APPENDIX C

- **ASSOCIATED TRANSPORTATION ENGINEERS – TRAFFIC IMPACT ANALYSIS**
- **ASSOCIATED TRANSPORTATION ENGINEERS – TECHNICAL APPENDIX FOR TRAFFIC IMPACT ANALYSIS**

LAS PILITAS ROCK QUARRY PROJECT
SAN LUIS OBISPO COUNTY, CALIFORNIA

TRAFFIC IMPACT STUDY
PEER REVIEW AND SUPPLEMENTAL ANALYSES

April 24, 2012

ATE #11054

Prepared For:

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TRAFFIC IMPACT STUDY PEER REVIEW AND SUPPLEMENTAL ANALYSES FOR THE LAS PILITAS ROCK QUARRY PROJECT, SAN LUIS OBISPO COUNTY, CALIFORNIA

Associated Transportation Engineers (ATE) has prepared the following peer review of the traffic impact study prepared for the Las Pilitas Rock Quarry Project by TPG Consulting. The peer review is also supplemented with additional analyses requested by the County. It is our understanding that the results of the traffic analysis will be incorporated into the EIR being prepared by URS.

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STATE OF CALIFORNIA

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INTRODUCTION

The Las Pilitas Rock Quarry Project (the "Project") is proposed on the north side of State Route (SR) 58 (also known as Calf Canyon Highway), east of the Salinas River in the Santa Margarita area of San Luis Obispo County. Figure 1 shows the Project location. The Project site plan is shown on Figure 2.

A traffic impact study was prepared for the Project by TPG Consulting in 2009 and submitted to the County as part of the application package.[1] The County since hired Associated Transportation Engineer (ATE) to peer review and supplement the TPG traffic impact study (TPG Study) for the EIR. A copy of the TPG Study (including the appendices) is included in the Technical Appendix of this peer review report.

The TPG Study analyzed A.M. and P.M. peak hour operations at the following four intersections within the study area.

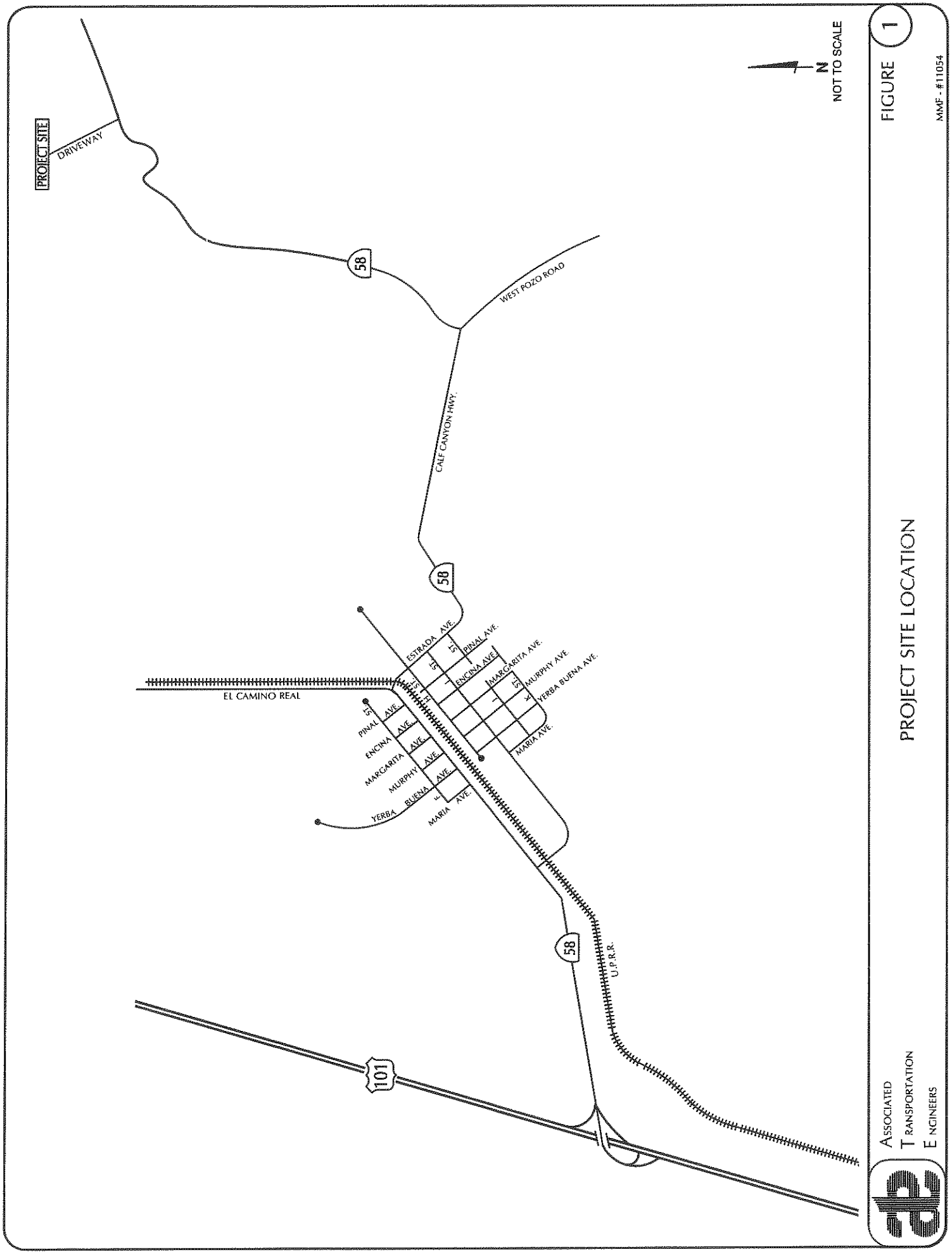
- Estrada Avenue at El Camino Real
- Estrada Avenue at H Street
- West Pozo Road at Calf Canyon Highway
- Project Driveway at Calf Canyon Highway

The following scenarios were analyzed in the TPG Study:

- Existing Conditions
- Existing + Project Conditions
- 2030 Conditions (Cumulative)
- 2030 + Project Conditions

The U.S. 101/SR 58 interchange was not analyzed in the TPG Study since it is the applicant's opinion that the interchange would not likely experience a change in trips due to the proposed Project. The Project would operate in the same quarry, recycling, and asphalt market as the Hansen Quarry that is located on El Camino Real north of Santa Margarita. Since Hansen Quarry already routes trucks through Santa Margarita to the U.S. 101/SR 58 interchange, it is the applicant's opinion that Las Pilitas trucks would replace Hansen trucks, thus resulting in a net balance of "quarry-related" trips at the interchange.

[1] Las Pilitas Rock Quarry Traffic Impact Study, TPG Consulting, May 2009.


PROJECT SITE
DRIVEWAY
58
WEST POZO ROAD
CALF CANYON HWY.
58
ESTRADA AVE.
PINAL AVE.
ENCINA AVE.
MARGARITA AVE.
MURPHY AVE.
YERBA BUENA AVE.
MARIA AVE.
EL CAMINO REAL
PINAL AVE.
ENCINA AVE.
MARGARITA AVE.
MURPHY AVE.
YERBA BUENA AVE.
MARIA AVE.
58
U.P.R.R.
101
N
NOT TO SCALE
FIGURE 1
PROJECT SITE LOCATION
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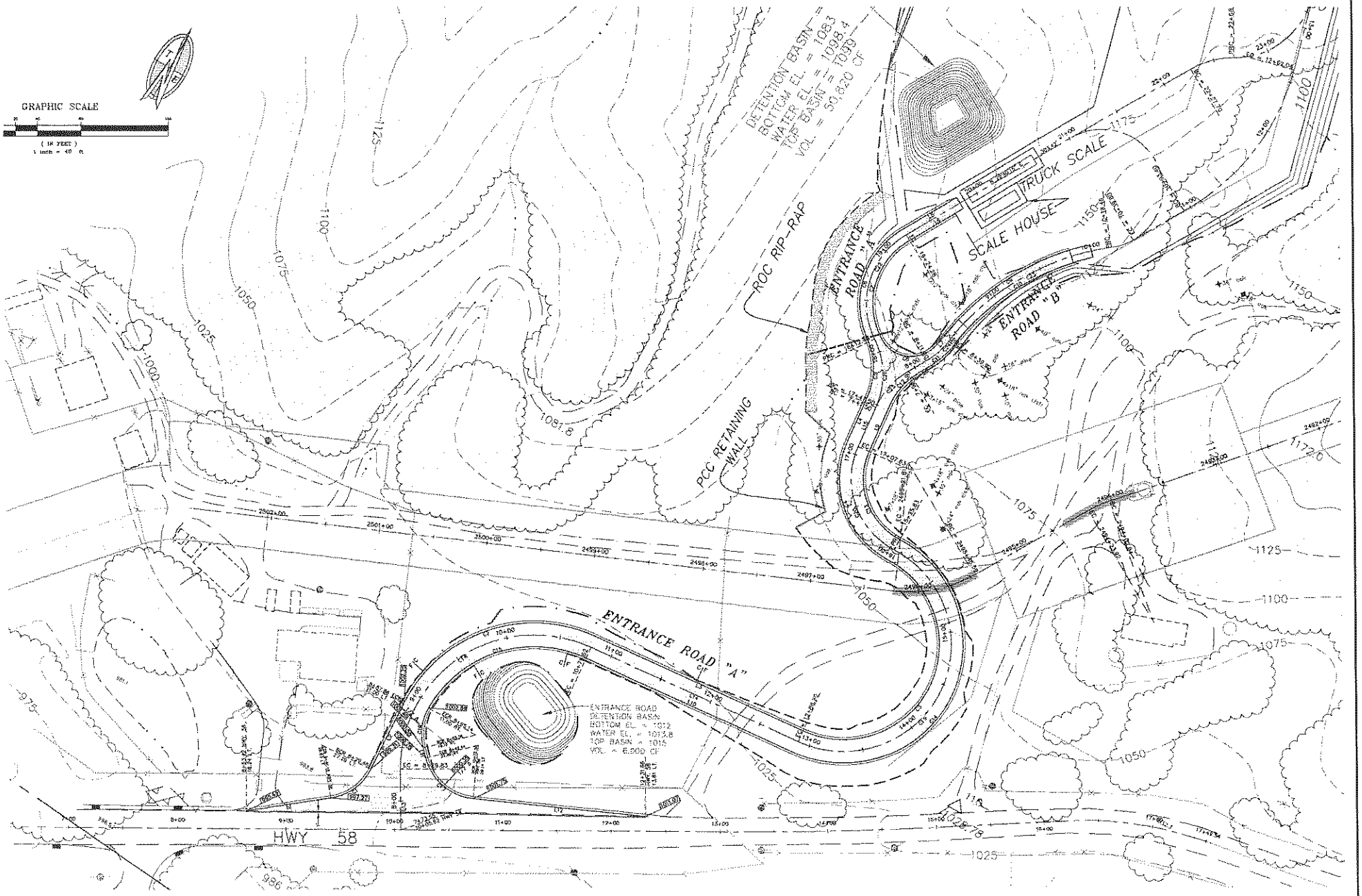

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PROJECT SITE PLAN

FIGURE 2

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A meeting was held at the County's offices to discuss the approach to the peer review and identify additional traffic issues to be addressed in the EIR. The meeting was attended by representatives from the County, Caltrans, ATE, URS, and the applicant. Through the project scoping process, the team agreed that the peer review should supplemented with the following additional analyses.

- Evaluate Existing operations and potential Project impacts to the U.S. 101/SR 58 interchange.
- Provide a more thorough analysis of operations at the Estrada Avenue/El Camino Real intersection given it proximity to the UPRR tracks south of the intersection as well as the school located adjacent to the Estrada Avenue/H Street intersection.
- Review truck circulation along the proposed truck route within the Santa Margarita area, include evaluation of Existing and Existing + Project truck volumes, roadway geometry, and roadway pavement conditions.

PEER REVIEW & SUPPLEMENTAL ANALYSIS

The peer review-supplemental analysis is presented in a step-wise approach. Analysis derived from the TPG Study is first provided (quoted from the TPG report in italic text) and ATE peer review comments are then presented. Supplemental analysis prepared by ATE are provided within the appropriate report sections.

IMPACT THRESHOLDS

TPG Study - Level of Service Standards

County of San Luis Obispo. The County of San Luis Obispo policy calls for a LOS C threshold in rural areas and a LOS D threshold in urban areas. Although two of the study intersections are within the "urban" area of Santa Margarita, the rural character of the town and roadways justifies using the rural area threshold for all study locations. This should be considered a worst-case scenario.

Caltrans. Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on State highway facilities. However, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than the appropriate target LOS, the existing measures of effectiveness should be maintained.[2] *Based on the LOS standards of the two (2) controlling agencies, all study locations are evaluated against the LOS C threshold.*

---

[2] Guide for the Preparation of Traffic Impact Studies, State of California Department of Transportation, December 2002.

ATE Peer Review. Application of the LOS C standard for all of the study-area roadways and intersections is consistent with County practices. Further, Caltrans has prepared a Transportation Planning Fact Sheet for SR 58.[3] Transportation Planning Fact Sheets are succinct and frequently updated documents that summarize statistics, and characteristics for State highways and State highway segments based on Transportation Concept Reports (TCR's). These documents articulate Caltrans' long-range plans for each state route in San Luis Obispo County. TCR's are documents that establish a 20-year planning concept for each State highway by identifying deficiencies and analyzing current and projected operating conditions for the facility. The Transportation Planning Fact Sheet for SR 58 shows LOS E as the target level of service for the SR 58 segment between U.S. 101 and Pozo Road; and LOS D as the target level of service for the SR 58 segment between Pozo Road and the Kern County line.

EXISTING CONDITIONS

TPG Study - Transit/Bike Facilities/Pedestrian Facilities

Transit. Currently, the Regional Transit Authority (RTA) operates one (1) transit route in the study area. Route 9, operates between San Miguel, Paso Robles, Templeton, Atascadero, Santa Margarita, and San Luis Obispo. Route 9 has one (1) stop in Santa Margarita near the intersection of El Camino Real and Encina Avenue. Since this route does not operate a stop within walking distance of the Project site, no employee trips are anticipated to utilize transit. The Atascadero Unified School District operates three (3) bus routes that travel through the study area. Routes 7 and 8 pick up students from Pozo and Santa Margarita and deliver them to Santa Margarita Elementary (Route 8) and Atascadero High School and Junior High (Route 7). Route 9 picks up students from the rural area between Santa Margarita and Atascadero and delivers them to Santa Margarita Elementary and Atascadero High School and Junior High.

Bike Facilities. Portions of SR 58, in the study area, are designated as a Bike Route with appropriate signing. Shoulder widths vary along SR 58 and cannot always accommodate bicyclists. Bike Lanes are located on El Camino Real east/north of its intersection with Estrada Avenue. No other designated bicycle facilities are located in the study area.

Pedestrian Facilities. Due to the rural nature of Santa Margarita, sidewalks are limited in the study area. The only sidewalk in the study area is located on the north side of H Street, east of Estrada Avenue. A pedestrian bridge is also located on the north side of H Street, west of Estrada Avenue, to cross a small creek. A marked crosswalk is also located on the north side of the Estrada Avenue at H Street intersection. These limited pedestrian facilities serve the Santa Margarita Elementary School. According to the Santa Margarita Design Plan, improvement of pedestrian facilities throughout the community is recommended, particularly along Estrada Avenue. (Further analysis of the Estrada Avenue at H Street intersection and the school crossing is included in Appendix I)

---

[3] Transportation Planning Fact Sheet, State Route 58 in San Luis Obispo County, Caltrans, September 2009.

ATE Peer Review. The existing transit, bike and pedestrian facilities in the study area have not change substantially since the time that the TPG Study was prepared. RTA Route 9 still serves the Santa Margarita area and the Atascadero Unified School District still operates bus routes that pick up students from Pozo and Santa Margarita and delivers them to Santa Margarita Elementary, Atascadero High School and Atascadero Junior High School. Portions of SR 58 are designated as a bike route with appropriate signing and bike lanes are located on El Camino Real east/north of its intersection with Estrada Avenue. The only sidewalk in the study area is located on the north side of H Street east of Estrada Avenue and a marked crosswalk is located on the north side of the Estrada Avenue at H Street intersection adjacent to the Santa Margarita Elementary School.

TPG Study - Roadways/Intersections/Traffic Counts

Roadways. The following table describes the Existing street system in the study area including the street classification, number of lanes, and the posted speed limits.

Table 1
Study-Area Street System

Street	*Classification*	*Number of Lanes (2 directions)*	*Posted Speed*
State Route 58(a)	*Principal Arterial*	*2*	*35-55*
El Camino Real	*Arterial*	*2*	*35-55*
Estrada Avenue	*Local Street*	*2*	*25-35(b)*
H Street	*Local Street*	*2*	*25*
W Pozo Road	*Rural Road*	*2*	*55*
Calf Canyon Highway	*Rural Road*	*2*	*55*

(a) Portions of El Camino Real, Estrada Avenue, W Pozo Road, and Calf Canyon Highway are all designated as State Route 58.
(b) 25 MPH posted for school zone.

The following table lists the study intersections and their associated intersection control.

Table 2
Study-Area Intersections

Intersection	*Signalized/Unsignalized*	*Type*
Estrada Ave/El Camino Real	*Unsignalized*	*TWSC*
Estrada Ave/H St	*Unsignalized*	*TWSC*
W Pozo Rd/Calf Canyon Hwy	*Unsignalized*	*TWSC*
Calf Canyon Hwy/Project Driveway	*NA*	*NA*

TWSC = Two-Way Stop Control.

The existing traffic counts taken for the Project were compared to traffic counts taken in 2006 for the Santa Margarita Ranch Transportation Impact Analysis.[4] Based on this comparison, certain movements currently have fewer vehicles in the peak hour(s) in 2009 than were counted in 2006. Due to the relatively low number of vehicles for all movements, the minor decreases in vehicles are not outside a typical day-to-day fluctuation. However, all movements which are currently showing a lower number of vehicles were adjusted to the 2006 counts. This adjustment should be considered a worst-case scenario.

ATE Peer Review. The existing roadway and intersection information listed in Tables 1 and 2 have not changed. All of the street segments in the study area are 2-lane roads and the key intersections are controlled by stop signs.

The Existing traffic counts used are worst-case since they use the highest volume recorded for each movement taken from the 2006 and 2009 counts. Since the time that the traffic study was prepared, additional counts were collected by Caltrans in 2010 and provided to TPG for analysis. TPG compared the Caltrans 2010 counts to the older and found that traffic has decreased in the Santa Margarita area (Caltrans 2010 counts are lower than the 2006/2009 counts). A copy of the TPG traffic count analysis is included in the Technical Appendix for reference.

ATE also collected traffic counts at the Estrada Ave/El Camino Real intersection in June 2011 in order to verify the accuracy of the count data used in the TPG study. Those counts also show lower volumes than the counts used in the TPG study. The counts used in the TPG Study are higher than other counts and are therefore conservative for assessing traffic operations. It is noted that counts collected by Caltrans and ATE show that 3-4% of the traffic using El Camino Real and Estrada Avenue is comprised of trucks with 3 or more axles.

---

4 Santa Margarita Ranch Transportation Impact Analysis, Fehr and Peers, December 2006.

ATE Supplemental Analysis - SR 58. The County and Caltrans agreed that the traffic analysis should include additional analyses for SR 58 (including roadway geometry, truck volumes, roadway pavement conditions, and operations in the vicinity of the Santa Margarita Elementary School).

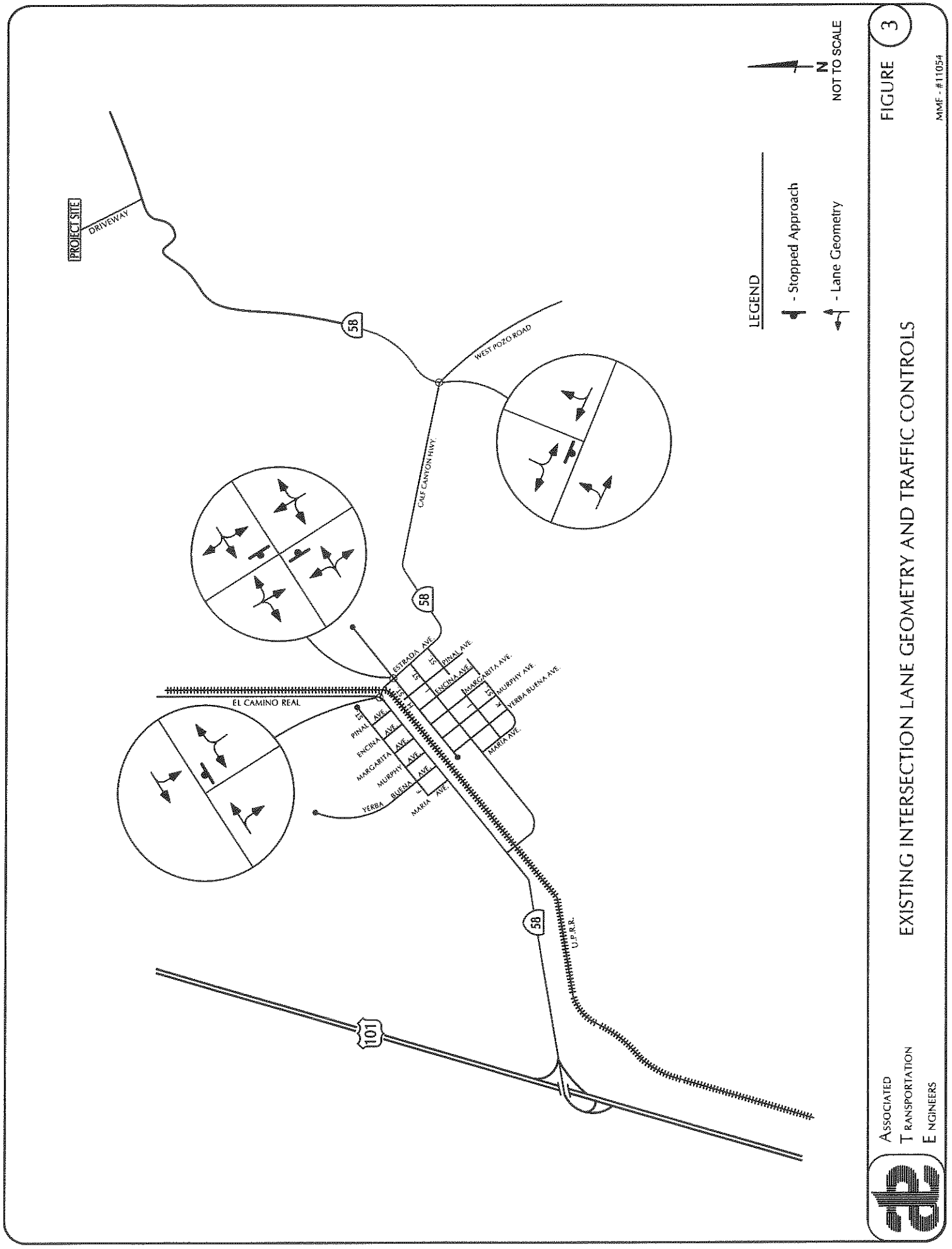
SR 58 from El Camino Real to the Project site is a two-lane roadway with 12-foot travel lanes and 2- to 4-foot shoulders. SR 58 has a 30-foot King Pin-to-Rear Axle (KPRA) Advisory from El Camino Real to the San Luis Obispo/Kern County line. Trucks that do not exceed the 30-foot KPRA can maneuver the SR 58 turns without crossing the centerline. The traffic counts show that the percentage of trucks with 3 or more axles is 4% south of the El Camino Real intersection. Based on pavement ratings of Good, Fair, or Poor, the pavement condition along SR 58 is rated as Good to Fair.

The roadway is named Estrada Avenue southeast of El Camino Real. The Santa Margarita Elementary School is located just east of Estrada Avenue adjacent to the H Street intersection. Field observation found that there are brief periods of the day when SR 58 traffic operations are affected by school traffic. The school day begins at 8:20 A.M. for all students. Kindergarten dismissal is at 1:40 P.M. and Grades 1-6 are dismissed at 2:40 P.M. (except for Fridays, when Grades 1-6 are dismissed at 1:40 P.M.). Access to the school is provided via the east leg of the Estrada Avenue/H Street intersection. A school crossing guards is present at the crosswalk located at the intersection to assist school children crossing the street. Pedestrian counts collected at the intersection found a total of 12 pedestrians crossed Estrada Avenue at the H Street intersection during the morning period at the start of the school day and 29 crossed the intersection during the afternoon period at the end of the school day. The speed limit on Estrada Avenue is 25 MPH during the morning and afternoon periods when children are present. Field observations found that vehicles and pedestrians were observant of one another and there are no significant operational issues. While morning and afternoon traffic peaks sometime cause queuing on Estrada Avenue, the peak periods last approximately 10-15 minutes just prior to the start and end of the school day. Since the time that the TPG Study was prepared, the County has plans to install flashing warning signs adjacent to the Estrada Avenue/H Street intersection to advise motorist of the presence of school children.

Estrada Avenue continues southeasterly and makes a 90-degree turn at J Street. There is a 15 MPH curve warning sign for westbound traffic but no curve warning sign for eastbound traffic. From J Street to the intersection with Pozo Road, the roadway continues as a two-lane road with 2- to 4-foot shoulders. This segment is also known as Calf Canyon Road. The roadway turn northeasterly at the Pozo Road intersection and continues to the Project site (and beyond) as a two-lane highway with 2- to 4-foot shoulders.

TPG Study - Levels of Service

Level of Service. The Existing intersection lane configurations, intersection control, and peak hour traffic volumes are shown on Figure 3. Using the lane configurations and volumes shown on Figure 4, the intersections were analyzed for Existing levels of service. Table 3 shows the Existing levels of service for the study intersections.


PROJECT SITE
DRIVEWAY
58
WEST POZO ROAD
CALF CANYON HWY.
EL CAMINO REAL
ESTRADA AVE.
PINAL AVE.
ENCINA AVE.
MARGARITA AVE.
MURPHY AVE.
YERBA BUENA AVE.
MARIA AVE.
U.P.R.R.
101
LEGEND
- Stopped Approach
- Lane Geometry
N
NOT TO SCALE
FIGURE 3
EXISTING INTERSECTION LANE GEOMETRY AND TRAFFIC CONTROLS
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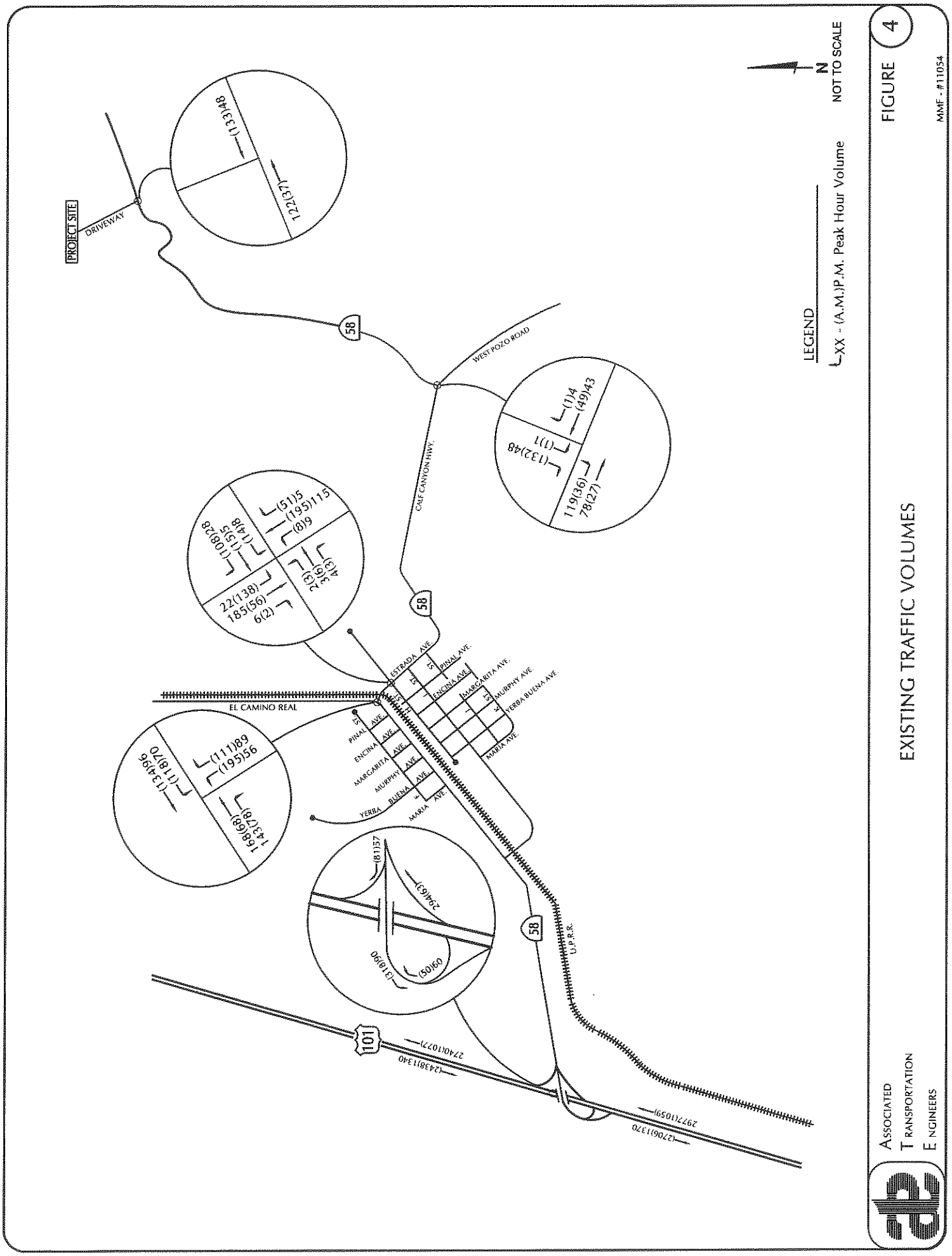
Associated Transportation Engineers


PROJECT SITE
DRIVEWAY
(133)48
(221)37
58
WEST POZO ROAD
CALF CANYON HWY.
(1)4
(49)43
(1)1
(132)48
119(36)
78(27)
(51)5
(195)115
6(8)
(108)28
(15)5
(14)8
22(138)
185(56)
6(2)
2(3)
4(3)
EL CAMINO REAL
ESTRADA AVE.
PINAL AVE.
ENCINA AVE.
MARGARITA AVE.
MURPHY AVE.
YERBA BUENA AVE.
MARIA AVE.
(134)96
(118)70
(111)89
(195)56
168(68)
143(78)
(81)57
294(63)
(31)90
(50)50
101
(2438)1340
2740(1077)
(2706)1370
2977(1059)
U.P.R.R.
LEGEND
XX - (A.M.)P.M. Peak Hour Volume
N
NOT TO SCALE
FIGURE 4
EXISTING TRAFFIC VOLUMES
MMF - #11054
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TRANSPORTATION
ENGINEERS

Table 3
Existing Levels of Service

Intersection	Delay/LOS(a)	
	A.M. Peak Hour	P.M. Peak Hour
Estrada Ave/El Camino Real		
WB Left + Thru	4.1 Sec./LOS A	3.8 Sec./LOS A
NB Approach	19.7 Sec./LOS C	12.7 Sec./LOS B
Estrada Ave/H St		
EB Approach	15.2 Sec./LOS C	11.0 Sec./LOS B
WB Approach	12.5 Sec./LOS B	10.2 Sec./LOS B
NB Approach	0.3 Sec./LOS A	0.6 Sec./LOS A
SB Approach	6.1 Sec./LOS A	0.9 Sec./LOS A
W Pozo Rd/Calf Canyon Hwy		
EB Left + Thru	4.6 Sec./LOS A	6.2 Sec./LOS A
SB Approach	9.3 Sec./LOS A	9.3 Sec./LOS A
Calf Canyon Hwy/Project Driveway		
EB Left + Thru	NA	NA
SB Approach	NA	NA

TWSC = Two-Way Stop Control.

As shown, all of the study intersections are currently operating at or above the appropriate adopted level of service standard in the Existing conditions scenario.

ATE Peer Review. The TPG Study used the operations method outlined in the Highway Capacity Manual to calculate the Existing levels of service, which is the method recommended by the County and Caltrans.

ATE reviewed the input variables used in the level of service calculations (traffic controls, lane geometry, peak hour factors, etc.) and found that the assumptions represent the existing conditions observed in the field. In addition, ATE performed a field review and collected traffic counts at the Estrada Ave/El Camino Real intersection in June 2011. Vehicle delays and queues were measured in order to verify the level of service information presented in the TPG Study. The field measured delays for the northbound approach averaged 17.3 seconds (LOS C) during the A.M. peak period and 12.1 seconds (LOS B) during the P.M. peak period, which match the delays/levels of service presented in the TPG Study (see Table 3 for delays presented in the TPG Study).

It is important to note that the levels of service presented in the TPG Study represent the peak 15-minute periods within the A.M. and P.M. peak hours periods through application of "Peak Hour Factors". Peak hour factors are applied to the 1-hour volumes to simulate traffic flows, vehicle delays, and operations experienced during the highest 15-minute period within the peak hour. Thus, the traffic analyses provided in the TPG Study focus on the peak

15-minute period within the A.M. and P.M. peak hour periods (peak hour factors are applied in all scenarios in the TPG Study).

ATE Supplemental Analysis - U.S. 101/SR 58 Levels of Service. As noted, the U.S. 101/SR 58 interchange was not analyzed in the TPG Study. The County and Caltrans agreed that the traffic analysis should include operational analyses of the U.S. 101 mainline and the merge/diverge/weave movements at the U.S. 101/SR ramp connections. ATE collected A.M. and P.M. peak hour traffic volumes on U.S. 101 and on the SR 58 ramps on Wednesday, September 7, 2011 for the supplemental analysis (Figure 4 shows the Existing traffic volumes and count data is contained in the Technical Appendix).

The operational analysis for the U.S. 101 mainline and SR 58 ramp junctions were assessed using the methods outlined in the Highway Capacity Manual. The performance of U.S. 101 can be characterized by three measures: density in passenger cars per mile per lane (pc/mi/ln), average speed in miles per hour (mph), and the ratio of volume flow rate to capacity (v/c). Because speed is constant though a broad range of flows and the v/c ratio is not directly discernible to road users, the performance measure used to rate levels of service is density. U.S. 101 operations are also influenced by vehicles merging onto the freeway from on-ramps and vehicles diverging from the freeway to off-ramps. The action of merging vehicles entering the freeway traffic stream can create turbulence in the vicinity of the on-ramp/freeway junction and approaching vehicles move toward the left lane to avoid the turbulence. Similarly, vehicles exiting the freeway traffic stream can create turbulence in the vicinity of the off-ramp by merging into the right lane and other freeway vehicles move to the left lane to avoid the turbulence in the diverge area. Similar to freeway segments, the performance measure is the density (pc/mi/ln) of traffic in the merge and diverge areas; or where the off-ramp demand exceeds the off-ramp capacity.

The U.S. 101/SR 58 interchange is a free-flow design (stop signs and/or traffic signals do not control the ramp/local street intersections). Traffic volumes are relatively light on the ramp system, ranging from 50 to 318 vehicles per hour during the peak hour period (see Figure 4), which are well within the capacities of the ramps. Table 4 shows the Existing A.M. and P.M. peak hour levels of service for U.S. 101 and the merge/diverge areas (level of service calculation worksheets are contained in the Technical Appendix for reference).

The operational analysis shows that the U.S. 101 mainline segments and the ramp merge/diverge areas operate at LOS D or better during the peak hour periods. The Transportation Concept Reports prepared for U.S. 101 by Caltrans shows LOS D as the target level of service for U.S. 101;[5] and the Transportation Planning Fact Sheet for SR 58 shows LOS E as the target level of service for SR 58. Therefore, the Existing traffic conditions do not exceed the Caltrans LOS standards.

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5 Transportation Concept Report for U.S. Route 101 in Caltrans District 5, California Department of Transportation, District 5, October 2001.

Table 4
Existing Levels of Service - U.S. 101/SR 58 Interchange

Mainline or Ramp	Time Period	Lanes	Operations(a)	
			Density	LOS
Mainline Segment				
U.S. 101 NB n/o SR 58	A.M. Peak P.M. Peak	2	9.1 24.1	LOS A LOS C
U.S. 101 NB s/o SR 58	A.M. Peak P.M. Peak	2	9.0 26.8	LOS A LOS D
U.S. 101 SB n/o SR 58	A.M. Peak P.M. Peak	2	21.0 11.4	LOS C LOS B
U.S. 101 SB s/o SR 58	A.M. Peak P.M. Peak	2	23.7 11.7	LOS C LOS B
Ramp Junction				
SR 58 NB On Ramp	A.M. Peak P.M. Peak	1	14.2 29.7	LOS B LOS D
SR 58 NB Off Ramp	A.M. Peak P.M. Peak	1	15.1 34.8	LOS B LOS D
SR 58 SB On Ramp	A.M. Peak P.M. Peak	1	29.2 16.9	LOS D LOS B
SR 58 SB Off Ramp	A.M. Peak P.M. Peak	1	29.3 18.0	LOS D LOS B

(a) Density = passenger car equivalents per lane per mile. LOS based on Density.

ATE Supplemental Analysis - U.S. 101/SR 58 Accident Rates. The County and Caltrans agreed that the traffic analysis should include a review of accident rates at the U.S. 101/SR 58 interchange. Caltrans provided accident histories for the 3-year period between August 1, 2007 and July 31, 2010 (accident data contained in the Technical Appendix for reference). The accident rates for the ramps that comprise the U.S. 101/SR 58 interchange are shown in Table 5.

As shown, the accident rates are below the State average, except for the SR 58 Southbound On-Ramp to U.S. 101. Review of the data did not find a pattern of accidents. There were 2 accidents on the SR 58 Southbound On-Ramp to U.S. 101 during the 3-year period. One accident involved a single vehicle hitting a fixed object (e.g. sign pole, tree) and the other accident was a rear-end collision.

Table 5
U.S. 101/SR 58 Accident Rates

Facility	Accident Rates	
	Actual	State Average
SR 58 Southbound On-Ramp to U.S. 101	0.99	0.35
SR 58 Southbound Off-Ramp from U.S. 101	0.00	1.10
SR 58 Northbound On-Ramp to U.S. 101	0.00	0.30
SR 58 Northbound Off-Ramp from U.S. 101	0.00	0.35

Accident rates expressed as # accidents per million vehicle miles.

ATE Supplemental Analysis - Park-And-Ride Lot. The County and Caltrans agreed that the traffic analysis should include a review of operations at the park-and-ride lot located along the south side of SR 58 just east of U.S. 101. Operations at the park-and-ride lot were assessed by determining if sufficient gaps are available in the SR 58 traffic stream for vehicles to enter and exit the park-and-ride. Traffic counts were collected during the A.M. and P.M. commuter periods at the park-and-ride lot. Gap analysis was performed using HCM procedures (worksheets are contained in the Technical Appendix). The analysis found minimal delays for vehicles entering/exiting the park-and-ride lot during the A.M. and P.M. peak commuter periods, indicating that gaps are sufficient for turning into and out of the lot. Delays are less than 10 seconds for vehicles entering the lot and less than 15 seconds for vehicles leaving the lot. The field review determined that the sight distances are adequate for vehicles to enter/exit the lot. No operational issues were observed at the park-and-ride lot.

TPG Study - Signal Warrants

Peak Hour signal warrants were also prepared for the following three (3) unsignalized intersection:

- *Estrada Avenue at El Camino Real*
- *Estrada Avenue at H Street*
- *W Pozo Road at Calf Canyon Road*

Based on the Peak Hour signal warrants, a traffic signal is currently warranted at the Estrada Avenue at El Camino Real intersection in the Existing conditions scenario. The remaining study intersections do not currently meet the Peak Hour signal warrant. These warrant analyses are limited to the peak hour volume warrant only and other conditions may exist which meet other traffic signal warrants. (Peak hour warrant analysis is included in Appendix H)

ATE Peer Review. The TPG Study incorrectly used the Peak Hour signal warrant to evaluated the need for traffic signals. Since the intersection is under the jurisdiction of Caltrans (SR 58 is a State facility), Caltrans will be required to make the determination for installing traffic signals. The Caltrans Peak Hour signal warrant clearly states, "The Peak Hour signal warrant is intended for use at a location where traffic conditions are such that for a minimum of 1 hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street...This signal warrant shall be applied only in unusual cases, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time." Thus, Caltrans will not allow installation of traffic signals based on the Peak Hour warrant being satisfied.

ATE Supplemental Analysis - Signal Warrants. ATE prepared a signal warrant analysis for the Estrada Avenue/El Camino Real intersection using the warrant criteria contained in the Manual of Uniform Traffic Control Devices (MUTCD), California Supplement, Caltrans, January 2010. Caltrans has 8 warrants to determine the need for traffic signal control. ATE collected 24-hour traffic volumes at the intersection, along with pedestrian and bicycle counts, on Wednesday, September 7, 2011 (note that it was a regular school day for the adjacent Santa Margarita Elementary School). Table 6 summarizes the results of the signal warrant analysis prepared by ATE for Existing conditions (traffic counts data and the signal warrant worksheets are contained in the Technical Appendix for reference).

Table 6
Estrada Avenue/El Camino Real Signal Warrants - Existing Conditions

Warrant #	Type	Warrant Satisfied
1	Eight-Hour Vehicular Volume	NO
2	Four-Hour Vehicular Volume	NO
3	Peak Hour	NA(a)
4	Pedestrian Volume	NO
5	School Crossing	NO
6	Coordinated Signal System	NA(b)
7	Crash Experience Warrant	NO
8	Roadway Network	NO

(a) Peak Hour Warrant not applicable.
(b) Coordinated Signal System not applicable.

As shown, the Existing conditions at the intersection do not meet the minimum criteria for consideration of traffic signals. Vehicular volumes are well below the minimum criteria. There were 0 pedestrians and 1 bicyclist crossing the intersection during the A.M. peak period at the beginning of the Santa Margarita Elementary School day; and 3 pedestrians and 0 bicyclists crossing the intersection during the P.M. peak period at the end of the school day. The pedestrian/bicycle volumes recorded at the intersection are also well below the

minimum criteria for consideration of traffic signals. Similarly, the accident data provided by Caltrans (copy in Technical Appendix) shows that there were 0 accidents during the 3-year period between June 1, 2007, and May 31, 2010. Thus, the accident history is below the minimum criteria for consideration of traffic signal (minimum criteria = 5 or more correctable accidents per year).

TPG Study - Project Trip Generation

The Project trip generation information was developed from the production and employee information provided by the applicant. Table 7 shows the projected number of daily, A.M. and P.M. peak hour trips that would be generated by the Project. (Details of the Project trip generation calculations are included in Appendix B)

Table 7
Project Trip Generation

Trip Type	Daily Trips(a)	A.M. Peak Hour			P.M. Peak Hour		
		Inbound	Outbound	Total	Inbound	Outbound	Total
Employees	10	5	0	5	0	5	5
Trucks	198	14	13	27	11	11	22
Total	208	19	13	32	11	16	27

(a) Daily trip ends (1-directional).

ATE Peer Review-Supplemental Analysis. The trip generation methodology used in the TGP study is reasonable. However, the project team decided that an additional 75 truck trips per day should be included in the analysis to account for anticipated deliveries of concrete material for recycling. Table 8 shows the revised number of daily, A.M. and P.M. peak hour trips for the Project.

Table 8
Revised Project Trip Generation

Trip Type	Daily Trips(a)	A.M. Peak Hour			P.M. Peak Hour		
		Inbound	Outbound	Total	Inbound	Outbound	Total
Employees	10	5	0	5	0	5	5
Trucks	273	19	19	38	15	15	30
Total	283	24	19	43	15	20	35

(a) Daily trip ends (1-directional).

TPG Study - Project Trip Distribution

Trip distribution for the Project trips was based on client provided information. The majority of Project trips (employees and trucks) are projected to travel between U.S. 101 and the Project site. The Project's market will primarily be south of Santa Margarita and U.S. 101 is the main north-south corridor in the area. Approximately 20% of project trips are shown traveling outside the projected route (north on El Camino Real, east on W Pozo Road, and north on Calf Canyon Highway). Using this trip distribution, all Project trips travel through the study intersections.

ATE Peer Review-Supplemental Analysis. The trip distribution pattern is reasonable. The traffic assignment shows 90% of project-generated trips distributed to the Santa Margarita street network. Figure 5 shows the trip distribution pattern and assignment of the revised trip generation estimates.

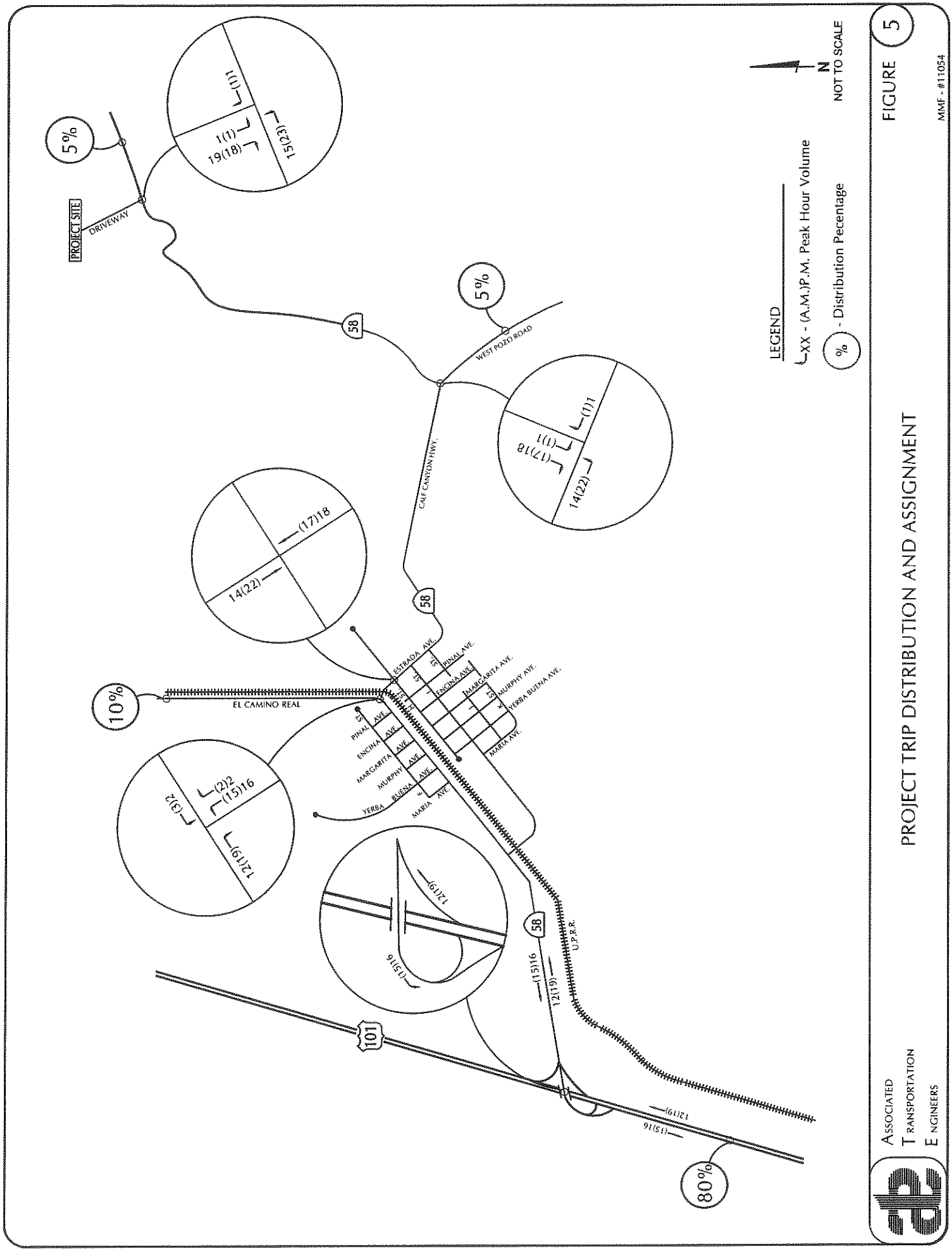
EXISTING + PROJECT CONDITIONS

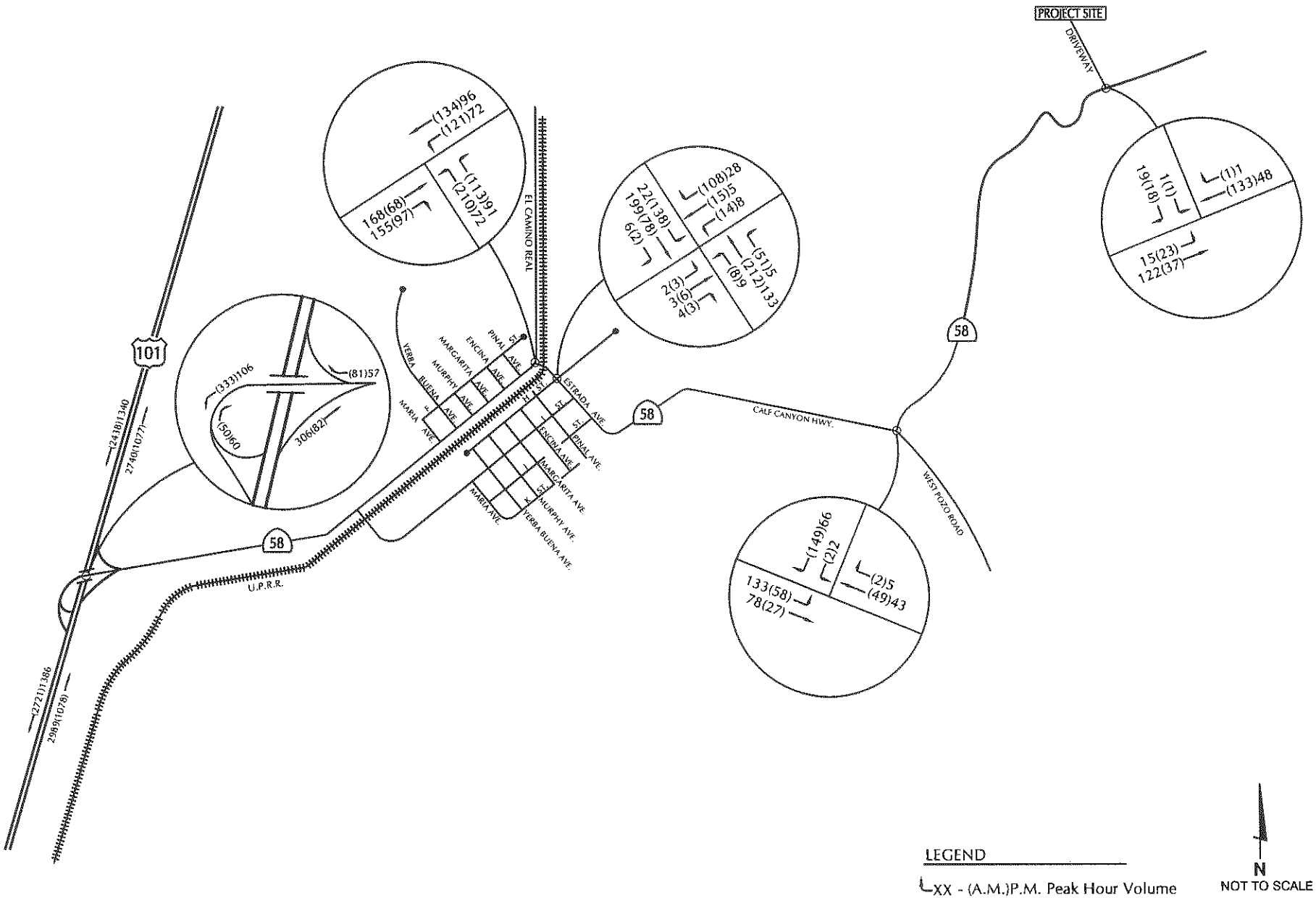
TPG Study - Levels of Service

The Existing + Project level of service analysis in the TPG Study is no longer valid given the change to the Project trip generation forecasts.

ATE Supplemental Analysis - Levels of Service. ATE calculated Existing + Project levels of service for study-area intersections assuming the revised trip generation estimates. Existing + Project are shown on Figure 6 and the Existing + Project levels of service are presented in Table 9.

As shown, the study-area intersections are forecast to operate at LOS C or better under Existing + Project conditions. Since LOS C meets County and Caltrans standards, the Project would not significantly impact levels of service at the study-area intersections.


PROJECT SITE
DRIVEWAY
5%
1(1)
19(18)
1(1)
15(23)
58
WEST POZO ROAD
5%
CALF CANYON HWY.
1(1)
(17)18
(1)1
14(22)
(17)18
14(22)
58
ESTRADA AVE.
PINAL AVE.
ENCINA AVE.
MARGARITA AVE.
MURPHY AVE.
YERBA BUENA AVE.
MARIA AVE.
10%
EL CAMINO REAL
PINAL AVE.
ENCINA AVE.
MARGARITA AVE.
MURPHY AVE.
YERBA BUENA AVE.
MARIA AVE.
(2)2
(15)16
(3)2
12(19)
12(19)
(15)16
58
(15)16
12(19)
U.P.R.R.
101
12(19)
(15)16
80%
N
NOT TO SCALE
LEGEND
XX - (A.M.)P.M. Peak Hour Volume
% - Distribution Pecentage
FIGURE 5
MMF - #11054
PROJECT TRIP DISTRIBUTION AND ASSIGNMENT
ASSOCIATED TRANSPORTATION ENGINEERS



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ENGINEERS

EXISTING + PROJECT TRAFFIC VOLUMES

FIGURE 6

MMF - #11054

Table 9
Existing + Project Levels of Service

Intersection	Delay/LOS(a)	
	A.M. Peak Hour	P.M. Peak Hour
Estrada Ave/El Camino Real		
WB Left + Thru	4.2 Sec./LOS A	3.9 Sec./LOS A
NB Approach	22.2 Sec./LOS C	13.4 Sec./LOS B
Estrada Ave/H St		
EB Approach	15.9 Sec./LOS C	11.2 Sec./LOS B
WB Approach	12.9 Sec./LOS B	10.3 Sec./LOS B
NB Approach	0.3 Sec./LOS A	0.5 Sec./LOS A
SB Approach	5.6 Sec./LOS A	0.9 Sec./LOS A
W Pozo Rd/Calf Canyon Hwy		
EB Left + Thru	5.7 Sec./LOS A	6.7 Sec./LOS A
SB Approach	9.4 Sec./LOS A	10.1 Sec./LOS B
Calf Canyon Hwy/Project Driveway		
EB Left + Thru	3.0 Sec./LOS A	0.9 Sec./LOS A
SB Approach	9.2 Sec./LOS A	8.7 Sec./LOS A

ATE Supplemental Analysis - SR 58 Truck Impacts. About 5% of Project traffic would be to/from the east via SR 58, which equates to about 1 inbound truck and 1 outbound truck per hour. The minor amount of traffic added to this segment would not affect traffic operations. Similarly, about 5% of Project traffic would be to/from the east via Pozo Road (1 inbound truck and 1 outbound truck per hour) and not affect operations on that roadway segment.

Most of the Project traffic would use SR 58 west of Pozo Road (90%). The Project would add about 12 inbound trucks and 12 outbound trucks per hour along the segment of SR 58 between El Camino Real and Pozo Road. As discussed, SR 58 from El Camino Real to the Project site is a two-lane roadway with 12-foot travel lanes and 2- to 4-foot shoulders. SR 58 has a 30-foot KPRA Advisory from El Camino Real to the San Luis Obispo/Kern County line. It is recommended that the Project use double type tractor-trailer trucks along SR 58. Field review found that double trailers can maneuver the SR 58 turns without crossing the centerline.

The additional truck traffic would not significantly affect traffic operations along the SR 58 route between the site and U.S. 101. There is a crest vertical curve south of H Street in the vicinity of the Santa Margarita Elementary School. Truck drivers have a higher eye height than automobile drivers and can view the crosswalk from approximately 350 feet, which is a safe stopping sight distance for 40 MPH. SR 58 crosses the UPRR tracks approximately 100 feet east of the El Camino Real intersection (edge of traveled way to centerline of tracks).

There is approximately 75 feet between the edge of traveled way to the crossing gates, which would accommodate one truck with a set of double trailers.

For the SR 58 segment between Estrada Avenue and U.S. 101, the Project would add about 11 inbound trucks and 11 outbound trucks per hour. This segment is relatively flat and straight with standard travel lanes and paved shoulders. Caltrans count data shows that this segment carries about 7,900 daily trips. The Project's addition of 226 daily trips would not significantly impact traffic operation on this segment of SR 58 between Estrada Avenue and U.S. Highway 101.

ATE Supplemental Analysis - U.S. 101/SR 58 Levels of Service. According to the Project trip distribution analysis, 80% of project-generated traffic would use U.S. 101 and the Project's market will primarily be south of Santa Margarita. Existing + Project level of service were calculated assuming that all U.S. 101 trips would be to/from the south on U.S. 101. Table 10 shows the Existing + Project A.M. and P.M. peak hour levels of service for U.S. 101 and the merge/diverge areas for this scenario.

Table 10
Existing + Project Levels of Service - U.S. 101/SR 58 - Project Trips To/From South

Mainline or Ramp	Time Period	Lanes	Operations(a)	
			Density	LOS
Mainline Segment				
U.S. 101 NB n/o SR 58	A.M. Peak P.M. Peak	2	9.1 24.1	LOS A LOS C
U.S. 101 NB s/o SR 58	A.M. Peak P.M. Peak	2	9.2 27.0	LOS A LOS D
U.S. 101 SB n/o SR 58	A.M. Peak P.M. Peak	2	21.0 11.4	LOS C LOS B
U.S. 101 SB s/o SR 58	A.M. Peak P.M. Peak	2	23.9 11.8	LOS C LOS B
Ramp Junction				
SR 58 NB On Ramp	A.M. Peak P.M. Peak	1	14.2 29.7	LOS B LOS D
SR 58 NB Off Ramp	A.M. Peak P.M. Peak	1	15.1 34.8	LOS B LOS D
SR 58 SB On Ramp	A.M. Peak P.M. Peak	1	29.4 17.1	LOS D LOS B
SR 58 SB Off Ramp	A.M. Peak P.M. Peak	1	29.3 18.0	LOS D LOS B

(a) Density = passenger car equivalents per lane per mile. LOS based on Density.

The Project would add 34 A.M. trips and 28 P.M. trips to the U.S. 101/SR 58 interchange and adjacent freeway facilities. The operational analysis shows that the U.S. 101 mainline segments and the ramp merge/diverge areas are forecast to operate at LOS D or better during the peak hour periods under Existing + Project conditions, which meets Caltrans' LOS D standard for U.S. 101. By comparison to Existing Condition (see Table 4), levels of service would not degrade as a result of the Project. Thus, the Project would not significantly impact the U.S. 101/SR 58 interchange or U.S. 101 mainline operations.

Speed studies were also taken at the SR 58 southbound on-ramp where vehicles are merging onto the U.S. 101 mainline (data contained in Technical Appendix for reference). The speed surveys were taken for passenger cars and trucks in order to determine if slow moving trucks affect operations when merging onto the freeway. The speed surveys show an average speed of 59.1 MPH for passenger vehicles merging onto the freeway and 51.1 MPH for large trucks merging onto the freeway. The field observation and speeds survey found that large trucks merging onto the freeway do not significantly affect mainline operations. These results are consistent with the operational analysis performed using the Highway Capacity Manual (see Table 10), which show that the ramp junction operates at LOS D during the A.M. peak hour period and LOS B during the P.M. peak hour period with Existing + Project traffic - which meets the Caltrans LOS D standard.

Existing + Project level of service were also calculated assuming that all Project trips using U.S. 101 would be to/from the north in order to address the potential for trucks traveling to those market areas. Table 11 shows the Existing + Project A.M. and P.M. peak hour levels of service for U.S. 101 and the merge/diverge areas for this scenario. The operational analysis shows that the U.S. 101 mainline segments and the ramp merge/diverge areas are forecast to operate at LOS D or better during the peak hour periods under Existing + Project conditions assuming all Project trips using U.S. 101 are to/from the north. By comparison to Existing Condition (see Table 4), levels of service would not degrade as a result of the Project. Thus, the Project would not significantly impact the U.S. 101/SR 58 interchange and mainline operations north of SR 58 since LOS D meets the Caltrans standard for U.S. 101.

Table 11
Existing + Project Levels of Service - U.S. 101/SR 58 - Project Trips To/From North

Mainline or Ramp	Time Period	Lanes	Operations(a)	
			Density	LOS
Mainline Segment				
U.S. 101 NB n/o SR 58	A.M. Peak P.M. Peak	2	9.3 24.3	LOS A LOS C
U.S. 101 NB s/o SR 58	A.M. Peak P.M. Peak	2	9.0 26.8	LOS A LOS D
U.S. 101 SB n/o SR 58	A.M. Peak P.M. Peak	2	21.2 11.5	LOS C LOS B
U.S. 101 SB s/o SR 58	A.M. Peak P.M. Peak	2	23.7 11.7	LOS C LOS B
Ramp Junction				
SR 58 NB On Ramp	A.M. Peak P.M. Peak	1	14.3 29.8	LOS B LOS D
SR 58 NB Off Ramp	A.M. Peak P.M. Peak	1	15.1 34.8	LOS B LOS D
SR 58 SB On Ramp	A.M. Peak P.M. Peak	1	29.2 16.9	LOS D LOS B
SR 58 SB Off Ramp	A.M. Peak P.M. Peak	1	29.3 18.0	LOS D LOS B

(a) Density = passenger car equivalents per lane per mile. LOS based on Density.

TPG Study - Project Access

The Project is proposing to construct a single access point to be used by trucks and employees. This access point will be located east of the Salinas River bridge and west of Park Hill Road. The driveway will be located between two (2) existing residential homes and out-buildings currently located on the north side of Calf Canyon Highway. Due to the relatively low volume of Project trips, low background traffic on Calf Canyon Highway, and acceptable levels of service, a separate left-turn lane is not necessary for acceptable operation of the Project Driveway. However, the Project is proposing to construct an eastbound left-turn lane on Calf Canyon Highway at the project driveway. Based on the projected peak hour eastbound left-turn volumes at this location, the turn lane should provide sufficient storage to accommodate 1 truck and 1 passenger car.[6]

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[6] Highway Design Manual, Caltrans, September 1, 2006, Section 405.2(2)(e).

ATE Peer Review. ATE determined that sight distances along SR 58 at the site access driveway are sufficient for 65 MPH traffic, which exceeds the minimums required by Caltrans for SR 58 at the site. In general, traffic on this section of SR 58 is light and the sight distances are good. While the separate left-turn lane is not necessary for acceptable operation of the Project Driveway, it will improve operations for access to the site as well as for traffic traveling along SR 58.

TPG Study - Signal Warrants

Peak Hour signal warrants were again prepared for the following three (3) unsignalized intersection:

- *Estrada Avenue at El Camino Real*
- *Estrada Avenue at H Street*
- *W Pozo Road at Calf Canyon Road*

Signal warrants were not prepared for the Calf Canyon Highway at Project Driveway intersection since the low projected Project Driveway volumes will not satisfy any part of the Peak Hour signal warrant. Based on the Peak Hour signal warrants, a traffic signal is still warranted at the Estrada Avenue at El Camino Real intersection in the Existing Plus Project conditions scenario. The remaining study intersections are not projected to meet the Peak Hour signal warrant. These warrant analyses are limited to the peak hour volume warrant only and other conditions may exist which meet other traffic signal warrants. (Peak hour warrant analysis is included in Appendix H)

ATE Supplemental Analysis - Estrada Avenue/El Camino Real Signal Warrants. As discussed, Peak Hour warrants are not applicable to the Estrada Avenue/El Camino Real intersection. The signal warrants prepared by ATE found that the Existing traffic volumes are well below the warrant criteria. The Existing + Project traffic volumes would also be below the minimums required for consideration of traffic signals. The Project would add 255 trips to the intersection through the day, with 39 trips added during the A.M. peak hour and 32 trips added during the P.M. peak hour).

The project team decided to evaluate the need for traffic signals assuming the additional traffic generated by approved projects in the vicinity of the intersection. County staff provided a list of approved projects for this scenario (list of approved projects is included in the Technical Appendix). The results of the analysis found that the 4-hour volume warrant would be met under Existing + Approved Projects + Project conditions (signal warrant worksheets are contained in the Technical Appendix).

2030 NO PROJECT CONDITIONS

TPG Study - Traffic Forecasts

The 2030 No Project traffic conditions were developed using a historic growth rate calculated using traffic volumes along SR 58 through the study area. Based on Caltrans

counts from the past 5 years, SR 58 has experienced 1.88% growth per year. This growth rate was applied to the Existing traffic volumes to develop the "base" 2030 traffic volumes. In addition to the historic growth, projected traffic from one (1) approved project was added to the "base" 2030 traffic volumes. The Santa Margarita Ranch development was recently approved to construct 112 single-family dwelling units to be located south of the existing Santa Margarita urban area. The projected trip generation and distribution for this development was taken from the Santa Margarita Ranch Transportation Impact Analysis[7]. The approved portion of the Santa Margarita Ranch development is referred to as the Agricultural Residential Cluster Subdivision (ARCS). Additionally, this project has proposed a Future Development Plan (FDP) which will construct and additional 431 homes as well as several other uses including a golf course, wineries, churches, etc.). The FDP has not been approved by the San Luis Obispo Board of Supervisors and is therefore not included in the 2030 No Project and 2030 Project analyses.

ATE Peer Review. The 2030 No Project traffic forecasts are reasonable. While the applied growth rate is based on Caltrans counts from the past 5 years, traffic growth rates are declining in San Luis Obispo County, as well as California and across the United States, due to the downturn in the economy. Further, the 2030 No Project traffic forecasts were cross-checked with the 2030 forecasts contained in the Santa Margarita Ranch Transportation Impact Analysis. That review found that the TPG Study forecasts are higher than those used in the Santa Margarita Ranch Transportation Impact Analysis (the Santa Margarita Ranch Transportation Impact Analysis used an annual growth factor of 1.4% versus the 1.88% factored used in the TPG Study).

TPG Study - Levels of Service

The 2030 No Project intersection lane configurations, intersection controls, and peak hour traffic volumes are shown on Figure 7. Using the lane configurations and volumes shown on Figure 7, the intersections were analyzed for 2030 No Project levels of service. Table 12 shows the 2030 No Project levels of service for the study intersections (The 2030 No Project intersection levels of service calculations are included in Appendix E).

As shown, the following study intersections, by time period, are projected to operate below the appropriate level of service standard in the 2030 No Project conditions scenario:

- *Estrada Avenue at El Camino Real*
  NB Approach - A.M. and P.M. peak hours
- *Estrada Avenue at H Street*
  EB Approach - A.M. peak hour

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[7] Santa Margarita Ranch Transportation Impact Analysis, Fehr and Peers, December 2006.

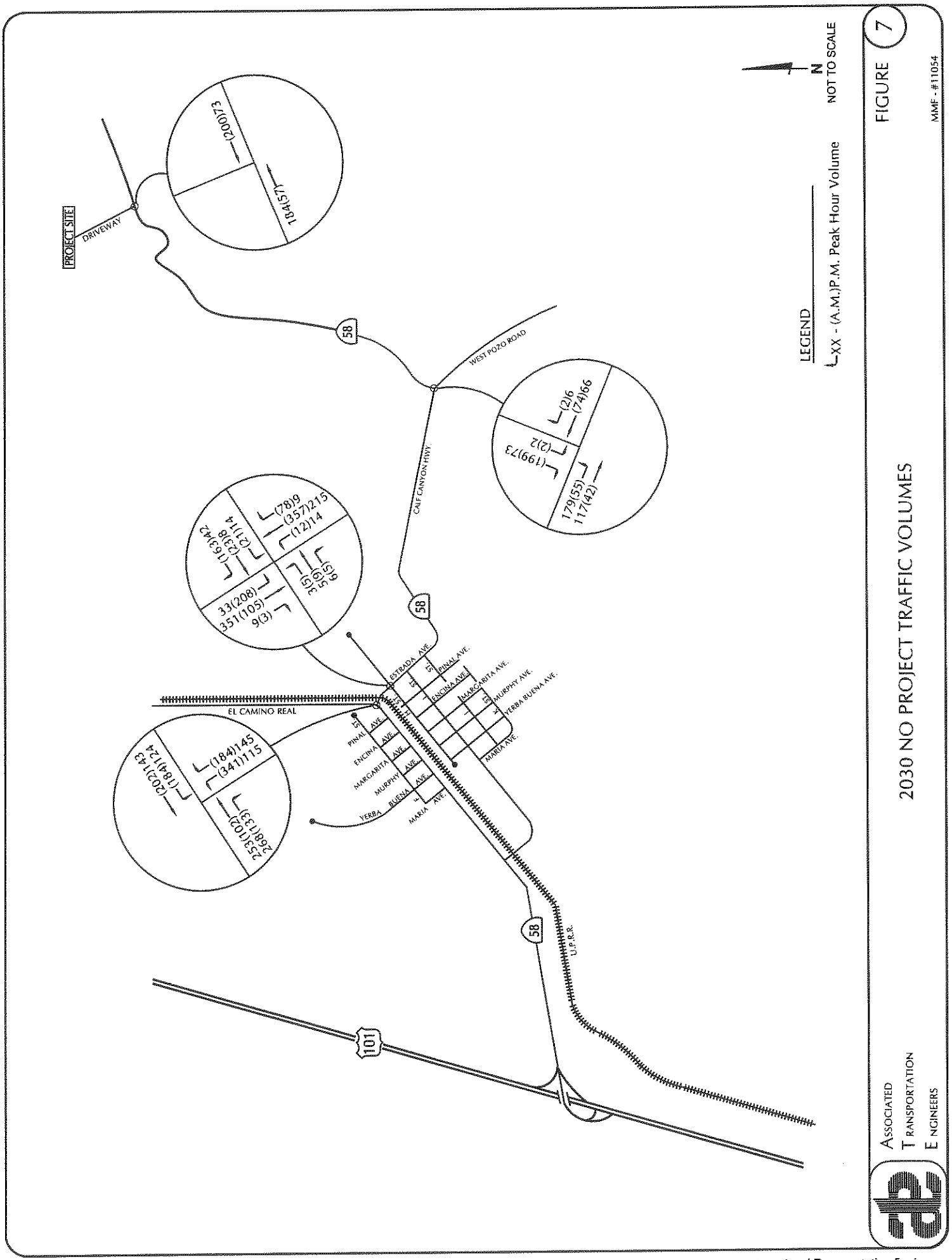

PROJECT SITE
DRIVEWAY
(200)73
184(57)
58
WEST POZO ROAD
CALF CANYON HWY.
(2)6
(74)66
(199)73
(2)2
179(55)
117(42)
(78)9
(357)215
(12)14
(163)42
(23)18
(21)14
33(208)
351(105)
9(3)
6(5)
5(6)
3(5)
ESTRADA AVE.
PINAL AVE.
ENCINA AVE.
MARGARITA AVE.
MURPHY AVE.
YERBA BUENA AVE.
MARIA AVE.
EL CAMINO REAL
(184)145
(341)115
(202)143
(184)124
253(102)
268(133)
101
U.P.R.R.
LEGEND
XX - (A.M.)P.M. Peak Hour Volume
N
NOT TO SCALE
FIGURE 7
2030 NO PROJECT TRAFFIC VOLUMES
MMF - #11054
ASSOCIATED
TRANSPORTATION
ENGINEERS

Table 12
2030 No Project Levels of Service

Intersection	Delay/LOS(a)	
	A.M. Peak Hour	P.M. Peak Hour
Estrada Ave/El Camino Real		
WB Left + Thru	4.7 Sec./LOS A	5.0 Sec./LOS A
NB Approach	**255.7 Sec./LOS F**	**31.6 Sec./LOS D**
Estrada Ave/H St		
EB Approach	**30.2 Sec./LOS D**	14.4 Sec./LOS B
WB Approach	24.7 Sec./LOS C	12.9 Sec./LOS B
NB Approach	0.3 Sec./LOS A	0.6 Sec./LOS A
SB Approach	6.8 Sec./LOS A	0.9 Sec./LOS A
W Pozo Rd/Calf Canyon Hwy		
EB Left + Thru	4.9 Sec./LOS A	8.1 Sec./LOS A
SB Approach	10.0 Sec./LOS B	12.3 Sec./LOS B
Calf Canyon Hwy/Project Driveway		
EB Left + Thru	NA	NA
SB Approach	NA	NA

ATE Peer Review. The TPG Study correctly calculates delays and levels of service for the study intersections. ATE concurs with the finding that two of the study intersections are forecast to degrade to LOS D, which exceeds the County's LOS C standard for Santa Margarita.

TPG Study - Signal Warrants

Peak Hour signal warrants were again prepared for the following three (3) unsignalized intersection:

- *Estrada Avenue at El Camino Real*
- *Estrada Avenue at H Street*
- *W Pozo Road at Calf Canyon Road*

Signal warrants were not prepared for the Calf Canyon Highway at Project Driveway intersection since the low projected Project Driveway volumes will not satisfy any part of the Peak Hour signal warrant. Based on the Peak Hour signal warrants, a traffic signal is still warranted at the Estrada Avenue at El Camino Real intersection in the 2030 No Project conditions scenario. The Estrada Avenue at H Street intersection is also projected to meet the Peak Hour signal warrant in the 2030 No Project conditions scenario. The remaining study intersection is not projected to meet the Peak Hour signal warrant. These warrant analyses are limited to the peak hour volume warrant only and other conditions may exist which meet other traffic signal warrants.

ATE Peer Review. Since the TPG Study incorrectly used the Peak Hour warrants, ATE prepared a signal warrant analysis using the 2030 No Project traffic forecasts (copy contained in the Technical Appendix). The results show that the Estrada Avenue/El Camino Real intersection would satisfy the 8-hour volume warrants. For the Estrada Avenue/H Street intersection, the side street volumes are well below the 8-hour volume warrant criteria. Thus, signals would not be warranted at the Estrada Avenue/H Street intersection.

2030 + PROJECT CONDITIONS

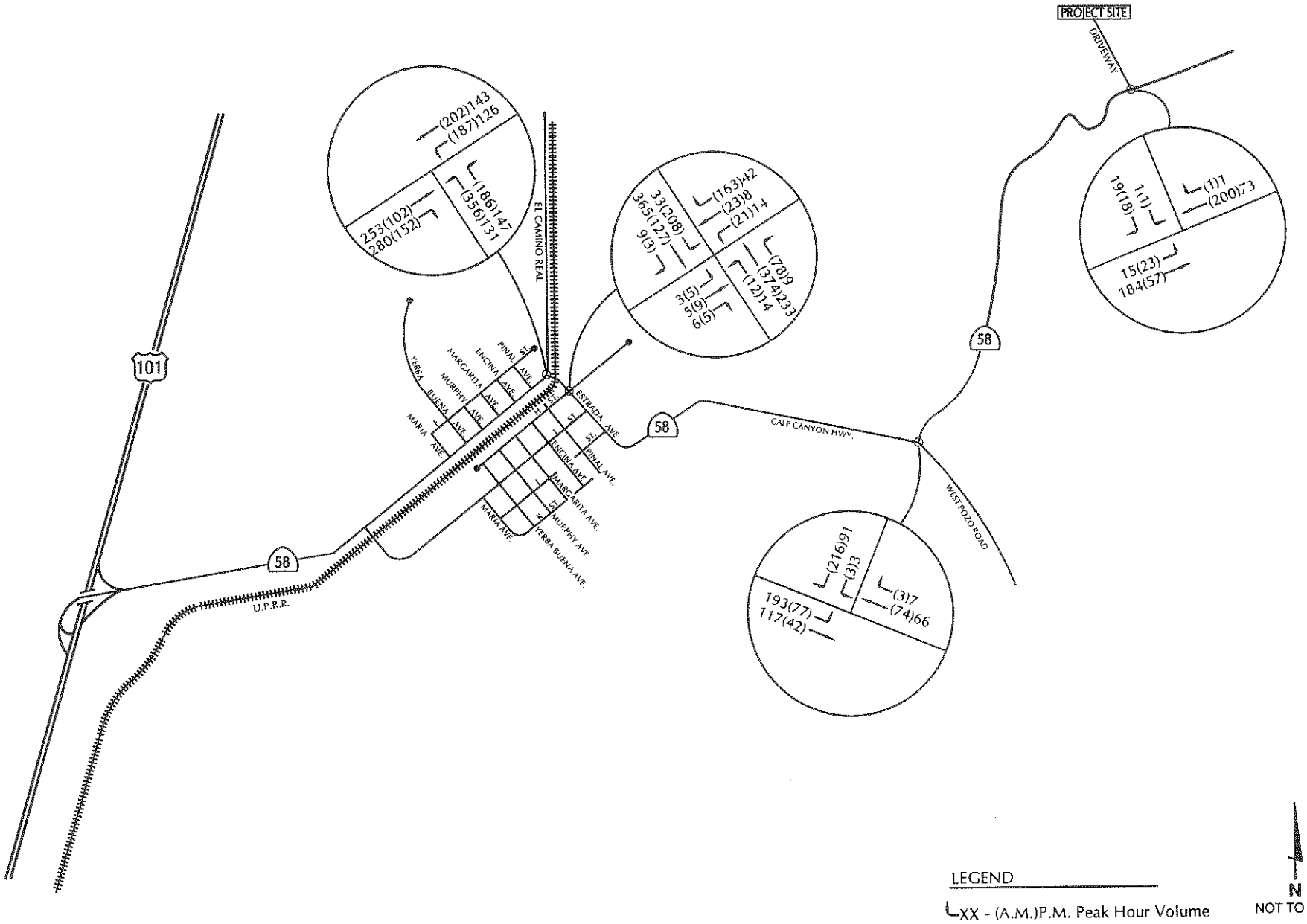
TPG Study - Levels of Service

The 2030 + Project level of service analysis in the TPG Study is no longer valid given the change to the Project trip generation forecasts.

ATE Supplemental Analysis. ATE calculated 2030 + Project levels of service for study-area intersections assuming the revised trip generation estimates. 2030 + Project traffic volumes are shown on Figure 8 and the levels of service are presented in Table 13.

Table 13
2030 + Project Levels of Service

Intersection	Delay/LOS(a)	
	A.M. Peak Hour	P.M. Peak Hour
Estrada Ave/El Camino Real		
WB Left + Thru	4.8 Sec./LOS A	5.1 Sec./LOS A
NB Approach	**302.1 Sec./LOS F**	**38.2 Sec./LOS E**
Estrada Ave/H St		
EB Approach	**32.7 Sec./LOS D**	14.8 Sec./LOS B
WB Approach	**26.9 Sec./LOS D**	13.2 Sec./LOS B
NB Approach	0.3 Sec./LOS A	0.6 Sec./LOS A
SB Approach	6.6 Sec./LOS A	0.9 Sec./LOS A
W Pozo Rd/Calf Canyon Hwy		
EB Left + Thru	5.8 Sec./LOS A	8.8 Sec./LOS A
SB Approach	10.3 Sec./LOS B	15.0 Sec./LOS C
Calf Canyon Hwy/Project Driveway		
EB Left + Thru	2.3 Sec./LOS A	0.6 Sec./LOS A
SB Approach	9.7 Sec./LOS A	8.9 Sec./LOS A



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2030 + PROJECT TRAFFIC VOLUMES

FIGURE 8

MMF - #11054

The result in Table 13 show that two of the study-area intersections are forecast to exceed the County's LOS C standard under 2030 + Project conditions.

- Estrada Avenue at El Camino Real (A.M. and P.M. peak hour)
- Estrada Avenue at H Street (A.M. peak hour)

These are the same locations that are forecast to exceed the County's LOS C standard under 2030 No Project conditions.

TPG Study - Signal Warrants

Peak Hour signal warrants were again prepared for the following three (3) unsignalized intersection:

- *Estrada Avenue at El Camino Real*
- *Estrada Avenue at H Street*
- *W Pozo Road at Calf Canyon Road*

Signal warrants were not prepared for the Calf Canyon Highway at Project Driveway intersection since the low projected Project Driveway volumes will not satisfy any part of the Peak Hour signal warrant. Based on the Peak Hour signal warrants, a traffic signal is still warranted at the Estrada Avenue at El Camino Real and the Estrada Avenue at H Street intersections in the 2030 + Project conditions scenario. The remaining study intersection is not projected to meet the Peak Hour signal warrant. These warrant analyses are limited to the peak hour volume warrant only and other conditions may exist which meet other traffic signal warrants.

ATE Peer Review. The warrants prepared by ATE for the Estrada Avenue/El Camino Real found that signals are warranted for the 2030 No Project scenario. Thus, signals would also by warranted under the 2030 + Project scenario. For the Estrada Avenue/H Street intersection, the side street volumes are forecasted well below the 8-hour volume warrant criteria. Thus, traffic signals are not warranted at the Estrada Avenue/H Street intersection. Additional analyses of the need for traffic signals at the Estrada Avenue/H Street intersection is presented in the ATE Peer Review of Mitigated 2030 + Project conditions below.

MITIGATED 2030 + PROJECT CONDITIONS

TPG Study - Recommended Improvements. The TPG Study includes the following recommended improvements for the 2030 and 2030 + Project impacts to the Estrada Avenue/El Camino Real and Estrada Avenue/H Street intersections.

<u>TPG Study - Estrada Avenue at El Camino Real</u>. The Estrada Avenue at El Camino Real intersection currently meets the Peak Hour signal warrant and is projected to continue to meet the warrant in all study scenarios. Since the intersection is currently operating at acceptable levels of service and is projected to do so in the Existing Plus Project scenarios, the installation of the traffic signal is not recommended. However, the intersection operates

below the level of service standard and continues to meet the Peak Hour signal warrant in the 2030 No Project and 2030 Project scenarios. Although the Project does not cause the level of service failure or trigger the Peak Hour signal warrant, it will contribute to those impacts. The Project may be responsible for paying its fair-share for the proposed improvement.

The proposed installation of a traffic signal for the Estrada Avenue at El Camino Real intersection does not include widening the existing paved sections to accommodate additional lanes/shoulder/etc. since the intersection is projected to operate acceptably with a permitted WB left-turn movement. However, the Salinas River Area Plan and the Santa Margarita Design Plan both call for additional improvements to this intersection. A channelized left-turn lane and installation of bike lanes and sidewalks are both proposed for El Camino Real at this intersection. A landscaped median may or may not be included in this improvement as well. Since these improvements are not currently funded, they are not included in the proposed mitigation.

ATE Peer Review - Estrada Avenue/El Camino Real. The TPG Study incorrectly used the Peak Hour warrants (Caltrans will not allow installation of traffic signals based on the Peak Hour warrant). The signal warrant analysis prepared by ATE found that signals are not warranted for the Existing and Existing + Project scenarios; but are warranted in the Existing + Approved Project + Project, 2030 No Project, and 2030 + Project scenarios. Installation of traffic signals would provide LOS B during the A.M. peak period and LOS A during the P.M. peak period under the 2030 + Project scenario. The Project share of the traffic signal improvement is presented below in the Proportionate Share Percentages section of this report.

TPG Study - Estrada Avenue at H Street. The Estrada Avenue at H Street intersection is projected to operate below the level of service standard and meet the Peak Hour signal warrant in the 2030 No Project and 2030 Project scenarios. The level of service impacts to the Estrada Avenue at H Street intersection occur during the AM peak hour and are due mostly to the SB left-turns and WB right-turns associated with the elementary school dropoff. The following unique criteria apply to this intersection:

- *The majority of the school-associated AM peak hour traffic occurs in a 15-30 minute period. This tends to increase delay for the minor street movements for that short time period, but leaves the remainder of the peak hour with lower impacts.*

- *The level of delay experienced by the minor street movements is somewhat alleviated by a crossing guard located on the north side of the intersection. The crossing guard provides regular breaks in the major street traffic which provides gaps for some minor street movements that would normally not occur during this period.*

- *While the intersection meets the Peak Hour signal warrant, it is unknown whether or not it will meet other signal warrants, now or in the future.*

Additional warrants may not be met which are more paramount to the operation of the intersection than the Peak Hour warrant.

It is suggested that this intersection be monitored and at such time that the intersection level of service falls below the adopted thresholds and/or meets additional signal warrants, that a determination of the improvements be made. Although the Project does not cause the level of service failure or trigger the Peak Hour signal warrant, it will contribute to those impacts. The Project may be responsible for paying its fair-share for any improvements to this intersection.

ATE Peer Review - Estrada Avenue/H Street. The signal warrant analysis prepared by ATE found that traffic volumes are below the minimum criteria for the Existing, Existing + Project, 2030 No Project and 2030 + Project scenarios. As noted, the majority of the school-associated traffic occurs at the start and end of the school day. While morning and afternoon traffic peaks sometime cause queuing on Estrada Avenue, the peak periods last approximately 10-15 minutes just prior to the start and end of the school day. Further, the County has plans to install flashing warning signs adjacent to the intersection to advise motorists of the presence of school children. It is recommended that operations at the intersection be monitored over time to determine if additional traffic controls or changes to the intersection geometry are necessary for orderly flow of vehicular, pedestrian and bicycle traffic.

TPG Study - Proportionate Share Percentages

The Caltrans Proportionate Share Percentage was calculated by taking the Project trips and dividing by the total 2030 + Project volumes minus the Existing volumes for the given intersection. The formula used in calculating the Proportionate Share Percentage is:

Proportionate Share Percentage = Project Trips / 2030 Project Volume - Existing Volume

Table 14 shows the volumes used to calculate the Proportionate Share Percentages and the resulting percentages for intersections that have proposed improvements. The volumes projected to cause the highest proportionate share percentage are shown bolded in Table 14.

Table 14
Proportionate Share Percentages

Intersection	Existing A.M./P.M.	Project A.M./P.M. Trips	2030 + Project A.M./P.M. Trips	Proportionate Share % A.M./P.M.
Estrada Ave/El Camino Real	**704**/621	**28**/23	**1,174**/1,071	**5.96**/5.11
Estrada Ave/H St	599/**392**	28/**23**	1,017/**732**	6.70/**6.76**

ATE Peer Review. The proportionate share calculations presented in the TPG Study are no longer valid given the change to the Project's trip generation. Table 15 shows the revised proportionate share calculations.

Table 15
Proportionate Share Percentages - Revised Trip Generation Estimates

Intersection	Existing A.M./P.M.	Project A.M./P.M. Trips	2030 + Project A.M./P.M. Trips	Proportionate Share % A.M./P.M.
Estrada Ave/El Camino Real	704/622	39/32	1,185/1,080	8.1/7.0
Estrada Ave/H St	599/392	39/32	1,028/741	9.1/9.2

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LAS POLITAS ROCK QUARRY PROJECT
SAN LUIS OBISPO COUNTY, CALIFORNIA

TECHNICAL APPENDIX FOR THE
TRAFFIC IMPACT STUDY PEER REVIEW AND SUPPLEMENTAL ANALYSES

April 24, 2012 **ATE #11054**

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TPG Consulting - Traffic Count Analysis

Supplemental Traffic Counts

Caltrans Accident Data

Supplemental Signal Warrants

Supplemental Level of Service Calculation Worksheets

Supplemental Speed Surveys

Approved Project List

TPG Consulting - Las Pilitas Rock Quarry Traffic Impact Study

MAY 2009

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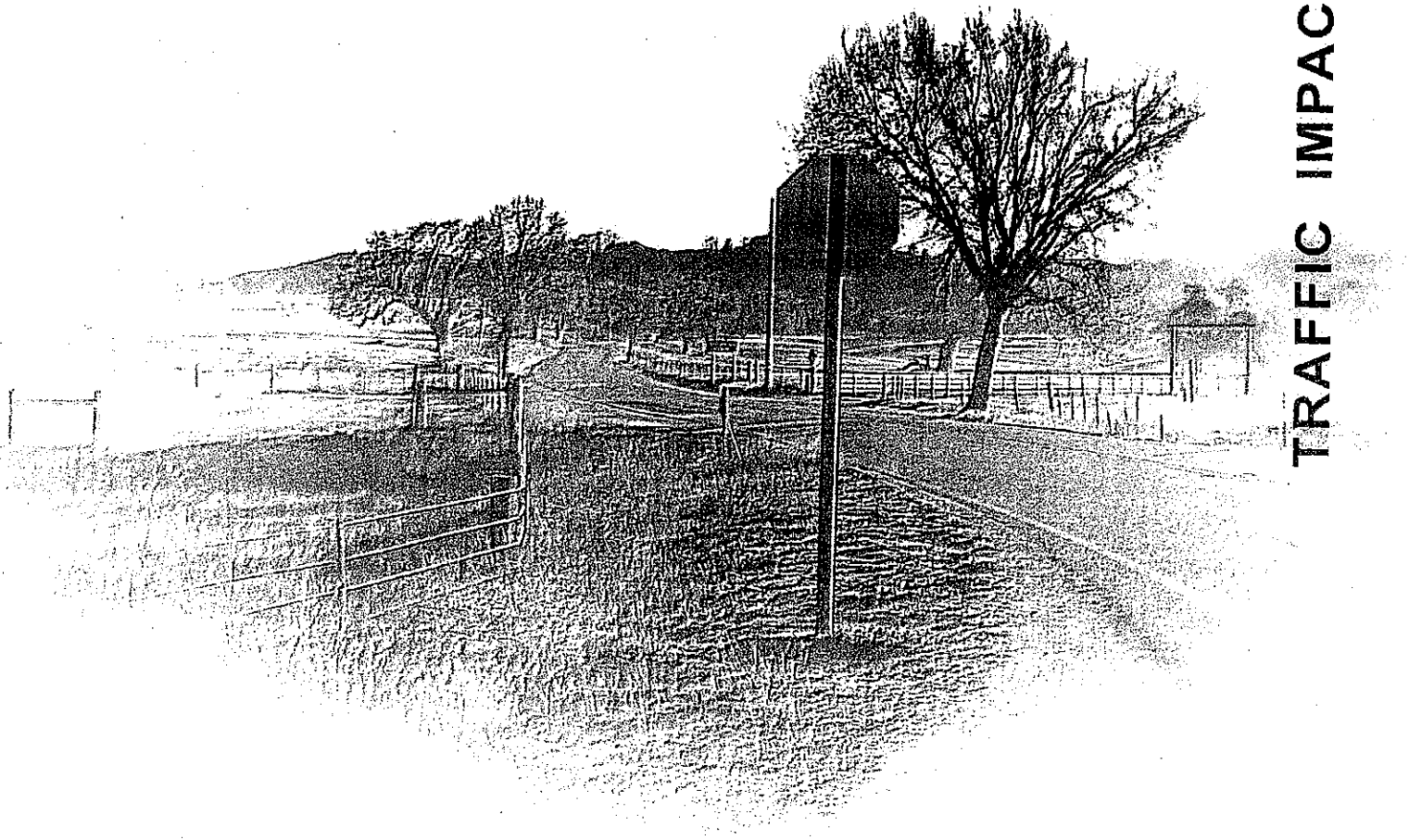
Las Pilitas Rock Quarry

San Luis Obispo County

TRAFFIC IMPACT STUDY



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TRAFFIC IMPACT STUDY

FOR THE

LAS PILITAS ROCK QUARRY

San Luis Obispo County, California

May 2009

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TRAFFIC IMPACT STUDY
FOR THE
LAS PILITAS ROCK QUARRY

INTRODUCTION

This Traffic Impact Study (TIS) was prepared to assess the traffic impacts due to the proposed Las Pilitas Rock Quarry (Project), which will be located on the north side of State Route (SR) 58/Calf Canyon Highway, east of the Salinas River, in San Luis Obispo County. The Project site is currently unoccupied. The proposed Project will produce 495,000 tons per year (tpy) when operating at full capacity. This study evaluates the impacts of the proposed development on adjacent intersection operations and provides an assessment of the Project driveway. Figure 1 shows the Project location.

The Project study area for the analysis of traffic impacts extends from El Camino Real to the Project Driveway along SR 58. This report analyzes four (4) intersections for two (2) time periods (weekday AM and PM peak hours). Unsignalized and signalized intersection levels of service were calculated using *Synchro 7.0* software, which incorporates the *2000 Highway Capacity Manual (HCM 2000)* methodologies. Signal warrants were prepared using the *California Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways*. The analysis methodology used in this report is summarized in Appendix A.

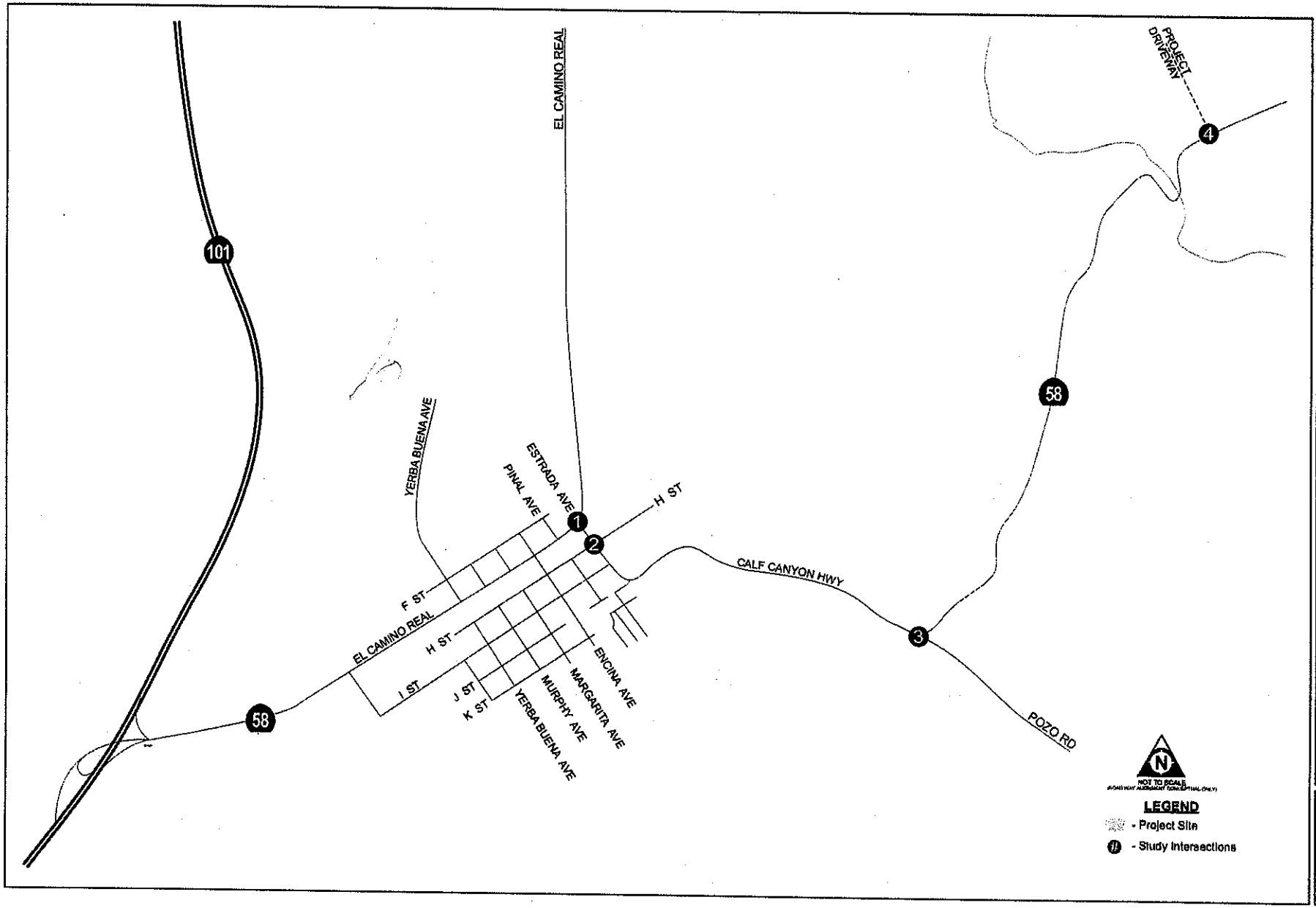
To analyze the traffic impacts resulting from the build out of the Project, the following four (4) scenarios were evaluated:

- Existing (2009) Traffic Conditions
- Existing Plus Project Traffic Conditions
- 2030 No Project Traffic Conditions
- 2030 Project Traffic Conditions
- Mitigated 2030 Project Traffic Conditions

The following intersections were analyzed:

- Estrada Avenue at El Camino Real
- Estrada Avenue at H Street
- W Pozo Road at Calf Canyon Highway
- Project Driveway at Calf Canyon Highway

The SR 101 interchange at El Camino Real was not analyzed in this report. It is the applicant's opinion that the interchange will not likely experience a change in trips due to the operation of the proposed Project. The Project will operate in the same quarry, recycling, and asphalt market as the already operational Hansen Quarry located on El Camino Real, north of Santa Margarita. Hansen already operates trucks through Santa Margarita to the SR 101 interchange. The Project is contending that its own operations will likely remove Hansen trucks at the interchange while replacing those with Project trucks, resulting in a net balance of current "quarry-related" trips through the interchange.



VICINITY MAP

Los Pilitas Rock Quarry
San Marguerita, CA

09-1196

Figure 1

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EXECUTIVE SUMMARY

Table 1 shows the levels of service (LOS) for the study intersections for the various scenarios. Intersections with movements currently operating below or with movements projected to operate below the County of San Luis Obispo or Caltrans' adopted level of service standards are shown in bold in Table 1. The signalized intersection levels of service shown in Table 1 are representative of the whole intersection. Individual intersection movements or approaches may operate above or below the signalized level of service or delay shown in Table 1.

Level of Service Impacts

As shown in Table 1, the following locations, by scenario, are projected to operate below the appropriate adopted level of service standard:

2030 No Project

- Estrada Avenue at El Camino Real
  - NB Approach – AM and PM peak hours
- Estrada Avenue at H Street
  - EB Approach – AM peak hour

2030 Project

- Estrada Avenue at El Camino Real
  - NB Approach – AM and PM peak hours
- Estrada Avenue at H Street
  - EB Approach – AM peak hour
  - WB Approach – AM peak hour

Signal Warrants

Peak Hour signal warrants were prepared for all unsignalized study intersections. Based on the warrant, the following locations, by scenario, are projected to meet the Peak Hour signal warrant:

Existing

- Estrada Avenue at El Camino Real

Existing Plus Project

- Estrada Avenue at El Camino Real

2030 No Project

- Estrada Avenue at El Camino Real
- Estrada Avenue at H Street

2030 Project

- Estrada Avenue at El Camino Real
- Estrada Avenue at H Street

TABLE 1:
WEEKDAY LEVELS OF SERVICE SUMMARY FOR THE STUDY SEGMENTS AND INTERSECTIONS

Intersection	Existing		Existing Plus Project		2030 No Project		2030 Project		Mitigated 2030 Project	
	LOS AM/PM	Delay[1] AM/PM (secs)	LOS AM/PM	Delay[1] AM/PM (secs)	LOS AM/PM	Delay[1] AM/PM (secs)	LOS AM/PM	Delay[1] AM/PM (secs)	LOS AM/PM	Delay[1] AM/PM (secs)
Estrada Ave at El Camino Real										
• WB Left-Through	A/A	4.1/3.8	A/A	4.1/3.8	A/A	4.7/5.0	A/A	4.8/5.0	B/A	18.1/8.6
• **NB Approach**	C/B	19.7/12.7	C/B	21.2/13.3	**F/D**	**255.7/31.6**	**F/E**	**285.4/37.0**		
Estrada Ave at H Street										
• **EB Approach**	C/B	15.2/11.0	C/B	15.6/11.1	D/B	30.2/14.4	D/B	31.7/14.7	D/B	31.7/14.7
• **WB Approach**	B/B	12.5/10.2	B/B	12.8/10.3	C/B	24.7/12.9	D/B	26.1/13.2	D/B	26.1/13.2
• NB Approach	A/A	0.3/0.6	A/A	0.3/0.5	A/A	0.3/0.6	A/A	0.3/0.6	A/A	0.3/0.6
• SB Approach	A/A	6.1/0.9	A/A	5.7/0.9	A/A	6.8/0.9	A/A	6.6/0.9	A/A	6.6/0.9
W Pozo Road at Calf Canyon Hwy										
• EB Left-Through	A/A	4.6/6.2	A/A	5.5/6.5	A/A	4.9/8.1	A/A	5.6/8.4	A/A	5.6/8.4
• SB Approach	A/A	9.3/9.3	A/A	9.4/9.9	B/B	10.0/12.3	B/B	10.2/14.4	B/B	10.2/14.4
Calf Canyon Hwy at Project Driveway										
• EB Left	n/a	n/a	A/A	7.6/7.3	n/a	n/a	A/A	7.7/7.4	A/A	7.7/7.4
• SB Approach	n/a	n/a	A/A	9.1/8.9	n/a	n/a	A/A	9.6/9.0	A/A	9.6/9.0

[1] *delay per vehicle* *secs = seconds* *NB = northbound* *SB = southbound* *EB = eastbound* *WB = westbound* *n/a = not applicable*

Recommended Improvements

To mitigate the intersections that are projected to operate below the appropriate adopted level of service standard and/or meet the Peak Hour signal warrant, the following improvements by scenario are recommended:

Estrada Avenue at El Camino Real

- Signalize the intersection

The Estrada Avenue at El Camino Real intersection currently meets the Peak Hour signal warrant and is projected to continue to meet the warrant in all study scenarios. Since the intersection is currently operating at acceptable levels of service and is projected to do so in the Existing Plus Project scenarios, the installation of the traffic signal is not recommended. However, the intersection operates below the level of service standard and continues to meet the Peak Hour signal warrant in the 2030 No Project and 2030 Project scenarios. Although the Project does not cause the level of service failure or trigger the Peak Hour signal warrant, it will contribute to those impacts. The Project may be responsible for paying its fair-share for the proposed improvement.

The proposed installation of a traffic signal for the Estrada Avenue at El Camino Real intersection does not include widening the existing paved sections to accommodate additional lanes/shoulder/etc. since the intersection is projected to operate acceptably with a permitted WB left-turn movement. However, the *Salinas River Area Plan* and the *Santa Margarita Design Plan* both call for additional improvements to this intersection. A channelized left-turn lane and installation of bike lanes and sidewalks are both proposed for El Camino Real at this intersection. A landscaped median may or may not be included in this improvement as well. Since these improvements are not currently funded, they are not included in the proposed mitigation

Estrada Avenue at H Street

The Estrada Avenue at H Street intersection is projected to operate below the level of service standard and meet the Peak Hour signal warrant in the 2030 No Project and 2030 Project scenarios. The level of service impacts to the Estrada Avenue at H Street intersection occur during the AM peak hour and are due mostly to the SB left-turns and WB right-turns associated with the elementary school drop-off. The following unique criteria apply to this intersection:

- The majority of the school-associated AM peak hour traffic occurs in a 15-30 minute period. This tends to increase delay for the minor street movements for that short time period, but leaves the remainder of the peak hour with lower impacts.
- The level of delay experienced by the minor street movements is somewhat alleviated by a crossing guard located on the north side of the intersection. The crossing guard provides regular breaks in the major street traffic which provides gaps for some minor street movements that would normally not occur during this period.
- While the intersection meets the Peak Hour signal warrant, it is unknown whether or not it will meet other signal warrants, now or in the future. Additional warrants may not be met which are more paramount to the operation of the intersection than the Peak Hour warrant.

It is suggested that this intersection be monitored and at such time that the intersection level of service falls below the adopted thresholds and/or meets additional signal warrants, that a determination of the improvements be made. Although the Project does not cause the level of service failure or trigger the Peak Hour signal warrant, it will contribute to those impacts. The Project may be responsible for paying its fair-share for any improvements to this intersection.

Proportionate Share Percentages

The Caltrans Proportionate Share Percentage was calculated by taking the Project trips and dividing by the total 2030 Project volumes minus the Existing volumes for the given intersection. The formula used in calculating the Proportionate Share Percentage is:

Proportionate Share Percentage = Project only trips / 2030 Project volume – Existing volume

Table 2 shows the volumes used to calculate the Proportionate Share Percentages and the resulting percentages for intersections that have proposed improvements. The volumes projected to cause the highest proportionate share percentage are shown bolded in Table 2.

TABLE 2:
PROPORTIONATE SHARE PERCENTAGES

Intersections	Existing AM/PM	Project Trips AM/PM	2030 Project AM/PM	Proportionate Share % AM/PM
Estrada Ave at El Camino Real	704/621	28/23	1,174/1,071	5.96/5.11
Estrada Ave at H Street	599/392	28/23	1,017/732	6.70/6.76

PROJECT

The proposed Project will produce 495,000 tons per year (tpy) when operating at full capacity. The Project will be located on the north side of State Route (SR) 58/Calf Canyon Highway, east of the Salinas River, in San Luis Obispo County. The Project site is currently unoccupied. The project will operate from 6:00 AM to 5:00 PM on weekdays. Figure 2 shows the Project site plan.

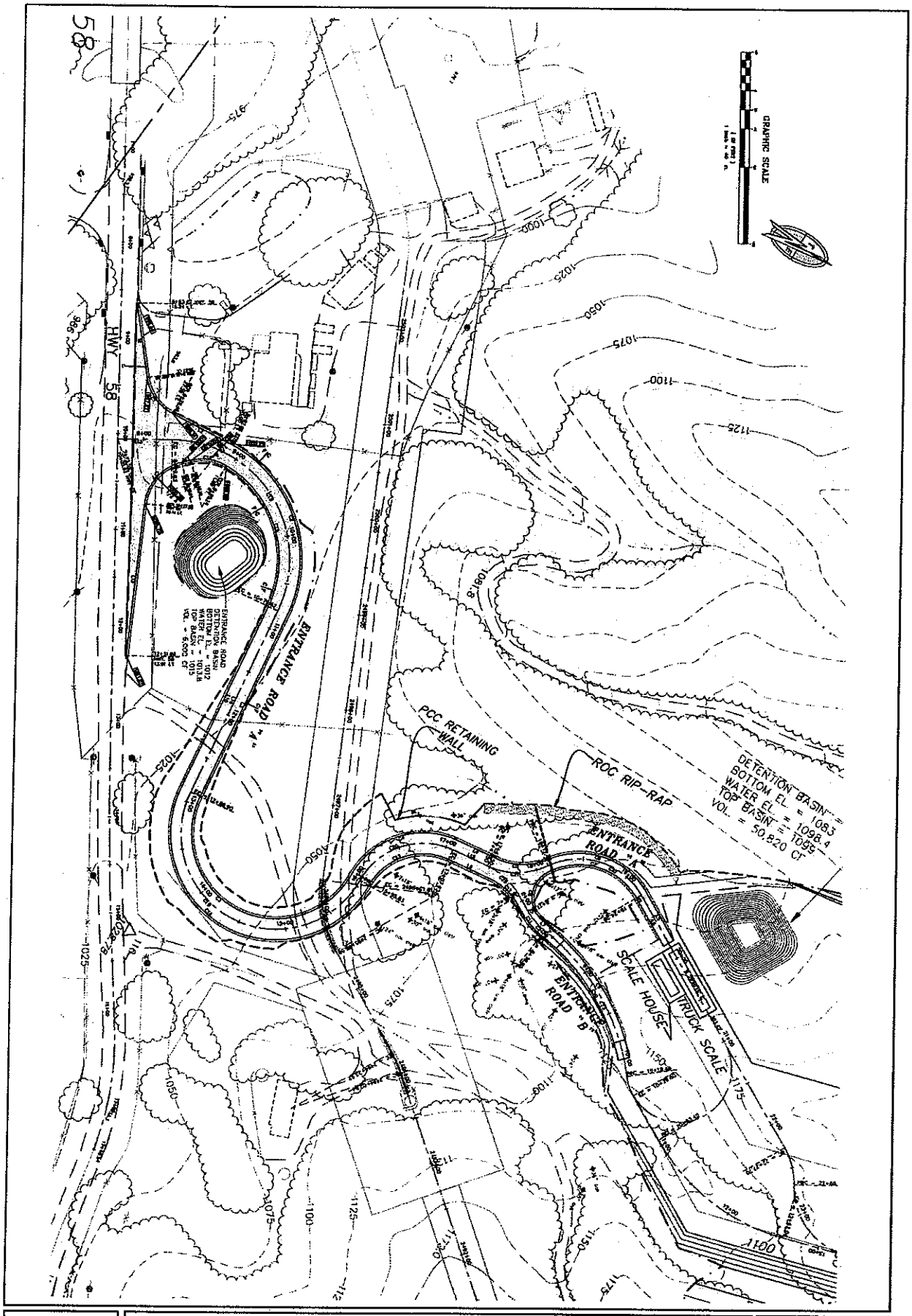
Project Access

The Project is proposing to construct a single access point to be used by trucks and employees. This access point will be located east of the Salinas River bridge and west of Park Hill Road. The driveway will be located between two (2) existing residential homes and out-buildings currently located on the north side of Calf Canyon Highway. Due to the relatively low volume of Project trips, low background traffic on Calf Canyon Highway, and acceptable levels of service, a separate left-turn lane is not necessary for acceptable operation of the Project Driveway. However, the Project is proposing to construct an eastbound left-turn lane on Calf Canyon Highway at the project driveway. Based on the projected peak hour eastbound left-turn volumes at this location, the turn lane should provide sufficient storage to accommodate 1 truck and 1 passenger car.[1]

Project Trip Generation

The Project trip generation information was developed from the production and employee information provided by the applicant. Details of the Project trip generation calculations are included in Appendix B. Table 3 shows the projected number of daily, AM and PM peak hour trips that would be generated by the Project.

[1] *Highway Design Manual*, Caltrans, September 1, 2006, Section 405.2(2)(e).



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PROJECT SITE PLAN

Las Pilitas Rock Quarry
San Margarita, CA

Figure 2

09-1198

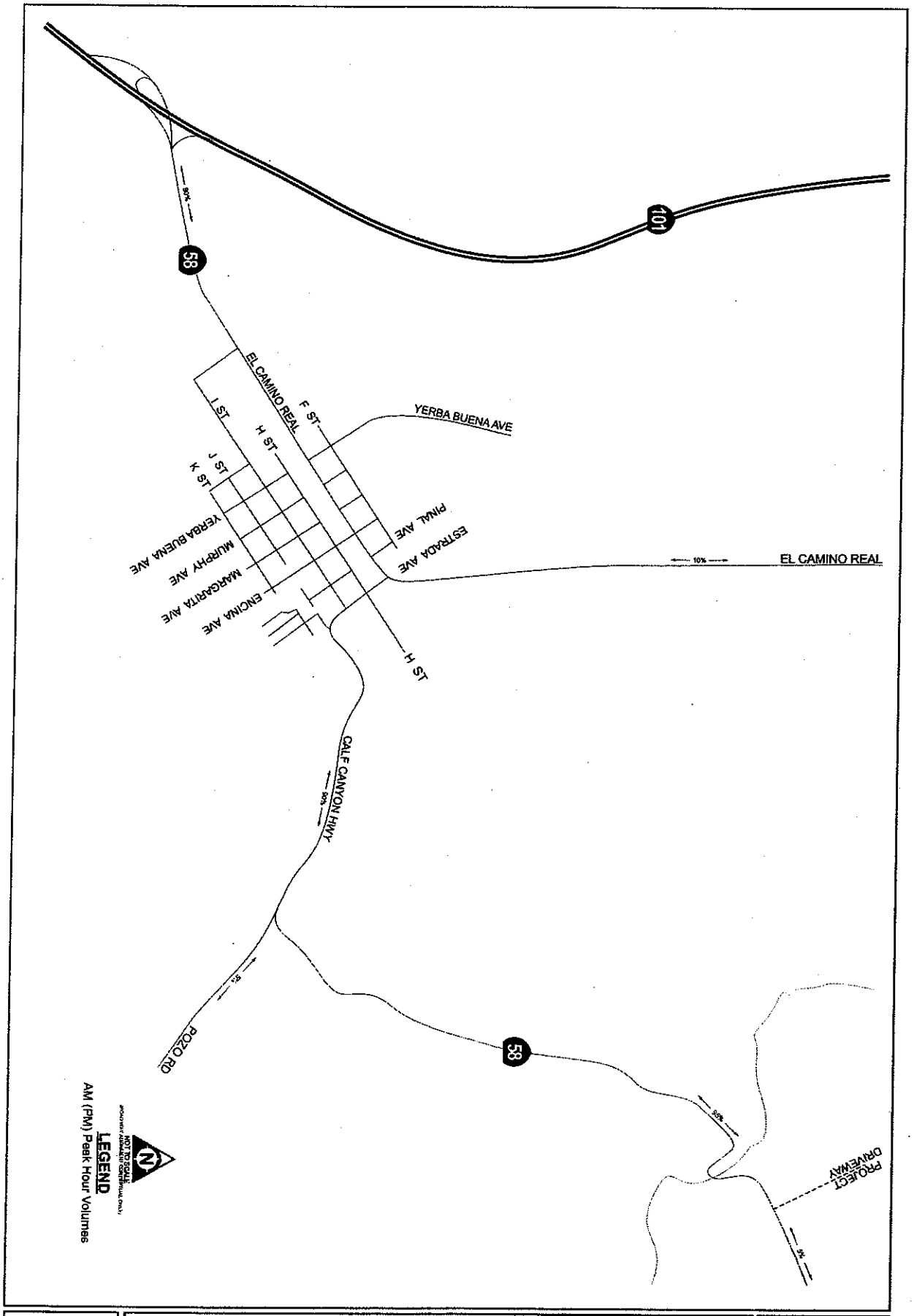
TABLE 3:
PROJECT TRIP GENERATION DATA

Project Trip Types	Daily (trips)[1]	AM			PM		
		Enter (trips)	Exit (trips)	Total	Enter (trips)	Exit (trips)	Total
Employee Trips	10	5	0	5	0	5	5
Truck Trips	198	14	13	27	11	11	22
Total Project Trips	**208**	**19**	**13**	**32**	**11**	**16**	**27**

[1] *Daily trip ends (1-directional)*

Project Trip Distribution

Trip distribution for the Project trips was based on client provided information. The majority of Project trips (employees and trucks) are projected to travel between SR 101 and the Project site. The Project's market will primarily be south of Santa Margarita and SR 101 is the main north-south corridor in the area. Approximately 20% of project trips are shown traveling outside the projected route (north on El Camino Real, east on W Pozo Road, and north on Calf Canyon Highway). Using this trip distribution, all Project trips travel through the study intersections. Figure 3 shows trip distribution percentages for all analysis years. Figure 4 shows the intersection assignment for Project trips for all analysis trips.



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TRIP DISTRIBUTION PERCENTAGES

Project Trips

Las Pilitas Rock Quarry
San Margarita, CA

Figure 3

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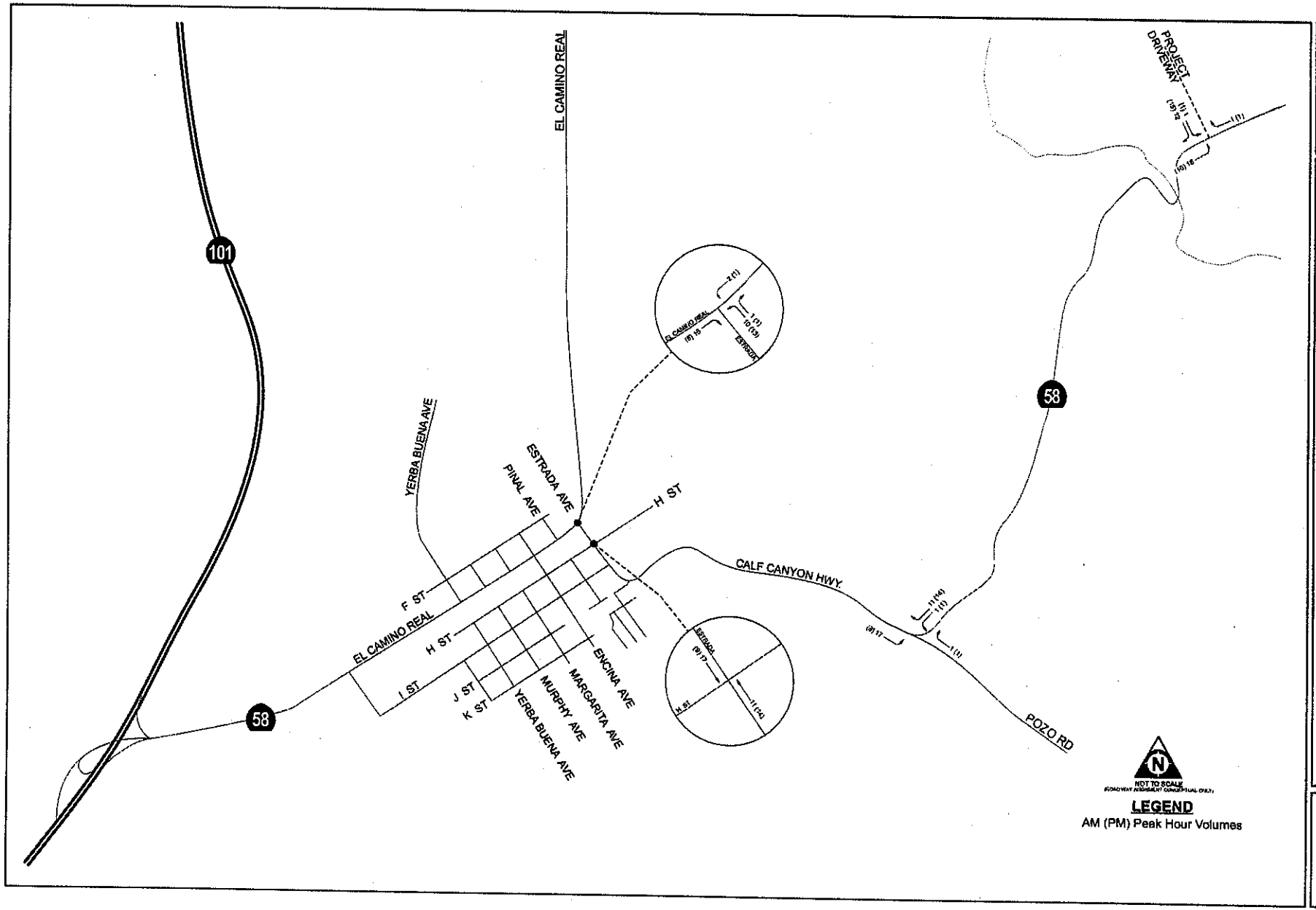

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Las Pilitas Rock Quarry
San Margarita, CA

Figure 4

PEAK HOUR TRAFFIC VOLUMES

Project Trips

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EXISTING CONDITIONS

Transit

Currently, the Regional Transit Authority (RTA) operates one (1) transit route in the study area. Route 9, operates between San Miguel, Paso Robles, Templeton, Atascadero, Santa Margarita, and San Luis Obispo. Route 9 has one (1) stop in Santa Margarita near the intersection of El Camino Real and Encina Avenue. Since this route does not operate a stop within walking distance of the Project site, no employee trips are anticipated to utilize transit.

The Atascadero Unified School District operates three (3) bus routes that travel through the study area. Routes 7 and 8 pick up students from Pozo and Santa Margarita and deliver them to Santa Margarita Elementary (Route 8) and Atascadero High School and Junior High (Route 7). Route 9 picks up students from the rural area between Santa Margarita and Atascadero and delivers them to Santa Margarita Elementary and Atascadero High School and Junior High.

Bike Facilities

Portions of SR 58, in the study area, are designated as a Bike Route with appropriate signing. Shoulder widths vary along SR 58 and cannot always accommodate bicyclists. Bike Lanes are located on El Camino Real east/north of its intersection with Estrada Avenue. No other designated bicycle facilities are located in the study area.

Pedestrian Facilities

Due to the rural nature of Santa Margarita, sidewalks are limited in the study area. The only sidewalk in the study area is located on the north side of H Street, east of Estrada Avenue. A pedestrian bridge is also located on the north side of H Street, west of Estrada Avenue, to cross a small creek. A marked crosswalk is also located on the north side of the Estrada Avenue at H Street intersection. These limited pedestrian facilities serve the Santa Margarita Elementary School. According to the *Santa Margarita Design Plan*, improvement of pedestrian facilities throughout the community is recommended, particularly along Estrada Avenue. Further analysis of the Estrada Avenue at H Street intersection and the school crossing is included in Appendix I.

Roadways

Table 4 describes the Existing street system in the study area including the street classification, number of lanes, and the posted speed limits.

TABLE 4:
DESCRIPTION OF EXISTING STREET SYSTEM

Street	Classification	No. of Lanes (2-dir)	Posted Speed Limit (mph)
State Route 58[1]	Principal Arterial	2	35-55
El Camino Real	Arterial	2	35-55
Estrada Avenue	Local Street	2	25[2]-35
H Street	Local Street	2	25
W Pozo Road	Rural Road	2	55
Calf Canyon Highway	Rural Road	2	55

[1] *Portions of El Camino Real, Estrada Ave, W Pozo Rd, and Calf Canyon Hwy are all designated as State Route 58*
[2] *25 mph posted for school zone*

Table 5 lists the study intersections and their associated intersection control.

TABLE 5:
EXISTING INTERSECTION CONTROL

Intersection	Signalized/Unsignalized	Type
Estrada Ave at El Camino Real	Unsignalized	TWSC
Estrada Ave at H Street	Unsignalized	TWSC
W Pozo Road at Calf Canyon Hwy	Unsignalized	TWSC
Calf Canyon Hwy at Project Driveway	n/a	n/a

TWSC = two-way stop-control *n/a = not applicable*

The existing traffic counts taken for this Project were compared to traffic counts taken in 2006 for the *Santa Margarita Ranch Transportation Impact Analysis*[2]. Based on this comparison, certain movements currently have fewer vehicles in the peak hour(s) in 2009 than were counted in 2006. Due to the relatively low number of vehicles for all movements, the minor decreases in vehicles are not outside a typical day-to-day fluctuation. However, all movements which are currently showing a lower number of vehicles were adjusted to the 2006 counts. This adjustment should be considered a worst-case scenario.

Level of Service

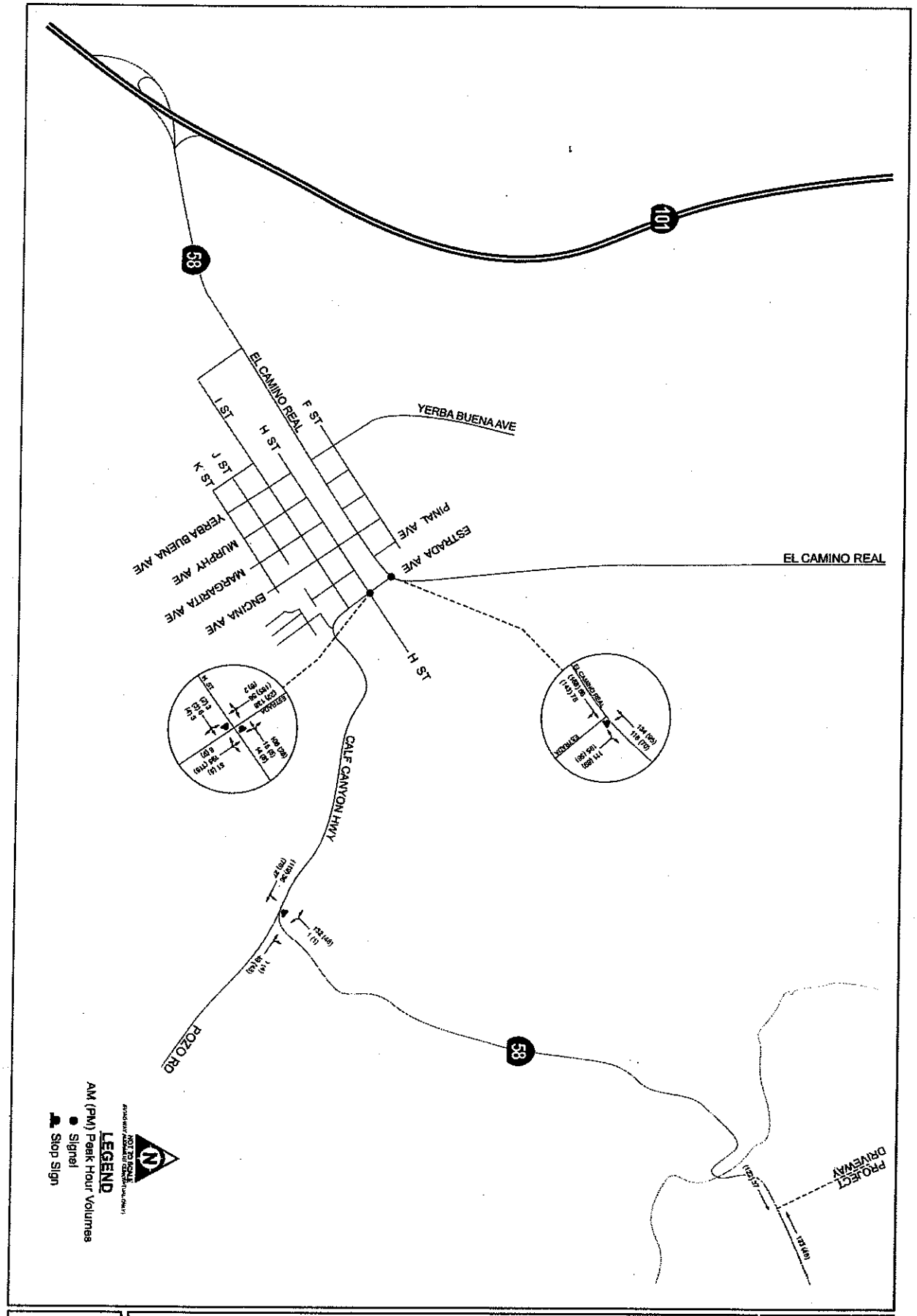
The Existing intersection lane configurations, intersection control, and peak hour traffic volumes are shown on Figure 5. Using the lane configurations and volumes shown on Figure 5, the intersections were analyzed for Existing levels of service. Table 6 shows the Existing levels of service for the study intersections. The Existing intersection levels of service calculations are included in Appendix C.

TABLE 6:
EXISTING CONDITIONS ANALYSIS
INTERSECTION WEEKDAY LEVEL OF SERVICE

	AM Peak Hour		PM Peak Hour	
Intersection	LOS	Delay[1] (secs)	LOS	Delay[1] (secs)
Estrada Ave at El Camino Real				
• WB Left-Through	A	4.1	A	3.8
• NB Approach	C	19.7	B	12.7
Estrada Ave at H Street				
• EB Approach	C	15.2	B	11.0
• WB Approach	B	12.5	B	10.2
• NB Approach	A	0.3	A	0.6
• SB Approach	A	6.1	A	0.9
W Pozo Road at Calf Canyon Hwy				
• EB Left-Through	A	4.6	A	6.2
• SB Approach	A	9.3	A	9.3
Calf Canyon Hwy at Project Driveway				
• EB Left-Through	n/a	n/a	n/a	n/a
• SB Approach	n/a	n/a	n/a	n/a

[1] *Delay per vehicle* *secs = seconds* *SB = southbound* *NB = northbound*
EB = eastbound *WB = westbound* *n/a = not applicable*

[2] *Santa Margarita Ranch Transportation Impact Analysis*, Fehr and Peers, December 2006.



TPG Consulting

PEAK HOUR TRAFFIC VOLUMES AND INTERSECTION CONFIGURATIONS
Existing

Las Pilitas Rock Quarry
San Margarita, CA

Figure 5

As shown in Table 6, all the study intersections are currently operating at or above the appropriate adopted level or service standard in the Existing conditions scenario.

Signal Warrants

Peak Hour signal warrants were also prepared for the following three (3) unsignalized intersection:

- Estrada Avenue at El Camino Real
- Estrada Avenue at H Street
- W Pozo Road at Calf Canyon Road

Based on the Peak Hour signal warrants, a traffic signal is currently warranted at the Estrada Avenue at El Camino Real intersection in the Existing conditions scenario. The remaining study intersections do not currently meet the Peak Hour signal warrant. These warrant analyses are limited to the peak hour volume warrant only and other conditions may exist which meet other traffic signal warrants. Copies of the warrant analyses are included in Appendix H.

EXISTING PLUS PROJECT CONDITIONS

The Existing Plus Project traffic conditions were developed using the Existing traffic volumes shown in Figure 6 and the Project trips shown in Figure 4.

Level of Service

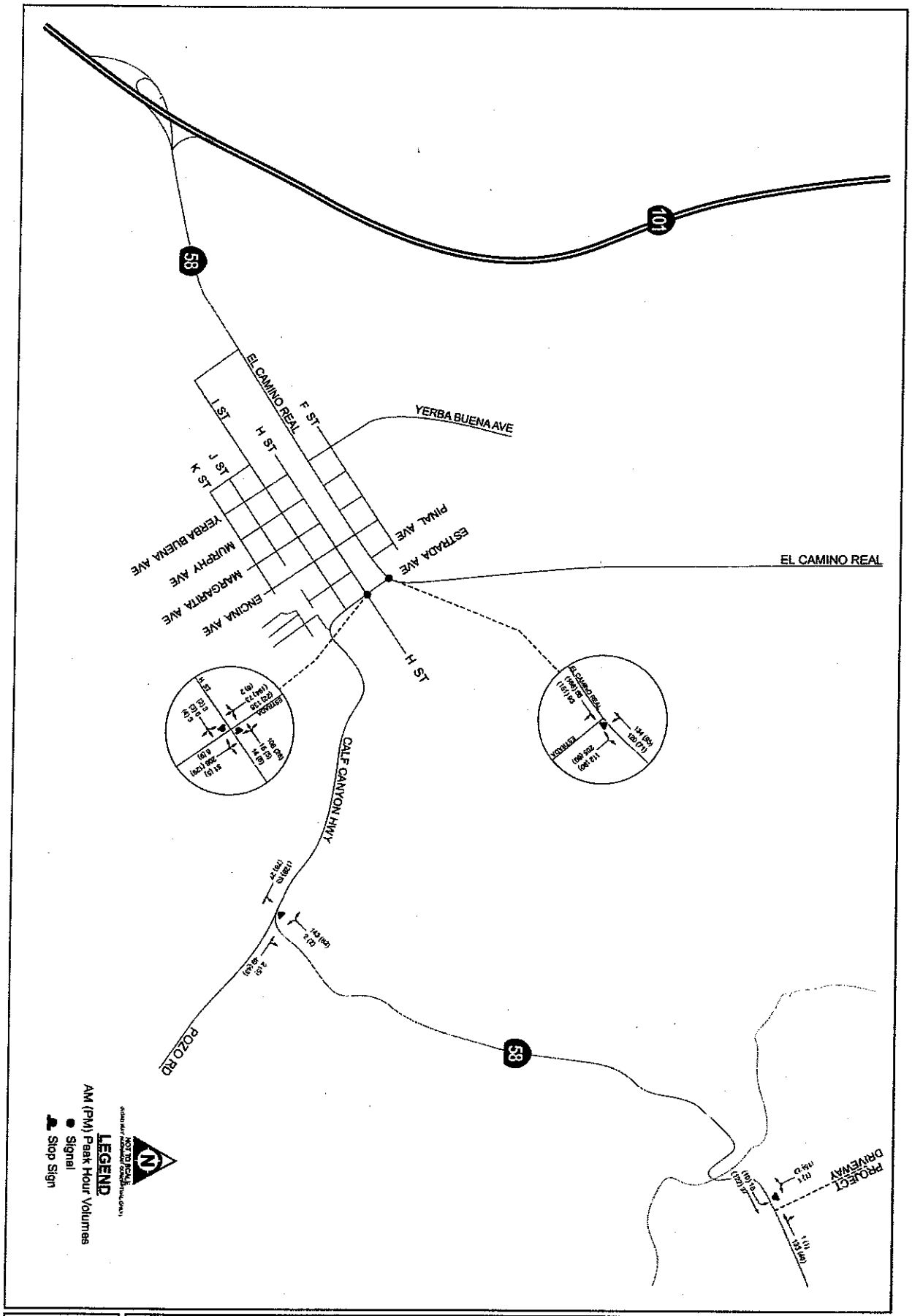
The Existing Plus Project intersection lane configurations, intersection controls, and peak hour traffic volumes are shown on Figure 6. Using the lane configurations and volumes shown on Figure 6, the intersections were analyzed for Existing Plus Project levels of service. Table 7 shows the Existing Plus Project levels of service for the study intersections. The Existing Plus Project intersection levels of service calculations are included in Appendix D.

TABLE 7:
EXISTING PLUS PROJECT CONDITIONS ANALYSIS
INTERSECTION WEEKDAY LEVEL OF SERVICE

	AM Peak Hour		PM Peak Hour	
Intersection	**LOS**	**Delay[1] (secs)**	**LOS**	**Delay[1] (secs)**
Estrada Ave at El Camino Real				
• WB Left-Through	A	4.1	A	3.8
• NB Approach	C	21.2	B	13.3
Estrada Ave at H Street				
• EB Approach	C	15.6	B	11.1
• WB Approach	B	12.8	B	10.3
• NB Approach	A	0.3	A	0.5
• SB Approach	A	5.7	A	0.9
W Pozo Road at Calf Canyon Hwy				
• EB Left-Through	A	5.5	A	6.5
• SB Approach	A	9.4	A	9.9
Calf Canyon Hwy at Project Driveway				
• EB Left	A	7.6	A	7.3
• SB Approach	A	9.1	A	8.9

[1] Delay per vehicle *secs = seconds* *SB = southbound* *NB = northbound*
EB = eastbound *WB = westbound*

As shown in Table 7, all the study intersections are currently operating at or above the appropriate adopted level or service standard in the Existing Plus Project conditions scenario.



TPG Consulting

PEAK HOUR TRAFFIC VOLUMES AND INTERSECTION CONFIGURATIONS

Existing Plus Project

Las Pilitas Rock Quarry
San Margarita, CA

Figure 6

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Signal Warrants

Peak Hour signal warrants were again prepared for the following three (3) unsignalized intersection:

- Estrada Avenue at El Camino Real
- Estrada Avenue at H Street
- W Pozo Road at Calf Canyon Road

Signal warrants were not prepared for the Calf Canyon Highway at Project Driveway intersection since the low projected Project Driveway volumes will not satisfy any part of the Peak Hour signal warrant. Based on the Peak Hour signal warrants, a traffic signal is still warranted at the Estrada Avenue at El Camino Real intersection in the Existing Plus Project conditions scenario. The remaining study intersections are not projected to meet the Peak Hour signal warrant. These warrant analyses are limited to the peak hour volume warrant only and other conditions may exist which meet other traffic signal warrants. Copies of the warrant analyses are included in Appendix H.

2030 NO PROJECT CONDITIONS

The 2030 No Project traffic conditions were developed using a historic growth rate calculated using traffic volumes along SR 58 through the study area. Based on Caltrans counts from the past 5 years, SR 58 has experienced 1.88% growth per year. This growth rate was applied to the Existing traffic volumes to develop the "base" 2030 traffic volumes. In addition to the historic growth, projected traffic from one (1) approved project was added to the "base" 2030 traffic volumes. The Santa Margarita Ranch development was recently approved to construct 112 single-family dwelling units to be located south of the existing Santa Margarita urban area. The projected trip generation and distribution for this development was taken from the *Santa Margarita Ranch Transportation Impact Analysis*[3]. The approved portion of the Santa Margarita Ranch development is referred to as the Agricultural Residential Cluster Subdivision (ARCS). Additionally, this project has proposed a Future Development Plan (FDP) which will construct and additional 431 homes as well as several other uses including a golf course, wineries, churches, etc.). The FDP has not been approved by the San Luis Obispo Board of Supervisors and is therefore not included in the 2030 No Project and 2030 Project analyses.

Level of Service

The 2030 No Project intersection lane configurations, intersection controls, and peak hour traffic volumes are shown on Figure 7. Using the lane configurations and volumes shown on Figure 7, the intersections were analyzed for 2030 No Project levels of service. Table 8 shows the 2030 No Project levels of service for the study intersections. The 2030 No Project intersection levels of service calculations are included in Appendix E.

[3] *Santa Margarita Ranch Transportation Impact Analysis*, Fehr and Peers, December 2006.

TABLE 8:
2030 NO PROJECT CONDITIONS ANALYSIS
INTERSECTION WEEKDAY LEVEL OF SERVICE

Intersection	AM Peak Hour		PM Peak Hour	
	LOS	Delay[1] (secs)	LOS	Delay[1] (secs)
Estrada Ave at El Camino Real				
• WB Left-Through	A	4.7	A	5.0
• **NB Approach**	**F**	**255.7**	**D**	**31.6**
Estrada Ave at H Street				
• **EB Approach**	**D**	**30.2**	B	14.4
• WB Approach	C	24.7	B	12.9
• NB Approach	A	0.3	A	0.6
• SB Approach	A	6.8	A	0.9
W Pozo Road at Calf Canyon Hwy				
• EB Left-Through	A	4.9	A	8.1
• SB Approach	B	10.0	B	12.3
Calf Canyon Hwy at Project Driveway				
• EB Left-Through	n/a	n/a	n/a	n/a
• SB Approach	n/a	n/a	n/a	n/a

[1] *Delay per vehicle* *secs = seconds* *SB = southbound* *NB = northbound*
EB = eastbound *WB = westbound* *n/a = not applicable*

As shown in Table 8, the following study intersections, by time period, are projected to operate below the appropriate level of service standard in the 2030 No Project conditions scenario:

- Estrada Avenue at El Camino Real
  - NB Approach – AM and PM peak hours
- Estrada Avenue at H Street
  - EB Approach – AM peak hour

All the remaining study intersections are projected to operate at or above the appropriate adopted level or service standard in the 2030 No Project conditions scenario.

Signal Warrants

Peak Hour signal warrants were again prepared for the following three (3) unsignalized intersection:

- Estrada Avenue at El Camino Real
- Estrada Avenue at H Street
- W Pozo Road at Calf Canyon Road

Signal warrants were not prepared for the Calf Canyon Highway at Project Driveway intersection since the low projected Project Driveway volumes will not satisfy any part of the Peak Hour signal warrant. Based on the Peak Hour signal warrants, a traffic signal is still warranted at the Estrada Avenue at El Camino Real intersection in the 2030 No Project conditions scenario. The Estrada Avenue at H Street intersection is also projected to meet the Peak Hour signal warrant in the 2030 No Project conditions scenario. The remaining study intersection is not projected to meet the Peak Hour signal warrant. These warrant analyses are limited to the peak hour volume warrant only and other conditions may exist which meet other traffic signal warrants. Copies of the warrant analyses are included in Appendix H.

2030 PROJECT CONDITIONS

The Existing Plus Project traffic conditions were developed using the 2030 No Project traffic volumes shown in Figure 9 and the Project trips shown in Figure 4.

Level of Service

The 2030 Project intersection lane configurations, intersection controls, and peak hour traffic volumes are shown on Figure 8. Using the lane configurations and volumes shown on Figure 8, the intersections were analyzed for 2030 Project levels of service. Table 9 shows the 2030 Project levels of service for the study intersections. The 2030 Project intersection levels of service calculations are included in Appendix F.

TABLE 9:
2030 PROJECT CONDITIONS ANALYSIS
INTERSECTION WEEKDAY LEVEL OF SERVICE

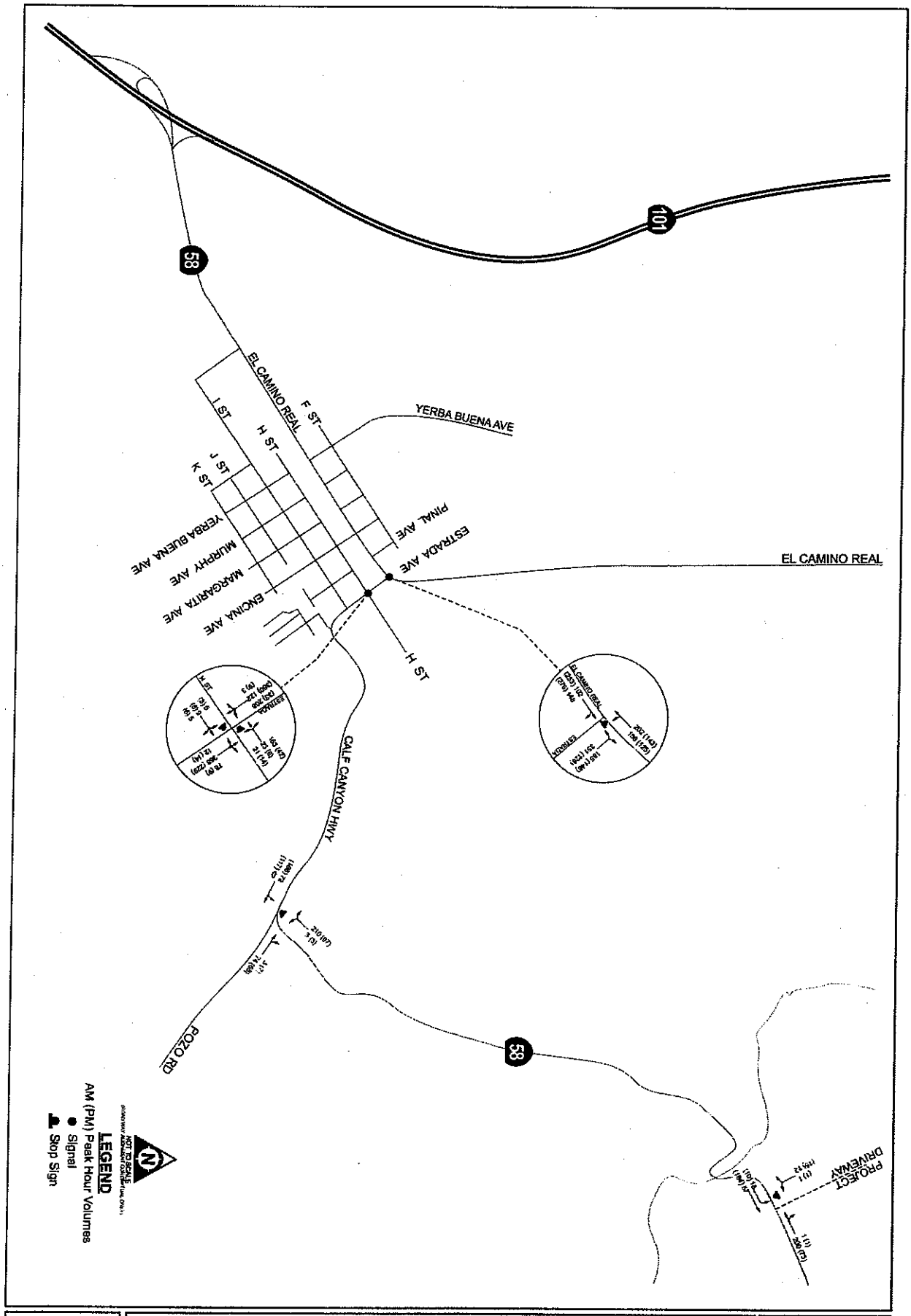
	AM Peak Hour		PM Peak Hour	
Intersection	**LOS**	**Delay[1] (secs)**	**LOS**	**Delay[1] (secs)**
Estrada Ave at El Camino Real				
• WB Left-Through	A	4.8	A	5.0
• **NB Approach**	**F**	**285.4**	**E**	**37.0**
Estrada Ave at H Street				
• **EB Approach**	**D**	**31.7**	B	14.7
• **WB Approach**	**D**	**26.1**	B	13.2
• NB Approach	A	0.3	A	0.6
• SB Approach	A	6.6	A	0.9
W Pozo Road at Calf Canyon Hwy				
• EB Left-Through	A	5.6	A	8.5
• SB Approach	B	10.2	B	14.4
Calf Canyon Hwy at Project Driveway				
• EB Left	A	7.7	A	7.4
• SB Approach	A	9.6	A	9.0

[1] Delay per vehicle *secs = seconds* *SB = southbound* *NB = northbound*
EB = eastbound *WB = westbound*

As shown in Table 9, the following study intersections, by time period, are projected to operate below the appropriate level of service standard in the 2030 Project conditions scenario:

- Estrada Avenue at El Camino Real
  - NB Approach – AM and PM peak hours
- Estrada Avenue at H Street
  - EB Approach – AM peak hour
  - WB Approach – AM peak hour

All the remaining study intersections are projected to operate at or above the appropriate adopted level or service standard in the 2030 Project conditions scenario.



TPG Consulting

PEAK HOUR TRAFFIC VOLUMES AND INTERSECTION CONFIGURATIONS
2030 Project

Las Pilitas Rock Quarry
San Margarita, CA

Figure 8

Signal Warrants

Peak Hour signal warrants were again prepared for the following three (3) unsignalized intersection:

- Estrada Avenue at El Camino Real
- Estrada Avenue at H Street
- W Pozo Road at Calf Canyon Road

Signal warrants were not prepared for the Calf Canyon Highway at Project Driveway intersection since the low projected Project Driveway volumes will not satisfy any part of the Peak Hour signal warrant. Based on the Peak Hour signal warrants, a traffic signal is still warranted at the Estrada Avenue at El Camino Real and the Estrada Avenue at H Street intersections in the 2030 Project conditions scenario. The remaining study intersection is not projected to meet the Peak Hour signal warrant. These warrant analyses are limited to the peak hour volume warrant only and other conditions may exist which meet other traffic signal warrants. Copies of the warrant analyses are included in Appendix H.

MITIGATED 2030 PROJECT CONDITIONS

Level of Service Impacts

Based on the information provided in the previous sections, the following locations, by scenario, are projected to operate below the appropriate adopted level of service standard:

2030 No Project

- Estrada Avenue at El Camino Real
  - NB Approach – AM and PM peak hours
- Estrada Avenue at H Street
  - EB Approach – AM peak hour

2030 Project

- Estrada Avenue at El Camino Real
  - NB Approach – AM and PM peak hours
- Estrada Avenue at H Street
  - EB Approach – AM peak hour
  - WB Approach – AM peak hour

Signal Warrants

Peak Hour signal warrants were also prepared for all unsignalized study intersections. Based on the warrant, the following locations, by scenario, are projected to meet the Peak Hour signal warrant:

Existing

- Estrada Avenue at El Camino Real

Existing Plus Project

- Estrada Avenue at El Camino Real

2030 No Project

- Estrada Avenue at El Camino Real
- Estrada Avenue at H Street

2030 Project

- Estrada Avenue at El Camino Real
- Estrada Avenue at H Street

Recommended Improvements

To mitigate the intersections that are projected to operate below the appropriate adopted level of service standard and/or meet the Peak Hour signal warrant, the following improvements by scenario are recommended:

Estrada Avenue at El Camino Real

- Signalize the intersection

The Estrada Avenue at El Camino Real intersection currently meets the Peak Hour signal warrant and is projected to continue to meet the warrant in all study scenarios. Since the intersection is currently operating at acceptable levels of service and is projected to do so in the Existing Plus Project scenarios, the installation of the traffic signal is not recommended. However, the intersection operates below the level of service standard and continues to meet the Peak Hour signal warrant in the 2030 No Project and 2030 Project scenarios. Although the Project does not cause the level of service failure or trigger the Peak Hour signal warrant, it will contribute to those impacts. The Project may be responsible for paying its fair-share for the proposed improvement.

The proposed installation of a traffic signal for the Estrada Avenue at El Camino Real intersection does not include widening the existing paved sections to accommodate additional lanes/shoulder/etc. since the intersection is projected to operate acceptably with a permitted WB left-turn movement. However, the *Salinas River Area Plan* and the *Santa Margarita Design Plan* both call for additional improvements to this intersection. A channelized left-turn lane and installation of bike lanes and sidewalks are both proposed for El Camino Real at this intersection. A landscaped median may or may not be included in this improvement as well. Since these improvements are not currently funded, they are not included in the proposed mitigation

Estrada Avenue at H Street

The Estrada Avenue at H Street intersection is projected to operate below the level of service standard and meet the Peak Hour signal warrant in the 2030 No Project and 2030 Project scenarios. The level of service impacts to the Estrada Avenue at H Street intersection occur during the AM peak hour and are due mostly to the SB left-turns and WB right-turns associated with the elementary school drop-off. The following unique criteria apply to this intersection:

- The majority of the school-associated AM peak hour traffic occurs in a 15-30 minute period. This tends to increase delay for the minor street movements for that short time period, but leaves the remainder of the peak hour with lower impacts.
- The level of delay experienced by the minor street movements is somewhat alleviated by a crossing guard located on the north side of the intersection. The crossing guard provides regular breaks in the major street traffic which provides gaps for some minor street movements that would normally not occur during this period.

- While the intersection meets the Peak Hour signal warrant, it is unknown whether or not it will meet other signal warrants, now or in the future. Additional warrants may not be met which are more paramount to the operation of the intersection than the Peak Hour warrant.

It is suggested that this intersection be monitored and at such time that the intersection level of service falls below the adopted thresholds and/or meets additional signal warrants, that a determination of the improvements be made. Although the Project does not cause the level of service failure or trigger the Peak Hour signal warrant, it will contribute to those impacts. The Project may be responsible for paying its fair-share for any improvements to this intersection.

Level of Service

The Mitigated 2030 Project intersection lane configurations, intersection controls, and peak hour traffic volumes are shown on Figure 9. Using the lane configurations and volumes shown on Figure 9, the intersections were analyzed for Mitigated 2030 Project levels of service. Table 10 shows the Mitigated 2030 Project levels of service for the study intersections. The Mitigated 2030 Project intersection levels of service calculations are included in Appendix G.

TABLE 10:
MITIGATED 2030 PROJECT CONDITIONS ANALYSIS
INTERSECTION WEEKDAY LEVEL OF SERVICE

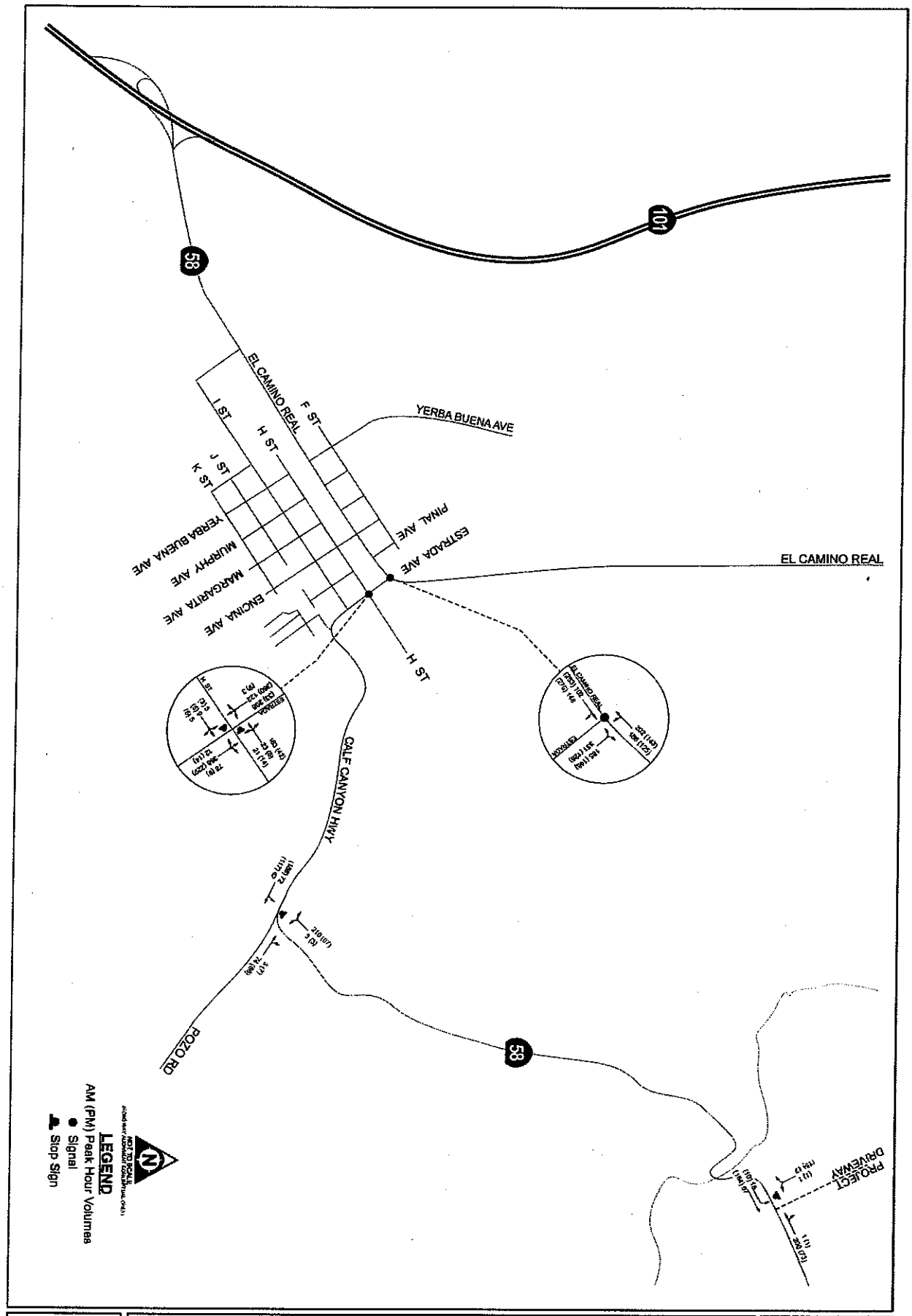
	AM Peak Hour		PM Peak Hour	
Intersection	**LOS**	**Delay[1] (secs)**	**LOS**	**Delay[1] (secs)**
Estrada Ave at El Camino Real	B	18.1	A	8.6
Estrada Ave at H Street				
• **EB Approach**	**D**	**31.7**	B	14.7
• **WB Approach**	**D**	**26.1**	B	13.2
• NB Approach	A	0.3	A	0.6
• SB Approach	A	6.6	A	0.9
W Pozo Road at Calf Canyon Hwy				
• EB Left-Through	A	5.6	A	8.5
• SB Approach	B	10.2	B	14.4
Calf Canyon Hwy at Project Driveway				
• EB Left	A	7.7	A	7.4
• SB Approach	A	9.6	A	9.0

[1] Delay per vehicle *secs = seconds* *SB = southbound* *NB = northbound*
EB = eastbound *WB = westbound*

As shown in Table 10, the following study intersections, by time period, are projected to operate below the appropriate level of service standard in the Mitigated 2030 Project conditions scenario:

- Estrada Avenue at H Street
  - EB Approach – AM peak hour
  - WB Approach – AM peak hour

With the recommended improvements, all the remaining study intersections are projected to operate at or above the appropriate adopted level or service standard in the Mitigated 2030 Project conditions scenario.



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PEAK HOUR TRAFFIC VOLUMES AND INTERSECTION CONFIGURATIONS

Mitigated 2030 Project

Las Piñas Rock Quarry
San Margarita, CA

Figure 9

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CONCLUSIONS AND RECOMMENDATIONS

As shown in the previous sections, the following impacts and improvements are recommended for the study locations.

Level of Service

As shown in Table 1, the following locations, by scenario, are projected to operate below the appropriate adopted level of service standard:

2030 No Project

- Estrada Avenue at El Camino Real
  - NB Approach – AM and PM peak hours
- Estrada Avenue at H Street
  - EB Approach – AM peak hour

2030 Project

- Estrada Avenue at El Camino Real
  - NB Approach – AM and PM peak hours
- Estrada Avenue at H Street
  - EB Approach – AM peak hour
  - WB Approach – AM peak hour

Signal Warrants

Peak Hour signal warrants were also prepared for all unsignalized study intersections. Based on the warrant, the following locations, by scenario, are projected to meet the Peak Hour signal warrant:

Existing

- Estrada Avenue at El Camino Real

Existing Plus Project

- Estrada Avenue at El Camino Real

2030 No Project

- Estrada Avenue at El Camino Real
- Estrada Avenue at H Street

2030 Project

- Estrada Avenue at El Camino Real
- Estrada Avenue at H Street

Recommended Improvements

To mitigate the intersections that are projected to operate below the appropriate adopted level of service standard and/or meet the Peak Hour signal warrant, the following improvements by scenario are recommended:

Estrada Avenue at El Camino Real

- Signalize the intersection

The Estrada Avenue at El Camino Real intersection currently meets the Peak Hour signal warrant and is projected to continue to meet the warrant in all study scenarios. Since the intersection is currently operating at acceptable levels of service and is projected to do so in the Existing Plus Project scenarios, the installation of the traffic signal is not recommended. However, the intersection operates below the level of service standard and continues to meet the Peak Hour signal warrant in the 2030 No Project and 2030 Project scenarios. Although the Project does not cause the level of service failure or trigger the Peak Hour signal warrant, it will contribute to those impacts. The Project may be responsible for paying its fair-share for the proposed improvement.

The proposed installation of a traffic signal for the Estrada Avenue at El Camino Real intersection does not include widening the existing paved sections to accommodate additional lanes/shoulder/etc. since the intersection is projected to operate acceptably with a permitted WB left-turn movement. However, the *Salinas River Area Plan* and the *Santa Margarita Design Plan* both call for additional improvements to this intersection. A channelized left-turn lane and installation of bike lanes and sidewalks are both proposed for El Camino Real at this intersection. A landscaped median may or may not be included in this improvement as well. Since these improvements are not currently funded, they are not included in the proposed mitigation

Estrada Avenue at H Street

The Estrada Avenue at H Street intersection is projected to operate below the level of service standard and meet the Peak Hour signal warrant in the 2030 No Project and 2030 Project scenarios. The level of service impacts to the Estrada Avenue at H Street intersection occur during the AM peak hour and are due mostly to the SB left-turns and WB right-turns associated with the elementary school drop-off. The following unique criteria apply to this intersection:

- The majority of the school-associated AM peak hour traffic occurs in a 15-30 minute period. This tends to increase delay for the minor street movements for that short time period, but leaves the remainder of the peak hour with lower impacts.
- The level of delay experienced by the minor street movements is somewhat alleviated by a crossing guard located on the north side of the intersection. The crossing guard provides regular breaks in the major street traffic which provides gaps for some minor street movements that would normally not occur during this period.
- While the intersection meets the Peak Hour signal warrant, it is unknown whether or not it will meet other signal warrants, now or in the future. Additional warrants may not be met which are more paramount to the operation of the intersection than the Peak Hour warrant.

It is suggested that this intersection be monitored and at such time that the intersection level of service falls below the adopted thresholds and/or meets additional signal warrants, that a determination of the improvements be made. Although the Project does not cause the level of service failure or trigger the Peak Hour signal warrant, it will contribute to those impacts. The Project may be responsible for paying its fair-share for any improvements to this intersection.

Proportionate Share Percentages

The Caltrans Proportionate Share Percentage was calculated by taking the Project trips and dividing by the total 2030 Project volumes minus the Existing volumes for the given intersection. The formula used in calculating the Proportionate Share Percentage is:

Proportionate Share Percentage = Project only trips / 2030 Project volume – Existing volume

Table 11 shows the volumes used to calculate the Proportionate Share Percentages and the resulting percentages for intersections that have proposed improvements. The volumes projected to cause the highest proportionate share percentage are shown bolded in Table 11.

TABLE 11:
PROPORTIONATE SHARE PERCENTAGES

Intersections	Existing AM/PM	Project Trips AM/PM	2030 Project AM/PM	Proportionate Share % AM/PM
Estrada Ave at El Camino Real	**704/621**	**28/23**	**1,174/1,071**	**5.96/5.11**
Estrada Ave at H Street	**599/392**	**28/23**	**1,017/732**	**6.70/6.76**

APPENDIX A

ANALYSIS METHODOLOGY

ANALYSIS METHODOLOGY

In order to prepare the traffic evaluation for the Project, a variety of data and technical assumptions had to be developed. This section of the report describes the various sources, data and technical assumptions used in this evaluation.

Sources

This report was prepared using information taken from the following sources:

- *2000 Highway Capacity Manual* (*HCM 2000*), Transportation Research Board, 2000.
- *Guide for the Preparation of Traffic Impact Studies*, State of California Department of Transportation, December, 2002.
- *Synchro 7.0*, Trafficware, 2007.
- *Salinas River Area Plan*, County of San Luis Obispo, Revised January 2007.
- *Santa Margarita Design Plan*, Department of Planning and Building, County of San Luis Obispo, October 9, 2001.
- *Santa Margarita Ranch Transportation Impact Analysis*, Fehr and Peers, December 2006.
- *Traffic Impact Analysis for Site Development*, A Recommended Practice, ITE, Transportation Planners Council Task Force on Traffic Access/Impact Studies, 2006.
- *Vision 2025: A Regional Transportation Plan*, San Luis Obispo Council of Governments, April 6, 2005.

Scenarios

The scenarios that were analyzed for this study included:

- Existing (2009) Traffic Conditions
- Existing Plus Project Traffic Conditions
- 2030 No Project Traffic Conditions
- 2030 Project Traffic Conditions
- Mitigated 2030 Project Traffic Conditions

The Existing Plus Project and 2030 Project scenarios reflect cumulative conditions analysis as required by CEQA.

Study Locations

The following intersections were analyzed:

- Estrada Avenue at El Camino Real
- Estrada Avenue at H Street
- W Pozo Road at Calf Canyon Highway
- Project Driveway at Calf Canyon Highway

Analysis Time Periods

According to *Traffic Impact Analyses for Site Development*, the overall purpose of a traffic impact study is to determine the project impacts that are likely to occur to the surrounding street system. In order to accomplish this purpose you need to determine what occurs when the peak of the project generated traffic overlays the peak of the street traffic. *Traffic Impact Analyses for Site Development* states "the peak periods [of the adjacent street and highway system] are generally the weekday morning (7-9 a.m.) and evening (4-6 p.m.) peak hours, although local area characteristics occasionally result in other peaks (e.g., at major shopping or recreational centers)". The peak hours analyzed in this study were:

- 7:00 to 9:00 AM
- 4:00 to 6:00 PM

These are the standard peak hours of the street typically used for study in the City of Fresno as stated in the *Traffic Impact Study Report Guidelines*.

Traffic Counts

According to the Caltrans *Guide for the Preparation of Traffic Impact Studies*, one of the common rules for counting vehicular traffic is:

> "Vehicle counts should be conducted on Tuesdays, Wednesdays, or Thursdays during weeks not containing a holiday and conducted in favorable weather conditions."[4]

The City of Fresno *Traffic Impact Study Report Guidelines* states that "Counts shall be collected during A.M. (7:00 a.m. to 9:00 a.m.) and P.M. (4:00 p.m. to 6:00 p.m.) peak hours, unless otherwise specified (such as midday or weekend peak periods)".[5]

Table A1 shows the date and day the Existing intersection count was taken for this Project. Prior to conducting these counts it was verified that these were non-holiday weeks.

TABLE A1:
EXISTING INTERSECTION COUNTS
DATES AND DAYS COUNTED

Intersections	Day	Date
Estrada Ave at El Camino Real	Tuesday	4/7/09
Estrada Ave at H Street	Tuesday	4/7/09
W Pozo Road at Calf Canyon Hwy	Tuesday	4/7/09
Calf Canyon Hwy at Project Driveway	Tuesday-Wednesday	4/7/09-4/8/09

As shown in Table A1, all intersection counts were conducted on days that were appropriate to count. The existing traffic counts were compared to traffic counts taken in 2006 for the *Santa Margarita Ranch Transportation Impact Analysis*[6]. Based on this comparison, certain movements at the study intersections currently have fewer vehicles in the peak hour(s) in 2009 than were counted in 2006. Due to the relatively low number of vehicles for all movements, the minor decreases in vehicles are not outside a typical day-to-day fluctuation. However, all movements which are currently showing a

[4] *Guide for the Preparation of Traffic Impact Studies*, State of California Department of Transportation, December 2002, page 4.
[5] Traffic Impact Study Report Guideline, City of Fresno, March 2006, page 5.
[6] *Santa Margarita Ranch Transportation Impact Analysis*, Fehr and Peers, December 2006.

lower number of vehicles were adjusted to the 2006 counts. This adjustment should be considered a worst-case scenario.

Approved/Pending/Proposed Project Trips

One (1) Approved/Pending/Proposed Projects was identified in the Project area and was included for analysis in this study. The Santa Margarita Ranch development was recently approved to construct 112 single-family dwelling units to be located south of the existing Santa Margarita urban area. The projected trip generation and distribution for this development was taken from the *Santa Margarita Ranch Transportation Impact Analysis*[7]. The approved portion of the Santa Margarita Ranch development is referred to as the Agricultural Residential Cluster Subdivision (ARCS). Additionally, this project has proposed a Future Development Plan (FDP) which will construct and additional 431 homes as well as several other uses including a golf course, wineries, churches, etc.).

Intersection Analysis and Volume Adjustments

Intersection heavy vehicle percentages were developed from the Existing conditions count data. Heavy vehicle percentages used in the analysis were the greater of either the counted or the *HCM 2000* 2% default. These percentages were used in all scenarios. The urban default peak hour factor (PHF) of 0.92 was used at the Estrada Avenue at El Camino Real and Estrada Avenue at H Street intersections and the rural default PHF of 0.88 was used at the W Pozo Road at Calf Canyon Highway and Project Driveway at Calf Canyon Highway intersections.

Signal Warrant Analysis

Peak Hour signal warrants (Warrant 3) were prepared for all unsignalized intersections, except the Project Driveway, based on the methodology presented in the *California Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways*, pages 4C-4, 4C-5 and 4C-10. A copy of this warrant is included in Appendix D. According to the MUTCD, "the satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal." Therefore prior to making a final determination on installation of a proposed signal, a thorough engineering investigation, including collision history, should be conducted.

Level of Service Analysis Methods

Unsignalized and signalized intersection analyses were completed using *Synchro 7.0*, which incorporates the *HCM 2000* methodologies. *Synchro 7.0* allows for optimization of signals to provide for the greatest reduction in overall intersection delay. This optimization process can result in different signal cycle lengths for both the AM and PM peak hours of a given scenario and across all scenarios. The changing of the signal cycle length somewhat reflects the agency process whereby the agency will adjust intersection signal cycle lengths for differing traffic conditions based on current count data.

Level of Service

For analysis purposes, the *HCM 2000* defines six levels of service for various facility types. The six levels are given letter designations ranging from "A" to "F", with "A" representing the best operating conditions and "F" the worst. Quantifiable measures of effectiveness that best describe the quality of operation on the subject facility type are used to determine the facilities level of service. For

[7] *Santa Margarita Ranch Transportation Impact Analysis*, Fehr and Peers, December 2006.

signalized and unsignalized intersections, the quantifiable measure of effectiveness is average control delay.[8]

Control delay for two-way stop-controlled (TWSC) intersections, which have stop signs on only the minor street approaches, is per vehicle and is computed for the stop-controlled or minor street movements only since theoretically the through movements on the major street are not experiencing any delay. Since there is no aggregation of delay for a TWSC intersection, there is no intersection level of service as a whole, only levels of service for the individual minor movements. The minor movements generally consist of separate lefts on the major street approaches and all movements on both minor street approaches.

Table A2 shows the six levels of service and their corresponding ranges of average control delay for both signalized and unsignalized intersections. Table A2 also contains a brief traffic flow description for signalized intersections for each level of service category. The level of service diagrams provided throughout the report show the levels of service for the study intersections. The levels of service shown for signalized intersections are representative of the overall level of service for that intersection. For TWSC intersections, the level of service shown on the maps is the level of service for the worst operating movement at that intersection as opposed to the overall intersection level of service.

TABLE A2: INTERSECTION LEVEL OF SERVICE DESCRIPTION			**Intersections**	
			Signalized	**Unsignalized[1]**
Level of Service	**Conditions**	**Signalized Intersection Description**	**Delay (secs/veh)**	**Delay (secs/veh)**
"A"	Free Flow	*Users experience very low delay. Progression is favorable and most vehicles do not stop at all.*	≤10.0	≤10.0
"B"	Stable Operations	*Vehicles travel with good progression. Some vehicles stop, causing slight delay.*	>10.0 – 20.0	>10.0 – 15.0
"C"	Stable Operations	*Higher delays result from fair progression. A significant number of vehicles stop, although many continue to pass through the intersection without stopping.*	>20.0 to 35.0	>15.0 – 25.0
"D"	Approaching Unstable	*Congestion is noticeable. Progression is unfavorable, with more vehicles stopping rather than passing through the intersection.*	>35.0 – 55.0	>25.0 – 35.0
"E"	Unstable Operations	*Traffic volumes are at capacity. Users experience poor progression and long delays.*	>55.0 – 80.0	>35.0 – 50.0
"F"	Forced Flow	*Intersection's capacity is oversaturated, causing poor progression and unusually long delays.*	>80.0	>50.0

Source: 2000 Highway Capacity Manual, Transportation Research Board.
[1] Unsignalized intersections include TWSC and AWSC

Level of Service Standards

The County of San Luis Obispo policy calls for a LOS "C" threshold in rural areas and a LOS "D" threshold in urban areas. Although two (2) of the study intersections are within the "urban" area of Santa Margarita, the rural character of the town and roadways justifies using the rural area threshold for all study locations. This should be considered a worst-case scenario.

[8] Control delay, according to the *2000 Highway Capacity Manual*, page 16-1, includes initial acceleration delay, queue move-up time, stopped delay, and final acceleration delay.

"Caltrans endeavors to maintain a target LOS at the transition between LOS "C" and LOS "D" on State highway facilities, however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than the appropriate target LOS, the existing measures of effectiveness should be maintained."[9]

Based on the LOS standards of the two (2) controlling agencies, all study locations will be evaluated against the LOS "C" threshold.

[9] Guide for the Preparation of Traffic Impact Studies, State of California Department of Transportation, December, 2002.

APPENDIX B

PROJECT TRIP GENERATION CALCULATIONS

Las Pilitas Resources: Project Trip Generation

Max Annual Volume
225,000 CY 2.2 Tons Per CY

250 Maximum Working Days
20 Tons Per Truck Load

6AM to 5PM Operating Hours
11 Hours Per Day Working

AM peak hour = 1.5 x Loads per Hour
PM peak hour = 1.2 x Loads per Hour

495,000 Total Tons Annually

24,750 Total Annual Loads
99.0 Average Daily Truck Loads
9.0 Loads Per Hour

14 Estimated AM Peak Loads
11 Estimated PM Peak Loads

Trucks

49,500 Annual Trip Ends
198.0 Daily Trip Ends
18.0 Trip Ends Per Hour

27 Estimated AM Peak Trip Ends
22 Estimated PM Peak Trip Ends

	Enter	Exit
AM	14	13
PM	11	11

Employees 5

2,500 Annual Trip Ends
10.0 Daily Trip Ends

5 Estimated AM Peak Trip Ends
5 Estimated PM Peak Trip Ends

	Enter	Exit
AM	5	0
PM	0	5

APPENDIX C

EXISTING CONDITIONS

INTERSECTION LEVELS OF SERVICE CALCULATIONS

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	68	78	118	134	195	111
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	74	85	128	146	212	121
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			159		518	116
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			159		518	116
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			91		55	87
cM capacity (veh/h)			1415		469	933

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	159	274	333
Volume Left	0	128	212
Volume Right	85	0	121
cSH	1700	1415	572
Volume to Capacity	0.09	0.09	0.58
Queue Length 95th (ft)	0	7	93
Control Delay (s)	0.0	4.1	19.7
Lane LOS		A	C
Approach Delay (s)	0.0	4.1	19.7
Approach LOS			C

Intersection Summary			
Average Delay	10.0		
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	168	143	70	95	56	89
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	183	155	76	103	61	97
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			338		516	260
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			338		516	260
tC, single (s)			4.1		6.5	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.4
p0 queue free %			94		87	87
cM capacity (veh/h)			1210		480	769

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	338	179	158
Volume Left	0	76	61
Volume Right	155	0	97
cSH	1700	1210	624
Volume to Capacity	0.20	0.06	0.25
Queue Length 95th (ft)	0	5	25
Control Delay (s)	0.0	3.8	12.7
Lane LOS		A	B
Approach Delay (s)	0.0	3.8	12.7
Approach LOS			B

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	45.0%	ICU Level of Service	A
Analysis Period (min)	15		

Existing AM
2: H Street & Estrada Avenue / SR 58

4/24/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	6	3	14	15	108	8	195	51	138	56	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	7	3	15	16	117	9	212	55	150	61	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	745	647	62	626	620	240	63			267		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	745	647	62	626	620	240	63			267		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	98	100	96	95	85	99			88		
cM capacity (veh/h)	246	342	1003	352	353	797	1540			1279		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	149	276	213
Volume Left	3	15	9	150
Volume Right	3	117	55	2
cSH	367	629	1540	1279
Volume to Capacity	0.04	0.24	0.01	0.12
Queue Length 95th (ft)	3	23	0	10
Control Delay (s)	15.2	12.5	0.3	6.1
Lane LOS	C	B	A	A
Approach Delay (s)	15.2	12.5	0.3	6.1
Approach LOS	C	B		

Intersection Summary			
Average Delay	5.3		
Intersection Capacity Utilization	43.6%	ICU Level of Service	A
Analysis Period (min)	15		

Existing PM
2: H Street & Estrada Avenue / SR 58

4/24/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	3	4	8	5	28	9	115	5	22	185	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	3	4	9	5	30	10	125	5	24	201	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	433	402	204	405	403	128	208			130		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	433	402	204	405	403	128	208			130		
tC, single (s)	7.2	6.6	6.3	7.2	6.6	6.3	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	100	99	99	98	99	97	99			98		
cM capacity (veh/h)	496	518	826	533	518	912	1340			1431		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	10	45	140	232
Volume Left	2	9	10	24
Volume Right	4	30	5	7
cSH	614	740	1340	1431
Volume to Capacity	0.02	0.06	0.01	0.02
Queue Length 95th (ft)	1	5	1	1
Control Delay (s)	11.0	10.2	0.6	0.9
Lane LOS	B	B	A	A
Approach Delay (s)	11.0	10.2	0.6	0.9
Approach LOS	B	B		

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	26.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	36	27	49	1	1	132
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.25	0.25	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	144	108	56	1	1	150
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	57				452	56
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	57				452	56
tC, single (s)	4.1				6.5	6.3
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.4
p0 queue free %	91				100	85
cM capacity (veh/h)	1561				506	999

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	252	57	151
Volume Left	144	0	1
Volume Right	0	1	150
cSH	1561	1700	992
Volume to Capacity	0.09	0.03	0.15
Queue Length 95th (ft)	8	0	13
Control Delay (s)	4.6	0.0	9.3
Lane LOS	A		A
Approach Delay (s)	4.6	0.0	9.3
Approach LOS			A

Intersection Summary			
Average Delay	5.6		
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	119	78	43	4	1	48
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.25	0.25	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	476	312	49	5	1	55
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	53				1315	51
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	53				1315	51
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	70				99	95
cM capacity (veh/h)	1565				121	1017

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	788	53	56
Volume Left	476	0	1
Volume Right	0	5	55
cSH	1565	1700	884
Volume to Capacity	0.30	0.03	0.06
Queue Length 95th (ft)	32	0	5
Control Delay (s)	6.2	0.0	9.3
Lane LOS	A		A
Approach Delay (s)	6.2	0.0	9.3
Approach LOS			A

Intersection Summary			
Average Delay	6.1		
Intersection Capacity Utilization	27.4%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX D

EXISTING PLUS PROJECT CONDITIONS

INTERSECTION LEVELS OF SERVICE CALCULATIONS

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	68	93	120	134	205	112
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	74	101	130	146	223	122
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			175		531	124
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			175		531	124
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			91		52	87
cM capacity (veh/h)			1395		460	924

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	175	276	345
Volume Left	0	130	223
Volume Right	101	0	122
cSH	1700	1395	559
Volume to Capacity	0.10	0.09	0.62
Queue Length 95th (ft)	0	8	104
Control Delay (s)	0.0	4.1	21.2
Lane LOS		A	C
Approach Delay (s)	0.0	4.1	21.2
Approach LOS			C

Intersection Summary			
Average Delay	10.6		
Intersection Capacity Utilization	51.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	168	151	71	95	69	90
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	183	164	77	103	75	98
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			347		522	265
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			347		522	265
tC, single (s)			4.1		6.5	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.4
p0 queue free %			94		84	87
cM capacity (veh/h)			1201		475	764

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	347	180	173
Volume Left	0	77	75
Volume Right	164	0	98
cSH	1700	1201	605
Volume to Capacity	0.20	0.06	0.29
Queue Length 95th (ft)	0	5	29
Control Delay (s)	0.0	3.8	13.3
Lane LOS		A	B
Approach Delay (s)	0.0	3.8	13.3
Approach LOS			B

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	46.3%	ICU Level of Service	A
Analysis Period (min)	15		

Existing + Project AM
2: H Street & Estrada Avenue / SR 58

5/13/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	6	3	14	15	108	8	206	51	138	73	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	7	3	15	16	117	9	224	55	150	79	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	775	677	80	656	651	252	82			279		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	775	677	80	656	651	252	82			279		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	98	100	95	95	85	99			88		
cM capacity (veh/h)	234	328	980	335	339	785	1516			1266		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	149	288	232
Volume Left	3	15	9	150
Volume Right	3	117	55	2
cSH	351	613	1516	1266
Volume to Capacity	0.04	0.24	0.01	0.12
Queue Length 95th (ft)	3	24	0	10
Control Delay (s)	15.6	12.8	0.3	5.7
Lane LOS	C	B	A	A
Approach Delay (s)	15.6	12.8	0.3	5.7
Approach LOS	C	B		

Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		

Existing + Project PM
2: H Street & Estrada Avenue / SR 58

5/13/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	3	4	8	5	28	9	129	5	22	194	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	3	4	9	5	30	10	140	5	24	211	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	458	427	214	430	428	143	217			146		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	458	427	214	430	428	143	217			146		
tC, single (s)	7.2	6.6	6.3	7.2	6.6	6.3	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	100	99	99	98	99	97	99			98		
cM capacity (veh/h)	476	501	816	513	501	894	1329			1412		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	10	45	155	241
Volume Left	2	9	10	24
Volume Right	4	30	5	7
cSH	597	721	1329	1412
Volume to Capacity	0.02	0.06	0.01	0.02
Queue Length 95th (ft)	1	5	1	1
Control Delay (s)	11.1	10.3	0.5	0.9
Lane LOS	B	B	A	A
Approach Delay (s)	11.1	10.3	0.5	0.9
Approach LOS	B	B		

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	27.4%	ICU Level of Service	A
Analysis Period (min)	15		

Existing + Project AM
3: Pozo Road / SR 58 & SR 58

5/13/2009

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	53	27	49	2	2	143
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.25	0.25	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	212	108	56	2	2	162
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	58				589	57
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	58				589	57
tC, single (s)	4.1				6.5	6.3
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.4
p0 queue free %	86				99	84
cM capacity (veh/h)	1559				401	998

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	320	58	165
Volume Left	212	0	2
Volume Right	0	2	162
cSH	1559	1700	978
Volume to Capacity	0.14	0.03	0.17
Queue Length 95th (ft)	12	0	15
Control Delay (s)	5.5	0.0	9.4
Lane LOS	A		A
Approach Delay (s)	5.5	0.0	9.4
Approach LOS			A

Intersection Summary			
Average Delay	6.1		
Intersection Capacity Utilization	26.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	128	78	43	5	2	62
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.25	0.25	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	512	312	49	6	2	70
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	55				1388	52
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	55				1388	52
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	67				98	93
cM capacity (veh/h)	1564				106	1016

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	824	55	73
Volume Left	512	0	2
Volume Right	0	6	70
cSH	1564	1700	801
Volume to Capacity	0.33	0.03	0.09
Queue Length 95th (ft)	36	0	7
Control Delay (s)	6.5	0.0	9.9
Lane LOS	A		A
Approach Delay (s)	6.5	0.0	9.9
Approach LOS			A

Intersection Summary			
Average Delay	6.4		
Intersection Capacity Utilization	28.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	18	37	133	1	1	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	20	42	151	1	1	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	152				235	152
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	152				235	152
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	98
cM capacity (veh/h)	1428				747	900

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	20	42	152	15
Volume Left	20	0	0	1
Volume Right	0	0	1	14
cSH	1428	1700	1700	886
Volume to Capacity	0.01	0.02	0.09	0.02
Queue Length 95th (ft)	1	0	0	1
Control Delay (s)	7.6	0.0	0.0	9.1
Lane LOS	A			A
Approach Delay (s)	2.5		0.0	9.1
Approach LOS				A

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	23.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	10	122	48	1	1	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.25	0.25
Hourly flow rate (vph)	11	139	55	1	4	60
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	56				216	55
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	56				216	55
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	94
cM capacity (veh/h)	1549				771	1017

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	11	139	56	64
Volume Left	11	0	0	4
Volume Right	0	0	1	60
cSH	1549	1700	1700	997
Volume to Capacity	0.01	0.08	0.03	0.06
Queue Length 95th (ft)	1	0	0	5
Control Delay (s)	7.3	0.0	0.0	8.9
Lane LOS	A			A
Approach Delay (s)	0.6		0.0	8.9
Approach LOS				A

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	17.2%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX E

2030 NO PROJECT CONDITIONS

INTERSECTION LEVELS OF SERVICE CALCULATIONS

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	102	133	184	202	341	184
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	111	145	200	220	371	200
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			255		803	183
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			255		803	183
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			85		0	77
cM capacity (veh/h)			1304		298	857

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	255	420	571
Volume Left	0	200	371
Volume Right	145	0	200
cSH	1700	1304	386
Volume to Capacity	0.15	0.15	1.48
Queue Length 95th (ft)	0	14	755
Control Delay (s)	0.0	4.7	255.7
Lane LOS		A	F
Approach Delay (s)	0.0	4.7	255.7
Approach LOS			F

Intersection Summary			
Average Delay	118.7		
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	253	268	124	143	115	145
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	275	291	135	155	125	158
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			566		846	421
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			566		846	421
tC, single (s)			4.1		6.5	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.4
p0 queue free %			86		56	75
cM capacity (veh/h)			996		283	624

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	566	290	283
Volume Left	0	135	125
Volume Right	291	0	158
cSH	1700	996	407
Volume to Capacity	0.33	0.14	0.69
Queue Length 95th (ft)	0	12	128
Control Delay (s)	0.0	5.0	31.6
Lane LOS		A	D
Approach Delay (s)	0.0	5.0	31.6
Approach LOS			D

Intersection Summary			
Average Delay	9.1		
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		

2030 No Project AM
2: H Street & Estrada Avenue / SR 58

4/28/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	9	5	21	23	163	12	357	78	208	105	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	10	5	23	25	177	13	388	85	226	114	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1214	1067	116	1035	1026	430	117			473		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1214	1067	116	1035	1026	430	117			473		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	94	99	86	86	72	99			79		
cM capacity (veh/h)	85	174	937	166	183	623	1471			1074		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	21	225	486	343
Volume Left	5	23	13	226
Volume Right	5	177	85	3
cSH	164	403	1471	1074
Volume to Capacity	0.13	0.56	0.01	0.21
Queue Length 95th (ft)	11	83	1	20
Control Delay (s)	30.2	24.7	0.3	6.8
Lane LOS	D	C	A	A
Approach Delay (s)	30.2	24.7	0.3	6.8
Approach LOS	D	C		

Intersection Summary			
Average Delay	8.0		
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		

2030 No Project PM
2: H Street & Estrada Avenue / SR 58

4/28/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	5	6	14	8	42	14	215	9	33	351	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	5	7	15	9	46	15	234	10	36	382	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	777	732	386	736	732	239	391			243		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	777	732	386	736	732	239	391			243		
tC, single (s)	7.2	6.6	6.3	7.2	6.6	6.3	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	99	98	99	95	97	94	99			97		
cM capacity (veh/h)	277	330	653	312	330	791	1146			1300		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	15	70	259	427
Volume Left	3	15	15	36
Volume Right	7	46	10	10
cSH	398	524	1146	1300
Volume to Capacity	0.04	0.13	0.01	0.03
Queue Length 95th (ft)	3	11	1	2
Control Delay (s)	14.4	12.9	0.6	0.9
Lane LOS	B	B	A	A
Approach Delay (s)	14.4	12.9	0.6	0.9
Approach LOS	B	B		

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	41.3%	ICU Level of Service	A
Analysis Period (min)	15		

2030 No Project AM
3: Pozo Road / SR 58 & SR 58

4/28/2009

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	55	42	74	2	2	199
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.25	0.25	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	220	168	84	2	2	226
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	86				693	85
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	86				693	85
tC, single (s)	4.1				6.5	6.3
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.4
p0 queue free %	86				99	77
cM capacity (veh/h)	1523				345	963

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	388	86	228
Volume Left	220	0	2
Volume Right	0	2	226
cSH	1523	1700	946
Volume to Capacity	0.14	0.05	0.24
Queue Length 95th (ft)	13	0	24
Control Delay (s)	4.9	0.0	10.0
Lane LOS	A		B
Approach Delay (s)	4.9	0.0	10.0
Approach LOS			B

Intersection Summary			
Average Delay		6.0	
Intersection Capacity Utilization		31.0%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	179	117	66	6	2	73
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.25	0.25	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	716	468	75	7	2	83
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	82				1978	78
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	82				1978	78
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	53				94	92
cM capacity (veh/h)	1528				36	982

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1184	82	85
Volume Left	716	0	2
Volume Right	0	7	83
cSH	1528	1700	578
Volume to Capacity	0.47	0.05	0.15
Queue Length 95th (ft)	64	0	13
Control Delay (s)	8.1	0.0	12.3
Lane LOS	A		B
Approach Delay (s)	8.1	0.0	12.3
Approach LOS			B

Intersection Summary			
Average Delay	7.9		
Intersection Capacity Utilization	34.0%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX F

2030 PROJECT CONDITIONS

INTERSECTION LEVELS OF SERVICE CALCULATIONS

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	102	148	186	202	351	185
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	111	161	202	220	382	201
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			272		815	191
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			272		815	191
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			84		0	76
cM capacity (veh/h)			1286		291	848

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	272	422	583
Volume Left	0	202	382
Volume Right	161	0	201
cSH	1700	1286	377
Volume to Capacity	0.16	0.16	1.55
Queue Length 95th (ft)	0	14	812
Control Delay (s)	0.0	4.8	285.4
Lane LOS		A	F
Approach Delay (s)	0.0	4.8	285.4
Approach LOS			F

Intersection Summary			
Average Delay	131.9		
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		

2030 Project PM
1: El Camino Real / SR 58 & Estrada Avenue / SR 58

5/13/2009

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	253	276	125	143	128	146
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	275	300	136	155	139	159
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			575		852	425
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			575		852	425
tC, single (s)			4.1		6.5	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.4
p0 queue free %			86		50	74
cM capacity (veh/h)			988		280	621

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	575	291	298
Volume Left	0	136	139
Volume Right	300	0	159
cSH	1700	988	396
Volume to Capacity	0.34	0.14	0.75
Queue Length 95th (ft)	0	12	152
Control Delay (s)	0.0	5.0	37.0
Lane LOS		A	E
Approach Delay (s)	0.0	5.0	37.0
Approach LOS			E

Intersection Summary			
Average Delay	10.7		
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		

2030 Project AM
2: H Street & Estrada Avenue / SR 58

5/13/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	9	5	21	23	163	12	368	78	208	122	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	10	5	23	25	177	13	400	85	226	133	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1245	1097	134	1065	1057	442	136			485		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1245	1097	134	1065	1057	442	136			485		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	94	99	86	86	71	99			79		
cM capacity (veh/h)	80	166	915	158	175	613	1448			1063		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	21	225	498	362
Volume Left	5	23	13	226
Volume Right	5	177	85	3
cSH	155	390	1448	1063
Volume to Capacity	0.13	0.58	0.01	0.21
Queue Length 95th (ft)	11	87	1	20
Control Delay (s)	31.7	26.1	0.3	6.6
Lane LOS	D	D	A	A
Approach Delay (s)	31.7	26.1	0.3	6.6
Approach LOS	D	D		

Intersection Summary				
Average Delay		8.2		
Intersection Capacity Utilization		66.5%	ICU Level of Service	C
Analysis Period (min)		15		

2030 Project PM
2: H Street & Estrada Avenue / SR 58

5/13/2009

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	5	6	14	8	42	14	229	9	33	360	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	5	7	15	9	46	15	249	10	36	391	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	802	757	396	761	757	254	401			259		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	802	757	396	761	757	254	401			259		
tC, single (s)	7.2	6.6	6.3	7.2	6.6	6.3	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	99	98	99	95	97	94	99			97		
cM capacity (veh/h)	266	319	645	300	319	775	1136			1283		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	15	70	274	437
Volume Left	3	15	15	36
Volume Right	7	46	10	10
cSH	386	508	1136	1283
Volume to Capacity	0.04	0.14	0.01	0.03
Queue Length 95th (ft)	3	12	1	2
Control Delay (s)	14.7	13.2	0.6	0.9
Lane LOS	B	B	A	A
Approach Delay (s)	14.7	13.2	0.6	0.9
Approach LOS	B	B		

Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	42.1%	ICU Level of Service	A	
Analysis Period (min)	15			

2030 Project AM
3: Pozo Road / SR 58 & SR 58

5/13/2009

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	72	42	74	3	3	210
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.25	0.25	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	288	168	84	3	3	239
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	88				830	86
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	88				830	86
tC, single (s)	4.1				6.5	6.3
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.4
p0 queue free %	81				99	75
cM capacity (veh/h)	1521				271	962

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	456	88	242
Volume Left	288	0	3
Volume Right	0	3	239
cSH	1521	1700	929
Volume to Capacity	0.19	0.05	0.26
Queue Length 95th (ft)	17	0	26
Control Delay (s)	5.6	0.0	10.2
Lane LOS	A		B
Approach Delay (s)	5.6	0.0	10.2
Approach LOS			B

Intersection Summary			
Average Delay	6.4		
Intersection Capacity Utilization	32.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	188	117	66	7	3	87
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.25	0.25	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	752	468	75	8	3	99
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	83				2051	79
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	83				2051	79
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	51				89	90
cM capacity (veh/h)	1527				31	981

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1220	83	102
Volume Left	752	0	3
Volume Right	0	8	99
cSH	1527	1700	486
Volume to Capacity	0.49	0.05	0.21
Queue Length 95th (ft)	71	0	20
Control Delay (s)	8.4	0.0	14.4
Lane LOS	A		B
Approach Delay (s)	8.4	0.0	14.4
Approach LOS			B

Intersection Summary			
Average Delay	8.4		
Intersection Capacity Utilization	35.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	18	57	200	1	1	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	20	65	227	1	1	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	228				334	228
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	228				334	228
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				100	98
cM capacity (veh/h)	1340				655	816

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	20	65	228	15
Volume Left	20	0	0	1
Volume Right	0	0	1	14
cSH	1340	1700	1700	801
Volume to Capacity	0.02	0.04	0.13	0.02
Queue Length 95th (ft)	1	0	0	1
Control Delay (s)	7.7	0.0	0.0	9.6
Lane LOS	A			A
Approach Delay (s)	1.9		0.0	9.6
Approach LOS				A

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		

2030 Project PM
4: SR 58 & Project Driveway

5/13/2009

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	10	184	73	1	1	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.25	0.25
Hourly flow rate (vph)	11	209	83	1	4	60
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	84				315	84
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	84				315	84
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	94
cM capacity (veh/h)	1513				677	981

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	11	209	84	64
Volume Left	11	0	0	4
Volume Right	0	0	1	60
cSH	1513	1700	1700	955
Volume to Capacity	0.01	0.12	0.05	0.07
Queue Length 95th (ft)	1	0	0	5
Control Delay (s)	7.4	0.0	0.0	9.0
Lane LOS	A			A
Approach Delay (s)	0.4		0.0	9.0
Approach LOS				A

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	19.7%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX G

MITIGATED 2030 PROJECT CONDITIONS

INTERSECTION LEVELS OF SERVICE CALCULATIONS

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	102	148	186	202	351	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6			4.6	4.6	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.92			1.00	0.95	
Flt Protected	1.00			0.98	0.97	
Satd. Flow (prot)	1649			1802	1703	
Flt Permitted	1.00			0.70	0.97	
Satd. Flow (perm)	1649			1295	1703	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	111	161	202	220	382	201
RTOR Reduction (vph)	94	0	0	0	34	0
Lane Group Flow (vph)	178	0	0	422	549	0
Heavy Vehicles (%)	6%	6%	3%	3%	3%	3%
Turn Type			Perm			
Protected Phases	2			6	8	
Permitted Phases			6			
Actuated Green, G (s)	19.9			19.9	18.8	
Effective Green, g (s)	19.9			19.9	18.8	
Actuated g/C Ratio	0.42			0.42	0.39	
Clearance Time (s)	4.6			4.6	4.6	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	685			538	668	
v/s Ratio Prot	0.11				c0.32	
v/s Ratio Perm				c0.33		
v/c Ratio	0.26			0.78	0.82	
Uniform Delay, d1	9.2			12.1	13.0	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.2			7.4	8.0	
Delay (s)	9.4			19.5	21.1	
Level of Service	A			B	C	
Approach Delay (s)	9.4			19.5	21.1	
Approach LOS	A			B	C	

Intersection Summary

HCM Average Control Delay	18.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	47.9	Sum of lost time (s)	9.2
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	253	276	125	143	128	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6			4.6	4.6	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.93			1.00	0.93	
Flt Protected	1.00			0.98	0.98	
Satd. Flow (prot)	1732			1785	1625	
Flt Permitted	1.00			0.57	0.98	
Satd. Flow (perm)	1732			1038	1625	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	275	300	136	155	139	159
RTOR Reduction (vph)	78	0	0	0	93	0
Lane Group Flow (vph)	497	0	0	291	205	0
Heavy Vehicles (%)	2%	2%	4%	4%	6%	6%
Turn Type			Perm			
Protected Phases	2			6	8	
Permitted Phases			6			
Actuated Green, G (s)	16.8			16.8	7.7	
Effective Green, g (s)	16.8			16.8	7.7	
Actuated g/C Ratio	0.50			0.50	0.23	
Clearance Time (s)	4.6			4.6	4.6	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	863			517	371	
v/s Ratio Prot	c0.29				c0.13	
v/s Ratio Perm				0.28		
v/c Ratio	0.58			0.56	0.55	
Uniform Delay, d1	5.9			5.9	11.5	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.9			1.4	1.8	
Delay (s)	6.9			7.3	13.3	
Level of Service	A			A	B	
Approach Delay (s)	6.9			7.3	13.3	
Approach LOS	A			A	B	

Intersection Summary

HCM Average Control Delay	8.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	33.7	Sum of lost time (s)	9.2
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX H

PEAK HOUR SIGNAL WARRANT ANALYSES

WARRANT 3 - Peak Hour

El Camino Real at Estrada Avenue

Existing Conditions

PART A or PART B SATISFIED **YES** NO

PART A

(All parts 1,2, and 3 below must be satisfied)

1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND — YES **NO**

2. The volume on the same minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND — **YES** NO

3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches. — **YES** NO

PART B

SATISFIED (Figure 4C-4) **YES** NO

APPROACH LANES	One	2 or More	AM Peak	PM Peak
Both Approaches Major Street	√		398	476
Highest Approach Minor Street	√		306	145

The plotted points for vehicles per hour on major streets (both approaches) and the corresponding per hour higher volume vehicle minor street approach (one direction only) for one hour (any four consecutive 15 minute periods) fall above the applicable curves in MUTCD Figure 4C-3 or 4C-4.

TRAFFIC SIGNAL WARRANTS

CALC WH DATE 4/27/09 CHK _____ DATE _____

MAJOR STREET: SR 58 / EL CAMINO REAL Critical Approach Speed 35/55 mph

MINOR STREET: SR 58 / ESTRADA AVENUE Critical Approach Speed 35 mph

Critical speed of major street traffic > 40 mph ---------- ☒ or RURAL (R)

In built up area of isolated community of < 10,000 pop. -------- ☒ ☐ URBAN (U)

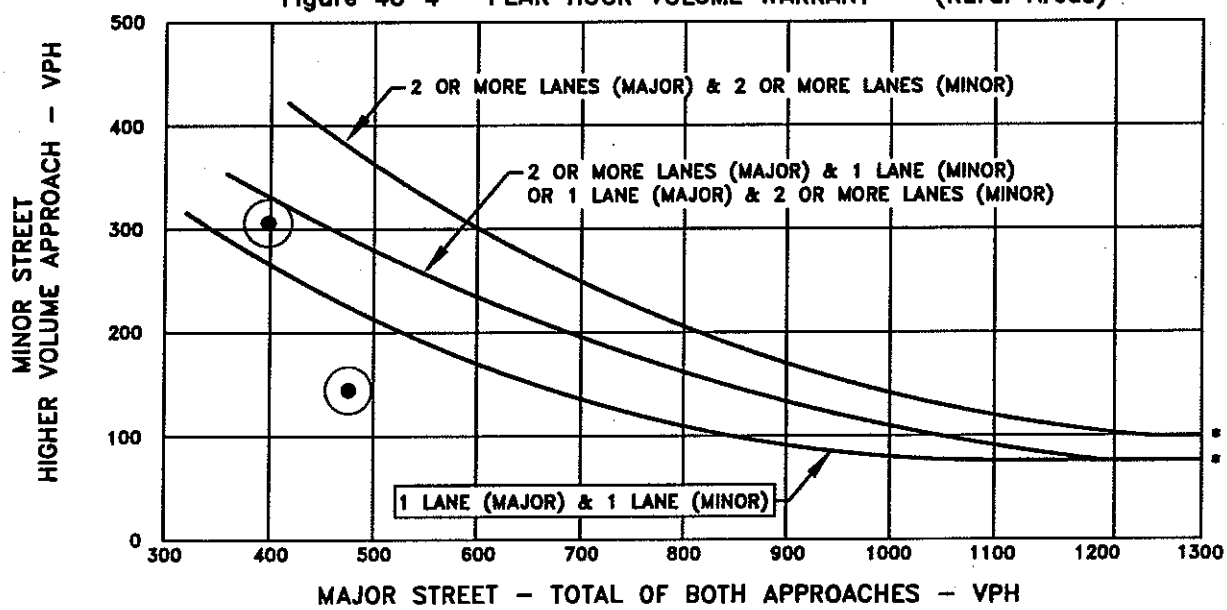
CONDITION: EXISTING

WARRANT 3 – Peak Haur Volume SATISFIED* YES ☒ NO ☐

Approach Lanes	One	2 or more	AM PEAK	PM PEAK				Hour
Both Approaches – Major Street	✓		398	476				
Highest Approaches – Minor Street	✓		306	145				

* Refer to Fig. 4C-3 (URBAN AREAS) or Fig. 4C-4 (RURAL AREAS) to determine if this warrant is satisfied.

Figure 4C-4 PEAK HOUR VOLUME WARRANT (Rural Areas)



* NOTE:
100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

The satisfaction of a warrant is not necessarily justification for a signal. Delay, congestion, confusion or other evidence of the need for right of way assignment must be shown.

TPG Consulting Incorporated

TPG Consulting - Traffic Count Analysis

TPG Consulting incorporated

Exceeding expectations in
Engineering, Planning & Transportation

December 21, 2010

Mr. Ken Johnston
Las Pilitas Resources
P.O. Box 975
Santa Margarita, CA 93453

Dear Mr. Johnston:

TPG Consulting has performed a comparison of traffic counts taken on State Route (SR) 58 in the town of Santa Margarita. The first set of traffic counts were taken by TPG Consulting, Inc. in April of 2009 to be used in the *Traffic Impact Study for the Las Pilitas Rock Quarry*. The second set of traffic counts includes segment axle counts conducted by Caltrans in October and November of 2010.

Count Data

The TIS counts were performed during the AM (7-9) and PM (4-6) peak hour time periods at four intersections along SR 58:

1. El Camino Real at Estrada Avenue
2. H Street at Estrada Avenue
3. Pozo Road at Calf Canyon Highway
4. Calf Canyon Highway at Project Driveway (approx 200' east of bridge)

Recently, Caltrans has performed segment counts on SR 58 at select locations, adjacent to the TIS study intersections. The following locations were provided by Caltrans staff:

1. SR 58 (El Camino Real) between Pinal Avenue and Estrada Avenue
2. SR 58 (Estrada Avenue) between El Camino Real and H Street
3. SR 58 (Estrada Avenue) between H Street and J Street
4. SR 58 (Pozo Road) west of Calf Canyon Highway
5. SR 58 (Calf Canyon Highway) east of Pozo Road
6. SR 58 (Calf Canyon Highway) east and west of Park Hill Road

These traffic counts were taken over approximately a one-week time period during October and November of 2010.

In order to compare the traffic counts, the Caltrans counts were adjusted as follows:

- Weekend days were excluded
- School holiday days were excluded
- Remaining weekday counts were averaged for each location
- Peak hour traffic volumes were determined for the AM and PM peak hour periods

It should also be noted that the Caltrans traffic counts represent axle counts, but do not differentiate between vehicles. Therefore, every 2 axle counts are assumed to represent one vehicle. For locations with low truck volumes, this will result in fairly accurate traffic volumes. According to the counts published in the Caltrans *2009 Annual Average Daily Truck Traffic* (AADTT), SR 58 has approximately 6.2% total trucks east of SR 101 and

Visalia Office
222 N. Garden Street
Suite 109
Visalia, CA 93291
Tel 559.739.8072
Fax 559.739.8377

Colorado Office
1950 W. Littleton Blvd
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Littleton, CO 80120
Tel 303.797.0989
Fax 303.797.0987

5.4% to the west of SR 229. These truck percentages also include 2-axle single unit trucks which represent more than 50% of the total truck volumes.

Since fewer than 3% of all trucks on SR 58, through the study locations, have more than 2 axles, no adjustments were made to the Caltrans axle counts. This means that the Caltrans counts referenced throughout this letter are slightly higher than actual in terms of the number of vehicles.

Count Comparison

Table 1 shows a comparison of the 2009 TIS and 2010 Caltrans traffic counts for the AM and PM peak hour periods. Approach and/or departure volumes for the intersection counts were used to calculate segment volumes to compare to the Caltrans segment counts.

TABLE 1:
COMPARISON OF TRAFFIC COUNTS

Segment	2009 TIS Counts (AM/PM)	2010 Caltrans Counts (AM/PM)	% Decrease (AM/PM)
SR 58 between Pinal Avenue and Estrada Avenue			
• Westbound	329/151	276/140	16%/7%
• Eastbound	146/311	139/275	5%/12%
SR 58 between El Camino Real and H Street			
• Westbound	306/145	202/89	34%/39%
• Eastbound	196/213	55/194	72%/9%
SR 58 between H Street and J Street			
• Westbound	254/129	179/75	30%/42%
• Eastbound	73/197	51/168	30%/15%
SR 58 west of Calf Canyon Highway			
• Westbound	181/91	139/84	23%/8%
• Eastbound	63/197	49/125	22%/37%
SR 58 east of Pozo Road			
• Westbound	133/49	104/55	22%/**-12%**
• Eastbound	37/123	23/98	38%/20%
SR 58 west of Park Hill Road			
• Westbound	133/48	102/51	23%/**-6%**
• Eastbound	37/122	13/92	65%/25%

As shown in Table 1, only 2 locations/time periods show a higher traffic volume during the Caltrans 2010 traffic counts than the 2009 TIS counts. These locations and time periods are shown bolded in Table 1. Note that even at these 2 locations, only the westbound direction shows an increase, while the eastbound direction shows a decrease. Ultimately all study locations experience an overall traffic decrease.

Variability Factors

The town of Santa Margarita and the study segments or SR 58 likely experience little variation in traffic throughout the year based on traffic associated with **local residents and businesses**. However, several factors may contribute to the difference in the traffic volumes. Efforts were made to remove or reduce these factors for this comparison.

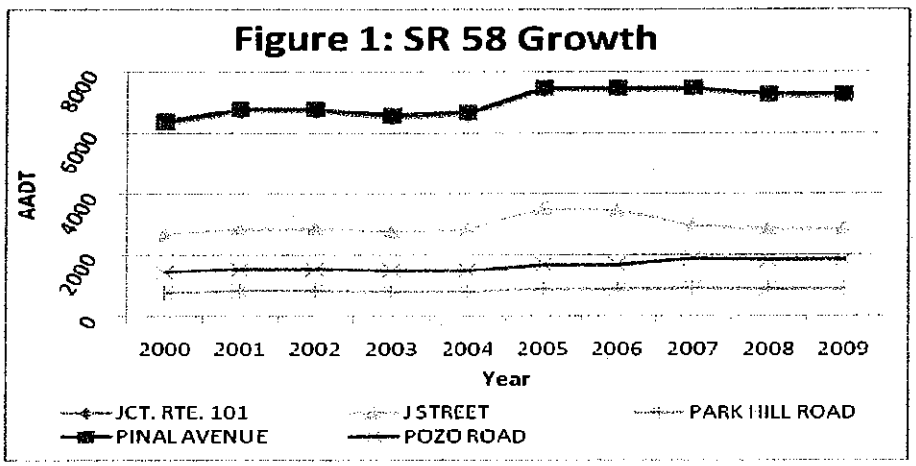
Santa Margarita Elementary School is located on H Street, east of Estrada Avenue, and draws a large number of trips during the AM peak hour. Based on the school calendar and field observations, all traffic counts were conducted while school was in normal session. This factor is not presumed to represent a significant influence between the traffic counts. No significant public events were running during the count dates that are anticipated to skew the traffic volumes. Changes in housing and/or business development may also contribute to traffic changes. No significant growth or reduction in development between the two count dates is known.

The seasonal fluctuation is likely the largest factor contributing to the change in traffic volumes. Santa Margarita Lake County Park is located south of the community of Santa Margarita off of Pozo Road. Aside from the tourist/recreational opportunities within the community itself, the park and lake activities likely draw a larger amount of tourist and recreational activities during the spring than during the winter.

Additional events that may affect traffic volumes include construction on roadways. According to field observations, construction was occurring on Pozo Road, south of Calf Canyon Highway during the Caltrans traffic counts. While this may have negatively affected local and recreational traffic, it also increased traffic due to worker and material delivery.

Traffic Growth

Figure 1 shows the growth in AADT for the study area of SR 58 over the past 10 years:



Source: http://traffic-counts.dot.ca.gov/index.htm

As shown in Figure 1, the AADT on SR 58 has seen a small increase over the past 10 years. Some decrease in traffic was seen around 2007 and 2009 for certain locations. Based on the historic trends, it is expected that background traffic will slowly increase in the study area.

Conclusions

As shown in the comparison and discussions above, the traffic counts taken in 2009 for the Traffic Impact Study are higher than the recent traffic counts taken by Caltrans in 2010. However, this is not necessarily due to the effects of local area development or travel pattern changes. The most likely cause, as stated above, is the seasonal fluctuation and the variability of recreational traffic.

Thank you for the opportunity to provide you with this analysis. If you have any additional questions, please feel free to contact me by email (whutcheson@tpgconsulting.net) or phone (559/739-8072).

Sincerely,

Wally Hutcheson, TE
Associate Engineer

Supplemental Traffic Counts

ITM Peak Hour Summary

Prepared by:

NDS

National Data & Surveying Services

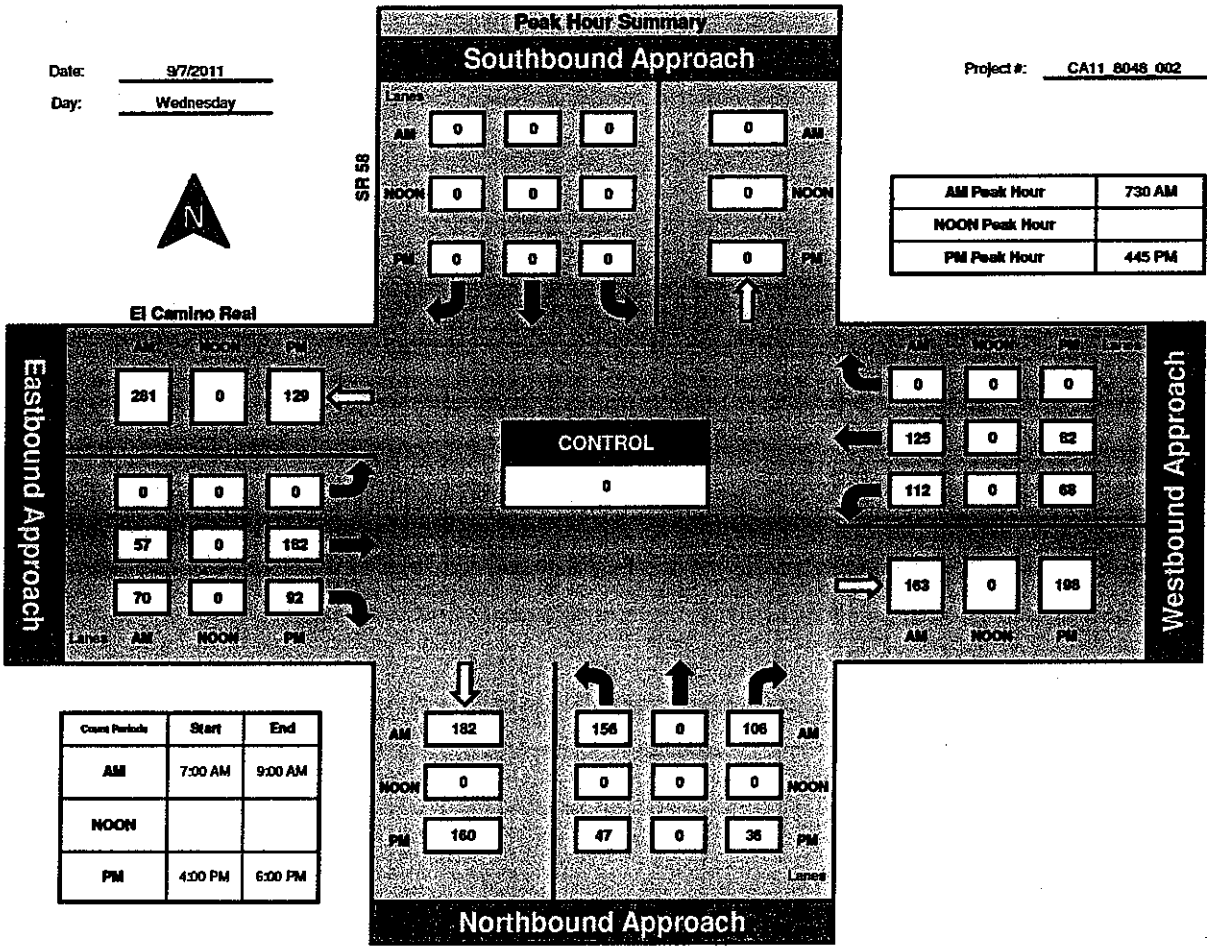
SR 58 and El Camino Real , City of Santa Margarita

Date: 9/7/2011

Day: Wednesday

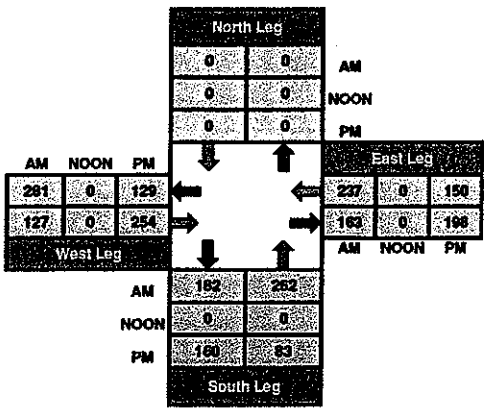
Project #: CA11_8048_002

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	445 PM

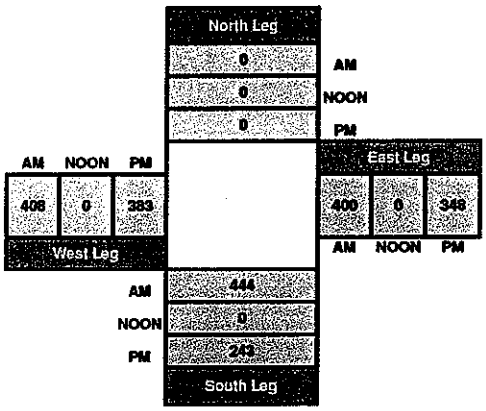


Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

NDS

National Data & Surveying Services

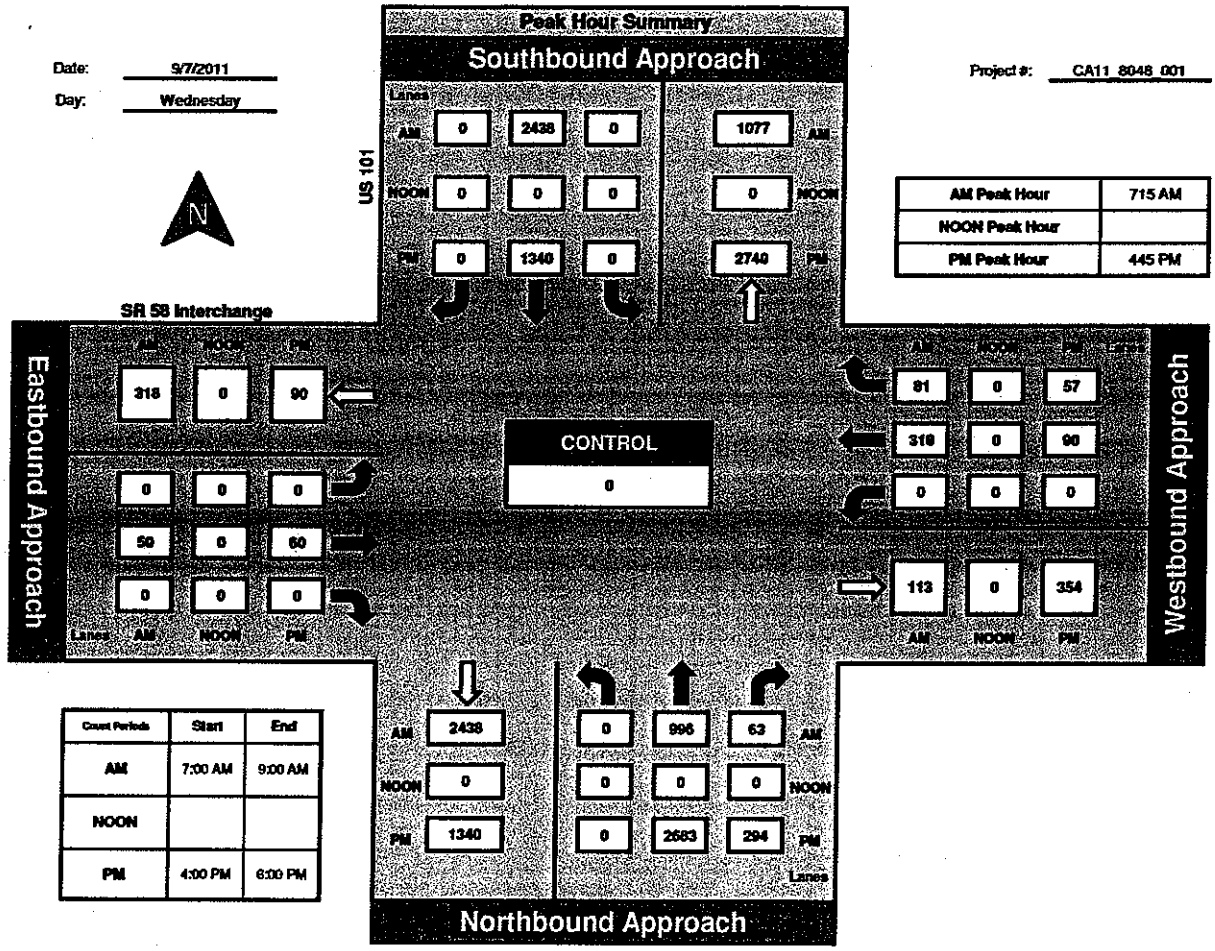
US 101 and SR 58 Interchange , City of Santa Margarita

Date: 9/7/2011

Day: Wednesday

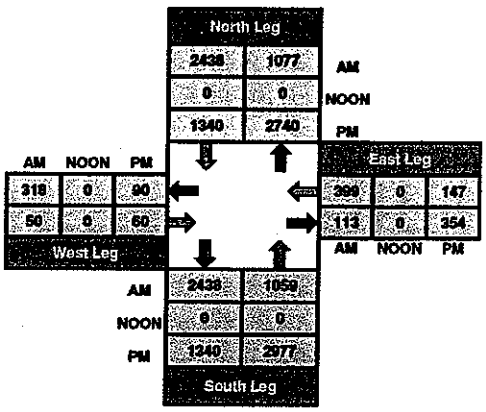
Project #: CA11_8048_001

AM Peak Hour	715 AM
NOON Peak Hour	
PM Peak Hour	445 PM

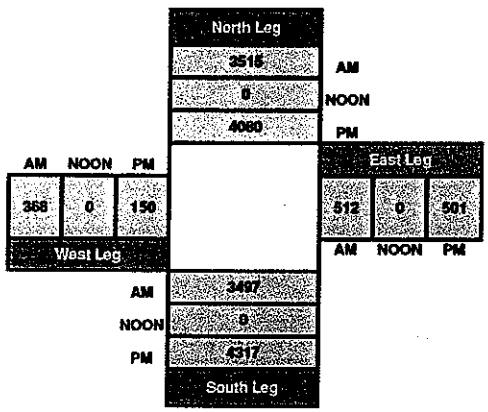


Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg



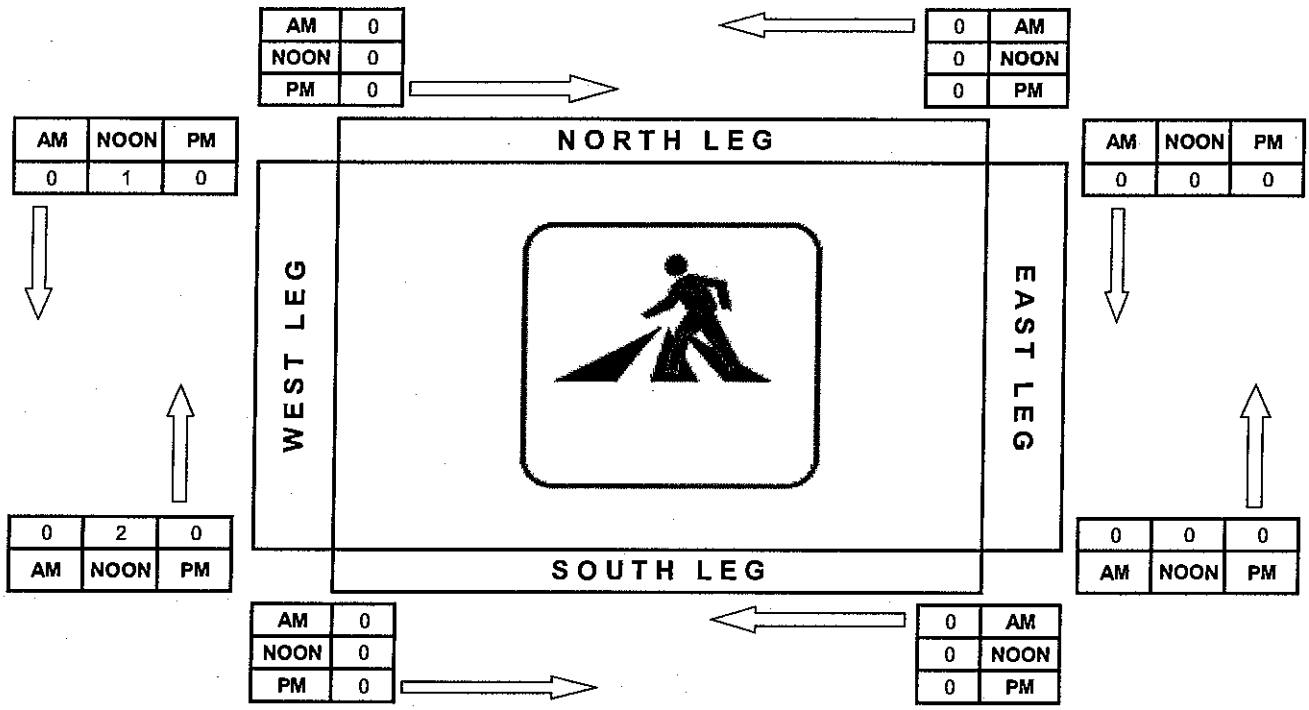
PREPARED BY NATIONAL DATA & SURVEYING SERVICES

Pedestrian Count

PROJECT#:	11-8048-002
N/S Street:	SR 58
E/W Street:	El Camino Real
DATE:	9/7/2011
CITY:	Santa Margarita

DAY: Wednesday

	Start:	End:
AM	7:00	9:00
NOON	14:30	15:30
PM	16:00	18:00



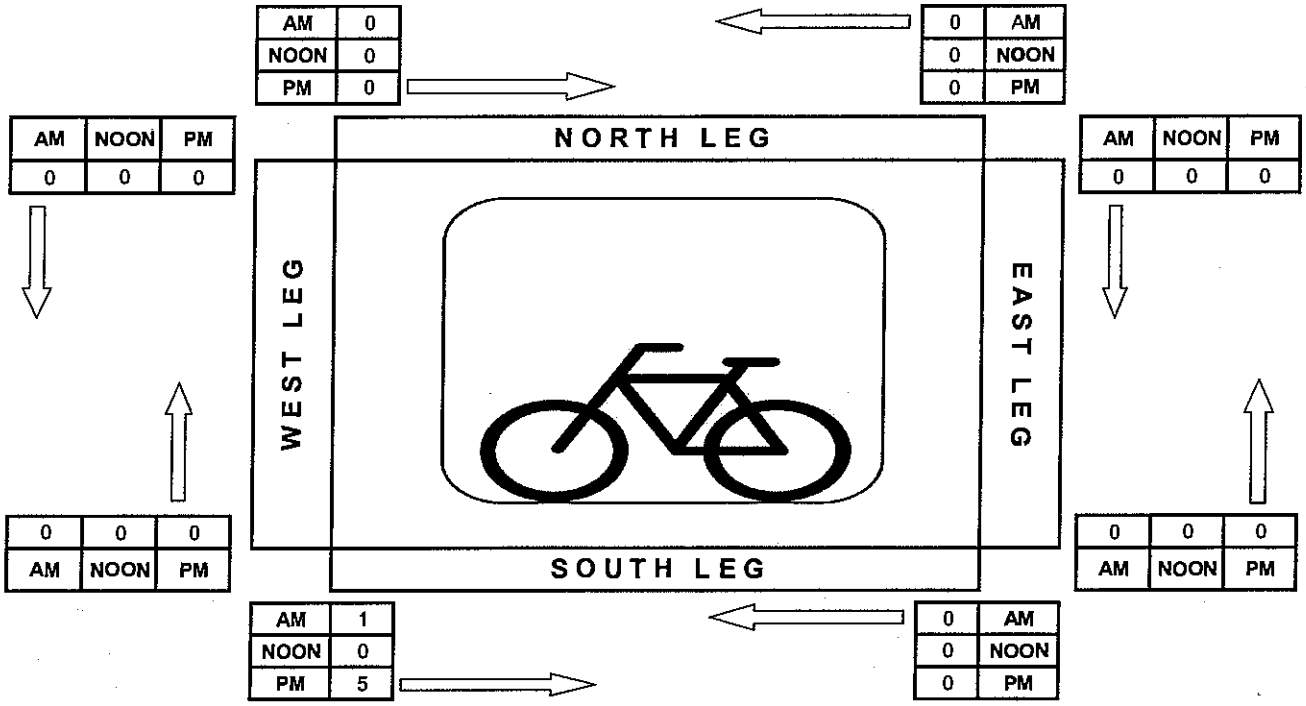
PREPARED BY NATIONAL DATA & SURVEYING SERVICES

Bicycle Count

	Start:	End:
AM	7:00	9:00
NOON	14:30	15:30
PM	16:00	18:00

PROJECT#: 11-8048-002
N/S Street: SR 58
E/W Street: El Camino Real
DATE: 9/7/2011
CITY: Santa Margarita

DAY: Wednesday

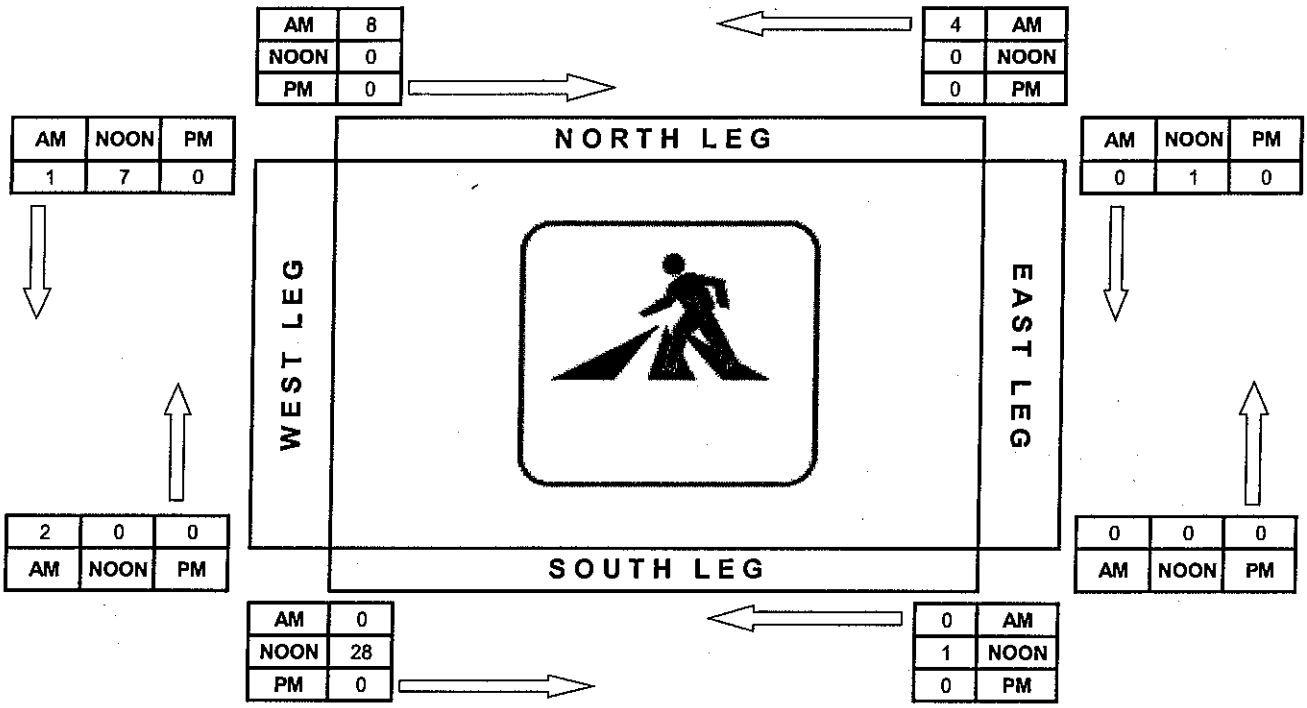


PREPARED BY NATIONAL DATA & SURVEYING SERVICES

Pedestrian Count

	Start:	End:
AM	8:00	9:00
NOON	14:30	15:30
PM		

PROJECT#: 11-8048-003
N/S Street: SR 58
E/W Street: H St
DATE: 9/7/2011 DAY: Wednesday
CITY: Santa Margarita

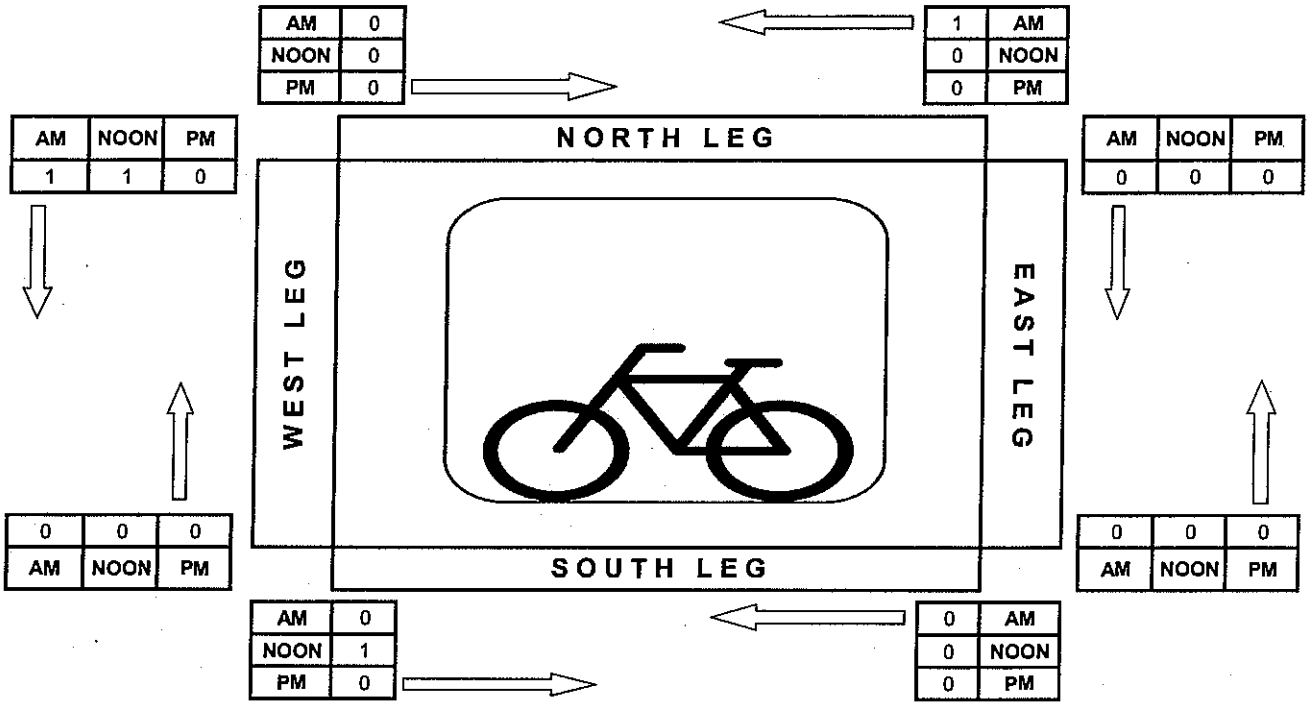


PREPARED BY NATIONAL DATA & SURVEYING SERVICES

Bicycle Count

	Start:	End:
AM	8:00	9:00
NOON	14:30	15:30
PM		

PROJECT#: 11-8048-003
N/S Street: SR 58
E/W Street: H St
DATE: 9/7/2011 DAY: Wednesday
CITY: Santa Margarita

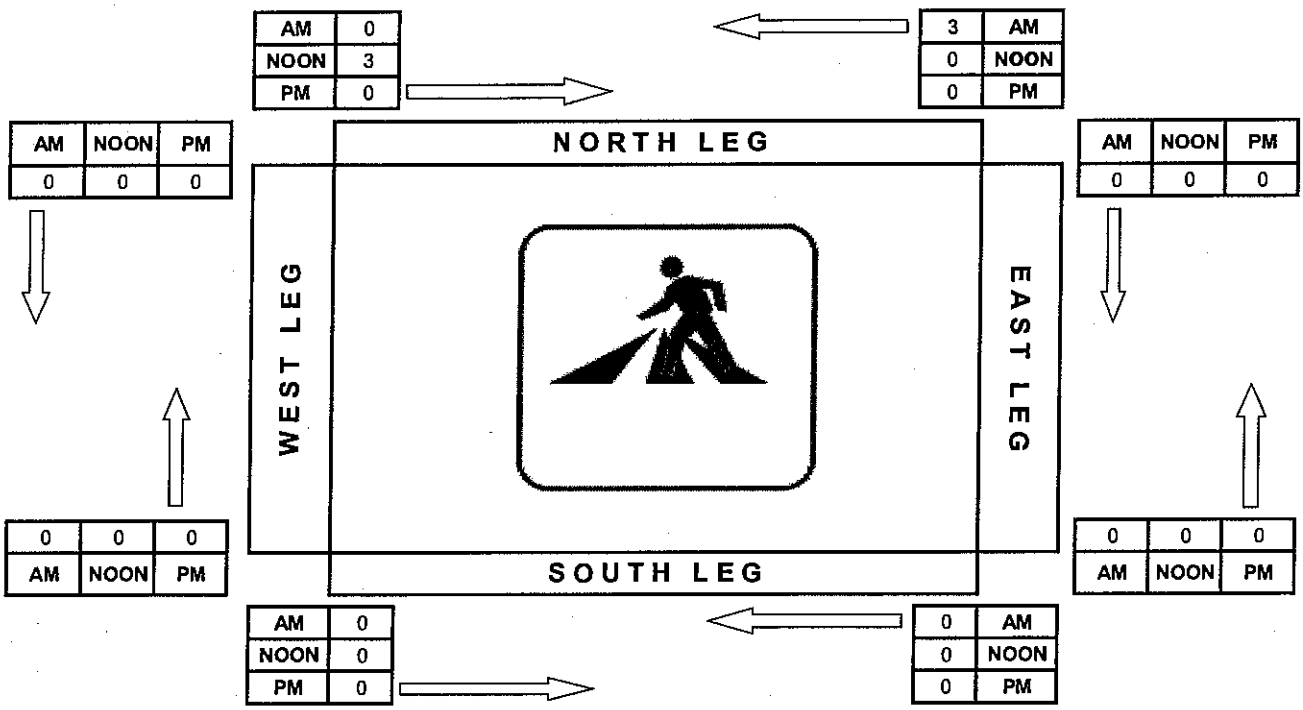


PREPARED BY NATIONAL DATA & SURVEYING SERVICES

Pedestrian Count

	Start:	End:
AM	8:00	9:00
NOON	14:30	15:30
PM		

PROJECT#: 11-8048-003
N/S Street: SR 58
E/W Street: H St
DATE: 9/7/2011 DAY: Wednesday
CITY: Santa Margarita

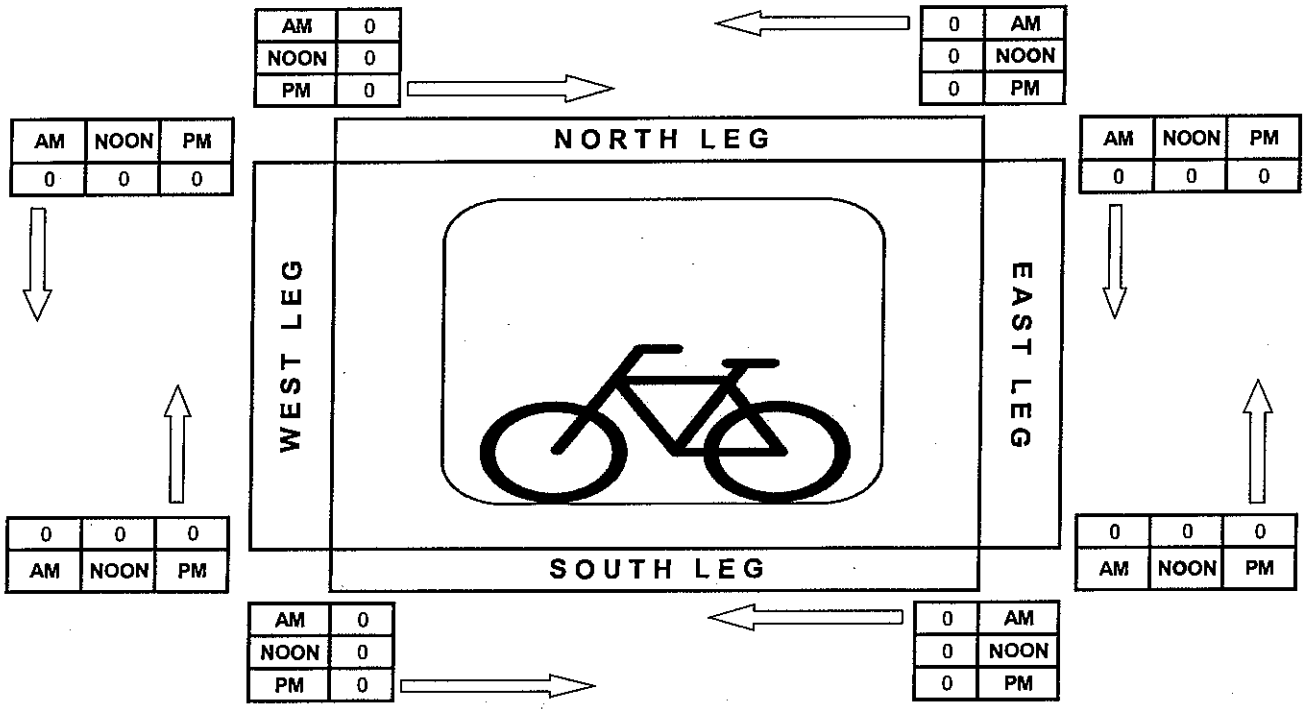


PREPARED BY NATIONAL DATA & SURVEYING SERVICES

Bicycle Count

	Start:	End:
AM	8:00	9:00
NOON	14:30	15:30
PM		

PROJECT#: 11-8048-003
N/S Street: SR 58
E/W Street: H St
DATE: 9/7/2011 DAY: Wednesday
CITY: Santa Margarita



Day: TUESDAY
Date: 9/6/11

Classification Report / Prepared by: National Data & Surveying Services
Location: El Camino Real e/o Estrada Ave

City: Santa Margarita
Project #: 11-8049-001

SUMMARY

Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
00:00 AM	0	10	1	0	1	0	0	0	0	0	0	0	0	12
01:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
02:00	0	3	2	0	0	1	0	0	0	0	0	0	0	6
03:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
04:00	0	11	2	0	1	0	0	0	0	0	0	0	0	14
05:00	0	39	15	1	8	0	0	1	0	0	0	0	0	64
06:00	3	77	31	1	25	3	0	3	2	0	0	0	0	145
07:00	5	176	60	1	36	5	0	5	6	0	0	0	0	294
08:00	5	197	60	3	34	2	0	3	2	0	0	0	0	306
09:00	6	125	47	3	22	3	0	2	3	0	0	0	0	211
10:00	4	115	42	1	28	2	0	0	5	0	0	0	0	197
11:00	2	149	55	1	29	0	0	1	4	0	0	0	0	241
12:00 PM	5	140	47	3	30	2	0	1	3	0	0	0	0	231
13:00	2	158	52	2	31	2	0	2	7	0	0	0	0	256
14:00	2	176	70	2	42	2	0	1	5	0	0	0	0	300
15:00	5	178	78	3	40	3	0	4	5	0	0	0	0	316
16:00	6	185	62	3	37	0	0	1	6	0	0	0	0	300
17:00	6	213	71	1	32	0	0	0	3	0	0	0	0	326
18:00	6	154	37	1	29	1	0	1	1	0	0	0	0	230
19:00	1	111	31	2	13	1	0	1	0	0	0	0	0	160
20:00	1	86	25	1	16	1	0	0	0	0	0	0	0	130
21:00	0	55	10	0	9	0	0	0	0	0	0	0	0	74
22:00	0	32	9	0	3	0	0	0	0	0	0	0	0	44
23:00	0	18	7	0	1	0	0	0	0	0	0	0	0	26
Totals	**59**	**2418**	**816**	**29**	**467**	**28**		**26**	**52**					**3895**
% of Totals	2%	62%	21%	1%	12%	1%		1%	1%					100%
	25	912	317	11	184	16	0	15	22	0	0	0	0	1502
% AM	1%	23%	8%	0%	5%	0%		0%	1%					39%
AM Peak Hour	09:00	08:00	07:00	08:00	07:00	07:00		07:00	07:00					08:00
Volume	6	197	60	3	36	5		5	6					306
	34	1506	499	18	283	12	0	11	30	0	0	0	0	2393
% PM	1%	39%	13%	0%	7%	0%		0%	1%					61%
PM Peak Hour	16:00	17:00	15:00	12:00	14:00	15:00		15:00	13:00					17:00
Volume	6	213	78	3	42	3		4	7					326

Peak Period Totals	AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
	Volume	%	Volume	%	Volume	%	Volume	%
	600	15%	487	13%	626	16%	2182	56%

61

Day: WEDNESDAY
Date: 9/7/11

Classification Report / Prepared by: National Data & Surveying Services
Location: El Camino Real e/o Estrada Ave

City: Santa Margarita
Project #: 11-8049-001

SUMMARY

Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
00:00 AM	0	7	0	0	1	0	0	0	0	0	0	0	0	8
01:00	1	4	0	0	0	0	0	0	0	0	0	0	0	5
02:00	0	3	3	0	0	0	0	0	0	0	0	0	0	6
03:00	0	3	2	0	0	0	0	1	0	0	0	0	0	6
04:00	0	13	4	0	0	0	0	0	0	0	0	0	0	17
05:00	1	43	16	1	12	0	0	0	1	0	0	0	0	74
06:00	3	73	30	1	14	2	0	1	5	0	0	0	0	129
07:00	3	181	63	3	31	3	0	4	4	0	0	0	0	292
08:00	6	205	64	4	33	4	0	0	3	0	0	0	0	319
09:00	7	122	44	2	27	2	0	2	1	0	0	0	0	207
10:00	7	118	47	2	23	2	0	2	2	0	0	0	0	203
11:00	5	149	54	3	35	2	0	0	1	0	0	0	0	249
12:00 PM	4	133	48	0	29	5	0	2	6	0	0	0	0	227
13:00	7	150	53	4	31	1	0	4	5	0	0	0	0	255
14:00	4	169	60	2	39	0	0	3	3	0	0	0	0	280
15:00	2	177	67	4	35	1	0	1	7	0	0	0	0	294
16:00	4	217	58	2	29	0	0	0	5	0	0	0	0	315
17:00	4	200	70	1	36	1	0	0	1	0	0	0	0	313
18:00	5	178	45	1	24	2	0	1	3	0	0	0	0	259
19:00	4	136	33	1	17	1	0	1	1	0	0	0	0	194
20:00	0	97	32	1	11	0	0	0	0	0	0	0	0	141
21:00	0	65	20	1	7	0	0	0	0	0	0	0	0	93
22:00	0	28	10	0	5	0	0	0	0	0	0	0	0	43
23:00	0	18	4	0	3	0	0	0	0	0	0	0	0	25
Totals	**67**	**2489**	**827**	**33**	**442**	**26**		**22**	**48**					**3954**
% of Totals	2%	63%	21%	1%	11%	1%		1%	1%					100%
	33	921	327	16	176	15	0	10	17	0	0	0	0	1515
% AM	1%	23%	8%	0%	4%	0%		0%	0%					38%
AM Peak Hour	09:00	08:00	08:00	08:00	11:00	08:00		07:00	06:00					08:00
Volume	7	205	64	4	35	4		4	5					319
	34	1568	500	17	266	11	0	12	31	0	0	0	0	2439
% PM	1%	40%	13%	0%	7%	0%		0%	1%					62%
PM Peak Hour	13:00	16:00	17:00	13:00	14:00	12:00		13:00	15:00					16:00
Volume	7	217	70	4	39	5		4	7					315

Peak Period Totals	AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
	Volume	%	Volume	%	Volume	%	Volume	%
	611	15%	482	12%	628	16%	2233	56%

Day: THURSDAY
Date: 9/8/11

Classification Report / Prepared by: National Data & Surveying Services
Location: El Camino Real e/o Estrada Ave

City: Santa Margarita
Project #: 11-8049-001

SUMMARY

Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
00:00 AM	0	7	0	0	0	0	0	0	0	0	0	0	0	7
01:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
02:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
03:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
04:00	0	17	2	0	4	0	0	0	0	0	0	0	0	23
05:00	0	37	14	1	4	0	0	0	0	0	0	0	0	56
06:00	3	74	36	1	19	1	0	3	1	0	0	0	0	138
07:00	4	175	51	0	29	1	0	6	15	0	0	0	0	281
08:00	2	209	59	2	39	2	0	6	5	0	0	0	0	324
09:00	4	109	52	1	23	2	0	2	6	0	0	0	0	199
10:00	6	121	47	3	23	2	0	2	4	0	0	0	0	208
11:00	5	133	60	0	22	2	0	1	10	0	0	0	0	233
12:00 PM	2	142	49	2	26	4	0	2	2	0	0	0	0	229
13:00	4	133	39	1	31	0	0	0	5	0	0	0	0	213
14:00	3	168	57	4	26	3	0	2	2	0	0	0	0	265
15:00	5	170	53	3	37	1	0	4	7	0	0	0	0	280
16:00	4	168	61	2	46	0	0	5	2	0	0	0	0	288
17:00	8	248	67	3	42	0	0	0	1	0	0	0	0	369
18:00	7	179	52	1	28	1	0	2	2	0	0	0	0	272
19:00	5	147	38	1	22	0	0	0	1	0	0	0	0	214
20:00	2	88	32	0	18	0	0	0	0	0	0	0	0	140
21:00	0	65	20	0	8	0	0	0	0	0	0	0	0	93
22:00	0	31	10	0	10	0	0	0	0	0	0	0	0	51
23:00	0	17	4	0	6	0	0	0	0	0	0	0	0	27
Totals	**64**	**2450**	**804**	**25**	**463**	**19**		**35**	**63**					**3923**
% of Totals	2%	62%	20%	1%	12%	0%		1%	2%					100%
	24	894	322	8	163	10	0	20	41	0	0	0	0	1482
% AM	1%	23%	8%	0%	4%	0%		1%	1%					38%
AM Peak Hour	10:00	08:00	11:00	10:00	08:00	08:00		07:00	07:00					08:00
Volume	6	209	60	3	39	2		6	15					324
	40	1556	482	17	300	9	0	15	22	0	0	0	0	2441
% PM	1%	40%	12%	0%	8%	0%		0%	1%					62%
PM Peak Hour	17:00	17:00	17:00	14:00	16:00	12:00		16:00	15:00					17:00
Volume	8	248	67	4	46	4		5	7					369

Peak Period Totals	AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
	Volume	%	Volume	%	Volume	%	Volume	%
	605	15%	442	11%	657	17%	2219	57%

Day: TUESDAY
Date: 9/6/11

Classification Report / Prepared by: National Data & Surveying Services
Location: Estrada Ave s/o El Camino Real

City: Santa Margarita
Project #: 11-8049-002

SUMMARY

Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
00:00 AM	0	6	2	0	0	0	0	0	0	0	0	0	0	8
01:00	1	6	1	0	0	0	0	0	0	0	0	0	0	8
02:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	0	4	0	4	0	0	0	0	0	0	0	0	8
05:00	1	45	12	2	14	2	0	4	3	0	0	0	0	83
06:00	2	82	39	0	17	4	0	6	10	0	0	0	0	160
07:00	6	175	60	1	27	2	0	1	1	0	0	0	0	273
08:00	5	220	63	0	33	2	0	1	4	0	0	0	0	328
09:00	4	108	49	2	20	2	0	0	4	0	0	0	0	189
10:00	4	111	41	1	17	1	0	1	2	0	0	0	0	178
11:00	2	127	47	0	31	0	0	1	4	0	0	0	0	212
12:00 PM	4	109	46	1	30	2	0	2	3	0	0	0	0	197
13:00	4	115	47	2	26	1	0	0	1	0	0	0	0	196
14:00	3	186	64	0	49	4	0	2	3	0	0	0	0	311
15:00	6	123	64	1	38	0	0	1	4	0	0	0	0	237
16:00	6	147	48	0	32	0	0	2	2	0	0	0	0	237
17:00	3	177	48	0	33	0	0	1	4	0	0	0	0	266
18:00	4	130	42	0	25	0	0	1	2	0	0	0	0	204
19:00	1	86	24	0	11	0	0	0	1	0	0	0	0	123
20:00	1	73	19	0	15	0	0	0	1	0	0	0	0	109
21:00	0	43	5	0	4	0	0	0	1	0	0	0	0	53
22:00	1	27	12	0	4	0	0	0	0	0	0	0	0	44
23:00	0	12	7	0	1	0	0	0	0	0	0	0	0	20
Totals	**58**	**2113**	**745**	**10**	**431**	**20**		**23**	**50**					**3450**
% of Totals	2%	61%	22%	0%	12%	1%		1%	1%					100%
	25	885	319	6	163	13	0	14	28	0	0	0	0	1453
% AM	1%	26%	9%	0%	5%	0%		0%	1%					42%
AM Peak Hour	07:00	08:00	08:00	05:00	08:00	06:00		06:00	06:00					08:00
Volume	6	220	63	2	33	4		6	10					328
	33	1228	426	4	268	7	0	9	22	0	0	0	0	1997
% PM	1%	36%	12%	0%	8%	0%		0%	1%					58%
PM Peak Hour	15:00	14:00	14:00	13:00	14:00	14:00		12:00	15:00					14:00
Volume	6	186	64	2	49	4		2	4					311

Peak Period Totals	AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
	Volume	%	Volume	%	Volume	%	Volume	%
	601	17%	393	11%	503	15%	1953	57%

64

Day: WEDNESDAY
Date: 9/7/11

Classification Report / Prepared by: National Data & Surveying Services
Location: Estrada Ave s/o El Camino Real

City: Santa Margarita
Project #: 11-8049-002

SUMMARY

Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
00:00 AM	0	7	0	0	3	0	0	0	0	0	0	0	0	10
01:00	1	6	3	2	0	0	0	0	0	0	0	0	0	12
02:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
03:00	0	2	2	0	2	1	0	0	0	0	0	0	0	7
04:00	0	4	2	1	2	0	0	1	0	0	0	0	0	10
05:00	1	50	20	1	14	0	0	1	2	0	0	0	0	89
06:00	6	82	30	0	25	1	0	2	2	0	0	0	0	148
07:00	2	177	59	1	33	2	0	0	5	0	0	0	0	279
08:00	0	236	73	1	40	3	0	2	9	0	0	0	0	364
09:00	9	97	37	0	12	0	0	0	2	0	0	0	0	157
10:00	4	105	36	0	15	2	0	0	0	0	0	0	0	162
11:00	2	125	49	1	40	1	0	0	4	0	0	0	0	222
12:00 PM	1	98	46	1	29	2	0	2	2	0	0	0	0	181
13:00	6	112	48	3	34	0	0	1	3	0	0	0	0	207
14:00	1	177	63	1	27	2	0	1	7	0	0	0	0	279
15:00	0	134	41	1	34	0	0	2	5	0	0	0	0	217
16:00	3	136	56	1	36	0	0	2	8	0	0	0	0	242
17:00	3	144	49	0	37	0	0	0	1	0	0	0	0	234
18:00	10	126	41	1	23	0	0	0	2	0	0	0	0	203
19:00	2	92	29	1	16	0	0	0	1	0	0	0	0	141
20:00	1	68	25	0	11	0	0	0	1	0	0	0	0	106
21:00	0	48	9	0	9	0	0	0	0	0	0	0	0	66
22:00	4	20	8	0	4	0	0	0	0	0	0	0	0	36
23:00	0	13	5	0	3	0	0	0	0	0	0	0	0	21
Totals	**56**	**2060**	**732**	**16**	**449**	**14**		**14**	**54**					**3395**
% of Totals	2%	61%	22%	0%	13%	0%		0%	2%					100%
	25	892	312	7	186	10	0	6	24	0	0	0	0	1462
% AM	1%	26%	9%	0%	5%	0%		0%	1%					43%
AM Peak Hour	09:00	08:00	08:00	01:00	08:00	08:00		06:00	08:00					08:00
Volume	9	236	73	2	40	3		2	9					364
	31	1168	420	9	263	4	0	8	30	0	0	0	0	1933
% PM	1%	34%	12%	0%	8%	0%		0%	1%					57%
PM Peak Hour	18:00	14:00	14:00	13:00	17:00	12:00		12:00	16:00					14:00
Volume	10	177	63	3	37	2		2	8					279

Peak Period Totals	AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
	Volume	%	Volume	%	Volume	%	Volume	%
	643	19%	388	11%	476	14%	1888	56%

65

Day: THURSDAY
Date: 9/8/11

Classification Report / Prepared by: National Data & Surveying Services
Location: Estrada Ave s/o El Camino Real

City: Santa Margarita
Project #: 11-8049-002

SUMMARY

Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
00:00 AM	0	9	4	0	0	0	0	0	0	0	0	0	0	13
01:00	0	5	2	0	0	0	0	0	0	0	0	0	0	7
02:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
03:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
04:00	0	9	5	0	4	1	0	0	0	0	0	0	0	19
05:00	1	35	14	1	12	1	0	0	1	0	0	0	0	65
06:00	2	91	34	1	20	2	0	6	6	0	0	0	0	162
07:00	2	187	54	0	22	1	0	6	4	0	0	0	0	276
08:00	4	195	75	3	38	3	0	4	8	0	0	0	0	330
09:00	1	91	41	0	31	0	0	3	6	0	0	0	0	173
10:00	3	79	37	0	15	3	0	5	3	0	0	0	0	145
11:00	5	131	39	0	19	1	0	5	5	0	0	0	0	205
12:00 PM	1	109	46	0	32	6	0	0	4	0	0	0	0	198
13:00	3	96	39	1	13	2	0	4	3	0	0	0	0	161
14:00	8	165	84	2	38	5	0	3	5	0	0	0	0	310
15:00	4	153	41	2	21	1	0	1	6	0	0	0	0	229
16:00	4	150	50	1	40	2	0	3	6	0	0	0	0	256
17:00	5	227	49	0	36	1	0	0	6	0	0	0	0	324
18:00	20	173	46	0	24	0	0	0	4	0	0	0	0	267
19:00	5	146	31	0	19	0	0	0	2	0	0	0	0	203
20:00	2	93	19	0	15	0	0	0	4	0	0	0	0	133
21:00	0	58	15	0	5	0	0	0	1	0	0	0	0	79
22:00	0	21	7	0	8	0	0	0	0	0	0	0	0	36
23:00	0	17	1	0	1	0	0	0	1	0	0	0	0	20
Totals	**70**	**2246**	**734**	**11**	**413**	**29**		**40**	**75**					**3618**
% of Totals	2%	62%	20%	0%	11%	1%		1%	2%					100%
	18	838	306	5	161	12	0	29	33	0	0	0	0	1402
% AM	0%	23%	8%	0%	4%	0%		1%	1%					39%
AM Peak Hour	11:00	08:00	08:00	08:00	08:00	08:00		06:00	08:00					08:00
Volume	5	195	75	3	38	3		6	8					330
	52	1408	428	6	252	17	0	11	42	0	0	0	0	2216
% PM	1%	39%	12%	0%	7%	0%		0%	1%					61%
PM Peak Hour	18:00	17:00	14:00	14:00	16:00	12:00		13:00	15:00					17:00
Volume	20	227	84	2	40	6		4	6					324

Peak Period Totals	AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
	Volume	%	Volume	%	Volume	%	Volume	%
	606	17%	359	10%	580	16%	2073	57%

Day: TUESDAY
Date: 9/6/11

Classification Report / Prepared by: National Data & Surveying Services
Location: El Camino Real w/o Estrada Ave

City: Santa Margarita
Project #: 11-8049-003

SUMMARY

Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
00:00 AM	2	11	4	0	0	0	0	0	0	0	0	0	0	17
01:00	1	7	2	0	1	0	0	0	0	0	0	0	0	11
02:00	0	4	2	0	0	1	0	0	0	0	0	0	0	7
03:00	0	5	1	0	1	0	0	0	0	0	0	0	0	7
04:00	0	8	5	0	2	0	0	0	0	0	0	0	0	15
05:00	1	66	14	1	13	2	0	4	1	0	0	0	0	102
06:00	3	105	46	1	20	3	0	5	13	0	1	0	0	197
07:00	5	200	72	4	35	4	0	6	6	0	2	0	0	334
08:00	5	214	63	3	30	4	0	3	5	0	0	0	0	327
09:00	6	143	56	2	25	3	0	2	4	0	0	0	0	241
10:00	5	144	61	2	27	3	0	1	4	0	0	0	0	247
11:00	6	164	53	3	32	3	0	1	3	0	0	0	0	265
12:00 PM	4	149	64	3	32	5	0	3	5	0	0	0	0	265
13:00	6	164	63	3	37	4	0	4	4	0	0	0	0	285
14:00	3	185	67	2	43	4	0	2	5	0	0	0	0	311
15:00	9	198	87	1	45	2	0	3	9	0	0	0	0	354
16:00	12	233	70	3	33	2	0	3	6	0	0	0	0	362
17:00	9	258	86	2	44	0	0	1	5	0	0	0	0	405
18:00	7	171	50	2	37	0	0	2	2	0	0	0	0	271
19:00	2	125	32	2	16	3	0	0	1	0	0	0	0	181
20:00	1	94	31	0	14	1	0	0	1	0	0	0	0	142
21:00	1	52	12	1	7	0	0	1	0	0	0	0	0	74
22:00	0	34	10	0	9	1	0	0	0	0	0	0	0	54
23:00	0	18	10	0	3	0	0	0	0	0	0	0	0	31
Totals	**88**	**2752**	**961**	**35**	**506**	**45**		**41**	**74**		**3**			**4505**
% of Totals	2%	61%	21%	1%	11%	1%		1%	2%		0%			100%
	34	1071	379	16	186	23	0	22	36	0	3	0	0	1770
% AM	1%	24%	8%	0%	4%	1%		0%	1%		0%			39%
AM Peak Hour	09:00	08:00	07:00	07:00	07:00	07:00		07:00	06:00		07:00			07:00
Volume	6	214	72	4	35	4		6	13		2			334
	54	1681	582	19	320	22	0	19	38	0	0	0	0	2735
% PM	1%	37%	13%	0%	7%	0%		0%	1%					61%
PM Peak Hour	16:00	17:00	15:00	12:00	15:00	12:00		13:00	15:00					17:00
Volume	12	258	87	3	45	5		4	9					405

Peak Period Totals	AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
	Volume	%	Volume	%	Volume	%	Volume	%
	661	15%	550	12%	767	17%	2527	56%

67

Day: WEDNESDAY
Date: 9/7/11

Classification Report / Prepared by: National Data & Surveying Services
Location: El Camino Real w/o Estrada Ave

City: Santa Margarita
Project #: 11-8049-003

SUMMARY

Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
00:00 AM	0	5	1	0	3	0	0	0	0	0	0	0	0	9
01:00	1	9	4	0	0	1	0	0	0	0	0	0	0	15
02:00	0	4	2	0	0	0	0	0	0	0	0	0	0	6
03:00	0	2	1	0	0	1	0	1	0	0	0	0	0	5
04:00	0	16	6	1	1	0	0	1	0	0	0	0	0	25
05:00	5	74	21	1	17	0	0	1	2	0	0	0	0	121
06:00	6	93	49	1	25	1	0	3	8	0	0	0	0	186
07:00	5	229	72	2	39	5	0	4	6	0	0	0	0	362
08:00	6	220	69	3	30	3	0	3	7	0	0	0	0	341
09:00	8	137	51	3	26	3	0	2	2	0	0	0	0	232
10:00	7	132	54	2	26	4	0	1	2	0	0	0	0	228
11:00	6	173	61	2	38	1	0	1	3	0	0	0	0	285
12:00 PM	2	141	65	3	30	6	0	5	7	0	0	0	0	259
13:00	4	162	64	5	38	3	0	4	4	0	0	0	0	284
14:00	4	191	57	1	37	2	0	7	5	0	0	0	0	304
15:00	3	193	74	3	37	0	0	3	8	0	0	0	0	321
16:00	4	239	89	3	45	1	0	2	8	0	0	0	0	391
17:00	8	261	72	1	36	0	0	0	1	0	0	0	0	379
18:00	8	186	55	1	31	1	0	3	4	0	0	0	0	289
19:00	4	144	35	2	18	1	0	0	1	0	0	0	0	205
20:00	2	117	34	0	10	0	0	0	0	0	0	0	0	163
21:00	1	60	13	1	5	1	0	0	0	0	0	0	0	81
22:00	0	24	10	0	5	0	0	0	0	0	0	0	0	39
23:00	0	25	5	0	2	0	0	0	0	0	0	0	0	32
Totals	**84**	**2837**	**964**	**35**	**499**	**34**		**41**	**68**					**4562**
% of Totals	2%	62%	21%	1%	11%	1%		1%	1%					100%
	44	1094	391	15	205	19	0	17	30	0	0	0	0	1815
% AM	1%	24%	9%	0%	4%	0%		0%	1%					40%
AM Peak Hour	09:00	07:00	07:00	08:00	07:00	07:00		07:00	06:00					07:00
Volume	8	229	72	3	39	5		4	8					362
	40	1743	573	20	294	15	0	24	38	0	0	0	0	2747
% PM	1%	38%	13%	0%	6%	0%		1%	1%					60%
PM Peak Hour	17:00	17:00	16:00	13:00	16:00	12:00		14:00	15:00					16:00
Volume	8	261	89	5	45	6		7	8					391

Peak Period Totals

AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
Volume	%	Volume	%	Volume	%	Volume	%
703	15%	543	12%	770	17%	2546	56%

Day: THURSDAY
Date: 9/8/11

Classification Report / Prepared by: National Data & Surveying Services
Location: El Camino Real w/o Estrada Ave

City: Santa Margarita
Project #: 11-8049-003

SUMMARY

Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
00:00 AM	0	10	5	0	0	0	0	0	0	0	0	0	0	15
01:00	0	7	2	0	1	0	0	0	0	0	0	0	0	10
02:00	0	6	2	0	0	0	0	0	0	0	0	0	0	8
03:00	0	4	1	0	0	0	0	0	0	0	0	0	0	5
04:00	0	20	7	0	6	1	0	0	0	0	0	0	0	34
05:00	2	60	15	0	8	1	0	1	0	0	0	0	0	87
06:00	1	109	41	1	25	2	0	5	7	0	0	0	0	191
07:00	5	216	67	3	34	1	0	8	11	0	0	0	0	345
08:00	5	202	74	1	32	3	0	7	10	0	0	0	0	334
09:00	8	138	54	2	34	2	0	4	7	0	0	0	0	249
10:00	6	135	53	5	28	5	0	5	9	0	0	0	0	246
11:00	4	151	51	1	24	5	0	6	9	0	0	0	0	251
12:00 PM	4	176	58	2	25	6	0	2	4	0	0	0	0	277
13:00	4	155	55	3	21	2	0	3	5	0	0	0	0	248
14:00	7	180	59	4	30	3	0	6	6	0	0	0	0	295
15:00	10	197	54	1	36	1	0	4	6	0	0	0	0	309
16:00	5	199	89	2	49	2	0	3	5	0	0	0	0	354
17:00	6	294	89	2	39	1	0	0	5	0	0	0	0	436
18:00	13	192	55	3	28	2	0	0	3	0	0	0	0	296
19:00	9	139	41	1	15	0	0	0	0	0	0	0	0	205
20:00	4	95	25	0	14	1	0	0	2	0	0	0	0	141
21:00	1	76	21	1	5	0	0	0	1	0	0	0	0	105
22:00	0	26	7	0	4	0	0	0	0	0	0	0	0	37
23:00	0	15	8	0	5	0	0	0	1	0	0	0	0	29
Totals	**94**	**2802**	**933**	**32**	**463**	**38**		**54**	**91**					**4507**
% of Totals	2%	62%	21%	1%	10%	1%		1%	2%					100%
	31	1058	372	13	192	20	0	36	53	0	0	0	0	1775
% AM	1%	23%	8%	0%	4%	0%		1%	1%					39%
AM Peak Hour	09:00	07:00	08:00	10:00	07:00	10:00		07:00	07:00					07:00
Volume	8	216	74	5	34	5		8	11					345
	63	1744	561	19	271	18	0	18	38	0	0	0	0	2732
% PM	1%	39%	12%	0%	6%	0%		0%	1%					61%
PM Peak Hour	18:00	17:00	16:00	14:00	16:00	12:00		14:00	14:00					17:00
Volume	13	294	89	4	49	6		6	6					436

Peak Period Totals	AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
	Volume	%	Volume	%	Volume	%	Volume	%
	679	15%	525	12%	790	18%	2513	56%

ASSOCIATED TRANSPORTATION ENGINEERS

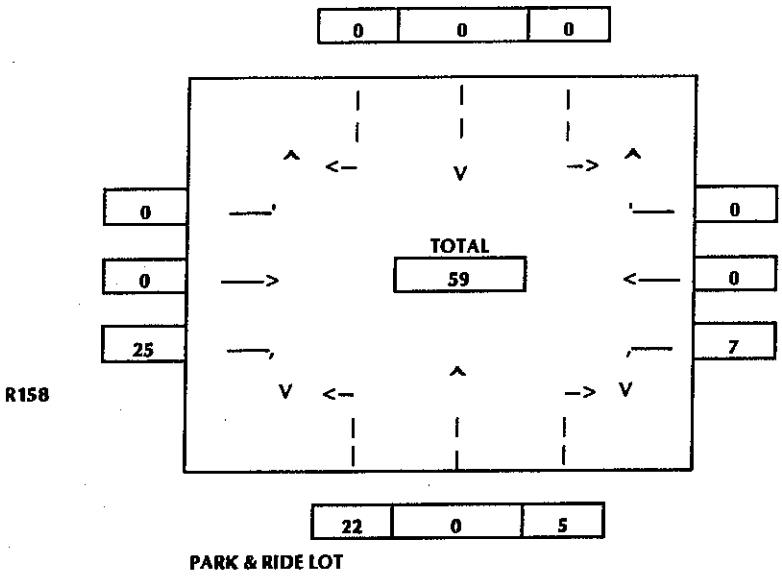
INTERSECTION TURNING MOVEMENT SUMMARY

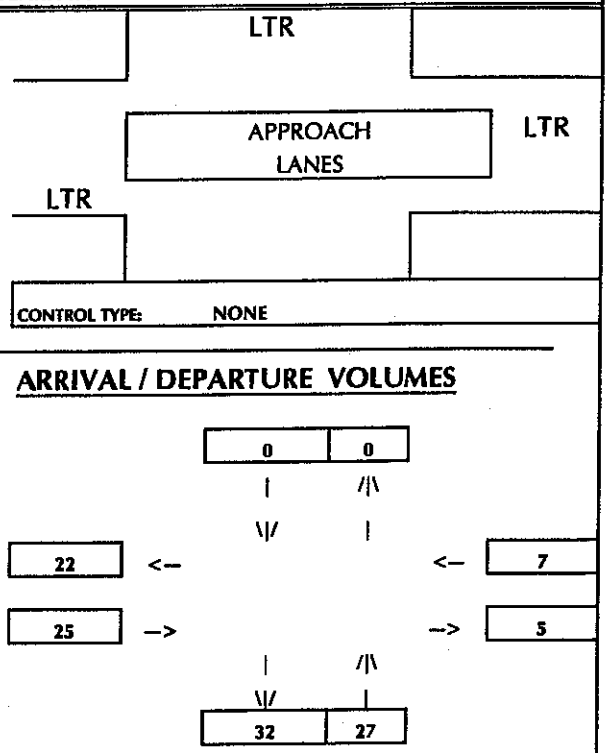
PROJECT: LOS PILITAS QUARRY | PROJECT #: 11054 | COUNT DATE: 02-15-12 | FILE NAME: 01AM

N-S Approach: PARK & RIDE LOT | COUNT TIME: 07:00 AM TO 9:00

E-W Approach: SR158 | CITY: SANTA MARGARITTA | WEATHER: MOSTLY CLOUDY

PEAK HOUR: 08:00 AM TO 09:00 AM





TIME PERIOD From	—	To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL VOLUMES
COUNT DATA															
07:00 AM	—	07:15 AM	10	0	0	0	0	0	0	0	7	3	0	0	20
07:15 AM	—	07:30 AM	13	0	1	0	0	0	0	0	15	3	0	0	32
07:30 AM	—	07:45 AM	15	0	2	0	0	0	0	0	19	4	0	0	40
07:45 AM	—	08:00 AM	18	0	3	0	0	0	0	0	23	4	0	0	48
08:00 AM	—	08:15 AM	23	0	4	0	0	0	0	0	26	4	0	0	57
08:15 AM	—	08:30 AM	26	0	5	0	0	0	0	0	28	5	0	0	64
08:30 AM	—	08:45 AM	32	0	6	0	0	0	0	0	36	8	0	0	82
08:45 AM	—	09:00 AM	40	0	8	0	0	0	0	0	48	11	0	0	107
TOTAL BY PERIOD															
07:00 AM	—	07:15 AM	10	0	0	0	0	0	0	0	7	3	0	0	20
07:15 AM	—	07:30 AM	3	0	1	0	0	0	0	0	8	0	0	0	12
07:30 AM	—	07:45 AM	2	0	1	0	0	0	0	0	4	1	0	0	8
07:45 AM	—	08:00 AM	3	0	1	0	0	0	0	0	4	0	0	0	8
08:00 AM	—	08:15 AM	5	0	1	0	0	0	0	0	3	0	0	0	9
08:15 AM	—	08:30 AM	3	0	1	0	0	0	0	0	2	1	0	0	7
08:30 AM	—	08:45 AM	6	0	1	0	0	0	0	0	8	3	0	0	18
08:45 AM	—	09:00 AM	8	0	2	0	0	0	0	0	12	3	0	0	25
HOURLY TOTALS															
07:00 AM	—	08:00 AM	18	0	3	0	0	0	0	0	23	4	0	0	48
07:15 AM	—	08:15 AM	13	0	4	0	0	0	0	0	19	1	0	0	37
07:30 AM	—	08:30 AM	13	0	4	0	0	0	0	0	13	2	0	0	32
07:45 AM	—	08:45 AM	17	0	4	0	0	0	0	0	17	4	0	0	42
08:00 AM	—	09:00 AM	22	0	5	0	0	0	0	0	25	7	0	0	59

ASSOCIATED TRANSPORTATION ENGINEERS

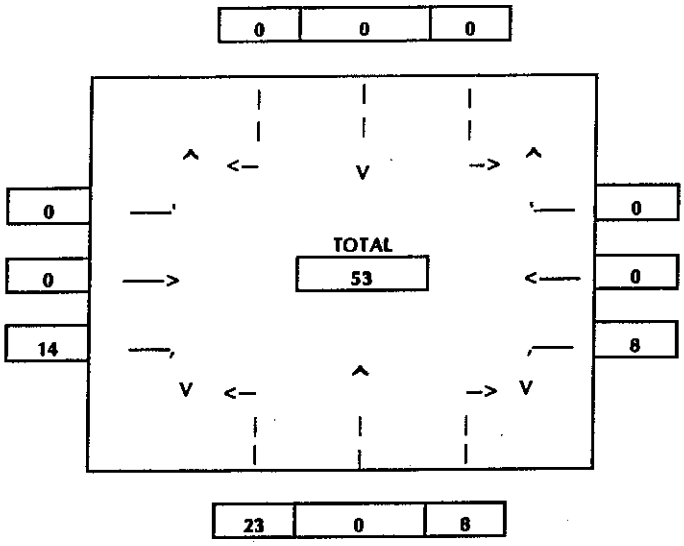
INTERSECTION TURNING MOVEMENT SUMMARY

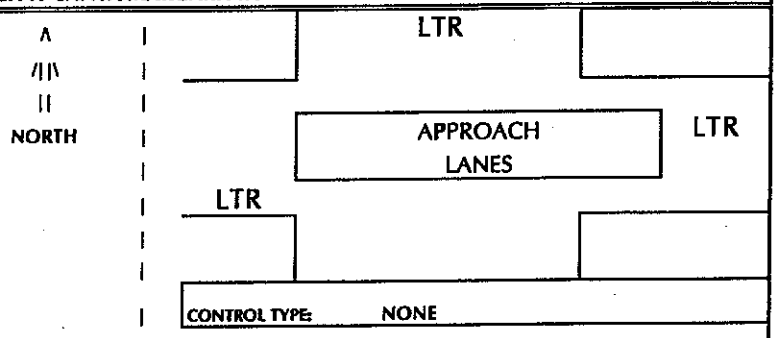
PROJECT: LOS PILITAS QUARRY | PROJECT #: 11054 | COUNT DATE: 02-15-12 | FILE NAME: 01PM

N-S Approach: PARK & RIDE LOT | COUNT TIME: 04:00 PM TO 6:00

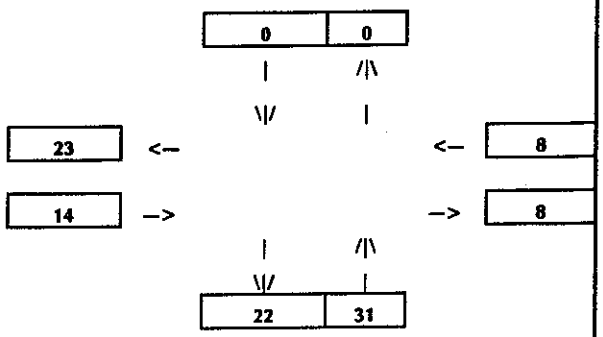
E-W Approach: SR158 | CITY: SANTA MARGARITTA | WEATHER: CLEAR

PEAK HOUR: 04:45 PM TO 05:45 PM





ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From	—	To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL VOLUMES
COUNT DATA															
04:00 PM	—	04:15 PM	9	0	0	0	0	0	0	0	8	0	0	0	17
04:15 PM	—	04:30 PM	13	0	2	0	0	0	0	0	11	1	0	0	27
04:30 PM	—	04:45 PM	17	0	5	0	0	0	0	0	14	2	0	0	38
04:45 PM	—	05:00 PM	20	0	5	0	0	0	0	0	17	3	0	0	45
05:00 PM	—	05:15 PM	25	0	6	0	0	0	0	0	22	4	0	0	57
05:15 PM	—	05:30 PM	32	0	10	0	0	0	0	0	26	6	0	0	74
05:30 PM	—	05:45 PM	40	0	13	0	0	0	0	0	28	10	0	0	91
05:45 PM	—	06:00 PM	40	0	13	0	0	0	0	0	29	10	0	0	92
TOTAL BY PERIOD															
04:00 PM	—	04:15 PM	9	0	0	0	0	0	0	0	8	0	0	0	17
04:15 PM	—	04:30 PM	4	0	2	0	0	0	0	0	3	1	0	0	10
04:30 PM	—	04:45 PM	4	0	3	0	0	0	0	0	3	1	0	0	11
04:45 PM	—	05:00 PM	3	0	0	0	0	0	0	0	3	1	0	0	7
05:00 PM	—	05:15 PM	5	0	1	0	0	0	0	0	5	1	0	0	12
05:15 PM	—	05:30 PM	7	0	4	0	0	0	0	0	4	2	0	0	17
05:30 PM	—	05:45 PM	8	0	3	0	0	0	0	0	2	4	0	0	17
05:45 PM	—	06:00 PM	0	0	0	0	0	0	0	0	1	0	0	0	1
HOURLY TOTALS															
04:00 PM	—	05:00 PM	20	0	5	0	0	0	0	0	17	3	0	0	45
04:15 PM	—	05:15 PM	16	0	6	0	0	0	0	0	14	4	0	0	40
04:30 PM	—	05:30 PM	19	0	8	0	0	0	0	0	15	5	0	0	47
04:45 PM	—	05:45 PM	23	0	8	0	0	0	0	0	14	8	0	0	53
05:00 PM	—	06:00 PM	20	0	8	0	0	0	0	0	12	7	0	0	47

Caltrans Accident Data

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 SLO 058 000.000 - 05 SLO 058 000.499				.500 MI H 02	4	0	2	2	4	0	0	0	7.2	3.96	0.000	.51	1.01	0.026	.34	.80
0001-0001	2007-08-01	2010-07-31	36 mo.	R								2								
05 SLO 101 037.424 - 05 SLO 101 038.063				.640 MI H	11	0	4	4	2	2	4	0	42.8	30.05	0.000	.13	.37	0.012	.21	.57
0001-0003	2007-08-01	2010-07-31	36 mo.	R								5								
05 SLO 101 037.540 101/SB ON FROM RTE 58				R 63	2	0	2	2	1	1	0	0	1.8	2.03 +	0.000	.99	.99	0.003	.11	.35
0001-0004	2007-08-01	2010-07-31	36 mo.	R			H95	H95				2	.0							
05 SLO 101 037.760 101/SB OFF TO RTE 58				R 69	0	0	0	0	0	0	0	0	.9	.94 +	0.000	.00	.00	0.006	.31	1.10
0001-0004	2007-08-01	2010-07-31	36 mo.	R								0	.0							
05 SLO 101 037.790 101/NB OFF TO RTE 58				R 61	0	0	0	0	0	0	0	0	1.9	2.09 +	0.000	.00	.00	0.003	.10	.30
0001-0004	2007-08-01	2010-07-31	36 mo.	R								0	.0							
05 SLO 101 037.937 101/NB ON FR RTE 58				R 63	0	0	0	0	0	0	0	0	.9	1.04 +	0.000	.00	.00	0.003	.11	.35
0001-0004	2007-08-01	2010-07-31	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)

California Department of Transportation

OTM22215

TSAR - ACCIDENT SUMMARY

Policy controlling the use of Traffic Accident Surveillance and Analysis System (TASAS) - Transportation Systems Network (TSN) Reports

1. TASAS - TSN has officially replaced the TASAS - "Legacy" database.
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California Department of Transportation

OTM22215

TSAR - ACCIDENT SUMMARY

REPORT PARAMETERS:

REPORT DATE	:	02/24/2012
REFERENCE DATE	:	02/24/2012
SUBMITTOR	:	T5SCADEN
REPORT TITLE	:	' All Collisions, Mainline SLO 101 PM 37.424 to 38.064 Date Range 08/01/2007 to 07/31/2010 '
EVENT ID	:	3426797

LOCATION CRITERIA:

FROM: 05-SLO-101 037.424 TO: 05-SLO-101 038.064

SELECTION CRITERIA:

1 2 AND 515 - INTRS/RAMP ACC LOC IN -,5
1 3 AND 515 - INTRS/RAMP ACC LOC NOT IN 6,4,3,2,1

Accidents Date Range:

From -- 08/01/2007 To -- 07/31/2010

TASAS SELECTIVE RECORD RETRIEVAL
TSAR - ACCIDENT SUMMARY
' All Collisions, Mainline SLO 101 PM 37.424 to 38.064 Date Range 08/01/2007 to 07/31/2010 '

Event ID 3426797

TOTAL ACCIDENTS	FATAL	INJURY	PDO	PERSONS KILLED	PERSONS INJURED
11	0	4	7	0	5

MOTOR VEHICLES INVOLVED

NUMBER	PCT	CODE
9	81.8	1
1	9.1	2
1	9.1	3
0	0.0	>3

<---LINES CODED--->

NUMBER	PCT	CODE
6	54.5	1
4	36.4	2
1	9.1	3
0	0.0	4
0	0.0	5
0	0.0	6
0	0.0	7
0	0.0	8
0	0.0	9

<---- HOUR OF DAY ---->

NUMBER	PCT	CODE
0	0.0	00- 12 MID.
0	0.0	01- 1 A.M.
0	0.0	02- 2 A.M.
2	18.2	03- 3 A.M.
0	0.0	04- 4 A.M.
1	9.1	05- 5 A.M.
1	9.1	06- 6 A.M.
1	9.1	07- 7 A.M.
0	0.0	08- 8 A.M.
0	0.0	09- 9 A.M.
0	0.0	10- 10 A.M.
0	0.0	11- 11 A.M.
0	0.0	12- 12 NOON
0	0.0	13- 1 P.M.
3	27.3	14- 2 P.M.
0	0.0	15- 3 P.M.
0	0.0	16- 4 P.M.
0	0.0	17- 5 P.M.
1	9.1	18- 6 P.M.
0	0.0	19- 7 P.M.
1	9.1	20- 8 P.M.
0	0.0	21- 9 P.M.
1	9.1	22- 10 P.M.
0	0.0	23- 11 P.M.
0	0.0	25- UNKNOWN

<--- ACCESS CONTROL --->

NUMBER	PCT	CODE
0	0.0	C-CONVENTIONAL
0	0.0	E-EXPRESSWAY
11	100.0	F-FREEWAY
0	0.0	S-1-WAY CITY ST
0	0.0	--INVALID DATA
0	0.0	+-NO DATA

<--- SIDE OF HIGHWAY --->

NUMBER	PCT	CODE
4	36.4	N-NORTHBOUND
7	63.6	S-SOUTHBOUND
0	0.0	E-EASTBOUND
0	0.0	W-WESTBOUND

<----- YEAR ----->

NUMBER	PCT	CODE
0	0.0	2000
0	0.0	2001
0	0.0	2002
0	0.0	2003
0	0.0	2004
0	0.0	2005
0	0.0	2006
1	9.1	2007
2	18.2	2008
4	36.4	2009
4	36.4	2010
0	0.0	2011

<----- MONTH ----->

NUMBER	PCT	CODE
1	9.1	01-JANUARY
0	0.0	02-FEBRUARY
1	9.1	03-MARCH
1	9.1	04-APRIL
1	9.1	05-MAY
1	9.1	06-JUNE
1	9.1	07-JULY
2	18.2	08-AUGUST
0	0.0	09-SEPTEMBER
1	9.1	10-OCTOBER
1	9.1	11-NOVEMBER
1	9.1	12-DECEMBER

<---- DAY OF WEEK ---->

NUMBER	PCT	CODE
1	9.1	1-SUNDAY
0	0.0	2-MONDAY
1	9.1	3-TUESDAY
3	27.3	4-WEDNESDAY
0	0.0	5-THURSDAY
2	18.2	6-FRIDAY
4	36.4	7-SATURDAY

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TASAS SELECTIVE RECORD RETRIEVAL
TSAR - ACCIDENT SUMMARY
' All Collisions, Mainline SLO 101 PM 37.424 to 38.064 Date Range 08/01/2007 to 07/31/2010 '

<-- PRIMARY COLLISION FACTOR -->

NUMBER	PCT	CODE
1	9.1	1-INFLUENCE ALCOHOL
0	0.0	2-FOLLOW TOO CLOSE
0	0.0	3-FAILURE TO YIELD
4	36.4	4-IMPROPER TURN
2	18.2	5-SPEEDING
1	9.1	6-OTHER VIOLATIONS
0	0.0	B-IMPROPER DRIVING
3	27.3	C-OTHER THAN DRIVER
0	0.0	D-UNKNOWN
0	0.0	E-FELL SLEEP
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<--- TYPE OF COLLISION --->

NUMBER	PCT	CODE
0	0.0	A-HEAD-ON
1	9.1	B-SIDESWIPE
1	9.1	C-REAR END
1	9.1	D-BROADSIDE
6	54.5	E-HIT OBJECT
0	0.0	F-OVERTURN
0	0.0	G-AUTO-PEDESTRIAN
2	18.2	H-OTHER
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<--- ROADWAY CONDITION --->

NUMBER	PCT	CODE
0	0.0	A-HOLES, RUTS
0	0.0	B-LOOSE MATERIAL
0	0.0	C-OBSTRUCTION ON ROAD
0	0.0	D-CONSTRUCT-REPAIR-ZONE
0	0.0	E-REDUCED ROAD WIDTH
0	0.0	F-FLOODED
0	0.0	G-OTHER
11	100.0	H-NO UNUSUAL CONDITION
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<--------- WEATHER --------->

NUMBER	PCT	CODE
8	72.7	A-CLEAR
2	18.2	B-CLOUDY
1	9.1	C-RAINING
0	0.0	D-SNOWING
0	0.0	E-FOG
0	0.0	F-OTHER
0	0.0	G-WIND
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<---------- LIGHTING ---------->

NUMBER	PCT	CODE
7	63.6	A-DAY LIGHT
0	0.0	B-DUSK/DAWN
1	9.1	C-DARK-STREET LIGHT
3	27.3	D-DARK-NO STREET LIGHT
0	0.0	E-DARK-INOPR STREET LIGHT
0	0.0	F-DARK-NOT STATED
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<----- ROAD SURFACE ----->

NUMBER	PCT	CODE
9	81.8	A-DRY
2	18.2	B-WET
0	0.0	C-SNOWY, ICY
0	0.0	D-SLIPPERY
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<------ RIGHT OF WAY CONTROL ------>

NUMBER	PCT	CODE
0	0.0	A-CONTROL FUNCTIONING
0	0.0	B-CONTROL NOT FUNCTIONING
0	0.0	C-CONTROLS OBSCURED
11	100.0	D-NO CONTROLS PRESENT
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<-------- HIGHWAY GROUP -------->

NUMBER	PCT	CODE
0	0.0	R-IND. ALIGN RIGHT
0	0.0	L-IND. ALIGN LEFT
11	100.0	D-DIVIDED
0	0.0	U-UNDIVIDED

<- INTERSECTION/RAMP ACCIDENT LOCATION ->

NUMBER	PCT	CODE
0	0.0	1-RAMP INTERSECTION (EXIT)
0	0.0	2-RAMP
0	0.0	3-RAMP ENTRY
0	0.0	4-RAMP AREA, INTERSECTION STREET
0	0.0	5-IN INTERSECTION
0	0.0	6-OUTSIDE INTRSCT-NONSTATE RTE
11	100.0	--DOES NOT APPLY

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TASAS SELECTIVE RECORD RETRIEVAL
TSAR - PARTY SUMMARY
' All Collisions, Mainline SLO 101 PM 37.424 to 38.064 Date Range 08/01/2007 to 07/31/2010 '

<---------- PARTY TYPE ---------->

NUMBER	PCT	CODE
9	81.8	A-PASNGR CAR/STA WAGON
0	0.0	B-PASNGR CAR W/TRAILER
0	0.0	C-MOTORCYCLE
2	18.2	D-PICKUP/PANEL TRUCK
1	9.1	E-PICKUP/PANEL W/TRAILER
0	0.0	F-TRUCK/TRUCK TRACTOR
0	0.0	G-TRUCK/TRACTOR & 1 TRAILER
0	0.0	2-TRUCK/TRACTOR & 2 TRAILER
0	0.0	3-TRUCK/TRACTOR & 3 TRAILER
0	0.0	4-SINGLE UNIT TANKER
0	0.0	5-TRUCK/TRA & 1 TANK TRALR
0	0.0	6-TRUCK/TRA & 2 TANK TRALR
0	0.0	H-SCHOOL BUS
0	0.0	I-OTHER BUS
1	9.1	J-EMERGENCY VEHICLE
0	0.0	K-HIGHWAY CONST EQUP.**
0	0.0	L-BICYCLE
0	0.0	M-OTHER-MOTOR VEH
0	0.0	N-OTHER-NON-MOTOR VEH
0	0.0	O-SPILLED LOADS
0	0.0	P-DISENGAGED TOW
0	0.0	Q-UNINVOLVED VEHICLE
0	0.0	R-MOPED
0	0.0	T-TRAIN
0	0.0	U-PEDESTRIAN
0	0.0	V-DISMOUNT PEDESTRIAN
0	0.0	W-ANIMAL - LIVESTOCK
2	18.2	X-ANIMAL - DEER
1	9.1	Z-ANIMAL - OTHER

<- MOVEMENT PRECEDING COLLISION ->

NUMBER	PCT	CODE
1	9.1	A-STOPPED
6	54.5	B-PROCEDED STRAIGHT
2	18.2	C-RAN OFF ROAD
0	0.0	D-MAKING RIGHT TURN
0	0.0	E-MAKING LEFT TURN
0	0.0	F-MAKING U TURN
0	0.0	G-BACKING
0	0.0	H-SLOWING, STOPPING
0	0.0	I-PASS OTHER VEHICLE
1	9.1	J-CHANGING LANES
0	0.0	K-PARKING
0	0.0	L-ENTER FROM SHLDR
1	9.1	M-OTHER UNSAFE TURN
0	0.0	N-CROSS INTO OPP LN
0	0.0	O-PARKED
0	0.0	P-MERGING
0	0.0	Q-TRAVEL WRONG WAY
2	18.2	R-OTHER
0	0.0	<-NOT STATED

PEDESTRIAN

NUMBER	PCT	CODE
0	0.0	2- XING XWALK - INTRST
0	0.0	3- XING XWALK - NOT INTR
0	0.0	4- XING NOT XWALK
0	0.0	5- ROADWAY - INCL SHLDR
0	0.0	6- NOT IN ROADWAY
0	0.0	7- APRH-LEAVE SCHL BUS
0	0.0	- INVALID CODES

<---- OTHER ASSOCIATED FACTORS ---->

#1 NUMBER	#1 PCT	#2 NUMBER	#2 PCT	CODE
0	0.0	0	0.0	1-INFLUENCE ALCOHOL
0	0.0	0	0.0	2-FOLLOW TOO CLOSE
0	0.0	0	0.0	3-FAILURE TO YIELD
1	9.1	0	0.0	4-IMPROPER TURN
0	0.0	0	0.0	5-SPEEDING
0	0.0	0	0.0	6-OTHER VIOLATIONS
0	0.0	0	0.0	A-CELL PHONE* (INATTN)
0	0.0	0	0.0	B-ELECTRC EQUIP*(INATTN)
0	0.0	0	0.0	C-RADIO/CD/HDPHN*(INATTN)
0	0.0	0	0.0	D-SMOKING* (INATTN)
0	0.0	0	0.0	E-VISION OBSCUREMENT
0	0.0	0	0.0	F-INATTENTION - OTHER
0	0.0	0	0.0	G-STOP & GO TRAFFIC
0	0.0	0	0.0	H-ENTER/LEAVE RAMP
0	0.0	0	0.0	I-PREVIOUS COLLISION
0	0.0	0	0.0	J-UNFAMILIAR WITH ROAD
0	0.0	0	0.0	K-DEFECT VEHICLE EQUIP
0	0.0	0	0.0	L-UNINVOLVED VEHICLE
0	0.0	0	0.0	M-OTHER
10	90.9	0	0.0	N-NONE APPARENT
0	0.0	0	0.0	P-WIND
0	0.0	0	0.0	R-RAMP ACCIDENT
0	0.0	0	0.0	S-RUNAWAY VEHICLE
0	0.0	0	0.0	T-EATING* (INATTN)
0	0.0	0	0.0	U-CHILDREN* (INATTN)
0	0.0	0	0.0	V-ANIMALS* (INATTN)
0	0.0	0	0.0	W-PERSNL HYGIENE*(INATTN)
0	0.0	0	0.0	X-READING* (INATTN)
3	27.3	11	100.0	<-NOT STATED
0	0.0	0	0.0	--DOES NOT APPLY

* INATTENTION CODES EFF. 01-01-01

<---- DIRECTION OF TRAVEL ---->

NUMBER	PCT	CODE
4	36.4	N-N, NE, NW BOUND
7	63.6	S-S, SE, SW BOUND
0	0.0	E-EASTBOUND
0	0.0	W-WESTBOUND
3	27.3	<-NOT STATED
0	0.0	--DOES NOT APPLY
0	0.0	-INVALID CODES

** INCLUDES EQUIPMENT ENGAGED IN CONST/MAINT ACTIVITIES AS OF 00-02-22

<---- SPECIAL INFORMATION ---->

NUMBER	PCT	CODE
0	0.0	A-HAZARDOUS MATERIALS
0	0.0	B-CELL PHONE IN USE*
10	90.9	C-CELL PHONE NOT IN USE*
0	0.0	D-CELL PHONE NONE/UNKNOWN*
4	36.4	<-NOT STATED
0	0.0	--DOES NOT APPLY
0	0.0	-INVALID CODES

* SPECIAL INFORMATION CODES EFF. 04-01-01

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TASAS SELECTIVE RECORD RETRIEVAL
TSAR - PARTY SUMMARY
' All Collisions, Mainline SLO 101 PM 37.424 to 38.064 Date Range 08/01/2007 to 07/31/2010 '

<------------------- OBJECT STRUCK ------------------->

PRIMARY NUMBER	PCT	OTHERS NUMBER	PCT	CODE
0	0.0	0	0.0	01-SIDE OF BRIDGE RAILING
0	0.0	0	0.0	02-END OF BRIDGE RAILING
0	0.0	0	0.0	03-PIER, COLUMN, ABUTMENT
0	0.0	0	0.0	04-BOTTOM OF STRUCTURE
0	0.0	0	0.0	05-BRIDGE END POST IN GORE
0	0.0	0	0.0	06-END OF GUARD RAIL
2	18.2	0	0.0	07-BRIDGE APPROACH GUARD RAIL
0	0.0	0	0.0	10-LIGHT OR SIGNAL POLE
0	0.0	0	0.0	11-UTILITY POLE
0	0.0	0	0.0	12-POLE (TYPE NOT STATED)
0	0.0	0	0.0	13-TRAFFIC SIGN/SIGN POST
0	0.0	0	0.0	14-OTHER SIGNS NOT TRAFFIC
0	0.0	1	9.1	15-GUARDRAIL
2	18.2	0	0.0	16-MEDIAN BARRIER
0	0.0	0	0.0	17-WALL (EXCEPT SOUND WALL)
0	0.0	0	0.0	18-DIKE OR CURB
0	0.0	0	0.0	19-TRAFFIC ISLAND
0	0.0	0	0.0	20-RAISED BARS
0	0.0	0	0.0	21-CONCRETE OBJ (HDWL, D.I.)
0	0.0	0	0.0	22-GUIDEPOST, CULVERT, PM
1	9.1	0	0.0	23-CUT SLOPE OR EMBANKMENT
0	0.0	0	0.0	24-OVER EMBANKMENT
0	0.0	0	0.0	25-IN WATER
0	0.0	0	0.0	26-DRAINAGE DITCH
0	0.0	0	0.0	27-FENCE
0	0.0	0	0.0	28-TREES
0	0.0	0	0.0	29-PLANTS
0	0.0	0	0.0	30-SOUND WALL
0	0.0	0	0.0	40-NATURAL MATRL ON ROAD
0	0.0	0	0.0	41-TEMP BARRICADES, CONES
0	0.0	0	0.0	42-OTHER OBJECT ON ROAD
0	0.0	0	0.0	43-OTHER OBJECT OFF ROAD
0	0.0	1	9.1	44-OVERTURNED
0	0.0	0	0.0	45-CRASH CUSHION (SAND)
0	0.0	0	0.0	46-CRASH CUSHION (OTHER)
0	0.0	0	0.0	51-CALL BOX
0	0.0	0	0.0	98-UNKNOWN OBJECT STRUCK
1	9.1	0	0.0	99- NO OBJECT INVOLVED
5	45.5	1	9.1	V1 THRU V9 VEHICLE 1 TO 9
0	0.0	0	0.0	<< NOT STATED
1	9.1	11	100.0	-- DOES NOT APPLY
0	0.0	0	0.0	- INVALID CODES

<------ LOCATION OF COLLISION ------>

PRIMARY NUMBER	PCT	OTHERS NUMBER	PCT	CODE
0	0.0	0	0.0	A-BEYOND MEDIAN OR STRIPE-LEFT
5	45.5	0	0.0	B-BEYOND SHLDER DRIVERS LEFT
0	0.0	0	0.0	C-LEFT SHOULDER AREA
3	27.3	2	18.2	D-LEFT LANE
0	0.0	0	0.0	E-INTERIOR LANES
2	18.2	0	0.0	F-RIGHT LANE
0	0.0	0	0.0	G-RIGHT SHOULDER AREA
2	18.2	1	9.1	H-BEYOND SHLDER DRIVERS RIGHT
0	0.0	0	0.0	I-GORE AREA
0	0.0	0	0.0	J-OTHER
0	0.0	0	0.0	V-HOV LANE(S)
0	0.0	0	0.0	W-HOV LANE BUFFER AREA
0	0.0	0	0.0	<-NOT STATED
4	36.4	11	100.0	--DOES NOT APPLY
0	0.0	0	0.0	-INVALID CODES

<------ DRUG/PHYSICAL ------>

PRIMARY NUMBER	PCT	OTHERS NUMBER	PCT	CODE
10	90.9	0	0.0	A-HAD NOT BEEN DRINKING
1	9.1	0	0.0	B-HBD - UNDER INFLUENCE
0	0.0	0	0.0	C-HBD - NOT UNDER INFLUENCE
0	0.0	0	0.0	D-HBD - IMPAIRMENT UNKNOWN
0	0.0	0	0.0	E-UNDER DRUG INFLUENCE
0	0.0	0	0.0	F-OTHER PHYSICAL IMPAIRMENT
1	9.1	0	0.0	G-IMPAIRMENT NOT KNOWN
0	0.0	0	0.0	H-NOT APPLICABLE
0	0.0	1	9.1	I-FATIGUE
3	27.3	10	90.9	< NOT STATED
0	0.0	0	0.0	--DOES NOT APPLY
0	0.0	0	0.0	-INVALID CODES

California Department of Transportation

OTM22215

TSAR - ACCIDENT SUMMARY

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California Department of Transportation

OTM22215

TSAR - ACCIDENT SUMMARY

REPORT PARAMETERS:

REPORT DATE	:	02/24/2012
REFERENCE DATE	:	02/24/2012
SUBMITTOR	:	T5SCADEN
REPORT TITLE	:	' SLO 101 SB on ramp from Rt 058 PM 37.54 Date Range 08/01/2007 to 07/31/2010 '
EVENT ID	:	3426817

LOCATION CRITERIA:

FROM: 05-SLO-101 037.540 TO: 05-SLO-101 037.541

SELECTION CRITERIA:

1 1 AND 515 - INTRS/RAMP ACC LOC IN 1,2,3,4

Accidents Date Range:

From -- 08/01/2007 To -- 07/31/2010

TASAS SELECTIVE RECORD RETRIEVAL
TSAR - ACCIDENT SUMMARY
' SLO 101 SB on ramp from Rt 058 PM 37.54 Date Range 08/01/2007 to 07/31/2010 '

TOTAL ACCIDENTS	FATAL	INJURY	PDO	PERSONS KILLED	PERSONS INJURED
2	0	2	0	0	2

MOTOR VEHICLES INVOLVED

NUMBER	PCT	CODE
1	50.0	1
1	50.0	2
0	0.0	3
0	0.0	>3

<---LINES CODED--->

NUMBER	PCT	CODE
1	50.0	1
1	50.0	2
0	0.0	3
0	0.0	4
0	0.0	5
0	0.0	6
0	0.0	7
0	0.0	8
0	0.0	9

<---- HOUR OF DAY ---->

NUMBER	PCT	CODE
0	0.0	00- 12 MID.
0	0.0	01- 1 A.M.
0	0.0	02- 2 A.M.
0	0.0	03- 3 A.M.
0	0.0	04- 4 A.M.
0	0.0	05- 5 A.M.
0	0.0	06- 6 A.M.
1	50.0	07- 7 A.M.
1	50.0	08- 8 A.M.
0	0.0	09- 9 A.M.
0	0.0	10- 10 A.M.
0	0.0	11- 11 A.M.
0	0.0	12- 12 NOON
0	0.0	13- 1 P.M.
0	0.0	14- 2 P.M.
0	0.0	15- 3 P.M.
0	0.0	16- 4 P.M.
0	0.0	17- 5 P.M.
0	0.0	18- 6 P.M.
0	0.0	19- 7 P.M.
0	0.0	20- 8 P.M.
0	0.0	21- 9 P.M.
0	0.0	22- 10 P.M.
0	0.0	23- 11 P.M.
0	0.0	25- UNKNOWN

<--- ACCESS CONTROL --->

NUMBER	PCT	CODE
0	0.0	C-CONVENTIONAL
0	0.0	E-EXPRESSWAY
2	100.0	F-FREEWAY
0	0.0	S-1-WAY CITY ST
0	0.0	--INVALID DATA
0	0.0	+-NO DATA

<--- SIDE OF HIGHWAY --->

NUMBER	PCT	CODE
0	0.0	N-NORTHBOUND
2	100.0	S-SOUTHBOUND
0	0.0	E-EASTBOUND
0	0.0	W-WESTBOUND

<----- YEAR ----->

NUMBER	PCT	CODE
0	0.0	2000
0	0.0	2001
0	0.0	2002
0	0.0	2003
0	0.0	2004
0	0.0	2005
0	0.0	2006
0	0.0	2007
1	50.0	2008
1	50.0	2009
0	0.0	2010
0	0.0	2011

<----- MONTH ----->

NUMBER	PCT	CODE
1	50.0	01-JANUARY
0	0.0	02-FEBRUARY
0	0.0	03-MARCH
0	0.0	04-APRIL
0	0.0	05-MAY
0	0.0	06-JUNE
0	0.0	07-JULY
0	0.0	08-AUGUST
0	0.0	09-SEPTEMBER
0	0.0	10-OCTOBER
1	50.0	11-NOVEMBER
0	0.0	12-DECEMBER

<---- DAY OF WEEK ---->

NUMBER	PCT	CODE
0	0.0	1-SUNDAY
0	0.0	2-MONDAY
2	100.0	3-TUESDAY
0	0.0	4-WEDNESDAY
0	0.0	5-THURSDAY
0	0.0	6-FRIDAY
0	0.0	7-SATURDAY

TASAS SELECTIVE RECORD RETRIEVAL
TSAR - ACCIDENT SUMMARY
' SLO 101 SB on ramp from Rt 058 PM 37.54 Date Range 08/01/2007 to 07/31/2010 '

<-- PRIMARY COLLISION FACTOR -->

NUMBER	PCT	CODE
0	0.0	1-INFLUENCE ALCOHOL
0	0.0	2-FOLLOW TOO CLOSE
0	0.0	3-FAILURE TO YIELD
1	50.0	4-IMPROPER TURN
1	50.0	5-SPEEDING
0	0.0	6-OTHER VIOLATIONS
0	0.0	B-IMPROPER DRIVING
0	0.0	C-OTHER THAN DRIVER
0	0.0	D-UNKNOWN
0	0.0	E-FELL SLEEP
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<--- TYPE OF COLLISION --->

NUMBER	PCT	CODE
0	0.0	A-HEAD-ON
0	0.0	B-SIDESWIPE
1	50.0	C-REAR END
0	0.0	D-BROADSIDE
1	50.0	E-HIT OBJECT
0	0.0	F-OVERTURN
0	0.0	G-AUTO-PEDESTRIAN
0	0.0	H-OTHER
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<--- ROADWAY CONDITION --->

NUMBER	PCT	CODE
0	0.0	A-HOLES, RUTS
0	0.0	B-LOOSE MATERIAL
0	0.0	C-OBSTRUCTION ON ROAD
0	0.0	D-CONSTRUCT-REPAIR-ZONE
0	0.0	E-REDUCED ROAD WIDTH
0	0.0	F-FLOODED
0	0.0	G-OTHER
2	100.0	H-NO UNUSUAL CONDITION
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<--------- WEATHER --------->

NUMBER	PCT	CODE
1	50.0	A-CLEAR
1	50.0	B-CLOUDY
0	0.0	C-RAINING
0	0.0	D-SNOWING
0	0.0	E-FOG
0	0.0	F-OTHER
0	0.0	G-WIND
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<------------ LIGHTING ------------>

NUMBER	PCT	CODE
2	100.0	A-DAY LIGHT
0	0.0	B-DUSK/DAWN
0	0.0	C-DARK-STREET LIGHT
0	0.0	D-DARK-NO STREET LIGHT
0	0.0	E-DARK-INOPR STREET LIGHT
0	0.0	F-DARK-NOT STATED
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<----- ROAD SURFACE ----->

NUMBER	PCT	CODE
1	50.0	A-DRY
1	50.0	B-WET
0	0.0	C-SNOWY, ICY
0	0.0	D-SLIPPERY
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<------ RIGHT OF WAY CONTROL ------>

NUMBER	PCT	CODE
1	50.0	A-CONTROL FUNCTIONING
0	0.0	B-CONTROL NOT FUNCTIONING
0	0.0	C-CONTROLS OBSCURED
1	50.0	D-NO CONTROLS PRESENT
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<-------- HIGHWAY GROUP -------->

NUMBER	PCT	CODE
0	0.0	R-IND. ALIGN RIGHT
0	0.0	L-IND. ALIGN LEFT
2	100.0	D-DIVIDED
0	0.0	U-UNDIVIDED

<- INTERSECTION/RAMP ACCIDENT LOCATION ->

NUMBER	PCT	CODE
0	0.0	1-RAMP INTERSECTION (EXIT)
1	50.0	2-RAMP
0	0.0	3-RAMP ENTRY
1	50.0	4-RAMP AREA, INTERSECTION STREET
0	0.0	5-IN INTERSECTION
0	0.0	6-OUTSIDE INTRSCT-NONSTATE RTE
0	0.0	--DOES NOT APPLY

TASAS SELECTIVE RECORD RETRIEVAL
TSAR - PARTY SUMMARY
'SLO 101 SB on ramp from Rt 058 PM 37.54 Date Range 08/01/2007 to 07/31/2010'

<---------- PARTY TYPE ---------->

NUMBER	PCT	CODE
2	100.0	A-PASNGR CAR/STA WAGON
0	0.0	B-PASNGR CAR W/TRAILER
0	0.0	C-MOTORCYCLE
0	0.0	D-PICKUP/PANEL TRUCK
0	0.0	E-PICKUP/PANEL W/TRAILER
0	0.0	F-TRUCK/TRUCK TRACTOR
0	0.0	G-TRUCK/TRACTOR & 1 TRAILER
0	0.0	2-TRUCK/TRACTOR & 2 TRAILER
0	0.0	3-TRUCK/TRACTOR & 3 TRAILER
0	0.0	4-SINGLE UNIT TANKER
0	0.0	5-TRUCK/TRA & 1 TANK TRALR
0	0.0	6-TRUCK/TRA & 2 TANK TRALR
0	0.0	H-SCHOOL BUS
0	0.0	I-OTHER BUS
0	0.0	J-EMERGENCY VEHICLE
0	0.0	K-HIGHWAY CONST EQUP.**
0	0.0	L-BICYCLE
0	0.0	M-OTHER-MOTOR VEH
0	0.0	N-OTHER-NON-MOTOR VEH
0	0.0	O-SPILLED LOADS
0	0.0	P-DISENGAGED TOW
0	0.0	Q-UNINVOLVED VEHICLE
0	0.0	R-MOPED
0	0.0	T-TRAIN
0	0.0	U-PEDESTRIAN
0	0.0	V-DISMOUNT PEDESTRIAN
0	0.0	W-ANIMAL - LIVESTOCK
0	0.0	X-ANIMAL - DEER
0	0.0	Z-ANIMAL - OTHER

<- MOVEMENT PRECEDING COLLISION ->

NUMBER	PCT	CODE
0	0.0	A-STOPPED
1	50.0	B-PROCEDED STRAIGHT
1	50.0	C-RAN OFF ROAD
0	0.0	D-MAKING RIGHT TURN
0	0.0	E-MAKING LEFT TURN
0	0.0	F-MAKING U TURN
0	0.0	G-BACKING
1	50.0	H-SLOWING, STOPPING
0	0.0	I-PASS OTHER VEHICLE
0	0.0	J-CHANGING LANES
0	0.0	K-PARKING
0	0.0	L-ENTER FROM SHLDR
0	0.0	M-OTHER UNSAFE TURN
0	0.0	N-CROSS INTO OPP LN
0	0.0	O-PARKED
0	0.0	P-MERGING
0	0.0	Q-TRAVEL WRONG WAY
0	0.0	R-OTHER
0	0.0	<-NOT STATED

PEDESTRIAN

NUMBER	PCT	CODE
0	0.0	2- XING XWALK - INTRST
0	0.0	3- XING XWALK - NOT INTR
0	0.0	4- XING NOT XWALK
0	0.0	5- ROADWAY - INCL SHLDR
0	0.0	6- NOT IN ROADWAY
0	0.0	7- APRH-LEAVE SCHL BUS
0	0.0	- INVALID CODES

<---- OTHER ASSOCIATED FACTORS ---->

#1 NUMBER	#1 PCT	#2 NUMBER	#2 PCT	CODE
0	0.0	0	0.0	1-INFLUENCE ALCOHOL
0	0.0	0	0.0	2-FOLLOW TOO CLOSE
0	0.0	0	0.0	3-FAILURE TO YIELD
0	0.0	0	0.0	4-IMPROPER TURN
0	0.0	0	0.0	5-SPEEDING
0	0.0	0	0.0	6-OTHER VIOLATIONS
0	0.0	0	0.0	A-CELL PHONE* (INATTN)
0	0.0	0	0.0	B-ELECTRC EQUIP*(INATTN)
0	0.0	0	0.0	C-RADIO/CD/HDPHN*(INATTN)
0	0.0	0	0.0	D-SMOKING* (INATTN)
0	0.0	0	0.0	E-VISION OBSCUREMENT
0	0.0	0	0.0	F-INATTENTION - OTHER
0	0.0	0	0.0	G-STOP & GO TRAFFIC
0	0.0	0	0.0	H-ENTER/LEAVE RAMP
0	0.0	0	0.0	I-PREVIOUS COLLISION
0	0.0	0	0.0	J-UNFAMILIAR WITH ROAD
0	0.0	0	0.0	K-DEFECT VEHICLE EQUIP
0	0.0	0	0.0	L-UNINVOLVED VEHICLE
0	0.0	0	0.0	M-OTHER
2	100.0	0	0.0	N-NONE APPARENT
0	0.0	0	0.0	P-WIND
0	0.0	0	0.0	R-RAMP ACCIDENT
0	0.0	0	0.0	S-RUNAWAY VEHICLE
0	0.0	0	0.0	T-EATING* (INATTN)
0	0.0	0	0.0	U-CHILDREN* (INATTN)
0	0.0	0	0.0	V-ANIMALS* (INATTN)
0	0.0	0	0.0	W-PERSNL HYGIENE*(INATTN)
0	0.0	0	0.0	X-READING* (INATTN)
0	0.0	2	100.0	<-NOT STATED
0	0.0	0	0.0	--DOES NOT APPLY

* INATTENTION CODES EFF. 01-01-01

<---- DIRECTION OF TRAVEL ---->

NUMBER	PCT	CODE
0	0.0	N-N, NE, NW BOUND
1	50.0	S-S, SE, SW BOUND
0	0.0	E-EASTBOUND
1	50.0	W-WESTBOUND
0	0.0	<-NOT STATED
0	0.0	--DOES NOT APPLY
0	0.0	-INVALID CODES

** INCLUDES EQUIPMENT ENGAGED IN CONST/MAINT ACTIVITIES AS OF 00-02-22

<---- SPECIAL INFORMATION ---->

NUMBER	PCT	CODE
0	0.0	A-HAZARDOUS MATERIALS
0	0.0	B-CELL PHONE IN USE*
1	50.0	C-CELL PHONE NOT IN USE*
1	50.0	D-CELL PHONE NONE/UNKNOWN*
0	0.0	<-NOT STATED
0	0.0	--DOES NOT APPLY
0	0.0	-INVALID CODES

* SPECIAL INFORMATION CODES EFF. 04-01-01

TASAS SELECTIVE RECORD RETRIEVAL
TSAR - PARTY SUMMARY
' SLO 101 SB on ramp from Rt 058 PM 37.54 Date Range 08/01/2007 to 07/31/2010 '

<---------- OBJECT STRUCK ---------->

PRIMARY NUMBER	PCT	OTHERS NUMBER	PCT	CODE
0	0.0	0	0.0	01-SIDE OF BRIDGE RAILING
0	0.0	0	0.0	02-END OF BRIDGE RAILING
0	0.0	0	0.0	03-PIER, COLUMN, ABUTMENT
0	0.0	0	0.0	04-BOTTOM OF STRUCTURE
0	0.0	0	0.0	05-BRIDGE END POST IN GORE
0	0.0	0	0.0	06-END OF GUARD RAIL
0	0.0	0	0.0	07-BRIDGE APPROACH GUARD RAIL
1	50.0	0	0.0	10-LIGHT OR SIGNAL POLE
0	0.0	0	0.0	11-UTILITY POLE
0	0.0	0	0.0	12-POLE (TYPE NOT STATED)
0	0.0	0	0.0	13-TRAFFIC SIGN/SIGN POST
0	0.0	0	0.0	14-OTHER SIGNS NOT TRAFFIC
0	0.0	0	0.0	15-GUARDRAIL
0	0.0	0	0.0	16-MEDIAN BARRIER
0	0.0	0	0.0	17-WALL (EXCEPT SOUND WALL)
0	0.0	0	0.0	18-DIKE OR CURB
0	0.0	0	0.0	19-TRAFFIC ISLAND
0	0.0	0	0.0	20-RAISED BARS
0	0.0	0	0.0	21-CONCRETE OBJ (HDWL, D.I.)
0	0.0	0	0.0	22-GUIDEPOST, CULVERT, PM
0	0.0	0	0.0	23-CUT SLOPE OR EMBANKMENT
0	0.0	0	0.0	24-OVER EMBANKMENT
0	0.0	0	0.0	25-IN WATER
0	0.0	0	0.0	26-DRAINAGE DITCH
0	0.0	0	0.0	27-FENCE
1	50.0	0	0.0	28-TREES
0	0.0	0	0.0	29-PLANTS
0	0.0	0	0.0	30-SOUND WALL
0	0.0	0	0.0	40-NATURAL MATRL ON ROAD
0	0.0	0	0.0	41-TEMP BARRICADES, CONES
0	0.0	0	0.0	42-OTHER OBJECT ON ROAD
0	0.0	0	0.0	43-OTHER OBJECT OFF ROAD
0	0.0	0	0.0	44-OVERTURNED
0	0.0	0	0.0	45-CRASH CUSHION (SAND)
0	0.0	0	0.0	46-CRASH CUSHION (OTHER)
0	0.0	0	0.0	51-CALL BOX
0	0.0	0	0.0	98-UNKNOWN OBJECT STRUCK
0	0.0	0	0.0	99- NO OBJECT INVOLVED
1	50.0	0	0.0	V1 THRU V9 VEHICLE 1 TO 9
0	0.0	0	0.0	<< NOT STATED
0	0.0	2	100.0	-- DOES NOT APPLY
0	0.0	0	0.0	- INVALID CODES

<------ LOCATION OF COLLISION ------>

PRIMARY NUMBER	PCT	OTHERS NUMBER	PCT	CODE
0	0.0	0	0.0	A-BEYOND MEDIAN OR STRIPE-LEFT
0	0.0	0	0.0	B-BEYOND SHLDER DRIVERS LEFT
0	0.0	0	0.0	C-LEFT SHOULDER AREA
0	0.0	0	0.0	D-LEFT LANE
0	0.0	0	0.0	E-INTERIOR LANES
1	50.0	0	0.0	F-RIGHT LANE
0	0.0	0	0.0	G-RIGHT SHOULDER AREA
1	50.0	0	0.0	H-BEYOND SHLDER DRIVERS RIGHT
0	0.0	0	0.0	I-GORE AREA
0	0.0	0	0.0	J-OTHER
0	0.0	0	0.0	V-HOV LANE(S)
0	0.0	0	0.0	W-HOV LANE BUFFER AREA
0	0.0	0	0.0	<-NOT STATED
0	0.0	2	100.0	--DOES NOT APPLY
0	0.0	0	0.0	-INVALID CODES

<------ DRUG/PHYSICAL ------>

PRIMARY NUMBER	PCT	OTHERS NUMBER	PCT	CODE
2	100.0	0	0.0	A-HAD NOT BEEN DRINKING
0	0.0	0	0.0	B-HBD - UNDER INFLUENCE
0	0.0	0	0.0	C-HBD - NOT UNDER INFLUENCE
0	0.0	0	0.0	D-HBD - IMPAIRMENT UNKNOWN
0	0.0	0	0.0	E-UNDER DRUG INFLUENCE
0	0.0	0	0.0	F-OTHER PHYSICAL IMPAIRMENT
0	0.0	0	0.0	G-IMPAIRMENT NOT KNOWN
0	0.0	0	0.0	H-NOT APPLICABLE
0	0.0	0	0.0	I-FATIGUE
0	0.0	2	100.0	< NOT STATED
0	0.0	0	0.0	--DOES NOT APPLY
0	0.0	0	0.0	-INVALID CODES

California Department of Transportation

OTM22215

TSAR - ACCIDENT SUMMARY

Policy controlling the use of Traffic Accident Surveillance and Analysis System (TASAS) - Transportation Systems Network (TSN) Reports

1. TASAS - TSN has officially replaced the TASAS - "Legacy" database.
2. Reports from TSN are to be used and interpreted by the California Department of Transportation (Caltrans) officials or authorized representative.
3. Electronic versions of these reports may be emailed between Caltrans' employees only using the State computer system.
4. The contents of these reports shall be considered confidential and may be privileged pursuant to 23 U.S.C. Section 409, and are for the sole use of the intended recipient(s). Any unauthorized review, use, disclosure or distribution is prohibited. If you are not the intended recipient, please contact the sender by reply e-mail and destroy all copies of the original message. Do not print, copy or forward.

California Department of Transportation

OTM22215

TSAR - ACCIDENT SUMMARY

REPORT PARAMETERS:

REPORT DATE	:	02/24/2012
REFERENCE DATE	:	02/24/2012
SUBMITTOR	:	T5SCADEN
REPORT TITLE	:	' All Collisions, Mainline SLO 058 PM 0.00 to 0.50 Date Range 08/01/2007 to 07/31/2010 '
EVENT ID	:	3426795

LOCATION CRITERIA:

FROM: 05-SLO-058 000.000 TO: 05-SLO-058 000.500

SELECTION CRITERIA:

1 2 AND 515 - INTRS/RAMP ACC LOC IN -,5
1 3 AND 515 - INTRS/RAMP ACC LOC NOT IN 6,4,3,2,1

Accidents Date Range:

From -- 08/01/2007 To -- 07/31/2010

TASAS SELECTIVE RECORD RETRIEVAL
TSAR - ACCIDENT SUMMARY
' All Collisions, Mainline SLO 058 PM 0.00 to 0.50 Date Range 08/01/2007 to 07/31/2010 '

TOTAL ACCIDENTS	FATAL	INJURY	PDO	PERSONS KILLED	PERSONS INJURED
4	0	2	2	0	2

MOTOR VEHICLES INVOLVED

NUMBER	PCT	CODE
0	0.0	1
3	75.0	2
1	25.0	3
0	0.0	>3

<---LINES CODED--->

NUMBER	PCT	CODE
0	0.0	1
3	75.0	2
1	25.0	3
0	0.0	4
0	0.0	5
0	0.0	6
0	0.0	7
0	0.0	8
0	0.0	9

<---- HOUR OF DAY ---->

NUMBER	PCT	CODE
0	0.0	00- 12 MID.
0	0.0	01- 1 A.M.
0	0.0	02- 2 A.M.
0	0.0	03- 3 A.M.
0	0.0	04- 4 A.M.
0	0.0	05- 5 A.M.
0	0.0	06- 6 A.M.
0	0.0	07- 7 A.M.
0	0.0	08- 8 A.M.
0	0.0	09- 9 A.M.
0	0.0	10- 10 A.M.
0	0.0	11- 11 A.M.
0	0.0	12- 12 NOON
0	0.0	13- 1 P.M.
2	50.0	14- 2 P.M.
0	0.0	15- 3 P.M.
1	25.0	16- 4 P.M.
0	0.0	17- 5 P.M.
1	25.0	18- 6 P.M.
0	0.0	19- 7 P.M.
0	0.0	20- 8 P.M.
0	0.0	21- 9 P.M.
0	0.0	22- 10 P.M.
0	0.0	23- 11 P.M.
0	0.0	25- UNKNOWN

<--- ACCESS CONTROL --->

NUMBER	PCT	CODE
4	100.0	C-CONVENTIONAL
0	0.0	E-EXPRESSWAY
0	0.0	F-FREEWAY
0	0.0	S-1-WAY CITY ST
0	0.0	--INVALID DATA
0	0.0	+-NO DATA

<--- SIDE OF HIGHWAY --->

NUMBER	PCT	CODE
0	0.0	N-NORTHBOUND
0	0.0	S-SOUTHBOUND
3	75.0	E-EASTBOUND
1	25.0	W-WESTBOUND

<----- YEAR ----->

NUMBER	PCT	CODE
0	0.0	2000
0	0.0	2001
0	0.0	2002
0	0.0	2003
0	0.0	2004
0	0.0	2005
0	0.0	2006
2	50.0	2007
1	25.0	2008
1	25.0	2009
0	0.0	2010
0	0.0	2011

<----- MONTH ----->

NUMBER	PCT	CODE
0	0.0	01-JANUARY
0	0.0	02-FEBRUARY
1	25.0	03-MARCH
0	0.0	04-APRIL
0	0.0	05-MAY
0	0.0	06-JUNE
0	0.0	07-JULY
1	25.0	08-AUGUST
0	0.0	09-SEPTEMBER
1	25.0	10-OCTOBER
1	25.0	11-NOVEMBER
0	0.0	12-DECEMBER

<---- DAY OF WEEK ---->

NUMBER	PCT	CODE
1	25.0	1-SUNDAY
0	0.0	2-MONDAY
1	25.0	3-TUESDAY
0	0.0	4-WEDNESDAY
0	0.0	5-THURSDAY
1	25.0	6-FRIDAY
1	25.0	7-SATURDAY

TASAS SELECTIVE RECORD RETRIEVAL
TSAR - ACCIDENT SUMMARY
' All Collisions, Mainline SLO 058 PM 0.00 to 0.50 Date Range 08/01/2007 to 07/31/2010 '

<-- PRIMARY COLLISION FACTOR -->

NUMBER	PCT	CODE
0	0.0	1-INFLUENCE ALCOHOL
1	25.0	2-FOLLOW TOO CLOSE
3	75.0	3-FAILURE TO YIELD
0	0.0	4-IMPROPER TURN
0	0.0	5-SPEEDING
0	0.0	6-OTHER VIOLATIONS
0	0.0	B-IMPROPER DRIVING
0	0.0	C-OTHER THAN DRIVER
0	0.0	D-UNKNOWN
0	0.0	E-FELL SLEEP
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<--- TYPE OF COLLISION --->

NUMBER	PCT	CODE
0	0.0	A-HEAD-ON
1	25.0	B-SIDESWIPE
1	25.0	C-REAR END
2	50.0	D-BROADSIDE
0	0.0	E-HIT OBJECT
0	0.0	F-OVERTURN
0	0.0	G-AUTO-PEDESTRIAN
0	0.0	H-OTHER
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<--- ROADWAY CONDITION --->

NUMBER	PCT	CODE
0	0.0	A-HOLES, RUTS
0	0.0	B-LOOSE MATERIAL
0	0.0	C-OBSTRUCTION ON ROAD
0	0.0	D-CONSTRUCT-REPAIR-ZONE
0	0.0	E-REDUCED ROAD WIDTH
0	0.0	F-FLOODED
0	0.0	G-OTHER
4	100.0	H-NO UNUSUAL CONDITION
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<--------- WEATHER --------->

NUMBER	PCT	CODE
3	75.0	A-CLEAR
1	25.0	B-CLOUDY
0	0.0	C-RAINING
0	0.0	D-SNOWING
0	0.0	E-FOG
0	0.0	F-OTHER
0	0.0	G-WIND
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<---------- LIGHTING ---------->

NUMBER	PCT	CODE
4	100.0	A-DAY LIGHT
0	0.0	B-DUSK/DAWN
0	0.0	C-DARK-STREET LIGHT
0	0.0	D-DARK-NO STREET LIGHT
0	0.0	E-DARK-INOPR STREET LIGHT
0	0.0	F-DARK-NOT STATED
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<----- ROAD SURFACE ----->

NUMBER	PCT	CODE
4	100.0	A-DRY
0	0.0	B-WET
0	0.0	C-SNOWY, ICY
0	0.0	D-SLIPPERY
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<------ RIGHT OF WAY CONTROL ------>

NUMBER	PCT	CODE
0	0.0	A-CONTROL FUNCTIONING
0	0.0	B-CONTROL NOT FUNCTIONING
0	0.0	C-CONTROLS OBSCURED
4	100.0	D-NO CONTROLS PRESENT
0	0.0	<-NOT STATED
0	0.0	-INVALID CODES

<-------- HIGHWAY GROUP -------->

NUMBER	PCT	CODE
0	0.0	R-IND. ALIGN RIGHT
0	0.0	L-IND. ALIGN LEFT
0	0.0	D-DIVIDED
4	100.0	U-UNDIVIDED

<- INTERSECTION/RAMP ACCIDENT LOCATION ->

NUMBER	PCT	CODE
0	0.0	1-RAMP INTERSECTION (EXIT)
0	0.0	2-RAMP
0	0.0	3-RAMP ENTRY
0	0.0	4-RAMP AREA, INTERSECTION STREET
0	0.0	5-IN INTERSECTION
0	0.0	6-OUTSIDE INTRSCT-NONSTATE RTE
4	100.0	--DOES NOT APPLY

TASAS SELECTIVE RECORD RETRIEVAL
TSAR - PARTY SUMMARY
' All Collisions, Mainline SLO 058 PM 0.00 to 0.50 Date Range 08/01/2007 to 07/31/2010 '

<---------- PARTY TYPE ---------->

NUMBER	PCT	CODE
3	75.0	A-PASNGR CAR/STA WAGON
0	0.0	B-PASNGR CAR W/TRAILER
1	25.0	C-MOTORCYCLE
3	75.0	D-PICKUP/PANEL TRUCK
0	0.0	E-PICKUP/PANEL W/TRAILER
0	0.0	F-TRUCK/TRUCK TRACTOR
0	0.0	G-TRUCK/TRACTOR & 1 TRAILER
0	0.0	2-TRUCK/TRACTOR & 2 TRAILER
0	0.0	3-TRUCK/TRACTOR & 3 TRAILER
0	0.0	4-SINGLE UNIT TANKER
0	0.0	5-TRUCK/TRA & 1 TANK TRALR
0	0.0	6-TRUCK/TRA & 2 TANK TRALR
0	0.0	H-SCHOOL BUS
0	0.0	I-OTHER BUS
0	0.0	J-EMERGENCY VEHICLE
0	0.0	K-HIGHWAY CONST EQUP.**
0	0.0	L-BICYCLE
0	0.0	M-OTHER-MOTOR VEH
0	0.0	N-OTHER-NON-MOTOR VEH
0	0.0	O-SPILLED LOADS
0	0.0	P-DISENGAGED TOW
0	0.0	Q-UNINVOLVED VEHICLE
0	0.0	R-MOPED
0	0.0	T-TRAIN
0	0.0	U-PEDESTRIAN
0	0.0	V-DISMOUNT PEDESTRIAN
0	0.0	W-ANIMAL - LIVESTOCK
0	0.0	X-ANIMAL - DEER
0	0.0	Z-ANIMAL - OTHER

<- MOVEMENT PRECEDING COLLISION ->

NUMBER	PCT	CODE
1	25.0	A-STOPPED
4	100.0	B-PROCEDED STRAIGHT
0	0.0	C-RAN OFF ROAD
0	0.0	D-MAKING RIGHT TURN
2	50.0	E-MAKING LEFT TURN
1	25.0	F-MAKING U TURN
0	0.0	G-BACKING
1	25.0	H-SLOWING, STOPPING
0	0.0	I-PASS OTHER VEHICLE
0	0.0	J-CHANGING LANES
0	0.0	K-PARKING
0	0.0	L-ENTER FROM SHLDR
0	0.0	M-OTHER UNSAFE TURN
0	0.0	N-CROSS INTO OPP LN
0	0.0	O-PARKED
0	0.0	P-MERGING
0	0.0	Q-TRAVEL WRONG WAY
0	0.0	R-OTHER
0	0.0	<-NOT STATED

PEDESTRIAN

NUMBER	PCT	CODE
0	0.0	2- XING XWALK - INTRST
0	0.0	3- XING XWALK - NOT INTR
0	0.0	4- XING NOT XWALK
0	0.0	5- ROADWAY - INCL SHLDR
0	0.0	6- NOT IN ROADWAY
0	0.0	7- APRH-LEAVE SCHL BUS
0	0.0	- INVALID CODES

<---- OTHER ASSOCIATED FACTORS ---->

#1 NUMBER	#1 PCT	#2 NUMBER	#2 PCT	CODE
0	0.0	0	0.0	1-INFLUENCE ALCOHOL
0	0.0	0	0.0	2-FOLLOW TOO CLOSE
0	0.0	0	0.0	3-FAILURE TO YIELD
0	0.0	0	0.0	4-IMPROPER TURN
0	0.0	0	0.0	5-SPEEDING
0	0.0	0	0.0	6-OTHER VIOLATIONS
0	0.0	0	0.0	A-CELL PHONE* (INATTN)
0	0.0	0	0.0	B-ELECTRC EQUIP*(INATTN)
0	0.0	0	0.0	C-RADIO/CD/HDPHN*(INATTN)
0	0.0	0	0.0	D-SMOKING* (INATTN)
0	0.0	0	0.0	E-VISION OBSCUREMENT
1	25.0	0	0.0	F-INATTENTION - OTHER
0	0.0	0	0.0	G-STOP & GO TRAFFIC
1	25.0	0	0.0	H-ENTER/LEAVE RAMP
0	0.0	0	0.0	I-PREVIOUS COLLISION
0	0.0	0	0.0	J-UNFAMILIAR WITH ROAD
0	0.0	0	0.0	K-DEFECT VEHICLE EQUIP
0	0.0	0	0.0	L-UNINVOLVED VEHICLE
0	0.0	0	0.0	M-OTHER
4	100.0	0	0.0	N-NONE APPARENT
0	0.0	0	0.0	P-WIND
0	0.0	0	0.0	R-RAMP ACCIDENT
0	0.0	0	0.0	S-RUNAWAY VEHICLE
0	0.0	0	0.0	T-EATING* (INATTN)
0	0.0	0	0.0	U-CHILDREN* (INATTN)
0	0.0	0	0.0	V-ANIMALS* (INATTN)
0	0.0	0	0.0	W-PERSNL HYGIENE*(INATTN)
0	0.0	0	0.0	X-READING* (INATTN)
0	0.0	4	100.0	<-NOT STATED
0	0.0	0	0.0	--DOES NOT APPLY

* INATTENTION CODES EFF. 01-01-01

<---- DIRECTION OF TRAVEL ---->

NUMBER	PCT	CODE
2	50.0	N-N, NE, NW BOUND
0	0.0	S-S, SE, SW BOUND
4	100.0	E-EASTBOUND
2	50.0	W-WESTBOUND
0	0.0	<-NOT STATED
0	0.0	--DOES NOT APPLY
0	0.0	-INVALID CODES

** INCLUDES EQUIPMENT ENGAGED IN CONST/MAINT ACTIVITIES AS OF 00-02-22

<---- SPECIAL INFORMATION ---->

NUMBER	PCT	CODE
0	0.0	A-HAZARDOUS MATERIALS
0	0.0	B-CELL PHONE IN USE*
4	100.0	C-CELL PHONE NOT IN USE*
0	0.0	D-CELL PHONE NONE/UNKNOWN*
0	0.0	<-NOT STATED
0	0.0	--DOES NOT APPLY
0	0.0	-INVALID CODES

* SPECIAL INFORMATION CODES EFF. 04-01-01

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TASAS SELECTIVE RECORD RETRIEVAL
TSAR - PARTY SUMMARY
' All Collisions, Mainline SLO 058 PM 0.00 to 0.50 Date Range 08/01/2007 to 07/31/2010 '

<------------------- OBJECT STRUCK ------------------->

PRIMARY NUMBER	PRIMARY PCT	OTHERS NUMBER	OTHERS PCT	CODE
0	0.0	0	0.0	01-SIDE OF BRIDGE RAILING
0	0.0	0	0.0	02-END OF BRIDGE RAILING
0	0.0	0	0.0	03-PIER, COLUMN, ABUTMENT
0	0.0	0	0.0	04-BOTTOM OF STRUCTURE
0	0.0	0	0.0	05-BRIDGE END POST IN GORE
0	0.0	0	0.0	06-END OF GUARD RAIL
0	0.0	0	0.0	07-BRIDGE APPROACH GUARD RAIL
0	0.0	0	0.0	10-LIGHT OR SIGNAL POLE
0	0.0	0	0.0	11-UTILITY POLE
0	0.0	0	0.0	12-POLE (TYPE NOT STATED)
0	0.0	0	0.0	13-TRAFFIC SIGN/SIGN POST
0	0.0	0	0.0	14-OTHER SIGNS NOT TRAFFIC
0	0.0	0	0.0	15-GUARDRAIL
0	0.0	0	0.0	16-MEDIAN BARRIER
0	0.0	0	0.0	17-WALL (EXCEPT SOUND WALL)
0	0.0	0	0.0	18-DIKE OR CURB
0	0.0	0	0.0	19-TRAFFIC ISLAND
0	0.0	0	0.0	20-RAISED BARS
0	0.0	0	0.0	21-CONCRETE OBJ (HDWL, D.I.)
0	0.0	0	0.0	22-GUIDEPOST, CULVERT, PM
0	0.0	0	0.0	23-CUT SLOPE OR EMBANKMENT
0	0.0	0	0.0	24-OVER EMBANKMENT
0	0.0	0	0.0	25-IN WATER
0	0.0	0	0.0	26-DRAINAGE DITCH
0	0.0	0	0.0	27-FENCE
0	0.0	0	0.0	28-TREES
0	0.0	0	0.0	29-PLANTS
0	0.0	0	0.0	30-SOUND WALL
0	0.0	0	0.0	40-NATURAL MATRL ON ROAD
0	0.0	0	0.0	41-TEMP BARRICADES, CONES
0	0.0	0	0.0	42-OTHER OBJECT ON ROAD
0	0.0	0	0.0	43-OTHER OBJECT OFF ROAD
0	0.0	1	25.0	44-OVERTURNED
0	0.0	0	0.0	45-CRASH CUSHION (SAND)
0	0.0	0	0.0	46-CRASH CUSHION (OTHER)
0	0.0	0	0.0	51-CALL BOX
0	0.0	0	0.0	98-UNKNOWN OBJECT STRUCK
0	0.0	0	0.0	99- NO OBJECT INVOLVED
4	100.0	1	25.0	V1 THRU V9 VEHICLE 1 TO 9
0	0.0	0	0.0	<< NOT STATED
1	25.0	4	100.0	-- DOES NOT APPLY
0	0.0	0	0.0	- INVALID CODES

<------ LOCATION OF COLLISION ------>

PRIMARY NUMBER	PRIMARY PCT	OTHERS NUMBER	OTHERS PCT	CODE
0	0.0	0	0.0	A-BEYOND MEDIAN OR STRIPE-LEFT
0	0.0	0	0.0	B-BEYOND SHLDER DRIVERS LEFT
0	0.0	0	0.0	C-LEFT SHOULDER AREA
1	25.0	0	0.0	D-LEFT LANE
0	0.0	0	0.0	E-INTERIOR LANES
4	100.0	1	25.0	F-RIGHT LANE
0	0.0	0	0.0	G-RIGHT SHOULDER AREA
0	0.0	1	25.0	H-BEYOND SHLDER DRIVERS RIGHT
0	0.0	0	0.0	I-GORE AREA
0	0.0	1	25.0	J-OTHER
0	0.0	0	0.0	V-HOV LANE(S)
0	0.0	0	0.0	W-HOV LANE BUFFER AREA
0	0.0	0	0.0	<-NOT STATED
1	25.0	4	100.0	--DOES NOT APPLY
0	0.0	0	0.0	-INVALID CODES

<------ DRUG/PHYSICAL ------>

PRIMARY NUMBER	PRIMARY PCT	OTHERS NUMBER	OTHERS PCT	CODE
4	100.0	0	0.0	A-HAD NOT BEEN DRINKING
0	0.0	0	0.0	B-HBD - UNDER INFLUENCE
0	0.0	0	0.0	C-HBD - NOT UNDER INFLUENCE
0	0.0	0	0.0	D-HBD - IMPAIRMENT UNKNOWN
0	0.0	0	0.0	E-UNDER DRUG INFLUENCE
0	0.0	0	0.0	F-OTHER PHYSICAL IMPAIRMENT
0	0.0	0	0.0	G-IMPAIRMENT NOT KNOWN
0	0.0	0	0.0	H-NOT APPLICABLE
0	0.0	0	0.0	I-FATIGUE
0	0.0	4	100.0	< NOT STATED
0	0.0	0	0.0	--DOES NOT APPLY
0	0.0	0	0.0	-INVALID CODES

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California Department of Transportation

OTM22130

Table B - Selective Accident Rate Calculation

Policy controlling the use of Traffic Accident Surveillance and Analysis System (TASAS) - Transportation Systems Network (TSN) Reports

1. TASAS - TSN has officially replaced the TASAS - "Legacy" database.

2. Reports from TSN are to be used and interpreted by the California Department of Transportation (Caltrans) officials or authorized representative.

3. Electronic versions of these reports may be emailed between Caltrans' employees only using the State computer system.

4. The contents of these reports shall be considered confidential and may be privileged pursuant to 23 U.S.C. Section 409, and are for the sole use of the intended recipient(s). Any unauthorized review, use, disclosure or distribution is prohibited. If you are not the intended recipient, please contact the sender by reply e-mail and destroy all copies of the original message. Do not print, copy or forward.

OTM22130

Table B - Selective Accident Rate Calculation

Report Parameters-

Event ID: 3421868

Request Name: CPRA 05 1508 SLO 058 101

Ref Date: 02/22/2012

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 SLO 058 000.000 - 05 SLO 058 000.500	01-AUG-07	31-JUL-10	N	L						N	N	Y
1 3		H	T	I 05 SLO 101 037.424 - 05 SLO 101 038.064	01-AUG-07	31-JUL-10	N	L						N	N	Y
1 4		R	T	I 05 SLO 101 037.540 - 05 SLO 101 037.938	01-AUG-07	31-JUL-10	N	L						N	N	N

Event Log:

Job id is : 432659 Accidents Table B Request CPRA 05 1508 SLO 058 101 Submitted by T5SCADEN
05 SLO 058 0 - 05 SLO 058 .5 08/01/2007 TO 07/31/2010
05 SLO 101 37.424 - 05 SLO 101 38.064 08/01/2007 TO 07/31/2010
05 SLO 101 37.54 - 05 SLO 101 37.938 08/01/2007 TO 07/31/2010

Supplemental Signal Warrants

EXISTING CONDITIONS

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 1 of 4)

5	SLO	58	
DIST	CO	RTE	PM

COUNT DATE SEPT. 2011
CALC MMF DATE 10/24/2011
CHK DLD DATE 10/24/2011

Major St: EL CAMINO REAL - SR 58 — Critical Approach Speed 35 mph
Minor St: SR 58 — Critical Approach Speed 25 mph

Speed limit or critical speed on major street traffic > 64 km/h (40 mph)..... ☐ or
In built up area of isolated community of < 10,000 population..... ☒
} RURAL (R)
☐ URBAN (U)

WARRANT 1 - Eight Hour Vehicular Volume SATISFIED YES ☐ NO ☒
(Condition A or Condition B or combination of A and B must be satisfied)

Condition A - Minimum Vehicle Volume 100% SATISFIED YES ☐ NO ☒
80% SATISFIED YES ☐ NO ☒

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				8 AM	7 AM	5 PM	4 PM	3 PM	2 PM	1 PM	11 AM
	U	(R)	U	R								
APPROACH LANES	(1)		2 or More									
Both Approaches Major Street	500 (400)	350 (280)	600 (480)	420 (336)	397	402	396	393	338	291	293	268
Highest Approach Minor Street	150 (120)	105 (84)	200 (160)	140 (112)	221	197	191	154	126	161	86	96

Hour

Condition B - Interruption of Continuous Traffic 100% SATISFIED YES ☐ NO ☒
80% SATISFIED YES ☐ NO ☒

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)											
	U	(R)	U	R								
APPROACH LANES	(1)		2 or More									
Both Approaches Major Street	750 (600)	525 (420)	900 (720)	630 (504)	397	402	396	393	338	291	293	268
Highest Approach Minor Street	75 (60)	53 (42)	100 (80)	70 (56)	221	197	191	154	126	161	86	96

Hour

Combination of Conditions A & B SATISFIED YES ☐ NO ☐

REQUIREMENT	CONDITION	✓	FULFILLED
TWO CONDITIONS SATISFIED 80%	A. MINIMUM VEHICULAR VOLUME		Yes ☐ No ☐
	AND, B. INTERRUPTION OF CONTINUOUS TRAFFIC		
AND, AN ADEQUATE TRIAL OF OTHER ALTERNATIVES THAT COULD CAUSE LESS DELAY AND INCONVENIENCE TO TRAFFIC HAS FAILED TO SOLVE THE TRAFFIC PROBLEMS			Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 4)

WARRANT 2 - Four Hour Vehicular Volume SATISFIED* YES ☐ NO ☑

Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	One	2 or More	8 AM	7 AM	5 PM	4 PM	Hour
Both Approaches - Major Street	✓		397	402	396	393	
Higher Approach - Minor Street	✓		221	197	191	154	

*All plotted points fall above the applicable curve in Figure 4C-1. (URBAN AREAS)	Yes ☐ No ☐
OR, All plotted points fall above the applicable curve in Figure 4C-2. (RURAL AREAS)	Yes ☐ No ☐

WARRANT 3 - Peak Hour
(Part A or Part B must be satisfied) N/A SATISFIED YES ☐ NO ☐

PART A SATISFIED YES ☐ NO ☐

(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND	Yes ☐ No ☐
2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND	Yes ☐ No ☐
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes ☐ No ☐

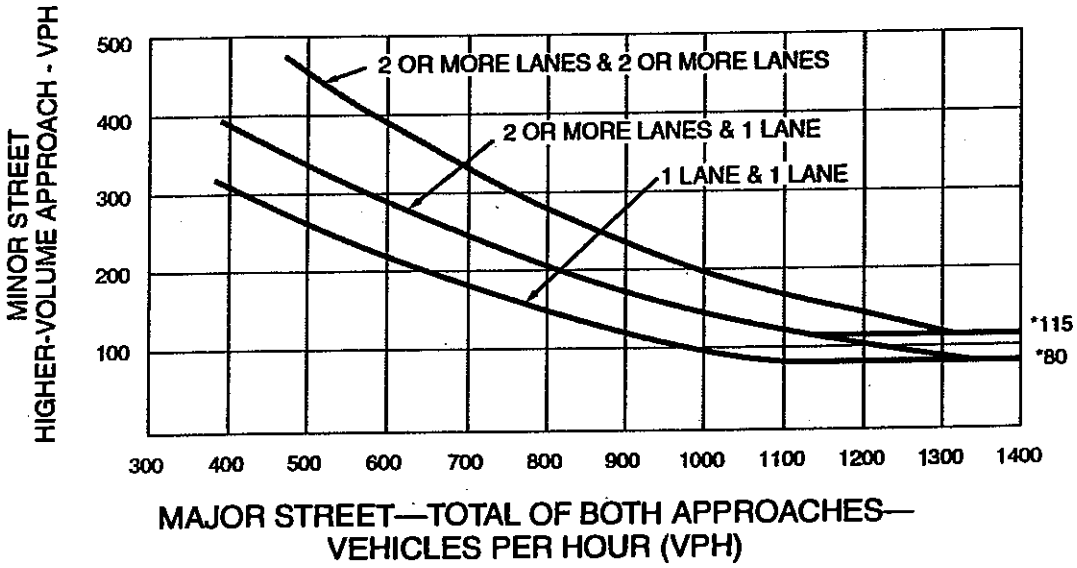
PART B N/A SATISFIED YES ☐ NO ☐

APPROACH LANES	One	2 or More	Hour
Both Approaches - Major Street			
Higher Approach - Minor Street			

The plotted point falls above the applicable curve in Figure 4C-3. (URBAN AREAS)	Yes ☐ No ☐
OR, The plotted point falls above the applicable curve in Figure 4C-4. (RURAL AREAS)	Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

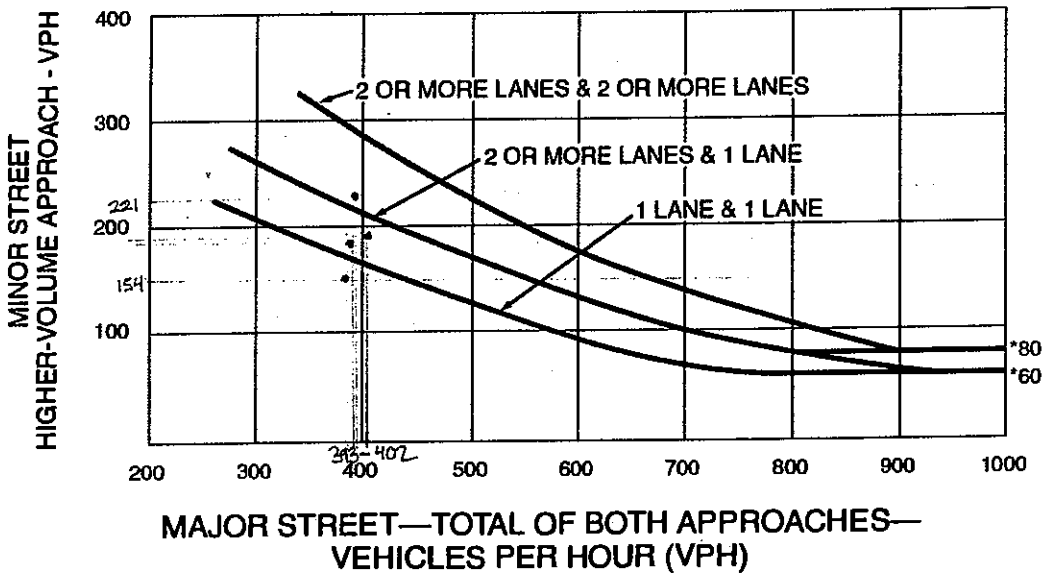
Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h OR ABOVE 40 mph ON MAJOR STREET)



*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 3 of 4)

WARRANT 4 - Pedestrian Volume (Parts A and B Must Be Satisfied) — SATISFIED YES ☐ NO ☒

Part A (Parts 1 or 2 must be satisfied) — SATISFIED YES ☐ NO ☒

Hours - - ->

1.	Pedestrian Volume	5	3	1	-	Any hour ≥ 190 — Yes ☐ No ☒
						OR any 4 hours ≥ 100 — Yes ☐ No ☒
	Adequate Crossing Gaps					AND < 60 gaps/hr — Yes ☐ No ☐

2.	Pedestrian Volume	Any hour ≥ 95	Yes ☐ No ☒
		OR Any 4 hours ≥ 50	Yes ☐ No ☒
		AND ped crossing speed < 1.2m/s (4 ft/sec)	Yes ☐ No ☒
		AND < 60 gaps/hr	Yes ☐ No ☒

Part B — SATISFIED YES ☐ NO ☒

AND, The distance to the nearest traffic signal along the major street is greater than 90 m (300 ft)	Yes ☐ No ☐
OR, The proposed traffic signal will not restrict progressive traffic flow along the major street.	Yes ☐ No ☐

WARRANT 5 - School Crossing (Parts A and B Must Be Satisfied) — SATISFIED YES ☐ NO ☒

Part A — SATISFIED YES ☐ NO ☒

Gap/Minutes and # of Children

Hour

Gaps vs Minutes	Minutes Children Using Crossing	30
	Number of Adequate Gaps	
School Age Pedestrians Crossing Street / hr		

Gaps < Minutes — YES ☐ NO ☒

AND Children > 20/hr — YES ☐ NO ☒

AND, Consideration has been given to less restrictive remedial measures.	Yes ☐ No ☐

Part B — SATISFIED YES ☐ NO ☒

The distance to the nearest traffic signal along the major street is greater than 90 m (300 ft)	Yes ☐ No ☐
OR, The proposed signal will not restrict the progressive movement of traffic.	Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 4 of 4)

WARRANT 6 - Coordinated Signal System N/A **SATISFIED YES ☐ NO ☐**
(All Parts Must Be Satisfied)

MINIMUM REQUIREMENTS	DISTANCE TO NEAREST SIGNAL	
≥ 300 m (1000 ft)	N _____ ft, S _____ ft, E _____ ft, W _____ ft	Yes ☐ No ☐
On a one-way street or a street that has traffic predominantly in one direction, the adjacent traffic control signals are so far apart that they do not provide the necessary degree of vehicular platooning.		Yes ☐ No ☐
OR, On a two-way street, adjacent traffic control signals do not provide the necessary degree of platooning and the proposed and adjacent traffic control signals will collectively provide a progressive operation.		

WARRANT 7 - Crash Experience Warrant **SATISFIED YES ☐ NO ☒**
(All Parts Must Be Satisfied)

Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency.			Yes ☐ No ☐
REQUIREMENTS	Number of crashes reported within a 12 month period susceptible to correction by a traffic signal, and involving injury or damage exceeding the requirements for a reportable crash.		Yes ☐ No ☒
5 OR MORE			
REQUIREMENTS	CONDITIONS	✓	
ONE CONDITION SATISFIED 80%	Warrant 1, Condition A - Minimum Vehicular Volume		Yes ☐ No ☒
	OR, Warrant 1, Condition B - Interruption of Continuous Traffic		
	OR, Warrant 4, Pedestrian Volume Condition Ped Vol ≥ 152 for any hour OR, Ped Vol ≥ 80 for any 4 hours		

WARRANT 8 - Roadway Network **SATISFIED YES ☐ NO ☒**
(All Parts Must Be Satisfied)

MINIMUM VOLUME REQUIREMENTS	ENTERING VOLUMES - ALL APPROACHES	✓	FULFILLED
1000 Veh/Hr	During Typical Weekday Peak Hour 555 Veh/Hr and has 5-year projected traffic volumes that meet one or more of Warrants 1, 2, and 3 during an average weekday.		Yes ☐ No ☒
	OR During Each of Any 5 Hrs. of a Sat. or Sun _____ Veh/Hr		

CHARACTERISTICS OF MAJOR ROUTES	MAJOR ROUTE A	MAJOR ROUTE B	
Hwy. System Serving as Principal Network for Through Traffic			
Rural or Suburban Highway Outside Of, Entering, or Traversing a City			
Appears as Major Route on an Official Plan			
Any Major Route Characteristics Met, Both Streets			Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

EX + APPROVED + PROJECT

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 1 of 4)

COUNT DATE N/A
CALC MMC DATE 4/10/2012
CHK DLD DATE 4/10/2012

DIST	CO	RTE	PM
	SLO	58	

Major St: SR 58 - EL CAMINO REAL — Critical Approach Speed _____ mph
Minor St: SR 58 - ESTRADA AVENUE — Critical Approach Speed _____ mph

Speed limit or critical speed on major street traffic > 64 km/h (40 mph)..... ☐ or
In built up area of isolated community of < 10,000 population..... ☒ } RURAL (R)
☐ URBAN (U)

WARRANT 1 - Eight Hour Vehicular Volume SATISFIED YES ☐ NO ☒
(Condition A or Condition B or combination of A and B must be satisfied)

Condition A - Minimum Vehicle Volume 100% SATISFIED YES ☐ NO ☒
80% SATISFIED YES ☒ NO ☐

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)											
	U	(R)	U	R								
APPROACH LANES	1		2 or More									Hour
Both Approaches Major Street	500 (400)	350 (280)	600 (480)	420 (336)	507	476	481	493	427	374	380	315
Highest Approach Minor Street	150 (120)	105 (84)	200 (160)	140 (112)	264	276	252	221	186	218	145	143

Condition B - Interruption of Continuous Traffic 100% SATISFIED YES ☐ NO ☒
80% SATISFIED YES ☐ NO ☒

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)											
	U	(R)	U	R								
APPROACH LANES	1		2 or More									Hour
Both Approaches Major Street	750 (600)	525 (420)	900 (720)	630 (504)	507	476	481	493	427	374	380	315
Highest Approach Minor Street	75 (60)	53 (42)	100 (80)	70 (56)	264	276	252	221	186	218	145	143

Combination of Conditions A & B SATISFIED YES ☐ NO ☒

REQUIREMENT	CONDITION	✓	FULFILLED
TWO CONDITIONS SATISFIED 80%	A. MINIMUM VEHICULAR VOLUME		Yes ☐ No ☐
	AND, B. INTERRUPTION OF CONTINUOUS TRAFFIC		
AND, AN ADEQUATE TRIAL OF OTHER ALTERNATIVES THAT COULD CAUSE LESS DELAY AND INCONVENIENCE TO TRAFFIC HAS FAILED TO SOLVE THE TRAFFIC PROBLEMS			Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 4)

WARRANT 2 - Four Hour Vehicular Volume SATISFIED* YES ☒ NO ☐

Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	One	2 or More	/	/	/	/ Hour
Both Approaches - Major Street	✓		507	476	481	493
Higher Approach - Minor Street	✓		264	276	252	221

*All plotted points fall above the applicable curve in Figure 4C-1. (URBAN AREAS)	Yes ☐	No ☐
OR, All plotted points fall above the applicable curve in Figure 4C-2. (RURAL AREAS)	Yes ☒	No ☐

WARRANT 3 - Peak Hour SATISFIED YES ☒ NO ☐
(Part A or Part B must be satisfied)

PART A SATISFIED YES ☐ NO ☐
(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND	Yes ☒	No ☐
2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND	Yes ☒	No ☐
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes ☒	No ☐

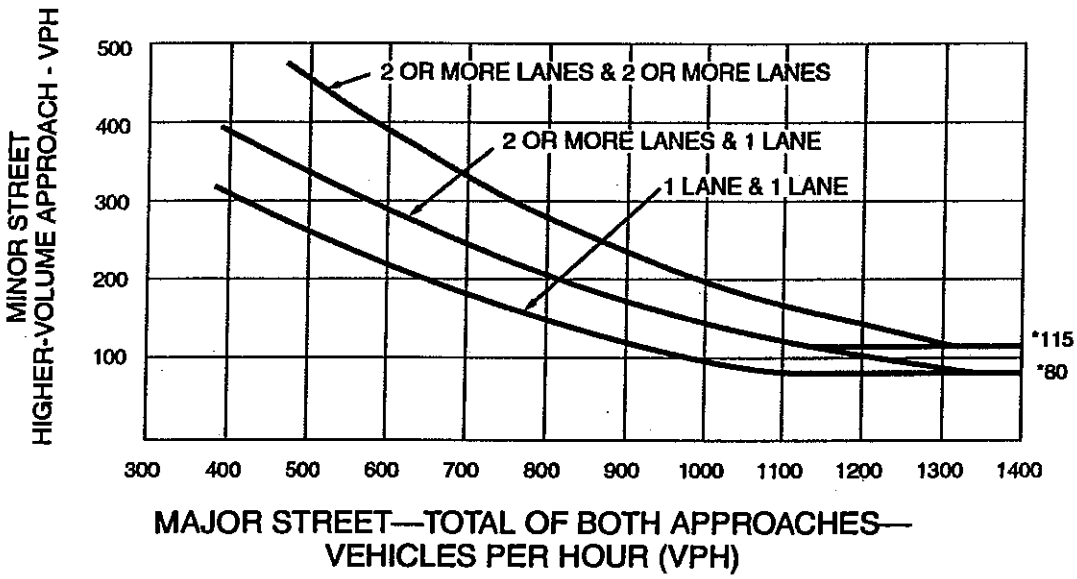
PART B SATISFIED YES ☒ NO ☐

APPROACH LANES	One	2 or More	/ Hour
Both Approaches - Major Street			
Higher Approach - Minor Street			

The plotted point falls above the applicable curve in Figure 4C-3. (URBAN AREAS)	Yes ☐	No ☐
OR, The plotted point falls above the applicable curve in Figure 4C-4. (RURAL AREAS)	Yes ☒	No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

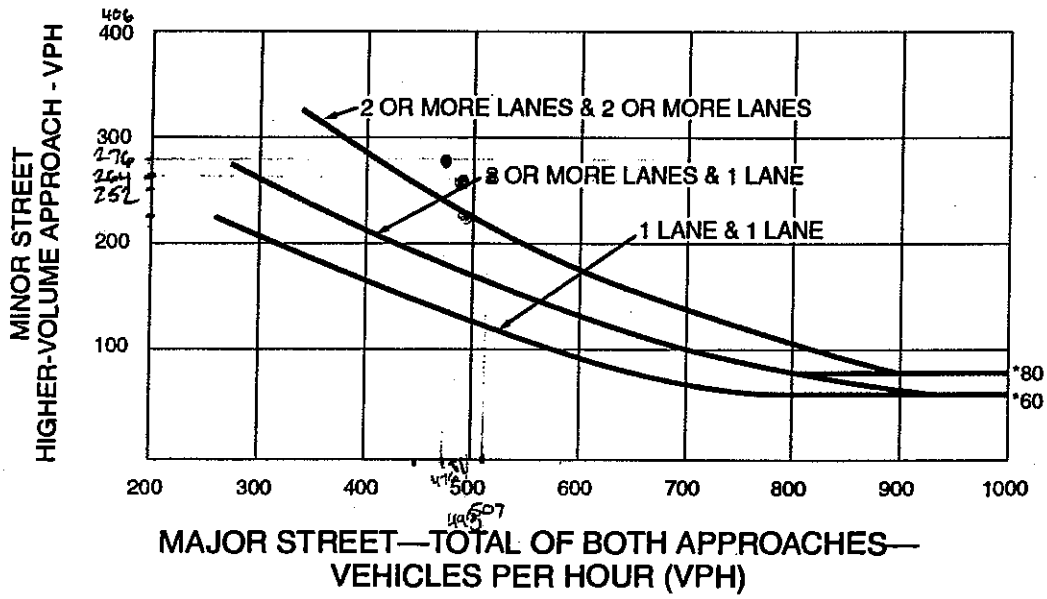
Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

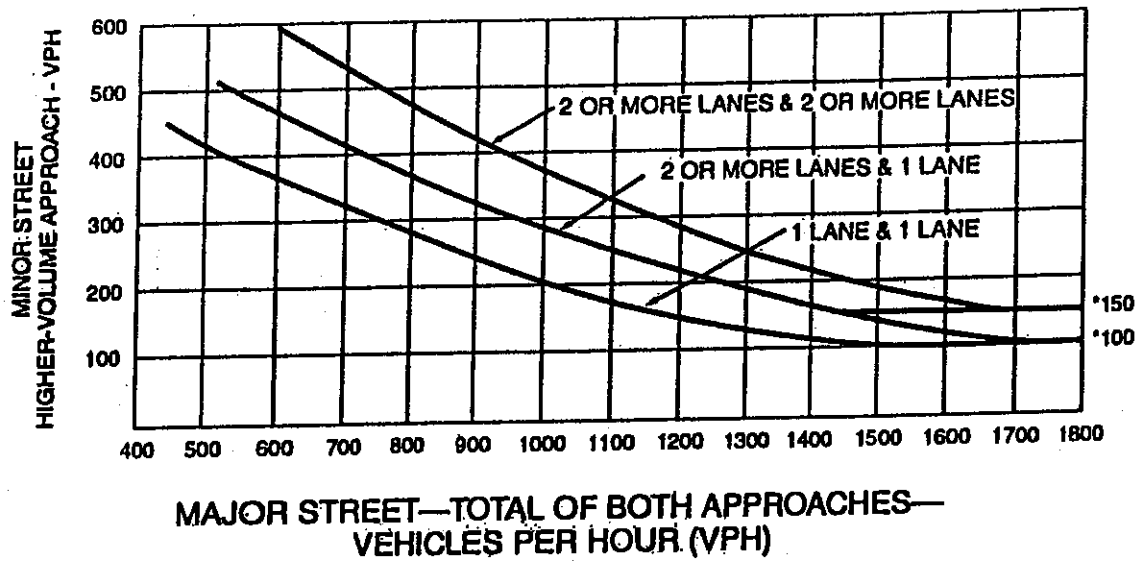
Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h OR ABOVE 40 mph ON MAJOR STREET)



*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

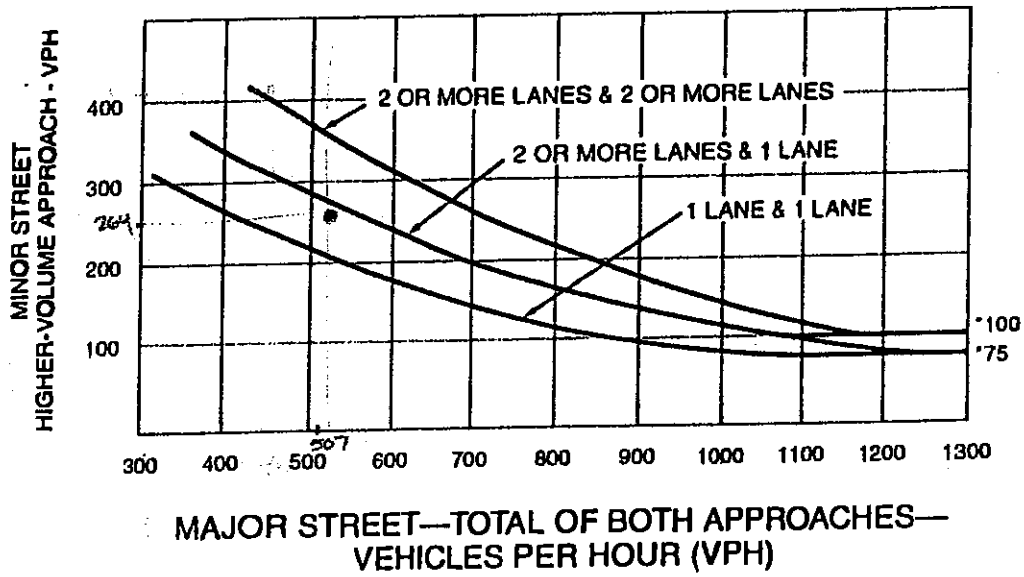
Figure 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE ~~70~~ 64 km/h OR ABOVE 40 mph ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

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2030 NO PROJECT
* FUTURE VOLUMES *

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 1 of 4)

COUNT DATE N/A

5	SLO	58	
DIST	CO	RTE	PM

CALC MMF DATE 10/24/2011
CHK DLO DATE 10/24/2011

Major St: EL CAMINO REAL - SR58 Critical Approach Speed 35 mph
Minor St: SR 58 Critical Approach Speed 25 mph

Speed limit or critical speed on major street traffic > 64 km/h (40 mph)..... ☐ or ☒ } RURAL (R)
In built up area of isolated community of < 10,000 population..... ☐ URBAN (U)

WARRANT 1 - Eight Hour Vehicular Volume SATISFIED YES ☒ NO ☐
(Condition A or Condition B or combination of A and B must be satisfied)

Condition A - Minimum Vehicle Volume 100% SATISFIED YES ☒ NO ☐
80% SATISFIED YES ☒ NO ☐

	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)												Hour
	U	(R)	U	R	8 AM	7 AM	5 PM	4 PM	3PM	2 PM	1 PM	11 AM	
APPROACH LANES	(1)		2 or More										
Both Approaches Major Street	500 (400)	350 (280)	600 (480)	420 (336)	635	643	634	629	541	466	469	429	
Highest Approach Minor Street	150 (120)	105 (84)	200 (160)	140 (112)	391	349	338	273	223	285	152	170	

Condition B - Interruption of Continuous Traffic 100% SATISFIED YES ☐ NO ☒
80% SATISFIED YES ☒ NO ☐

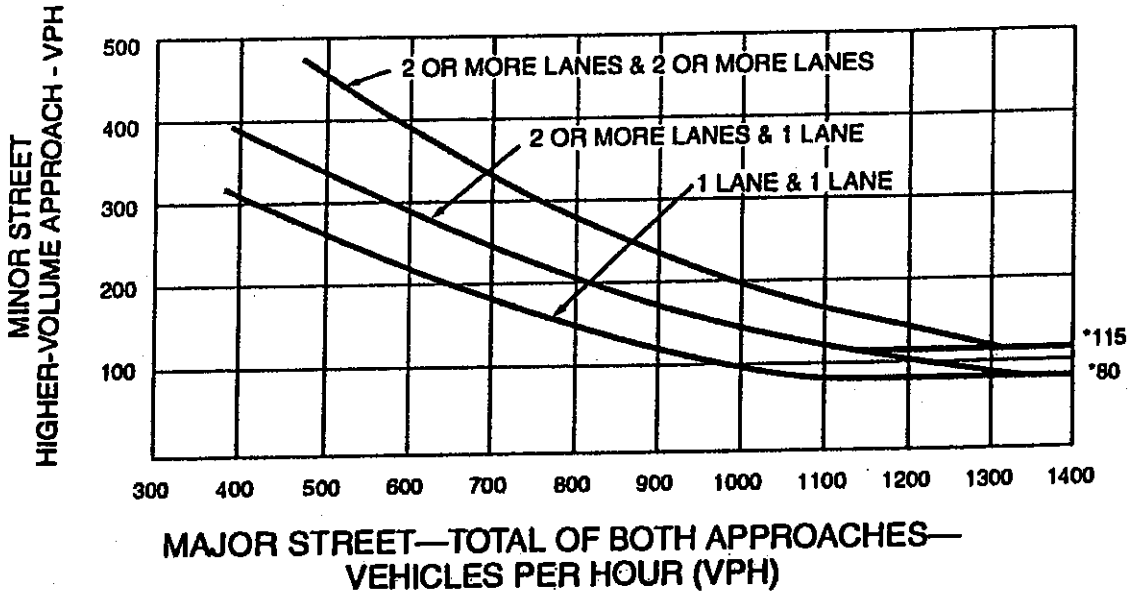
	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)												Hour
	U	(R)	U	R									
APPROACH LANES	(1)		2 or More										
Both Approaches Major Street	750 (600)	525 (420)	900 (720)	630 (504)	635	643	634	629	541	466	469	429	
Highest Approach Minor Street	75 (60)	53 (42)	100 (80)	70 (56)	391	349	338	273	223	285	152	170	

Combination of Conditions A & B SATISFIED YES ☒ NO ☐

REQUIREMENT	CONDITION	✓	FULFILLED
TWO CONDITIONS SATISFIED 80%	A. MINIMUM VEHICULAR VOLUME	✓	Yes ☒ No ☐
	AND, B. INTERRUPTION OF CONTINUOUS TRAFFIC	✓	
AND, AN ADEQUATE TRIAL OF OTHER ALTERNATIVES THAT COULD CAUSE LESS DELAY AND INCONVENIENCE TO TRAFFIC HAS FAILED TO SOLVE THE TRAFFIC PROBLEMS			Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

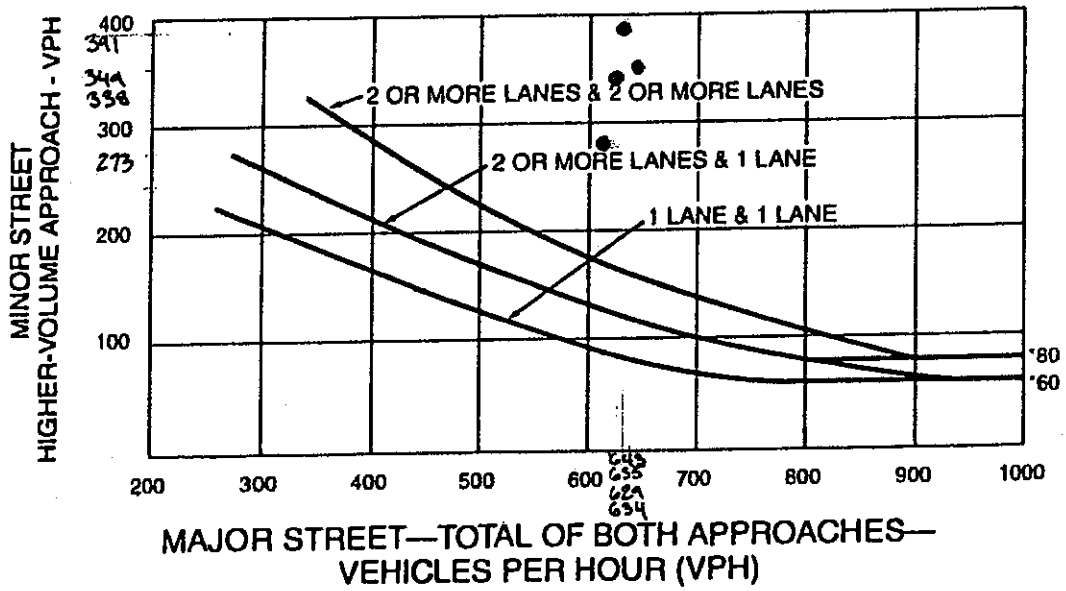
Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE ~~79~~ 64 km/h OR ABOVE 40 mph ON MAJOR STREET)



*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

Supplemental Level of Service Calculation Worksheets

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	68	78	118	134	195	111
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	74	85	128	146	212	121
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			159		518	116
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			159		518	116
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			91		55	87
cM capacity (veh/h)			1409		467	931

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	159	274	333
Volume Left	0	128	212
Volume Right	85	0	121
cSH	1700	1409	570
Volume to Capacity	0.09	0.09	0.58
Queue Length 95th (ft)	0	7	93
Control Delay (s)	0.0	4.1	19.8
Lane LOS		A	C
Approach Delay (s)	0.0	4.1	19.8
Approach LOS			C

Intersection Summary			
Average Delay	10.1		
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	168	143	70	95	56	89
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	183	155	76	103	61	97
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			338		516	260
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			338		516	260
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		87	87
cM capacity (veh/h)			1210		483	773

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	338	179	158
Volume Left	0	76	61
Volume Right	155	0	97
cSH	1700	1210	628
Volume to Capacity	0.20	0.06	0.25
Queue Length 95th (ft)	0	5	25
Control Delay (s)	0.0	3.8	12.6
Lane LOS		A	B
Approach Delay (s)	0.0	3.8	12.6
Approach LOS			B

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	45.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	6	3	14	15	108	8	195	51	138	56	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	7	3	15	16	117	9	212	55	150	61	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	745	647	62	626	620	240	63			267		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	745	647	62	626	620	240	63			267		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	98	100	96	95	85	99			88		
cM capacity (veh/h)	245	340	997	351	352	794	1527			1285		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	149	276	213
Volume Left	3	15	9	150
Volume Right	3	117	55	2
cSH	365	627	1527	1285
Volume to Capacity	0.04	0.24	0.01	0.12
Queue Length 95th (ft)	3	23	0	10
Control Delay (s)	15.2	12.5	0.3	6.0
Lane LOS	C	B	A	A
Approach Delay (s)	15.2	12.5	0.3	6.0
Approach LOS	C	B		

Intersection Summary			
Average Delay	5.3		
Intersection Capacity Utilization	43.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	2	3	4	8	5	28	9	115	5	22	185	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	3	4	9	5	30	10	125	5	24	201	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	433	402	204	405	403	128	208			130		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	433	402	204	405	403	128	208			130		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	99	98	99	97	99			98		
cM capacity (veh/h)	499	521	831	537	521	917	1352			1443		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	10	45	140	232
Volume Left	2	9	10	24
Volume Right	4	30	5	7
cSH	617	745	1352	1443
Volume to Capacity	0.02	0.06	0.01	0.02
Queue Length 95th (ft)	1	5	1	1
Control Delay (s)	10.9	10.1	0.6	0.9
Lane LOS	B	B	A	A
Approach Delay (s)	10.9	10.1	0.6	0.9
Approach LOS	B	B		

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	26.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	36	27	49	1	1	132
Peak Hour Factor	0.25	0.25	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	144	108	56	1	1	150
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	57				452	56
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	57				452	56
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				100	85
cM capacity (veh/h)	1535				509	1005

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	252	57	151
Volume Left	144	0	1
Volume Right	0	1	150
cSH	1535	1700	997
Volume to Capacity	0.09	0.03	0.15
Queue Length 95th (ft)	8	0	13
Control Delay (s)	4.7	0.0	9.3
Lane LOS	A		A
Approach Delay (s)	4.7	0.0	9.3
Approach LOS			A

Intersection Summary			
Average Delay	5.6		
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	119	78	43	4	1	48
Peak Hour Factor	0.25	0.25	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	476	312	49	5	1	55
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	53				1315	51
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	53				1315	51
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	69				99	95
cM capacity (veh/h)	1539				119	1011

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	788	53	56
Volume Left	476	0	1
Volume Right	0	5	55
cSH	1539	1700	877
Volume to Capacity	0.31	0.03	0.06
Queue Length 95th (ft)	33	0	5
Control Delay (s)	6.3	0.0	9.4
Lane LOS	A		A
Approach Delay (s)	6.3	0.0	9.4
Approach LOS			A

Intersection Summary			
Average Delay	6.1		
Intersection Capacity Utilization	27.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	0	0	0	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	0	0	0
Volume Left (vph)	0	0	0
Volume Right (vph)	0	0	0
Hadj (s)	0.00	0.00	0.00
Departure Headway (s)	3.9	3.9	3.9
Degree Utilization, x	0.00	0.00	0.00
Capacity (veh/h)	917	917	917
Control Delay (s)	6.9	6.9	6.9
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A	A	A

Intersection Summary			
Delay	0.0		
HCM Level of Service	A		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	0	0	0	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	0	0	0
Volume Left (vph)	0	0	0
Volume Right (vph)	0	0	0
Hadj (s)	0.00	0.00	0.00
Departure Headway (s)	3.9	3.9	3.9
Degree Utilization, x	0.00	0.00	0.00
Capacity (veh/h)	917	917	917
Control Delay (s)	6.9	6.9	6.9
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A	A	A

Intersection Summary			
Delay	0.0		
HCM Level of Service	A		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	68	97	121	134	210	113
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	74	105	132	146	228	123
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			179		535	127
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			179		535	127
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			90		50	87
cM capacity (veh/h)			1384		455	918

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	179	277	351
Volume Left	0	132	228
Volume Right	105	0	123
cSH	1700	1384	552
Volume to Capacity	0.11	0.10	0.64
Queue Length 95th (ft)	0	8	111
Control Delay (s)	0.0	4.2	22.2
Lane LOS		A	C
Approach Delay (s)	0.0	4.2	22.2
Approach LOS			C

Intersection Summary			
Average Delay	11.1		
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	168	155	72	95	72	91
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	183	168	78	103	78	99
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			351		527	267
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			351		527	267
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		84	87
cM capacity (veh/h)			1197		475	767

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	351	182	177
Volume Left	0	78	78
Volume Right	168	0	99
cSH	1700	1197	603
Volume to Capacity	0.21	0.07	0.29
Queue Length 95th (ft)	0	5	30
Control Delay (s)	0.0	3.9	13.4
Lane LOS		A	B
Approach Delay (s)	0.0	3.9	13.4
Approach LOS			B

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	46.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	6	3	14	15	108	8	212	51	138	78	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	7	3	15	16	117	9	230	55	150	85	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	787	689	86	668	662	258	87			286		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	787	689	86	668	662	258	87			286		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	98	100	95	95	85	99			88		
cM capacity (veh/h)	227	321	967	328	332	776	1496			1265		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	149	295	237
Volume Left	3	15	9	150
Volume Right	3	117	55	2
cSH	343	603	1496	1265
Volume to Capacity	0.04	0.25	0.01	0.12
Queue Length 95th (ft)	3	24	0	10
Control Delay (s)	15.9	12.9	0.3	5.6
Lane LOS	C	B	A	A
Approach Delay (s)	15.9	12.9	0.3	5.6
Approach LOS	C	B		

Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	45.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	2	3	4	8	5	28	9	133	5	22	199	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	3	4	9	5	30	10	145	5	24	216	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	467	437	220	440	438	147	223			150		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	467	437	220	440	438	147	223			150		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	99	98	99	97	99			98		
cM capacity (veh/h)	472	498	815	509	497	894	1334			1419		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	10	45	160	247
Volume Left	2	9	10	24
Volume Right	4	30	5	7
cSH	593	718	1334	1419
Volume to Capacity	0.02	0.06	0.01	0.02
Queue Length 95th (ft)	1	5	1	1
Control Delay (s)	11.2	10.3	0.5	0.9
Lane LOS	B	B	A	A
Approach Delay (s)	11.2	10.3	0.5	0.9
Approach LOS	B	B		

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	27.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	58	27	49	2	2	149
Peak Hour Factor	0.25	0.25	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	232	108	56	2	2	169
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	58				629	57
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	58				629	57
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	85				99	83
cM capacity (veh/h)	1533				376	1004

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	340	58	172
Volume Left	232	0	2
Volume Right	0	2	169
cSH	1533	1700	982
Volume to Capacity	0.15	0.03	0.17
Queue Length 95th (ft)	13	0	16
Control Delay (s)	5.7	0.0	9.4
Lane LOS	A		A
Approach Delay (s)	5.7	0.0	9.4
Approach LOS			A

Intersection Summary			
Average Delay	6.2		
Intersection Capacity Utilization	27.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	133	78	43	5	2	66
Peak Hour Factor	0.25	0.25	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	532	312	49	6	2	75
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	55				1428	52
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	55				1428	52
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	65				98	93
cM capacity (veh/h)	1538				96	1010

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	844	55	77
Volume Left	532	0	2
Volume Right	0	6	75
cSH	1538	1700	790
Volume to Capacity	0.35	0.03	0.10
Queue Length 95th (ft)	39	0	8
Control Delay (s)	6.7	0.0	10.1
Lane LOS	A		B
Approach Delay (s)	6.7	0.0	10.1
Approach LOS			B

Intersection Summary			
Average Delay	6.6		
Intersection Capacity Utilization	29.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	23	37	133	1	1	18
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	26	42	151	1	1	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	152				246	152
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	152				246	152
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				100	98
cM capacity (veh/h)	1416				724	889

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	68	152	22
Volume Left	26	0	1
Volume Right	0	1	20
cSH	1416	1700	879
Volume to Capacity	0.02	0.09	0.02
Queue Length 95th (ft)	1	0	2
Control Delay (s)	3.0	0.0	9.2
Lane LOS	A		A
Approach Delay (s)	3.0	0.0	9.2
Approach LOS			A

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	23.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	15	122	48	1	1	19
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	17	139	55	1	1	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	56				228	55
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	56				228	55
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	98
cM capacity (veh/h)	1536				748	1006

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	156	56	23
Volume Left	17	0	1
Volume Right	0	1	22
cSH	1536	1700	989
Volume to Capacity	0.01	0.03	0.02
Queue Length 95th (ft)	1	0	2
Control Delay (s)	0.9	0.0	8.7
Lane LOS	A		A
Approach Delay (s)	0.9	0.0	8.7
Approach LOS			A

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	23.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	102	133	184	202	341	184
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	111	145	200	220	371	200
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			255		803	183
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			255		803	183
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			85		0	77
cM capacity (veh/h)			1298		296	854

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	255	420	571
Volume Left	0	200	371
Volume Right	145	0	200
cSH	1700	1298	384
Volume to Capacity	0.15	0.15	1.49
Queue Length 95th (ft)	0	14	759
Control Delay (s)	0.0	4.7	258.6
Lane LOS		A	F
Approach Delay (s)	0.0	4.7	258.6
Approach LOS			F

Intersection Summary			
Average Delay	120.1		
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	253	268	124	143	115	145
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	275	291	135	155	125	158
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			566		846	421
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			566		846	421
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			86		56	75
cM capacity (veh/h)			996		285	629

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	566	290	283
Volume Left	0	135	125
Volume Right	291	0	158
cSH	1700	996	410
Volume to Capacity	0.33	0.14	0.69
Queue Length 95th (ft)	0	12	126
Control Delay (s)	0.0	5.0	31.0
Lane LOS		A	D
Approach Delay (s)	0.0	5.0	31.0
Approach LOS			D

Intersection Summary			
Average Delay	9.0		
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	5	9	5	21	23	163	12	357	78	208	105	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	10	5	23	25	177	13	388	85	226	114	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1214	1067	116	1035	1026	430	117			473		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1214	1067	116	1035	1026	430	117			473		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	94	99	86	86	71	99			79		
cM capacity (veh/h)	84	172	931	165	182	621	1459			1079		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	21	225	486	343
Volume Left	5	23	13	226
Volume Right	5	177	85	3
cSH	162	401	1459	1079
Volume to Capacity	0.13	0.56	0.01	0.21
Queue Length 95th (ft)	11	83	1	20
Control Delay (s)	30.4	24.8	0.3	6.8
Lane LOS	D	C	A	A
Approach Delay (s)	30.4	24.8	0.3	6.8
Approach LOS	D	C		

Intersection Summary			
Average Delay	8.1		
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	5	6	14	8	42	14	215	9	33	351	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	5	7	15	9	46	15	234	10	36	382	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	777	732	386	736	732	239	391			243		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	777	732	386	736	732	239	391			243		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	98	99	95	97	94	99			97		
cM capacity (veh/h)	279	332	657	315	332	795	1156			1311		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	15	70	259	427
Volume Left	3	15	15	36
Volume Right	7	46	10	10
cSH	401	527	1156	1311
Volume to Capacity	0.04	0.13	0.01	0.03
Queue Length 95th (ft)	3	11	1	2
Control Delay (s)	14.3	12.9	0.6	0.9
Lane LOS	B	B	A	A
Approach Delay (s)	14.3	12.9	0.6	0.9
Approach LOS	B	B		

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	41.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	55	42	74	2	2	199
Peak Hour Factor	0.25	0.25	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	220	168	84	2	2	226
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	86				693	85
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	86				693	85
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	85				99	77
cM capacity (veh/h)	1497				346	968

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	388	86	228
Volume Left	220	0	2
Volume Right	0	2	226
cSH	1497	1700	951
Volume to Capacity	0.15	0.05	0.24
Queue Length 95th (ft)	13	0	23
Control Delay (s)	5.0	0.0	10.0
Lane LOS	A		A
Approach Delay (s)	5.0	0.0	10.0
Approach LOS			A

Intersection Summary			
Average Delay	6.0		
Intersection Capacity Utilization	31.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	179	117	66	6	2	73
Peak Hour Factor	0.25	0.25	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	716	468	75	7	2	83
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	82				1978	78
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	82				1978	78
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	52				94	92
cM capacity (veh/h)	1503				35	977

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1184	82	85
Volume Left	716	0	2
Volume Right	0	7	83
cSH	1503	1700	569
Volume to Capacity	0.48	0.05	0.15
Queue Length 95th (ft)	66	0	13
Control Delay (s)	8.3	0.0	12.4
Lane LOS	A		B
Approach Delay (s)	8.3	0.0	12.4
Approach LOS			B

Intersection Summary			
Average Delay	8.0		
Intersection Capacity Utilization	34.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	102	152	187	202	356	186
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	111	165	203	220	387	202
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			276		820	193
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			276		820	193
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			84		0	76
cM capacity (veh/h)			1275		288	843

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	276	423	589
Volume Left	0	203	387
Volume Right	165	0	202
cSH	1700	1275	372
Volume to Capacity	0.16	0.16	1.59
Queue Length 95th (ft)	0	14	843
Control Delay (s)	0.0	4.8	302.1
Lane LOS		A	F
Approach Delay (s)	0.0	4.8	302.1
Approach LOS			F

Intersection Summary			
Average Delay	139.8		
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	253	280	126	143	131	147
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	275	304	137	155	142	160
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			579		857	427
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			579		857	427
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			86		49	74
cM capacity (veh/h)			985		280	623

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	579	292	302
Volume Left	0	137	142
Volume Right	304	0	160
cSH	1700	985	395
Volume to Capacity	0.34	0.14	0.76
Queue Length 95th (ft)	0	12	158
Control Delay (s)	0.0	5.1	38.2
Lane LOS		A	E
Approach Delay (s)	0.0	5.1	38.2
Approach LOS			E

Intersection Summary			
Average Delay	11.1		
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	5	9	5	21	23	163	12	374	78	208	127	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	10	5	23	25	177	13	407	85	226	138	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1257	1109	140	1077	1068	449	141			491		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1257	1109	140	1077	1068	449	141			491		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	94	99	85	85	71	99			79		
cM capacity (veh/h)	77	162	903	154	171	606	1429			1062		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	21	225	504	367
Volume Left	5	23	13	226
Volume Right	5	177	85	3
cSH	151	383	1429	1062
Volume to Capacity	0.14	0.59	0.01	0.21
Queue Length 95th (ft)	12	90	1	20
Control Delay (s)	32.7	26.9	0.3	6.6
Lane LOS	D	D	A	A
Approach Delay (s)	32.7	26.9	0.3	6.6
Approach LOS	D	D		

Intersection Summary			
Average Delay	8.3		
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	5	6	14	8	42	14	233	9	33	365	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	5	7	15	9	46	15	253	10	36	397	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	812	767	402	771	767	258	407			263		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	812	767	402	771	767	258	407			263		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	98	99	95	97	94	99			97		
cM capacity (veh/h)	264	317	644	298	317	776	1141			1290		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	15	70	278	442
Volume Left	3	15	15	36
Volume Right	7	46	10	10
cSH	384	506	1141	1290
Volume to Capacity	0.04	0.14	0.01	0.03
Queue Length 95th (ft)	3	12	1	2
Control Delay (s)	14.8	13.2	0.6	0.9
Lane LOS	B	B	A	A
Approach Delay (s)	14.8	13.2	0.6	0.9
Approach LOS	B	B		

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	42.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	77	42	74	3	3	216
Peak Hour Factor	0.25	0.25	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	308	168	84	3	3	245
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	88				870	86
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	88				870	86
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	79				99	75
cM capacity (veh/h)	1496				254	967

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	476	88	249
Volume Left	308	0	3
Volume Right	0	3	245
cSH	1496	1700	932
Volume to Capacity	0.21	0.05	0.27
Queue Length 95th (ft)	19	0	27
Control Delay (s)	5.8	0.0	10.3
Lane LOS	A		B
Approach Delay (s)	5.8	0.0	10.3
Approach LOS			B

Intersection Summary			
Average Delay	6.6		
Intersection Capacity Utilization	33.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	193	117	66	7	3	91
Peak Hour Factor	0.25	0.25	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	772	468	75	8	3	103
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	83				2091	79
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	83				2091	79
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	49				88	89
cM capacity (veh/h)	1502				28	976

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1240	83	107
Volume Left	772	0	3
Volume Right	0	8	103
cSH	1502	1700	466
Volume to Capacity	0.51	0.05	0.23
Queue Length 95th (ft)	77	0	22
Control Delay (s)	8.8	0.0	15.0
Lane LOS	A		C
Approach Delay (s)	8.8	0.0	15.0
Approach LOS			C

Intersection Summary			
Average Delay	8.8		
Intersection Capacity Utilization	36.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	23	57	200	1	1	18
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	26	65	227	1	1	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	228				345	228
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	228				345	228
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				100	97
cM capacity (veh/h)	1328				635	806

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	91	228	22
Volume Left	26	0	1
Volume Right	0	1	20
cSH	1328	1700	795
Volume to Capacity	0.02	0.13	0.03
Queue Length 95th (ft)	2	0	2
Control Delay (s)	2.3	0.0	9.7
Lane LOS	A		A
Approach Delay (s)	2.3	0.0	9.7
Approach LOS			A

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	28.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	15	184	73	1	1	19
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	17	209	83	1	1	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	84				327	84
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	84				327	84
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	98
cM capacity (veh/h)	1500				656	970

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	226	84	23
Volume Left	17	0	1
Volume Right	0	1	22
cSH	1500	1700	948
Volume to Capacity	0.01	0.05	0.02
Queue Length 95th (ft)	1	0	2
Control Delay (s)	0.6	0.0	8.9
Lane LOS	A		A
Approach Delay (s)	0.6	0.0	8.9
Approach LOS			A

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	27.2%	ICU Level of Service	A
Analysis Period (min)	15		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	DLD	Intersection	SR 58/PARK&RIDE
Agency/Co.	ATE	Jurisdiction	CALTRANS
Date Performed	4/16/2012	Analysis Year	EXISTING
Analysis Time Period	AM PEAK		

Project Description

East/West Street: SR 58	North/South Street: PARK&RIDE
Intersection Orientation: East-West	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		88	25	7	377	
Peak-Hour Factor, PHF	1.00	0.88	0.88	0.88	0.88	1.00
Hourly Flow Rate, HFR (veh/h)	0	100	28	7	428	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	22		5			
Peak-Hour Factor, PHF	0.88	1.00	0.88	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	25	0	5	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR				
v (veh/h)		7		30				
C (m) (veh/h)		1470		537				
v/c		0.00		0.06				
95% queue length		0.01		0.18				
Control Delay (s/veh)		7.5		12.1				
LOS		A		B				
Approach Delay (s/veh)	--	--	12.1					
Approach LOS	--	--	B					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	DLD	Intersection	SR 58/PARK&RIDE
Agency/Co.	ATE	Jurisdiction	CALTRANS
Date Performed	4/16/2012	Analysis Year	EXISTING
Analysis Time Period	PM PEAK		

Project Description

East/West Street: SR 58	North/South Street: PARK&RIDE
Intersection Orientation: East-West	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		340	14	8	124	
Peak-Hour Factor, PHF	1.00	0.88	0.88	0.88	0.88	1.00
Hourly Flow Rate, HFR (veh/h)	0	386	15	9	140	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	23		8			
Peak-Hour Factor, PHF	0.88	1.00	0.88	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	26	0	9	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR				
v (veh/h)		9		35				
C (m) (veh/h)		1169		528				
v/c		0.01		0.07				
95% queue length		0.02		0.21				
Control Delay (s/veh)		8.1		12.3				
LOS		A		B				
Approach Delay (s/veh)	--	--	12.3					
Approach LOS	--	--	B					

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway/Direction of Travel	U.S. 101 NB
Agency or Company	ATE	From/To	N/O SR 58
Date Performed	10/13/2011	Jurisdiction	CALTRANS D5
Analysis Time Period	AM PEAK HOUR	Analysis Year	2011 (EXISTING)

Project Description

☒ Oper.(LOS) ☒ Des.(N) ☒ Planning Data

Flow Inputs

Volume, V	1077	veh/h	Peak-Hour Factor, PHF	0.88
AADT		veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K			%RVs, P_R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs / Calc Speed Adj and FFS

Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	2		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures / Design (N)

Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	643	pc/h/ln	Design LOS		
S	70.0	mph	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
D = v_p / S	9.2	pc/mi/ln	S		mph
LOS	A		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*DLD*	Highway/Direction of Travel	*U.S. 101 NB*
Agency or Company	*ATE*	From/To	*N/O SR 58*
Date Performed	*10/13/2011*	Jurisdiction	*CALTRANS D5*
Analysis Time Period	*PM PEAK HOUR*	Analysis Year	*2011 (EXISTING)*

Project Description

☒ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*2740*	veh/h	Peak-Hour Factor, PHF	*0.88*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*2*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*70.0*	mph	FFS	*70.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1635*	pc/h/ln	Design LOS	
S	*67.8*	mph	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
D = v_p / S	*24.1*	pc/mi/ln	S	mph
LOS	*C*		D = v_p / S	pc/mi/ln
			Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway/Direction of Travel	U.S. 101 NB
Agency or Company	ATE	From/To	S/O SR 58
Date Performed	10/13/2011	Jurisdiction	CALTRANS D5
Analysis Time Period	AM PEAK HOUR	Analysis Year	2011 (EXISTING)

Project Description

☒ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	1059	veh/h	Peak-Hour Factor, PHF	0.88
AADT		veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K			%RVs, P_R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs / Calc Speed Adj and FFS

Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	2		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures / Design (N)

Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	632	pc/h/ln	Design LOS		
S	70.0	mph	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
D = v_p / S	9.0	pc/mi/ln	S		mph
LOS	A		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway/Direction of Travel	U.S. 101 NB
Agency or Company	ATE	From/To	S/O SR 58
Date Performed	10/13/2011	Jurisdiction	CALTRANS D5
Analysis Time Period	PM PEAK HOUR	Analysis Year	2011 (EXISTING)

Project Description

☒ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	2977	veh/h	Peak-Hour Factor, PHF	0.88
AADT		veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K			%RVs, P_R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	2		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1776	pc/h/ln	Design LOS		
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S	66.2	mph	S		mph
D = v_p / S	26.8	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	D		Required Number of Lanes, N		

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway/Direction of Travel	U.S. 101 SB
Agency or Company	ATE	From/To	N/O SR 58
Date Performed	10/13/2011	Jurisdiction	CALTRANS D5
Analysis Time Period	AM PEAK HOUR	Analysis Year	2011 (EXISTING)

Project Description

☒ Oper.(LOS) ☐ Des.(N) ☒ Planning Data

Flow Inputs

Volume, V	2438	veh/h	Peak-Hour Factor, PHF	0.88
AADT		veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K			%RVs, P_R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs / Calc Speed Adj and FFS

Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	2		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures / Design (N)

Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1454	pc/h/ln	Design LOS		
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S	69.3	mph	S		mph
D = v_p / S	21.0	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	C		Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway/Direction of Travel	U.S. 101 SB
Agency or Company	ATE	From/To	N/O SR 58
Date Performed	10/13/2011	Jurisdiction	CALTRANS D5
Analysis Time Period	PM PEAK HOUR	Analysis Year	2011 (EXISTING)

Project Description

☒ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	1340	veh/h	Peak-Hour Factor, PHF	0.88
AADT		veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K			%RVs, P_R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs / Calc Speed Adj and FFS

Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	2		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures / Design (N)

Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	799	pc/h/ln	Design LOS		
S	70.0	mph	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
D = v_p / S	11.4	pc/mi/ln	S		mph
LOS	B		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway/Direction of Travel	U.S. 101 SB
Agency or Company	ATE	From/To	S/O SR 58
Date Performed	10/13/2011	Jurisdiction	CALTRANS D5
Analysis Time Period	AM PEAK HOUR	Analysis Year	2011 (EXISTING)

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	2706	veh/h	Peak-Hour Factor, PHF	0.88
AADT		veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K			%RVs, P_R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	2	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	70.0	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	70.0	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1614	pc/h/ln
S	68.0	mph
D = v_p / S	23.7	pc/mi/ln
LOS	C	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway/Direction of Travel	U.S. 101 SB
Agency or Company	ATE	From/To	S/O SR 58
Date Performed	10/13/2011	Jurisdiction	CALTRANS D5
Analysis Time Period	PM PEAK HOUR	Analysis Year	2011 (EXISTING)

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	1370	veh/h	Peak-Hour Factor, PHF	0.88
AADT		veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K			%RVs, P_R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	2		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	817	pc/h/ln	Design LOS	
S	70.0	mph	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
D = v_p / S	11.7	pc/mi/ln	S	mph
LOS	B		D = v_p / S	pc/mi/ln
			Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	DLD	Freeway/Dir of Travel	U.S. 101 NB ON
Agency or Company	ATE	Junction	SR 58
Date Performed	10/13/2011	Jurisdiction	CALTRANS D5
Analysis Time Period	AM PEAK HOUR	Analysis Year	2011 (Existing)
Project Description			

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☐ No ☑ Off	Acceleration Lane Length, L_A: 200	☑ No ☐ Off
L_{up} = 1200 ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = 63 veh/h	Freeway Volume, V_F: 996	V_D = veh/h
	Ramp Volume, V_R: 81	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	996	0.88	Level	10	0	0.952	1.00	1188
Ramp	81	0.88	Level	10	0	0.952	1.00	97
UpStream	63	0.88	Level	10	0	0.952	1.00	75
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1188 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1285	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1285	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 14.2 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.317 (Exibit 13-11)

S_R = 61.1 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 61.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_S = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

General Information		Site Information	
Analyst	DLD	Freeway/Dir of Travel	U.S. 101 NB ON
Agency or Company	ATE	Junction	SR 58
Date Performed	10/13/2011	Jurisdiction	CALTRANS D5
Analysis Time Period	PM PEAK HOUR	Analysis Year	2011 (Existing)
Project Description			

Inputs

Upstream Adj Ramp		Number of Lanes, N	2	Downstream Adj Ramp
☑ Yes	☑ On	Acceleration Lane Length, L_A	200	☐ Yes ☐ On
☐ No	☐ Off	Deceleration Lane Length L_D		☑ No ☐ Off
L_{up} =	1200 ft	Freeway Volume, V_F	2683	L_{down} = ft
		Ramp Volume, V_R	57	
		Freeway Free-Flow Speed, S_{FF}	70.0	
V_u =	294 veh/h	Ramp Free-Flow Speed, S_{FR}	45.0	V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2683	0.88	Level	10	0	0.952	1.00	3201
Ramp	57	0.88	Level	10	0	0.952	1.00	68
UpStream	294	0.88	Level	10	0	0.952	1.00	351
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3201 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3269	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3269	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 29.7 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.406 (Exibit 13-11)

S_R= 58.6 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 58.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	DLD	Freeway/Dir of Travel	U.S. 101 NB OFF
Agency or Company	ATE	Junction	SR 58
Date Performed	10/13/2011	Jurisdiction	Caltrans D5
Analysis Time Period	AM PEAK	Analysis Year	2011 (Existing)
Project Description			

Inputs

Upstream Adj Ramp				Downstream Adj Ramp
☒ Yes ☒ On	Number of Lanes, N	2		☒ Yes ☒ On
	Acceleration Lane Length, L_A			
☒ No ☒ Off	Deceleration Lane Length L_D	0		☒ No ☒ Off
L_{up} = ft	Freeway Volume, V_F	1059		L_{down} = 1200 ft
	Ramp Volume, V_R	63		
V_u = veh/h	Freeway Free-Flow Speed, S_{FF}	70.0		V_D = 81 veh/h
	Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1059	0.88	Level	10	0	0.952	1.00	1264
Ramp	63	0.88	Level	10	0	0.952	1.00	75
UpStream								
DownStream	81	0.88	Level	10	0	0.952	1.00	97

Merge Areas

Estimation of v_{12}

$V_{12} = V_F(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1264 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☒ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☒ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1264	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1189	Exhibit 13-8	4800	No
V_R	75	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1264	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 15.1 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.305 (Exhibit 13-12)

S_R= 61.5 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 61.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

General Information		Site Information	
Analyst	DLD	Freeway/Dir of Travel	U.S. 101 NB OFF
Agency or Company	ATE	Junction	SR 58
Date Performed	10/13/2011	Jurisdiction	Caltrans D5
Analysis Time Period	PM PEAK	Analysis Year	2011 (Existing)
Project Description			

Inputs

Upstream Adj Ramp		Number of Lanes, N	2	Downstream Adj Ramp	
☐ Yes	☐ On	Acceleration Lane Length, L_A		☑ Yes	☑ On
☑ No	☐ Off	Deceleration Lane Length L_D	0	☑ No	☐ Off
L_{up} =	ft	Freeway Volume, V_F	2977	L_{down} =	1200 ft
V_u =	veh/h	Ramp Volume, V_R	294	V_D =	57 veh/h
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2977	0.88	Level	10	0	0.952	1.00	3552
Ramp	294	0.88	Level	10	0	0.952	1.00	351
UpStream								
DownStream	57	0.88	Level	9	0	0.957	1.00	68

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 3552 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3552	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	3201	Exhibit 13-8	4800	No
V_R	351	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3552	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 34.8 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.330 (Exhibit 13-12)

S_R= 60.8 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 60.8 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

General Information		Site Information	
Analyst	DLD	Freeway/Dir of Travel	U.S. 101 SB ON
Agency or Company	ATE	Junction	SR 58
Date Performed	10/13/2011	Jurisdiction	CALTRANS D5
Analysis Time Period	AM PEAK HOUR	Analysis Year	2011 (Existing)
Project Description			

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☐ No ☑ Off	Acceleration Lane Length, L_A: 200	☑ No ☐ Off
L_{up} = 1900 ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = 50 veh/h	Freeway Volume, V_F: 2388	V_D = veh/h
	Ramp Volume, V_R: 318	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2388	0.88	Level	10	0	0.952	1.00	2849
Ramp	318	0.88	Level	10	0	0.952	1.00	379
UpStream	50	0.88	Level	10	0	0.952	1.00	60
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2849 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3228	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3228	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 29.2 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.401 (Exibit 13-11)

S_R = 58.8 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 58.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	DLD	Freeway/Dir of Travel	U.S. 101 SB ON
Agency or Company	ATE	Junction	SR 58
Date Performed	10/13/2011	Jurisdiction	CALTRANS D5
Analysis Time Period	PM PEAK HOUR	Analysis Year	2011 (Existing)
Project Description			

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☐ No ☑ Off	Acceleration Lane Length, L_A: 200	☑ No ☐ Off
L_{up} = 1900 ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = 60 veh/h	Freeway Volume, V_F: 1280	V_D = veh/h
	Ramp Volume, V_R: 90	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1280	0.88	Level	10	0	0.952	1.00	1527
Ramp	90	0.88	Level	10	0	0.952	1.00	107
UpStream	60	0.88	Level	10	0	0.952	1.00	72
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1527 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1634	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1634	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 16.9 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.323 (Exibit 13-11)

S_R= 61.0 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

General Information		Site Information	
Analyst	DLD	Freeway/Dir of Travel	U.S. 101 SB OFF
Agency or Company	ATE	Junction	SR 58
Date Performed	10/13/2011	Jurisdiction	Caltrans D5
Analysis Time Period	AM PEAK	Analysis Year	2011 (Existing)
Project Description			

Inputs

Upstream Adj Ramp		Number of Lanes, N	2	Downstream Adj Ramp	
☐ Yes	☐ On	Acceleration Lane Length, L_A		☑ Yes	☑ On
☑ No	☐ Off	Deceleration Lane Length L_D	0	☐ No	☐ Off
L_{up} =	ft	Freeway Volume, V_F	2438	L_{down} =	1900 ft
V_u =	veh/h	Ramp Volume, V_R	50	V_D =	318 veh/h
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	35.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2438	0.88	Level	10	0	0.952	1.00	2909
Ramp	50	0.88	Level	10	0	0.952	1.00	60
UpStream								
DownStream	318	0.88	Level	9	0	0.957	1.00	378

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2909 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2909	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	2849	Exhibit 13-8	4800	No
V_R	60	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2909	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 29.3 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.433 (Exhibit 13-12)

S_R= 57.9 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 57.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

General Information		Site Information	
Analyst	DLD	Freeway/Dir of Travel	U.S. 101 SB OFF
Agency or Company	ATE	Junction	SR 58
Date Performed	10/13/2011	Jurisdiction	Caltrans D5
Analysis Time Period	PM PEAK	Analysis Year	2011 (Existing)

Project Description

Inputs

Upstream Adj Ramp		Number of Lanes, N	2	Downstream Adj Ramp	
☐ Yes	☐ On	Acceleration Lane Length, L_A		☑ Yes	☑ On
☑ No	☐ Off	Deceleration Lane Length L_D	0	☐ No	☐ Off
L_{up} =	ft	Freeway Volume, V_F	1340	L_{down} =	1900 ft
V_u =	veh/h	Ramp Volume, V_R	60	V_D =	90 veh/h
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	35.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1340	0.88	Level	10	0	0.952	1.00	1599
Ramp	60	0.88	Level	10	0	0.952	1.00	72
UpStream								
DownStream	90	0.88	Level	10	0	0.952	1.00	107

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1599 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1599	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1527	Exhibit 13-8	4800	No
V_R	72	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1599	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 18.0 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.434 (Exhibit 13-12)

S_R= 57.8 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 57.8 mph (Exhibit 13-13)

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway/Direction of Travel	U.S. 101 NB
Agency or Company	ATE	From/To	S/O SR 58
Date Performed	4/16/2012	Jurisdiction	CALTRANS D5
Analysis Time Period	AM PEAK HOUR	Analysis Year	EXISTING+PROJECT

Project Description

☒ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	1078	veh/h	Peak-Hour Factor, PHF	0.88
AADT		veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K			%RVs, P_R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs / Calc Speed Adj and FFS

Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	2		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures / Design (N)

Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	643	pc/h/ln	Design LOS		
S	70.0	mph	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
D = v_p / S	9.2	pc/mi/ln	S		mph
LOS	A		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway/Direction of Travel	U.S. 101 NB
Agency or Company	ATE	From/To	S/O SR 58
Date Performed	4/16/2012	Jurisdiction	CALTRANS D5
Analysis Time Period	PM PEAK HOUR	Analysis Year	EXISTING+PROJECT

Project Description

☒ Oper.(LOS) ☒ Des.(N) ☒ Planning Data

Flow Inputs

Volume, V	2989	veh/h	Peak-Hour Factor, PHF	0.88
AADT		veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K			%RVs, P_R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length	mi
			Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	2		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1783	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	66.1	mph	S	mph
D = v_p / S	27.0	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	D		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*DLD*	Highway/Direction of Travel	*U.S. 101 SB*
Agency or Company	*ATE*	From/To	*S/O SR 58*
Date Performed	*4/16/2012*	Jurisdiction	*CALTRANS D5*
Analysis Time Period	*AM PEAK HOUR*	Analysis Year	*EXISTING+PROJECT*

Project Description

☒ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs				
Volume, V	*2722*	veh/h	Peak-Hour Factor, PHF	*0.88*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments			
f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*2*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*70.0*	mph	FFS	*70.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1624*	pc/h/ln	Design LOS	
S	*67.9*	mph	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
D = v_p / S	*23.9*	pc/mi/ln	S	mph
LOS	*C*		D = v_p / S	pc/mi/ln
			Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*DLD*	Highway/Direction of Travel	*U.S. 101 SB*
Agency or Company	*ATE*	From/To	*S/O SR 58*
Date Performed	*4/16/2012*	Jurisdiction	*CALTRANS D5*
Analysis Time Period	*PM PEAK HOUR*	Analysis Year	*EXISTING+PROJECT*

Project Description

☒ Oper.(LOS) ☒ Des.(N) ☒ Planning Data

Flow Inputs

Volume, V	*1386*	veh/h	Peak-Hour Factor, PHF	*0.88*
AADT		veh/day	%Trucks and Buses, P_T	*10*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs / Calc Speed Adj and FFS

Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*2*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*70.0*	mph	FFS	*70.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures / Design (N)

Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*827*	pc/h/ln	Design LOS		
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S	*70.0*	mph	S		mph
D = v_p / S	*11.8*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*B*		Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	DLD	Freeway/Dir of Travel	U.S. 101 NB OFF
Agency or Company	ATE	Junction	SR 58
Date Performed	4/16/2012	Jurisdiction	Caltrans D5
Analysis Time Period	AM PEAK	Analysis Year	Existing+Project
Project Description			

Inputs

Upstream Adj Ramp		Number of Lanes, N	2	Downstream Adj Ramp	
☒ Yes	☒ On	Acceleration Lane Length, L_A		☒ Yes	☒ On
☒ No	☒ Off	Deceleration Lane Length L_D	0	☒ No	☒ Off
L_{up} =	ft	Freeway Volume, V_F	1059	L_{down} =	1200 ft
V_u =	veh/h	Ramp Volume, V_R	82	V_D =	81 veh/h
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1059	0.88	Level	10	0	0.952	1.00	1264
Ramp	82	0.88	Level	10	0	0.952	1.00	98
UpStream								
DownStream	81	0.88	Level	10	0	0.952	1.00	97

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☒ Yes ☒ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☒ Yes ☒ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1264 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☒ Yes ☒ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☒ Yes ☒ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1264	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1166	Exhibit 13-8	4800	No
V_R	98	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1264	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 15.1 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.307 (Exhibit 13-12)

S_R= 61.4 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 61.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	DLD	Freeway/Dir of Travel	U.S. 101 NB OFF
Agency or Company	ATE	Junction	SR 58
Date Performed	5/16/2012	Jurisdiction	Caltrans D5
Analysis Time Period	PM PEAK	Analysis Year	Existing+Project

Project Description

Inputs

Upstream Adj Ramp		Number of Lanes, N	2	Downstream Adj Ramp	
☐ Yes	☐ On	Acceleration Lane Length, L_A		☐ Yes	☐ On
☒ No	☐ Off	Deceleration Lane Length L_D	0	☐ No	☐ Off
L_{up} =	ft	Freeway Volume, V_F	2977	L_{down} =	1200 ft
V_u =	veh/h	Ramp Volume, V_R	306	V_D =	57 veh/h
		Freeway Free-Flow Speed, S_{FF}	70.0		
		Ramp Free-Flow Speed, S_{FR}	45.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2977	0.88	Level	10	0	0.952	1.00	3552
Ramp	306	0.88	Level	10	0	0.952	1.00	365
UpStream								
DownStream	57	0.88	Level	9	0	0.957	1.00	68

Merge Areas

Estimation of v_{12}

$V_{12} = V_F(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 3552 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☒ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☒ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3552	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	3187	Exhibit 13-8	4800	No
V_R	365	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3552	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 34.8 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.331 (Exhibit 13-12)

S_R= 60.7 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 60.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	DLD	Freeway/Dir of Travel	U.S. 101 SB ON
Agency or Company	ATE	Junction	SR 58
Date Performed	4/16/2012	Jurisdiction	CALTRANS D5
Analysis Time Period	AM PEAK HOUR	Analysis Year	Existing+Project

Project Description

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☒ Yes ☒ On	Number of Lanes, N: 2	☒ Yes ☒ On
☒ No ☒ Off	Acceleration Lane Length, L_A: 200	☒ No ☒ Off
L_{up} = 1900 ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = 50 veh/h	Freeway Volume, V_F: 2388	V_D = veh/h
	Ramp Volume, V_R: 333	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2388	0.88	Level	10	0	0.952	1.00	2849
Ramp	333	0.88	Level	10	0	0.952	1.00	397
UpStream	50	0.88	Level	10	0	0.952	1.00	60
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2849 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☒ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☒ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3246	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3246	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 29.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.403 (Exibit 13-11)

S_R = 58.7 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 58.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	DLD	Freeway/Dir of Travel	U.S. 101 SB ON
Agency or Company	ATE	Junction	SR 58
Date Performed	4/16/2012	Jurisdiction	CALTRANS D5
Analysis Time Period	PM PEAK HOUR	Analysis Year	Existing+Project

Project Description

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☒ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☐ No ☒ Off	Acceleration Lane Length, L_A: 200	☒ No ☒ Off
L_{up} = 1900 ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = 60 veh/h	Freeway Volume, V_F: 1280	V_D = veh/h
	Ramp Volume, V_R: 106	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1280	0.88	Level	10	0	0.952	1.00	1527
Ramp	106	0.88	Level	10	0	0.952	1.00	126
UpStream	60	0.88	Level	10	0	0.952	1.00	72
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1527 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☒ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☒ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1653	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1653	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 17.1 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.323 (Exibit 13-11)

S_R = 60.9 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 60.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway/Direction of Travel	U.S. 101 NB
Agency or Company	ATE	From/To	N/O SR 58
Date Performed	4/16/2012	Jurisdiction	CALTRANS D5
Analysis Time Period	AM PEAK HOUR	Analysis Year	EXISTING+PROJECT

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	1092	veh/h	Peak-Hour Factor, PHF	0.88
AADT		veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K			%RVs, P_R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	2		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	651	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	70.0	mph	S	mph
D = v_p / S	9.3	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	A		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*DLD*	Highway/Direction of Travel	*U.S. 101 NB*
Agency or Company	*ATE*	From/To	*N/O SR 58*
Date Performed	*4/16/2012*	Jurisdiction	*CALTRANS D5*
Analysis Time Period	*PM PEAK HOUR*	Analysis Year	*EXISTING+PROJECT*

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2756*	veh/h	Peak-Hour Factor, PHF	*0.88*	
AADT		veh/day	%Trucks and Buses, P_T	*10*	
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*	
Peak-Hr Direction Prop, D			General Terrain:	*Level*	
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.952*

Speed Inputs / Calc Speed Adj and FFS

Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*2*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*70.0*	mph	FFS	*70.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures / Design (N)

Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1644*	pc/h/ln	Design LOS		
S	*67.7*	mph	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
D = v_p / S	*24.3*	pc/mi/ln	S		mph
LOS	*C*		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway/Direction of Travel	U.S. 101 SB
Agency or Company	ATE	From/To	N/O SR 58
Date Performed	4/16/2012	Jurisdiction	CALTRANS D5
Analysis Time Period	AM PEAK HOUR	Analysis Year	EXISTING+PROJECT

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	2457	veh/h	Peak-Hour Factor, PHF	0.88
AADT		veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K			%RVs, P_R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	2		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1466	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	69.2	mph	S	mph
D = v_p / S	21.2	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	C		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway/Direction of Travel	U.S. 101 SB
Agency or Company	ATE	From/To	N/O SR 58
Date Performed	4/16/2012	Jurisdiction	CALTRANS D5
Analysis Time Period	PM PEAK HOUR	Analysis Year	EXISTING+PROJECT

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	1352	veh/h	Peak-Hour Factor, PHF	0.88
AADT		veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K			%RVs, P_R	0
Peak-Hr Direction Prop, D			General Terrain:	Level
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	2		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	807	pc/h/ln	Design LOS	
S	70.0	mph	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
D = v_p / S	11.5	pc/mi/ln	S	mph
LOS	B		D = v_p / S	pc/mi/ln
			Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	DLD	Freeway/Dir of Travel	U.S. 101 NB ON
Agency or Company	ATE	Junction	SR 58
Date Performed	4/16/2012	Jurisdiction	CALTRANS D5
Analysis Time Period	AM PEAK HOUR	Analysis Year	Existing+Project

Project Description

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Number of Lanes, N: 2	☐ Yes ☐ On
☐ No ☑ Off	Acceleration Lane Length, L_A: 200	☑ No ☐ Off
L_{up} = 1200 ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = 63 veh/h	Freeway Volume, V_F: 996	V_D = veh/h
	Ramp Volume, V_R: 96	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	996	0.88	Level	10	0	0.952	1.00	1188
Ramp	96	0.88	Level	10	0	0.952	1.00	115
UpStream	63	0.88	Level	10	0	0.952	1.00	75
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1188 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1303	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1303	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 14.3 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.317 (Exibit 13-11)

S_R= 61.1 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 61.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	DLD	Freeway/Dir of Travel	U.S. 101 NB ON
Agency or Company	ATE	Junction	SR 58
Date Performed	4/16/2012	Jurisdiction	CALTRANS D5
Analysis Time Period	PM PEAK HOUR	Analysis Year	Existing+Project

Project Description

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☑ On	Number of Lanes, N: 2	☐ Yes ☐ On
☐ No ☐ Off	Acceleration Lane Length, L_A: 200	☑ No ☐ Off
L_{up} = 1200 ft	Deceleration Lane Length L_D:	L_{down} = ft
V_u = 294 veh/h	Freeway Volume, V_F: 2683	V_D = veh/h
	Ramp Volume, V_R: 73	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 45.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2683	0.88	Level	10	0	0.952	1.00	3201
Ramp	73	0.88	Level	10	0	0.952	1.00	87
UpStream	294	0.88	Level	10	0	0.952	1.00	351
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3201 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3288	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3288	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 29.8 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.407 (Exibit 13-11)

S_R = 58.6 mph (Exhibit 13-11)

S_0 = N/A mph (Exhibit 13-11)

S = 58.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R = mph (Exhibit 13-12)

S_0 = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	DLD	Freeway/Dir of Travel	U.S. 101 SB OFF
Agency or Company	ATE	Junction	SR 58
Date Performed	4/16/2012	Jurisdiction	Caltrans D5
Analysis Time Period	AM PEAK	Analysis Year	Existing+Project

Project Description

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N: 2	☑ Yes ☑ On
☑ No ☐ Off	Acceleration Lane Length, L_A	☐ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D: 0	L_{down} = 1900 ft
V_u = veh/h	Freeway Volume, V_F: 2438	V_D = 318 veh/h
	Ramp Volume, V_R: 69	
	Freeway Free-Flow Speed, S_{FF}: 70.0	
	Ramp Free-Flow Speed, S_{FR}: 35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2438	0.88	Level	10	0	0.952	1.00	2909
Ramp	69	0.88	Level	10	0	0.952	1.00	82
UpStream								
DownStream	318	0.88	Level	9	0	0.957	1.00	378

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2909 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2909	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	2827	Exhibit 13-8	4800	No
V_R	82	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2909	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 29.3 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.435 (Exhibit 13-12)

S_R= 57.8 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 57.8 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

General Information		Site Information	
Analyst	DLD	Freeway/Dir of Travel	U.S. 101 SB OFF
Agency or Company	ATE	Junction	SR 58
Date Performed	4/16/2012	Jurisdiction	Caltrans D5
Analysis Time Period	PM PEAK	Analysis Year	Existing+Project

Project Description

Inputs

Upstream Adj Ramp		Number of Lanes, N	2	Downstream Adj Ramp	
☐ Yes	☐ On	Acceleration Lane Length, L_A		☑ Yes	☑ On
☑ No	☐ Off	Deceleration Lane Length L_D	0	☐ No	☐ Off
L_{up} =	ft	Freeway Volume, V_F	1340	L_{down} =	1900 ft
		Ramp Volume, V_R	72		
		Freeway Free-Flow Speed, S_{FF}	70.0		
V_u =	veh/h	Ramp Free-Flow Speed, S_{FR}	35.0	V_D =	90 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1340	0.88	Level	10	0	0.952	1.00	1599
Ramp	72	0.88	Level	10	0	0.952	1.00	86
UpStream								
DownStream	90	0.88	Level	10	0	0.952	1.00	107

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1599 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1599	Exhibit 13-8	4800	No
$V_{FO} = V_F - V_R$	1513	Exhibit 13-8	4800	No
V_R	86	Exhibit 13-10	2000	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1599	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 18.0 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.436 (Exhibit 13-12)

S_R= 57.8 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 57.8 mph (Exhibit 13-13)

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Supplemental Speed Surveys

Spot Speed Study

Prepared by: Associated Transportation Engineers

DATE: 2/15/2012 **Location:** SR158/U.S. 101 SB ON-RAMP @ GORE POINT - PASSENGER VEHICLES

DAY: WEDNESDAY **Posted Speed:** N/A **Project #:** 11054

Speed mph	ALL Vehicles
<=10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
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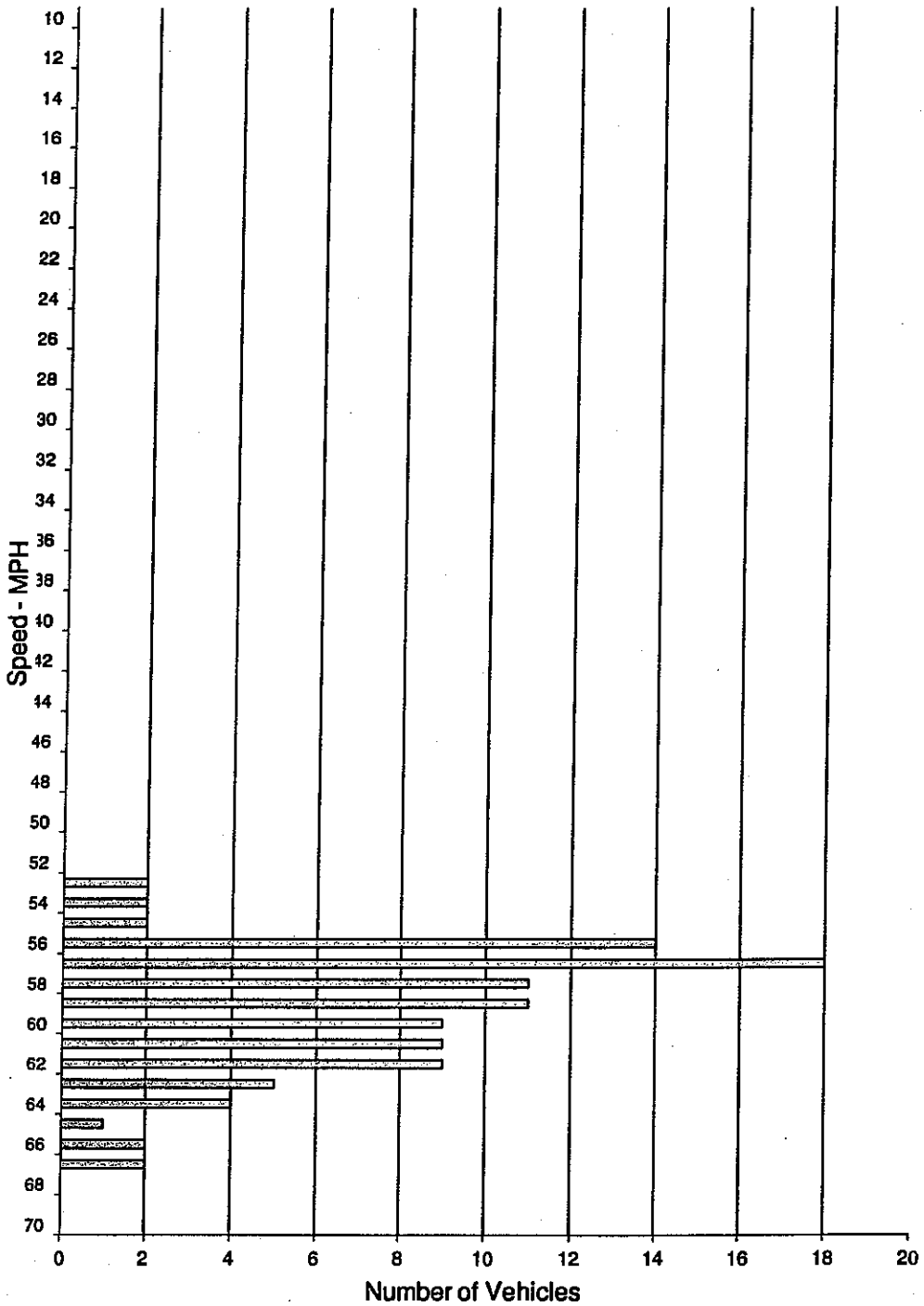
53	2
54	2
55	2
56	14
57	18
58	11
59	11
60	9
61	9
62	9
63	5
64	4
65	1
66	2
67	2
68	
69	
>=70	

Spot Speeds



SPEED PARAMETERS										
Class	Count	Average Speed	Range	50th Percentile	85th Percentile	10 MPH Pace	# In Pace	Percent in Pace	# / % Below Pace	# / % Above Pace
ALL	101	59.1	53 - 67	59 mph	62 mph	55 - 64	92	91%	3% / 4	5% / 5

Spot Speed Study

Prepared by: Associated Transportation Engineers

DATE: 2/15/2012 **Location:** SR158/U.S. 101 SB ON-RAMP @ GORE POINT -HEAVY VEHICLES

DAY: WEDNESDAY **Posted Speed:** N/A **Project #:** 11054

Speed mph	ALL Vehicles
<=10	
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52	1
53	2
54	2
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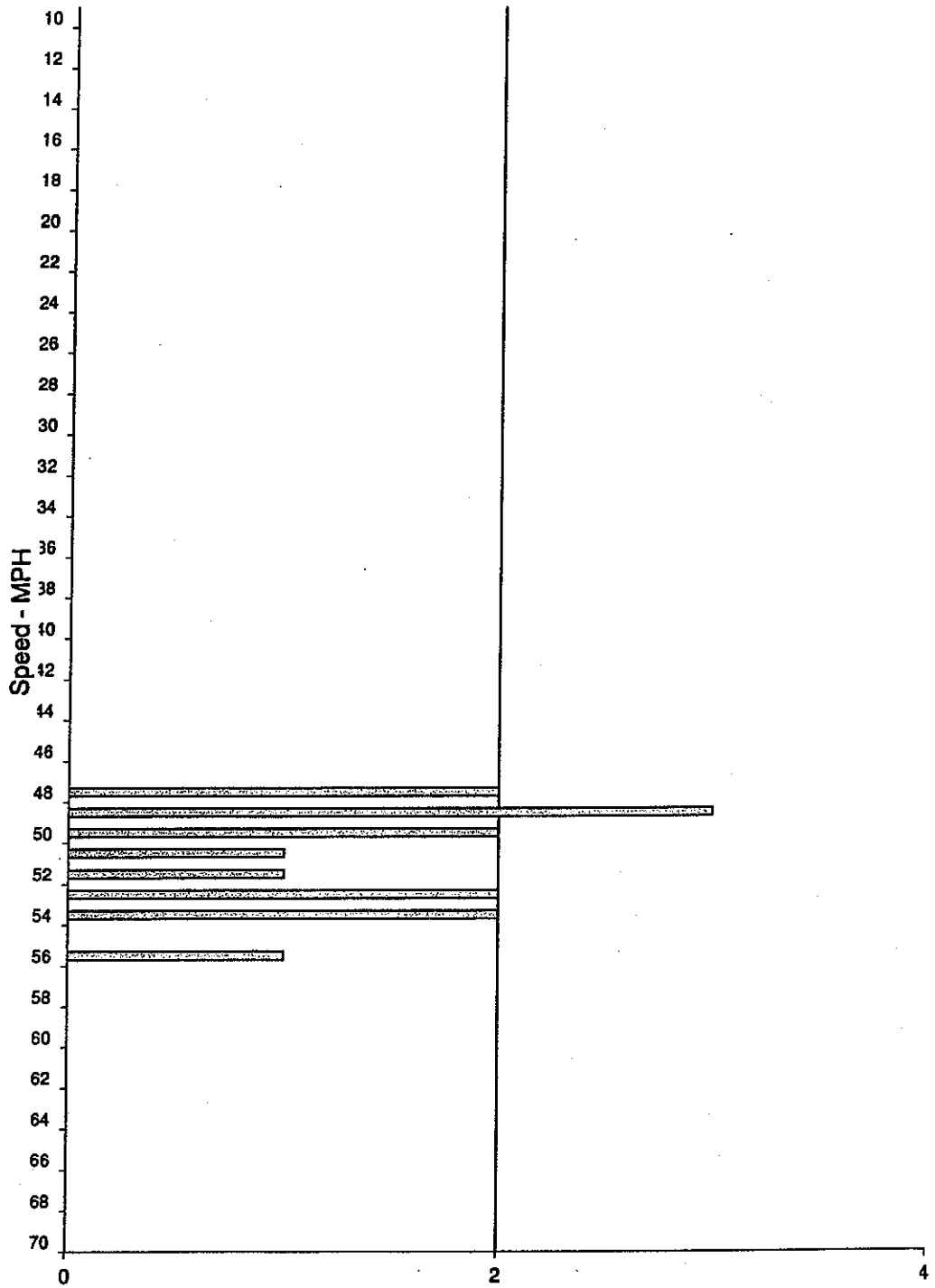
Spot Speeds



SPEED PARAMETERS										
Class	Count	Average Speed	Range	50th Percentile	85th Percentile	10 MPH Pace	# In Pace	Percent In Pace	# / % Below Pace	# / % Above Pace
ALL	14	51.1	48 - 56	50 mph	54 mph	47 - 56	14	100%	0% / 0	0% / 0

Approved Project List

Cumulative Project List – Oster / Las Pilitas Quarry

Consultant needs to talk to the City of Atascadero about projects within their jurisdiction south of Santa Barbara Road.

1. **Project name / number:** Eagle Ranch – City of Atascadero
   Location: West of 101 at Santa Barbara Road
   Description: Annexation / Specific Plan

2. **Project name / number:** Major Domo / LRP2008-00004
   Location: 7500 West Pozo Road (070-091-015)
   Description: Re-zone 2.95-acres from Agriculture to Public Facilities for expanded cemetery.

3. **Project name / number:** Church of the Nazarene / LRP2010-00002 / DRC2009-00016
   Location: 4850 Coyote Creek Road (043-301-035)
   Description: Re-zone from Agriculture to Rural Lands and expansion of organizational camp to add 10,000 sq.ft. of yurt clusters and an approximately 4,000 square foot dining room addition, with an increase of campers from 120 to 250.

4. **Project name / number:** Hendrix MUP / DRC2009-00105
   Location: 7075 Via Spanish Oaks (070-093-017)
   Description: Temporary Events including: 10 events with no more than 300 attendees; 5 events with no more than 200 attendees; 5 events with no more than 150 attendees; and 8 events with no more than 125 attendees.

5. **Project name / number:** Cully Parcel Map / SUB2007-00153
   Location: Highway 58 and El Camino Real (069-044-005)
   Description: 4 lot parcel map (~9.5 acres)

6. **Project name / number:** Johansen Parcel Map / SUB2007-00005
   Location: 9301 Santa margarita Road (059-241-021)
   Description: 2 lot parcel map (~5 acres)

7. **Project name / number:** Wonsley Parcel Map / SUB2005-00216
   Location: 9280 Huer Huero Road (070-172-006)
   Description: 2 lot parcel map (~42 acres)

8. **Project name / number:** Ioppini Parcel Map / SUB2004-00398
   Location: 9615 Santa Clara Road (059-061-015)
   Description: 2 lot parcel map with TDC's (~2.5 acres)

9. **Project name / number:** Volbrecht Parcel Map / SUB2004-00405
   Location: 854 Carmel Road (059-181-064 /065)
   Description: 2 lot parcel map with TDC's (~2.2 acres)

10. **Project name / number:** Galena Parcel Map / SUB2004-00355
    Location: 854 Santa Margarita Road (059-431-042)
    Description: 2 lot parcel map with TDC's (~2.5 acres)

11. **Project name / number:** Barre Parcel Map / SUB2004-00141
    Location: 12100 El Camino Real (059-331-029)
    Description: 2 lot parcel map (~2 acres)

12. **Project name / number:** Kelling Parcel Map / SUB2004-00121
    Location: 14200 San Antonio Road (059-141-059)
    Description: 2 lot parcel map with TDC's (~4.9 acres)

13. **Project name / number:** Burgett Parcel Map / SUB2004-00355
    Location: 14250 San Antonio Road (059-141-053)
    Description: 3 lot parcel map with TDC's (~5.4 acres)

14. **Project name / number:** Damon Parcel Map / SUB2004-00106
    Location: 4250 Parkhill Road (070-191-057)
    Description: 2 lot parcel map (~ 46 acres)

15. **Project name / number:** Dickerson Parcel Map / SUB2003-00124
    Location: 4295 Calf Canyon
    Description: 2 lot parcel map (~47 acres)

16. **Project name / number:** Kregger Parcel Map / S030159P
    Location: Highway 58, just past J St. (069-133-030)
    Description: 4 lot parcel map

17. **Project name / number:** Santa margarita Ranch / S030115U
    Location: 5995 West Pozo Road
    Description: 150 lot Ag Cluster

18. **Project name / number:** Topaz Solar Farm and Tract Map / DRC2008-00009 / SUB2010-00060
    Location: Located on both sides of Highway 58, in between the intersection of Highway 58 and Bitterwater Road and just west of the intersection of Highway 58 and Soda Lake Road, north of the village of California Valley, in the Shandon-Carrizo planning area.
    Description: The project would allow for a 550 megawatt (MW) photovoltaic (PV) solar power plant over approximately 3,500 acres. The project is proposed to be constructed on 19 properties (totaling approximately 7,182 acres, or approx. 9.9 square miles). The project includes the following components: approximately 460 arrays, and associated electrical equipment (e.g. Power Conversion Stations, PV Combining Switchgear houses), and support facilities. The project also includes a Vesting Tentative Tract Map (Tract 3032) that creates one parcel of 320 acres from three legal parcels of 40, 40, and 80 acres each, and four 40-acre illegally created parcels.

19. **Project name / number:** California Valley Solar Ranch (SunPower) / DRC2008-00097

Location: The project is located mostly south of Highway 58, about 4 miles east of Soda Lake Rd., immediately north of the village of California Valley, in the Shandon-Carrizo planning area.
Description: A request to establish a 250 megawatt (MW) photovoltaic power plant on 25 properties totaling approx. 4,685 ac. The project includes: ten solar photovoltaic arrays, electrical equipment/lines, access roads, substation, overlook trail, operations/maintenance bldg. (5,000 sq. ft.), water process facility, water tank, and a 2.8-mile connecting transmission line from the substation to an existing transmission line to the north.