TECHNICAL MEMORANDUM – EXISTING TRAFFIC CONDITIONS
US 101 / MAIN STREET INTERCHANGE

Date: July 1, 2011

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Pages: 24 (Not including appendices)

Project No.: WBS 300150

Jurisdiction: County of San Luis Obispo

Subject: Summary of traffic conditions with existing traffic volumes at the US 101 / Main Street interchange, in San Luis Obispo County. Memorandum includes the following:

1.) Introduction
2.) Site description
3.) Existing geometric conditions
4.) AM and PM Level of Service analysis
5.) Queuing Analysis
6.) Review of historical accident data
7.) Evaluation of proposed short-term mitigation measures

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1.0 INTRODUCTION

As requested by the County of San Luis Obispo, Rick Engineering Company (RICK) has prepared this technical memorandum analyzing the existing traffic conditions at the US 101 / Main Street Interchange in the Templeton Community of unincorporated San Luis Obispo County. **Exhibit 1** shows a vicinity map with the study interchange and the surrounding roadway network system.

This technical memorandum has been initiated by the County of San Luis Obispo in response to the findings of several area circulation studies that have identified the US 101 / Main Street interchange as failing to meet Caltrans and the County of San Luis Obispo "Level of Service" (LOS) standards, both under existing conditions and future build-out conditions.

These studies, which will be referenced in this memorandum as supporting documents and for background information, include the following:

1. Templeton Circulation Study, 2009 Comprehensive Update (Omni-Means, Ltd.)
2. Project Study Report for Main Street / SR 101 Interchange, dated November, 2006 (California Department of Transportation)

However, while the County has recognized that this interchange is currently problematic with regard to area traffic flow, the various studies listed above have differed in their conclusions as to the extent of the congestion. This memorandum utilizes the most recent traffic count data and the current geometric layout to quantify the existing traffic conditions. The evaluation of existing conditions includes an analysis of LOS, accident rates, and vehicle queues at the four (4) study intersections. Several proposed short-term mitigation measures are also analyzed to determine whether they would noticeably impact traffic flow in either a positive or negative manner.

2.0 EXISTING ROADWAY NETWORK

The following is a brief description of the local roadway network within the project study area.

US 101 is a north-south freeway in the project area with two lanes in each direction, a divided median and a posted speed limit of 65 miles per hour (mph). Access between US 101 and Main Street is provided via northbound and southbound on- and off-ramps. The north and southbound off-ramps are stop sign controlled at Main Street.

Main Street is a north-south arterial through the Templeton community. Main Street parallels US 101 and serves the local downtown commercial areas. Main Street has more of an east-west alignment near the US 101 interchange. The existing bridge over US 101 has a single lane in each direction, with a roadway width of approximately 30' and a 5’ wide sidewalk on the south side. Main Street also provides access to Ramada Drive and Theatre Drive. West of Theatre Drive, Main Street narrows and serves as an access road for a local lumberyard, the Caltrans maintenance station, and a private residence. Main Street has a posted speed limit of 45 mph south of the US 101 interchange.

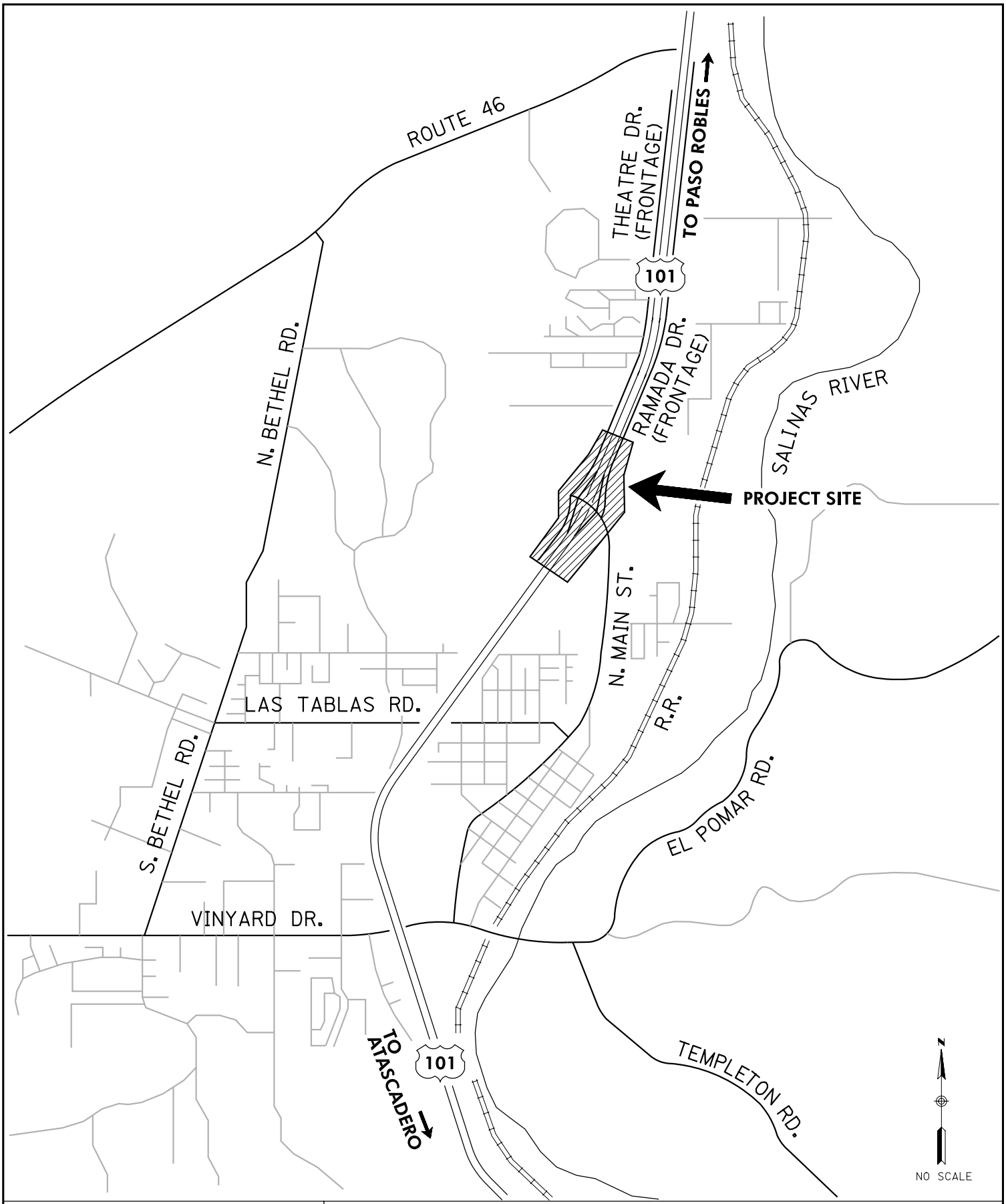

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EXHIBIT 1

PROJECT VICINITY

US 101/NORTH MAIN STREET TRAFFIC STUDY

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Theatre Drive is a north-south collector road that serves as a frontage road along the west side of US 101. As noted in previous studies, due to congestion at the US 101 / State Route (SR) 46 West interchange (next interchange to the north) many drivers use the US 101 / Main Street interchange and Theatre Drive to access the local residential and commercial uses on the west side of US 101. Theatre Drive has a posted speed limit of 45 mph north of Main Street. South of Main Street, Theatre Drive provides access for a local lumberyard and residences. Theater Drive terminates approximately 800 feet south of Main Street. Future plans include extending Theatre Drive to the south to connect with Las Tablas Road. Currently, the four-legged intersection of Theatre Drive and Main Street has three-way stop sign control, with free traffic movements allowed for westbound traffic on Main Street.

Discussions with Caltrans staff indicated that to the north, Theatre Drive south of SR 46 West is currently under construction. This project will close the portion of Theatre Drive between SR 46 West (opposite Vine Street) and Alexa Court (access road for Hampton Inn and La Bellasera Hotel). Traffic on Theatre Drive with a destination to SR 46 West will be re-routed to Gahan Place. This construction project also includes the installation of traffic signal control at the SR 46 West and Gahan Place intersection.

Ramada Drive is a north-south collector road with a single travel lane in each direction. Ramada Drive serves as a frontage road along the east side of US 101. Main Street is the southern terminus of Ramada Drive, with a mix of commercial, industrial and agricultural developments to the north. Ramada Drive also provides access to the US 101 / SR 46 West interchange. The posted speed limit on Ramada Drive is 45 mph in the vicinity of the project site. Currently, the three-legged intersection of Ramada Drive and Main Street is stop controlled only at Ramada Drive, with free traffic movements allowed for east and westbound traffic on Main Street.

Exhibit 2 shows the existing intersection lane configurations of the study intersections. It should be noted that the northbound approach on Theatre Drive, the US 101 southbound and northbound off-ramps, and the southbound approach on Ramada Drive are flared at their intersection with Main Street. This widening of the approach effectively creates a short separate lane for vehicles making right turns from the cross street provided that the queue for the left turn and through movements (shared lane) is not backed up beyond the limits of the flare (approximately 50').

3.0 EXISTING TRAFFIC VOLUMES

Existing morning (7:00-9:00 AM) and afternoon (3:00-6:00 PM) peak period turning movement traffic count data was collected at the 4 study intersections by Metro Traffic Data, on September 16, 2009. The traffic count data was analyzed on both sides of US 101 to balance the volumes and determine the common peak periods for the 4 study intersections. Average daily traffic (ADT) for Main Street, Ramada Drive and Theatre Drive near the project area was obtained from County traffic count data (September 2009). ADT on each of the four (4) freeway ramps was obtained from Caltrans published ramp data (2007). Segment ADT are shown as part of this memorandum for informational purposes only. **Exhibit 3** shows the existing peak hour turning movement volumes and ADTs in the project study area. **Appendix A** contains the traffic count data for the study intersections, as well as the roadways.

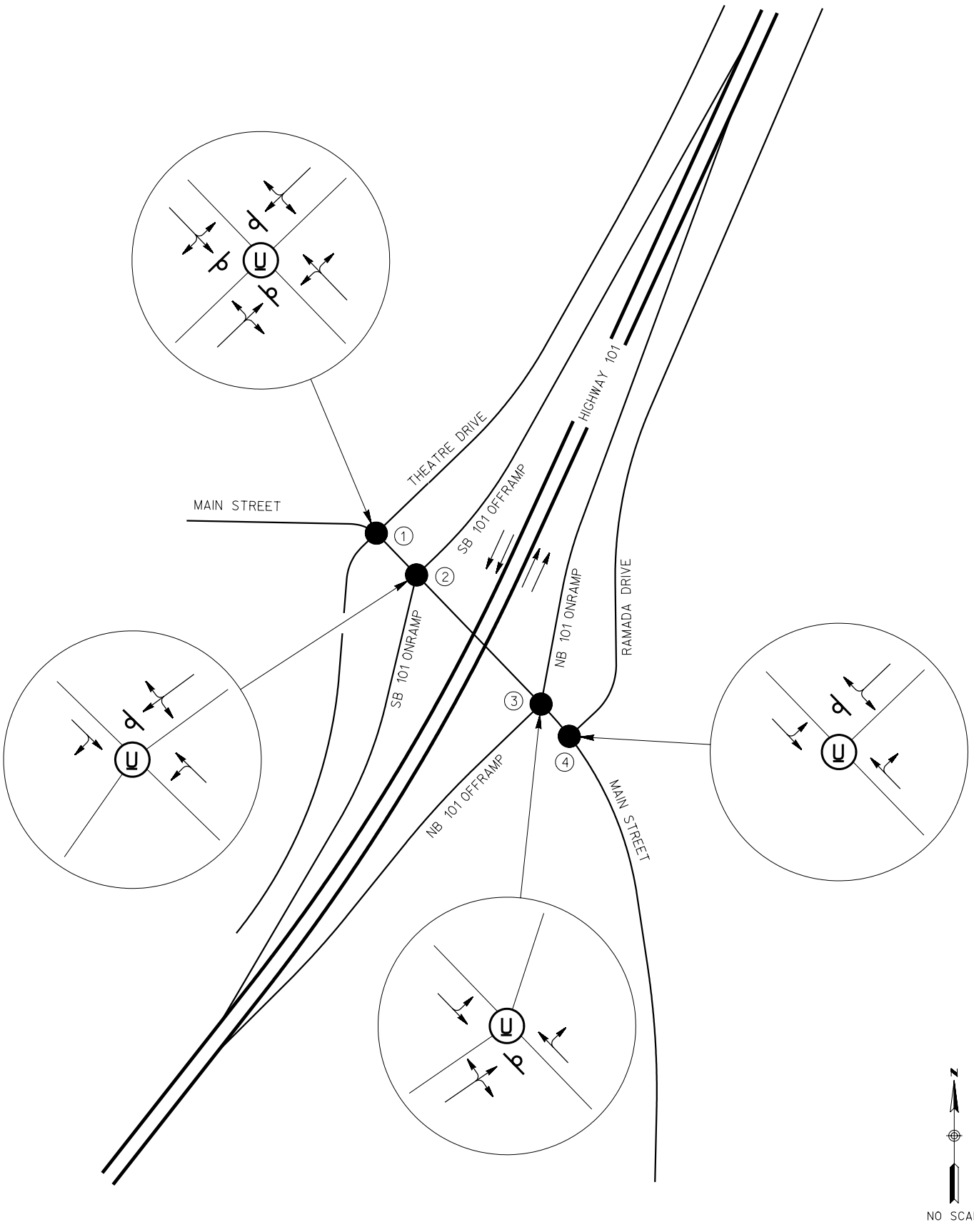

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EXHIBIT 2

EXISTING INTERSECTION
LANE CONFIGURATION

LEGEND:

● = STUDY INTERSECTION (U) = UNSIGNALIZED

o = STOP-CONTROLLED (TS) = TRAFFIC SIGNAL

US 101/NORTH MAIN STREET TRAFFIC STUDY

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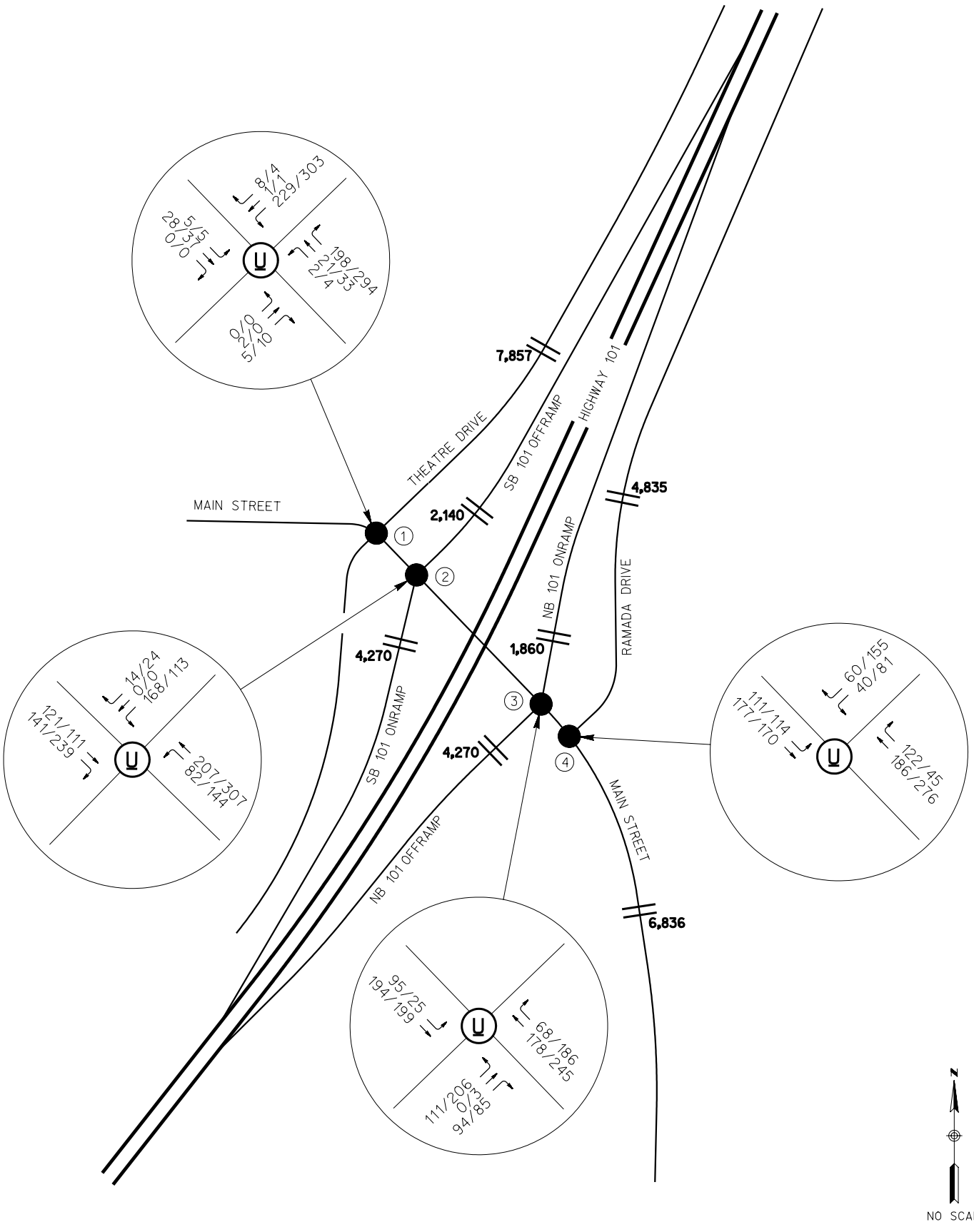

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EXHIBIT 3

EXISTING TRAFFIC

US 101/NORTH MAIN STREET TRAFFIC STUDY

LEGEND:

● = STUDY INTERSECTION

XX/XX = AM/PM PEAK HOUR

XX = ADT IN VEHICLES PER DAY

(U) = UNSIGNALIZED

(TS) = TRAFFIC SIGNAL

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4.0 INTERSECTION ANALYSIS METHODOLOGY

The analysis of existing peak hour operations at the 4 study intersections was performed using methodologies contained in the Highway Capacity Manual (HCM2000), and modeled with the "Synchro" and "SimTraffic" software (Version 7). To accurately model existing operations the appropriate peak hour factor (PHF) adjustments were applied. The software estimates vehicle delays for the overall peak hour operations as an “average” and for each “critical” movement (i.e.: stop sign controlled approach, main line left-turns, etc).

It should be noted that the Main Street and Theatre Drive intersection is currently three-way stop sign controlled, which cannot be modeled correctly using Synchro. RICK determined that modeling the existing intersection as a two-way stop rather than an all-way stop would more closely approximate actual conditions. Since traffic westbound on Main Street currently flows freely, modeling this movement as stop-controlled would inaccurately estimate vehicle delays and queues. Eastbound traffic entering the intersection comprises a relatively small portion of the total intersection volume. In addition, conflicting movements between east and westbound traffic are minimal. Therefore, it was decided that a more accurate representation of actual operations would be obtained by utilizing the two-way stop controlled methodology.

As discussed in Section 2.0 (Existing Roadway Network), the northbound approach on Theatre Drive, the US 101 southbound and northbound off-ramps, and the southbound approach on Ramada Drive are flared at their intersection with Main Street. These flares essentially create a short separate lane that vehicles use to make right turns when the left-through movement queues do not backed up beyond the limits of the flare. Therefore, the analysis of these approaches assumes a single lane approach with a short 50' turn lane for right turn movements.

5.0 LEVEL OF SERVICE METHODOLOGY

5.1 Level of Service Ratings

LOS ratings are quantitative descriptions of intersection operations and are reported using an "A" through "F" letter rating system to describe vehicle delays and congestion. LOS A indicates free-flow conditions with little or no delay and LOS F indicates forced-flow conditions with excessive delays and queues. See **Table 1** for the LOS characteristics. **Appendix B** contains the HCM2000 tables illustrating the LOS-to-delay relationship data for intersection operations (i.e.: two-way stop controlled, all-way stop controlled and signalized intersections).

The peak hour LOS values for each intersection are based on the estimated "average" vehicle delays. The LOS values are also reported for the various critical movements (i.e.: stop sign approach, main line left-turns, etc.), which are based on the estimated delays for the individual approach and/or movement. Typically, Caltrans uses the "average" control delay for reporting an intersection Measure of Effectiveness (MOE). However, the LOS analyses performed for this technical memorandum utilize the lowest performing critical movement LOS for determining when improvements are warranted, consistent with County methodology used in the Templeton Circulation Study.

TABLE 1
LEVEL OF SERVICE CHARACTERISTICS

LOS	Characteristics
A	Free flow conditions exist. Each individual driver is virtually unaffected by the presence of others in the traffic stream.
B	Stable traffic flow exists. The individual drivers have the freedom to select a desired speed, but encounter a slight decline in the freedom to maneuver.
C	Stable and acceptable flow exists, but speed and maneuverability are somewhat restricted due to higher traffic volumes. The individual driver will be significantly affected by the presence of others.
D	High density but stable flow will occur. The individual driver will experience a generally poor level of comfort and convenience. Small increases in traffic flow will cause operational problems and restrict driver maneuverability.
E	Speeds are low, but relatively uniform. The individual driver's ability to maneuver becomes extremely difficult with high frustration. The traffic volume on the road is near capacity.
F	Forced or breakdown flow has occurred. The individual driver is stopped for long periods due to congestion.

Source: Highway Capacity Manual, Transportation Research Board (TRB), 2000 Edition.

5.2 Level of Service Standards

The County of San Luis Obispo has adopted LOS C threshold as the minimum standard for rural roadway operations and LOS D or better for roadways within the boundary of the Templeton Urban Reserve Line (URL). Since the US 101 / Main Street interchange is located within the URL, LOS D is the minimum acceptable standard for peak hour operations at the intersections of Main Street with Ramada Drive and Theatre Drive. For the two intersections of Main Street with the northbound and southbound US 101 ramps, this study uses the standards found in the Caltrans traffic study guidelines (Guide for the Preparation of Traffic Impact Studies, December 2002). These traffic guidelines state that Caltrans endeavors to maintain a target LOS at the transition between LOS C and D range. Therefore, at the intersection of Main Street with the two US 101 intersections, LOS C will be considered the minimum acceptable standard for peak hour operations.

6.0 EXISTING INTERSECTION OPERATIONS

6.1 Intersections Operations

The following 4 intersections were studied as part of this traffic analysis:

1) Main Street & Theatre Drive
2) Main Street & US 101 SB Ramps
3) Main Street & US 101 NB Ramps
4) Main Street & Ramada Drive

Table 2 summarizes the intersection LOS analysis under Existing Conditions. **Appendix C** contains the intersection LOS worksheets for Existing Conditions.

TABLE 2
EXISTING INTERSECTION LOS ANALYSIS

Study Intersection	Critical Movement	2009 Existing Traffic	
		Delay (Sec.)	LOS
Main Street & Theatre Drive (TWSC)	**AM Peak (Avg.)**	**6.2**	**A**
	EB	1.2	A
	NB	9.3	A
	SB	12.4	B
	PM Peak (Avg.)	**7.0**	**A**
	EB	2.2	A
	NB	8.8	A
	SB	14.5	B
Main Street & US 101 SB Ramps (TWSC)			
	AM Peak (Avg.)	**7.1**	**A**
	WB	2.8	A
	SB	24.1	C
	PM Peak (Avg.)	**7.2**	**A**
	WB	4.1	A
	SB	35.5	E
Main Street & US 101 NB Ramps (TWSC)			
	AM Peak (Avg.)	**5.7**	**A**
	EB	3.2	A
	NB	16.1	C
	PM Peak (Avg.)	**8.4**	**A**
	EB	1.1	A
	NB	26.4	D
Main Street & Ramada Drive (TWSC)			
	AM Peak (Avg.)	**3.4**	**A**
	EB	3.8	A
	SB	12.8	B
	PM Peak (Avg.)	**5.5**	**A**
	EB	4.0	A
	SB	14.8	B

X.X – Bold Data Represents Total Average Vehicle Delays During the Peak Hour
LOS = Level of Service; Average Delay in seconds.
TWSC = Two-Way Stop Controlled Intersection
NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound

The data in **Table 2** indicates that average vehicle delays at the 4 study intersections are currently within acceptable limits during the AM and PM peak hours (LOS C or better at the ramp intersections, and LOS D or better at the frontage road intersections). However, delays for the US 101 north and southbound off-ramps are within the LOS D-E range during the PM peak hour. While alternative traffic control measures may bring the LOS for the off-ramp movements up to minimum LOS standards, the overall functionality of the entire intersection may actually

decrease as a result (i.e.: average delays may increase). See Section 7 for analysis of traffic control mitigation measures.

Although the LOS values in **Table 2** are slightly different than the findings of the Templeton Circulation Study, the patterns of vehicle delays are consistent with their findings. Updated peak hour traffic counts, as well as small differences in how the geometrical street layout was drawn, slightly influenced the LOS results. In order to check the computed LOS, field observations were conducted during the PM peak hour on January 24, 2011, to verify estimated delay times and queue lengths. Both minor street delays and queue lengths observed were consistent with the findings summarized in **Table 2** and **Table 4.**

6.2 Collision Analysis

Traffic collision data for the project area was obtained from the County records and the Caltrans Traffic Accident Surveillance and Analysis System (TASAS). The compiled accident records, accident rate calculations, and Caltrans published Statewide average intersection accident rates are contained in **Appendix D**. The data has been reduced to the most recent three-year study period available, which occurred between January 1, 2007 and December 31, 2009. During the 3 year period for which data was provided there were a total of 16 reported accidents at the 4 study intersections, which are shown graphically on **Exhibit 4** and **Exhibit 5**. Of the 16 accidents, 3 of the accidents (19%) involved injuries, and the remaining 13 (81%) accidents were reported as Property Damage Only (PDO). None of the accidents involved fatalities. The 4 intersections had accident rates ranging from 0.18 to 0.56 accidents per million entering vehicles during the study period. For comparison purposes, the Statewide average rates for similar type intersections throughout the State of California, as reported by Caltrans, are also shown in **Table 3.**

TABLE 3

ACCIDENT RATE SUMMARY

Study Intersection	No. of Accidents				Total MEV	Accident Rates					
						Existing			Statewide Averages		
	Total	Inj.	Fat.	F+I		Fat.	F+I	Total	Fat.	F+I	Total
Main Street & Theatre Drive	2	0	0	0	8.50	0.00	0.00	0.23	0.008	0.16	0.33
Main St. & US101 SB Ramps	2	1	0	1	11.11	0.00	0.09	0.18	0.008	0.16	0.33
Main St. & US101 NB Ramps	7	2	0	2	12.56	0.00	0.16	0.56	0.008	0.16	0.33
Main Street & Ramada Drive	5	0	0	0	9.55	0.00	0.00	0.52	0.004	0.10	0.22

As shown in **Table 3**, rates for accidents resulting in injuries and/or fatalities were lower than or equal to the Statewide averages at all 4 study intersections. However, the total accident rate at 2 of the study intersections are actually higher than the Statewide average. Of particular note, 7 of the 12 accidents occurring at the 2 intersections east of US 101 involved eastbound traffic on Main Street either colliding with traffic entering Main Street from the US 101 northbound off-ramp or rear-ending traffic waiting to turn left onto Ramada Drive. It is likely that this may be a result of eastbound drivers accelerating across the bridge in anticipation of the 45 mph speed limit on Main Street south of US 101.

It is suggested that mitigation measures be considered by the County to slow eastbound through traffic on Main Street until the vehicles have passed Ramada Drive. Several methods are available for slowing this traffic, including posting warning signage or by adding All-Way stop control or a signal at the NB 101 Ramps intersection. Additionally, lowering the posted speed limit may be a possibility, but would require a speed survey at this location demonstrating that observed 85th percentile traffic speeds would warrant this action. Please see Sections 7.3 and 8.3 for additional discussion regarding traffic control at this intersection, and **Appendix J** for recently completed speed surveys in the area.

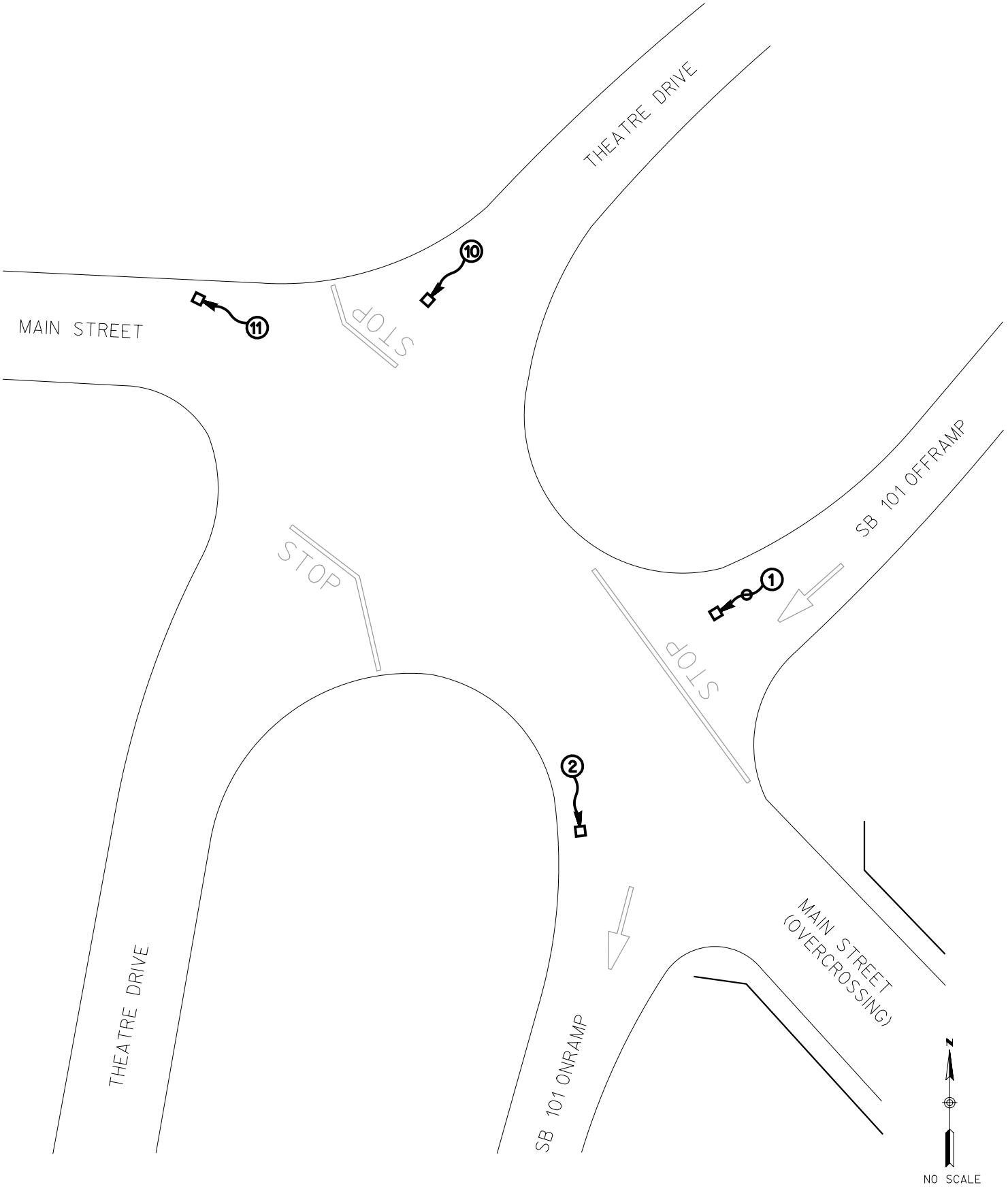

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EXHIBIT 4

COLLISION DIAGRAM
THEATRE DRIVE & SB RAMPS

US 101/NORTH MAIN STREET TRAFFIC STUDY

LEGEND:

- PATH OF MOVING VEHICLE
- STOPPED VEHICLE
- FIXED OBJECT
- INJURY ACCIDENT

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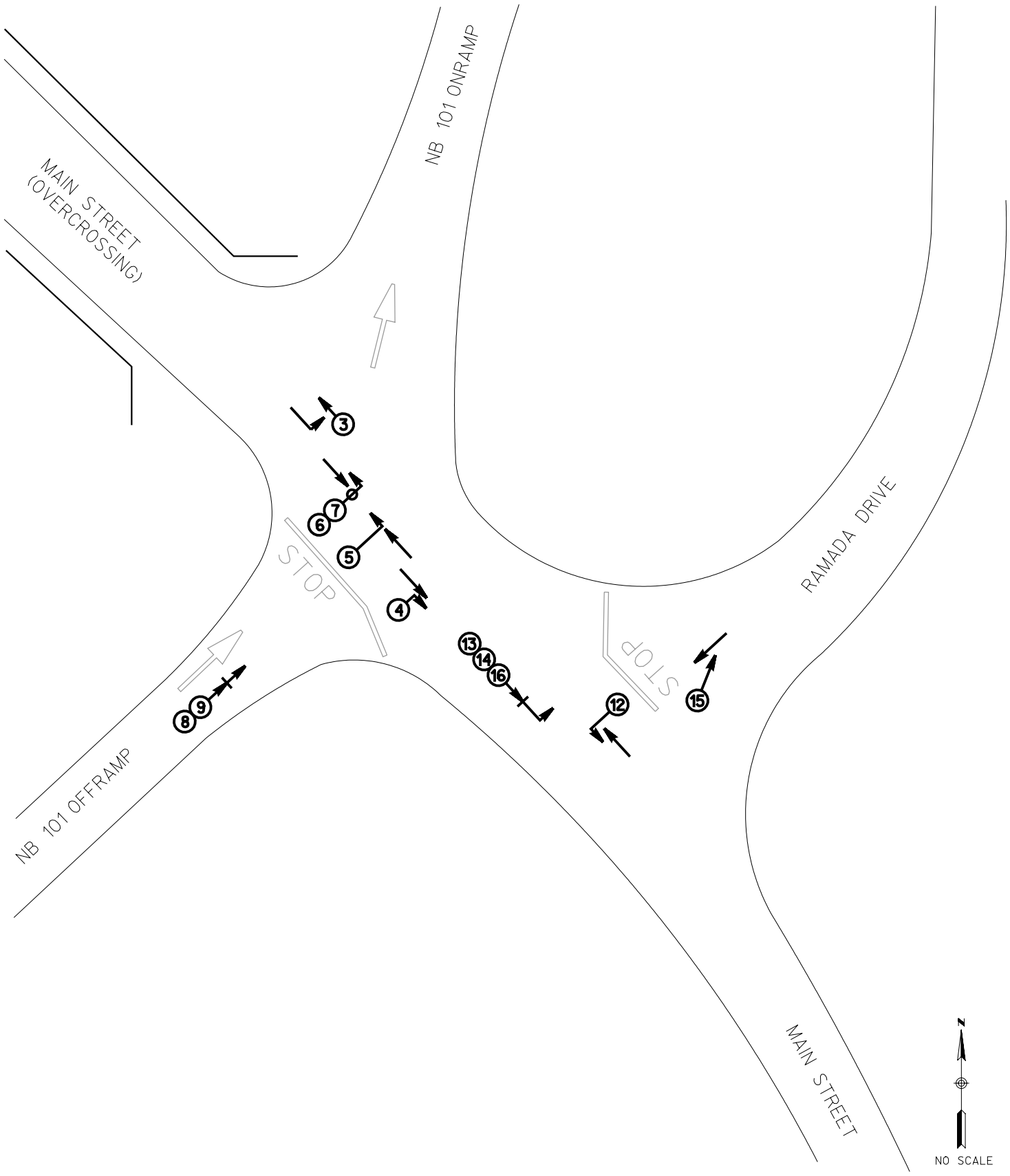

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EXHIBIT 5

COLLISION DIAGRAM
RAMADA DRIVE & NB RAMPS

LEGEND:

- PATH OF MOVING VEHICLE
- STOPPED VEHICLE
- FIXED OBJECT
- INJURY ACCIDENT

US 101/NORTH MAIN STREET TRAFFIC STUDY

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6.3 Queuing Analysis

To analyze queuing lengths under existing conditions, simulations were run using the SimTraffic software within SYNCHRO. The only modification made to the network was to lower the AM peak hour truck volumes on Ramada Drive in order to more accurately reflect observed field conditions. **Table 4** summarizes the intersection queuing analysis results under Existing Conditions and **Appendix H** contains the SimTraffic queuing data.

TABLE 4
EXISTING INTERSECTION QUEUE ANALYSIS (CRITICAL MOVEMENTS)

Study Intersection	Critical Movement (Exist. PHV)	Existing Storage Length (feet)	95th Percentile Queue Length (feet)	Storage Length Sufficient / Insufficient
Main Street & Theatre Drive (TWSC)				
	AM Peak			
	NB LTR	-	34	Sufficient
	SB LTR	-	112	Sufficient
	PM Peak			
	NB LTR	-	24	Sufficient
	SB LTR	-	103	Sufficient
Main Street & US 101 SB Ramps (TWSC)				
	AM Peak			
	WB LT	335	66	Sufficient
	SB LT	1000	102	Sufficient
	PM Peak			
	WB LT	335	108	Sufficient
	SB LT	1000	78	Sufficient
Main Street & US 101 NB Ramps (TWSC)				
	AM Peak			
	EB LT	335	113	Sufficient
	NB LT	800	98	Sufficient
	PM Peak			
	EB LT	335	56	Sufficient
	NB LT	800	99	Sufficient
Main Street & Ramada Drive (TWSC)				
	AM Peak			
	EB LT	**40[1]**	**55**	**Insufficient**
	SB L	-	46	Sufficient
	PM Peak			
	EB LT	**40[1]**	**42**	**Insufficient**
	SB L	-	92	Sufficient

[1]Measured clear distance between adjacent intersections.
TWSC = Two-Way Stop Controlled Intersection
NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound
L = Left turn movement, T = Through movement, R = Right turn movement

All of the study intersections currently have adequate storage capacity for the 95th percentile queue length on all approach legs, except the eastbound lane on Main Street at the Ramada Drive intersection. On this approach, traffic waiting to turn left from Main Street to northbound Ramada Drive will occasionally block the northbound ramps intersection. The highest 95th percentile queuing values estimated were between approximately 100' and 120', or 4 to 5 cars in length. Field observation found these lengths to reflect actual conditions. All approach legs are adequate to accommodate generated queues, and as such, existing queue lengths do not necessitate roadway improvements at any of the 4 intersections.

7.0 INTERSECTION OPERATIONS WITH ALL-WAY STOP MITIGATION

As a part of this technical memorandum, an evaluation was conducted for the feasibility of utilizing all-way stop control as a short-term mitigation measure to alleviate traffic congestion at the US 101 / Main Street interchange and adjacent intersections. These measures are designed to be implemented under existing traffic volume and geometric layout conditions, and include all-way stop control at either one or both of the aforementioned intersections.

Note that the Synchro software utilizes the HCM methodology to compute the control delays and LOS (Shown in Table 2). Since this method treats the intersections separately, delays generated at one intersection will not be reflected at an adjacent intersection within close proximity**.** As such, increased average delays and decreased LOS are not shown by the Synchro software at the frontage road intersections. Although all-way stop control at the ramp intersections will almost certainly affect operations at the Theatre Drive and Ramada Drive intersections. However, these impacts are clearly seen when utilizing the SimTraffic simulation for the queuing analysis. The microlevel analysis found within SimTraffic is better able to accurately demonstrate the likely affects of the mitigation measures at the US 101 ramp intersections and at the adjacent frontage road intersections.

In addition, there was a discussion with County staff regarding analyzing the west side of the freeway as one intersection (US 101 southbound ramps and Theatre Drive combined) and the east side of the freeway as another intersection (US 101 northbound ramps and Ramada Drive combined). In order to optimize traffic flow and minimize queues, vehicles would need to be allowed free movements between the ramp and frontage road intersections. However, allowing free movements would create driver confusion, particularly for left turn turning vehicles with multiple options (i.e.: left turn at northbound on-ramp or at the Ramada Drive). In addition, on the west side of the freeway there would be 2 southbound approaches (Theater Drive and US 101 southbound off-ramp), which would also create driver confusion. A review of existing conditions indicate that the distance between the east and westbound limit lines on Main Street would be at least 200' on either side of the freeway. Due to the operational and safety concerns, it was decided that the east and west intersections should not be grouped together for the all-way stop control mitigation analysis. The installation of all-way stop control at all 4 study intersections is not considered a viable alternative, as significant vehicle queues would be experienced along Main Street.

7.1 Intersections Operations

The short-term mitigation measure scenarios were run in Synchro to determine the affects of adding all-way stop control at the Main Street and US 101 northbound ramps intersection only (Short-Term Measure #1), at the Main Street and US 101 southbound ramps intersection only (Short-Term Measure #2), and at both intersections simultaneously (Short-Term Measure #3). Currently, these intersections have stop control only for the off-ramp approaches. It should be noted that the evaluation of short-term mitigation measures focuses on the analysis of PM peak hour operations only, as this period represents the "worse case" scenario. The results of the LOS analysis for the short-term mitigation scenarios are presented in **Table 5**, with the LOS worksheets included in **Appendix E.**

TABLE 5

INTERSECTION LOS ANALYSIS WITH ALL-WAY STOP MITIGATION

Study Intersection Main Street at:	Critical Movement (PM Peak)	Vehicle Delay - LOS Value			
		Existing	**STM #1** US 101 NB Ramps	**STM #2** US 101 SB Ramps	**STM #3** US 101 NB & SB Ramps
Theatre Drive	**Average**	**7.0 - A**	**7.0 - A**	**7.0 - A**	**7.0 - A**
	EB	2.2 - A	2.2 - A	2.2 - A	2.2 - A
	NB	8.8 - A	8.8 - A	8.8 - A	8.8 - A
	SB	14.5 - B	14.5 - A	14.5 - B	14.5 - B
US 101 SB Ramps	**Average**	**7.2 - A**	**7.2 - A**	**15.4 - C**	**15.4 - C**
	EB	N/A	N/A	12.0 - B	12.0 - B
	WB	4.1- A	4.1 - A	19.1 - C	19.1 - C
	SB	35.5- E	35.5 - E	10.6 - B	10.6 - B
US 101 NB Ramps	**Average**	**8.4 - A**	**15.4 - C**	**8.4 - A**	**15.4 - C**
	EB	1.1 - A	12.6 - B	1.1 - A	12.6 - B
	WB	N/A	18.7 - C	N/A	18.7 - C
	NB	26.4 - D	12.8 - B	26.4 -D	14.4 - B
Ramada Drive	**Average**	**5.5 - A**	**5.5 - A**	**5.5 - A**	**5.5 - A**
	EB	4.0 - A	4.0 - A	4.0 - A	4.0 - A
	SB	14.8 - B	14.8 - B	14.8 - B	14.8 - B

- Delays and Level of Service (LOS) calculated utilizing the methodologies described in Chapters 16 and 17 of the 2000 Highway Capacity Manual (HCM).

X.X – Data Represents Total Average Peak Hour Volume

LOS = Level of Service; Average Delay in seconds.

TWSC = Two-Way Stop Controlled Intersection

NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound

The data in **Table 5** indicates that the installation of all-way stop control at either ramp intersection would significantly reduce delays for the off-ramp movements (STM #1, STM #2 or STM #3). The LOS for the southbound off-ramp would meet the minimum LOS threshold standards under STM #2 and STM # 3, and the LOS for the northbound off-ramp would meet minimum LOS threshold standards under STM #1 and STM #3. However, delays would increase significantly for the east and westbound approaches on Main Street. Increased delays for vehicles on Main Street would also result in longer vehicle queues.

As previously stated, the Synchro software treats the 4 study intersections separately. Therefore, the increase of delays on the east and westbound approaches of Main Street are not reflected at the adjacent frontage road intersections when installing all-way stop control at either ramp intersection. If all-way stop control is installed at the southbound ramps intersection delays would increase significantly on the southbound approach of Theatre Drive. In a similar manner, if all-way stop control is installed at the northbound ramps intersection delays would increase significantly on the southbound approach of Ramada Drive and westbound approach of Main Street. The impacts associated with these short-term mitigation measure alternatives are more clearly seen using the SimTraffic simulation. The queuing analysis using SimTraffic also better demonstrates the impacts associated with installing all-way stop control at either one or both the ramp intersections.

7.2 Queuing Analysis

An analysis of queuing results from SimTraffic shows that adding all-way stop control at the two US 101 ramp intersections on Main Street would result in additional queuing through the adjacent intersections with the frontage roads. See **Table 6** for summarized queuing results for the all-way stop controlled short-term mitigation scenarios, and **Appendix I** for the full SimTraffic queuing computations.

TABLE 6

INTERSECTION QUEUE LENGTHS WITH ALL-WAY STOP MITIGATION

Study Intersection Main Street at:	Critical Movement (Exist. PHV)	Existing Storage Length	95th Percentile Queue Length			
			Existing	**STM #1** US 101 NB Ramps	**STM #2** US 101 SB Ramps	**STM #3** US 101 NB & SB Ramps
Theatre Drive	**PM Peak**					
	NB LTR	---	24	24	24	24
	SB LTR	---	103	116	117	122
US 101 SB Ramps	**PM Peak**					
	EB RT	40[1]	N/A	N/A	57	56
	WB LT	335	108	95	110	99
	SB LT	1000	78	69	52	51
US 101 NB Ramps	**PM Peak**					
	EB LT	335	56	50	42	44
	WB RT	40[1]	N/A	49	N/A	50
	NB LT	800	99	73	114	80
Ramada Drive	**PM Peak**					
	EB LT	40[1]	42	44	44	44
	WB TR	---	N/A	271	26	329
	SB L	---	92	711	69	697

[1]Measured clear distance between adjacent intersections.
AWSC = All-Way Stop Controlled Intersection
TWSC = Two-Way Stop Controlled Intersection
NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound

The implementation of all-way stop control at the northbound ramps (STM #1) would reduce vehicle queues on the off-ramp by about 25%. However, due to the close proximity of the US 101 ramp intersections longer queues would be experienced on the southbound Ramada Drive approach (8 times existing) and westbound Main Street approach. Longer queues on the southbound Ramada Drive approach would also increase delays for vehicles currently making right turns, as the queue would back up beyond the flared roadway section. If all-way stop control is utilized as a near-term mitigation measure at the northbound ramps intersection, (STM #1), it would be necessary to install "KEEP CLEAR" pavement markings on North Main Street within the limits of the Ramada Drive and Main Street intersection in order to keep the westbound queue from blocking the eastbound and southbound left turn movements. In addition, westbound through traffic stopped at the northbound ramps will block the line-of-sight for vehicles making the southbound left turns from Ramada Drive to eastbound Main Street, potentially impacting safety at this intersection.

The implementation of all-way stop control at the southbound ramps (STM #2) would reduce vehicle queues on the off-ramp by about 35%. However, longer queues would be experienced on the southbound Theatre Drive approach. The westbound queue on Main Street would exceed the storage capacity between the Theatre Drive and ramps intersections, which would backup traffic past the southbound ramps intersection and onto the bridge. It would be necessary to install "KEEP CLEAR" pavement markings on Main Street within the limits of the southbound ramps and Main Street intersection to keep the westbound queue from blocking the southbound left turns from the off-ramp. At this location, line-of-sight could be impacted for the northbound Theatre Drive traffic. However, these traffic volumes are minimal, and do not pose the same safety concerns as at the Ramada Drive intersection.

The implementation of all-way stop control at both ramp intersections (STM #3) would reduce queues on both the north and southbound off-ramps (10-35%). However, longer queues would be experienced on the southbound approaches of Ramada Drive (7.5 times existing) and Theatre Drive (1.2 times existing), and on the westbound approach of Main Street at Ramada Drive. As discussed under STM #1 and STM #2, "KEEP CLEAR" pavement markings would be required on Main Street for westbound traffic at Ramada Drive and the southbound ramps intersection.

7.3 Conclusion: All-Way Stop Control feasibility

The analysis of queuing associated with STM #1, STM #2 and STM #3 alternatives indicates that the installation of all-way stop control at either one or both ramp intersections could reduce queuing on the US 101 off-ramps. However, stopping east-west free-flowing traffic on Main Street would increase queues on Main Street at the US 101 ramp and for adjacent frontage road intersections. In addition, since current queuing on the off-ramps has not been identified as a problem and utilizes less than 20% of the available capacity (see **Table 4**), it is **not recommended** that all-way stop control be considered as a viable short-term mitigation measure. However, as future traffic volumes increase on the off-ramps and queuing backs up toward the freeway main-line the implementation of all-way stop control may become a more viable alternative. The analysis of future year "2030" buildout demands may show a greater benefit to these short-term mitigation measure alternatives.

8.0 INTERSECTION OPERATIONS WITH TRAFFIC SIGNAL MITIGATION

This section evaluates the feasibility of utilizing traffic signals as a short-term mitigation measures to alleviate traffic congestion at the US 101/ Main Street interchange and adjacent intersections. These measures are designed to be implemented under existing traffic volume and geometric layout conditions.

As previously stated, the Synchro software treats the intersections separately, and therefore, delays generated at one intersection may not be reflected at an adjacent intersection within close proximity. For the scenarios where only the ramp intersections are signalized, there will be impacts on the traffic operations at the Theatre Drive and Ramada Drive intersections, although these impacts are not necessarily shown in the Synchro output.

Additionally, it should be noted that for the two scenarios where the intersections on the west side and the intersections on the east side are grouped, (STM #7 and STM #8), there is some difficulty in accurately modeling expected traffic conditions with Synchro software. At the eastern intersections, it was decided in discussions with County staff that the most accurate way of modeling the two intersections as a single system would be to run the two intersections as a single intersection (node) with five legs. At the western intersections, due to the more complex roadway geometry, the decision was made by County staff to model the intersections as separate intersections with two coordinated signal systems. While efforts were made to approximate actual traffic conditions with both intersections signalized, Synchro software is limited because it will not treat the two intersections as one. It is possible that at both the east and west intersection groups, actual field conditions would be better than those shown in **Table 7** and **Table 8** with optimized signal timing and striping layout.

8.1 Intersection Analysis

The short-term mitigation measure scenarios were run in Synchro to determine the affects of adding traffic signals at the Main Street and US 101 northbound ramps intersection only (Short-Term Measure #4), at the Main Street and US 101 southbound ramps intersection only (Short-Term Measure #5), and at both intersections simultaneously (Short-Term Measure #6). Two additional signal scenarios were also analyzed. First, a scenario was run with both intersections west of US 101 signalized and grouped as one traffic signal system, and the intersections east of US 101 configured as a single-node, five-legged intersection with a traffic signal (Short Term Measure #7). Secondly, a scenario was analyzed with the northbound ramps and Ramada Drive intersections configured as a single-node, five-legged intersection with a traffic signal, and an signal at the southbound ramps intersection only on the west side of US 101 (Short Term Measure #8). Currently, all intersections have stop control only on the minor streets. It should be noted that the evaluation of short-term mitigation measures focuses on the analysis of PM peak hour operations only, as this period represents the "worse case" scenario. The results of the LOS analysis for the short-term mitigation scenarios are presented in **Table 7**, with the LOS worksheets included in **Appendix E.**

TABLE 7

INTERSECTION LOS ANALYSIS WITH SIGNALIZED MITIGATION

Study Intersection Main Street at:	Critical Movement (PM Peak)	Vehicle Delay - LOS Value					
		Existing	**STM #4** US 101 NB Ramps	**STM #5** US 101 SB Ramps	**STM #6** US 101 NB & SB Ramps	**STM #7** Western & Eastern Intersections	**STM #8** Eastern Intersections & US 101 SB Ramps
Theatre Drive	**Average**	**7.0 - A**	**7.0 - A**	**6.3 - A**	**6.5 - A**	**19.3 – B**	**6.5 - A**
	EB	2.2 - A	2.2 - A	2.2 - A	2.2 - A	53.7 - D	2.2 - A
	WB	N/A	N/A	N/A	N/A	2.4 - A	N/A
	NB	8.8 - A	8.8 - A	8.7 - A	8.7 - A	46.9 - D	8.7 - A
	SB	14.5 - B	14.5 - B	13.1 - B	13.5 - B	33.4 - C	13.5 - B
US 101 SB Ramps	**Average**	**7.2 - A**	**7.2 - A**	**5.2 - A**	**6.6 - A**	**56.7 - E**	**9.0 - A**
	EB	N/A	N/A	2.9 - A	3.3 – A	2.9 – A	2.9 - A
	WB	4.1 - A	4.1 - A	54.3 - A	5.0 - A	91.4 - F	5.3 - A
	SB	35.5 - E	35.5 - E	13.8 - B	20.0 - C	67.7 - E	36.5 - D
US 101 NB Ramps	**Average**	**8.4 - A**	**7.0 - A**	**8.4 - A**	**9.3 – A**	**47.7 - D[1]**	**36.9 – D[1]**
	EB	1.1 - A	4.6 - A	1.1 - A	5.3 - A	60.0 – E	32.2 – C
	WB	N/A	5.2 - A	N/A	6.0 - A	N/A[1]	N/A[1]
	NB	26.4 - D	11.4 - B	26.4 -D	17.4 - B	37.6 -D	37.1 – D
Ramada Drive	**Average**	**5.5 - A**	**5.5 - A**	**5.5 - A**	**5.5 - A**	**N/A[1]**	**N/A[1]**
	EB	4.0 - A	4.0 - A	4.0 - A	4.0 - A	N/A[1]	N/A[1]
	SB	14.8 - B	14.8 - B	14.8 - B	14.8 - B	49.9 - D	36.6 – D
	WB	N/A	N/A	N/A	N/A	46.7 – D[1]	40.4 – D[1]

[1]For STM #7 and #8, the northbound ramps and Ramada Drive are modeled as one intersection. Westbound delays are shown only at Ramada Drive, and eastbound delays are shown only for the northbound ramps intersection.

- Delays and Level of Service (LOS) calculated utilizing the methodologies described in Chapters 16 and 17 of the 2000 Highway Capacity Manual (HCM).

X.X – Data Represents Total Average Peak Hour Volume

LOS = Level of Service; Average Delay in seconds.

NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound

As with the all-way stop control alternatives, adding traffic signal control on Main Street at either ramp intersection would reduce the off-ramp delays and improve the LOS at that intersection. The LOS at the southbound off-ramp would meet the minimum LOS standards with STM #5 or STM #6 in place. The LOS at the northbound off-ramp would meet the minimum LOS standards with STM #4 or STM #6 in place.

When both intersections were signalized on the west side of US 101 and the eastern intersections were grouped into a single node and signalized (STM #7), overall LOS for both the Theatre Drive intersection and the southbound ramps intersection worsened significantly. Of particular note is the worsening of eastbound and westbound traffic across the bridge, and at the Ramada Drive intersection. Under STM #7, both the southbound ramps intersection and the eastern intersection failed to meet the County and Caltrans LOS minimum. At the eastern intersection, (Ramada Dr. and northbound ramps intersections), split-phase timing was used for all approaches at the request of the County. This method will provide the greatest level of safety in

an intersection with multiple potential turning conflicts, but it also worsens the overall intersection LOS and queuing lengths.

With both intersections on the east side of US 101 grouped and signalized and just the southbound ramps intersection signalized on the west side of US 101, (STM #8), overall LOS and queuing was worse than existing conditions, although the impacts were primarily restricted to the east side US 101. Under this mitigation measure, the eastern intersection fails to meet the County and Caltrans LOS minimum.

As previously stated, the Synchro software treats the 4 study intersections independently. Therefore, the stopping of east-west vehicles on Main Street does not affect delays at the adjacent frontage road intersection (i.e.: the northbound ramps and Ramada Drive). If traffic signal control is installed at the southbound ramps intersection, delays may increase on the southbound approach of Theatre Drive. In a similar manner, if traffic signal control is installed at the northbound ramps intersection delays may increase on the southbound approach of Ramada Drive and westbound approach of Main Street. The impacts associated with these short-term mitigation measure alternatives are more clearly seen using the SimTraffic simulation. The queuing analysis using SimTraffic also better demonstrates the impacts associated with installing traffic signal control at either one or both the ramp intersections.

8.2 Queuing Analysis

An analysis of queuing results from SimTraffic shows that adding traffic signal control at the US 101 ramp intersections on Main Street would in some cases reduce queuing on the north or southbound off-ramps. However, queuing would increase at other approaches as a result. See **Table 8** for summarized queuing results for the traffic signal short-term mitigation scenarios, and **Appendix I** for full Synchro queuing computations.

Constructing traffic signals at the northbound and/or southbound ramps intersections would result in similar queuing patterns to the all-way stop control mitigation. The implementation of traffic signal control at the northbound ramps (STM #4) would increase vehicle queues on the southbound approach of Ramada Drive. Longer queues on the southbound Ramada Drive approach would also increase delays for vehicles currently making right turns, as the queue would back up beyond the flared roadway section. The westbound queue on Main Street would also exceed the available capacity between the ramp intersection and Ramada Drive. "KEEP CLEAR" pavement markings would be required on Main Street within the limits of the intersection with Ramada Drive in order to keep the westbound queue from blocking the east and southbound left turn movements through that intersection. Similar to the discussion for alternative STM #1 (all-way stop control at northbound ramps), westbound through traffic stopped at the northbound ramps may block the line-of-sight for vehicles making the southbound left turns from Ramada Drive to eastbound Main Street.

TABLE 8

INTERSECTION QUEUE LENGTHS WITH SIGNALIZED MITIGATION

Study Intersection Main Street at:	Critical Movement (PM Peak)	Existing Storage Length	95th Percentile Queue Length					
			Existing	**STM #4** US 101 NB Ramps	**STM #5** US 101 SB Ramps	**STM #6** US 101 NB & SB Ramps	**STM #7** Western & Eastern Intersections	**STM #8** Eastern Intersections & US 101 SB Ramps
Theatre Drive	**PM Peak**							
	NB LTR	---	24	25	24	24	46	37
	SB LTR	---	103	106	105	107	324	370
	EB LTR	---	N/A	N/A	N/A	N/A	39	N/A
	WB LTR	40[1]	N/A	N/A	N/A	N/A	72	N/A
US 101 SB Ramps	**PM Peak**							
	EB RT	40[1]	N/A	N/A	53	68	77	66
	WB LT	335	108	115	167	129	393	277
	SB LT	1000	78	79	93	72	143	210
US 101 NB Ramps	**PM Peak**							
	EB LT	335	56	78	49	86	232[3]	401[3]
	WB RT	40[1]	N/A	43	N/A	42	N/A[3]	N/A[3]
	NB LT	800	99	147	82	132	508	98
Ramada Drive	**PM Peak**							
	EB LT	40[1]	42	43	42	42	N/A[3]	N/A[3]
	WB TR	---	N/A	72	N/A	72	295[3]	371[3]
	SB L	---	92	176	143	177	472	188

[1]Measured clear distance between adjacent intersections.

[3] For STM #7 and #8, the northbound ramps and Ramada Drive are modeled as one intersection. Westbound queues are shown only at Ramada Drive, and eastbound queues are shown only for the northbound ramps intersection.

NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound

The implementation of signal control at the southbound ramps (STM #5) or at both ramp intersections (STM #6) would increase queues on the westbound approach of the southbound ramps intersection (1.2-1.5 times existing). The eastbound queue on Main Street would also exceed the available capacity between the ramp intersection and Theater Drive. Additionally, the southbound queues on Theatre Drive and Ramada Drive would not be improved.

Signalizing both intersections on the west side of US 101 and creating a single-node, five-way signalized intersection on the east side, (STM #7) would increase queues at nearly all approaches. Of particular importance, southbound Theatre Drive traffic turning left onto Main Street and westbound traffic on Main Street at the intersection with the northbound ramps would have significantly increased queue lengths. Since these movements comprise the majority of the traffic volumes through these two intersections, overall queuing at the intersections would be increased as a result of this mitigation measure.

Grouping and signalizing the intersections on the east side of US 101 and signalizing the southbound ramps intersection (STM #8), would increase queue lengths at nearly all approaches.

In particular, 95th percentile eastbound traffic queues at the northbound ramps intersection would exceed the storage capacity on the bridge.

It should be noted that comparing the queue lengths for both STM #7 and STM #8 with the existing condition and the other short-term mitigation measures is not exact, since the configuration of the eastern intersections was modeled as a single node in Synchro for these two mitigation measures to better reflect actual operational conditions.

8.3 Conclusion: Traffic Signal feasibility

Given existing traffic volumes and geometrical layout, for the first three short term mitigation measures (STM #4, #5 and #6), vehicle delays and LOS are not significantly better using traffic signals than those achieved using all-way stop control, and queuing is actually worse, on average.

On the east side of US 101, one signal warrant was met, (see Section 9.0 below). However, LOS was not improved significantly and queuing was worse, on average, when a signal was placed at the northbound ramps intersection (STM #4). Due to these considerations and the substantial additional costs associated with installation and maintenance of traffic signals as compared with all-way stop control, it is **not recommended** that signalization be considered as a short-term mitigation measure at the northbound US 101 ramps only.

Given that no signal warrants were met for the southbound ramps intersection, (see Section 9.0 below), and the considerable additional costs associated with installation and maintenance of traffic signals as compared with all-way stop control, it is **not recommended** that signalization be considered as a short-term mitigation measure at the southbound US 101 ramps intersection only (STM #5).

When both ramps were signalized and coordinated, (STM #6), LOS was improved for minor street approaches, but did not significantly improve overall LOS at the four intersections. On average, queues increased under this scenario. Due to the fact that conditions were not significantly improved, only a single warrant was met at for the northbound ramps intersection, and the substantial additional costs associated with installation and maintenance of traffic signals as compared with all-way stop control, it is **not recommended** that signalization be considered as a short-term mitigation measure at the southbound and northbound US 101 ramps.

With the western two intersections signalized and coordinated, and the eastern intersections grouped as a single node and signalized (STM #7), both LOS and queuing were significantly worse than under existing conditions. Thus, it is **not recommended** that signalization be considered as a short-term mitigation measure at the southbound and northbound US 101 ramps.

Similarly, with the eastern intersections grouped as a single node and signalized, and the southbound ramps intersection signalized (STM #8), both LOS and queuing were significantly worse than under existing conditions. It is **not recommended** that signalization be considered as a short-term mitigation measure at the southbound and northbound US 101 ramps. However, it should be noted that STM #7 and STM #8 would likely be more viable options with increased traffic volume. (See Deliverable 2)

9.0 SIGNAL WARRANT ANALYSIS

As part of this technical memorandum, an analysis of the feasibility of signalizing either one or both of the US 101 ramp intersections with Main Street as a short-term mitigation measure was completed in Section 8.0. However, since these intersections are within the limits of Caltrans right-of-way, they must also meet the justification for the installation of a traffic signal at an intersection, which is based on the eight warrants provided in the Caltrans Manual on Uniform Traffic Control Devices (CAMUTCD). Figures 4C-101 through 4C-4 in the CAMUTCD were used to analyze the traffic signal warrants based on existing average daily traffic and peak hour traffic volumes, and lane geometry.

There are a total of eight warrants that evaluate the need for a traffic signal based on many reasons including excessive delay to minor street traffic, large pedestrian volumes, a school crossing, signal progression, accident experience and excessive delay during the peak hour. When the 85th percentile speed of traffic on the major street exceeds 40 mph in either an urban or rural area, or when the intersection lies within the built-up area of an isolated community having a population of less than 10,000, the location is considered rural. See below for justification for roadway categorization:

1. Main Street is posted 45 mph to the south of the project limits, and speed surveys completed by the County on March 8, 2011 and May 3, 2011 indicate that the observed speeds are consistent with this posting. (**See Appendix J**)
2. The study location is considered to be within an isolated community with a population of less than 10,000.

The rural designation for signal warrants is meant to lower the traffic volume requirements for signalization in those areas were a significant amount of traffic will be entering the main street from minor streets in an otherwise rural area. At the ramp intersections, this situation is present. As such, the "rural" designation has been chosen for traffic signal warrant analysis. However, for comparison, an analysis was also completed for the "urban" warrants. See **Table 9** for a summary of the traffic signal warrant analysis and **Appendix F** for the signal warrant figures and tables.

As shown in the table below, under existing traffic conditions the only signal warrant which is met is Warrant #2, (Four-Hour Vehicular Volume), at the northbound ramps intersection with Main Street.

TABLE 9
TRAFFIC SIGNAL WARRANT SUMMARY

Traffic Signal Warrant	Main St. / NB 101 Ramps		Main St. / SB 101 Ramps	
	Rural[3]	Urban[3]	Rural[3]	Urban[3]
#1: 8-Hour Volumes	N/A[1]	N/A[1]	N/A[1]	N/A[1]
#2: 4-Hour Volumes	**Yes**	No	No	No
#3: Peak Hour	No	No	No	No
- Part A	No	No	No	No
- Part B	No	No	No	No
#4: Pedestrian Volume	No[2]	No[2]	No[2]	No[2]
#5: School Crossing	No	No	No	No
#6: Coordinated Signal System	No	No	No	No
#7: Crash Experience	No	No	No	No
#8: Roadway Network	No	No	No	No

[1]No 8-hour traffic counts have been completed at the study intersections.
[2]No observed pedestrian traffic during any field visits.
[3]See paragraph above for description of rural and urban designation. (Applicable for warrant #2 and #3)

10.0 SIGNALIZED INTERSECTING LANE VEHICLES (ILV) CAPACITY ANALYSIS

In addition to an analysis of traffic signal warrants, Caltrans utilizes the Signalized Intersection Capacity method in the Highway Design Manual to determine the traffic volume to intersection capacity relationship. The Intersection Lane Vehicles (ILV) method is a rough approximation of the functionality of a signalized intersection given traffic volumes. In general, with an ILV/hr of less than 1200, the signalized intersection would be expected to operate with minimal delay. (See **Table 10** ILV characteristics) Both intersections, during both AM and PM peak hours, are expected to have an ILV/hr of considerably less than 1200. (See **Appendix G** for the ILV method calculation sheets)

TABLE 10
ILV TRAFFIC FLOW CHARACTERISTICS

ILV/hr	Description
< 1200	Stable flow with slight, but acceptable delay. Occasional signal loading may develop. Free midblock operations.
1200-1500	Unstable flow with considerable delays possible. Some vehicles occasionally wait two or more cycles to pass through the intersection. Continuous backup occurs on some approaches.
> 1500	Stop-and-go operation with severe delay and heavy congestion. Traffic volume is limited by maximum discharge rates of each phase. Continuous backup in varying degrees occurs on all approaches. Where downstream capacity is restrictive, mainline congestion can impede orderly discharge through the intersection.

Source: Highway Design Manual, Table 406, California Department of Transportation.

APPENDIX A

TRAFFIC COUNT DATA

Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For: Michelle Olmsted-Matson, PE
County of San Luis Obispo
Department of Public Works
(805) 788-2830

LOCATION Main Street/Theater Drive/US 101 SB
COUNTY San Luis Obispo
COLLECTION DATE 9/16/2009

LATITUDE
LONGITUDE
WEATHER Clear

	Northbound (Theater Dr)					Southbound (Theater Dr)					Southbound (SB 101 OFF)						Eastbound					Westbound				
Time	L	T	R(Main)	R(SB 101)	Trucks	L	L(SB 101)	T	R	Trucks	L	T(SB 101)	R (Theater S)	R (Main)	R(Theater N)	Trucks	L	T(Main)	T(SB 101)	R(Theater)	Trucks	L(SB 101)	L(Theater)	T	R	Trucks
7:00 AM - 7:15 AM	0	0	0	0	0	15	13	0	1	2	27	0	0	0	3	1	0	3	0	0	1	17	0	0	25	7
7:15 AM - 7:30 AM	0	0	1	1	1	26	35	0	2	1	41	0	0	0	4	1	1	1	5	0	2	19	0	1	34	4
7:30 AM - 7:45 AM	0	0	1	1	1	31	28	0	4	3	37	0	0	0	2	2	1	3	8	0	4	17	0	6	38	6
7:45 AM - 8:00 AM	0	0	0	1	0	33	26	0	0	1	47	0	1	1	4	5	2	1	6	0	3	20	0	4	50	9
8:00 AM - 8:15 AM	0	2	0	0	1	22	26	1	2	0	41	0	1	0	1	4	1	0	4	0	0	23	0	8	60	9
8:15 AM - 8:30 AM	0	0	1	0	1	23	26	0	0	0	26	0	1	0	6	2	1	2	0	0	0	24	0	3	35	4
8:30 AM - 8:45 AM	0	0	1	0	0	11	23	0	2	3	19	0	0	0	4	4	1	1	2	0	1	17	0	0	52	7
8:45 AM - 9:00 AM	0	0	0	3	0	13	31	0	1	0	31	0	0	0	4	2	3	4	4	0	3	18	0	5	36	9
TOTAL	**0**	**2**	**4**	**6**	**4**	**174**	**208**	**1**	**12**	**10**	**269**	**0**	**3**	**1**	**28**	**21**	**10**	**15**	**29**	**0**	**14**	**155**	**0**	**27**	**330**	**55**

	Northbound (Theater Dr)					Southbound (Theater Dr)					Southbound (SB 101 OFF)						Eastbound					Westbound				
Time	L	T	R(Main)	R(SB 101)	Trucks	L	L(SB 101)	T	R	Trucks	L	T(SB 101)	R (Theater S)	R (Main)	R(Theater N)	Trucks	L	T(Main)	T(SB 101)	R(Theater)	Trucks	L(SB 101)	L(Theater)	T	R	Trucks
3:00 PM - 3:15 PM	0	0	2	1	0	33	46	0	2	2	32	0	0	0	6	3	1	0	2	0	0	41	0	4	73	6
3:15 PM - 3:30 PM	0	1	1	1	0	21	34	0	1	2	26	0	2	1	1	0	2	2	1	0	0	31	0	1	72	3
3:30 PM - 3:45 PM	0	0	1	0	1	36	47	0	1	2	28	0	0	0	9	2	0	1	6	0	0	37	0	5	68	3
3:45 PM - 4:00 PM	0	0	1	3	0	22	55	1	1	2	23	0	1	1	2	2	3	3	1	0	0	49	0	8	52	3
4:00 PM - 4:15 PM	0	0	0	4	0	17	59	0	1	3	31	0	2	0	4	1	1	4	7	0	0	20	0	7	68	0
4:15 PM - 4:30 PM	0	0	0	1	0	20	45	0	1	0	29	0	1	0	4	0	1	4	11	0	0	33	0	11	77	5
4:30 PM - 4:45 PM	0	0	1	0	0	26	45	1	5	1	31	0	1	0	4	1	3	1	5	0	0	31	0	5	57	5
4:45 PM - 5:00 PM	0	0	1	3	0	25	66	1	0	1	31	0	0	0	3	0	0	3	1	0	0	24	0	0	58	2
5:00 PM - 5:15 PM	0	2	2	2	0	41	47	1	0	0	22	0	1	0	5	3	0	3	5	0	0	34	0	1	80	4
5:15 PM - 5:30 PM	0	0	1	0	0	46	32	0	0	0	23	0	0	0	4	1	0	1	2	0	0	14	0	0	76	2
5:30 PM - 5:45 PM	0	0	0	0	0	27	53	0	0	1	27	0	0	0	5	3	0	0	0	0	0	16	0	0	65	2
5:45 PM - 6:00 PM	0	0	0	1	0	29	53	1	0	2	25	0	0	0	3	1	0	1	0	0	0	17	0	0	72	3
TOTAL	**0**	**3**	**10**	**16**	**1**	**343**	**582**	**5**	**12**	**16**	**328**	**0**	**8**	**2**	**50**	**17**	**11**	**23**	**41**	**0**	**0**	**347**	**0**	**42**	**818**	**38**

Peak Hour																										
7:15 AM - 8:15 AM	**0**	**2**	**2**	**3**	**3**	**112**	**115**	**1**	**8**	**5**	**166**	**0**	**2**	**1**	**11**	**12**	**5**	**5**	**23**	**0**	**9**	**79**	**0**	**19**	**182**	**28**
3:30 PM - 4:30 PM	**0**	**0**	**2**	**8**	**1**	**95**	**206**	**1**	**4**	**7**	**111**	**0**	**4**	**1**	**19**	**5**	**5**	**12**	**25**	**0**	**0**	**139**	**0**	**31**	**265**	**11**

	AM	PM
PHF	0.94	0.97
Trucks	7.74%	2.91%

Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:

Michelle Olmsted-Matson, PE
County of San Luis Obispo
Department of Public Works
(805) 788-2830

LOCATION Main Street/Ramada Drive/US 101 NB
COUNTY San Luis Obispo
COLLECTION DATE 9/16/2009

LATITUDE
LONGITUDE
WEATHER Clear

	Northbound					Southbound				Eastbound				Westbound			
Time	**L**	**T**	**R(Ramada)**	**R(Main)**	**Trucks**	**L**	**R(Main)**	**R(101N)**	**Trucks**	**L(101N)**	**L(Ramada)**	**T**	**Trucks**	**T**	**R(101N)**	**R(Ramada)**	**Trucks**
7:00 AM - 7:15 AM	17	0	11	3	1	4	1	13	7	13	12	17	3	21	3	21	10
7:15 AM - 7:30 AM	22	0	21	0	3	10	2	15	7	22	12	35	6	33	3	43	9
7:30 AM - 7:45 AM	33	0	18	5	11	10	4	10	8	26	8	43	11	42	3	26	5
7:45 AM - 8:00 AM	38	0	18	13	6	9	2	14	10	40	10	28	8	51	4	36	11
8:00 AM - 8:15 AM	21	0	11	8	6	11	1	13	3	8	14	47	9	49	6	17	8
8:15 AM - 8:30 AM	26	0	18	4	4	3	0	22	6	1	23	31	4	46	8	14	2
8:30 AM - 8:45 AM	30	0	27	6	8	2	2	16	7	4	0	27	6	37	11	4	1
8:45 AM - 9:00 AM	21	0	10	1	1	4	0	6	1	2	16	34	1	12	3	8	0
TOTAL	**208**	**0**	**134**	**40**	**40**	**53**	**12**	**109**	**49**	**116**	**95**	**262**	**48**	**291**	**41**	**169**	**46**

	Northbound					Southbound				Eastbound				Westbound			
Time	**L**	**T**	**R(Ramada)**	**R(Main)**	**Trucks**	**L**	**R(Main)**	**R(101N)**	**Trucks**	**L(101N)**	**L(Ramada)**	**T**	**Trucks**	**T**	**R(101N)**	**R(Ramada)**	**Trucks**
3:00 PM - 3:15 PM	60	0	12	8	5	20	7	36	7	7	13	49	2	69	17	15	1
3:15 PM - 3:30 PM	53	2	14	7	7	23	5	34	3	7	10	30	2	55	16	4	1
3:30 PM - 3:45 PM	47	0	21	2	4	12	10	31	7	7	13	41	3	48	20	9	1
3:45 PM - 4:00 PM	54	1	20	1	1	26	11	24	8	4	12	34	3	49	8	17	0
4:00 PM - 4:15 PM	45	0	8	11	4	21	6	30	3	10	11	25	4	56	17	10	0
4:15 PM - 4:30 PM	48	0	9	8	3	14	6	25	2	9	8	30	2	38	14	5	0
4:30 PM - 4:45 PM	64	1	11	5	7	14	14	32	4	6	9	50	0	42	10	11	1
4:45 PM - 5:00 PM	41	0	15	1	3	15	5	35	2	7	6	44	3	45	17	9	0
5:00 PM - 5:15 PM	35	0	5	7	2	12	6	28	3	10	9	55	0	43	9	6	0
5:15 PM - 5:30 PM	49	0	19	7	0	9	5	29	5	3	11	46	2	52	20	6	0
5:30 PM - 5:45 PM	66	1	7	9	2	9	0	18	0	4	13	35	2	35	14	5	0
5:45 PM - 6:00 PM	48	0	7	5	2	12	3	13	1	4	13	33	2	30	13	6	0
TOTAL	**610**	**5**	**148**	**71**	**40**	**187**	**78**	**335**	**45**	**78**	**128**	**472**	**25**	**562**	**175**	**103**	**4**

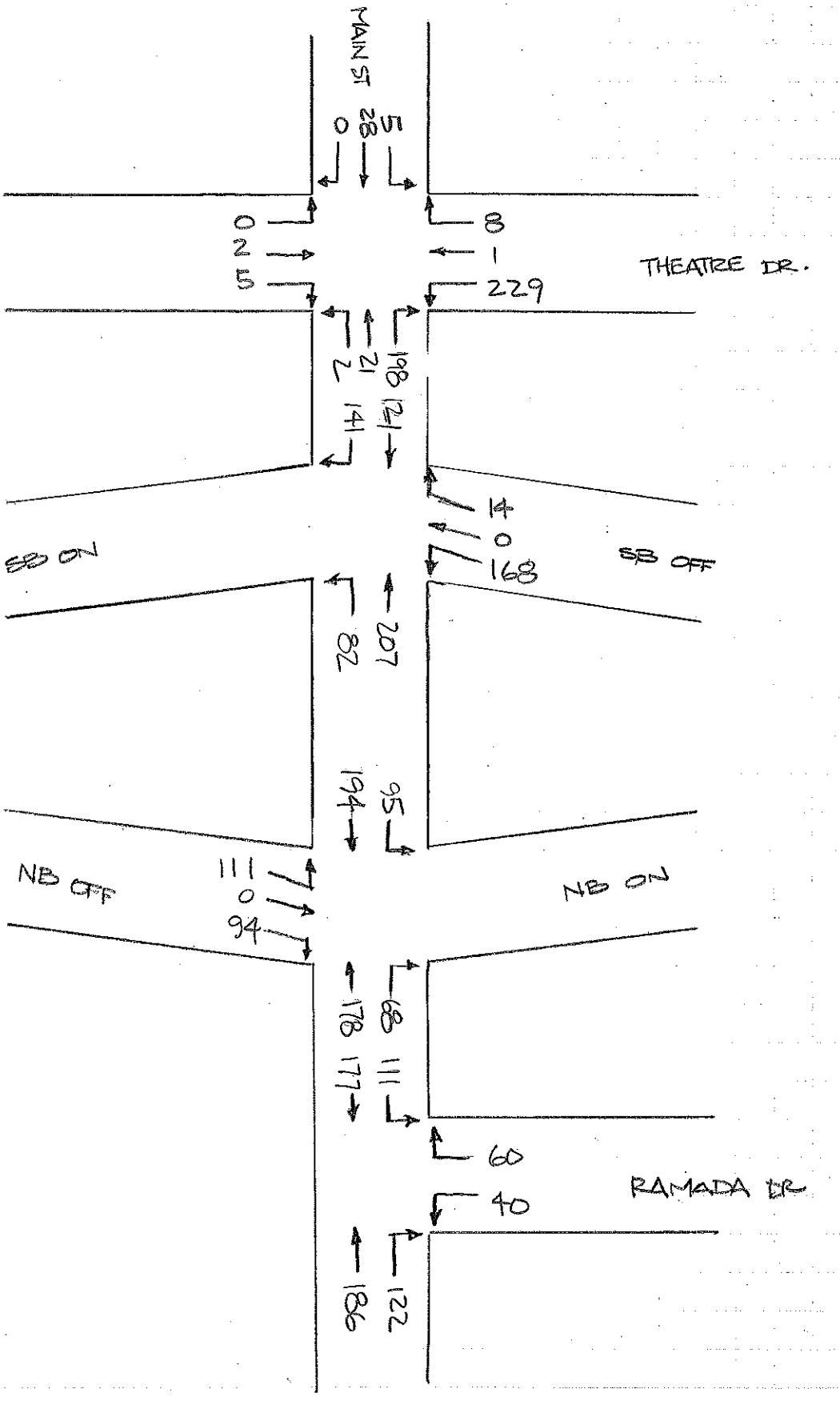
Peak Hour																	
7:15 AM - 8:15 AM	**114**	**0**	**68**	**26**	**26**	**40**	**9**	**52**	**28**	**96**	**44**	**153**	**34**	**175**	**16**	**122**	**33**
3:00 PM - 4:00 PM	**214**	**3**	**67**	**18**	**17**	**81**	**33**	**125**	**25**	**25**	**48**	**154**	**10**	**221**	**61**	**45**	**3**

	AM	PM
PHF	0.87	0.87
Trucks	13.22%	5.02%

RICK ENGINEERING COMPANY™
711 Tank Farm Road, Suite 110
San Luis Obispo, CA 93401
Tel: (805) 544-0707
Fax: (805) 544-2052

Date
Job No.
Page
Done By
Checked By

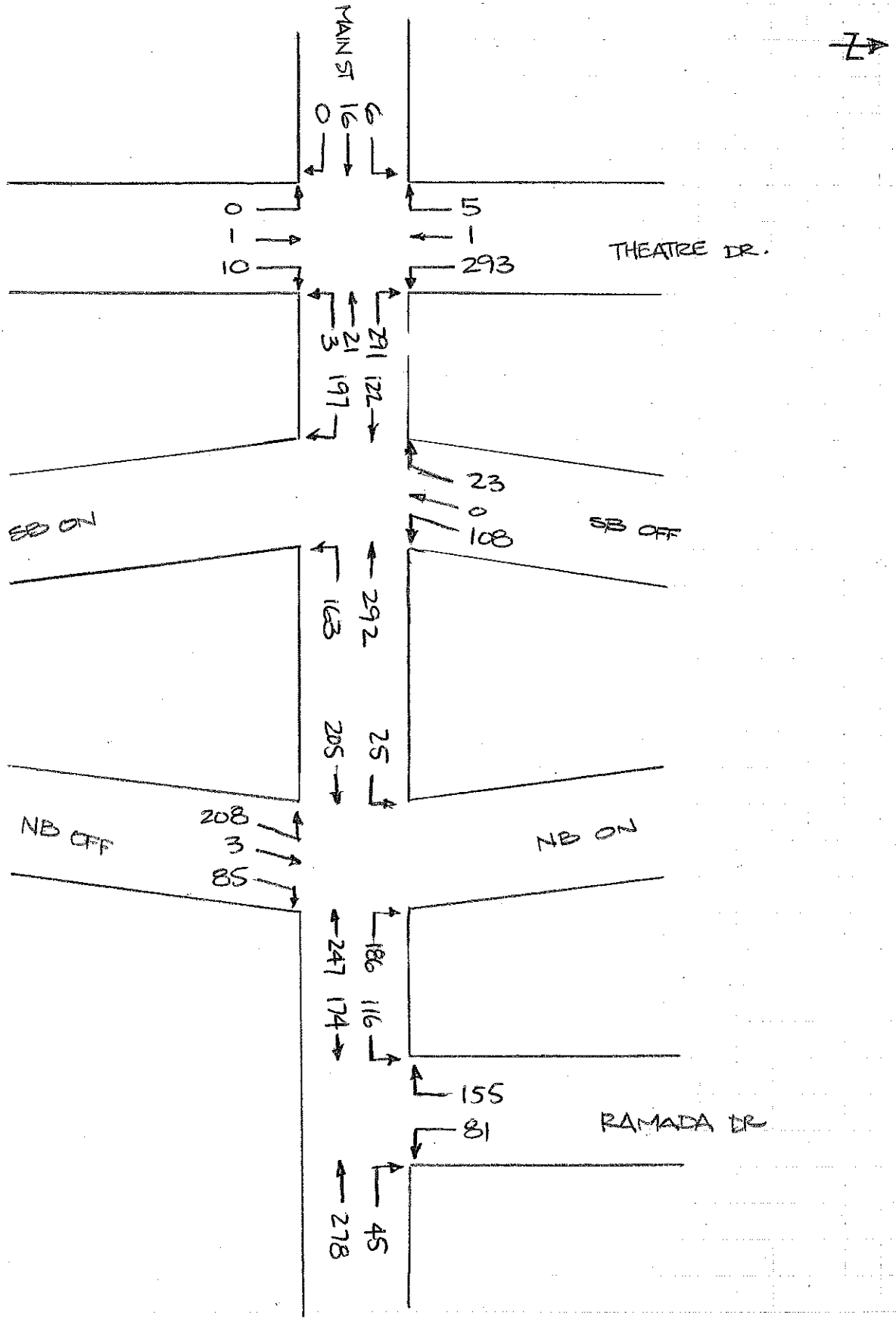
ADJUSTED AM PEAK HOUR



RICK ENGINEERING COMPANY™
711 Tank Farm Road, Suite 110
San Luis Obispo, CA 93401
Tel: (805) 544-0707
Fax: (805) 544-2052

Date
Job No.
Page
Done By
Checked By

ADJUSTED PM PEAK HOUR

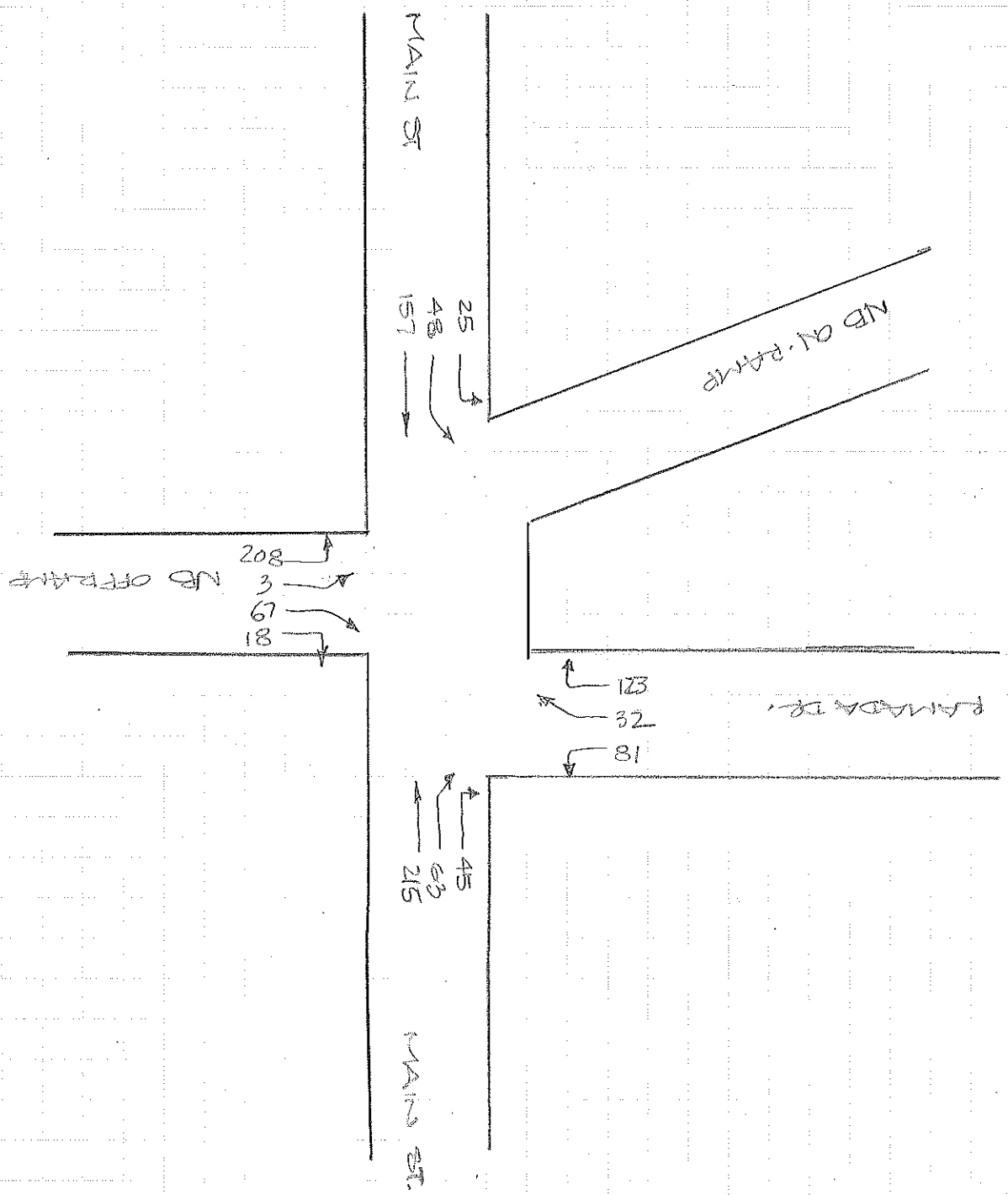


RICK ENGINEERING COMPANY™
711 Tank Farm Road, Suite 110
San Luis Obispo, CA 93401

Tel: (805) 544-0707
Fax: (805) 544-2052

ADD. PM PEAK HOUR (STM #7 & #8)

Date
Job No.
Page
Done By
Checked By



9:18:11 PRINT FILE FOR RAMP AADT 2009 CALTRANS RAMP DATA

05-SLO-101

P POST P MILE	S DESCRIPTION	2000 ADT	2001 ADT	2002 ADT	2003 ADT	2004 ADT	2005 ADT	2006 ADT	2007 ADT	2008 ADT	2009 ADT
049.120	SAN RAMON NB OFF		850			860			1280		
049.190	SAN RAMON SB ON		750			750			1040		
049.250	SAN RAMON NB ON		2600			1800			2320		
049.300	SAN RAMON SB OFF		1250			1430			1870		
050.480	VINEYARD SB ON		3500			3930			4620		
050.510	VINEYARD NB OFF		3700			4030			4810		
050.630	VINEYARD SB OFF		1050			1480			1560		
050.770	VINEYARD NB ON		1200			1400			1760		
051.310	LAS TABLAS SB ON		2700			3180			3530		
051.350	LAS TABLAS NB OFF		2950			3150			3520		
051.560	LAS TABLAS SB OFF		2850			3400			3260		
051.600	LAS TABLAS NB ON		3000			3530			3260		
052.340	MAIN SB ON		3000			3800			4270	+42%	
052.350	MAIN NB OFF		2750			3430			4270	+55%	
052.590	MAIN NB ON		1800			1900			1860		
052.620	MAIN SB OFF		1950			2000			2140		
053.956	S JCT 101/46 SB ON					1130				1100	
053.980	S JCT 101/46 NB OFF		1500			1800				2350	
054.260	S JCT 101/46 SB OFF		5350			6550				7000	
054.270	S JCT 101/46 NB ON		5300			6530				6700	
055.288	S PASO ROBLES NB OFF		11200							12000	
055.650	SO PASO ROBLES NB OFF RAMP					12900					

2009 CALTRANS VOLUMES

						BACK PEAK HOUR	BACK PEAK MONTH	BACK AADT	AHEAD PEAK HOUR	AHEAD PEAK MONTH	AHEAD AADT
05	101	SLO		12.521	ARROYO GRANDE, BRIDGE ST INTERCHANGE	6,000	55,000	51,000	5,800	52,000	48,000
05	101	SLO		13.173	ARROYO GRANDE, JCT. RTE. 227 N, GRAND AVE	5,800	52,000	48,000	6,500	57,000	53,000
05	101	SLO		13.747	ARROYO GRANDE, BRISCO RD INTERCHANGE	6,500	57,000	53,000	6,900	60,000	56,000
05	101	SLO		14.613	PISMO BEACH, OAK PARK RD INTERCHANGE	6,900	60,000	56,000	8,400	72,000	67,000
05	101	SLO		15.579	PISMO BEACH, PISMO OAKS INTERCHANGE	8,400	72,000	67,000	8,400	71,000	66,000
05	101	SLO		16.398	PISMO BEACH, SOUTH PISMO BEACH (VILLA CREEK)	8,400	71,000	66,000	7,100	60,000	56,000
05	101	SLO		17.756	PISMO BEACH, JCT. RTE. 1 SOUTH	7,100	60,000	56,000	7,300	63,000	58,500
05	101	SLO	R	19.812	NORTH SHELL BEACH INTERCHANGE	7,300	63,000	58,500	7,400	70,000	64,000
05	101	SLO	R	21.105	AVILA RD INTERCHANGE	7,400	70,000	64,000	7,000	68,000	62,000
05	101	SLO	R	22.289	NORTH AVILA RD INTERCHANGE	7,000	68,000	62,000	7,000	71,000	65,000
05	101	SLO	R	24.296	SANTA FE	7,000	71,000	65,000	6,200	68,000	60,000
05	101	SLO		25.911	SAN LUIS OBISPO, LOS OSOS RD	6,200	68,000	60,000	5,700	62,000	56,000
05	101	SLO		27.501	SAN LUIS OBISPO, MADONNA RD	5,700	62,000	56,000	6,300	67,000	62,000
05	101	SLO		28.088	SAN LUIS OBISPO, JCT. RTE. 227, MARCH ST	6,300	67,000	62,000	5,600	60,000	55,000
05	101	SLO		29.067	SAN LUIS OBISPO, JCT. RTE. 1 NORTH	5,600	60,000	55,000	4,700	49,000	45,000
05	101	SLO		29.375	SAN LUIS OBISPO, CALIFORNIA BLVD INTERCHANGE	4,700	49,000	45,000	4,200	44,000	40,000
05	101	SLO		29.767	SAN LUIS OBISPO, GRAND AVE INTERCHANGE	4,200	44,000	40,000	3,900	40,000	37,000
05	101	SLO		29.985	SAN LUIS OBISPO, BUENA VISTA INTERCHANGE	3,900	40,000	37,000	4,600	48,000	43,000
05	101	SLO		30.36	SAN LUIS OBISPO, NORTH CITY LIMITS	4,600	48,000	43,000	4,700	48,000	43,000
05	101	SLO		37.863	JCT. RTE. 58 EAST, SANTA MARGARITA	4,700	48,000	43,000	4,600	47,000	42,000
05	101	SLO		42.268	SANTA BARBARA RD INTERCHANGE	4,600	47,000	42,000	4,600	48,000	43,000
05	101	SLO		44.008	SANTA ROSA RD INTERCHANGE	4,600	48,000	43,000	5,200	54,000	49,000
05	101	SLO		44.841	CURBARIL AVE INTERCHANGE	5,200	54,000	49,000	5,600	58,000	53,000
05	101	SLO		45.572	ATASCADERO, JCT. RTE. 41	5,400	58,000	53,000	6,200	66,000	60,000
05	101	SLO		45.957	TRAFFIC WAY INTERCHANGE	6,200	66,000	60,000	6,200	66,000	60,000
05	101	SLO		46.867	SAN ANSELMO RD INTERCHANGE	6,200	66,000	60,000	5,900	63,000	58,000
05	101	SLO		48.331	DEL RIO RD INTERCHANGE	5,900	63,000	58,000	6,100	65,000	60,000
05	101	SLO		49.319	SAN RAMON RD INTERCHANGE	6,100	65,000	60,000	6,300	67,000	62,000
05	101	SLO		50.644	VINEYARD DR INTERCHANGE	6,300	67,000	62,000	5,800	61,000	57,000
05	101	SLO		51.447	LAS TABLAS AVE INTERCHANGE	5,800	61,000	57,000	5,800	60,000	57,000
05	101	SLO		52.44	TEMPLETON, MAIN ST	5,800	60,000	57,000	5,700	58,000	54,000
05	101	SLO		54.116	JCT. RTE. 46 WEST	5,700	58,000	54,000	6,400	63,000	61,000
05	101	SLO		55.674	SOUTH PASO ROBLES INTERCHANGE	6,400	63,000	61,000	4,000	38,000	37,000
05	101	SLO		56.88	PASO ROBLES, 13TH ST INTERCHANGE	4,000	38,000	37,000	3,300	31,000	30,000
05	101	SLO		57.92	PASO ROBLES, JCT. RTE. 46 EAST	3,300	31,000	30,000	2,600	24,000	23,000
05	101	SLO		58.762	PASO ROBLES, NORTH PASO ROBLES INTERCHANGE	2,600	24,000	23,000	2,600	25,000	23,000
05	101	SLO		60.98	HUEY-EXLINE RD	2,600	25,000	23,000	2,300	22,000	20,000
05	101	SLO		63.735	SAN MARCOS RD	2,300	22,000	20,000	2,200	21,000	19,000
05	101	SLO		65.082	SOUTH SAN MIGUEL INTERCHANGE	2,200	21,000	19,000	2,000	20,000	17,500
05	101	SLO		65.557	SAN MIGUEL, 10TH ST INTERCHANGE	2,000	20,000	17,500	2,000	20,000	17,000
05	101	SLO		67.228	NORTH SAN MIGUEL INTERCHANGE	2,000	20,000	17,000	2,000	20,000	17,000
05	101	SLO	R	67.712	SOUTH CAMP ROBERTS INTERCHANGE	2,000	20,000	17,000	2,000	21,000	17,400
05	101	SLO	R	69.322	SAN LUIS OBISPO/MONTEREY COUNTY LINE	2,000	21,000	17,400			
05	101	MON	R	0	SAN LUIS OBISPO/MONTEREY COUNTY LINE				2,200	19,200	17,400
05	101	MON	R	0.836	CAMP ROBERTS INTERCHANGE	2,200	19,200	17,400	2,200	21,900	16,700
05	101	MON	R	2.153	EAST GARRISON INTERCHANGE	2,200	21,900	16,700	2,100	21,500	16,200
05	101	MON	R	7.937	NORTH BRADLEY INTERCHANGE	2,100	21,500	16,200	2,050	21,000	15,600
05	101	MON	R	9.667	JOLON RD	2,050	21,000	15,600	1,100	18,500	14,900
05	101	MON	R	15.465	SAN BERNARDO INTERCHANGE	1,100	18,500	14,900	1,500	20,100	14,300

Location No	Road Name	Nearest Cross Stree	Date	A D T	AM Peak	AM Peak Volume	PM Peak	PM Peak Volume	Peak Day Volume	
2020	Main St (Cambria)	E of Highway 1	14-Aug-07	3771	1100	344	1400	359	Wed	3850
2100	Main St (Cambria)	E of Windsor Blvd	17-Jun-10	6041	1100	497	1400	668	Fri	7050
2100	Main St (Cambria)	E of Windsor Blvd	14-Aug-07	6858	1100	578	1200	595	Tues	6980
2460	Main St (Cambria)	W of Cambria Dr	14-Aug-07	8855	1100	721	1200	772	Thurs	8985
2500	Main St (Cambria)	W of Santa Rosa Creek Rd	14-Aug-07	3545	1100	299	1200	369	Thurs	3666
2510	Main St (Cambria)	E of Santa Rosa Creek Rd	14-Aug-07	3509	1100	303	1500	355	Wed	3577
2520	Main St (Cambria)	E of Burton Dr	21-Aug-07	6483	1100	576	1200	601	Wed	6681
6200	Main St (Cambria)	N of Eton Rd	09-Sep-08	3385	800	375	1500	348	Thurs	3538
6800	Main St (Cambria)	E of Pineknolls Dr	30-Jul-06	10852	1130	994	1545	1257	Fri	12269
6800	Main St (Cambria)	E of Pineknolls Dr	12-Aug-07	10884	1100	1006	1500	1212	Fri	12202
6800	Main St (Cambria)	E of Pineknolls Dr.	07-Sep-08	7358	800	773	1500	903	Fri	8433
6800	Main St (Cambria)	E of Pine Knolls Dr	17-Jun-10	7483	1100	680	1500	924	Fri	8903
6800	Main St (Cambria)	E of Pineknolls Dr.	13-Sep-09	6970	1100	590	1500	892	Fri	8672
6810	Main St (Cambria)	W of Burton Dr	14-Aug-07	7780	1100	729	1200	769	Tues	7853
8611	Main St (Cambria)	0.20 mi N of Eton Rd	12-Aug-07	1651	1100	96	1800	168	Thurs	1716
5390	Main St (Templeton)	N of Creekside Ranch	07-Jun-06	7700	700	667	1700	587	Wed	7700
5390	Main St (Templeton)	S of Ramada Dr	20-Sep-09	6836	1100	536	1500	717	Tues	7306
5750	Main St (Templeton)	S of Vineyard Dr	11-Sep-07	2687	700	697	1500	382	Wed	2988
5770	Main St (Templeton)	N of Vineyard Dr	15-Aug-06	6737	1115	596	1645	613	Thurs	6881
5770	Main St (Templeton)	N of Vineyard Dr	23-Sep-08	6479	800	616	1400	700	Wed	6608
5940	Main St (Templeton)	N of Second St	11-Sep-07	6874	700	529	1700	658	Wed	7229
7260	Mallagh St	N of Tefft St	26-Aug-08	898	800	143	1700	88	Thurs	962
7180	Mary Ave	N of Tefft St	30-Aug-09	4501	1100	330	1600	429	Tues	4600
7200	Mary Ave	S of Tefft St	03-Aug-09	2169	700	220	1700	242	Fri	2536
7210	Mary Ave	N of Hill St	06-Jun-10	1397	800	178	1200	176	Fri	1638
1150	McMillan Canyon Rd	S of Highway 46	09-Sep-08	2086	600	294	1600	156	Tues	2239
7520	McMillan Canyon Rd	N of SR (Highway) 46	08-Aug-06	252	900	32	1230	23	Thurs	292

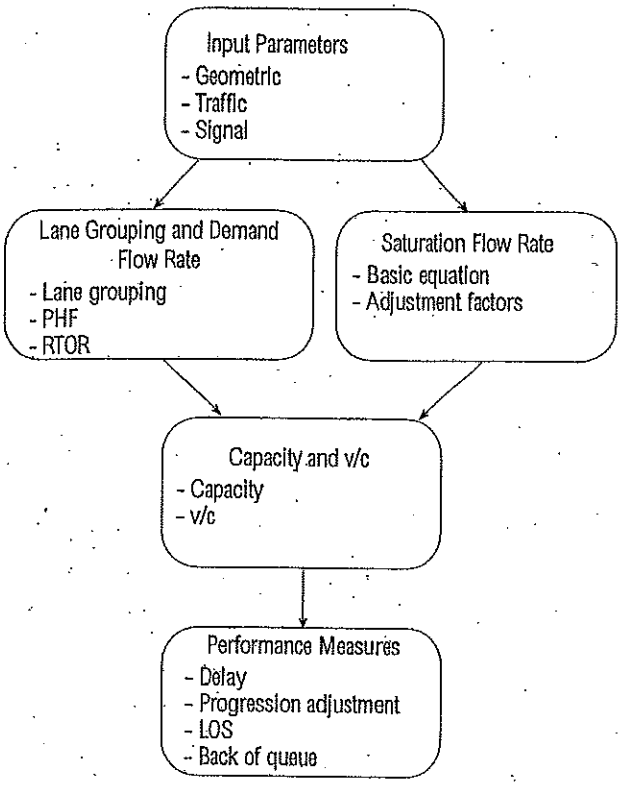
Location No	Road Name	Nearest Cross Stree	Date	A D T	AM Peak	AM Peak Volume	PM Peak	PM Peak Volume	Peak Day Volume	
7000	Pomeroy Rd	N of Willow Rd	06-Jun-06	2135	700	242	1700	219	Tues	2135
9720	Pomeroy Rd	N of Sandydale Dr	06-Jun-06	11040	800	698	500	920	Tues	11040
5070	Pozo Rd	E of Calf Canyon Highway	25-Jul-06	1022	930	91	1600	97	Wed	1076
5070	Pozo Rd	E of Calf Canyon Highway	17-Jun-10	1112	1100	133	1600	124	Sat	1533
6880	Pozo Rd	W of Carissa Highway	01-Aug-06	47	1030	9	1445	8	Thurs	54
6880	Pozo Rd	N of Santa Margarita Rd	01-Aug-06	787	1115	66	1730	80	Wed	805
3580	Prefumo Canyon Rd	1.5 miles W of Los Osos Valley Rd	11-Sep-07	298	700	30	1700	29	Thurs	323
3580	Prefumo Canyon Rd	1.5 miles W of Los Osos Valley Rd	17-Jun-10	300	1100	30	1400	43	Sun	332
2000	Price Canyon Rd	E of Lemoore St	21-Aug-07	8416	700	686	1700	814	Thurs	8425
6560	Price Canyon Rd	S of Highway 227	12-Aug-07	7256	700	677	1700	821	Wed	8525
6560	Price Canyon Rd	S of Highway 227	17-Jun-10	6964	700	674	1700	805	Thurs	8222
6560	Price Canyon Rd	S of Highway 227	13-Sep-09	6902	800	672	1700	810	Fri	8731
6560	Price Canyon Rd	W of Ormande Rd	25-Jul-06	8153	715	735	1630	854	Wed	8234
6560	Price Canyon Rd	S of Highway 227	07-Sep-08	6652	800	700	1700	792	Fri	7717
6560	Price Canyon Rd	S of Highway 227	30-Jul-06	7104	715	743	1630	852	Thurs	8308
2380	Price St (Nipomo)	E of Thompson Ave	28-Aug-07	1635	800	321	1500	245	Thurs	1882
4400	Printz Rd	W of Highway 227	15-Aug-06	1020	1145	95	1700	97	Wed	1049
5000	Quintana Rd	W of Chorro Creek Rd	26-Sep-06	434	930	44	1400	52	Tues	447
7050	Railroad St	S of Air Park Dr	28-Aug-07	828	1100	66	1200	79	Tues	843
1350	Ramada Dr	N of Main St	28-Aug-07	4673	1000	416	1400	467	Tues	4727
1350	Ramada Dr	N of Main St	15-Sep-09	4835	1000	436	1200	444	Wed	5066
5400	Ramada Dr	S of Highway 46	23-May-10	4115	1100	452	1200	514	Fri	5266
5400	Ramada Dr	S of Highway 46 W	08-Jun-06	3913	1100	348	1600	359	Wed	3913
5400	Ramada Dr	S of Highway 46	13-Sep-09	3378	1100	387	1200	413	TuesTues	4322
5400	Ramada Dr	S of Highway 46	30-Jul-06	4014	1145	565	1200	520	Mon	5133
5400	Ramada Dr	S of Highway 46	07-Sep-08	3907	1100	446	1200	475	Thurs	4943
5400	Ramada Dr	S of Highway 46	19-Aug-07	3769	1100	472	1400	450	Thurs	4713

Location No	Road Name	Nearest Cross Stree	Date	A D T	AM Peak	AM Peak Volume	PM Peak	PM Peak Volume	Peak Day Volume	
3200	Tenth St (Los Osos)	N of LOVR	06-Jun-10	3293	1000	291	1400	338	Fri	3708
1260	Tenth St (San Miguel)	W of Highway 101	15-Aug-06	517	645	57	1600	60	Tues	544
1480	Tenth St (San Miguel)	E of K St	28-Aug-07	1198	1100	83	1700	117	Tues	1320
1480	Tenth St (San Miguel)	E of K St	06-Jun-10	1070	1100	110	1500	103	Fri	1193
5030	Theater Dr	S of Cemetery Rd	11-Sep-07	7601	1100	580	1300	730	Wed	7663
5030	Theater Dr	S of Cemetery Rd	15-Sep-09	7857	1100	639	1500	744	Tues	7975
4520	Thirteenth St (Oceano)	S of The Pike	17-Jun-10	4985	1100	378	1600	485	Fri	5523
4810	Thirteenth St (Oceano)	N of Highway 1	15-Aug-06	3058	1145	230	1630	288	Tues	3161
4290	Thompson Ave	N of Highway 166	06-Jun-06	2589	700	322	1700	286	Tues	2589
4290	Thompson Ave	N of Hwy 166	06-Jun-10	2698	700	246	1600	337	Fri	3305
4310	Thompson Ave	E of northbound Highway 101	06-Jun-10	4834	700	571	1500	657	Fri	5914
4310	Thompson Ave	E of northbound Highway 101	06-Jun-06	4688	700	674	1700	556	Tues	4688
4530	Thompson Ave	N of Rancho Rd	28-Aug-07	3260	700	309	1700	315	Thurs	3367
4660	Thompson Ave	N of Tefft St	30-Aug-09	5834	700	935	1200	661	Fri	7396
8600	Thompson Ave	150' N of Sheehy Rd	15-Oct-06	4691	700	588	1700	425	Thurs	4999
3820	Tiffany Ranch Rd	W of Orcutt Rd	25-Jul-06	858	715	103	1630	98	Wed	875
1270	Toro Creek Rd	N of Highway 41	25-Jul-06	341	800	33	1645	35	Wed	346
2750	Toro Creek Rd	E of Highway 1	14-Aug-07	247	700	29	1700	26	Tues	267
8110	Truesdale Rd	S of Clark Rd	08-Aug-06	208	930	35	1445	24	Tues	247
3270	Turri Rd	N of Los Osos Valley Rd	25-Jul-06	414	1000	49	1445	50	Tues	449
4460	Twenty-First St (Oceano)	N of SR-1 (Highway 1)	25-Jul-06	851	1045	50	1715	107	Wed	874
9380	Twenty-First St (Oceano)	N of Paso Robles St	28-Aug-07	987	800	61	1400	105	Thurs	1018
7800	Twenty-Second St (Oceano)	S of the Pike	28-Aug-07	3002	800	204	1700	284	Thurs	3043
7800	Twenty-Second St (Oceano)	S of the Pike	26-Aug-08	2948	800	173	1700	283	Tues	2956
4090	Twenty-Second St (Oceano)	N of Highway 1	10-Oct-06	1216	1130	96	1645	142	Thurs	1259
9180	Twenty-Third St (Oceano)	N of Paso Robles St	03-Oct-06	1394	800	151	1715	153	Thurs	1430
1080	Union Rd	S of Highway 46	07-Jun-06	5032	700	407	1700	435	Wed	5032

APPENDIX B

2000 HCM LOS METHODOLOGY

EXHIBIT 16-1. SIGNALIZED INTERSECTION METHODOLOGY



LOS

The average control delay per vehicle is estimated for each lane group and aggregated for each approach and for the intersection as a whole. LOS is directly related to the control delay value. The criteria are listed in Exhibit 16-2.

LOS criteria

EXHIBIT 16-2. LOS CRITERIA FOR SIGNALIZED INTERSECTIONS

LOS	Control Delay per Vehicle (s/veh)
A	≤ 10
B	> 10–20
C	> 20–35
D	> 35–55
E	> 55–80
F	> 80

EXHIBIT 17-1. TWSC UNSIGNALIZED INTERSECTION METHODOLOGY

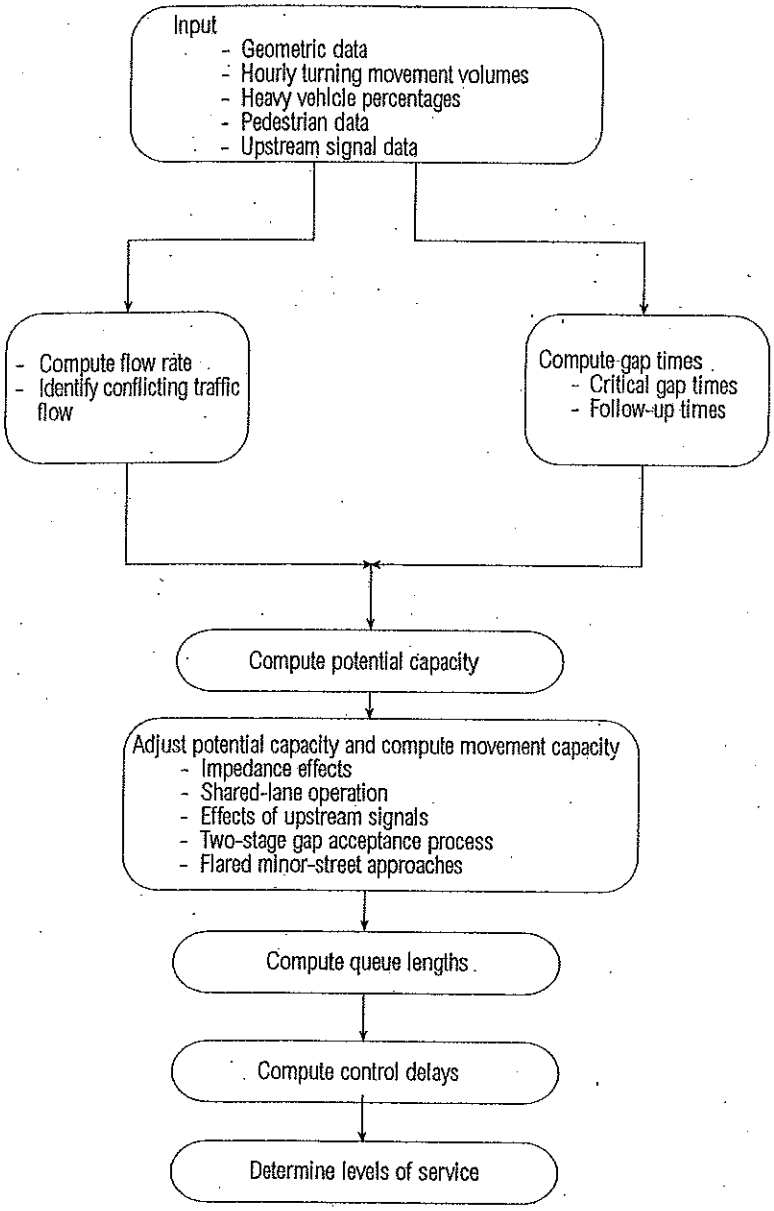
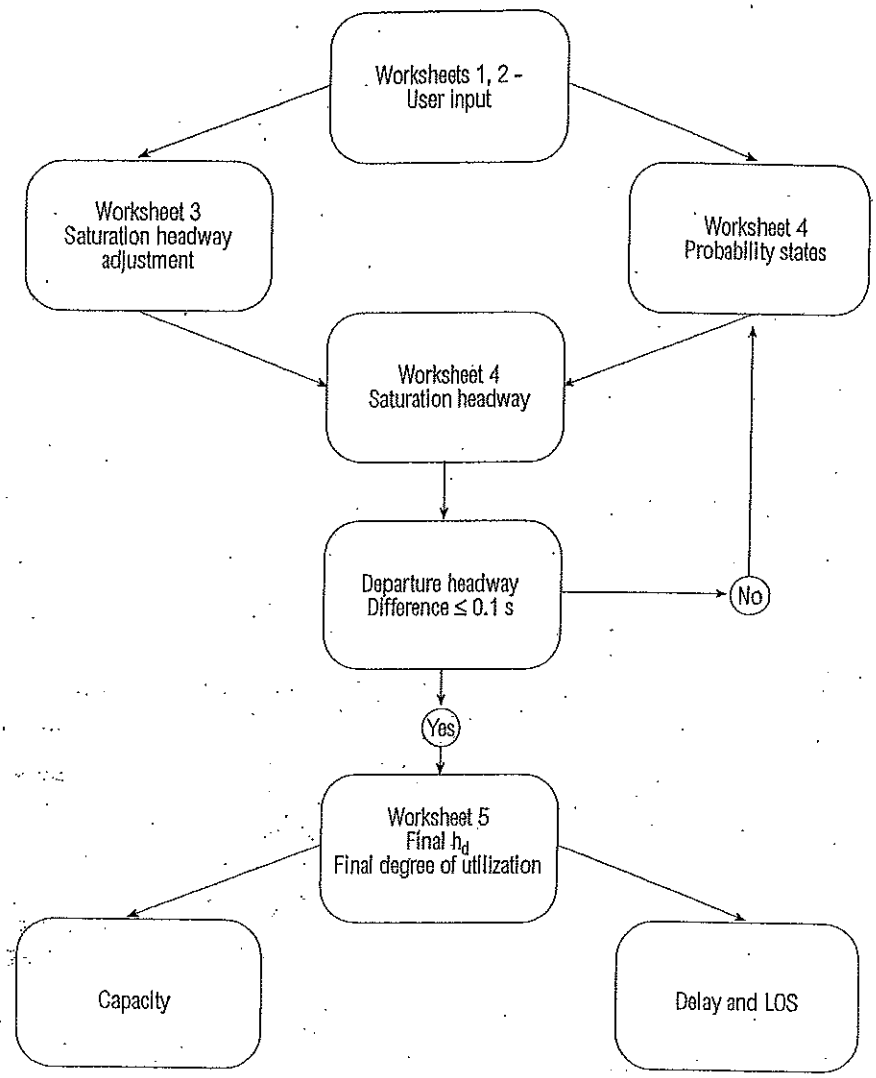


EXHIBIT 17-2. LEVEL-OF-SERVICE CRITERIA FOR TWSC INTERSECTIONS

Level of Service	Average Control Delay (s/veh)
A	0–10
B	> 10–15
C	> 15–25
D	> 25–35
E	> 35–50
F	> 50

EXHIBIT 17-31. AWSC INTERSECTION METHODOLOGY



LEVEL-OF-SERVICE CRITERIA

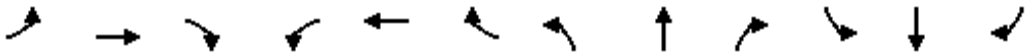
The level-of-service criteria are given in Exhibit 17-22. The criteria for AWSC intersections have different threshold values than do those for signalized intersections primarily because drivers expect different levels of performance from distinct types of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an AWSC intersection. Thus a higher level of control delay is acceptable at a signalized intersection for the same LOS.

EXHIBIT 17-22. LEVEL-OF-SERVICE CRITERIA FOR AWSC INTERSECTIONS

Level of Service	Control Delay (s/veh)
A	0–10
B	> 10–15
C	> 15–25
D	> 25–35
E	> 35–50
F	> 50

APPENDIX C

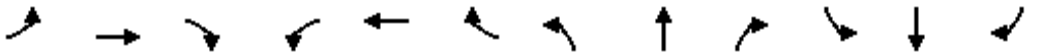
SYNCHRO LOS DATA:
EXISTING CONDITIONS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	28	0	2	21	198	0	2	5	229	1	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	31	0	2	23	220	0	2	6	254	1	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									2			
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	243			31			189	290	31	184	180	133
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	243			31			189	290	31	184	180	133
tC, single (s)	4.2			4.2			7.2	6.6	6.3	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			100	100	99	66	100	99
cM capacity (veh/h)	1261			1513			735	599	1012	744	690	887

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	37	246	8	264
Volume Left	6	2	0	254
Volume Right	0	220	6	9
cSH	1261	1513	1417	748
Volume to Capacity	0.00	0.00	0.01	0.35
Queue Length 95th (ft)	0	0	0	40
Control Delay (s)	1.2	0.1	9.3	12.4
Lane LOS	A	A	A	B
Approach Delay (s)	1.2	0.1	9.3	12.4
Approach LOS			A	B

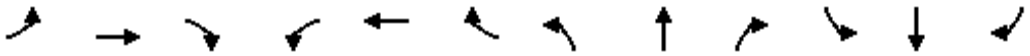
Intersection Summary				
Average Delay	6.2			
Intersection Capacity Utilization	40.2%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	121	141	82	207	0	0	0	0	168	0	14
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	134	157	91	230	0	0	0	0	187	0	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												2
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	230			291			633	625	213	625	703	230
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	230			291			633	625	213	625	703	230
tC, single (s)	4.2			4.2			7.2	6.6	6.3	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			92			100	100	100	48	100	98
cM capacity (veh/h)	1276			1210			349	358	800	360	322	783

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	291	321	202
Volume Left	0	91	187
Volume Right	157	0	16
cSH	1700	1210	390
Volume to Capacity	0.17	0.08	0.52
Queue Length 95th (ft)	0	6	72
Control Delay (s)	0.0	2.8	24.1
Lane LOS		A	C
Approach Delay (s)	0.0	2.8	24.1
Approach LOS			C

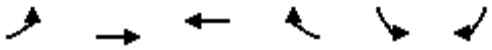
Intersection Summary				
Average Delay	7.1			
Intersection Capacity Utilization	49.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	95	194	0	0	178	68	111	0	94	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	106	216	0	0	198	76	123	0	104	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									2			
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	273			216			662	700	216	714	662	236
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	273			216			662	700	216	714	662	236
tC, single (s)	4.2			4.2			7.2	6.6	6.3	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	92			100			64	100	87	100	100	100
cM capacity (veh/h)	1256			1319			343	326	809	276	343	789

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	321	273	228
Volume Left	106	0	123
Volume Right	0	76	104
cSH	1256	1700	634
Volume to Capacity	0.08	0.16	0.36
Queue Length 95th (ft)	7	0	41
Control Delay (s)	3.2	0.0	16.1
Lane LOS	A		C
Approach Delay (s)	3.2	0.0	16.1
Approach LOS			C

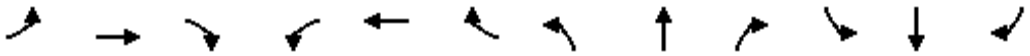
Intersection Summary			
Average Delay	5.7		
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	111	177	186	122	40	60
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	123	197	207	136	44	67
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	342				718	274
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	342				718	274
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	90				87	91
cM capacity (veh/h)	1184				351	757

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	320	342	111
Volume Left	123	0	44
Volume Right	0	136	67
cSH	1184	1700	877
Volume to Capacity	0.10	0.20	0.13
Queue Length 95th (ft)	9	0	11
Control Delay (s)	3.8	0.0	12.8
Lane LOS	A		B
Approach Delay (s)	3.8	0.0	12.8
Approach LOS			B

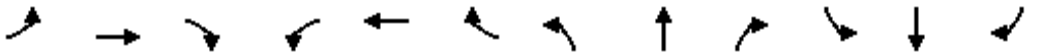
Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	16	0	3	21	291	0	1	10	293	1	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	7	18	0	3	23	323	0	1	11	326	1	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									2			
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	347			18			229	384	18	229	223	185
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	347			18			229	384	18	229	223	185
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	99	54	100	99
cM capacity (veh/h)	1196			1580			710	540	1052	707	666	850

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	24	350	12	332
Volume Left	7	3	0	326
Volume Right	0	323	11	6
cSH	1196	1580	1157	709
Volume to Capacity	0.01	0.00	0.01	0.47
Queue Length 95th (ft)	0	0	1	63
Control Delay (s)	2.2	0.1	8.8	14.5
Lane LOS	A	A	A	B
Approach Delay (s)	2.2	0.1	8.8	14.5
Approach LOS			A	B

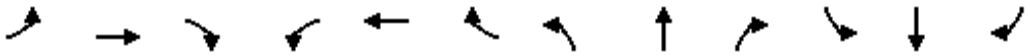
Intersection Summary			
Average Delay	7.0		
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	122	197	163	292	0	0	0	0	108	0	23
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	136	219	181	324	0	0	0	0	120	0	26
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												2
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	324			354			944	932	245	932	1041	324
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	324			354			944	932	245	932	1041	324
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			85			100	100	100	44	100	96
cM capacity (veh/h)	1219			1188			203	223	786	215	192	710

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	354	506	146
Volume Left	0	181	120
Volume Right	219	0	26
cSH	1700	1188	261
Volume to Capacity	0.21	0.15	0.56
Queue Length 95th (ft)	0	13	78
Control Delay (s)	0.0	4.1	35.5
Lane LOS		A	E
Approach Delay (s)	0.0	4.1	35.5
Approach LOS			E

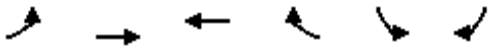
Intersection Summary				
Average Delay	7.2			
Intersection Capacity Utilization	58.9%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	205	0	0	247	186	208	3	85	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	28	228	0	0	274	207	231	3	94	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									2			
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	481			228			661	764	228	710	661	378
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	481			228			661	764	228	710	661	378
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			37	99	88	100	100	100
cM capacity (veh/h)	1076			1335			367	324	809	298	371	667

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	256	481	329
Volume Left	28	0	231
Volume Right	0	207	94
cSH	1076	1700	488
Volume to Capacity	0.03	0.28	0.67
Queue Length 95th (ft)	2	0	124
Control Delay (s)	1.1	0.0	26.4
Lane LOS	A		D
Approach Delay (s)	1.1	0.0	26.4
Approach LOS			D

Intersection Summary			
Average Delay	8.4		
Intersection Capacity Utilization	50.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	116	174	278	45	81	155
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	129	193	309	50	90	172
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	359				785	334
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	359				785	334
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				72	76
cM capacity (veh/h)	1194				321	706

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	322	359	262
Volume Left	129	0	90
Volume Right	0	50	172
cSH	1194	1700	936
Volume to Capacity	0.11	0.21	0.28
Queue Length 95th (ft)	9	0	29
Control Delay (s)	4.0	0.0	14.8
Lane LOS	A		B
Approach Delay (s)	4.0	0.0	14.8
Approach LOS			B

Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX D

ACCIDENT DATA

North Main St. / US 101 Southbound Ramps:

Accident Number	Date	Primary Street	Cross Street	Dist.	Dir.	Type of Collision	Motor Vehicle Involved With	Dir. of Travel 1	Movement Prior to Collision 1	Dir. of Travel 2	Movement Prior to Collision 2	Primary Contributing Factor	Injured	Killed
1	5/07	SB 101 Offramp	N. Main Street	25'	North	Overturn	Fixed Object (Curb)	South	Ran off road			Influence of Alcohol	1	0
2	10/07	SB 101 Onramp	N. Main Street	0'	In int.	Hit Object	Fixed Object (Curb)	South	Right turn			Speeding	0	0

Summation:

Broadside:	0	PDO:	1
Head on:	0	Injury:	1
Hit Object:	1	Fatality:	0
Overturned:	1	Total:	2
Rear End:	0		
Sideswipe:	0		
Total:	2		

North Main St. / US 101 Northbound Ramps:

Accident Number	Date	Primary Street	Cross Street	Dist.	Dir.	Type of Collision	Motor Vehicle Involved With	Dir. of Travel 1	Movement Prior to Collision 1	Dir. of Travel 2	Movement Prior to Collision 2	Primary Contributing Factor	Injured	Killed
3	Unk*	N. Main Street	NB 101 Onramp	0'	In int.	Sideswipe	Other Motor Vehicle	East	Left Turn	West	Straight	Improper Turn	0	0
4	Unk*	NB 101 Offramp	N. Main Street	0'	In int.	Sideswipe	Other Motor Vehicle	North	Right Turn	East	Straight	Failure to Yield	0	0
5	Unk*	NB 101 Offramp	N. Main Street	0'	In int.	Broadside	Other Motor Vehicle	North	Left Turn	West	Straight	Failure to Yield	0	0
6	Unk*	NB 101 Offramp	N. Main Street	0'	In int.	Broadside	Other Motor Vehicle	North	Left Turn	East	Straight	Failure to Yield	1	0
7	Unk*	NB 101 Offramp	N. Main Street	0'	In int.	Broadside	Other Motor Vehicle	North	Left Turn	East	Straight	Failure to Yield	1	0
8	Unk*	NB 101 Offramp	N. Main Street	50'	South	Rear End	Other Motor Vehicle	North	Straight	North	Stopped in Road	Failure to Stop	0	0
9	Unk*	NB 101 Offramp	N. Main Street	50'	South	Rear End	Fixed Object (Curb)	North	Straight	North	Stopped in Road	Failure to Stop	0	0

* Date of individual accidents is unable to be known from data provided by Caltrans.

Summation:

Broadside:	3	PDO:	5
Head on:	0	Injury:	2
Hit Object:	0	Fatality:	0
Overturned:	0	Total:	7
Rear End:	2		
Sideswipe:	2		
Total:	7		

North Main St. / Theatre Drive:

Accident Number	Date	Primary Street	Cross Street	Dist.	Dir.	Type of Collision	Motor Vehicle Involved With	Dir. of Travel 1	Movement Prior to Collision 1	Dir. of Travel 2	Movement Prior to Collision 2	Primary Contributing Factor	Injured	Killed
10	1/07	Theatre Drive	N. Main Street	0'	North	Hit Object	Fixed Object	South	Ran off road			Other than driver	0	0
11	10/09	N. Main Street	Theatre Drive	8'	West	Hit Object	Fixed Object	West	Ran off road			Other than driver	0	0

Summation:

Broadside:	0	PDO:	2
Head on:	0	Injury:	0
Hit Object:	2	Fatality:	0
Overturned:	0	Total:	2
Rear End:	0		
Sideswipe:	0		
Total:	2		

North Main St. / Ramada Drive:

Accident Number	Date	Primary Street	Cross Street	Dist.	Dir.	Type of Collision	Motor Vehicle Involved With	Dir. of Travel 1	Movement Prior to Collision 1	Dir. of Travel 2	Movement Prior to Collision 2	Primary Contributing Factor	Injured	Killed
12	5/07	Ramada Drive	N. Main Street	0'	In int.	Broadside	Other Motor Vehicle	South	Left Turn	West	Straight	Failure to Yield	0	0
13	10/07	N. Main Street	Ramada Drive	0'	In int.	Rear End	Other Motor Vehicle	East	Straight	East	Left Turn	Failure to Stop	0	0
14	3/09	N. Main Street	Ramada Drive	0'	In int.	Rear End	Other Motor Vehicle	East	Straight	East	Left Turn	Failure to Stop	0	0
15	4/09	Ramada Drive	N. Main Street	26'	North	Sideswipe	Other Motor Vehicle	North	Cross Centerline	South	Straight	Crossed Centerline	0	0
16	11/09	N. Main Street	Ramada Drive	20'	West	Rear End	Other Motor Vehicle	East	Slowing/Stopping	East	Left Turn	Unsafe Speed	0	0

Summation:

Broadside:	1	PDO:	5
Head on:	0	Injury:	0
Hit Object:	0	Fatality:	0
Overturned:	0	Total:	5
Rear End:	3		
Sideswipe:	1		
Total:	5		

RICK ENGINEERING COMPANY™
711 Tank Farm Road, Suite 110
San Luis Obispo, CA 93401
Tel: (805) 544-0707
Fax: (805) 544-2052

Date 2/9/2011
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THEATRE DR/MAIN ST. ACCIDENT RATE

THEATRE DRIVE:

$$\text{ACCIDENT RATE} = \frac{\#\text{ OF ACCIDENTS} \times (1\times10^6)}{\text{ENTERING VEHICLES} \times 365\ \frac{\text{DAYS}}{\text{YR}} \times \#\text{ OF YEARS}}$$

NUMBER OF ACCIDENTS: 2

ENTERING VEHICLES: ASSUMED 10× MAX PEAK HOUR VOLUMES UNLESS KNOWN

THEATRE DR. SB: ½(7857) = 3930*
THEATRE DR. NB: 10×10 = 100
MAIN ST. EB: 331×10 = 3310
MAIN ST. WB: 42×10 = 420

*- ½ OF TOTAL COUNTED ADT

TOTAL = 7,760/DAY

STUDY PERIOD: 1/1/07 → 12/31/09

$$\text{ACCIDENT RATE} = \frac{2\times(1\times10^6)}{7{,}760\times366\times3} = \boxed{0.23\ \text{ACC/MEV}}$$

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MAIN ST./SB 101 RAMPS
ACCIDENT RATE

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SB 101 RAMPS:

NUMBER OF ACCIDENTS: 2

ENTERING VEHICLES: ASSUMED 10 x MAX PEAK HOUR VOLUME UNLESS KNOWN.

MAIN ST. EB: 350 x 10 = 3,500
MAIN ST. WB: 451 x 10 = 4,510
101 SB OFFRAMP: 2,140 (FROM CALTRANS COUNTS)
} TOTAL = 10,150 VEH.

STUDY PERIOD: 1/1/07 → 12/31/09

$$\text{ACCIDENT RATE} = \frac{2 \times (1 \times 10^6)}{10{,}150 \times 365 \times 3} = \boxed{0.18 \text{ ACC/MEV}}$$

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MAIN ST/NB 101 RAMPS
ACCIDENT RATE

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NB 101 RAMPS:

NUMBER OF ACCIDENTS: 7

ENTERING VEHICLES: ASSUMED 10% MAX PEAK HOUR VOLUME UNLESS KNOWN.

MAIN ST. EB: 289 x 10 = 2,890
MAIN ST. WB: 431 x 10 = 4,310
101 NB OFFRAMP: 4,270 (FROM CALTRANS COUNTS)
} TOTAL = 11,470 VEH.

STUDY PERIOD: 1/1/07 → 12/31/09

ACCIDENT RATE: $\frac{7 \times (1 \times 10^6)}{11{,}470 \times 365 \times 3} = 0.56$ ACC/MEV

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RAMADA DR/MAIN ST.
ACCIDENT RATE

Date 2/9/2011
Job No. 16128
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RAMADA DR:

NUMBER OF ACCIDENTS: 5

ENTERING VEHICLES: 10 x MAX PEAK HOUR VOLUME UNLESS KNOWN
* ½ OF TOTAL COUNTED ADT

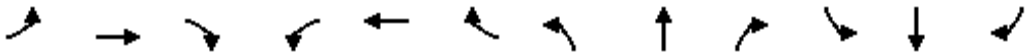
RAMADA DR: ½(4,835)* = 2,420
MAIN ST W/B: ½(6,836)* = 3,420
MAIN ST EB: 288 x 10 = 2,880
} 8,720 VEH.

STUDY PERIOD: 1/1/07 → 12/31/09

$$\text{ACCIDENT RATE} = \frac{5 \times (1 \times 10^6)}{8{,}720 \times 365 \times 3} = \boxed{0.52 \text{ ACC/MEV}}$$

APPENDIX E

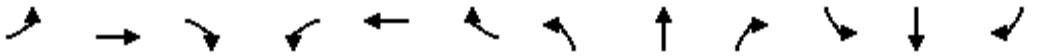
SYNCHRO LOS DATA:
NEAR-TERM MITIGATION MEASURES



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	16	0	3	21	291	0	1	10	293	1	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	7	18	0	3	23	323	0	1	11	326	1	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									2			
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	347			18			229	384	18	229	223	185
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	347			18			229	384	18	229	223	185
tC, single (s)	4.1			4.1			7.2	6.6	6.2	7.2	6.6	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	99	54	100	99
cM capacity (veh/h)	1196			1580			710	540	1052	707	666	850

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	24	350	12	332
Volume Left	7	3	0	326
Volume Right	0	323	11	6
cSH	1196	1580	1157	709
Volume to Capacity	0.01	0.00	0.01	0.47
Queue Length 95th (ft)	0	0	1	63
Control Delay (s)	2.2	0.1	8.8	14.5
Lane LOS	A	A	A	B
Approach Delay (s)	2.2	0.1	8.8	14.5
Approach LOS			A	B

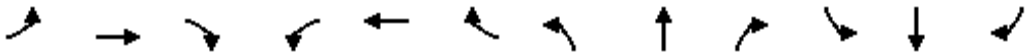
Intersection Summary				
Average Delay	7.0			
Intersection Capacity Utilization	49.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	122	197	163	292	0	0	0	0	108	0	23
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	136	219	181	324	0	0	0	0	120	0	26
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												2
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	324			354			944	932	245	932	1041	324
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	324			354			944	932	245	932	1041	324
tC, single (s)	4.1			4.1			7.2	6.6	6.2	7.2	6.6	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			85			100	100	100	44	100	96
cM capacity (veh/h)	1219			1188			203	223	786	215	192	710

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	354	506	146
Volume Left	0	181	120
Volume Right	219	0	26
cSH	1700	1188	261
Volume to Capacity	0.21	0.15	0.56
Queue Length 95th (ft)	0	13	78
Control Delay (s)	0.0	4.1	35.5
Lane LOS		A	E
Approach Delay (s)	0.0	4.1	35.5
Approach LOS			E

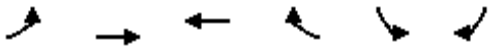
Intersection Summary				
Average Delay	7.2			
Intersection Capacity Utilization	58.9%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	25	205	0	0	247	186	208	3	85	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	28	228	0	0	274	207	231	3	94	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	256	481	234	94
Volume Left (vph)	28	0	231	0
Volume Right (vph)	0	207	0	94
Hadj (s)	0.07	-0.21	0.54	-0.65
Departure Headway (s)	5.7	5.1	7.0	5.8
Degree Utilization, x	0.41	0.69	0.45	0.15
Capacity (veh/h)	593	681	482	584
Control Delay (s)	12.6	18.7	14.4	8.6
Approach Delay (s)	12.6	18.7	12.8	
Approach LOS	B	C	B	

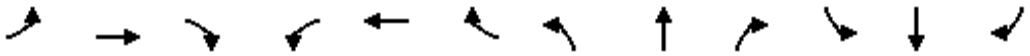
Intersection Summary				
Delay	15.4			
HCM Level of Service	C			
Intersection Capacity Utilization	50.1%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	116	174	278	45	81	155
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	129	193	309	50	90	172
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	359				785	334
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	359				785	334
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				72	76
cM capacity (veh/h)	1194				321	706

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	322	359	262
Volume Left	129	0	90
Volume Right	0	50	172
cSH	1194	1700	936
Volume to Capacity	0.11	0.21	0.28
Queue Length 95th (ft)	9	0	29
Control Delay (s)	4.0	0.0	14.8
Lane LOS	A		B
Approach Delay (s)	4.0	0.0	14.8
Approach LOS			B

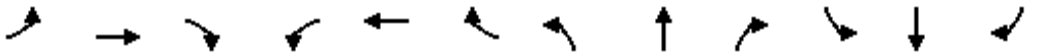
Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	16	0	3	21	291	0	1	10	293	1	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	7	18	0	3	23	323	0	1	11	326	1	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									2			
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	347			18			229	384	18	229	223	185
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	347			18			229	384	18	229	223	185
tC, single (s)	4.1			4.1			7.2	6.6	6.2	7.2	6.6	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	99	54	100	99
cM capacity (veh/h)	1196			1580			710	540	1052	707	666	850

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	24	350	12	332
Volume Left	7	3	0	326
Volume Right	0	323	11	6
cSH	1196	1580	1157	709
Volume to Capacity	0.01	0.00	0.01	0.47
Queue Length 95th (ft)	0	0	1	63
Control Delay (s)	2.2	0.1	8.8	14.5
Lane LOS	A	A	A	B
Approach Delay (s)	2.2	0.1	8.8	14.5
Approach LOS			A	B

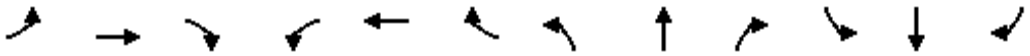
Intersection Summary				
Average Delay	7.0			
Intersection Capacity Utilization	49.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	122	197	163	292	0	0	0	0	108	0	23
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	136	219	181	324	0	0	0	0	120	0	26

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total (vph)	354	506	120	26
Volume Left (vph)	0	181	120	0
Volume Right (vph)	219	0	0	26
Hadj (s)	-0.29	0.16	0.59	-0.62
Departure Headway (s)	4.8	5.0	7.2	5.9
Degree Utilization, x	0.47	0.71	0.24	0.04
Capacity (veh/h)	718	703	452	543
Control Delay (s)	12.0	19.1	11.2	8.0
Approach Delay (s)	12.0	19.1	10.6	
Approach LOS	B	C	B	

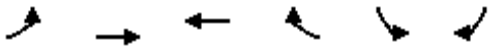
Intersection Summary				
Delay		15.4		
HCM Level of Service		C		
Intersection Capacity Utilization		58.9%	ICU Level of Service	B
Analysis Period (min)		15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	205	0	0	247	186	208	3	85	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	28	228	0	0	274	207	231	3	94	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									2			
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	481			228			661	764	228	710	661	378
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	481			228			661	764	228	710	661	378
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			37	99	88	100	100	100
cM capacity (veh/h)	1076			1335			367	324	809	298	371	667

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	256	481	329
Volume Left	28	0	231
Volume Right	0	207	94
cSH	1076	1700	488
Volume to Capacity	0.03	0.28	0.67
Queue Length 95th (ft)	2	0	124
Control Delay (s)	1.1	0.0	26.4
Lane LOS	A		D
Approach Delay (s)	1.1	0.0	26.4
Approach LOS			D

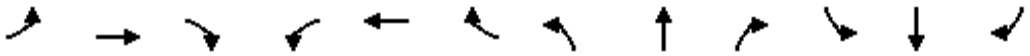
Intersection Summary			
Average Delay	8.4		
Intersection Capacity Utilization	50.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	116	174	278	45	81	155
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	129	193	309	50	90	172
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	359				785	334
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	359				785	334
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				72	76
cM capacity (veh/h)	1194				321	706

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	322	359	262
Volume Left	129	0	90
Volume Right	0	50	172
cSH	1194	1700	936
Volume to Capacity	0.11	0.21	0.28
Queue Length 95th (ft)	9	0	29
Control Delay (s)	4.0	0.0	14.8
Lane LOS	A		B
Approach Delay (s)	4.0	0.0	14.8
Approach LOS			B

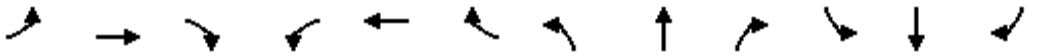
Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	16	0	3	21	291	0	1	10	293	1	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	7	18	0	3	23	323	0	1	11	326	1	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									2			
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	347			18			229	384	18	229	223	185
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	347			18			229	384	18	229	223	185
tC, single (s)	4.1			4.1			7.2	6.6	6.2	7.2	6.6	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	99	54	100	99
cM capacity (veh/h)	1196			1580			710	540	1052	707	666	850

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	24	350	12	332
Volume Left	7	3	0	326
Volume Right	0	323	11	6
cSH	1196	1580	1157	709
Volume to Capacity	0.01	0.00	0.01	0.47
Queue Length 95th (ft)	0	0	1	63
Control Delay (s)	2.2	0.1	8.8	14.5
Lane LOS	A	A	A	B
Approach Delay (s)	2.2	0.1	8.8	14.5
Approach LOS			A	B

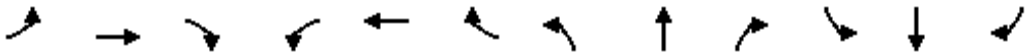
Intersection Summary				
Average Delay	7.0			
Intersection Capacity Utilization	49.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	122	197	163	292	0	0	0	0	108	0	23
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	136	219	181	324	0	0	0	0	120	0	26

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total (vph)	354	506	120	26
Volume Left (vph)	0	181	120	0
Volume Right (vph)	219	0	0	26
Hadj (s)	-0.29	0.16	0.59	-0.62
Departure Headway (s)	4.8	5.0	7.2	5.9
Degree Utilization, x	0.47	0.71	0.24	0.04
Capacity (veh/h)	718	703	452	543
Control Delay (s)	12.0	19.1	11.2	8.0
Approach Delay (s)	12.0	19.1	10.6	
Approach LOS	B	C	B	

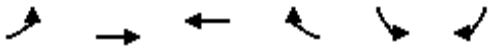
Intersection Summary				
Delay		15.4		
HCM Level of Service		C		
Intersection Capacity Utilization		58.9%	ICU Level of Service	B
Analysis Period (min)		15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	25	205	0	0	247	186	208	3	85	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	28	228	0	0	274	207	231	3	94	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	256	481	234	94
Volume Left (vph)	28	0	231	0
Volume Right (vph)	0	207	0	94
Hadj (s)	0.07	-0.21	0.54	-0.65
Departure Headway (s)	5.7	5.1	7.0	5.8
Degree Utilization, x	0.41	0.69	0.45	0.15
Capacity (veh/h)	593	681	482	584
Control Delay (s)	12.6	18.7	14.4	8.6
Approach Delay (s)	12.6	18.7	12.8	
Approach LOS	B	C	B	

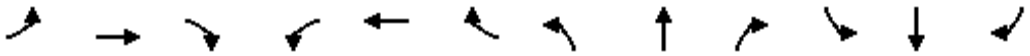
Intersection Summary				
Delay	15.4			
HCM Level of Service	C			
Intersection Capacity Utilization	50.1%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	116	174	278	45	81	155
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	129	193	309	50	90	172
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	359				785	334
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	359				785	334
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				72	76
cM capacity (veh/h)	1194				321	706

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	322	359	262
Volume Left	129	0	90
Volume Right	0	50	172
cSH	1194	1700	936
Volume to Capacity	0.11	0.21	0.28
Queue Length 95th (ft)	9	0	29
Control Delay (s)	4.0	0.0	14.8
Lane LOS	A		B
Approach Delay (s)	4.0	0.0	14.8
Approach LOS			B

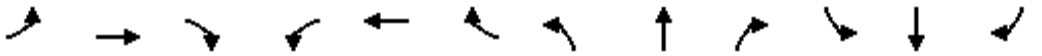
Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	16	0	3	21	291	0	1	10	293	1	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	7	18	0	3	23	323	0	1	11	326	1	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									2			
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					542							
pX, platoon unblocked												
vC, conflicting volume	347			18			229	384	18	229	223	185
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	347			18			229	384	18	229	223	185
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	99	54	100	99
cM capacity (veh/h)	1196			1580			710	540	1052	707	666	850

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	24	350	12	332
Volume Left	7	3	0	326
Volume Right	0	323	11	6
cSH	1196	1580	1157	709
Volume to Capacity	0.01	0.00	0.01	0.47
Queue Length 95th (ft)	0	0	1	63
Control Delay (s)	2.2	0.1	8.8	14.5
Lane LOS	A	A	A	B
Approach Delay (s)	2.2	0.1	8.8	14.5
Approach LOS			A	B

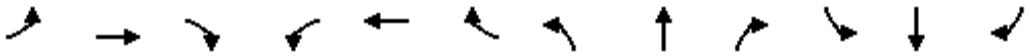
Intersection Summary			
Average Delay	7.0		
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	122	197	163	292	0	0	0	0	108	0	23
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	136	219	181	324	0	0	0	0	120	0	26
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												2
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					409							
pX, platoon unblocked												
vC, conflicting volume	324			354			944	932	245	932	1041	324
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	324			354			944	932	245	932	1041	324
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			85			100	100	100	44	100	96
cM capacity (veh/h)	1219			1188			203	223	786	215	192	710

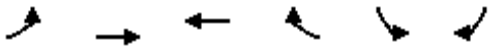
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	354	506	146
Volume Left	0	181	120
Volume Right	219	0	26
cSH	1700	1188	261
Volume to Capacity	0.21	0.15	0.56
Queue Length 95th (ft)	0	13	78
Control Delay (s)	0.0	4.1	35.5
Lane LOS		A	E
Approach Delay (s)	0.0	4.1	35.5
Approach LOS			E

Intersection Summary			
Average Delay	7.2		
Intersection Capacity Utilization	58.9%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	205	0	0	247	186	208	3	85	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	15	16	16	16	12	12	12	12	12	12
Total Lost time (s)		4.0			4.0			4.0	4.0			
Lane Util. Factor		1.00			1.00			1.00	1.00			
Frt		1.00			0.94			1.00	0.85			
Flt Protected		0.99			1.00			0.95	1.00			
Satd. Flow (prot)		2018			1969			1758	1568			
Flt Permitted		0.93			1.00			0.95	1.00			
Satd. Flow (perm)		1896			1969			1758	1568			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	28	228	0	0	274	207	231	3	94	0	0	0
RTOR Reduction (vph)	0	0	0	0	61	0	0	0	71	0	0	0
Lane Group Flow (vph)	0	256	0	0	420	0	0	234	23	0	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm						Split		Perm			
Protected Phases		2			2		4	4				
Permitted Phases	2								4			
Actuated Green, G (s)		16.6			16.6			7.9	7.9			
Effective Green, g (s)		16.6			16.6			7.9	7.9			
Actuated g/C Ratio		0.51			0.51			0.24	0.24			
Clearance Time (s)		4.0			4.0			4.0	4.0			
Vehicle Extension (s)		3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)		968			1006			427	381			
v/s Ratio Prot					c0.21			c0.13				
v/s Ratio Perm		0.14							0.01			
v/c Ratio		0.26			0.42			0.55	0.06			
Uniform Delay, d1		4.5			4.9			10.7	9.4			
Progression Factor		1.00			1.00			1.00	1.00			
Incremental Delay, d2		0.1			0.3			1.4	0.1			
Delay (s)		4.6			5.2			12.2	9.5			
Level of Service		A			A			B	A			
Approach Delay (s)		4.6			5.2			11.4			0.0	
Approach LOS		A			A			B			A	

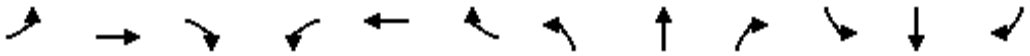
Intersection Summary			
HCM Average Control Delay	7.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	32.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	50.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	116	174	278	45	81	155
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	129	193	309	50	90	172
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		110				
pX, platoon unblocked					0.94	
vC, conflicting volume	359				785	334
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	359				741	334
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				72	76
cM capacity (veh/h)	1194				321	706

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	322	359	262
Volume Left	129	0	90
Volume Right	0	50	172
cSH	1194	1700	936
Volume to Capacity	0.11	0.21	0.28
Queue Length 95th (ft)	9	0	29
Control Delay (s)	4.0	0.0	14.8
Lane LOS	A		B
Approach Delay (s)	4.0	0.0	14.8
Approach LOS			B

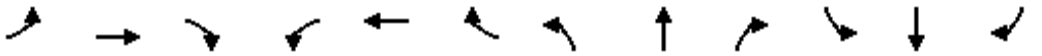
Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	16	0	3	21	291	0	1	10	293	1	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	7	18	0	3	23	323	0	1	11	326	1	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									2			
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					133							
pX, platoon unblocked	0.91						0.91	0.91		0.91	0.91	0.91
vC, conflicting volume	347			18			229	384	18	229	223	185
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	237			18			108	278	18	108	101	60
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	99	58	100	99
cM capacity (veh/h)	1199			1580			778	566	1052	775	710	910

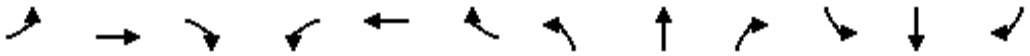
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	24	350	12	332
Volume Left	7	3	0	326
Volume Right	0	323	11	6
cSH	1199	1580	1157	776
Volume to Capacity	0.01	0.00	0.01	0.43
Queue Length 95th (ft)	0	0	1	54
Control Delay (s)	2.2	0.1	8.7	13.1
Lane LOS	A	A	A	B
Approach Delay (s)	2.2	0.1	8.7	13.1
Approach LOS			A	B

Intersection Summary			
Average Delay	6.3		
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	122	197	163	292	0	0	0	0	108	0	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	15	15	15	12	12	12	12	12	12
Total Lost time (s)		4.0			4.0						4.0	4.0
Lane Util. Factor		1.00			1.00						1.00	1.00
Frt		0.92			1.00						1.00	0.85
Flt Protected		1.00			0.98						0.95	1.00
Satd. Flow (prot)		1880			1955						1719	1538
Flt Permitted		1.00			0.77						0.95	1.00
Satd. Flow (perm)		1880			1526						1719	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	136	219	181	324	0	0	0	0	120	0	26
RTOR Reduction (vph)	0	86	0	0	0	0	0	0	0	0	0	22
Lane Group Flow (vph)	0	269	0	0	505	0	0	0	0	0	120	4
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type				Perm						Split		Perm
Protected Phases		2			2					8	8	
Permitted Phases				2								8
Actuated Green, G (s)		19.0			19.0						4.3	4.3
Effective Green, g (s)		19.0			19.0						4.3	4.3
Actuated g/C Ratio		0.61			0.61						0.14	0.14
Clearance Time (s)		4.0			4.0						4.0	4.0
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		1141			926						236	211
v/s Ratio Prot		0.14									c0.07	
v/s Ratio Perm					c0.33							0.00
v/c Ratio		0.24			0.55						0.51	0.02
Uniform Delay, d1		2.8			3.6						12.5	11.7
Progression Factor		1.00			1.00						1.00	1.00
Incremental Delay, d2		0.1			0.7						1.7	0.0
Delay (s)		2.9			4.3						14.2	11.7
Level of Service		A			A						B	B
Approach Delay (s)		2.9			4.3			0.0			13.8	
Approach LOS		A			A			A			B	

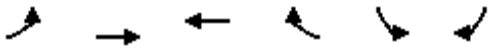
Intersection Summary			
HCM Average Control Delay	5.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	31.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	205	0	0	247	186	208	3	85	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	28	228	0	0	274	207	231	3	94	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									2			
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		409										
pX, platoon unblocked												
vC, conflicting volume	481			228			661	764	228	710	661	378
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	481			228			661	764	228	710	661	378
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			37	99	88	100	100	100
cM capacity (veh/h)	1076			1335			367	324	809	298	371	667

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	256	481	329
Volume Left	28	0	231
Volume Right	0	207	94
cSH	1076	1700	488
Volume to Capacity	0.03	0.28	0.67
Queue Length 95th (ft)	2	0	124
Control Delay (s)	1.1	0.0	26.4
Lane LOS	A		D
Approach Delay (s)	1.1	0.0	26.4
Approach LOS			D

Intersection Summary			
Average Delay	8.4		
Intersection Capacity Utilization	50.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	116	174	278	45	81	155
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	129	193	309	50	90	172
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		519				
pX, platoon unblocked						
vC, conflicting volume	359				785	334
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	359				785	334
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				72	76
cM capacity (veh/h)	1194				321	706

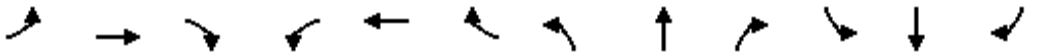
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	322	359	262
Volume Left	129	0	90
Volume Right	0	50	172
cSH	1194	1700	936
Volume to Capacity	0.11	0.21	0.28
Queue Length 95th (ft)	9	0	29
Control Delay (s)	4.0	0.0	14.8
Lane LOS	A		B
Approach Delay (s)	4.0	0.0	14.8
Approach LOS			B

Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	16	0	3	21	291	0	1	10	293	1	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	7	18	0	3	23	323	0	1	11	326	1	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									2			
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					133							
pX, platoon unblocked	0.94						0.94	0.94		0.94	0.94	0.94
vC, conflicting volume	347			18			229	384	18	229	223	185
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	271			18			146	312	18	146	139	99
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	99	57	100	99
cM capacity (veh/h)	1197			1580			756	557	1052	752	695	890

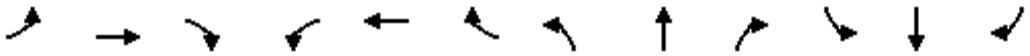
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	24	350	12	332
Volume Left	7	3	0	326
Volume Right	0	323	11	6
cSH	1197	1580	1157	754
Volume to Capacity	0.01	0.00	0.01	0.44
Queue Length 95th (ft)	0	0	1	57
Control Delay (s)	2.2	0.1	8.7	13.5
Lane LOS	A	A	A	B
Approach Delay (s)	2.2	0.1	8.7	13.5
Approach LOS			A	B

Intersection Summary			
Average Delay	6.5		
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		



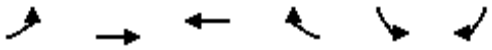
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	122	197	163	292	0	0	0	0	108	0	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	15	15	15	12	12	12	12	12	12
Total Lost time (s)		4.0			4.0						4.0	4.0
Lane Util. Factor		1.00			1.00						1.00	1.00
Frt		0.92			1.00						1.00	0.85
Flt Protected		1.00			0.98						0.95	1.00
Satd. Flow (prot)		1880			1955						1719	1538
Flt Permitted		1.00			0.76						0.95	1.00
Satd. Flow (perm)		1880			1521						1719	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	136	219	181	324	0	0	0	0	120	0	26
RTOR Reduction (vph)	0	69	0	0	0	0	0	0	0	0	0	22
Lane Group Flow (vph)	0	286	0	0	505	0	0	0	0	0	120	4
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type				Perm						Split		Perm
Protected Phases		2			2					4	4	
Permitted Phases				2								4
Actuated Green, G (s)		34.3			34.3						7.7	7.7
Effective Green, g (s)		34.3			34.3						7.7	7.7
Actuated g/C Ratio		0.69			0.69						0.15	0.15
Clearance Time (s)		4.0			4.0						4.0	4.0
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		1290			1043						265	237
v/s Ratio Prot		0.15									c0.07	
v/s Ratio Perm					c0.33							0.00
v/c Ratio		0.22			0.48						0.45	0.02
Uniform Delay, d1		2.9			3.7						19.2	17.9
Progression Factor		1.00			0.94						1.00	1.00
Incremental Delay, d2		0.4			1.5						1.2	0.0
Delay (s)		3.3			5.0						20.5	18.0
Level of Service		A			A						C	B
Approach Delay (s)		3.3			5.0			0.0			20.0	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM Average Control Delay	6.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	205	0	0	247	186	208	3	85	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	15	15	16	16	16	12	12	12	12	12	12
Total Lost time (s)		4.0			4.0			4.0	4.0			
Lane Util. Factor		1.00			1.00			1.00	1.00			
Frt		1.00			0.94			1.00	0.85			
Flt Protected		0.99			1.00			0.95	1.00			
Satd. Flow (prot)		2018			1969			1758	1568			
Flt Permitted		0.94			1.00			0.95	1.00			
Satd. Flow (perm)		1904			1969			1758	1568			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	28	228	0	0	274	207	231	3	94	0	0	0
RTOR Reduction (vph)	0	0	0	0	43	0	0	0	72	0	0	0
Lane Group Flow (vph)	0	256	0	0	438	0	0	234	22	0	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm						Split		Perm			
Protected Phases		2			2		4	4				
Permitted Phases	2								4			
Actuated Green, G (s)		30.1			30.1			11.9	11.9			
Effective Green, g (s)		30.1			30.1			11.9	11.9			
Actuated g/C Ratio		0.60			0.60			0.24	0.24			
Clearance Time (s)		4.0			4.0			4.0	4.0			
Vehicle Extension (s)		3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)		1146			1185			418	373			
v/s Ratio Prot					c0.22			c0.13				
v/s Ratio Perm		0.13							0.01			
v/c Ratio		0.22			0.37			0.56	0.06			
Uniform Delay, d1		4.6			5.1			16.7	14.7			
Progression Factor		1.07			1.00			1.00	1.00			
Incremental Delay, d2		0.4			0.9			1.6	0.1			
Delay (s)		5.3			6.0			18.4	14.8			
Level of Service		A			A			B	B			
Approach Delay (s)		5.3			6.0			17.4			0.0	
Approach LOS		A			A			B			A	

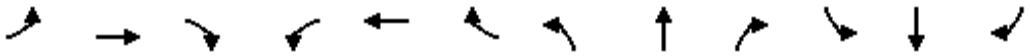
Intersection Summary			
HCM Average Control Delay	9.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	50.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	116	174	278	45	81	155
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	129	193	309	50	90	172
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						2
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		110				
pX, platoon unblocked					0.96	
vC, conflicting volume	359				785	334
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	359				755	334
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				72	76
cM capacity (veh/h)	1194				321	706

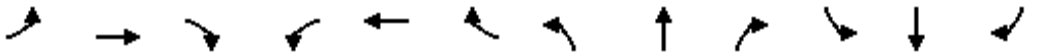
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	322	359	262
Volume Left	129	0	90
Volume Right	0	50	172
cSH	1194	1700	935
Volume to Capacity	0.11	0.21	0.28
Queue Length 95th (ft)	9	0	29
Control Delay (s)	4.0	0.0	14.8
Lane LOS	A		B
Approach Delay (s)	4.0	0.0	14.8
Approach LOS			B

Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	16	0	3	21	291	0	1	10	293	1	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	16	16	16	13	13	13	13	13	13
Total Lost time (s)		6.5			6.5			6.5	6.5		6.5	
Lane Util. Factor		1.00			1.00			1.00	1.00		1.00	
Frt		1.00			0.88			1.00	0.85		1.00	
Flt Protected		0.99			1.00			1.00	1.00		0.95	
Satd. Flow (prot)		1666			1794			1870	1589		1778	
Flt Permitted		0.99			1.00			1.00	1.00		0.95	
Satd. Flow (perm)		1666			1794			1870	1589		1778	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	7	18	0	3	23	323	0	1	11	326	1	6
RTOR Reduction (vph)	0	0	0	0	220	0	0	0	10	0	1	0
Lane Group Flow (vph)	0	25	0	0	129	0	0	1	1	0	332	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Split			Split			Split		Perm	Split		
Protected Phases	2	2		8	8		6	6		4	4	
Permitted Phases									6			
Actuated Green, G (s)		14.4			35.1			9.7	9.7		24.8	
Effective Green, g (s)		14.4			35.1			9.7	9.7		24.8	
Actuated g/C Ratio		0.13			0.32			0.09	0.09		0.23	
Clearance Time (s)		6.5			6.5			6.5	6.5		6.5	
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)		218			572			165	140		401	
v/s Ratio Prot		c0.02			c0.07			0.00			c0.19	
v/s Ratio Perm									c0.00			
v/c Ratio		0.11			0.23			0.01	0.01		0.83	
Uniform Delay, d1		42.2			27.5			45.8	45.8		40.6	
Progression Factor		1.00			0.07			1.00	1.00		1.00	
Incremental Delay, d2		1.1			0.0			0.0	0.0		13.2	
Delay (s)		43.2			2.1			45.8	45.8		53.8	
Level of Service		D			A			D	D		D	
Approach Delay (s)		43.2			2.1			45.8			53.8	
Approach LOS		D			A			D			D	

Intersection Summary			
HCM Average Control Delay	28.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	122	197	163	292	0	0	0	0	108	0	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	15	15	15	12	12	12	12	12	12
Total Lost time (s)		6.5			6.5						6.5	6.5
Lane Util. Factor		1.00			1.00						1.00	1.00
Frt		0.92			1.00						1.00	0.85
Flt Protected		1.00			0.98						0.95	1.00
Satd. Flow (prot)		1880			1955						1719	1538
Flt Permitted		1.00			0.74						0.95	1.00
Satd. Flow (perm)		1880			1469						1719	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	136	219	181	324	0	0	0	0	120	0	26
RTOR Reduction (vph)	0	54	0	0	0	0	0	0	0	0	0	21
Lane Group Flow (vph)	0	301	0	0	505	0	0	0	0	0	120	5
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type				Perm						Split		Perm
Protected Phases		4			8					6	6	
Permitted Phases		8		8	8							6
Actuated Green, G (s)		59.9			35.1						9.7	9.7
Effective Green, g (s)		59.9			35.1						9.7	9.7
Actuated g/C Ratio		0.54			0.32						0.09	0.09
Clearance Time (s)		6.5			6.5						6.5	6.5
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		1024			469						152	136
v/s Ratio Prot		c0.07									c0.07	
v/s Ratio Perm		0.09			c0.34							0.00
v/c Ratio		0.29			1.08						0.79	0.04
Uniform Delay, d1		13.6			37.4						49.1	45.9
Progression Factor		0.20			0.81						1.00	1.00
Incremental Delay, d2		0.1			61.2						23.2	0.1
Delay (s)		2.9			91.4						72.4	46.0
Level of Service		A			F						E	D
Approach Delay (s)		2.9			91.4			0.0			67.7	
Approach LOS		A			F			A			E	

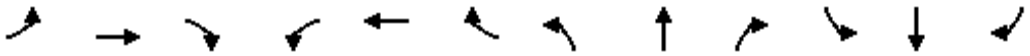
Intersection Summary			
HCM Average Control Delay	56.7	HCM Level of Service	E
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	40.4
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2	SWL2	SWL
Lane Configurations												
Volume (vph)	25	48	157	215	63	45	208	3	67	18	81	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	12	15	16	16	12	12	12	12	12	12	12
Total Lost time (s)			6.5	6.5				6.5	6.5			6.5
Lane Util. Factor			1.00	1.00				1.00	1.00			1.00
Frt			1.00	0.96				1.00	0.85			1.00
Flt Protected			0.98	1.00				0.95	1.00			0.95
Satd. Flow (prot)			1960	1971				1725	1568			1752
Flt Permitted			0.98	1.00				0.95	1.00			0.95
Satd. Flow (perm)			1960	1971				1725	1568			1752
Peak-hour factor, PHF	0.90	0.92	0.90	0.90	0.90	0.92	0.90	0.90	0.92	0.90	0.92	0.92
Adj. Flow (vph)	28	52	174	239	70	49	231	3	73	20	88	0
RTOR Reduction (vph)	0	0	0	7	0	0	0	0	8	0	0	0
Lane Group Flow (vph)	0	0	254	351	0	0	0	234	85	0	0	88
Heavy Vehicles (%)	5%	5%	5%	5%	3%	3%	5%	3%	3%	3%	3%	3%
Turn Type	Split	Split					Split		Perm		Split	
Protected Phases	2	2	2	4			6	6			8	8
Permitted Phases									6			
Actuated Green, G (s)			22.4	25.7				26.1	26.1			9.8
Effective Green, g (s)			22.4	25.7				26.1	26.1			9.8
Actuated g/C Ratio			0.20	0.23				0.24	0.24			0.09
Clearance Time (s)			6.5	6.5				6.5	6.5			6.5
Vehicle Extension (s)			3.0	3.0				3.0	3.0			3.0
Lane Grp Cap (vph)			399	460				409	372			156
v/s Ratio Prot			c0.13	c0.18				c0.14				c0.05
v/s Ratio Perm									0.05			
v/c Ratio			0.64	0.76				0.57	0.23			0.56
Uniform Delay, d1			40.1	39.3				37.0	33.8			48.1
Progression Factor			1.34	1.00				1.00	1.00			1.00
Incremental Delay, d2			6.5	7.4				1.9	0.3			4.6
Delay (s)			60.0	46.7				39.0	34.2			52.7
Level of Service			E	D				D	C			D
Approach Delay (s)			60.0	46.7				37.6				49.9
Approach LOS			E	D				D				D

Intersection Summary			
HCM Average Control Delay	47.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SWR	SWR2
Lane Configurations		
Volume (vph)	32	123
Ideal Flow (vphpl)	1900	1900
Lane Width	12	12
Total Lost time (s)	6.5	
Lane Util. Factor	1.00	
Frt	0.85	
Flt Protected	1.00	
Satd. Flow (prot)	1562	
Flt Permitted	1.00	
Satd. Flow (perm)	1562	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	35	134
RTOR Reduction (vph)	122	0
Lane Group Flow (vph)	47	0
Heavy Vehicles (%)	5%	3%
Turn Type	Perm	
Protected Phases		
Permitted Phases	8	
Actuated Green, G (s)	9.8	
Effective Green, g (s)	9.8	
Actuated g/C Ratio	0.09	
Clearance Time (s)	6.5	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	139	
v/s Ratio Prot		
v/s Ratio Perm	0.03	
v/c Ratio	0.34	
Uniform Delay, d1	47.1	
Progression Factor	1.00	
Incremental Delay, d2	1.4	
Delay (s)	48.5	
Level of Service	D	
Approach Delay (s)		
Approach LOS		

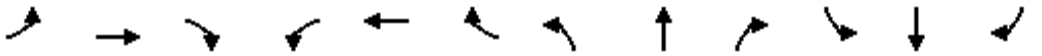
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	16	0	3	21	291	0	1	10	293	1	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	7	18	0	3	23	323	0	1	11	326	1	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									2			
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					133							
pX, platoon unblocked	0.94						0.94	0.94		0.94	0.94	0.94
vC, conflicting volume	347			18			229	384	18	229	223	185
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	273			18			147	313	18	147	141	101
tC, single (s)	4.1			4.1			7.2	6.6	6.2	7.2	6.6	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	99	57	100	99
cM capacity (veh/h)	1197			1580			755	557	1052	751	694	890

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	24	350	12	332
Volume Left	7	3	0	326
Volume Right	0	323	11	6
cSH	1197	1580	1157	753
Volume to Capacity	0.01	0.00	0.01	0.44
Queue Length 95th (ft)	0	0	1	57
Control Delay (s)	2.2	0.1	8.7	13.5
Lane LOS	A	A	A	B
Approach Delay (s)	2.2	0.1	8.7	13.5
Approach LOS			A	B

Intersection Summary			
Average Delay	6.5		
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	122	197	163	292	0	0	0	0	108	0	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	15	15	15	12	12	12	12	12	12
Total Lost time (s)		5.0			5.0						5.0	5.0
Lane Util. Factor		1.00			1.00						1.00	1.00
Frt		0.92			1.00						1.00	0.85
Flt Protected		1.00			0.98						0.95	1.00
Satd. Flow (prot)		1880			1955						1719	1538
Flt Permitted		1.00			0.75						0.95	1.00
Satd. Flow (perm)		1880			1492						1719	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	136	219	181	324	0	0	0	0	120	0	26
RTOR Reduction (vph)	0	53	0	0	0	0	0	0	0	0	0	23
Lane Group Flow (vph)	0	302	0	0	505	0	0	0	0	0	120	3
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type				Perm						Split		Perm
Protected Phases		4			8					2	2	
Permitted Phases				8								2
Actuated Green, G (s)		60.5			60.5						9.5	9.5
Effective Green, g (s)		60.5			60.5						9.5	9.5
Actuated g/C Ratio		0.76			0.76						0.12	0.12
Clearance Time (s)		5.0			5.0						5.0	5.0
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		1422			1128						204	183
v/s Ratio Prot		0.16									c0.07	
v/s Ratio Perm					c0.34							0.00
v/c Ratio		0.21			0.45						0.59	0.02
Uniform Delay, d1		2.8			3.6						33.4	31.1
Progression Factor		1.00			1.22						1.00	1.00
Incremental Delay, d2		0.1			0.9						4.3	0.0
Delay (s)		2.9			5.3						37.7	31.2
Level of Service		A			A						D	C
Approach Delay (s)		2.9			5.3			0.0			36.5	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM Average Control Delay	9.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2	SWL2	SWL
Lane Configurations												
Volume (vph)	25	48	157	215	63	45	208	3	67	18	81	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	15	12	15	16	16	12	12	12	12	12	12	12
Total Lost time (s)			6.5	6.5				6.5	6.5			6.5
Lane Util. Factor			1.00	1.00				1.00	1.00			1.00
Frt			1.00	0.95				1.00	0.85			1.00
Flt Protected			0.98	1.00				0.95	1.00			0.95
Satd. Flow (prot)			1959	1971				1725	1568			1752
Flt Permitted			0.98	1.00				0.95	1.00			0.95
Satd. Flow (perm)			1959	1971				1725	1568			1752
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	28	53	174	239	70	50	231	3	74	20	90	0
RTOR Reduction (vph)	0	0	0	7	0	0	0	0	12	0	0	0
Lane Group Flow (vph)	0	0	255	352	0	0	0	234	82	0	0	90
Heavy Vehicles (%)	5%	5%	5%	5%	3%	3%	5%	3%	3%	3%	3%	3%
Turn Type	Split	Split					Split		Prot		Split	
Protected Phases	2	2	2	8			6	6	6		4	4
Permitted Phases												
Actuated Green, G (s)			13.5	18.6				14.5	14.5			7.4
Effective Green, g (s)			13.5	18.6				14.5	14.5			7.4
Actuated g/C Ratio			0.17	0.23				0.18	0.18			0.09
Clearance Time (s)			6.5	6.5				6.5	6.5			6.5
Vehicle Extension (s)			3.0	3.0				3.0	3.0			3.0
Lane Grp Cap (vph)			331	458				313	284			162
v/s Ratio Prot			c0.13	c0.18				c0.14	0.05			c0.05
v/s Ratio Perm												
v/c Ratio			0.77	0.77				0.75	0.29			0.56
Uniform Delay, d1			31.8	28.7				31.0	28.3			34.7
Progression Factor			0.69	1.00				1.00	1.00			1.00
Incremental Delay, d2			10.3	11.7				9.4	0.6			4.1
Delay (s)			32.2	40.4				40.4	28.9			38.8
Level of Service			C	D				D	C			D
Approach Delay (s)			32.2	40.4				37.1				36.6
Approach LOS			C	D				D				D

Intersection Summary			
HCM Average Control Delay	36.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SWR	SWR2
Lane Configurations		
Volume (vph)	32	123
Ideal Flow (vphpl)	1900	1900
Lane Width	12	12
Total Lost time (s)	6.5	
Lane Util. Factor	1.00	
Frt	0.85	
Flt Protected	1.00	
Satd. Flow (prot)	1562	
Flt Permitted	1.00	
Satd. Flow (perm)	1562	
Peak-hour factor, PHF	0.90	0.90
Adj. Flow (vph)	36	137
RTOR Reduction (vph)	124	0
Lane Group Flow (vph)	49	0
Heavy Vehicles (%)	5%	3%
Turn Type	Prot	
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	7.4	
Effective Green, g (s)	7.4	
Actuated g/C Ratio	0.09	
Clearance Time (s)	6.5	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	144	
v/s Ratio Prot	0.03	
v/s Ratio Perm		
v/c Ratio	0.34	
Uniform Delay, d1	34.0	
Progression Factor	1.00	
Incremental Delay, d2	1.4	
Delay (s)	35.4	
Level of Service	D	
Approach Delay (s)		
Approach LOS		

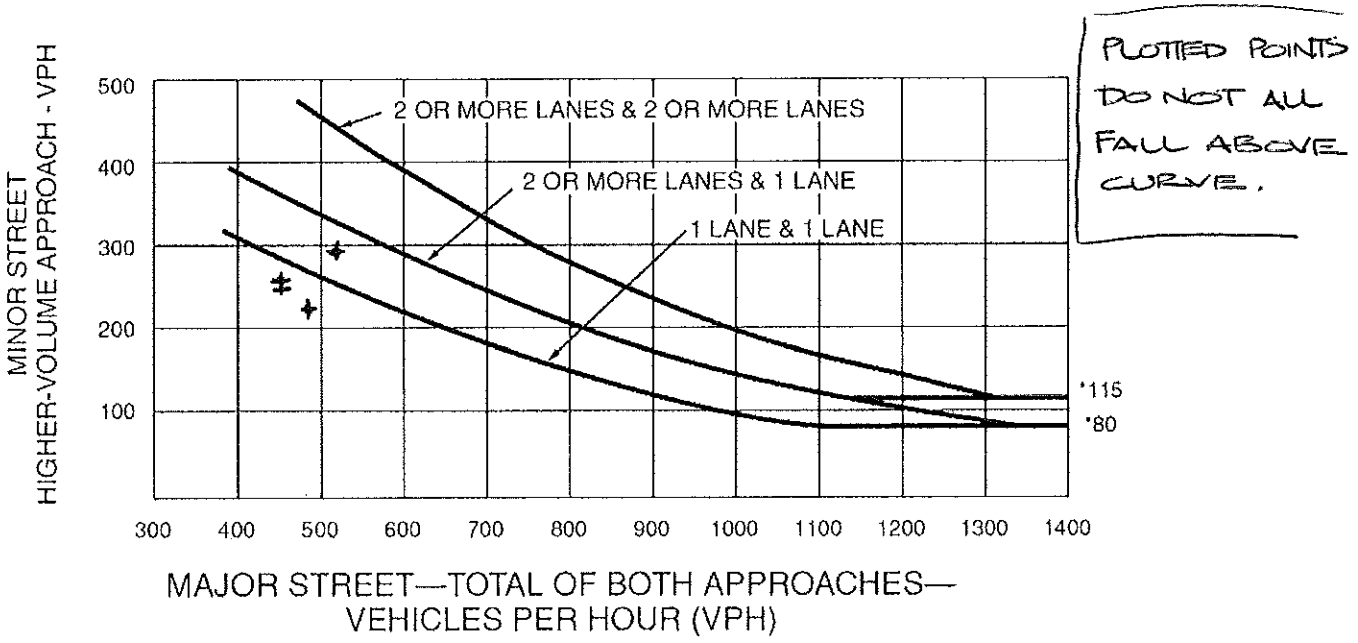
Intersection Summary

APPENDIX F

PEAK HOUR SIGNAL WARRANT ANALYSIS

NB RAMPS / MAIN ST

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

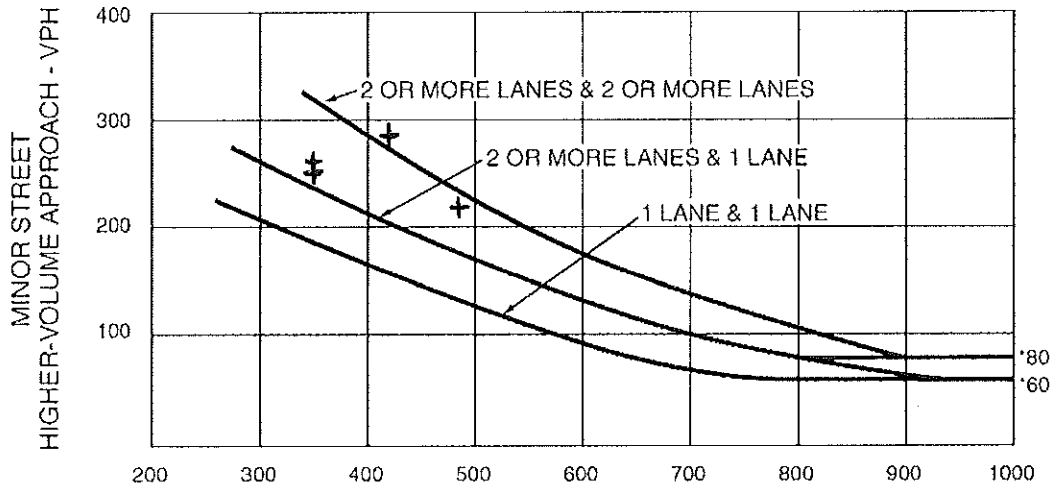


PLOTTED POINTS DO NOT ALL FALL ABOVE CURVE.

*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)

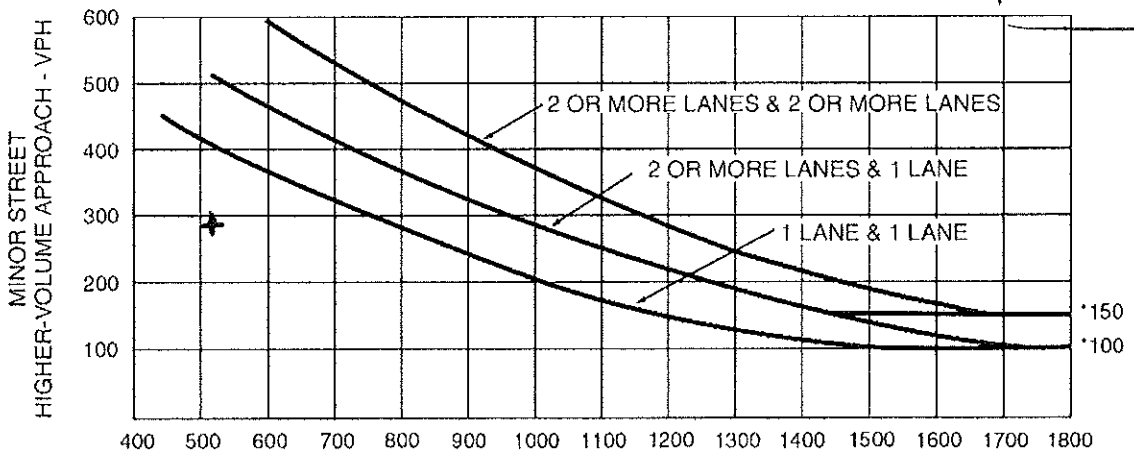
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE ~~70~~ 64 km/h OR ABOVE 40 mph ON MAJOR STREET)



*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.

PLOTTED POINT DOES NOT FALL ABOVE CURVE.

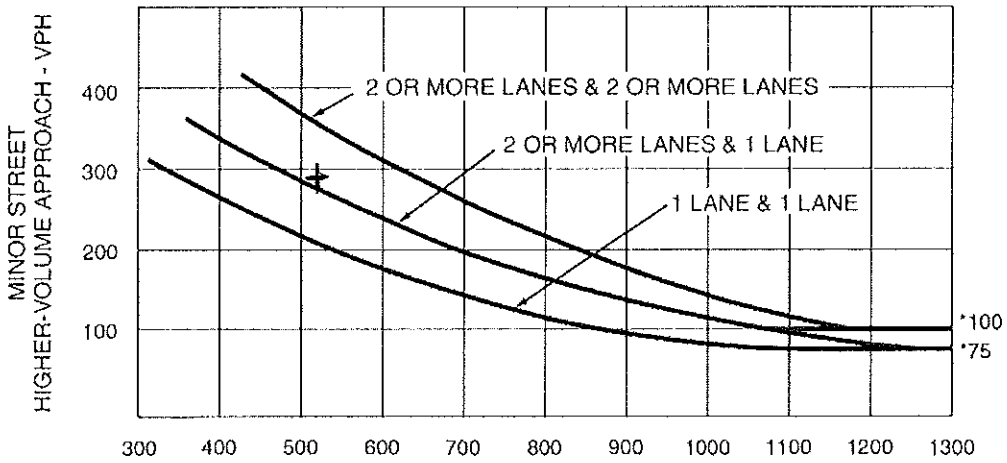
Figure 4C-3. Warrant 3, Peak Hour



*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.

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

05	SLO	101	52.5
DIST	CO	RTE	PM

COUNT DATE SEPT, 2009
CALC R. HAYES DATE 1/25/11
CHK _____ DATE _____

Major St: MAIN ST.
Minor St: HWY 101 NB RAMPS

Critical Approach Speed 30 mph
Critical Approach Speed 30 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)

NO 8-HOUR COUNTS

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	
Both Approaches Major Street	500 (400)	350 (280)	600 (480)	420 (336)
Highest Approach Minor Street	160 (120)	105 (84)	200 (160)	140 (112)

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)
Highest Approach Minor Street	75 (60)	53 (42)	100 (80)	70 (56)

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.

"URBAN"

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	7:30 AM	3:00 PM	4:30 PM	5:30 PM Hour
Both Approaches - Major Street	X		488	509	454	452
Higher Approach - Minor Street	X		213	299	266	264

*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	3:00 PM Hour
Both Approaches - Major Street	X		509
Higher Approach - Minor Street	X		299

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.

"RURAL"

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	1:30 AM	3:00 PM	4:00 PM	5:00 PM Hour
Both Approaches - Major Street	X		488	509	454	452
Higher Approach - Minor Street	X		243	299	246	264

*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	3:00 PM Hour
Both Approaches - Major Street	X		509
Higher Approach - Minor Street	X		299

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

WARRANT 4 - Pedestrian Volume
(Parts A and B Must Be Satisfied)

NO OBSERVED PED. TRAFFIC

SATISFIED YES ☐ NO ☒

Part A (Parts 1 or 2 must be satisfied)

SATISFIED YES ☐ NO ☐

		Hours - - ->					
1.	Pedestrian Volume					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)

NO SCHOOL CROSSING

SATISFIED YES ☐ NO ☒

Part A
Gap/Minutes and # of Children

SATISFIED YES ☐ NO ☐

		Hour		
Gaps vs Minutes	Minutes Children Using Crossing			
	Number of Adequate Gaps		Gaps < Minutes	YES ☐ NO ☐
School Age Pedestrians Crossing Street / hr			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)

NO SIGNALS IN VICINITY

WARRANT 6 - Coordinated Signal System **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 _____ 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.

RICK ENGINEERING COMPANY™
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Date 1/25/11
Job No. 16128
Page
Done By R. HAYES
Checked By

WARRANT 2:

1. TOTAL DELAY = 299 VEH/HR × 21.9 SEC/VEH = 6,548 $\frac{SEC}{HR}$ = 1.82 VEH · HRS NO

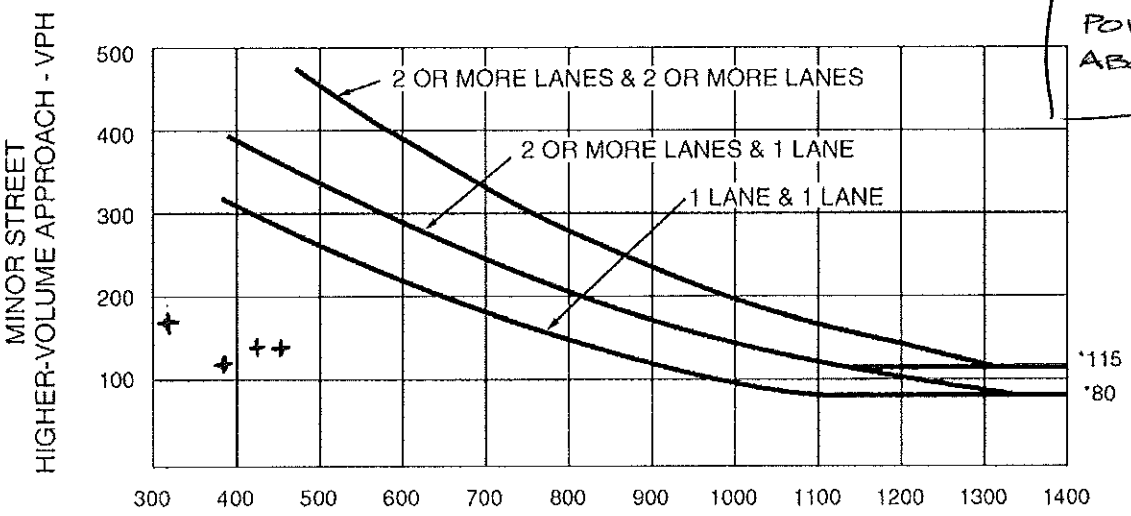
2. VOLUME = 299 VEH./HR > 100 VPH YES

3. TOTAL ENTERING VOLUME = 299 VEH + 509 VEH = 808 VEH > 650 VEH YES

SB RAMPS / MAIN ST

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

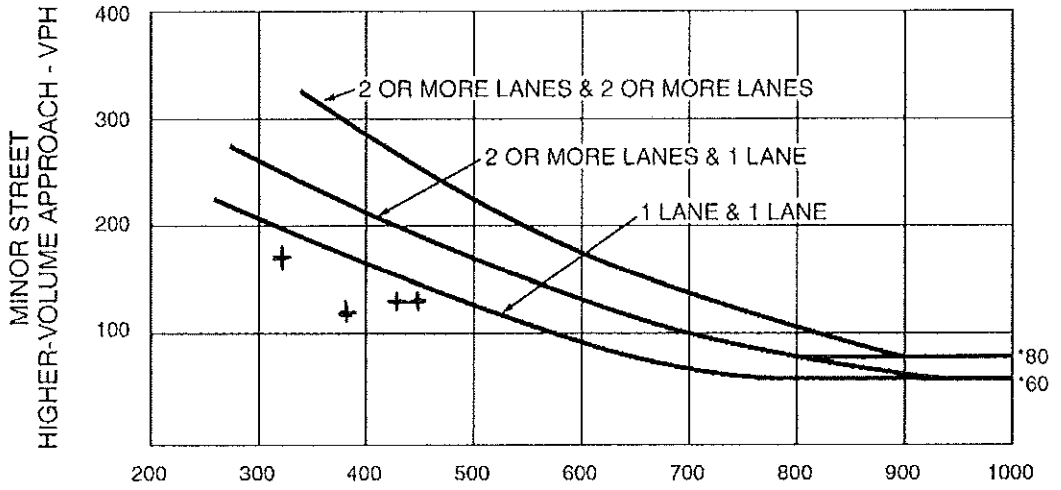
NO PLOTTED POINTS FALL ABOVE CURVE



*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)

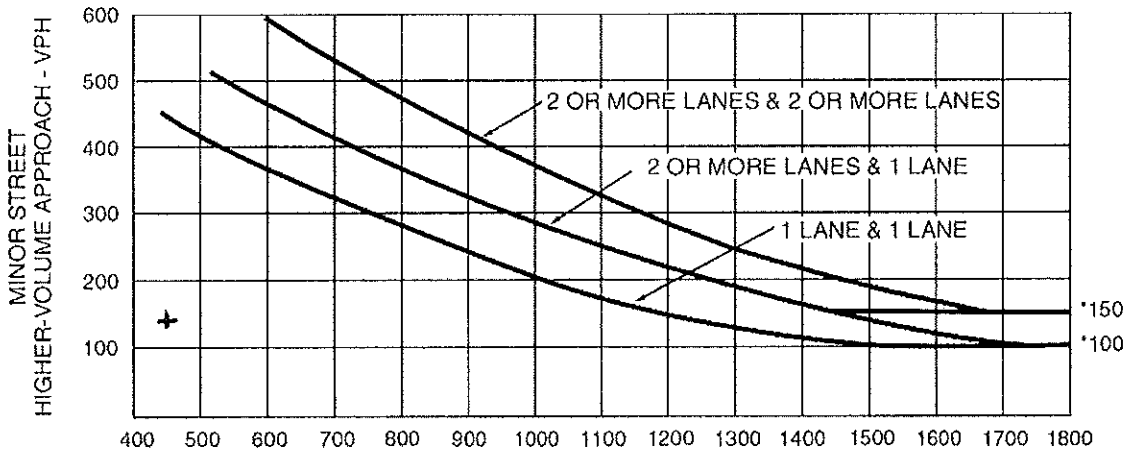
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE ~~70~~ 64 km/h OR ABOVE 40 mph ON MAJOR STREET)



*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.

PLOTTED POINT NOT ABOVE CURVE

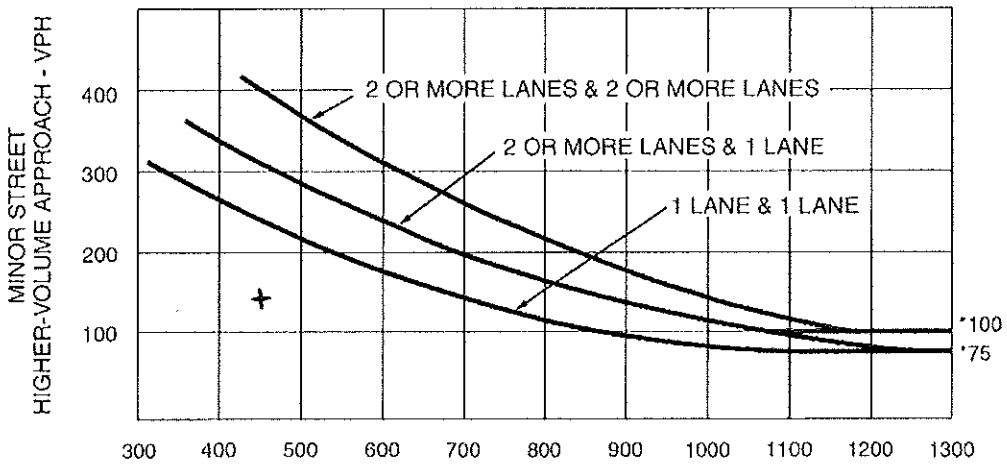
Figure 4C-3. Warrant 3, Peak Hour



*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.

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

05	SLO	101	52.5
DIST	CO	RTE	PM

COUNT DATE SEPT, 2009
CALC R. HAYES DATE 1/25/11
CHK _____ DATE _____

Major St: MAIN ST.
Minor St: HWY. 101 SB RAMPS

Critical Approach Speed 30 mph
Critical Approach Speed 30 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)

NO 8-HOUR COUNTS.

Condition A - Minimum Vehicle Volume 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	500 (400)	350 (280)	600 (480)	420 (336)							
Highest Approach Minor Street	150 (120)	105 (84)	200 (160)	140 (112)							

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)							
Highest Approach Minor Street	75 (60)	53 (42)	100 (80)	70 (56)							

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.

"URBAN"

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	7:15 AM	3:30 PM	4:30 PM	5:30 PM Hour
Both Approaches - Major Street	X		308	457	427	387
Higher Approach - Minor Street	X		180	132	141	115

*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	3:30 PM Hour
Both Approaches - Major Street	X		457
Higher Approach - Minor Street	X		132

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.

"RURAL"

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	2:15 PM	3:00 PM	4:00 PM	5:00 PM Hour
Both Approaches - Major Street	X		308	457	427	387
Higher Approach - Minor Street	X		180	132	141	115

*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	3:00 PM Hour
Both Approaches - Major Street	X		457
Higher Approach - Minor Street	X		132

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

WARRANT 4 - Pedestrian Volume (NO OBSERVED PEDS)
(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					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 (NO 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	
	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)

NO SIGNALS IN VICINITY

WARRANT 6 - Coordinated Signal System ~~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 _____ 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.

RICK ENGINEERING COMPANY™
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Date 1/25/11
Job No. 16128
Page
Done By R. HAYES
Checked By

WARRANT 2:

1. TOTAL DELAY = 35.9 SEC/VEH × 141 VEH/HR = 5,062 SEC/HR = 1.41 VEH·HR > 4 NO

2. MINOR ST. VOLUME = 141 VEH/HR > 100 VEH/HR YES

3. TOTAL ENTERING VOLUME = 589 VEH < 650 VEH. NO

APPENDIX G

SIGNALIZED INTERSECTION CAPACITY ANALYSIS (ILV)

INTERSECTION

Signalized Intersection
CAPACITY ANALYSIS

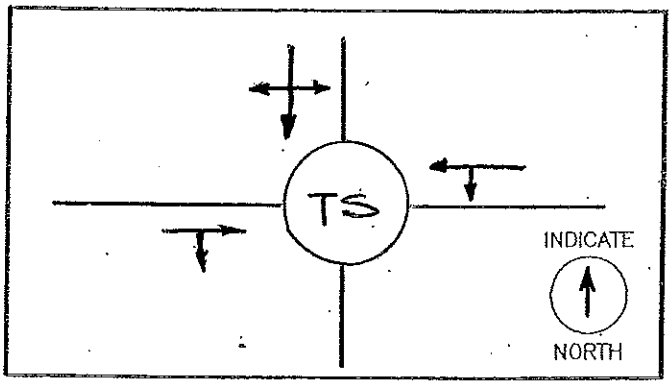
INTERSECTION MAIN ST / HWY 101 SB RAMPS (AM PEAK HOUR)

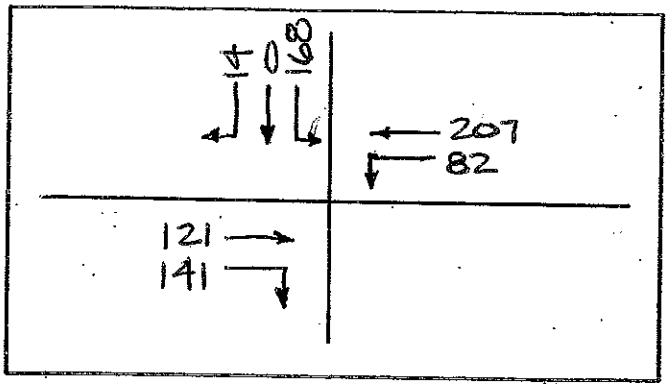
DIST. CO. RTE. P.M. 05-SLO-101-52.5

BY R HAYES DATE 1/25/11

TIME 7:15 (AM) PM

DIAGRAM AND TRAFFIC FLOWS:





LANE VOLUMES (ILV/HR)

PHASE 1	PHASE 2	PHASE 3	PHASE 4
82	207, 121, 141	14, 0, 168	

CRITICAL LANE VOLUMES (ILV/HR)

PHASE 1	PHASE 2	PHASE 3	PHASE 4
82	262	182	

TOTAL OPERATING LEVEL (ILV/HR) IS . . .

Σ
526

- ☒ < 1200 ILV/HR.
- ☐ > 1200 BUT < 1500 ILV/HR.
- ☐ > 1500 ILV/HR (CAPACITY)

REMARKS: SIGNAL WOULD BE CONSIDERED UNDER-UTILIZED AT THIS LOCATION. WITH SIGNAL, NO ADDITION OF LANES NECESSARY.

INTERSECTION

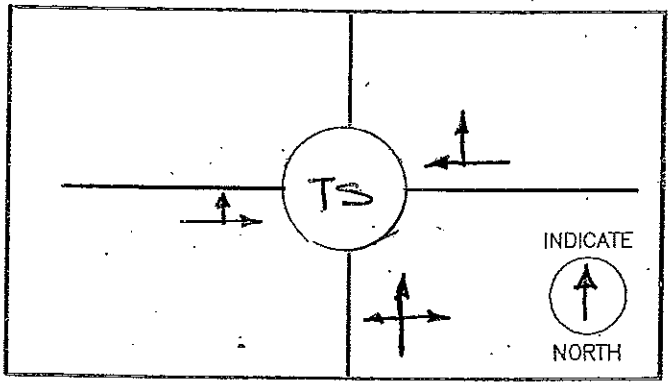
Signalized Intersection
CAPACITY ANALYSIS

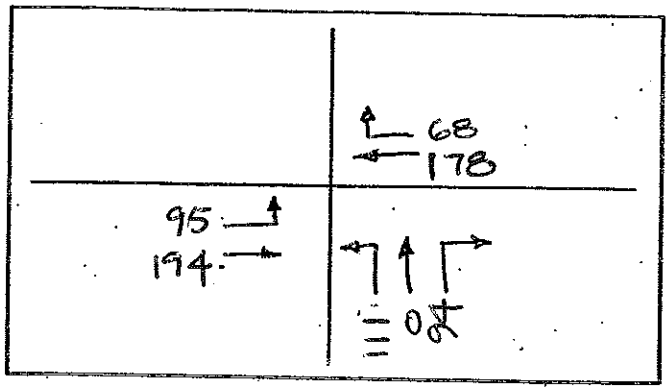
INTERSECTION MAIN ST/HWY 101 NB RAMPS (AM PEAK HOUR) DIST. CO. RTE. P.M. 05-SLO-101-52.5

BY R. HAYES DATE 1/25/11

TIME 7:15 (AM) PM

DIAGRAM AND TRAFFIC FLOWS:





LANE VOLUMES (ILV/HR)

PHASE 1	PHASE 2	PHASE 3	PHASE 4
95	68, 178, 194	0, 94	

CRITICAL LANE VOLUMES (ILV/HR)

PHASE 1	PHASE 2	PHASE 3	PHASE 4
95	246	205	

TOTAL OPERATING LEVEL (ILV/HR) IS . . .

Σ
546

- [x] < 1200 ILV/HR.
- [ ] > 1200 BUT < 1500 ILV/HR.
- [ ] > 1500 ILV/HR (CAPACITY)

REMARKS: SIGNAL WOULD BE CONSIDERED UNDERUTILIZED AT THIS LOCATION. WITH SIGNAL, NO ADDITION OF LANES NECESSARY.

INTERSECTION

Signalized Intersection
CAPACITY ANALYSIS

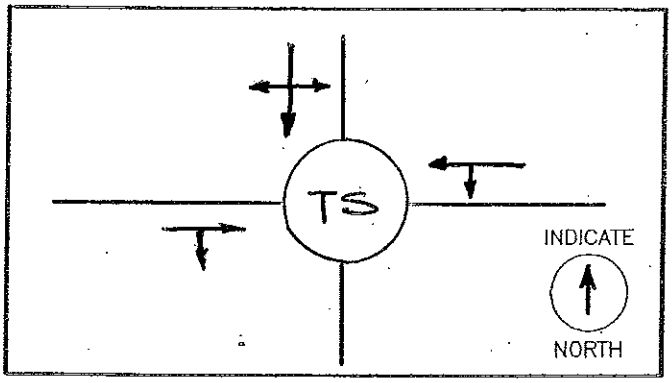
INTERSECTION MAIN ST / HWY 101 SB RAMPS (PM PEAK HOUR)

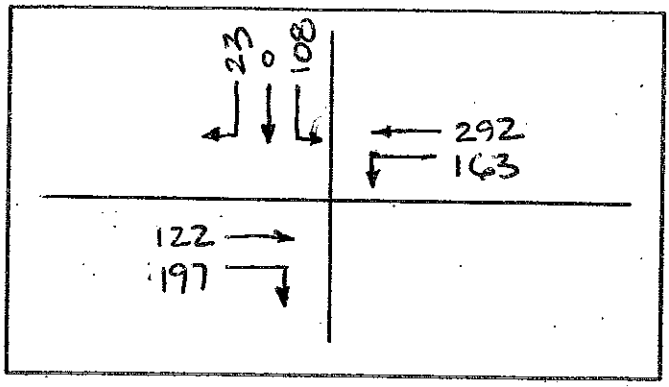
DIST. CO. RTE. P.M. 05-SLO-101-52.5

BY R. HAYES DATE 1/25/11

TIME 3:30 AM (PM)

DIAGRAM AND TRAFFIC FLOWS:





LANE VOLUMES (ILV/HR)

PHASE 1	PHASE 2	PHASE 3	PHASE 4
163	292, 122, 197	23, 0, 108	

CRITICAL LANE VOLUMES (ILV/HR)

PHASE 1	PHASE 2	PHASE 3	PHASE 4
163	319	131	

TOTAL OPERATING LEVEL (ILV/HR) IS . . .

Σ
613

- ☒ < 1200 ILV/HR.
- ☐ > 1200 BUT < 1500 ILV/HR.
- ☐ > 1500 ILV/HR (CAPACITY)

REMARKS: SIGNAL WOULD BE CONSIDERED UNDER-UTILIZED AT THIS LOCATION. WITH SIGNAL, NO ADDITION OF LANES NECESSARY.

INTERSECTION

Signalized Intersection
CAPACITY ANALYSIS

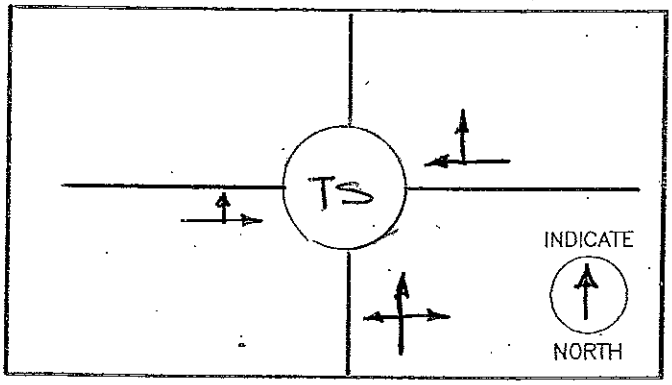
INTERSECTION MAIN ST/HWY 101 NB RAMPS (PM PEAK HOUR)

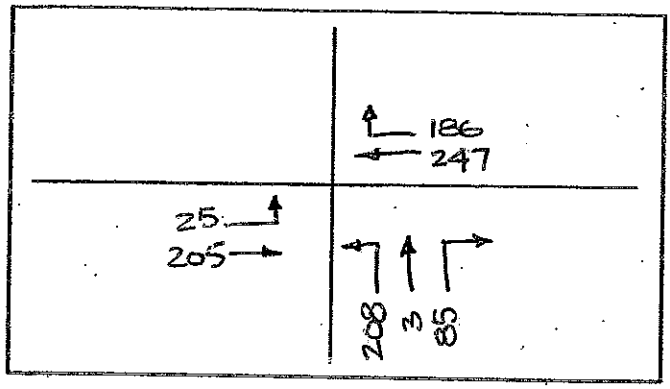
DIST. CO. RTE. P.M. 05-SLO-101-52.5

BY B. HAYES DATE 1/25/11

TIME 3:00 AM (PM)

DIAGRAM AND TRAFFIC FLOWS:





LANE VOLUMES (ILV/HR)

PHASE 1	PHASE 2	PHASE 3	PHASE 4
25	186, 247, 205	208, 3, 85	

CRITICAL LANE VOLUMES (ILV/HR)

PHASE 1	PHASE 2	PHASE 3	PHASE 4
25	433	296	

TOTAL OPERATING LEVEL (ILV/HR) IS . . .

Σ
754

- [X] < 1200 ILV/HR.
- [ ] > 1200 BUT < 1500 ILV/HR.
- [ ] > 1500 ILV/HR (CAPACITY)

REMARKS: SIGNAL WOULD BE CONSIDERED UNDERUTILIZED AT THIS LOCATION. WITH SIGNAL, NO ADDITION OF LANES NECESSARY.

APPENDIX H

QUEUING ANALYSIS:
EXISTING CONDITIONS

Intersection: 1: Main St. & Theatre Dr.

Movement	EB	NB	SB
Directions Served	LTR	R	LTR
Maximum Queue (ft)	51	53	120
Average Queue (ft)	5	8	65
95th Queue (ft)	29	34	112
Link Distance (ft)	4		443
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)		50	
Storage Blk Time (%)		0	
Queuing Penalty (veh)		0	

Intersection: 2: Main St. & SB 101 Offramp

Movement	EB	WB	SB	SB
Directions Served	TR	LT	LT	R
Maximum Queue (ft)	14	79	118	30
Average Queue (ft)	2	31	62	12
95th Queue (ft)	8	66	102	36
Link Distance (ft)	41	333	600	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				50
Storage Blk Time (%)			13	
Queuing Penalty (veh)			2	

Intersection: 3: Main St. & NB 101 Onramp

Movement	EB	WB	NB	NB
Directions Served	LT	TR	LT	R
Maximum Queue (ft)	221	25	153	75
Average Queue (ft)	24	5	48	50
95th Queue (ft)	113	21	98	78
Link Distance (ft)	333	25	780	
Upstream Blk Time (%)		0		
Queuing Penalty (veh)		1		
Storage Bay Dist (ft)				50
Storage Blk Time (%)			5	5
Queuing Penalty (veh)			5	6

Intersection: 4: Main St. & Ramada Dr.

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	55	31	50	69
Average Queue (ft)	26	4	21	31
95th Queue (ft)	55	20	46	62
Link Distance (ft)	25	622	675	
Upstream Blk Time (%)	7			
Queuing Penalty (veh)	20			
Storage Bay Dist (ft)				50
Storage Blk Time (%)			0	1
Queuing Penalty (veh)			0	1

Zone Summary

Zone wide Queuing Penalty: 33

Intersection: 1: Main St. & Theatre Dr.

Movement	EB	NB	SB
Directions Served	LTR	R	LTR
Maximum Queue (ft)	30	28	135
Average Queue (ft)	4	6	64
95th Queue (ft)	20	24	103
Link Distance (ft)	4		443
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)		50	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Main St. & SB 101 Offramp

Movement	EB	WB	SB	SB
Directions Served	TR	LT	LT	R
Maximum Queue (ft)	43	123	93	75
Average Queue (ft)	9	49	48	25
95th Queue (ft)	32	108	78	69
Link Distance (ft)	43	333	697	
Upstream Blk Time (%)	0			
Queuing Penalty (veh)	1			
Storage Bay Dist (ft)				50
Storage Blk Time (%)			13	2
Queuing Penalty (veh)			3	2

Intersection: 3: Main St. & NB 101 Onramp

Movement	EB	WB	NB	NB
Directions Served	LT	TR	LT	R
Maximum Queue (ft)	60	33	115	75
Average Queue (ft)	26	12	63	42
95th Queue (ft)	56	34	99	75
Link Distance (ft)	333	26	828	
Upstream Blk Time (%)		0		
Queuing Penalty (veh)		2		
Storage Bay Dist (ft)				50
Storage Blk Time (%)			11	4
Queuing Penalty (veh)			10	8

Intersection: 4: Main St. & Ramada Dr.

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	32	26	108	75
Average Queue (ft)	29	5	44	55
95th Queue (ft)	42	21	92	88
Link Distance (ft)	26	863	649	
Upstream Blk Time (%)	8			
Queuing Penalty (veh)	22			
Storage Bay Dist (ft)				50
Storage Blk Time (%)			4	12
Queuing Penalty (veh)			7	9

Zone Summary

Zone wide Queuing Penalty: 63

APPENDIX I

QUEUING ANALYSIS:
NEAR-TERM MITIGATION MEASURES

Intersection: 1: Main St. & Theatre Dr.

Movement	EB	NB	SB
Directions Served	LTR	R	LTR
Maximum Queue (ft)	28	28	157
Average Queue (ft)	2	6	68
95th Queue (ft)	14	24	116
Link Distance (ft)	4		443
Upstream Blk Time (%)	1		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)		50	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Main St. & SB 101 Offramp

Movement	EB	WB	SB	SB
Directions Served	TR	LT	LT	R
Maximum Queue (ft)	5	144	71	69
Average Queue (ft)	1	45	43	22
95th Queue (ft)	5	95	69	60
Link Distance (ft)	39	333	577	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				50
Storage Blk Time (%)			14	1
Queuing Penalty (veh)			3	1

Intersection: 3: Main St. & NB 101 Onramp

Movement	EB	WB	NB	NB
Directions Served	LT	TR	LT	R
Maximum Queue (ft)	42	51	76	74
Average Queue (ft)	37	32	52	35
95th Queue (ft)	50	49	73	62
Link Distance (ft)	333	25	801	
Upstream Blk Time (%)		14		
Queuing Penalty (veh)		60		
Storage Bay Dist (ft)				50
Storage Blk Time (%)			4	0
Queuing Penalty (veh)			4	0

Intersection: 4: Main St. & Ramada Dr.

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	31	367	739	75
Average Queue (ft)	24	106	477	75
95th Queue (ft)	44	271	711	75
Link Distance (ft)	25	800	732	
Upstream Blk Time (%)	3		1	
Queuing Penalty (veh)	9		0	
Storage Bay Dist (ft)				50
Storage Blk Time (%)			18	94
Queuing Penalty (veh)			29	76

Zone Summary

Zone wide Queuing Penalty: 182

Intersection: 1: Main St. & Theatre Dr.

Movement	EB	NB	SB
Directions Served	LTR	R	LTR
Maximum Queue (ft)	29	28	135
Average Queue (ft)	2	6	70
95th Queue (ft)	14	24	117
Link Distance (ft)	4		443
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)		50	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Main St. & SB 101 Offramp

Movement	EB	WB	SB	SB
Directions Served	TR	LT	LT	R
Maximum Queue (ft)	57	140	52	69
Average Queue (ft)	41	66	35	22
95th Queue (ft)	57	110	52	60
Link Distance (ft)	40	333	570	
Upstream Blk Time (%)	6			
Queuing Penalty (veh)	20			
Storage Bay Dist (ft)				50
Storage Blk Time (%)			1	0
Queuing Penalty (veh)			0	1

Intersection: 3: Main St. & NB 101 Onramp

Movement	EB	WB	NB	NB
Directions Served	LT	TR	LT	R
Maximum Queue (ft)	37	34	174	75
Average Queue (ft)	19	6	60	43
95th Queue (ft)	42	25	114	76
Link Distance (ft)	333	26	796	
Upstream Blk Time (%)		0		
Queuing Penalty (veh)		1		
Storage Bay Dist (ft)				50
Storage Blk Time (%)			10	3
Queuing Penalty (veh)			9	6

Intersection: 4: Main St. & Ramada Dr.

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	32	27	86	75
Average Queue (ft)	27	8	39	55
95th Queue (ft)	44	26	69	87
Link Distance (ft)	26	663	644	
Upstream Blk Time (%)	6			
Queuing Penalty (veh)	17			
Storage Bay Dist (ft)				50
Storage Blk Time (%)			2	12
Queuing Penalty (veh)			3	10

Zone Summary

Zone wide Queuing Penalty: 65

Intersection: 1: Main St. & Theatre Dr.

Movement	EB	NB	SB
Directions Served	LTR	R	LTR
Maximum Queue (ft)	29	28	135
Average Queue (ft)	2	6	73
95th Queue (ft)	14	24	122
Link Distance (ft)	4		443
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		50	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Main St. & SB 101 Offramp

Movement	EB	WB	SB	SB
Directions Served	TR	LT	LT	R
Maximum Queue (ft)	57	117	52	68
Average Queue (ft)	38	55	34	22
95th Queue (ft)	56	99	51	60
Link Distance (ft)	40	333	625	
Upstream Blk Time (%)	6			
Queuing Penalty (veh)	19			
Storage Bay Dist (ft)				50
Storage Blk Time (%)			1	1
Queuing Penalty (veh)			0	1

Intersection: 3: Main St. & NB 101 Onramp

Movement	EB	WB	NB	NB
Directions Served	LT	TR	LT	R
Maximum Queue (ft)	42	51	94	75
Average Queue (ft)	26	34	53	34
95th Queue (ft)	44	50	80	61
Link Distance (ft)	333	25	767	
Upstream Blk Time (%)		14		
Queuing Penalty (veh)		63		
Storage Bay Dist (ft)				50
Storage Blk Time (%)			5	0
Queuing Penalty (veh)			4	0

Intersection: 4: Main St. & Ramada Dr.

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	31	412	738	75
Average Queue (ft)	20	123	397	72
95th Queue (ft)	44	329	697	82
Link Distance (ft)	25	691	725	
Upstream Blk Time (%)	2		3	
Queuing Penalty (veh)	6		0	
Storage Bay Dist (ft)				50
Storage Blk Time (%)			8	90
Queuing Penalty (veh)			12	73

Zone Summary

Zone wide Queuing Penalty: 179

Intersection: 1: Main St. & Theatre Dr.

Movement	EB	NB	SB
Directions Served	LTR	R	LTR
Maximum Queue (ft)	29	30	157
Average Queue (ft)	4	6	65
95th Queue (ft)	20	25	111
Link Distance (ft)	4		443
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)		50	
Storage Blk Time (%)		0	
Queuing Penalty (veh)		0	

Intersection: 2: Main St. & SB 101 Offramp

Movement	EB	WB	SB	SB
Directions Served	TR	LT	LT	R
Maximum Queue (ft)	15	106	93	69
Average Queue (ft)	3	47	46	22
95th Queue (ft)	10	102	75	60
Link Distance (ft)	41	333	663	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				50
Storage Blk Time (%)			11	1
Queuing Penalty (veh)			3	2

Intersection: 3: Main St. & NB 101 Onramp

Movement	EB	WB	NB	NB
Directions Served	LT	TR	LT	R
Maximum Queue (ft)	124	36	138	75
Average Queue (ft)	57	33	79	43
95th Queue (ft)	97	40	120	84
Link Distance (ft)	333	26	808	
Upstream Blk Time (%)		11		
Queuing Penalty (veh)		47		
Storage Bay Dist (ft)				50
Storage Blk Time (%)			20	2
Queuing Penalty (veh)			17	4

Intersection: 4: Main St. & Ramada Dr.

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	31	76	221	75
Average Queue (ft)	29	30	79	62
95th Queue (ft)	41	73	179	89
Link Distance (ft)	26	533	831	
Upstream Blk Time (%)	5			
Queuing Penalty (veh)	15			
Storage Bay Dist (ft)				50
Storage Blk Time (%)			4	26
Queuing Penalty (veh)			7	21

Zone Summary

Zone wide Queuing Penalty: 116

Intersection: 1: Main St. & Theatre Dr.

Movement	EB	NB	SB
Directions Served	LTR	R	LTR
Maximum Queue (ft)	29	29	135
Average Queue (ft)	2	6	66
95th Queue (ft)	14	24	105
Link Distance (ft)	4		443
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)		50	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Main St. & SB 101 Offramp

Movement	EB	WB	SB	SB
Directions Served	TR	LT	LT	R
Maximum Queue (ft)	57	204	93	75
Average Queue (ft)	28	101	55	24
95th Queue (ft)	54	181	93	71
Link Distance (ft)	40	333	578	
Upstream Blk Time (%)	1			
Queuing Penalty (veh)	5			
Storage Bay Dist (ft)				50
Storage Blk Time (%)			13	0
Queuing Penalty (veh)			3	0

Intersection: 3: Main St. & NB 101 Onramp

Movement	EB	WB	NB	NB
Directions Served	LT	TR	LT	R
Maximum Queue (ft)	59	25	73	73
Average Queue (ft)	23	4	55	37
95th Queue (ft)	53	19	74	65
Link Distance (ft)	333	25	910	
Upstream Blk Time (%)		0		
Queuing Penalty (veh)		1		
Storage Bay Dist (ft)				50
Storage Blk Time (%)			8	1
Queuing Penalty (veh)			7	2

Intersection: 4: Main St. & Ramada Dr.

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	32	30	131	75
Average Queue (ft)	29	7	55	54
95th Queue (ft)	42	25	115	89
Link Distance (ft)	25	724	805	
Upstream Blk Time (%)	7			
Queuing Penalty (veh)	19			
Storage Bay Dist (ft)				50
Storage Blk Time (%)			4	11
Queuing Penalty (veh)			6	9

Zone Summary

Zone wide Queuing Penalty: 52

Intersection: 1: Main St. & Theatre Dr.

Movement	EB	NB	SB
Directions Served	LTR	R	LTR
Maximum Queue (ft)	30	28	135
Average Queue (ft)	4	6	70
95th Queue (ft)	20	24	114
Link Distance (ft)	4		443
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)		50	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Main St. & SB 101 Offramp

Movement	EB	WB	SB	SB
Directions Served	TR	LT	LT	R
Maximum Queue (ft)	58	167	93	75
Average Queue (ft)	36	83	56	19
95th Queue (ft)	65	144	93	63
Link Distance (ft)	41	333	598	
Upstream Blk Time (%)	4			
Queuing Penalty (veh)	14			
Storage Bay Dist (ft)				50
Storage Blk Time (%)			19	0
Queuing Penalty (veh)			4	0

Intersection: 3: Main St. & NB 101 Onramp

Movement	EB	WB	NB	NB
Directions Served	LT	TR	LT	R
Maximum Queue (ft)	85	51	202	75
Average Queue (ft)	50	31	112	53
95th Queue (ft)	92	47	178	91
Link Distance (ft)	333	26	848	
Upstream Blk Time (%)		7		
Queuing Penalty (veh)		28		
Storage Bay Dist (ft)				50
Storage Blk Time (%)			39	3
Queuing Penalty (veh)			33	6

Intersection: 4: Main St. & Ramada Dr.

Movement	EB	WB	SB	SB
Directions Served	LT	TR	L	R
Maximum Queue (ft)	32	65	177	75
Average Queue (ft)	29	21	77	62
95th Queue (ft)	42	53	173	91
Link Distance (ft)	26	791	763	
Upstream Blk Time (%)	6			
Queuing Penalty (veh)	16			
Storage Bay Dist (ft)				50
Storage Blk Time (%)			10	24
Queuing Penalty (veh)			15	19

Zone Summary

Zone wide Queuing Penalty: 137

Intersection: 1: Main St. & Theatre Dr.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	R	LTR
Maximum Queue (ft)	49	73	68	342
Average Queue (ft)	10	42	10	211
95th Queue (ft)	39	72	46	324
Link Distance (ft)	4	43		443
Upstream Blk Time (%)	9	14		
Queuing Penalty (veh)	0	44		
Storage Bay Dist (ft)			50	
Storage Blk Time (%)			1	
Queuing Penalty (veh)			0	

Intersection: 2: Main St. & SB 101 Offramp

Movement	EB	WB	SB	SB
Directions Served	TR	LT	LT	R
Maximum Queue (ft)	73	342	157	75
Average Queue (ft)	38	287	73	29
95th Queue (ft)	77	393	143	75
Link Distance (ft)	43	335	585	
Upstream Blk Time (%)	3	5		
Queuing Penalty (veh)	11	22		
Storage Bay Dist (ft)				50
Storage Blk Time (%)			19	8
Queuing Penalty (veh)			4	8

Intersection: 3: Main St. & Ramada Dr.

Movement	EB	WB	NB	NB	SW	SW
Directions Served	<LT	TR>	LT	R>	<L	R>
Maximum Queue (ft)	224	289	523	75	475	75
Average Queue (ft)	155	203	306	42	244	69
95th Queue (ft)	232	295	508	100	472	88
Link Distance (ft)	335	794	818		572	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)				50		50
Storage Blk Time (%)			68	17	49	45
Queuing Penalty (veh)			58	36	76	37

Zone Summary

Zone wide Queuing Penalty: 297

Intersection: 1: Main St. & Theatre Dr.

Movement	EB	NB	SB
Directions Served	LTR	R	LTR
Maximum Queue (ft)	30	56	456
Average Queue (ft)	5	9	171
95th Queue (ft)	22	37	370
Link Distance (ft)	4		443
Upstream Blk Time (%)	2		1
Queuing Penalty (veh)	0		0
Storage Bay Dist (ft)		50	
Storage Blk Time (%)		3	
Queuing Penalty (veh)		0	

Intersection: 2: Main St. & SB 101 Offramp

Movement	EB	WB	SB	SB
Directions Served	TR	LT	LT	R
Maximum Queue (ft)	58	256	224	74
Average Queue (ft)	38	145	108	14
95th Queue (ft)	66	277	210	56
Link Distance (ft)	40	335	172	
Upstream Blk Time (%)	25		6	
Queuing Penalty (veh)	80		0	
Storage Bay Dist (ft)				50
Storage Blk Time (%)			47	0
Queuing Penalty (veh)			11	0

Intersection: 3: Main St. & Ramada Dr.

Movement	EB	WB	NB	NB	SW	SW
Directions Served	<LT	TR>	LT	R>	<L	R>
Maximum Queue (ft)	352	437	226	75	241	75
Average Queue (ft)	267	204	152	62	84	63
95th Queue (ft)	401	371	237	98	188	89
Link Distance (ft)	335	1092	879		761	
Upstream Blk Time (%)	5					
Queuing Penalty (veh)	12					
Storage Bay Dist (ft)				50		50
Storage Blk Time (%)			56	19	18	26
Queuing Penalty (veh)			47	41	29	21

Zone Summary

Zone wide Queuing Penalty: 240

APPENDIX J

TRAFFIC SPEED SURVEYS

P:\TRAFFIC\Radar\5169A1-Ramada

SAN LUIS OBISPO COUNTY
PUBLIC WORKS DEPARTMENT

ENGINEERING & TRAFFIC SURVEY

Road No. 5201

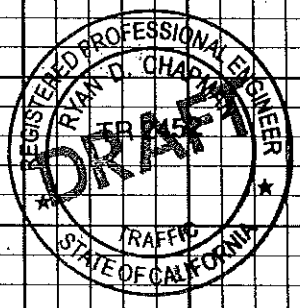
Road: Ramada s/o Cow Meadow | Date: 3/8/2011

Location: | Weather: clear

Recorder: Meyers | Begin time: 11:33 | End time: 12:45

Posted Speed Zone: 40 MPH | Road type: Two Lane Rural

MPH		5	10	15	20	25	Percent of Total	Cumulative Percentage
	9						0%	100%
	8						0%	100%
	7						0%	100%
	6						0%	100%
6	5						0%	100%
	4						0%	100%
	3						0%	100%
	2						0%	100%
	1						0%	100%
6	0						0%	100%
	9	N					1%	99%
	8						0%	99%
	7						0%	99%
	6						0%	99%
5	5						0%	99%
	4	N S					2%	97%
	3	N S					2%	95%
	2	S N N					3%	93%
	1	N N					2%	91%
>>>>>> 5	0	S N N S S N					5%	85%
	9	S N S N N S S S N S					9%	76%
	8	S N N S S S S S S N S S S					12%	65%
	7	N S N N S S S N N S S					10%	55%
	6	N N S N S N S N S S S					10%	45%
4	5	N N N N N S N					6%	38%
	4	S N S N S S S					6%	32%
	3	S S S S N N N					6%	25%
	2	N S S					3%	23%
	1	N N S S N N N N S S					9%	14%
4	0	S N N S N S N S S N S					10%	4%
	9	N N					2%	2%
	8	N					1%	1%
	7	N					1%	0%
	6						0%	0%
3	5						0%	0%
	4						0%	0%
	3						0%	0%
	2						0%	0%
	1						0%	0%
3	0						0%	0%
						Total Number of Vehicles	110	100%	100%



85th Percentile (Prevailing) Speed: 50 MPH

Pace Speed: 40 to 50 MPH | % in Pace: 72.00% | % under: 4.00% | % over: 24.00%

Signed: | Date: | Title: C.E Technician

Collision History Controls Y/(N) | Geometric Controls Y/(N) | Business/Residential Y/(N)

Recommended and Established Speed Limit: 50 MPH

Signed: | Date: | Title: C.E. Technician

SAN LUIS OBISPO COUNTY
ENGINEERING DEPARTMENT

P:\TRAFFIC\Radar\5200B1

ENGINEERING & TRAFFIC SURVEY

Road No. 5200

Road: Theatre Drive | Date: 5/3/2011

Location: at Suburban Propane | Weather: sunny/ clear

Recorder: J. Meyers | Begin time: 2:59 p.m. | End time: 3:09 p.m.

Posted Speed Zone: none MPH | Road type: 2 Lane Collector

MPH		5	10	15	20	25	Percent of Total	Cumulative Percentage
	9						0%	100%
	8						0%	100%
	7						0%	100%
	6						0%	100%
6	5						0%	100%
	4						0%	100%
	3						0%	100%
	2						0%	100%
	1						0%	100%
6	0						0%	100%
	9						0%	100%
	8						0%	100%
	7	S					1%	100%
	6	S					1%	99%
5	5	S					1%	98%
	4	S					1%	97%
	3	S S S N					4%	96%
	2	S S S					3%	92%
>>>>>>>>>	1	S S S N N N N N S					9%	89%
5	0	S S S N S N S					7%	80%
	9	S N S S					4%	73%
	8	S N N S S S N S S S N					11%	69%
	7	S S N S S S S					7%	58%
	6	S N S S N N S N N S N N N					13%	51%
4	5	S S S N N N N N S N					10%	38%
	4	S N N S N					5%	28%
	3	S N S N					4%	23%
	2	N N N N N					5%	19%
	1	N N S N S					5%	14%
4	0	N N S S S					5%	9%
	9						0%	4%
	8	N S					2%	4%
	7	S					1%	2%
	6	N					1%	1%
3	5						0%	0%
	4						0%	0%
	3						0%	0%
	2						0%	0%
	1						0%	0%
3	3						0%	0%
						Total Number of Vehicles	100	100%	0%

85th Percentile (Prevailing) Speed: 51 MPH

Pace Speed: 41 to 51 MPH | % in Pace: 77.00% | % under: 9.00% | % over: 14.00%

Signed _____ Date: May 3, 2011 Title: C.E. Technician

Collision History Controls (Y)/N | Geometric Controls Y/N | Pedestrian (Y)/N

Recommended and Established Speed Limit: 45 MPH

Signed _____ Date _____ Title _____

P:\TRAFFIC\Radar\5169A1-Main St

SAN LUIS OBISPO COUNTY
PUBLIC WORKS DEPARTMENT

ENGINEERING & TRAFFIC SURVEY Road No. 5186

Road: Main St. so/ River Run Rd — Date: 3/8/2011

Location: — Weather: clear

Recorder: Meyers — Begin time: 2:30 — End time: 3:03

Posted Speed Zone: 40 MPH — Road type: 2 Lane Collector

MPH	5	10	15	20	25	Percent of Total	Cumulative Percentage
69						0%	100%
68						0%	100%
67						0%	100%
66						0%	100%
65						0%	100%
64						0%	100%
63						0%	100%
62						0%	100%
61						0%	100%
60						0%	100%
59						0%	100%
58						0%	100%
57						0%	100%
56						0%	100%
55						0%	100%
54						0%	100%
53						0%	100%
52	S					1%	99%
51	S					1%	98%
50	S					1%	97%
49	S N					2%	95%
48	S N N					3%	92%
47	N S S N N					5%	87%
>>>>>> 46	S S N S S					5%	82%
45	S N S N N					5%	77%
44	N S S N S S N					7%	70%
43	S N S S S S S S					8%	62%
42	N S N S N S N S N N S					11%	51%
41	N N S S S N S S N N					10%	41%
40	N S N N N S N S S S S S N S					14%	27%
39	S S N S S S N S S N S S S					13%	14%
38	S N S N S S S S					8%	6%
37	N S S S N N					6%	0%
36						0%	0%
35						0%	0%
34						0%	0%
33						0%	0%
32						0%	0%
31						0%	0%
30						0%	0%
Total Number of Vehicles					100	100%	100%

REGISTERED PROFESSIONAL ENGINEER RYAN D. CHAPMAN TR 2452 TRAFFIC STATE OF CALIFORNIA

85th Percentile (Prevailing) Speed: 46 MPH

Pace Speed: 37 to 47 MPH — % in Pace: 87.00% — % under: 0.00% — % over: 13.00%

Signed: — Date: — Title: C.E Technician

Collision History Controls Y/N — Geometric Controls Y/N — Business/Residential Y/N — Ped Y/N

Recommended and Established Speed Limit: ~~40~~ 45 MPH

Signed: — Date: — Title: Traffic Engineer