM	25	0	2	2	0	PM
NOON	0	0	0	0	0	NOON
AM	24	0	3	13	0	AM

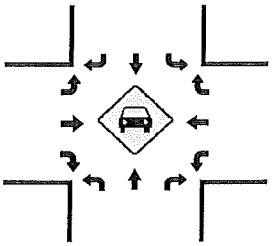
Total Vehicles (AM)



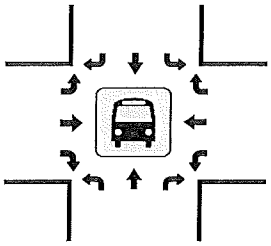
Total Vehicles (AM)



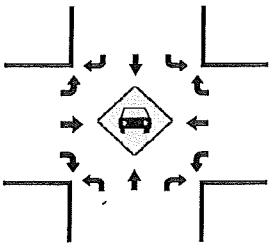
Total Vehicles (NOON)



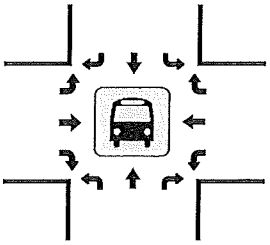
Total Vehicles (NOON)



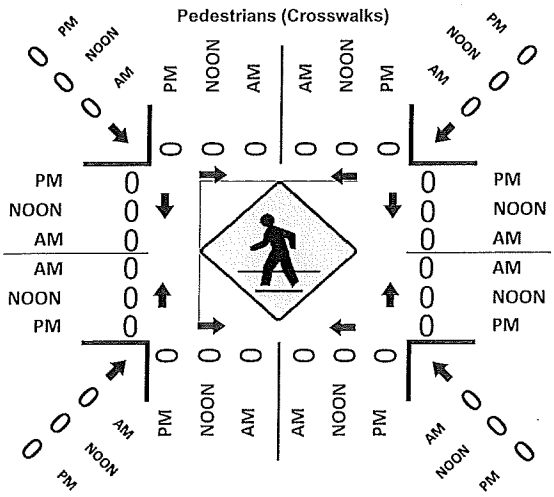
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Basic School Rd & SR 166

Peak Hour Turning Movement Count

ID: 17-08108-004
City: Bakersfield

Day: Thursday
Date: 11/16/2017

PEAK HOURS		COUNT PERIODS
07:30 AM - 08:30 AM		07:00 AM - 09:00 AM
NONE		NONE
04:00 PM - 05:00 PM		04:00 PM - 06:00 PM

Basic School Rd — SOUTHBOUND

AM	4	4	78	0	23	AM
NOON	0	0	0	0	0	NOON
PM	6	3	8	0	37	PM

SR 166 — EASTBOUND

AM	NOON	PM	
108	0	150	
0	0	0	0
2	0	3	0
160	0	124	1
0	0	1	0

SR 166 — WESTBOUND

	PM	NOON	AM
0	30	0	11
1	141	0	104
0	8	0	5
0	0	0	0
	144	0	248

CONTROL

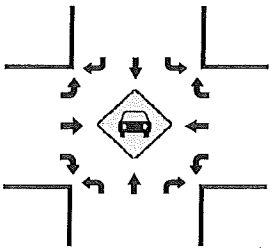
2-Way Stop(NB/SB)

TEV	388	0	343
	AM	NOON	PM
PHF	0.83		0.72

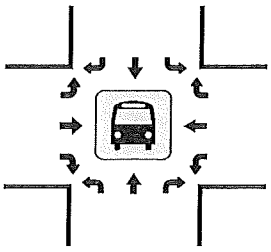
Basic School Rd — NORTHBOUND

PM	12	0	3	4	12	PM
NOON	0	0	0	0	0	NOON
AM	9	0	0	10	10	AM

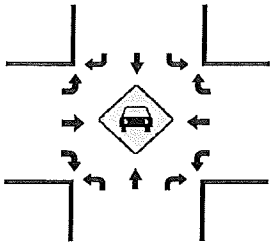
Total Vehicles (AM)



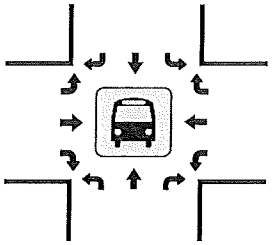
Total Vehicles (AM)



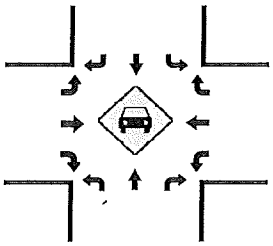
Total Vehicles (NOON)



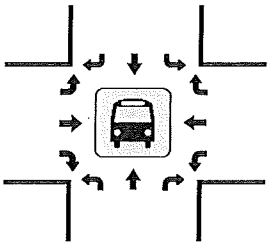
Total Vehicles (NOON)



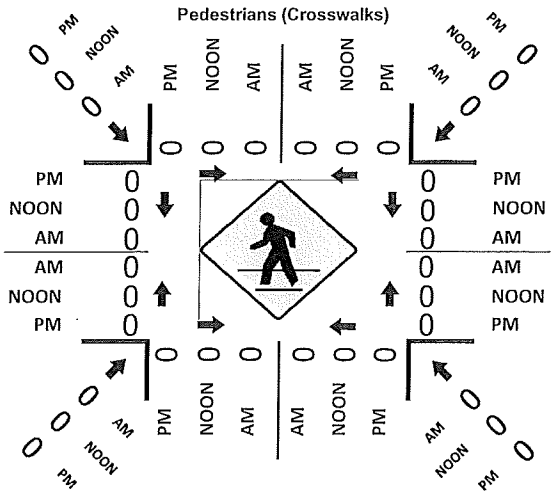
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

US 101 NB Ramps & Cuyama Lane/Hwy (Off ramp)

Peak Hour Turning Movement Count

ID: 17-08108-002
City: Santa Maria

Day: Thursday
Date: 11/16/2017

PEAK HOURS	COUNT PERIODS
07:00 AM - 08:00 AM	07:00 AM - 09:00 AM
NONE	NONE
04:30 PM - 05:30 PM	04:00 PM - 06:00 PM

SOUTHBOUND — US 101 NB Ramps

AM	0	0	0	0	80	AM
NOON	0	0	0	0	0	NOON
PM	0	0	0	0	67	PM

EASTBOUND — Cuyama Lane/Hwy (Off ramp)

AM	NOON	PM	
464	0	717	
0	0	0	0
48	0	22	0
29	0	60	1
0	0	0	0
AM	NOON	PM	

WESTBOUND — Cuyama Lane/Hwy (Off ramp)

	PM	NOON	AM
0	41	0	31
1	237	0	233
0	0	0	0
0	0	0	0
	320	0	201
	PM	NOON	AM

NORTHBOUND — US 101 NB Ramps

PM	0	0	480	4	260	PM
NOON	0	0	0	0	0	NOON
AM	0	0	231	1	172	AM

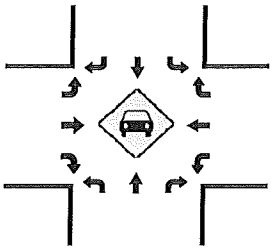
0	0	0	0
0	0.5	0.5	1

CONTROL

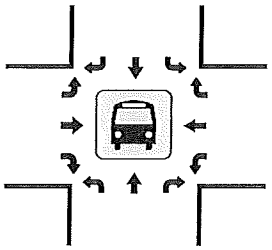
3-Way Stop(NB/EB/WB)

TEV	745	0	1104
	AM	NOON	PM
PHF	0.93		0.96

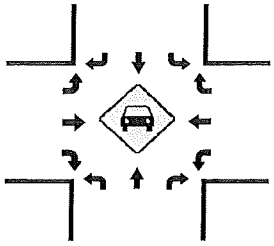
Total Vehicles (AM)



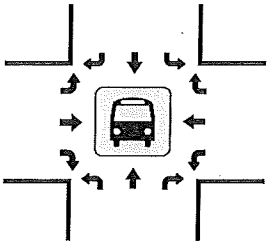
Total Vehicles (AM)



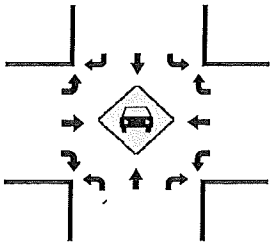
Total Vehicles (NOON)



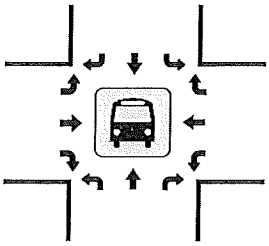
Total Vehicles (NOON)



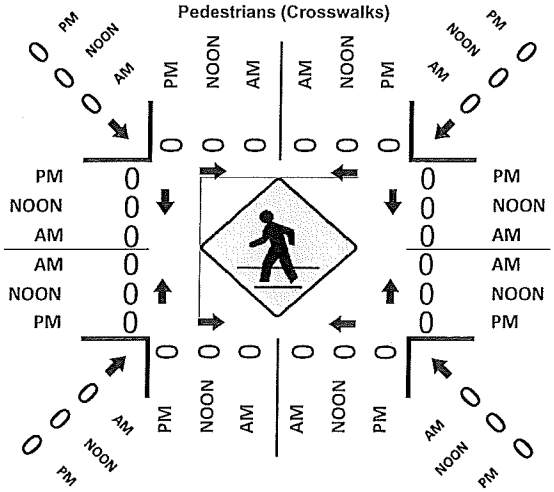
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

US 101 SB Ramps & Cuyama Lane/Hwy (Off ramp)

Peak Hour Turning Movement Count

ID: 17-08108-003
City: Santa Maria

Day: Thursday
Date: 11/16/2017

PEAK HOURS	COUNT PERIODS
07:15 AM - 08:15 AM	07:00 AM - 09:00 AM
NONE	NONE
04:30 PM - 05:30 PM	04:00 PM - 06:00 PM

SOUTHBOUND — US 101 SB Ramps

AM	19	1	22	0	0	AM
NOON	0	0	0	0	0	NOON
PM	38	1	43	0	0	PM
	0	1	0	0		

EASTBOUND — Cuyama Lane/Hwy (Off ramp)

AM	NOON	PM	
247	0	530	
0	0	0	0
0	0	0	0
55	0	38	1
372	0	423	0
AM	NOON	PM	

WESTBOUND — Cuyama Lane/Hwy (Off ramp)

	PM	NOON	AM
0	0	0	0
1	492	0	228
0	220	0	236
0	0	0	0
	81	0	77
	PM	NOON	AM

NORTHBOUND — US 101 SB Ramps

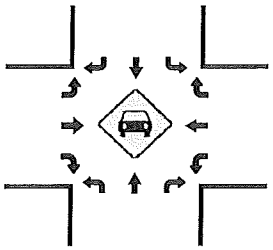
PM	644	0	0	0	0	PM
NOON	0	0	0	0	0	NOON
AM	609	0	0	0	0	AM
		0	0	0	0	

CONTROL

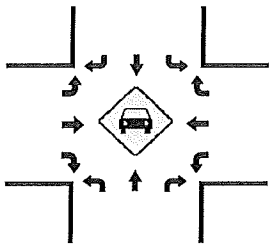
1-Way Stop(SB)

TEV	933	0	1255
	AM	NOON	PM
PHF	0.88		0.93

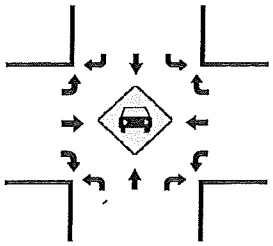
Total Vehicles (AM)



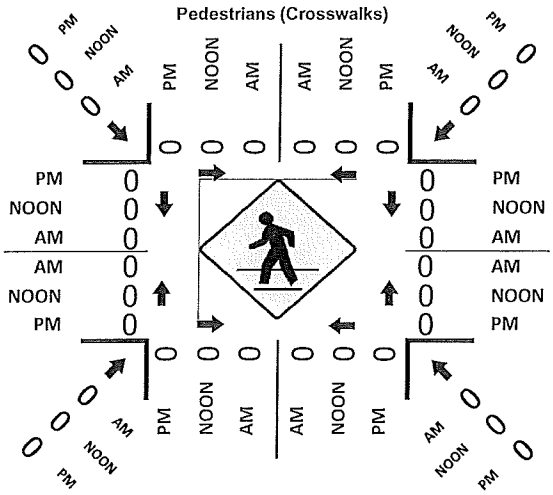
Total Vehicles (NOON)



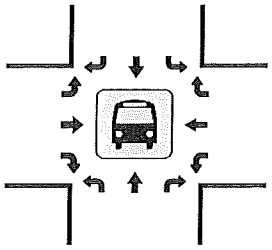
Total Vehicles (PM)



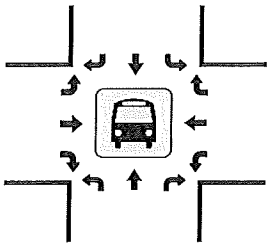
Pedestrians (Crosswalks)



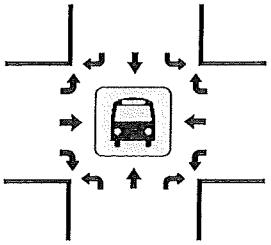
Total Vehicles (AM)



Total Vehicles (NOON)



Total Vehicles (PM)



LEVEL OF SERVICE CALCULATION WORKSHEETS

HCS7 Basic Freeway Report

Project Information

Analyst	DLD	Date	11/2/2017
Agency	ATE	Analysis Year	2017
Jurisdiction	SB COUNTY	Time Period Analyzed	PM PEAK
Project Description	US 101 NORTHBOUND - EXISTING - RUFUGIO TO SR 1		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.0	Total Ramp Density (TRD), ramps/mi	0.13
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	74.4
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	1515	Heavy Vehicle Adjustment Factor (f_{HV})	0.847
Peak Hour Factor (PHF)	0.88	Flow Rate (v_p), pc/h/ln	1016
Total Trucks, %	9.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.42
Passenger Car Equivalent (E_T)	3.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	74.4
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	13.7
Total Ramp Density Adjustment	0.6	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	74.4		

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HCS7 Basic Freeway Report

Project Information

Analyst	DLD	Date	11/2/2017
Agency	ATE	Analysis Year	2017
Jurisdiction	SB COUNTY	Time Period Analyzed	PM PEAK
Project Description	US 101 SOUTHBOUND - EXISTING - RUFUGIO TO SR 1		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.0	Total Ramp Density (TRD), ramps/mi	0.13
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	74.4
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	727	Heavy Vehicle Adjustment Factor (f_{HV})	0.847
Peak Hour Factor (PHF)	0.88	Flow Rate (v_p), pc/h/ln	488
Total Trucks, %	9.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.20
Passenger Car Equivalent (E_T)	3.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	74.4
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	6.6
Total Ramp Density Adjustment	0.6	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	74.4		

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HCS7 Basic Freeway Report

Project Information

Analyst	DLD	Date	11/2/2017
Agency	ATE	Analysis Year	2017
Jurisdiction	SB COUNTY	Time Period Analyzed	PM PEAK
Project Description	US 101 NORTHBOUND - EXISTING - SR 1 TO SR 246		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.0	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.2
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	958	Heavy Vehicle Adjustment Factor (f_{HV})	0.806
Peak Hour Factor (PHF)	0.88	Flow Rate (v_p), pc/h/ln	676
Total Trucks, %	12.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.28
Passenger Car Equivalent (E_T)	3.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.2
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	9.2
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.2		

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HCS7 Basic Freeway Report

Project Information

Analyst	DLD	Date	11/2/2017
Agency	ATE	Analysis Year	2017
Jurisdiction	SB COUNTY	Time Period Analyzed	PM PEAK
Project Description	US 101 SOUTHBOUND - EXISTING - SR 1 TO SR 246		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.0	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.2
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	636	Heavy Vehicle Adjustment Factor (f_{HV})	0.806
Peak Hour Factor (PHF)	0.88	Flow Rate (v_p), pc/h/ln	448
Total Trucks, %	12.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.19
Passenger Car Equivalent (E_T)	3.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.2
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	6.1
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.2		

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HCS7 Basic Freeway Report

Project Information

Analyst	DLD	Date	11/2/2017
Agency	ATE	Analysis Year	2017
Jurisdiction	SB COUNTY	Time Period Analyzed	PM PEAK
Project Description	US 101 NORTHBOUND - EXISTING - SR 246 TO CLARK		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.0	Total Ramp Density (TRD), ramps/mi	0.24
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	74.0
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	1173	Heavy Vehicle Adjustment Factor (f_{HV})	0.833
Peak Hour Factor (PHF)	0.88	Flow Rate (v_p), pc/h/ln	800
Total Trucks, %	10.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.33
Passenger Car Equivalent (E_T)	3.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	74.0
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	10.8
Total Ramp Density Adjustment	1.0	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	74.0		

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HCS7 Basic Freeway Report

Project Information

Analyst	DLD	Date	11/2/2017
Agency	ATE	Analysis Year	2017
Jurisdiction	SB COUNTY	Time Period Analyzed	PM PEAK
Project Description	US 101 SOUTHBOUND - EXISTING - SR 246 TO CLARK		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Rolling
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.0	Total Ramp Density (TRD), ramps/mi	0.24
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	74.0
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	958	Heavy Vehicle Adjustment Factor (f_{HV})	0.833
Peak Hour Factor (PHF)	0.88	Flow Rate (v_p), pc/h/ln	654
Total Trucks, %	10.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.27
Passenger Car Equivalent (E_T)	3.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	74.0
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	8.8
Total Ramp Density Adjustment	1.0	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	74.0		

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HCS7 Basic Freeway Report

Project Information

Analyst	DLD	Date	11/2/2017
Agency	ATE	Analysis Year	2017
Jurisdiction	SB COUNTY	Time Period Analyzed	PM PEAK
Project Description	US 101 NORTHBOUND - EXISTING - CLARK TO SM WAY		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.0	Total Ramp Density (TRD), ramps/mi	1.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.8
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	1545	Heavy Vehicle Adjustment Factor (f_{HV})	0.935
Peak Hour Factor (PHF)	0.90	Flow Rate (v_p), pc/h/ln	918
Total Trucks, %	7.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.38
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	71.8
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	12.8
Total Ramp Density Adjustment	3.2	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	71.8		

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HCS7 Basic Freeway Report

Project Information

Analyst	DLD	Date	11/2/2017
Agency	ATE	Analysis Year	2017
Jurisdiction	SB COUNTY	Time Period Analyzed	PM PEAK
Project Description	US 101 SOUTHBOUND - EXISTING - CLARK TO SM WAY		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.0	Total Ramp Density (TRD), ramps/mi	1.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.8
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	1323	Heavy Vehicle Adjustment Factor (f_{HV})	0.935
Peak Hour Factor (PHF)	0.90	Flow Rate (v_p), pc/h/ln	786
Total Trucks, %	7.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.33
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	71.8
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	10.9
Total Ramp Density Adjustment	3.2	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	71.8		

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HCS7 Basic Freeway Report

Project Information

Analyst	DLD	Date	11/2/2017
Agency	ATE	Analysis Year	2017
Jurisdiction	SB COUNTY	Time Period Analyzed	PM PEAK
Project Description	US 101 NORTHBOUND - EXISTING - SM WAY TO BETTERAVIA		

Geometric Data

Number of Lanes (N), ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	70.0	Total Ramp Density (TRD), ramps/mi	1.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	66.8
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	2228	Heavy Vehicle Adjustment Factor (f_{HV})	0.935
Peak Hour Factor (PHF)	0.90	Flow Rate (v_p), pc/h/ln	883
Total Trucks, %	7.00	Capacity (c), pc/h/ln	2368
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2368
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.37
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.8
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	13.2
Total Ramp Density Adjustment	3.2	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.8		

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HCS7 Basic Freeway Report

Project Information

Analyst	DLD	Date	11/2/2017
Agency	ATE	Analysis Year	2017
Jurisdiction	SB COUNTY	Time Period Analyzed	PM PEAK
Project Description	US 101 SOUTHBOUND - EXISTING - SM WAY TO BETTERAVIA		

Geometric Data

Number of Lanes (N), ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	70.0	Total Ramp Density (TRD), ramps/mi	1.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	66.8
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	1900	Heavy Vehicle Adjustment Factor (f_{HV})	0.935
Peak Hour Factor (PHF)	0.90	Flow Rate (v_p), pc/h/ln	753
Total Trucks, %	7.00	Capacity (c), pc/h/ln	2368
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2368
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.32
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.8
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	11.3
Total Ramp Density Adjustment	3.2	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.8		

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HCS7 Basic Freeway Report

Project Information

Analyst	DLD	Date	11/2/2017
Agency	ATE	Analysis Year	2017
Jurisdiction	SB COUNTY	Time Period Analyzed	PM PEAK
Project Description	US 101 NORTHBOUND - EXISTING - BETTERAVIA TO SR 166		

Geometric Data

Number of Lanes (N), ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	70.0	Total Ramp Density (TRD), ramps/mi	1.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	66.8
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	2808	Heavy Vehicle Adjustment Factor (f_{HV})	0.952
Peak Hour Factor (PHF)	0.90	Flow Rate (v_p), pc/h/ln	1092
Total Trucks, %	5.00	Capacity (c), pc/h/ln	2368
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2368
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.46
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.8
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	16.3
Total Ramp Density Adjustment	3.2	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.8		

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HCS7 Basic Freeway Report

Project Information

Analyst	DLD	Date	11/2/2017
Agency	ATE	Analysis Year	2017
Jurisdiction	SB COUNTY	Time Period Analyzed	PM PEAK
Project Description	US 101 SOUTHBOUND - EXISTING - BETTERAVIA TO SR 166		

Geometric Data

Number of Lanes (N), ln	3	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	70.0	Total Ramp Density (TRD), ramps/mi	1.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	66.8
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	2687	Heavy Vehicle Adjustment Factor (f_{HV})	0.952
Peak Hour Factor (PHF)	0.90	Flow Rate (v_p), pc/h/ln	1045
Total Trucks, %	5.00	Capacity (c), pc/h/ln	2368
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2368
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.44
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.8
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	15.6
Total Ramp Density Adjustment	3.2	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.8		

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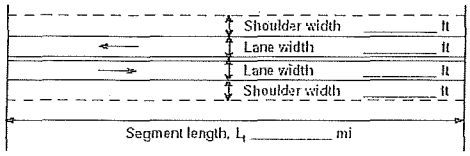
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 166
Agency or Company	ATE	From/To	US 101 to SR 33 South Junction
Date Performed	11/3/2017	Jurisdiction	CALTRANS
Analysis Time Period	PM PEAK HOUR	Analysis Year	2018

Project Description: EXISTING CONDITIONS

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF 0.88
No-passing zone 20%
% Trucks and Buses , P_T 10 %
% Recreational vehicles, P_R 4%
Access points mi 1/mi

Analysis direction vol., V_d 288veh/h
Opposing direction vol., V_o 192veh/h
Shoulder width ft 6.0
Lane Width ft 12.0
Segment Length mi 70.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	2.1	2.3
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.1	1.1
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.898	0.882
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	0.85	0.76
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	429	325

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	55.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.4 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	54.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	47.5 mi/h
		Percent free flow speed, PFFS	86.8 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.6	1.7
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.943	0.935
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	0.86	0.81
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	403	288
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	41.8	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	32.9	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	61.0	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	C
Volume to capacity ratio, v/c	0.20
Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	1644
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	1700
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	86.8

Bicycle Level of Service

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	327.3
Effective width, Wv (Eq. 15-29) ft	24.00
Effective speed factor, S_t (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	5.58
Bicycle level of service (Exhibit 15-4)	F

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis–the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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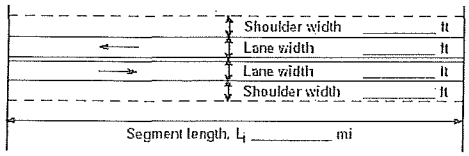
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 166
Agency or Company	ATE	From/To	SR 33 South - SR 33 North
Date Performed	11/3/2017	Jurisdiction	CALTRANS
Analysis Time Period	PM PEAK HOUR	Analysis Year	2018

Project Description: EXISTING CONDITIONS

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF 0.88

No-passing zone 20%

% Trucks and Buses , P_T 10 %

% Recreational vehicles, P_R 4%

Access points mi 1/mi

Analysis direction vol., V_d	168veh/h
Opposing direction vol., V_o	112veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	15.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	2.3	2.6
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.1	1.1
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.882	0.859
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	0.74	0.69
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	293	215

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	55.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.5 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	54.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	49.3 mi/h
		Percent free flow speed, PFFS	90.1 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.8	1.8
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.926	0.926
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	0.79	0.75
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	261	183
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	27.0	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	36.3	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	48.3	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	C
Volume to capacity ratio, v/c	0.12
Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	1644
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	1700
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	90.1

Bicycle Level of Service

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	190.9
Effective width, Wv (Eq. 15-29) ft	24.00
Effective speed factor, S_t (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	5.31
Bicycle level of service (Exhibit 15-4)	E

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis–the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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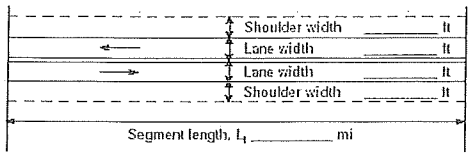
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 166
Agency or Company	ATE	From/To	East of SR 33 North Junction
Date Performed	11/3/2017	Jurisdiction	CALTRANS
Analysis Time Period	PM PEAK HOUR	Analysis Year	2018

Project Description: EXISTING CONDITIONS

Input Data



☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF 0.88

No-passing zone 20%

% Trucks and Buses, P_T 10 %

% Recreational vehicles, P_R 4%

Access points mi 1/mi

Analysis direction vol., V_d 168veh/h

Opposing direction vol., V_o 112veh/h

Shoulder width ft 6.0

Lane Width ft 12.0

Segment Length mi 5.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.5	1.8
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.952	0.926
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	201	137

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	55.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	0.9 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	54.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	51.3 mi/h
		Percent free flow speed, PFFS	93.6 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.1	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.990	0.990
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	193	129
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	20.9	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	34.0	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	41.3	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	B
Volume to capacity ratio, v/c	0.11
Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	1700
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	1700
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	93.6

Bicycle Level of Service

Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	190.9
Effective width, Wv (Eq. 15-29) ft	24.00
Effective speed factor, S_t (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	5.31
Bicycle level of service (Exhibit 15-4)	E

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis–the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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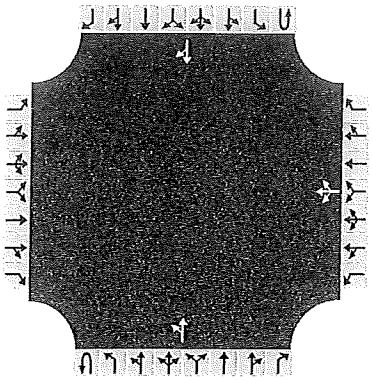
HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DLD	Intersection	US 101 NB/REFUGIO ROAD
Agency/Co.	ATE	Jurisdiction	SB COUNTY
Date Performed	11/28/2017	East/West Street	US 101 NB RAMP
Analysis Year	2017	North/South Street	REFUGIO ROAD
Time Analyzed	AM PEAK HOUR	Peak Hour Factor	0.81
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	EXISTING CONDITIONS		

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LTR			LT						TR
Volume, V (veh/h)						6	2	9		3	13				18	1
Percent Heavy Vehicles (%)						3	3	3		3						
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							20			4						
Capacity, c (veh/h)							998			1584						
v/c Ratio							0.02			0.00						
95% Queue Length, Q_{95} (veh)							0.1			0.0						
Control Delay (s/veh)							8.7			7.3						
Level of Service, LOS							A			A						
Approach Delay (s/veh)						8.7				1.5						
Approach LOS						A										

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US 101 NB & REFUGIO RD AM PEAK.xtw

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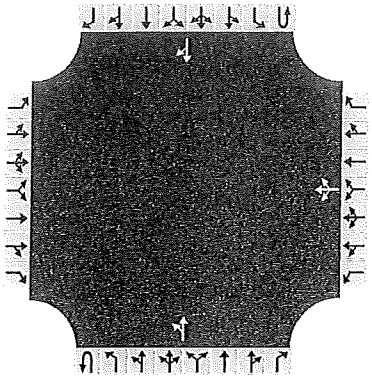
AWD = 8.5 sec = LOS A

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DLD	Intersection	US 101 NB/REFUGIO ROAD
Agency/Co.	ATE	Jurisdiction	SB COUNTY
Date Performed	11/28/2017	East/West Street	US 101 NB RAMP
Analysis Year	2017	North/South Street	REFUGIO ROAD
Time Analyzed	AM PEAK HOUR	Peak Hour Factor	0.81
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	EXISTING + PROJECT CONDITIONS		

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LTR			LT						TR
Volume, V (veh/h)						6	2	9		3	19				18	7
Percent Heavy Vehicles (%)						3	3	3		3						
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							20			4						
Capacity, c (veh/h)							985			1573						
v/c Ratio							0.02			0.00						
95% Queue Length, Q_{95} (veh)							0.1			0.0						
Control Delay (s/veh)							8.7			7.3						
Level of Service, LOS							A			A						
Approach Delay (s/veh)					8.7				1.1							
Approach LOS					A											

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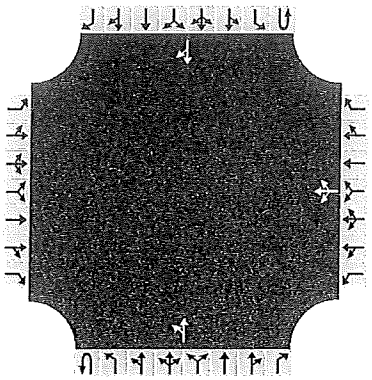
AWD = 8.5 SEC = LOS A

US 101 NB & REFUGIO RD AM PEAK EXISTING + PROJECT.xtw

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DLD	Intersection	US 101 NB/REFUGIO ROAD
Agency/Co.	ATE	Jurisdiction	SB COUNTY
Date Performed	11/28/2017	East/West Street	US 101 NB RAMP
Analysis Year	2017	North/South Street	REFUGIO ROAD
Time Analyzed	PM PEAK HOUR	Peak Hour Factor	0.65
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	EXISTING CONDITIONS		

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LTR			LT						TR
Volume, V (veh/h)						7	5	15		2	2				18	19
Percent Heavy Vehicles (%)						3	3	3		3						
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							42			3						
Capacity, c (veh/h)							985			1539						
v/c Ratio							0.04			0.00						
95% Queue Length, Q_{95} (veh)							0.1			0.0						
Control Delay (s/veh)							8.8			7.3						
Level of Service, LOS							A			A						
Approach Delay (s/veh)					8.8				3.7							
Approach LOS					A											

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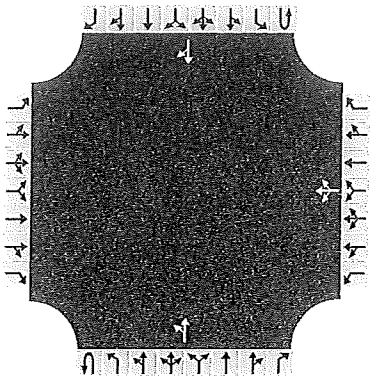
AWD = 8.7 SEC = LOS A

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DLD	Intersection	US 101 NB/REFUGIO ROAD
Agency/Co.	ATE	Jurisdiction	SB COUNTY
Date Performed	11/28/2017	East/West Street	US 101 NB RAMP
Analysis Year	2017	North/South Street	REFUGIO ROAD
Time Analyzed	PM PEAK HOUR	Peak Hour Factor	0.65
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	EXISTING + PROJECT CONDITIONS		

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LTR			LT						TR
Volume, V (veh/h)						7	5	15		2	8				18	25
Percent Heavy Vehicles (%)						3	3	3		3						
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							42			3						
Capacity, c (veh/h)							970			1528						
v/c Ratio							0.04			0.00						
95% Queue Length, Q_{95} (veh)							0.1			0.0						
Control Delay (s/veh)							8.9			7.4						
Level of Service, LOS							A			A						
Approach Delay (s/veh)						8.9				1.5						
Approach LOS						A										

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AWD = 8.8 DEL = LOS A

US 101 NB & REFUGIO RD PM PEAK EXISTING + PROJECT.xtw

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	485	300	0	0	130	115	170	0	60	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	0.97	0.95			0.95	1.00	0.95	0.95	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	3335	3438			3438	1538	1633	1633	1538			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	3335	3438			3438	1538	1633	1633	1538			
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	522	323	0	0	140	124	183	0	65	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	69	0	0	54	0	0	0
Lane Group Flow (vph)	522	323	0	0	140	55	91	92	11	0	0	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot					Perm	Prot		Perm			
Protected Phases	7	4			8		5	2				
Permitted Phases						8			2			
Actuated Green, G (s)	23.1	66.8			39.7	39.7	15.2	15.2	15.2			
Effective Green, g (s)	23.1	66.8			39.7	39.7	15.2	15.2	15.2			
Actuated g/C Ratio	0.26	0.74			0.44	0.44	0.17	0.17	0.17			
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	856	2552			1517	678	276	276	260			
v/s Ratio Prot	c0.16	c0.09			0.04		0.06	c0.06				
v/s Ratio Perm						0.04			0.01			
v/c Ratio	0.61	0.13			0.09	0.08	0.33	0.33	0.04			
Uniform Delay, d1	29.5	3.3			14.7	14.6	32.9	32.9	31.3			
Progression Factor	0.45	1.41			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	2.5	0.1			0.0	0.1	0.7	0.7	0.1			
Delay (s)	15.7	4.7			14.7	14.6	33.6	33.7	31.4			
Level of Service	B	A			B	B	C	C	C			
Approach Delay (s)		11.5			14.7			33.0			0.0	
Approach LOS		B			B			C			A	

Intersection Summary			
HCM Average Control Delay	16.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	485	300	0	0	136	115	170	0	66	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	0.97	0.95			0.95	1.00	0.95	0.95	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	3335	3438			3438	1538	1633	1633	1538			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	3335	3438			3438	1538	1633	1633	1538			
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	522	323	0	0	146	124	183	0	71	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	69	0	0	59	0	0	0
Lane Group Flow (vph)	522	323	0	0	146	55	91	92	12	0	0	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot					Perm	Prot		Perm			
Protected Phases	7	4			8		5	2				
Permitted Phases						8			2			
Actuated Green, G (s)	23.1	66.8			39.7	39.7	15.2	15.2	15.2			
Effective Green, g (s)	23.1	66.8			39.7	39.7	15.2	15.2	15.2			
Actuated g/C Ratio	0.26	0.74			0.44	0.44	0.17	0.17	0.17			
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	856	2552			1517	678	276	276	260			
v/s Ratio Prot	c0.16	c0.09			0.04		0.06	c0.06				
v/s Ratio Perm						0.04			0.01			
v/c Ratio	0.61	0.13			0.10	0.08	0.33	0.33	0.05			
Uniform Delay, d1	29.5	3.3			14.7	14.6	32.9	32.9	31.3			
Progression Factor	0.45	1.41			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	2.5	0.1			0.0	0.1	0.7	0.7	0.1			
Delay (s)	15.7	4.7			14.7	14.6	33.6	33.7	31.4			
Level of Service	B	A			B	B	C	C	C			
Approach Delay (s)		11.5			14.7			33.0			0.0	
Approach LOS		B			B			C			A	

Intersection Summary			
HCM Average Control Delay	16.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1115	265	0	0	425	330	240	0	80	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	0.97	0.95			0.95	1.00	0.95	0.95	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	3335	3438			3438	1538	1633	1633	1538			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	3335	3438			3438	1538	1633	1633	1538			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1186	282	0	0	452	351	255	0	85	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	213	0	0	72	0	0	0
Lane Group Flow (vph)	1186	282	0	0	452	138	127	128	13	0	0	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot					Perm	Prot		Perm			
Protected Phases	7	4			8		5	2				
Permitted Phases						8			2			
Actuated Green, G (s)	38.9	68.0			25.1	25.1	14.0	14.0	14.0			
Effective Green, g (s)	38.9	68.0			25.1	25.1	14.0	14.0	14.0			
Actuated g/C Ratio	0.43	0.76			0.28	0.28	0.16	0.16	0.16			
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	1441	2598			959	429	254	254	239			
v/s Ratio Prot	c0.36	0.08			c0.13		0.08	c0.08				
v/s Ratio Perm						0.09			0.01			
v/c Ratio	0.82	0.11			0.47	0.32	0.50	0.50	0.06			
Uniform Delay, d1	22.5	2.9			26.9	25.7	34.8	34.8	32.4			
Progression Factor	0.38	0.16			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	0.5	0.0			0.4	0.4	1.5	1.6	0.1			
Delay (s)	9.2	0.5			27.3	26.1	36.3	36.4	32.5			
Level of Service	A	A			C	C	D	D	C			
Approach Delay (s)		7.5			26.8			35.4			0.0	
Approach LOS		A			C			D			A	

Intersection Summary			
HCM Average Control Delay	17.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1115	265	0	0	431	330	240	0	86	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	0.97	0.95			0.95	1.00	0.95	0.95	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	3335	3438			3438	1538	1633	1633	1538			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	3335	3438			3438	1538	1633	1633	1538			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1186	282	0	0	459	351	255	0	91	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	213	0	0	77	0	0	0
Lane Group Flow (vph)	1186	282	0	0	459	138	127	128	14	0	0	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot					Perm	Prot		Perm			
Protected Phases	7	4			8		5	2				
Permitted Phases						8			2			
Actuated Green, G (s)	38.9	68.0			25.1	25.1	14.0	14.0	14.0			
Effective Green, g (s)	38.9	68.0			25.1	25.1	14.0	14.0	14.0			
Actuated g/C Ratio	0.43	0.76			0.28	0.28	0.16	0.16	0.16			
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	1441	2598			959	429	254	254	239			
v/s Ratio Prot	c0.36	0.08			c0.13		0.08	c0.08				
v/s Ratio Perm						0.09			0.01			
v/c Ratio	0.82	0.11			0.48	0.32	0.50	0.50	0.06			
Uniform Delay, d1	22.5	2.9			27.0	25.7	34.8	34.8	32.4			
Progression Factor	0.38	0.16			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	0.5	0.0			0.4	0.4	1.5	1.6	0.1			
Delay (s)	9.2	0.5			27.4	26.1	36.3	36.4	32.5			
Level of Service	A	A			C	C	D	D	C			
Approach Delay (s)		7.5			26.8			35.3			0.0	
Approach LOS		A			C			D			A	

Intersection Summary			
HCM Average Control Delay	17.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	650	165	45	255	0	0	0	0	135	0	980
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		*0.67	1.00	1.00	0.95					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		2425	1538	1719	3438					1633	1633	1538
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		2425	1538	1719	3438					1633	1633	1538
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	691	176	48	271	0	0	0	0	144	0	1043
RTOR Reduction (vph)	0	0	113	0	0	0	0	0	0	0	0	181
Lane Group Flow (vph)	0	691	63	48	271	0	0	0	0	72	72	862
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type			Perm	Prot						Prot		custom
Protected Phases		4 12		3	8					1	6	6 12
Permitted Phases			4 12									6
Actuated Green, G (s)		32.0	32.0	6.0	32.0					40.0	40.0	50.0
Effective Green, g (s)		32.0	32.0	6.0	32.0					40.0	40.0	50.0
Actuated g/C Ratio		0.36	0.36	0.07	0.36					0.44	0.44	0.56
Clearance Time (s)				4.0	4.0					4.0	4.0	
Vehicle Extension (s)				3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		862	547	115	1222					726	726	854
v/s Ratio Prot		c0.28		c0.03	0.08					0.04	0.04	c0.56
v/s Ratio Perm			0.04									
v/c Ratio		0.80	0.11	0.42	0.22					0.10	0.10	1.01
Uniform Delay, d1		26.1	19.5	40.3	20.3					14.5	14.5	20.0
Progression Factor		1.00	1.00	1.26	0.47					1.00	1.00	1.00
Incremental Delay, d2		5.4	0.1	2.4	0.1					0.1	0.1	33.0
Delay (s)		31.5	19.6	53.3	9.7					14.6	14.6	53.0
Level of Service		C	B	D	A					B	B	D
Approach Delay (s)		29.1			16.3			0.0			48.4	
Approach LOS		C			B			A			D	

Intersection Summary			
HCM Average Control Delay	37.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	650	165	51	255	0	0	0	0	135	0	980
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		*0.67	1.00	1.00	0.95					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		2425	1538	1719	3438					1633	1633	1538
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		2425	1538	1719	3438					1633	1633	1538
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	691	176	54	271	0	0	0	0	144	0	1043
RTOR Reduction (vph)	0	0	113	0	0	0	0	0	0	0	0	181
Lane Group Flow (vph)	0	691	63	54	271	0	0	0	0	72	72	862
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type			Perm	Prot						Prot		custom
Protected Phases		4 12		3	8					1	6	6 12
Permitted Phases			4 12									6
Actuated Green, G (s)		32.0	32.0	6.0	32.0					40.0	40.0	50.0
Effective Green, g (s)		32.0	32.0	6.0	32.0					40.0	40.0	50.0
Actuated g/C Ratio		0.36	0.36	0.07	0.36					0.44	0.44	0.56
Clearance Time (s)				4.0	4.0					4.0	4.0	
Vehicle Extension (s)				3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		862	547	115	1222					726	726	854
v/s Ratio Prot		c0.28		c0.03	0.08					0.04	0.04	c0.56
v/s Ratio Perm			0.04									
v/c Ratio		0.80	0.11	0.47	0.22					0.10	0.10	1.01
Uniform Delay, d1		26.1	19.5	40.5	20.3					14.5	14.5	20.0
Progression Factor		1.00	1.00	1.25	0.48					1.00	1.00	1.00
Incremental Delay, d2		5.4	0.1	3.0	0.1					0.1	0.1	33.0
Delay (s)		31.5	19.6	53.5	9.8					14.6	14.6	53.0
Level of Service		C	B	D	A					B	B	D
Approach Delay (s)		29.1			17.1			0.0			48.4	
Approach LOS		C			B			A			D	

Intersection Summary			
HCM Average Control Delay	37.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1295	290	80	585	0	0	0	0	85	0	885
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		*0.58	1.00	1.00	0.95					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		2099	1538	1719	3438					1633	1633	1538
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		2099	1538	1719	3438					1633	1633	1538
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	0	1308	293	81	591	0	0	0	0	86	0	894
RTOR Reduction (vph)	0	0	109	0	0	0	0	0	0	0	0	168
Lane Group Flow (vph)	0	1308	184	81	591	0	0	0	0	43	43	726
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type			Perm	Prot						Prot		custom
Protected Phases		4 12		3	8					1	6	6 12
Permitted Phases			4 12									6
Actuated Green, G (s)		47.0	47.0	8.0	49.0					23.0	23.0	33.0
Effective Green, g (s)		47.0	47.0	8.0	49.0					23.0	23.0	33.0
Actuated g/C Ratio		0.52	0.52	0.09	0.54					0.26	0.26	0.37
Clearance Time (s)				4.0	4.0					4.0	4.0	
Vehicle Extension (s)				3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1096	803	153	1872					417	417	564
v/s Ratio Prot		c0.62		c0.05	0.17					0.03	0.03	c0.47
v/s Ratio Perm			0.12									
v/c Ratio		1.19	0.23	0.53	0.32					0.10	0.10	1.29
Uniform Delay, d1		21.5	11.7	39.2	11.3					25.6	25.6	28.5
Progression Factor		1.00	1.00	0.91	0.82					1.00	1.00	1.00
Incremental Delay, d2		96.2	0.1	2.9	0.1					0.1	0.1	141.9
Delay (s)		117.7	11.8	38.5	9.4					25.7	25.7	170.4
Level of Service		F	B	D	A					C	C	F
Approach Delay (s)		98.3			12.9			0.0			157.7	
Approach LOS		F			B			A			F	

Intersection Summary			
HCM Average Control Delay	98.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1295	290	86	585	0	0	0	0	85	0	885
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		*0.58	1.00	1.00	0.95					0.95	0.95	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		2099	1538	1719	3438					1633	1633	1538
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		2099	1538	1719	3438					1633	1633	1538
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	0	1308	293	87	591	0	0	0	0	86	0	894
RTOR Reduction (vph)	0	0	109	0	0	0	0	0	0	0	0	168
Lane Group Flow (vph)	0	1308	184	87	591	0	0	0	0	43	43	726
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type			Perm	Prot						Prot		custom
Protected Phases		4 12		3	8					1	6	6 12
Permitted Phases			4 12									6
Actuated Green, G (s)		47.0	47.0	8.0	49.0					23.0	23.0	33.0
Effective Green, g (s)		47.0	47.0	8.0	49.0					23.0	23.0	33.0
Actuated g/C Ratio		0.52	0.52	0.09	0.54					0.26	0.26	0.37
Clearance Time (s)				4.0	4.0					4.0	4.0	
Vehicle Extension (s)				3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1096	803	153	1872					417	417	564
v/s Ratio Prot		c0.62		c0.05	0.17					0.03	0.03	c0.47
v/s Ratio Perm			0.12									
v/c Ratio		1.19	0.23	0.57	0.32					0.10	0.10	1.29
Uniform Delay, d1		21.5	11.7	39.3	11.3					25.6	25.6	28.5
Progression Factor		1.00	1.00	0.90	0.83					1.00	1.00	1.00
Incremental Delay, d2		96.2	0.1	4.3	0.1					0.1	0.1	141.9
Delay (s)		117.7	11.8	39.8	9.4					25.7	25.7	170.4
Level of Service		F	B	D	A					C	C	F
Approach Delay (s)		98.3			13.3			0.0			157.7	
Approach LOS		F			B			A			F	

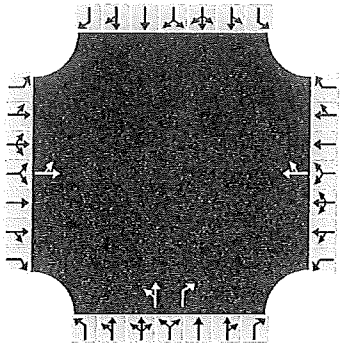
Intersection Summary			
HCM Average Control Delay	98.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCS7 All-Way Stop Control Report

General Information		Site Information	
Analyst	DLD	Intersection	US 101 NB/SR 166
Agency/Co.	ATE	Jurisdiction	SLO COUNTY
Date Performed	11/28/2017	East/West Street	SR 166
Analysis Year	2017	North/South Street	US 101 NB RAMP
Analysis Time Period (hrs)	0.25	Peak Hour Factor	0.93
Time Analyzed	AM PEAK HOUR		
Project Description	EXISTING CONDITIONS		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	48	29			233	31	231	1	172			
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LT			TR			LT	R				
Flow Rate, v (veh/h)	83			284			249	185				
Percent Heavy Vehicles	6			6			6	6				

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20			3.20			3.20	3.20				
Initial Degree of Utilization, x	0.074			0.252			0.222	0.164				
Final Departure Headway, hd (s)	5.64			5.14			6.09	4.88				
Final Degree of Utilization, x	0.130			0.405			0.422	0.251				
Move-Up Time, m (s)	2.0			2.0			2.3	2.3				
Service Time, ts (s)	3.64			3.14			3.79	2.58				

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	83			284			249	185				
Capacity	638			700			591	737				
95% Queue Length, Q_{95} (veh)	0.4			2.0			2.1	1.0				
Control Delay (s/veh)	9.5			11.6			13.2	9.2				
Level of Service, LOS	A			B			B	A				
Approach Delay (s/veh)	9.5			11.6			11.5					
Approach LOS	A			B			B					
Intersection Delay, s/veh | LOS	11.3						B					

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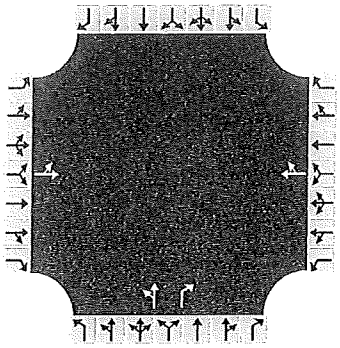
HCS7 All-Way Stop Control Report

General Information		Site Information	
Analyst	DLD	Intersection	US 101 NB/SR 166
Agency/Co.	ATE	Jurisdiction	SLO COUNTY
Date Performed	11/28/2017	East/West Street	SR 166
Analysis Year	2017	North/South Street	US 101 NB RAMP
Analysis Time Period (hrs)	0.25	Peak Hour Factor	0.93
Time Analyzed	AM PEAK HOUR		
Project Description	EXISTING + PROJECT CONDITIONS		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	48	29			239	31	231	1	178			
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LT			TR			LT	R				
Flow Rate, v (veh/h)	83			290			249	191				
Percent Heavy Vehicles	6			6			6	6				

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20			3.20			3.20	3.20				
Initial Degree of Utilization, x	0.074			0.258			0.222	0.170				
Final Departure Headway, hd (s)	5.67			5.16			6.11	4.90				
Final Degree of Utilization, x	0.130			0.416			0.423	0.261				
Move-Up Time, m (s)	2.0			2.0			2.3	2.3				
Service Time, ts (s)	3.67			3.16			3.81	2.60				

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	83			290			249	191				
Capacity	635			698			589	734				
95% Queue Length, Q_{95} (veh)	0.4			2.1			2.1	1.0				
Control Delay (s/veh)	9.5			11.8			13.2	9.3				
Level of Service, LOS	A			B			B	A				
Approach Delay (s/veh)	9.5			11.8			11.5					
Approach LOS	A			B			B					
Intersection Delay, s/veh | LOS	11.4						B					

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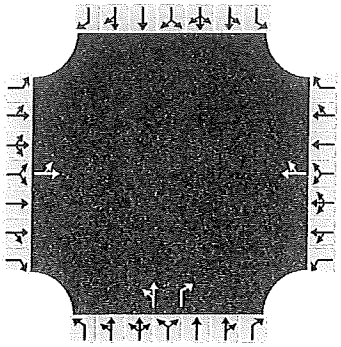
HCS7 All-Way Stop Control Report

General Information		Site Information	
Analyst	DLD	Intersection	US 101 NB/SR 166
Agency/Co.	ATE	Jurisdiction	SLO COUNTY
Date Performed	11/28/2017	East/West Street	SR 166
Analysis Year	2017	North/South Street	US 101 NB RAMP
Analysis Time Period (hrs)	0.25	Peak Hour Factor	0.96
Time Analyzed	PM PEAK HOUR		
Project Description	EXISTING CONDITIONS		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	22	60			237	41	480	4	260			
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LT			TR			LT	R				
Flow Rate, v (veh/h)	85			290			504	271				
Percent Heavy Vehicles	6			6			6	6				

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20			3.20			3.20	3.20				
Initial Degree of Utilization, x	0.076			0.257			0.448	0.241				
Final Departure Headway, hd (s)	6.42			5.86			6.25	5.05				
Final Degree of Utilization, x	0.152			0.472			0.876	0.380				
Move-Up Time, m (s)	2.0			2.0			2.3	2.3				
Service Time, ts (s)	4.42			3.86			3.95	2.75				

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	85			290			504	271				
Capacity	561			614			576	713				
95% Queue Length, Q_{95} (veh)	0.5			2.5			10.0	1.8				
Control Delay (s/veh)	10.6			14.0			38.0	10.8				
Level of Service, LOS	B			B			E	B				
Approach Delay (s/veh)	10.6			14.0			28.5					
Approach LOS	B			B			D					
Intersection Delay, s/veh | LOS	23.5						C					

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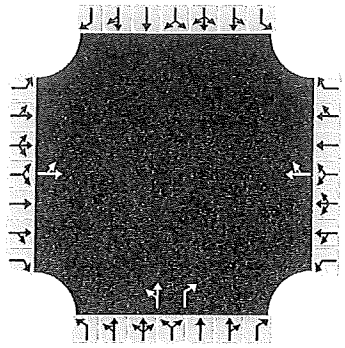
HCS7 All-Way Stop Control Report

General Information		Site Information	
Analyst	DLD	Intersection	US 101 NB/SR 166
Agency/Co.	ATE	Jurisdiction	SLO COUNTY
Date Performed	11/28/2017	East/West Street	SR 166
Analysis Year	2017	North/South Street	US 101 NB RAMP
Analysis Time Period (hrs)	0.25	Peak Hour Factor	0.96
Time Analyzed	PM PEAK HOUR		
Project Description	EXISTING + PROJECT CONDITIONS		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	22	60			243	41	480	4	266			
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LT			TR			LT	R				
Flow Rate, v (veh/h)	85			296			504	277				
Percent Heavy Vehicles	6			6			6	6				

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20			3.20			3.20	3.20				
Initial Degree of Utilization, x	0.076			0.263			0.448	0.246				
Final Departure Headway, hd (s)	6.44			5.87			6.27	5.07				
Final Degree of Utilization, x	0.153			0.483			0.879	0.390				
Move-Up Time, m (s)	2.0			2.0			2.3	2.3				
Service Time, ts (s)	4.44			3.87			3.97	2.77				

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	85			296			504	277				
Capacity	559			613			574	710				
95% Queue Length, Q_{95} (veh)	0.5			2.6			10.1	1.9				
Control Delay (s/veh)	10.6			14.2			38.5	11.0				
Level of Service, LOS	B			B			E	B				
Approach Delay (s/veh)	10.6			14.2			28.7					
Approach LOS	B			B			D					
Intersection Delay, s/veh | LOS	23.7						C					

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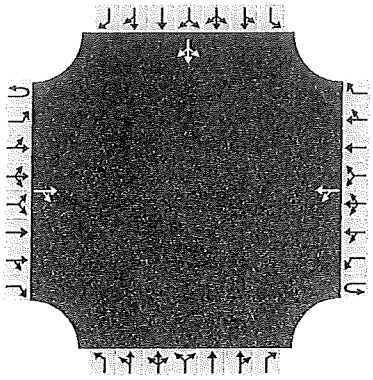
HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DLD	Intersection	US 101 SB/SR 166
Agency/Co.	ATE	Jurisdiction	SLO COUNTY
Date Performed	11/28/2017	East/West Street	SR 166
Analysis Year	2017	North/South Street	US 101 SB RAMP
Time Analyzed	AM PEAK HOUR	Peak Hour Factor	0.88
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	EXISTING CONDITIONS		

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration				TR		LT									LTR	
Volume, V (veh/h)			55	372		236	228							22	1	19
Percent Heavy Vehicles (%)						6								6	6	6
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized			No				No				No				No	
Median Type/Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						268									48	
Capacity, c (veh/h)						1059									341	
v/c Ratio						0.25									0.14	
95% Queue Length, Q_{95} (veh)						1.0									0.5	
Control Delay (s/veh)						9.5									17.3	
Level of Service, LOS						A									C	
Approach Delay (s/veh)						6.2								17.3		
Approach LOS														C		

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US 101 SB & SR 166 AM PEAK.xtw

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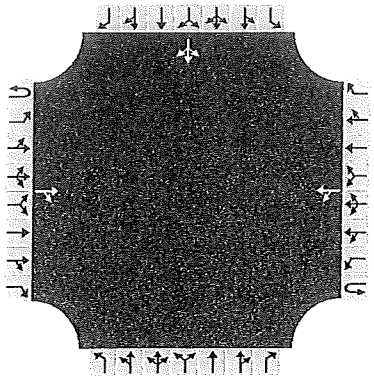
AWD = 10.7 sec = LOS B

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DLD	Intersection	US 101 SB/SR 166
Agency/Co.	ATE	Jurisdiction	SLO COUNTY
Date Performed	11/28/2017	East/West Street	SR 166
Analysis Year	2017	North/South Street	US 101 SB RAMP
Time Analyzed	AM PEAK HOUR	Peak Hour Factor	0.88
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	EXISTING + PROJECT CONDITIONS		

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration				TR		LT									LTR	
Volume, V (veh/h)			55	372		242	228							22	1	19
Percent Heavy Vehicles (%)						6								6	6	6
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized			No				No				No				No	
Median Type/Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						275									48	
Capacity, c (veh/h)						1059									335	
v/c Ratio						0.26									0.14	
95% Queue Length, Q_{95} (veh)						1.0									0.5	
Control Delay (s/veh)						9.6									17.5	
Level of Service, LOS						A									C	
Approach Delay (s/veh)						6.3								17.5		
Approach LOS														C		

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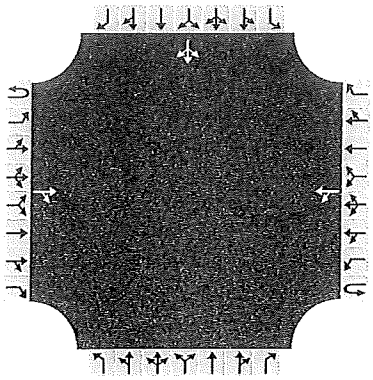
AWD = 10.8 SEC. = LOS B

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DLD	Intersection	US 101 SB/SR 166
Agency/Co.	ATE	Jurisdiction	SLO COUNTY
Date Performed	11/28/2017	East/West Street	SR 166
Analysis Year	2017	North/South Street	US 101 SB RAMP
Time Analyzed	PM PEAK HOUR	Peak Hour Factor	0.93
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	EXISTING CONDITIONS		

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration				TR		LT									LTR	
Volume, V (veh/h)			38	423		220	492							43	1	38
Percent Heavy Vehicles (%)						6								6	6	6
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized			No				No				No				No	
Median Type/Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						237									88	
Capacity, c (veh/h)						1049									258	
v/c Ratio						0.23									0.34	
95% Queue Length, Q_{95} (veh)						0.9									1.5	
Control Delay (s/veh)						9.4									26.0	
Level of Service, LOS						A									D	
Approach Delay (s/veh)						5.0								26.0		
Approach LOS														D		

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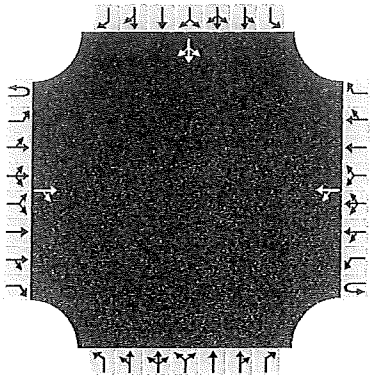
AWD = 13.9 SEC = LOS B

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DLD	Intersection	US 101 SB/SR 166
Agency/Co.	ATE	Jurisdiction	SLO COUNTY
Date Performed	11/28/2017	East/West Street	SR 166
Analysis Year	2017	North/South Street	US 101 SB RAMP
Time Analyzed	PM PEAK HOUR	Peak Hour Factor	0.93
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	EXISTING + PROJECT CONDITIONS		

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration				TR		LT									LTR	
Volume, V (veh/h)			38	423		226	492							43	1	38
Percent Heavy Vehicles (%)						6								6	6	6
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized			No				No				No				No	
Median Type/Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						243									88	
Capacity, c (veh/h)						1049									254	
v/c Ratio						0.23									0.35	
95% Queue Length, Q_{95} (veh)						0.9									1.5	
Control Delay (s/veh)						9.5									26.4	
Level of Service, LOS						A									D	
Approach Delay (s/veh)						5.1								26.4		
Approach LOS														D		

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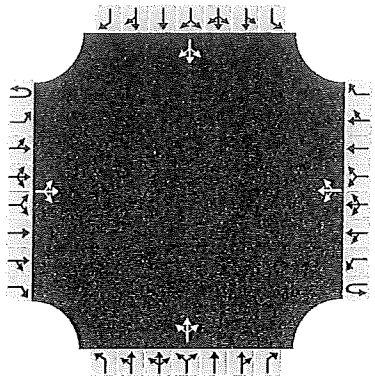
AWD = 14.0 sec = LOS B

US 101 SB & SR 166 PM PEAK EXISTING + PROJECT.xtw

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DLD	Intersection	SR 166/BASIC SCHOOL ROAD
Agency/Co.	ATE	Jurisdiction	KERN COUNTY
Date Performed	11/28/2017	East/West Street	SR 166
Analysis Year	2017	North/South Street	BASIC SCHOOL ROAD
Time Analyzed	AM PEAK HOUR	Peak Hour Factor	0.83
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	EXISTING CONDITIONS		

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume, V (veh/h)		2	160	0		5	104	11		0	10	10		78	4	4
Percent Heavy Vehicles (%)		6				6				6	6	6		6	6	6
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.16				4.16				7.16	6.56	6.26		7.16	6.56	6.26
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.25				2.25				3.55	4.05	3.35		3.55	4.05	3.35

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		2				6					24				104	
Capacity, c (veh/h)		1424				1359					677				585	
v/c Ratio		0.00				0.00					0.04				0.18	
95% Queue Length, Q_{95} (veh)		0.0				0.0					0.1				0.6	
Control Delay (s/veh)		7.5				7.7					10.5				12.5	
Level of Service, LOS		A				A					B				B	
Approach Delay (s/veh)	0.1				0.4				10.5				12.5			
Approach LOS									B				B			

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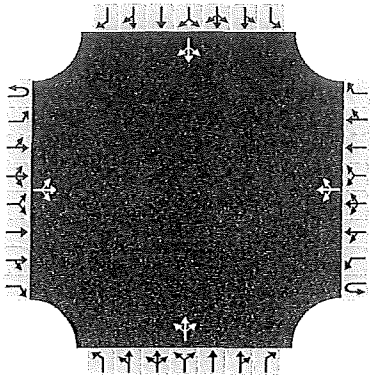
AWD = 11.9 SEC = LOS B

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DLD	Intersection	SR 166/BASIC SCHOOL ROAD
Agency/Co.	ATE	Jurisdiction	KERN COUNTY
Date Performed	11/28/2017	East/West Street	SR 166
Analysis Year	2017	North/South Street	BASIC SCHOOL ROAD
Time Analyzed	AM PEAK HOUR	Peak Hour Factor	0.83
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	EXISTING + PROJECT CONDITIONS		

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume, V (veh/h)		2	160	6		5	104	11		6	10	10		78	4	4
Percent Heavy Vehicles (%)		6				6				6	6	6		6	6	6
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		2				6					31				104	
Capacity, c (veh/h)		1424				1351					653				582	
v/c Ratio		0.00				0.00					0.05				0.18	
95% Queue Length, Q_{95} (veh)		0.0				0.0					0.1				0.6	
Control Delay (s/veh)		7.5				7.7					10.8				12.5	
Level of Service, LOS		A				A					B				B	
Approach Delay (s/veh)	0.1				0.4				10.8				12.5			
Approach LOS									B				B			

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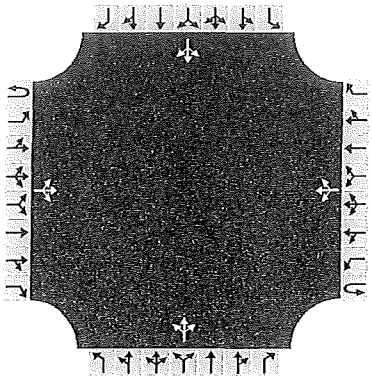
SR 166 & BASIC SCHOOL ROAD AM PEAK EXISING + PROJECT.xtw

AWD = 11.9 SBL = LOS B

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DLD	Intersection	SR 166/BASIC SCHOOL ROAD
Agency/Co.	ATE	Jurisdiction	KERN COUNTY
Date Performed	11/28/2017	East/West Street	SR 166
Analysis Year	2017	North/South Street	BASIC SCHOOL ROAD
Time Analyzed	PM PEAK HOUR	Peak Hour Factor	0.83
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	EXISTING CONDITIONS		

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume, V (veh/h)		3	124	1		8	141	30		3	4	12		8	3	6
Percent Heavy Vehicles (%)		6				6				6	6	6		6	6	6
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.16				4.16				7.16	6.56	6.26		7.16	6.56	6.26
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.25				2.25				3.55	4.05	3.35		3.55	4.05	3.35

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		4				10					23				21	
Capacity, c (veh/h)		1344				1410					716				627	
v/c Ratio		0.00				0.01					0.03				0.03	
95% Queue Length, Q_{95} (veh)		0.0				0.0					0.1				0.1	
Control Delay (s/veh)		7.7				7.6					10.2				10.9	
Level of Service, LOS		A				A					B				B	
Approach Delay (s/veh)	0.2				0.4				10.2				10.9			
Approach LOS									B				B			

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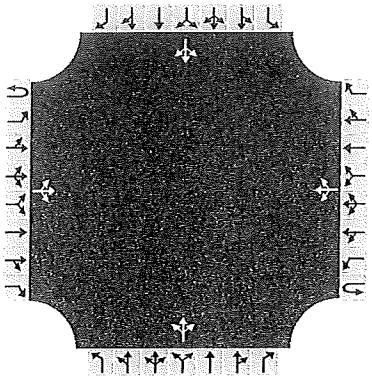
AWD = 9.8 SBL = LOS A

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	DLD	Intersection	SR 166/BASIC SCHOOL ROAD
Agency/Co.	ATE	Jurisdiction	KERN COUNTY
Date Performed	11/28/2017	East/West Street	SR 166
Analysis Year	2017	North/South Street	BASIC SCHOOL ROAD
Time Analyzed	PM PEAK HOUR	Peak Hour Factor	0.83
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	EXISTING + PROJECT CONDITIONS		

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume, V (veh/h)		3	124	7		8	141	30		9	4	12		8	3	6
Percent Heavy Vehicles (%)		6				6				6	6	6		6	6	6
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		4				10					30				21	
Capacity, c (veh/h)		1344				1401					671				624	
v/c Ratio		0.00				0.01					0.04				0.03	
95% Queue Length, Q_{95} (veh)		0.0				0.0					0.1				0.1	
Control Delay (s/veh)		7.7				7.6					10.6				11.0	
Level of Service, LOS		A				A					B				B	
Approach Delay (s/veh)	0.2				0.4				10.6				11.0			
Approach LOS									B				B			

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tWD = 10.1 sec = LOS B

ACCIDENT DATA

OTM22130

Table B - Selective Accident Rate Calculation

Report Parameters-

Event ID: 3950285

Request Name: sb-slo-kern-101-166-33

Ref Date: 11/07/2017

Request- & Line	LOC	DIR	LSC	Route/Location	Begin Date	End Date	Rate Type	Out Seq	Override Rates Rate	Override Rates Inj%	Override Rates Fat%	Override ADT Main	Override ADT Cross	Req. Type	Com- bine?	Excl Ramp?
1 1	H	T	I	05 SB 101 R036.619 - 05 SB 101 R057.117	01-AUG-12	31-JUL-15	N	L						N	N	N
1 2	H	T	I	05 SB 101 R057.117 - 05 SB 101 082.183	01-AUG-12	31-JUL-15	N	L						N	N	N
1 3	H	T	I	05 SB 101 082.183 - 05 SB 101 086.588	01-AUG-12	31-JUL-15	N	L						N	N	N
1 4	H	T	I	05 SB 101 086.588 - 05 SB 101 088.601	01-AUG-12	31-JUL-15	N	L						N	N	N

Event Log:

Job id is : 751047 Accidents Table B Request sb-slo-kern-101-166-33 Submitted by T5ETOYAM
05 SB 101 R 36.619 - 05 SB 101 R 57.117 08/01/2012 TO 07/31/2015
05 SB 101 R 57.117 - 05 SB 101 82.183 08/01/2012 TO 07/31/2015
05 SB 101 82.183 - 05 SB 101 86.588 08/01/2012 TO 07/31/2015
05 SB 101 86.588 - 05 SB 101 88.601 08/01/2012 TO 07/31/2015

California Department of Transportation
Table B - Selective Accident Rate Calculation

Location Description	Rate Group (RUS)	No. of Accidents / Significance Tot	Fat	Inj	F+I	Multi Veh	Wet	Dark	Pers Kld Inj	ADT Main X-St	Total MV+ or MVM	Accident Rates Actual Fat	F+I	Tot	Average Fat	F+I	Tot
05 SB 101 R036.619 - 05 SB 101 R057.116	**20.354 MI** H	362	2	102	104	128	165	145	2	27.1	603.08	0.003	.17	.60	0.009	.22	.56
0001-0001 2012-08-01 2015-07-31 *36 mo.*	R								139								
05 SB 101 R057.117 - 05 SB 101 082.182	**24.983 MI** H	215	2	71	73	86	13	89	2	28.0	765.79	0.003	.10	.28	0.009	.21	.54
0001-0002 2012-08-01 2015-07-31 *36 mo.*	NA								98								
05 SB 101 082.183 - 05 SB 101 086.587	**4.405 MI** H	73	0	27	27	43	7	30	0	45.2	217.98	0.000	.12	.34	0.004	.14	.43
0001-0003 2012-08-01 2015-07-31 *36 mo.*	S								39								
05 SB 101 086.588 - 05 SB 101 088.600	**2.013 MI** H	152	1	48	49	122	5	74	1	63.7	140.43	0.007	.35	1.08	0.003	.16	.49
0001-0004 2012-08-01 2015-07-31 *36 mo.*	NA								76								

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)

DEFINITIONS

$$\text{Number Expected} = \frac{\text{ADT} \times \text{Time} \times \text{Rate Expected} \times \text{Length}}{1000000}$$

$$\text{Number Significant} = \text{Number Expected} + (2.576 \times (\text{Number Expected}^{1/2})) + 1.329$$

NOTES: Number Significant using 99.5% confidence level.

For intersections, use annual number of entering vehicles in place of ADT and delete length. The NR is the same as for roadway segments.

CALCULATIONS - US 101 - REFUGIO RD I/C TO SR 246 I/C (August 1, 2012 through July 31, 2015)

$$\text{Number Expected} = \frac{27100 \times 1095 \times 0.56 \times 20.35}{1000000} = 338.171$$

Number Significant = 386.871

OTM22130

Table B - Selective Accident Rate Calculation

Report Parameters-

Event ID: 3953156

Request Name: sb-slo-kern-101-166-33

Ref Date: 11/16/2017

Request- & Line	LOC	DIR	LSC	Route/Location	Begin Date	End Date	Rate Type	Out Seq	Override Rates Rate	Override Rates Inj%	Override Rates Fat%	Override ADT Main	Override ADT Cross	Req. Type	Com-bine?	Excl Ramp?
7 1	R	T	I	05 SB 101 R036.380 - 05 SB 101 R036.381	01-AUG-12	31-JUL-15	N	L						N	N	N
7 2	R	T	I	05 SB 101 R036.888 - 05 SB 101 R036.889	01-AUG-12	31-JUL-15	N	L						N	N	N

Event Log:

Job id is : 752370 Accidents Table B Request sb-slo-kern-101-166-33 Submitted by T5ETOYAM
05 SB 101 R 36.38 - 05 SB 101 R 36.381 08/01/2012 TO 07/31/2015
05 SB 101 R 36.888 - 05 SB 101 R 36.889 08/01/2012 TO 07/31/2015

California Department of Transportation
Table B - Selective Accident Rate Calculation

Location Description	Rate Group (RUS)	No. of Accidents / Significance Tot	Fat	Inj	F+I	Multi Veh	Wet	Dark	Pers Kld Inj	ADT Main X-St	Total MV+ or MVM	Accident Rates Actual Fat	F+I	Tot	Average Fat	F+I	Tot
05 SB 101 R036.380 101/NB OFF TO REFUGIO	R 09	0	0	0	0	0	0	0	0	.3	.35 +	0.000	.00	.00	0.007	.34	1.04
0007-0001 2012-08-01 2015-07-31 *36 mo.*	R								0	.0							
05 SB 101 R036.888 101/NB ON FR REFUGIO	R 11	1	0	1	1	1	0	0	0	.2	.27 +	0.000	3.70	3.70	0.004	.17	.53
0007-0002 2012-08-01 2015-07-31 *36 mo.*	R								1	.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)

DEFINITIONS

$$\text{Number Expected} = \frac{\text{ADT} \times \text{Time} \times \text{Rate Expected} \times \text{Length}}{1000000}$$

$$\text{Number Significant} = \text{Number Expected} + (2.576 \times (\text{Number Expected})^{1/2}) + 1.329$$

NOTES: Number Significant using 99.5% confidence level.

For intersections, use annual number of entering vehicles in place of ADT and delete length. The NR is the same as for roadway segments.

CALCULATIONS - US 101 NB ON-RAMP FROM REFUGIO RD (August 1, 2012 through July 31, 2015)

$$\text{Number Expected} = \frac{270 \times 1095 \times 0.53 \times 1}{1000000} = 0.15669$$

Number Significant = 2.5054

OTM22130

Table B - Selective Accident Rate Calculation

Report Parameters-

Event ID: 3953157
Request Name: sb-slo-kern-101-166-33
Ref Date: 11/16/2017

Request- & Line	LOC	DIR	LSC	Route/Location	Begin Date	End Date	Rate Type	Out Seq	Override Rates Rate	Override Rates Inj%	Override Rates Fat%	Override ADT Main	Override ADT Cross	Req. Type	Com-bine?	Excl Ramp?
7 3	R	T	I	05 SB 101 R036.243 - 05 SB 101 R036.244	01-AUG-12	31-JUL-15	N	L						N	N	N
7 4	R	T	I	05 SB 101 R036.513 - 05 SB 101 R036.514	01-AUG-12	31-JUL-15	N	L						N	N	N

Event Log:

Job id is : 752371 Accidents Table B Request sb-slo-kern-101-166-33 Submitted by T5ETOYAM
05 SB 101 R 36.243 - 05 SB 101 R 36.244 08/01/2012 TO 07/31/2015
05 SB 101 R 36.513 - 05 SB 101 R 36.514 08/01/2012 TO 07/31/2015

California Department of Transportation
Table B - Selective Accident Rate Calculation

Location Description	Rate Group (RUS)	No. of Accidents / Significance Tot	Fat	Inj	F+I	Multi Veh	Wet	Dark	Pers Kld Inj	ADT Main X-St	Total MV+ or MVM	Accident Rates Actual Fat	F+I	Tot	Average Fat	F+I	Tot
05 SB 101 R036.243 101/SB ON FR REFUGIO	R 19	2	0	1	1	1	0	1	0	.3	.36 +	0.000	2.82	5.63	0.004	.18	.53
0007-0003 2012-08-01 2015-07-31 *36 mo.*	R								1	.0							
05 SB 101 R036.513 101/SB OFF TO REFUGIO	R 21	1	0	0	0	1	0	1	0	.2	.27 +	0.000	.00	3.72	0.018	.51	1.62
0007-0004 2012-08-01 2015-07-31 *36 mo.*	R								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)

DEFINITIONS

$$\text{Number Expected} = \frac{\text{ADT} \times \text{Time} \times \text{Rate Expected} \times \text{Length}}{1000000}$$

$$\text{Number Significant} = \text{Number Expected} + (2.576 \times (\text{Number Expected})^{1/2}) + 1.329$$

NOTES: Number Significant using 99.5% confidence level.

For intersections, use annual number of entering vehicles in place of ADT and delete length. The NR is the same as for roadway segments.

CALCULATIONS - US 101 SB ON-RAMP FROM REFUGIO RD (August 1, 2012 through July 31, 2015)

$$\text{Number Expected} = \frac{360 \times 1095 \times 0.53 \times 1}{1000000} = 0.20893$$

Number Significant = 2.71537

DEFINITIONS

$$\text{Number Expected} = \frac{\text{ADT} \times \text{Time} \times \text{Rate Expected} \times \text{Length}}{1000000}$$

$$\text{Number Significant} = \text{Number Expected} + (2.576 \times (\text{Number Expected})^{1/2}) + 1.329$$

NOTES: Number Significant using 99.5% confidence level.

For intersections, use annual number of entering vehicles in place of ADT and delete length. The NR is the same as for roadway segments.

CALCULATIONS - US 101 SB OFF-RAMP TO REFUGIO RD (August 1, 2012 through July 31, 2015)

$$\text{Number Expected} = \frac{270 \times 1095 \times 1.62 \times 1}{1000000} = 0.47895$$

Number Significant = 3.59071

OTM22130

Table B - Selective Accident Rate Calculation

Report Parameters-

Event ID: 3950522
Request Name: sb-slo-kern-101-166-33
Ref Date: 11/07/2017

Request-& Line	LOC	DIR	LSC	Route/Location	Begin Date	End Date	Rate Type	Out Seq	Override Rates Rate	Override Rates Inj%	Override Rates Fat%	Override ADT Main	Override ADT Cross	Req. Type	Com-bine?	Excl Ramp?
3 1	R	T	I	05 SB 101 086.470 - 05 SB 101 086.471	01-AUG-12	31-JUL-15	N	L						N	N	N
3 2	R	T	I	05 SB 101 086.690 - 05 SB 101 086.691	01-AUG-12	31-JUL-15	N	L						N	N	N

Event Log:

Job id is : 751197 Accidents Table B Request sb-slo-kern-101-166-33 Submitted by T5ETOYAM
05 SB 101 86.47 - 05 SB 101 86.471 08/01/2012 TO 07/31/2015
05 SB 101 86.69 - 05 SB 101 86.691 08/01/2012 TO 07/31/2015

California Department of Transportation
Table B - Selective Accident Rate Calculation

Location Description	Rate Group (RUS)	No. of Accidents / Significance Tot	Fat	Inj	F+I	Multi Veh	Wet	Dark	Pers Kld Inj	ADT Main X-St	Total MV+ or MVM	Accident Rates Actual Fat	F+I	Tot	Average Fat	F+I	Tot
05 SB 101 086.470 101/NB OFF TO BETTERAVIA RD	R 10	4	0	2	2	3	0	1	0	4.1	4.46 +	0.000	.45	.90	0.003	.35	1.01
0003-0001 2012-08-01 2015-07-31 *36 mo.*	U								2	.0							
05 SB 101 086.690 101/NB ON FROM BETTERAVIA R	R 12	6	0	0	0	6	0	1	0	10.1	11.10 +	0.000	.00	.54	0.002	.22	.63
0003-0002 2012-08-01 2015-07-31 *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)

California Department of Transportation
Table B - Selective Accident Rate Calculation

Location Description	Rate Group (RUS)	No. of Accidents / Significance Tot	Fat	Inj	F+I	Multi Veh	Wet	Dark	Pers Kld Inj	ADT Main X-St	Total MV+ or MVM	Accident Rates Actual Fat	F+I	Average Tot	Fat	F+I	Tot
05 SB 101 086.450 101/SB ON FROM BETTERAVIA R 0003-0003 2012-08-01 2015-07-31 *36 mo.*	R 12 U	3	0	2	2	3	2	3	0 4	3.5 .0	3.83 +	0.000	.52	.78	0.002	.22	.63
05 SB 101 086.700 101/SB OFF TO BETTERAVIA RD 0003-0004 2012-08-01 2015-07-31 *36 mo.*	R 10 U	16	0	1	1	16	1	1	0 1	9.5 .0	10.42 +	0.000	.10	1.54	0.003	.35	1.01

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)

DEFINITIONS

$$\text{Number Expected} = \frac{\text{ADT} \times \text{Time} \times \text{Rate Expected} \times \text{Length}}{1000000}$$

$$\text{Number Significant} = \text{Number Expected} + (2.576 \times (\text{Number Expected})^{1/2}) + 1.329$$

NOTES: Number Significant using 99.5% confidence level.

For intersections, use annual number of entering vehicles in place of ADT and delete length. The NR is the same as for roadway segments.

CALCULATIONS - US 101 SB ON-RAMP FROM BETTERAVIA RD (August 1, 2012 through July 31, 2015)

$$\text{Number Expected} = \frac{3830 \times 1095 \times 0.63 \times 1}{1000000} = 2.64213$$

Number Significant = 8.15831

DEFINITIONS

$$\text{Number Expected} = \frac{\text{ADT} \times \text{Time} \times \text{Rate Expected} \times \text{Length}}{1000000}$$

$$\text{Number Significant} = \text{Number Expected} + (2.576 \times (\text{Number Expected}^{1/2})) + 1.329$$

NOTES: Number Significant using 99.5% confidence level.

For intersections, use annual number of entering vehicles in place of ADT and delete length. The NR is the same as for roadway segments.

CALCULATIONS - US 101 SB OFF-RAMP FROM BETTERAVIA RD (August 1, 2012 through July 31, 2015)

$$\text{Number Expected} = \frac{10420 \times 1095 \times 1.01 \times 1}{1000000} = 11.524$$

Number Significant = 21.5978

OTM22130

Table B - Selective Accident Rate Calculation

Report Parameters-

Event ID: 3951350

Request Name: sb-slo-kern-101-166-33

Ref Date: 11/09/2017

Request-& Line	LOC	DIR	LSC	Route/Location	Begin Date	End Date	Rate Type	Out Seq	Override Rates Rate	Override Rates Inj%	Override Rates Fat%	Override ADT Main	Override ADT Cross	Req. Type	Com-bine?	Excl Ramp?
6 1	H	T	I	05 SB 101 086.588 - 05 SB 101 090.988	01-AUG-12	31-JUL-15	N	L						N	N	Y
6 2	H	T	I	05 SLO 101 000.000 - 05 SLO 101 000.813	01-AUG-12	31-JUL-15	N	L						N	N	Y

Event Log:

Job id is : 751514 Accidents Table B Request sb-slo-kern-101-166-33 Submitted by T5ETOYAM
05 SB 101 86.588 - 05 SB 101 90.988 08/01/2012 TO 07/31/2015
05 SLO 101 0 - 05 SLO 101 .813 08/01/2012 TO 07/31/2015

California Department of Transportation
Table B - Selective Accident Rate Calculation

Location Description	Rate Group (RUS)	No. of Accidents / Significance Tot	Fat	Inj	F+I	Multi Veh	Wet	Dark	Pers Kld Inj	ADT Main X-St	Total MV+ or MVM	Accident Rates Actual Fat	F+I	Tot	Average Fat	F+I	Tot
05 SB 101 086.588 - 05 SB 101 090.987 0006-0001 2012-08-01 2015-07-31 *36 mo.*	4.40 MI H NA	235	3	82	85	166	18	101	3 126	62.7	302.09	0.010	.28	.78	0.003	.17	.54
05 SLO 101 000.000 - 05 SLO 101 000.812 0006-0002 2012-08-01 2015-07-31 *36 mo.*	.813 MI H NA	47	1	11	12	33	14	20	2 17	65.7	58.52	0.017	.21	.80	0.004	.16	.49

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)

DEFINITIONS

$$\text{Number Expected} = \frac{\text{ADT} \times \text{Time} \times \text{Rate Expected} \times \text{Length}}{1000000}$$

$$\text{Number Significant} = \text{Number Expected} + (2.576 \times (\text{Number Expected})^{1/2}) + 1.329$$

NOTES: Number Significant using 99.5% confidence level.

For intersections, use annual number of entering vehicles in place of ADT and delete length. The NR is the same as for roadway segments.

CALCULATIONS - US 101 - BETTERAVIA RD I/C TO SB/SLO COUNTY LINE (August 1, 2012 through July 31, 2015)

$$\text{Number Expected} = \frac{62700 \times 1095 \times 0.54 \times 4.4}{1000000} = 163.128$$

$$\text{Number Significant} = 197.358$$

DEFINITIONS

$$\text{Number Expected} = \frac{\text{ADT} \times \text{Time} \times \text{Rate Expected} \times \text{Length}}{1000000}$$

$$\text{Number Significant} = \text{Number Expected} + (2.576 \times (\text{Number Expected})^{1/2}) + 1.329$$

NOTES: Number Significant using 99.5% confidence level.

For intersections, use annual number of entering vehicles in place of ADT and delete length. The NR is the same as for roadway segments.

CALCULATIONS - US 101 - SB/SLO COUNTY LINE TO SR 166 I/C (August 1, 2012 through July 31, 2015)

$$\text{Number Expected} = \frac{65700 \times 1095 \times 0.49 \times 0.813}{1000000} = 28.6593$$

Number Significant = 43.7788

OTM22130

Table B - Selective Accident Rate Calculation

Report Parameters-

Event ID: 3950576
Request Name: sb-slo-kern-101-166-33
Ref Date: 11/07/2017

Request-& Line	LOC	DIR	LSC	Route/Location	Begin Date	End Date	Rate Type	Out Seq	Override Rates Rate	Override Rates Inj%	Override Rates Fat%	Override ADT Main	Override ADT Cross	Req. Type	Com-bine?	Excl Ramp?
2 1	H	T	I	05 SLO 166 008.927 - 05 SLO 166 074.628	01-AUG-12	31-JUL-15	N	L						N	N	Y
2 2	H	T	I	05 SLO 033 002.691 - 05 SLO 033 004.951	01-AUG-12	31-JUL-15	N	L						N	N	Y
2 3	H	T	I	06 KER 033 000.000 - 06 KER 033 R011.555	01-AUG-12	31-JUL-15	N	L						N	N	Y
2 4	H	T	I	06 KER 166 000.010 - 06 KER 166 004.980	01-AUG-12	31-JUL-15	N	L						N	N	Y

Event Log:

Job id is : 751243 Accidents Table B Request sb-slo-kern-101-166-33 Submitted by T5ETOYAM
05 SLO 166 8.927 - 05 SLO 166 74.628 08/01/2012 TO 07/31/2015
05 SLO 033 2.691 - 05 SLO 033 4.951 08/01/2012 TO 07/31/2015
06 KER 033 0 - 06 KER 033 R 11.555 08/01/2012 TO 07/31/2015
06 KER 166 .01 - 06 KER 166 4.98 08/01/2012 TO 07/31/2015

California Department of Transportation
Table B - Selective Accident Rate Calculation

Location Description	Rate Group (RUS)	No. of Accidents / Significance Tot	Fat	Inj	F+I	Multi Veh	Wet	Dark	Pers Kld Inj	ADT Main X-St	Total MV+ or MVM	Accident Rates Actual Fat	Actual F+I	Actual Tot	Average Fat	Average F+I	Average Tot
05 SLO 166 008.927 - 05 SLO 166 074.627	62.165 MI H	111	4	48	52	33	12	40	4	2.9	194.14	0.021	.27	.57	0.019	.31	.73
0002-0001 2012-08-01 2015-07-31 *36 mo.*	R								79								
05 SLO 033 002.691 - 05 SLO 033 004.950	2.233 MI H	7	0	4	4	2	0	3	0	4.3	10.55	0.000	.38	.66	0.019	.31	.69
0002-0002 2012-08-01 2015-07-31 *36 mo.*	R								6								
06 KER 033 000.000 - 06 KER 033 R011.554	11.555 MI H	24	0	11	11	9	1	12	0	3.4	42.91	0.000	.26	.56	0.024	.45	1.01
0002-0003 2012-08-01 2015-07-31 *36 mo.*	NA								15								
06 KER 166 000.010 - 06 KER 166 004.979	4.970 MI H	10	0	4	4	5	1	3	0	2.8	15.44	0.000	.26	.65	0.019	.33	.79
0002-0004 2012-08-01 2015-07-31 *36 mo.*	NA								7								

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)

OTM22130

Table B - Selective Accident Rate Calculation

Report Parameters-

Event ID: 3951345
Request Name: sb-slo-kern-101-166-33
Ref Date: 11/09/2017

Request- & Line	LOC	DIR	LSC	Route/Location	Begin Date	End Date	Rate Type	Out Seq	Override Rates Rate	Override Rates Inj%	Override Rates Fat%	Override ADT Main	Override ADT Cross	Req. Type	Com-bine?	Excl Ramp?
6 3	R	T	I	05 SLO 101 000.680 - 05 SLO 101 000.681	01-AUG-12	31-JUL-15	N	L						N	N	N
6 4	R	T	I	05 SLO 101 001.002 - 05 SLO 101 001.003	01-AUG-12	31-JUL-15	N	L						N	N	N

Event Log:

Job id is : 751509 Accidents Table B Request sb-slo-kern-101-166-33 Submitted by T5ETOYAM
05 SLO 101 .68 - 05 SLO 101 .681 08/01/2012 TO 07/31/2015
05 SLO 101 1.002 - 05 SLO 101 1.003 08/01/2012 TO 07/31/2015

California Department of Transportation
Table B - Selective Accident Rate Calculation

Location Description	Rate Group (RUS)	No. of Accidents / Significance Tot	Fat	Inj	F+I	Multi Veh	Wet	Dark	Pers Kld Inj	ADT Main X-St	Total MV+ or MVM	Accident Rates Actual Fat	F+I	Tot	Average Fat	F+I	Tot
05 SLO 101 000.680 101/NB OFF TO N JCT 166	R 54	2	0	0	0	2	0	0	0	6.4	6.96 +	0.000	.00	.29	0.001	.25	.76
0006-0003 2012-08-01 2015-07-31 *36 mo.*	U								0	.0							
05 SLO 101 001.002 101/NB ON FR RTE 166	R 56	0	0	0	0	0	0	0	0	.9	.94 +	0.000	.00	.00	0.001	.18	.54
0006-0004 2012-08-01 2015-07-31 *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)

OTM22130

Table B - Selective Accident Rate Calculation

Report Parameters-

Event ID: 3951346

Request Name: sb-slo-kern-101-166-33

Ref Date: 11/09/2017

Request-& Line	LOC	DIR	LSC	Route/Location	Begin Date	End Date	Rate Type	Out Seq	Override Rates Rate	Override Rates Inj%	Override Rates Fat%	Override ADT Main	Override ADT Cross	Req. Type	Com-bine?	Excl Ramp?
6 5	R	T	I	05 SLO 101 000.670 - 05 SLO 101 000.671	01-AUG-12	31-JUL-15	N	L						N	N	N
6 6	R	T	I	05 SLO 101 000.980 - 05 SLO 101 000.981	01-AUG-12	31-JUL-15	N	L						N	N	N

Event Log:

Job id is : 751510 Accidents Table B Request sb-slo-kern-101-166-33 Submitted by T5ETOYAM
05 SLO 101 .67 - 05 SLO 101 .671 08/01/2012 TO 07/31/2015
05 SLO 101 .98 - 05 SLO 101 .981 08/01/2012 TO 07/31/2015

California Department of Transportation
Table B - Selective Accident Rate Calculation

Location Description				Rate Group (RUS)	No. of Accidents / Significance Tot	Fat	Inj	F+I	Multi Veh	Wet	Dark	Pers Kld Inj	ADT Main X-St	Total MV+ or MVM	Accident Rates Actual Fat	Actual F+I	Average Tot	Average Fat	Average F+I	Average Tot
05 SLO 101 000.670 101/SB ON FROM N JCT 166				R 56	3	0	0	0	2	0	0	0	6.8	7.40 +	0.000	.00	.41	0.001	.18	.54
0006-0005	2012-08-01	2015-07-31	*36 mo.*	U								0	.0							
05 SLO 101 000.980 101/SB OFF TO N JCT 166				R 54	0	0	0	0	0	0	0	0	1.1	1.26 +	0.000	.00	.00	0.001	.25	.76
0006-0006	2012-08-01	2015-07-31	*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)

OTM22130

Table B - Selective Accident Rate Calculation

Report Parameters-

Event ID: 3950508
Request Name: sb-slo-kern-101-166-33
Ref Date: 11/07/2017

Request- & Line	LOC	DIR	LSC	Route/Location	Begin Date	End Date	Rate Type	Out Seq	Override Rates Rate	Override Rates Inj%	Override Rates Fat%	Override ADT Main	Override ADT Cross	Req. Type	Com- bine?	Excl Ramp?
5 1	I	T	I	06 KER 166 004.980 - 06 KER 166 004.981	01-AUG-12	31-JUL-15	N	L						N	N	N

Event Log:

Job id is : 751187 Accidents Table B Request sb-slo-kern-101-166-33 Submitted by T5ETOYAM
06 KER 166 4.98 - 06 KER 166 4.981 08/01/2012 TO 07/31/2015

California Department of Transportation
Table B - Selective Accident Rate Calculation

Location Description	Rate Group (RUS)	No. of Accidents / Significance Tot	Fat	Inj	F+I	Veh	Multi Wet	Dark	Pers Kld Inj	ADT Main X-St	Total MV+ or MVM	Accident Rates Actual Fat	F+I	Tot	Average Fat	F+I	Tot
06 KER 166 004.980 BASIC SCHOOL ROAD,	I 17	3	0	0	0	2	0	0	0	3.2	3.56 +	0.000	.00	.84	0.003	.07	.16
0005-0001 2012-08-01 2015-07-31 *36 mo.*	R								0	.1							

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)

DEFINITIONS

$$\text{Number Expected} = \frac{\text{ADT} \times \text{Time} \times \text{Rate Expected} \times \text{Length}}{1000000}$$

$$\text{Number Significant} = \text{Number Expected} + (2.576 \times (\text{Number Expected})^{1/2}) + 1.329$$

NOTES: Number Significant using 99.5% confidence level.

For intersections, use annual number of entering vehicles in place of ADT and delete length. The NR is the same as for roadway segments.

CALCULATIONS - SR 166/BASIC SCHOOL ROAD INTERSECTION (August 1, 2012 through July 31, 2015)

$$\text{Number Expected} = \frac{3300 \times 1095 \times 0.16 \times 1}{1000000} = 0.57816$$

$$\text{Number Significant} = 3.86587$$