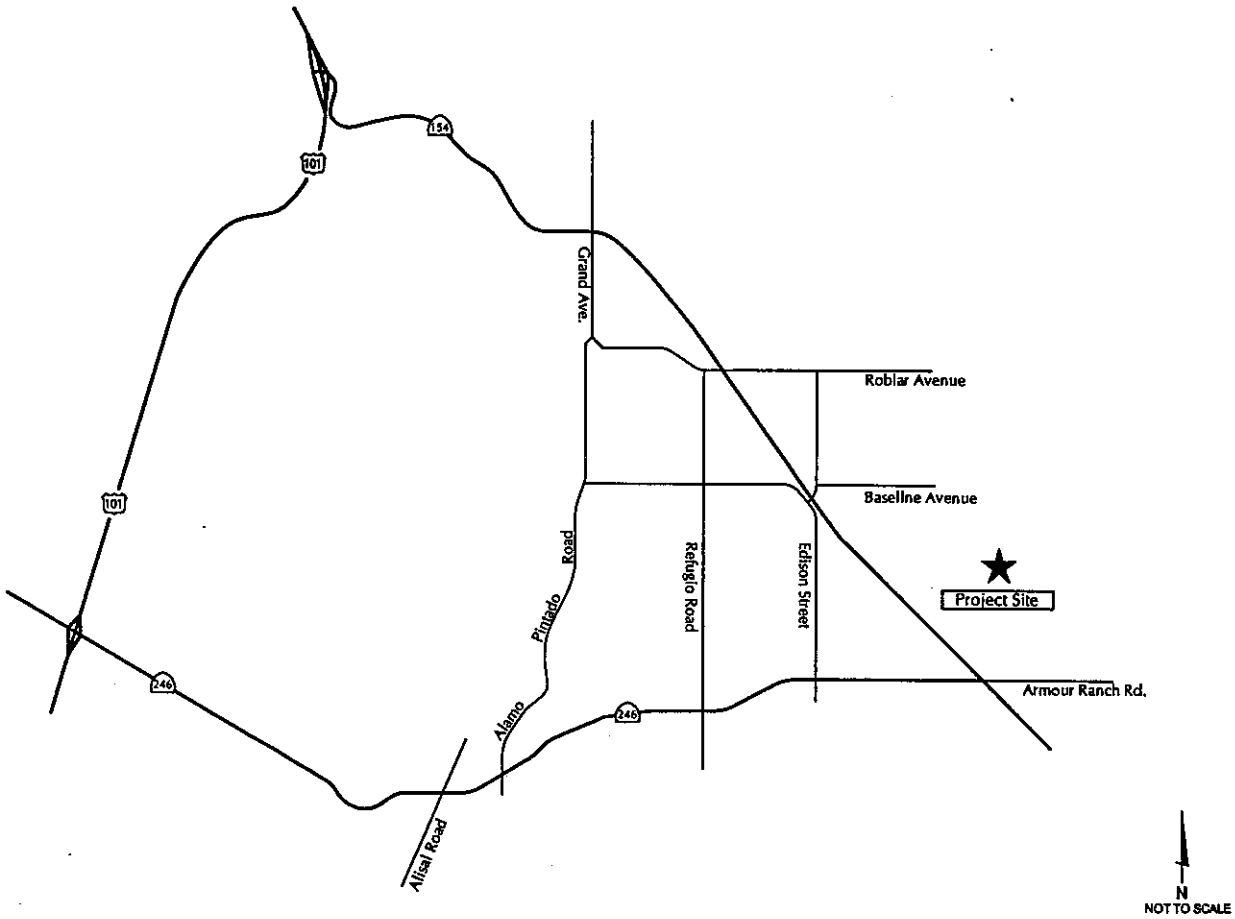
APPENDIX I

TRAFFIC IMPACT STUDY

CHUMASH CAMP 4 RESIDENTIAL FEE-TO-TRUST PROJECT
SANTA YNEZ, CALIFORNIA

TRAFFIC IMPACT STUDY



April 12, 2012

ATE #12018

Prepared For:

Analytical Environmental Services
1801 7th Street, Suite 100
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100 N. Hope Avenue, Suite 4, Santa Barbara, CA 93110 • (805) 687-4418 • FAX (805) 682-8509
Since 1978

Richard L. Pool, P.E.
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April 12, 2012

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TRAFFIC IMPACT STUDY FOR THE
CHUMASH CAMP 4 RESIDENTIAL FEE-TO-TRUST PROJECT, SANTA YNEZ, CALIFORNIA

Associated Transportation Engineers (ATE) has prepared the following traffic impact study for the Chumash Camp 4 Residential Fee-to-Trust Project. The study addresses potential traffic and circulation impacts associated with the project and identifies improvements where appropriate. It is understood that the results of the traffic impact study will be incorporated into the Environmental Assessment being prepared by Analytical Environmental Services.

Associated Transportation Engineers

Richard L. Pool, PE
President

REGISTERED PROFESSIONAL ENGINEER
RICHARD L. POOL
C 18030
CIVIL
STATE OF CALIFORNIA

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INTRODUCTION

The following report presents the results of the traffic impact study prepared by Associated Transportation Engineers (ATE) for the Chumash Camp 4 Residential Fee-To-Trust Project (the "Project"). The report provides information regarding existing and future traffic conditions within the project study-area and recommends improvements where necessary. The report also contains an analysis of the access and circulation plan proposed for the Project.

PROJECT DESCRIPTION

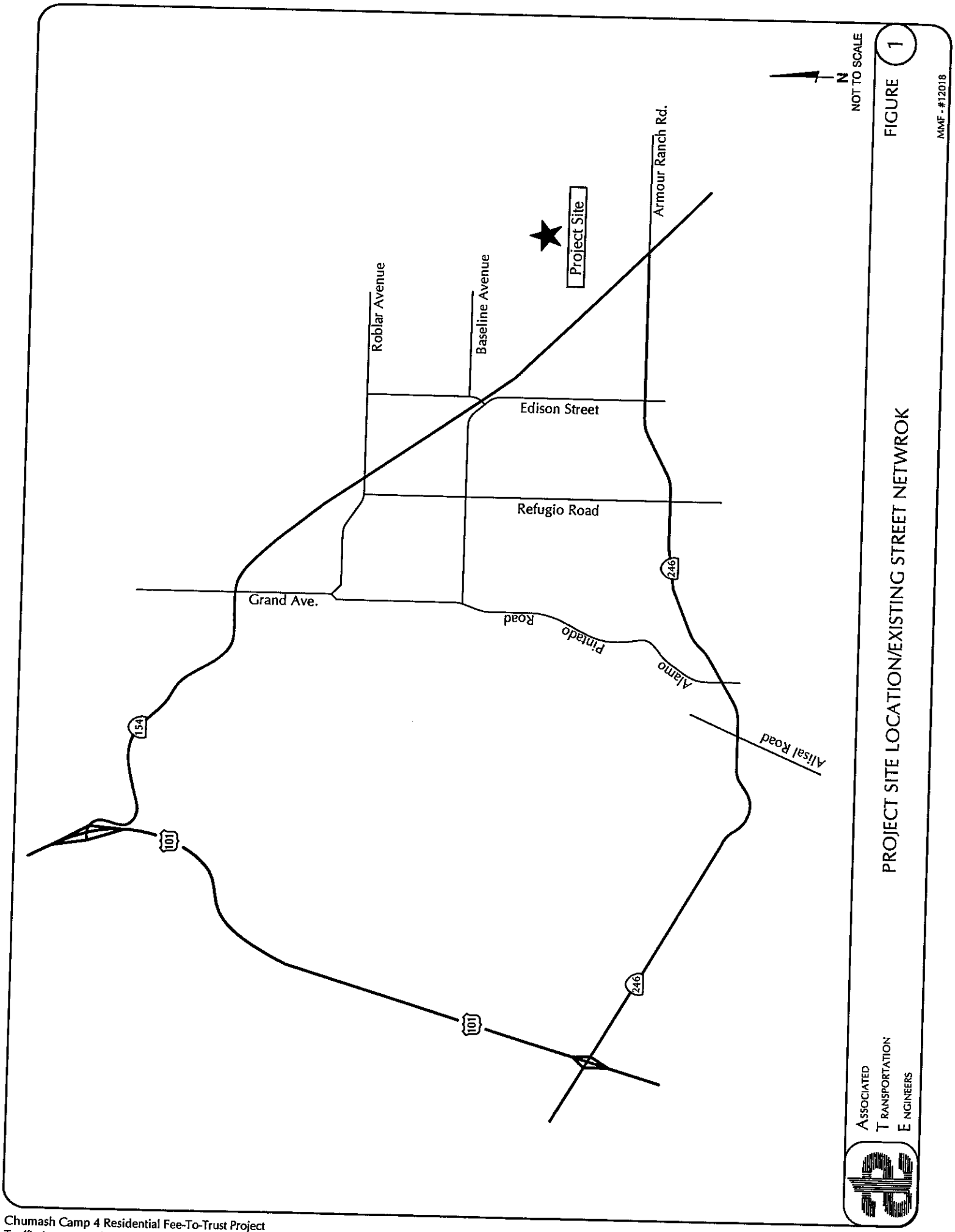
The Project is proposing a fee-to-trust land acquisition for the proposed ±1,433-acre site to allow for development of residential housing for Chumash tribe members. The site is located northeast of the SR 154/SR 246 intersection in the Santa Ynez area of Santa Barbara County (see Figure 1 - Project Site Location). Two alternatives have been developed for the site, both of which are analyzed in this traffic study. Alternative A includes 143 five-acres lots for single family dwelling units (see Figure 2 - Alternative A Site Plan). Alternative B includes 143 one-acres lots for single family dwelling units plus 30 acres of Tribal Government Development (see Figure 3 - Alternative B Site Plan). The Tribal Government Development would include a banquet/exhibition hall designed with an agriculture/equestrian theme, associated administrative spaces, a tribal office complex, and a tribal retreat including ceremony room and gymnasium. The facilities would be open to Tribal residents as a gathering place for socializing and recreation. The banquet/exhibition facilities would occasionally be made available to the public for the purposes of hosting exhibitions, business meetings, conferences, or events by appointment. No gaming would occur on the subject property. Access for the Project (both alternatives) is proposed via 2 connections to Baseline Avenue and 1 connection to Armour Ranch Road (see Figures 2 and 3).

SCOPE OF WORK AND STUDY METHODOLOGY

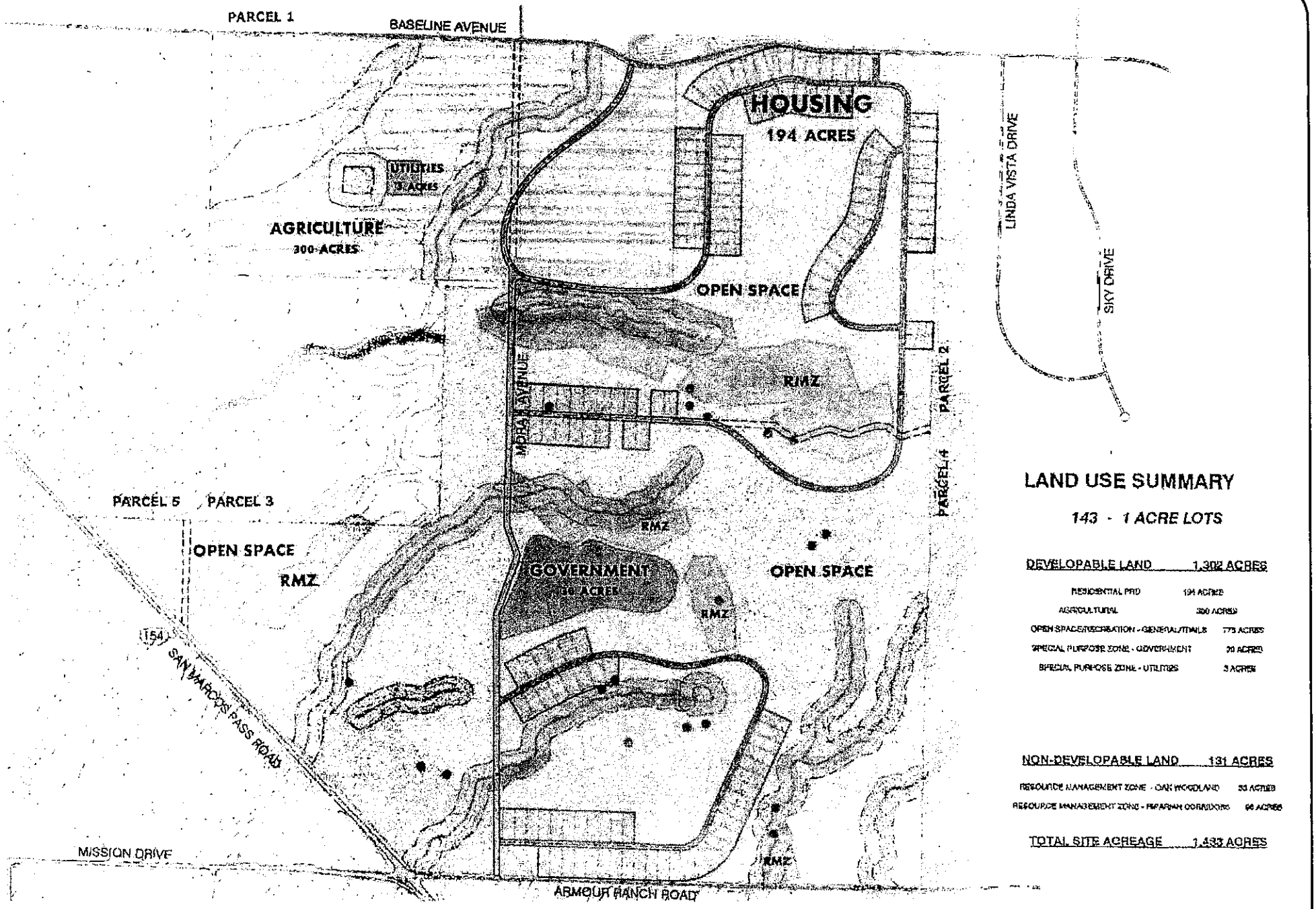
Scoping Process. Teleconference calls were held between AES/ATE/Caltrans and AES/ATE/Santa Barbara County to discuss the Project and the traffic study requirements. The scope of work for the traffic study was then developed by ATE. The scope of work is outlined below.

Traffic Scenarios. Traffic operations are analyzed for the following scenarios:

1) Existing Conditions (2012)
2) Near-Term Conditions (2014 without the Project)
3) Near-Term + Project Conditions (2014 with the Project)
4) Cumulative Conditions (2030 without the Project)
5) Cumulative + Project Conditions (2030 with the Project)


Roblar Avenue
Baseline Avenue
Project Site
Armour Ranch Rd.
Edison Street
Refugio Road
Grand Ave.
Pintado Road
Alamo
Alisal Road
154
101
246
N
NOT TO SCALE
FIGURE 1
MMF - #12018
PROJECT SITE LOCATION/EXISTING STREET NETWROK
Associated Transportation Engineers

LAND USE SUMMARY
143 - 5 ACRE LOTS
DEVELOPABLE LAND 1,392 ACRES
RESIDENTIAL PRD 792 ACRES
AGRICULTURAL 300 ACRES
OPEN SPACE/RECREATION - GENERAL/TRAILS 500 ACRES
SPECIAL PURPOSE ZONE - GOVERNMENT 00 ACRES
SPECIAL PURPOSE ZONE - UTILITIES 3 ACRES
NON-DEVELOPABLE LAND 131 ACRES
RESOURCE MANAGEMENT ZONE - OAK WOODLAND 74 ACRES
RESOURCE MANAGEMENT ZONE - RIPARIAN CORRIDORS 26 ACRES
TOTAL SITE ACREAGE 1,523 ACRES
SKY DRIVE
LINDA VISTA DRIVE
PARCEL 4
PARCEL 2
HOUSING
793 ACRES
RMZ
MORA AVENUE
ARMOUR RANCH ROAD
BASELINE AVENUE
UTILITIES
3 ACRES
AGRICULTURE
300 ACRES
PARCEL 1
PARCEL 3
PARCEL 5
OPEN SPACE
(154) SAN MARCOS PASS ROAD
MISSION DRIVE
ALTERNATIVE A SITE PLAN
FIGURE 2
ASSOCIATED TRANSPORTATION ENGINEERS
MMF - #12018



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ALTERNATIVE B SITE PLAN

FIGURE 3

MMF - #12018

Study-Area Facilities. The key roadways and intersections included in the traffic study were identified based on the level of traffic that would be generated by the Project and the location of the Project's access connections to the surrounding roadway network. Both local and regional facilities are analyzed in the study since traffic generated by the Project would use both County roads and State Highways. The roadways and intersections included in the study are listed in Table 1.

Table 1
Study-Area Roadways and Intersections

County Roadway Segments	State Highway Segments	State Highway Intersections
Baseline Ave east of Edison St	SR 154 north of Edison St	SR 154/U.S. 101 SB
Armour Ranch Rd east of SR 154	SR 154 south of SR 246	SR 154/U.S. 101 NB
	SR 246 west of SR 154	SR 154/Grand Ave
		SR 154/Roblar Ave
		SR 154/Edison St
		SR 246/Alisal Rd
		SR 246/Alamo Pintado Rd
		SR 246/Refugio Rd
		SR 246/Edison St
		SR 246/SR 154

Existing Traffic Volumes. Counts were collected in March 2012 for the key roadway segments and intersections where existing data is no longer representative of Existing conditions (traffic counts collected for this study are contained in the Technical Appendix for reference). "Average Daily Traffic" volumes represent traffic that travels on a specific roadway segment over an average 24-hour period. Average Daily Traffic (ADT) volumes were collected on the key roadway segments using machine traffic counters. Because traffic flow on a roadway network is most constrained at intersections, detailed traffic analyses also examine the operations at key intersections during peak travel periods. Turning movements were counted at the study-area intersections from 7:00 to 9:00 A.M. and from 4:00 to 6:00 P.M. The one-hour period containing the highest volume of traffic is considered the peak hour.

Future Traffic Forecasts. Near-Term traffic conditions (2014 without the Project) were forecast using a list of approved and pending projects located within the Santa Ynez Valley planning area. Cumulative traffic conditions (2030 without the Project) were taken from the

traffic study prepared for the Santa Ynez Valley Community Plan EIR.[1] The 20-Year Buildout forecasts contained in the Santa Ynez Valley Community Plan were used for the analysis. The 20-Year forecasts are based on 20-year buildout land uses provided by the County for the Santa Ynez Valley area, growth within the adjacent cities of Buellton and Solvang, plus cumulative growth from outside of the Santa Ynez Valley.

LEVEL OF SERVICE STANDARDS

The following level of service standards have been adopted for the street network that serves the Project. For reference, "Levels of Service" (LOS) A through F are used to rate traffic operations. Generally, LOS A indicates free flow operations with no delays; LOS B indicates stable flow with very little delay; LOS C indicates stable flow with low to moderate delays; LOS D indicates flows approaching unstable conditions with moderate to heavy delays; LOS E indicates unstable flow with significant delays; and LOS F indicates forced flow conditions resulting from volumes that are well above capacity.

Santa Barbara County Level of Service Standards

Armour Ranch Road and Baseline Avenue fall under the jurisdiction of Santa Barbara County. Through adoption of the Santa Ynez Valley Community Plan, the County adopted LOS B as the minimum standard for traffic operations for Armour Ranch Road and Baseline Avenue.

Caltrans Level of Service Standards

SR 154 and SR 246 fall under the jurisdiction of Caltrans. Caltrans District 5 established level of service goals for State Route 154 and State Route 246 in their Transportation Concept Reports.[2] The Transportation Concept Reports show LOS D as the minimum operating standard for both SR 154 and SR 246.

EXISTING CONDITIONS

Street Network

The principal components of the roadway network within the vicinity of the Project site are illustrated in Figure 1 and discussed below.

---

1 Traffic and Circulation Study for the Santa Ynez Valley Community Plan, Associated Transportation Engineers, April 2008.

2 Transportation Concept Report State Route 154, California Department of Transportation District 5, February 2007.

Transportation Concept Report State Route 246, California Department of Transportation District 5, May 2004.

U.S. Highway 101 is a four-lane freeway that serves as the major north-south link through Santa Barbara County and is the principal inter-city route along the Pacific Coast. The highway provides the principal connection between the Santa Ynez Valley and Santa Maria and San Luis Obispo to the north; and the Santa Barbara-Goleta area to the south.

SR 154 is a two-lane California state highway that provides regional access to the Santa Ynez Valley. SR 154 extends from U.S. Highway 101 north of the Los Olivos Township through the Santa Ynez Valley to the Santa Barbara-Goleta area to the south. SR 154 is divided by a double yellow centerline with passing lanes provided intermittently.

SR 246 is a two-lane California state highway that also provides regional access to the Santa Ynez Valley. SR 154 extends in an east-west direction within the Santa Ynez Valley area between SR 154 on the east and U.S. Highway 101 on the west. SR 246 is the major east-west route within the Santa Ynez Valley and is used by a significant number of local drivers as an intra-community route within the valley.

Edison Street is a two-lane County roadway that extends in a north-south direction on the east and west sides of SR 154.

Baseline Avenue is a two-lane County roadway that extends in an east-west direction on the east and west sides of SR 154. Baseline Avenue is classified as an S-3 roadway by the County.

Armour Ranch Road is a two-lane County roadway that extends east of SR 154. Armour Ranch Road is classified as an S-3 roadway by the County.

County Roadway Operations

Traffic operations were analyzed for the County roads (Baseline Avenue and Armour Ranch Road) by comparing the Existing traffic volumes to the "Acceptable Capacity" ratings adopted by the County. Table 2 shows the Existing traffic volumes and Acceptable Capacity ratings for the County roads. As shown, the County roadway segments carry volumes within their Acceptable Capacity ratings - indicating that they operate at LOS B or better - which meets the County's standards.

Table 2
Existing Operations - County Roadways

Roadway	Roadway Classification	Geometry	Existing ADT	Acceptable Capacity(a)
Baseline Avenue e/o Edison Street	County S-3	2 Lanes	1,600	5,530
Armour Ranch Road e/o SR 154	County S-3	2 Lanes	700	5,530

(a) Acceptable Capacity rating = 70% of Design Capacity and equates to County's LOS B standard adopted for the Santa Ynez area.

State Highway Operations

Operations for SR 154 and SR 246 were analyzed using the operations procedures outlined in the Highway Capacity Manual (HCM).[3] More specifically, operations for SR 154 were assessed using the HCM procedures for 2-lane highways since SR 154 is an uninterrupted flow highway. This method focuses on average travel speeds and the ability to pass for each direction of travel during the peak hour period. Operations for SR 246 between SR 154 and Solvang were assessed using the HCM procedures for signalized intersections since the flow of traffic is controlled by traffic signals on this segment of highway. This method focuses on average delays at each intersection during peak hour periods.

Figures 4 and 5 shows the Existing A.M. and P.M. peak hour traffic volumes used in the level of service analyses. Table 3 shows the Existing levels of service for the SR 154 segments north and south of the project site. Table 4 shows the Existing levels of service for the intersections along the SR 154 and SR 246 highway segments.

As shown in Table 3, both SR 154 and SR 246 operate at LOS D (or better) during the peak hour periods. As shown in Table 4, the intersections along SR 154 and SR 246 currently operate at LOS C or better during the A.M. and P.M. peak hours. The Existing conditions analysis shows that traffic operations along both SR 154 and SR 246 are within Caltrans' LOS D standard.

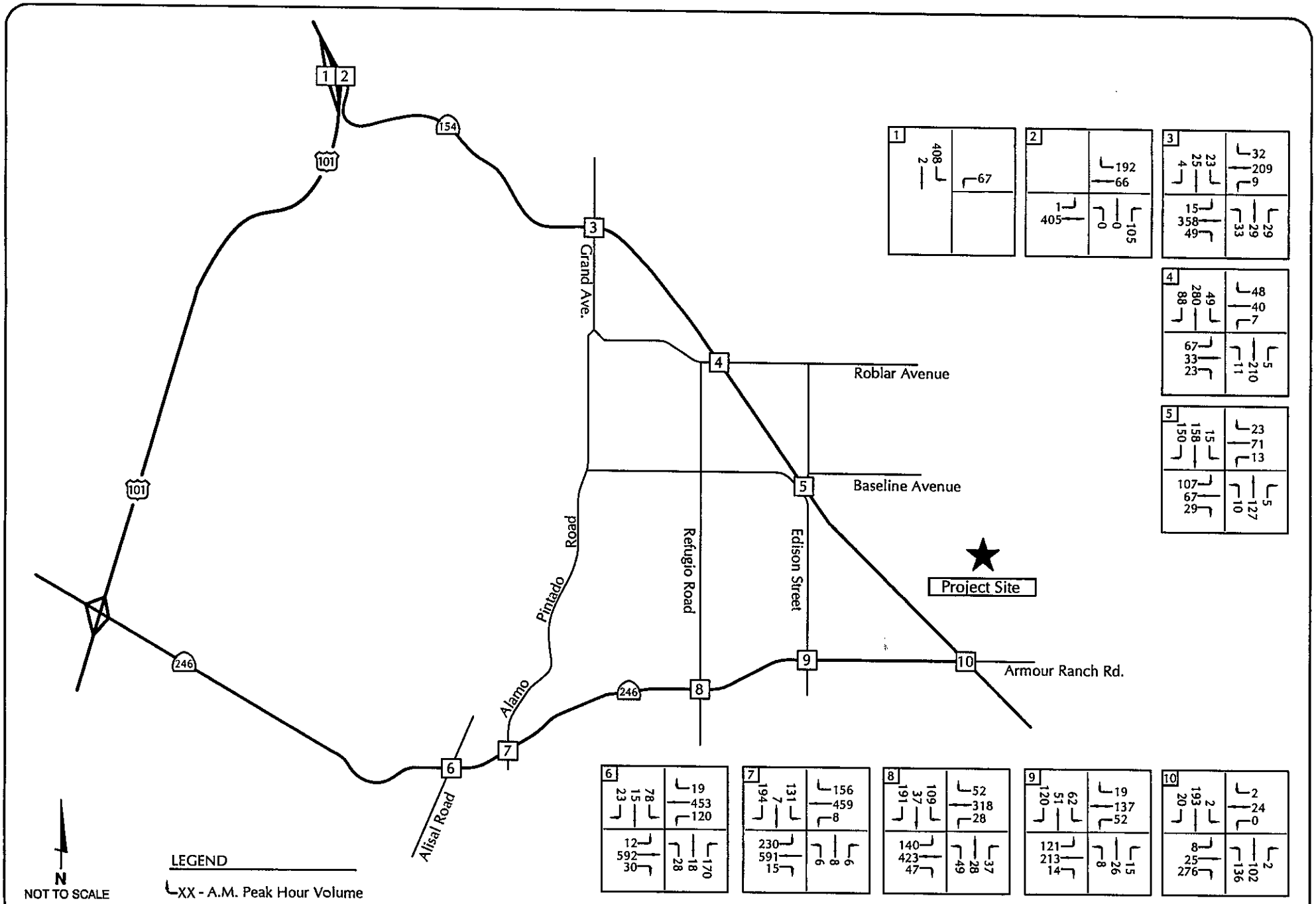
Table 3
Existing Operations - State Highway Segments

Highway Segment	Classification	Peak Hour LOS
SR 154 n/o Edison Street	State Highway	LOS D/LOS C(a)
SR 154 s/o SR 246-Armour Ranch Road	State Highway	LOS D/LOS D(a)
SR 246 from SR 154 to Solvang	State Highway	LOS B-C(b)

(a) Northbound/Southbound LOS reported based on travel speeds and ability to pass using P.M. peak hour flows.

(b) Signalized segment - LOS based on delays at intersections (See Table 4).

[3] 2010 Highway Capacity Manual, Transportation Research Board, 2010.



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EXISTING A.M. PEAK HOUR TRAFFIC VOLUMES

FIGURE 4

MMF - #12018

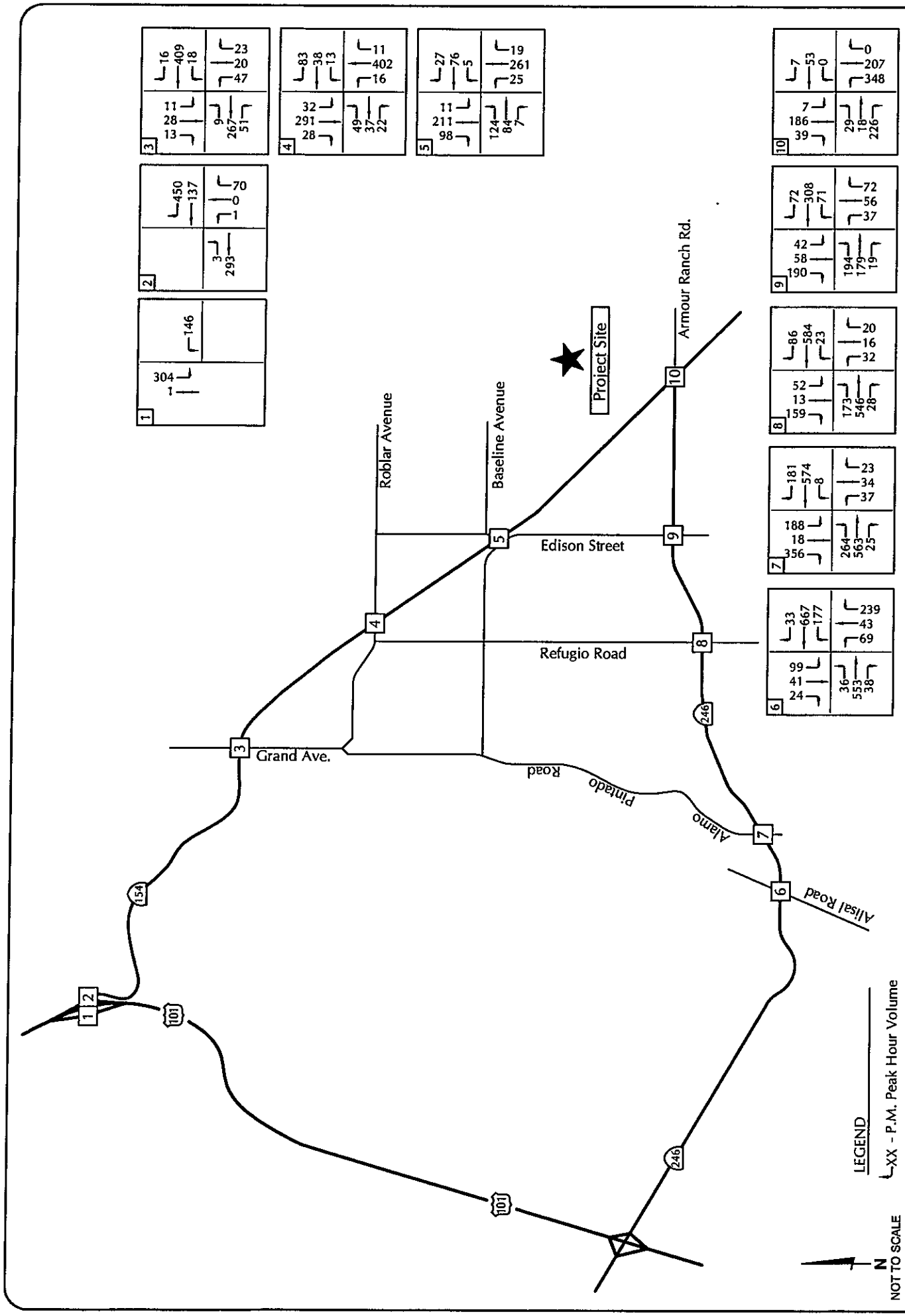


FIGURE 5

EXISTING P.M. PEAK HOUR TRAFFIC VOLUMES

Table 4
Existing Operations - State Highway Intersections

Intersection	Control	Delay / LOS	
		A.M. Peak	P.M. Peak
SR 154/U.S. 101 SB	STOP Sign	11.2 Sec/LOS B	10.1 Sec/LOS B
SR 154/U.S. 101 NB	STOP Sign	11.7 Sec/LOS B	10.3 Sec/LOS B
SR 154/Grand Avenue	STOP Sign	14.6 Sec/LOS B	16.2 Sec/LOS C
SR 154/Roblar Avenue	STOP Sign	15.0 Sec/LOS B	17.6 Sec/LOS C
SR 154/Edison Street	STOP Sign	11.1 Sec/LOS B	13.2 Sec/LOS B
SR 246/Alisal Road	Signal	22.1 Sec/LOS C	21.6 Sec/LOS C
SR 246/Alamo Pintado Road	Signal	19.4 Sec/LOS B	22.8 Sec/LOS C
SR 246/Refugio Road	Signal	17.3 Sec/LOS B	26.8 Sec/LOS C
SR 246/Edison Street	Signal	16.7 Sec/LOS B	21.4 Sec/LOS C
SR 246/SR 154	STOP Sign	10.8 Sec/LOS B	14.7 Sec/LOS C

PROJECT-GENERATED TRAFFIC

Project Trip Generation

Trip generation estimates were developed for the Project using rates contained in the Institute of Transportation Engineers' (ITE) trip generation report.[4] The ITE rates for Single Family Detached Housing (ITE Land Use Code #210) was selected to develop the trip generation estimates for Alternative A. The ITE rates for Single Family Detached Housing (ITE Land Use Code #210) and Recreational Community Center (ITE Land Use Code #495) were selected to develop the trip generation estimates for Alternative B. Table 3 presents the trip generation estimates for Alternative A and Alternative B (the trip generation calculation worksheet is included in the Technical Appendix for reference).

As shown in Table 5, Alternative A is forecast to generate a 1,369 average daily trips, with 107 trips occurring during the A.M. peak hour and 144 trips occurring during the P.M. peak hour. Alternative B is forecast to generate a 3,199 average daily trips, with 237 trips occurring during the A.M. peak hour and 260 trips occurring during the P.M. peak hour.

[4] Trip Generation, Institute of Transportation Engineers, 8th Edition, 2008.

Table 5
Project Trip Generation

Alternative & Land Uses	Size	ADT		A.M. Peak Hour		P.M. Peak Hour	
		Rate	Trips	Rate	Trips	Rate	Trips
Alternative A							
Single Family Residential	143 Units	9.57	1,369	0.75	107	1.01	144
Alternative B							
Single Family Residential	143 Units	9.57	1,369	0.75	107	1.01	144
Community Center	80,000 SF	22.88	1,830	1.62	130	1.45	116
Total			3,199		237		260

Trip rates per unit for Single Family Residential and per 1,000 SF for Community Center.

Project Trip Distribution & Assignment

Traffic generated by Alternative A and Alternative B was distributed to the study-area street network based on the trip distribution pattern shown in Table 6. The trip distribution pattern was developed by considering area population, surrounding land uses, existing traffic patterns and probable orientation of project trip types. Once distributed, the trips generated by the project were assigned to the key roadways and intersections within the study area. Figures 6 and 7 show the assignment of project-generated traffic for Alternative A and Alternative B.

Table 6
Project Trip Distribution

Origin/Destination	Direction	Distribution %	
		Residential	Community Center
U.S. 101 north of Los Olivos	North	10%	5%
SR 154 south of Santa Ynez	South	10%	5%
SR 246 west of Solvang	West	10%	5%
Santa Ynez Valley	West	70%	60%
Internal(a)	NA	0%	25%
Total			**100%**

(a) 25% of Community Center traffic is anticipated to be local trips within the Project site.

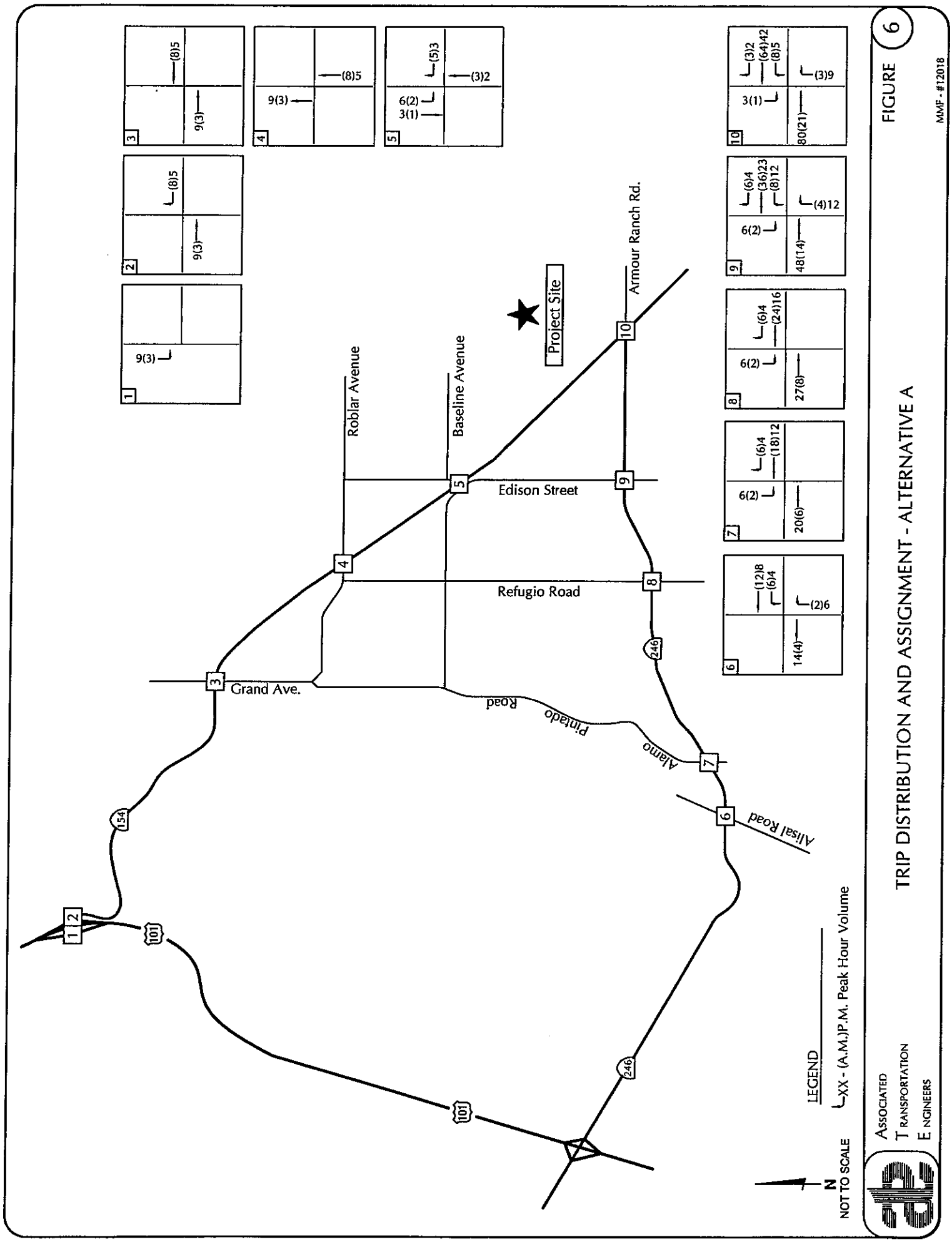


FIGURE 6
TRIP DISTRIBUTION AND ASSIGNMENT - ALTERNATIVE A
MMF - #12018
Project Site
Armour Ranch Rd.
Roblar Avenue
Baseline Avenue
Edison Street
Refugio Road
Grand Ave.
Pintado Road
Alamo
Alisal Road
101
154
246
LEGEND
XX - (A.M.)P.M. Peak Hour Volume
NOT TO SCALE
N
ASSOCIATED TRANSPORTATION ENGINEERS

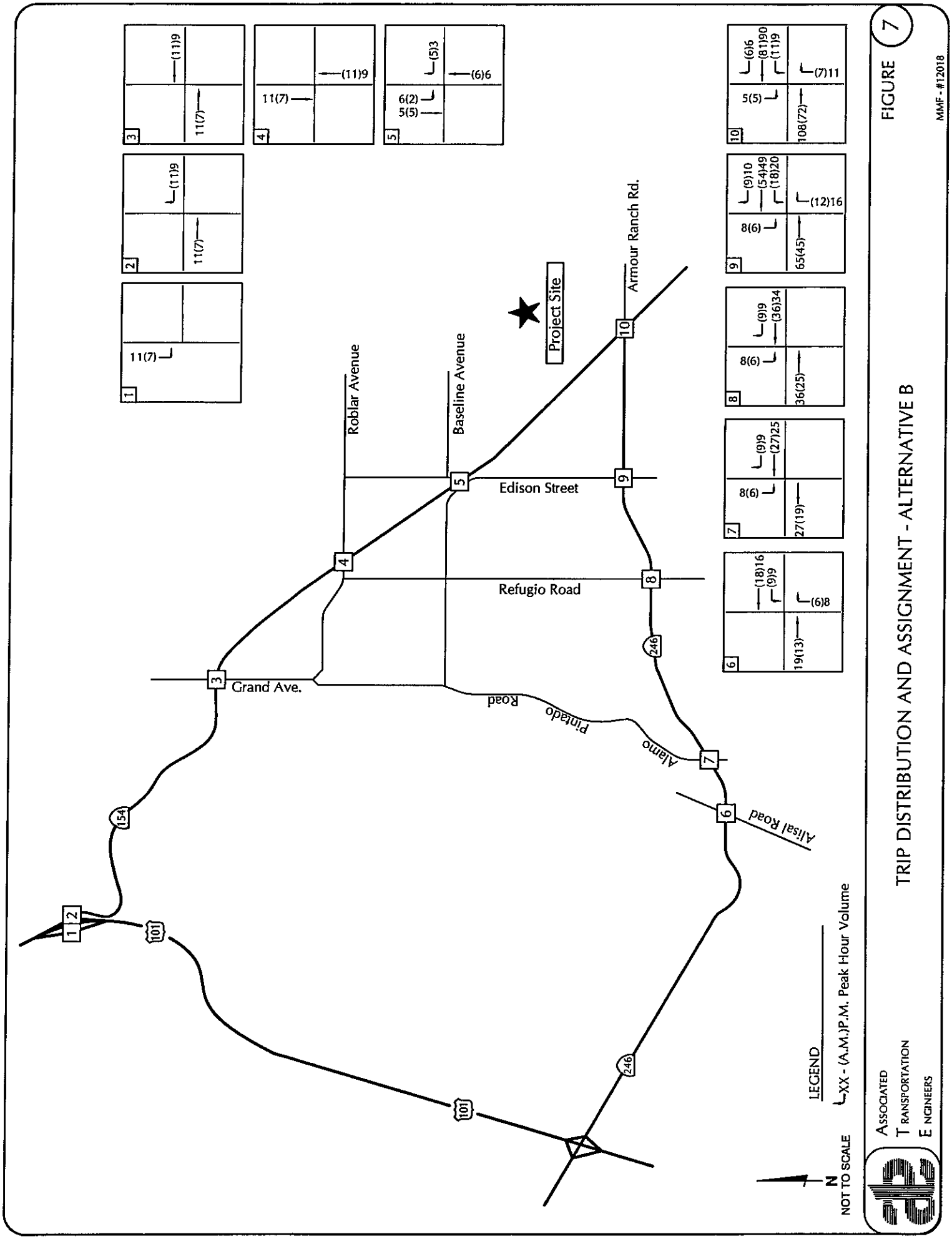


FIGURE 7
TRIP DISTRIBUTION AND ASSIGNMENT - ALTERNATIVE B
MMF - #12018
Project Site
Roblar Avenue
Baseline Avenue
Armour Ranch Rd.
Edison Street
Refugio Road
Grand Ave.
Pintado Road
Alamo
Alisal Road
154
101
246
1 2
3
4
5
6
7
8
9
10
11(7)
(11)9
11(7)
(11)9
11(7)
(11)9
(5)3
6(2)
5(5)
(6)6
(6)6
(81)90
(11)9
5(5)
(7)11
108(72)
(9)10
(54)49
(18)20
8(6)
(12)16
65(45)
(9)9
(36)34
8(6)
36(25)
(9)9
(27)25
8(6)
27(19)
(18)16
(9)9
(6)8
19(13)
LEGEND
XX - (A.M.)P.M. Peak Hour Volume
N
NOT TO SCALE
ASSOCIATED
TRANSPORTATION
ENGINEERS

NEAR-TERM CONDITIONS

Near-Term traffic conditions were forecast using a list of approved and pending projects located within the Santa Ynez planning area (the list of approved/pending projects is contained in the Technical Appendix for reference). ITE trip rates were used to estimate traffic generation for the approved/pending projects (a worksheet shown the trip generation calculations is contained in the Technical Appendix for reference). Figures 8 and 9 shows the Near-Term traffic volume forecasts. Levels of service for Near-Term Conditions are compared to Near-Term + Project Conditions in the following section.

NEAR-TERM + PROJECT CONDITIONS

Alternative A

Traffic that would be generated by Alternative A was added to the Near-Term traffic volume forecasts in order to assess potential impacts. Figures 10 and 11 show the Near-Term + Alternative A traffic forecasts.

County Roadway Impacts. Near-Term Conditions and Near-Term + Alternative A forecasts for the County roadways adjacent to the Project site are shown in Table 7. As shown, the County roadway segments are forecast to carry volumes within their Acceptable Capacity ratings under Near-Term + Alternative A Conditions - indicating that they would operate at LOS B or better - which meets County's adopted standard. Thus, Alternative A would not significantly impact the County roadways adjacent to the Project site.

Table 7
Near-Term + Alternative A - County Roadway Operations

Roadway	ADT Volume			
	Near-Term	Project Added	Near-Term + Project	Acceptable Capacity(a)
Baseline Avenue e/o Edison Street	1,640	205	1,845	5,530
Armour Ranch Road e/o SR 154	700	1,164	1,864	5,530

(a) Acceptable Capacity rating equates to County's LOS B standard adopted for the Santa Ynez area.

State Highway Impacts. Near-Term and Near-Term + Alternative A level of service forecasts for SR 154 and SR 246 are shown in Tables 8 and 9. As shown in Table 8, the SR 154 highway segments are forecast to operate at LOS C-D under Near-Term and Near-Term + Alternative A conditions - which meets the Caltrans LOS D standard. Most of the key intersections along SR 246 are forecast to operate at LOS B or LOS C under Near-Term and Near-Term + Alternative A conditions (see Table 9).

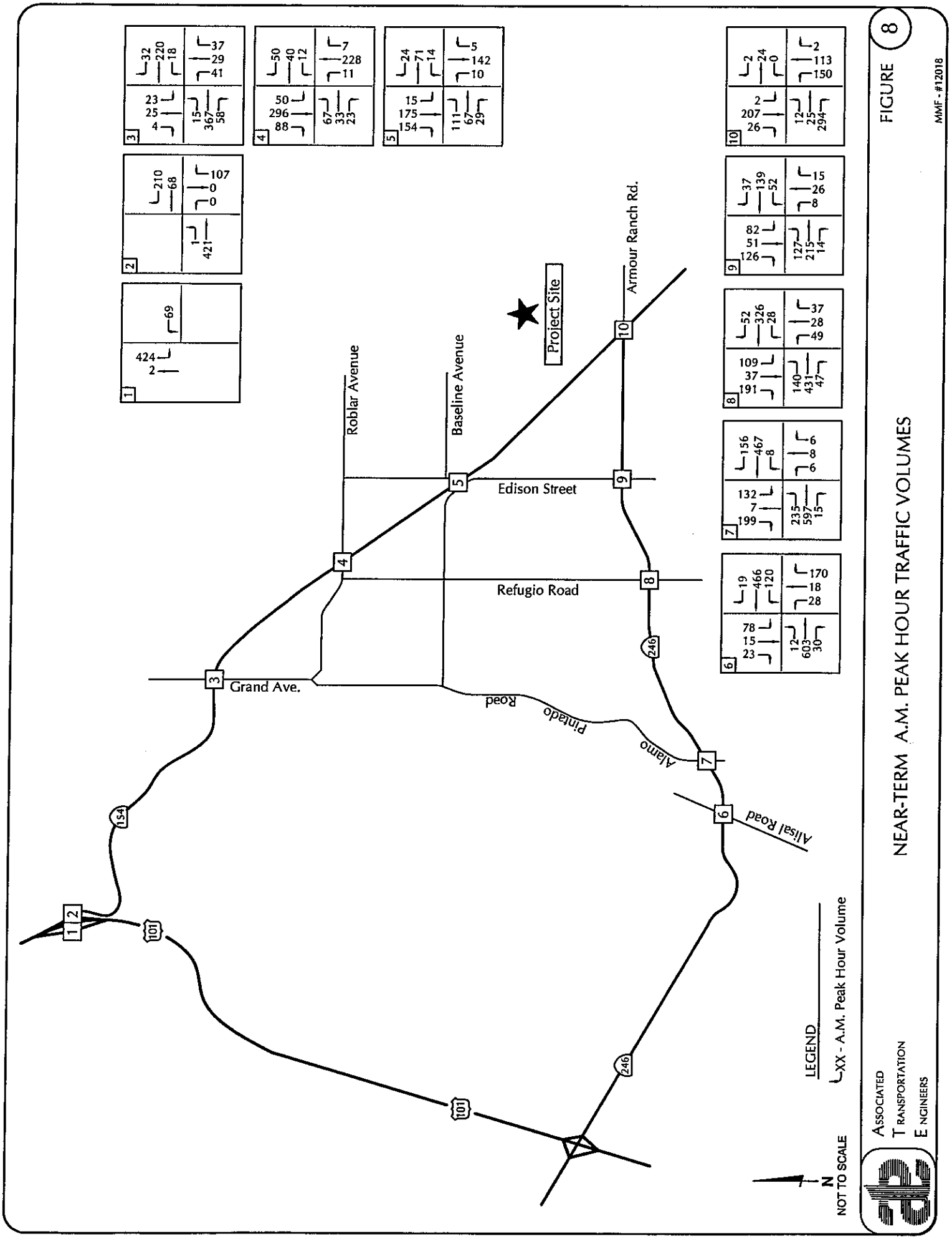
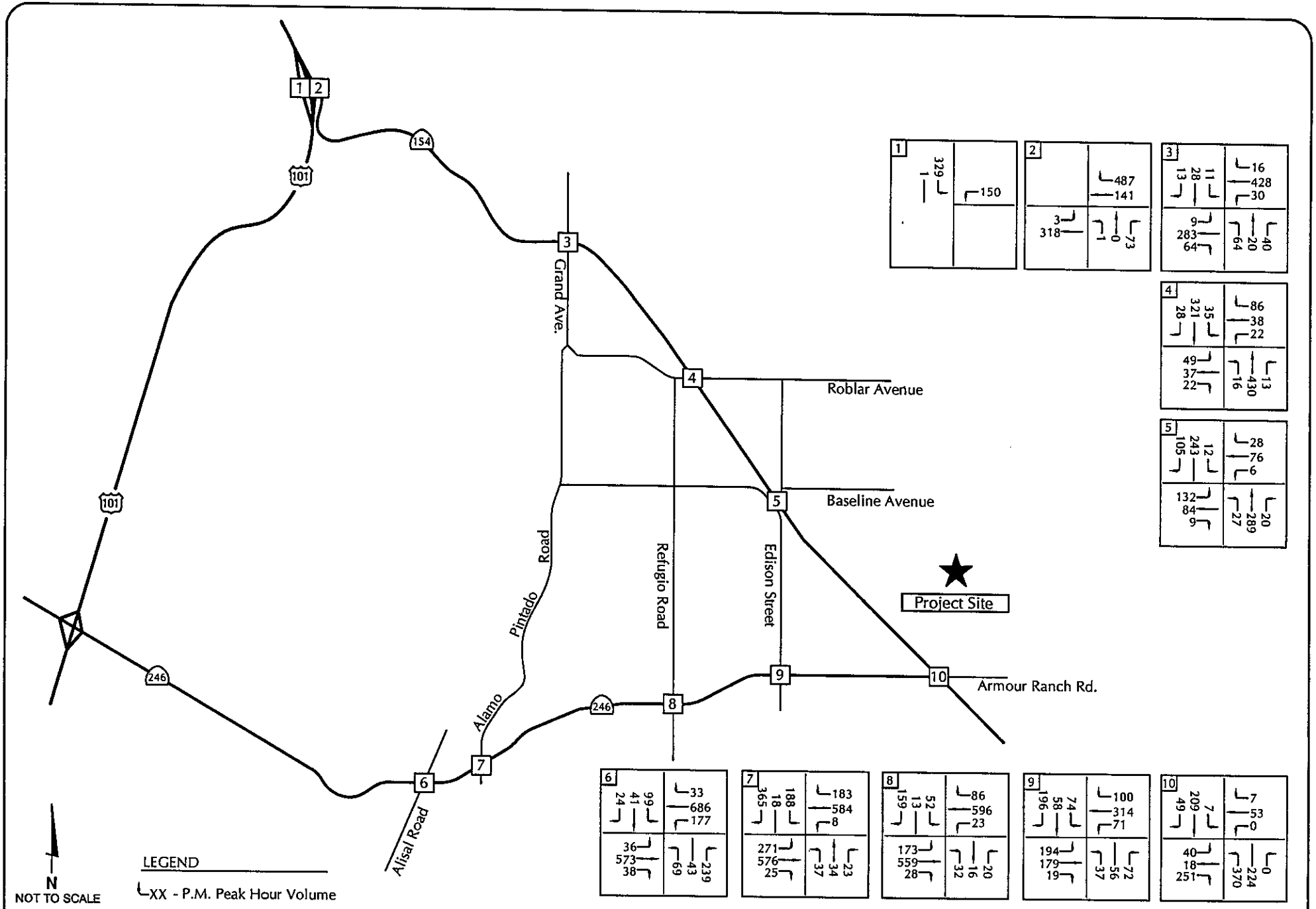


FIGURE 8
NEAR-TERM A.M. PEAK HOUR TRAFFIC VOLUMES
MMF - #12018
Project Site
Armour Ranch Rd.
Roblar Avenue
Baseline Avenue
Edison Street
Refugio Road
Grand Ave.
Pintado Road
Alamo
Alisal Road
154
101
246
1 2 3 4 5 6 7 8 9 10
1
424
2
69
2
210
68
1
421
107
0
0
3
23
25
4
15
367
58
32
220
18
37
29
41
4
50
296
88
50
40
12
67
33
23
7
228
11
5
24
71
14
15
175
154
111
67
29
5
142
10
10
2
207
26
2
24
0
12
25
294
2
113
150
9
82
51
126
127
215
14
37
139
52
15
26
8
8
109
37
191
140
431
47
52
326
28
37
28
49
7
132
7
199
235
597
15
156
467
8
6
8
6
6
78
15
23
12
603
30
19
466
120
170
18
28
LEGEND
XX - A.M. Peak Hour Volume
N
NOT TO SCALE
ASSOCIATED
TRANSPORTATION
ENGINEERS



ASSOCIATED TRANSPORTATION ENGINEERS

NEAR-TERM P.M. PEAK HOUR TRAFFIC VOLUMES

FIGURE 9

MMF - #12018

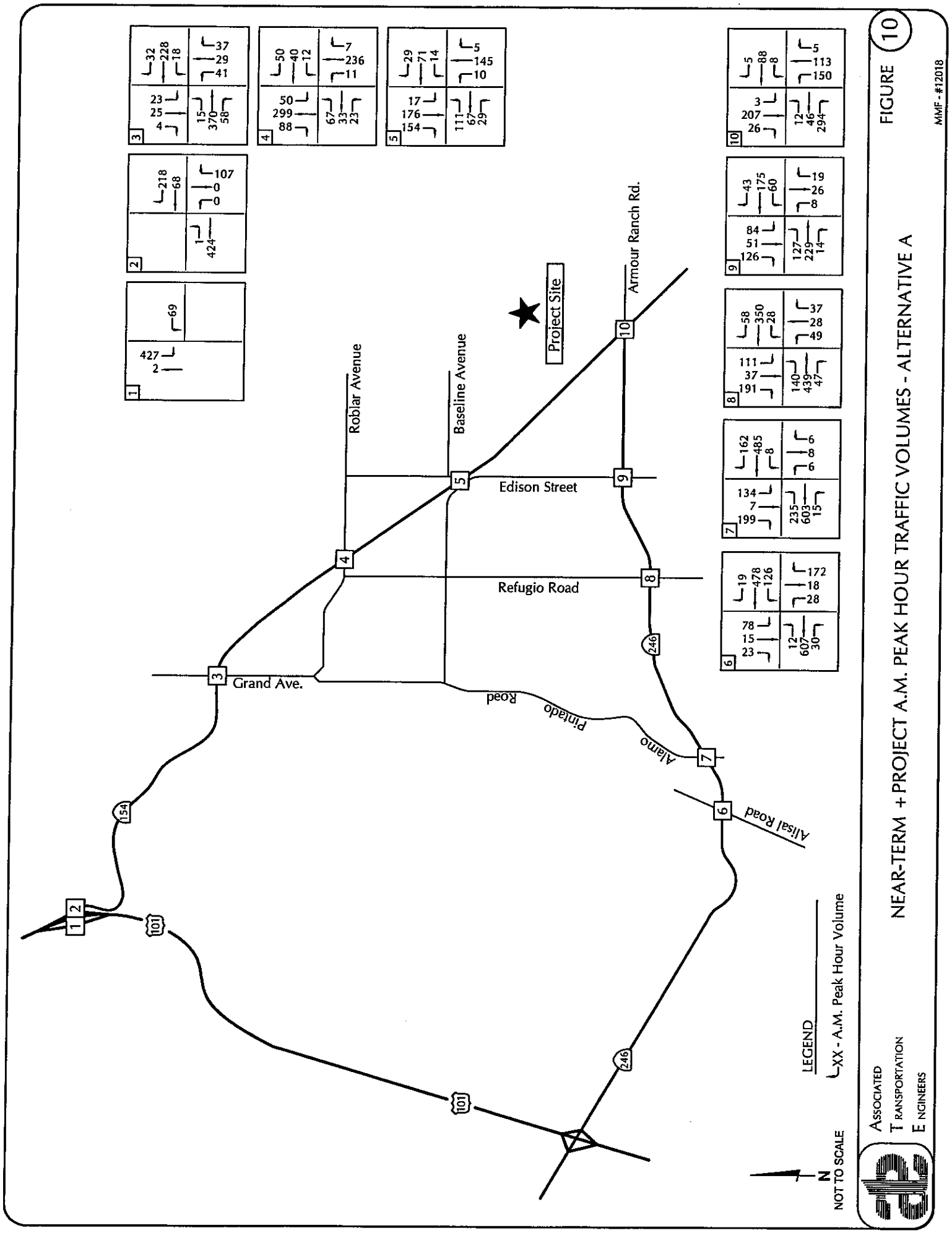


FIGURE 10
NEAR-TERM + PROJECT A.M. PEAK HOUR TRAFFIC VOLUMES - ALTERNATIVE A
MMF - #12018
Project Site
Armour Ranch Rd.
Roblar Avenue
Baseline Avenue
Edison Street
Refugio Road
Grand Ave.
Pintado Road
Alamo
Alisal Road
LEGEND
XX - A.M. Peak Hour Volume
NOT TO SCALE
N
Associated Transportation Engineers

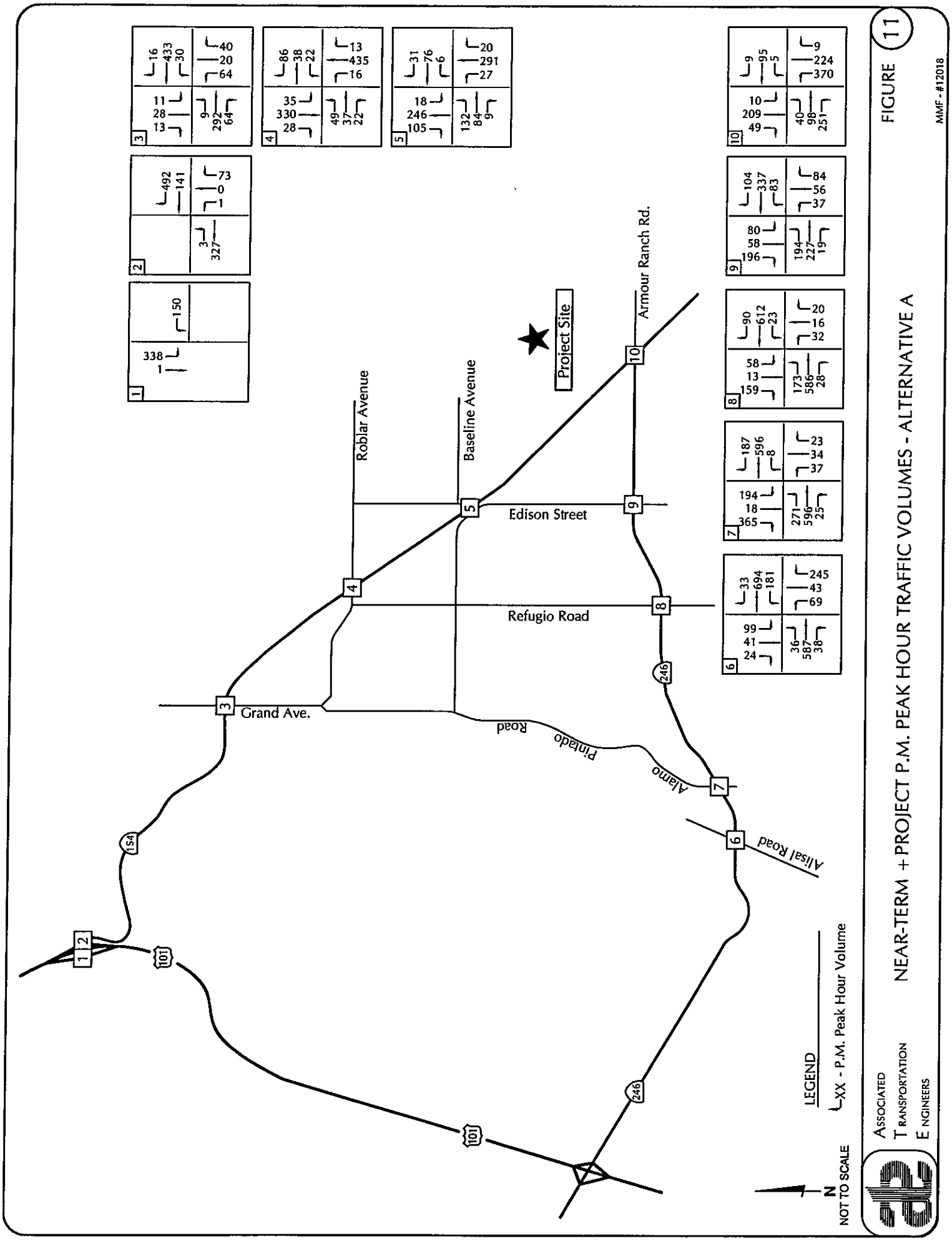


FIGURE 11

NEAR-TERM + PROJECT P.M. PEAK HOUR TRAFFIC VOLUMES - ALTERNATIVE A

As shown in Table 9, the SR 246/SR 154 intersection is forecast to degrade to LOS F during the P.M. peak hour period with the traffic that would added by Alternative A. The level of service analysis shows that there would not be a sufficient number of gaps in the SR 154 traffic stream for Alternative A traffic to cross SR 154 when traveling to/from the Project site. Improvements required to accommodate the Near-Term + Alternative A traffic forecasts are presented in the Mitigation Measures section of the report.

Table 8
Near-Term + Alternative A - State Highway Segment Operations

Highway Segment	Peak Hour LOS	
	Near-Term	Near-Term + Project
SR 154 n/o Edison Street(a)	LOS D/LOS C	LOS D/LOS C
SR 154 s/o SR 246-Armour Ranch Road(a)	LOS D/LOS D	LOS D/LOS D
SR 246 from SR 154 to Solvang(b)	LOS B-C	LOS B-C

(a) Northbound/Southbound LOS based on travel speeds and ability to pass using P.M. peak hour flows.
(b) Signalized segment - LOS based on delays at intersections (See Table 9).

Table 9
Near-Term + Alternative A - State Highway Intersection Operations

Intersection	Delay / LOS			
	Near-Term		Near-Term + Project	
	A.M. Peak	P.M. Peak	A.M. Peak	P.M. Peak
SR 154/U.S. 101 SB	11.5 Sec/LOS B	10.4 Sec/LOS B	11.6 Sec/LOS B	10.5 Sec/LOS B
SR 154/U.S. 101 NB	11.9 Sec/LOS B	10.6 Sec/LOS B	11.9 Sec/LOS B	10.6 Sec/LOS B
SR 154/Grand Ave	15.3 Sec/LOS C	18.0 Sec/LOS C	15.4 Sec/LOS C	18.4 Sec/LOS C
SR 154/Roblar Ave	15.9 Sec/LOS C	19.8 Sec/LOS C	16.1 Sec/LOS C	20.2 Sec/LOS C
SR 154/Edison Street	11.6 Sec/LOS B	14.9 Sec/LOS B	11.7 Sec/LOS B	15.1 Sec/LOS C
SR 246/Alisal Rd	22.4 Sec/LOS C	22.2 Sec/LOS C	21.5 Sec/LOS C	22.8 Sec/LOS C
SR 246/Alamo Pintado Rd	19.7 Sec/LOS B	26.2 Sec/LOS C	20.0 Sec/LOS B	26.6 Sec/LOS C
SR 246/Refugio Rd	16.9 Sec/LOS B	27.3 Sec/LOS C	16.8 Sec/LOS B	28.1 Sec/LOS C
SR 246/Edison St	16.8 Sec/LOS B	23.6 Sec/LOS C	17.6 Sec/LOS B	23.6 Sec/LOS C
SR 246/SR 154	11.1 Sec/LOS B	19.0 Sec/LOS C	12.7 Sec/LOS B	**>50.0 Sec/LOS F**

Bolded values exceed Caltrans LOS D standard.

Alternative B

Traffic that would be generated by Alternative B was added to the Near-Term traffic volume forecasts in order to assess potential impacts. Figures 12 and 13 show the Near-Term + Alternative B traffic forecasts.

County Roadway Impacts. Near-Term Conditions and Near-Term + Alternative B forecasts for the County roadways adjacent to the Project site are shown in Table 10. As shown, the County roadway segments are forecast to carry volumes within their Acceptable Capacity ratings under Near-Term + Alternative B Conditions - indicating that they would operate at LOS B or better - which meets County's adopted standard. Thus, Alternative B would not significantly impact the County roadways adjacent to the Project site.

Table 10
Near-Term + Alternative B - County Roadway Operations

Roadway	ADT Volume			
	Near-Term	Project Added	Near-Term + Project	Acceptable Capacity(a)
Baseline Avenue e/o Edison Street	1,640	411	2,051	5,530
Armour Ranch Road e/o SR 154	700	2,330	3,030	5,530

(a) Acceptable Capacity rating equates to County's LOS B standard adopted for the Santa Ynez area.

State Highway Impacts. Near-Term and Near-Term + Alternative B level of service forecasts for SR 154 and SR 246 are shown in Tables 11 and 12. As shown in Table 11, the SR 154 highway segments are forecast to operate at LOS C-D under Near-Term and Near-Term + Alternative B conditions - which meets the Caltrans LOS D standard. Most of the key intersections along SR 246 are forecast to operate at LOS B or LOS C under Near-Term and Near-Term + Alternative B conditions (see Table 12).

As shown in Table 12, the SR 246/SR 154 intersection is forecast to degrade to LOS F during the P.M. peak hour period with traffic that would added by Alternative B. The level of service analysis shows that there would not be a sufficient number of gaps in the SR 154 traffic stream for Alternative B traffic to cross SR 154 when traveling to/from the Project site. Improvements required to accommodate the Near-Term + Alternative B traffic forecasts are presented in the Mitigation Measures section of the report.

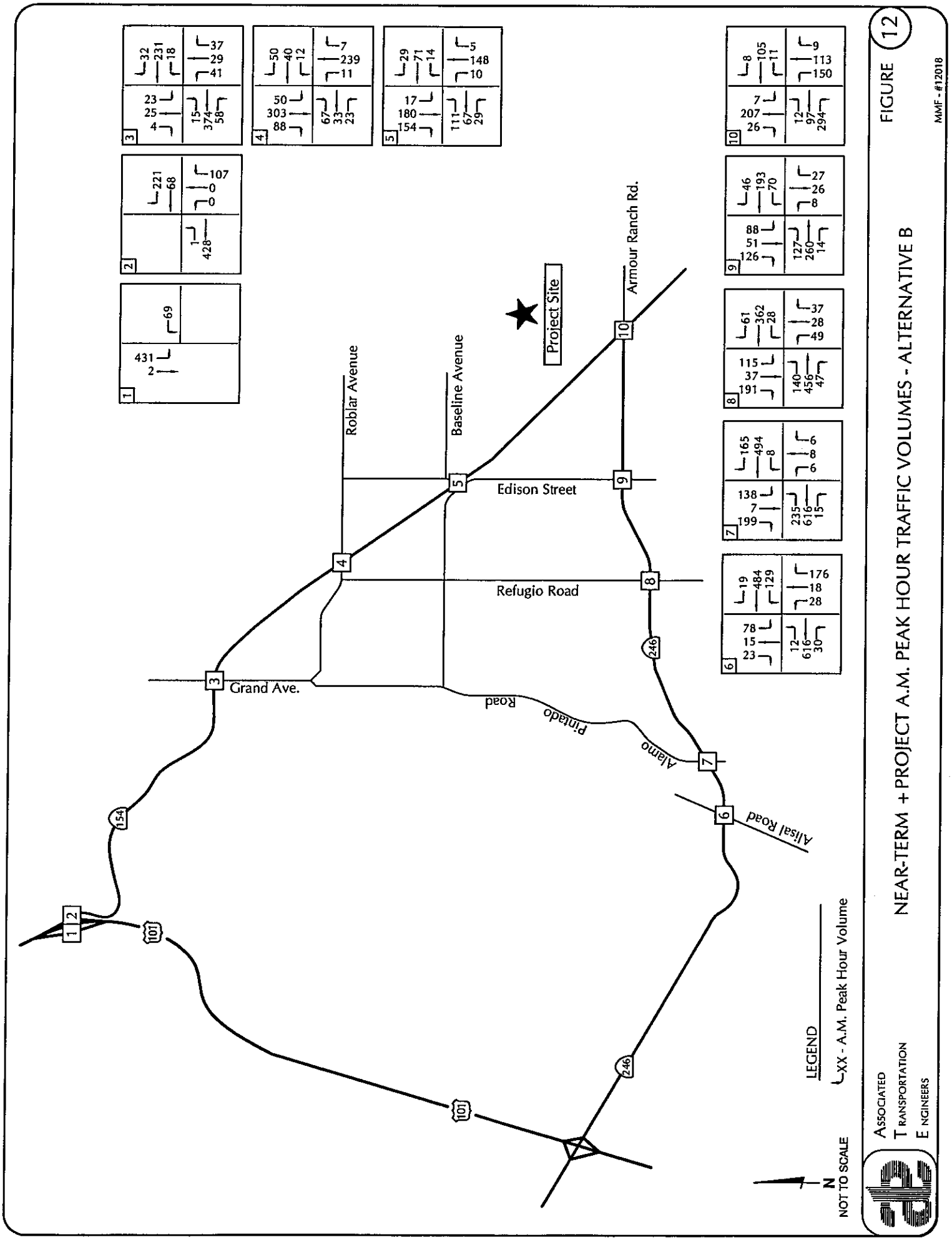


FIGURE 12
NEAR-TERM + PROJECT A.M. PEAK HOUR TRAFFIC VOLUMES - ALTERNATIVE B
MMF - #12018
Project Site
Armour Ranch Rd.
Roblar Avenue
Baseline Avenue
Edison Street
Refugio Road
Grand Ave.
Pintado Road
Alamo
Alisal Road
101
154
246
LEGEND
XX - A.M. Peak Hour Volume
NOT TO SCALE
N
Associated Transportation Engineers

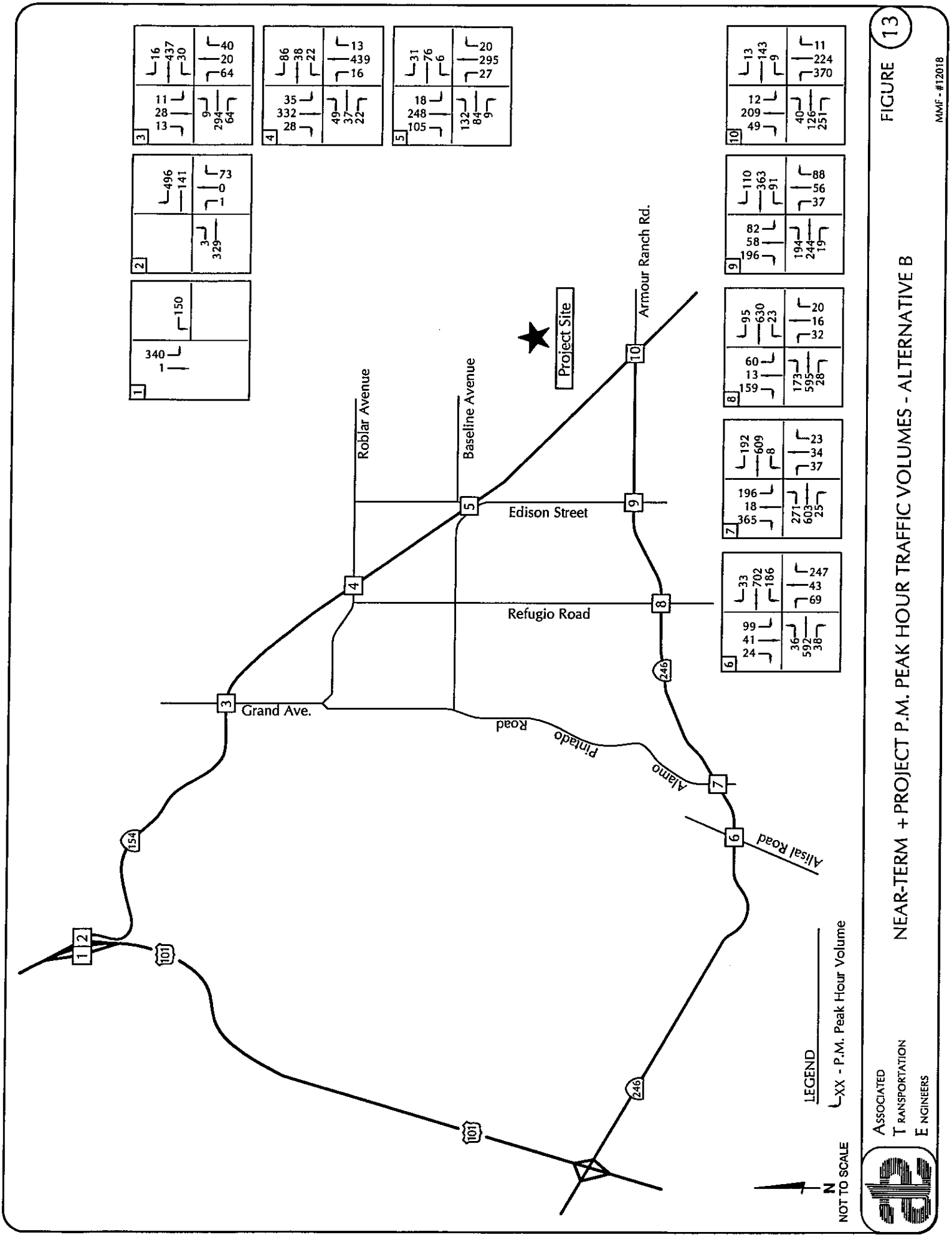


FIGURE 13

NEAR-TERM + PROJECT P.M. PEAK HOUR TRAFFIC VOLUMES - ALTERNATIVE B

ASSOCIATED TRANSPORTATION ENGINEERS

MMF - #12018

Table 11
Near-Term + Alternative B - State Highway Segment Operations

Highway Segment	Peak Hour LOS	
	Near-Term	Near-Term + Project
SR 154 n/o Edison Street(a)	LOS D/LOS C	LOS D/LOS C
SR 154 s/o SR 246-Armour Ranch Road(a)	LOS D/LOS D	LOS D/LOS D
SR 246 from SR 154 to Solvang(b)	LOS B-C	LOS B-C

(a) Northbound/Southbound LOS based on travel speeds and ability to pass using P.M. peak hour flows.
(b) Signalized segment - LOS based on delays at intersections (See Table 12).

Table 12
Near-Term + Alternative B - State Highway Intersection Operations

Intersection	Delay / LOS			
	Near-Term		Near-Term + Project	
	A.M. Peak	P.M. Peak	A.M. Peak	P.M. Peak
SR 154/U.S. 101 SB	11.5 Sec/LOS B	10.4 Sec/LOS B	11.7 Sec/LOS B	10.5 Sec/LOS B
SR 154/U.S. 101 NB	11.9 Sec/LOS B	10.6 Sec/LOS B	12.0 Sec/LOS B	10.7 Sec/LOS B
SR 154/Grand Ave	15.3 Sec/LOS C	18.0 Sec/LOS C	15.5 Sec/LOS C	18.5 Sec/LOS C
SR 154/Roblar Ave	15.9 Sec/LOS C	19.8 Sec/LOS C	16.3 Sec/LOS C	20.4 Sec/LOS C
SR 154/Edison St	11.6 Sec/LOS B	14.9 Sec/LOS B	11.8 Sec/LOS B	15.3 Sec/LOS C
SR 246/Alisal Rd	22.4 Sec/LOS C	22.2 Sec/LOS C	20.8 Sec/LOS C	23.3 Sec/LOS C
SR 246/Alamo Pintado Rd	19.7 Sec/LOS B	26.2 Sec/LOS C	20.2 Sec/LOS C	27.0 Sec/LOS C
SR 246/Refugio Rd	16.9 Sec/LOS B	27.3 Sec/LOS C	17.7 Sec/LOS B	27.3 Sec/LOS C
SR 246/Edison St	16.8 Sec/LOS B	23.6 Sec/LOS C	19.0 Sec/LOS B	22.2 Sec/LOS C
SR 246/SR 154	11.1 Sec/LOS B	19.0 Sec/LOS C	14.3 Sec/LOS B	**>50.0 Sec/LOS F**

Bolded values exceed Caltrans LOS D standard.

CUMULATIVE CONDITIONS

Cumulative traffic forecasts were derived from the traffic study prepared for the Santa Ynez Valley Community Plan. The 20-Year Buildout forecasts were used for the analysis. Figures 14 and 15 shows the Cumulative traffic volume forecasts. Levels of service for Cumulative Conditions are compared to Cumulative + Project Conditions in the following section.

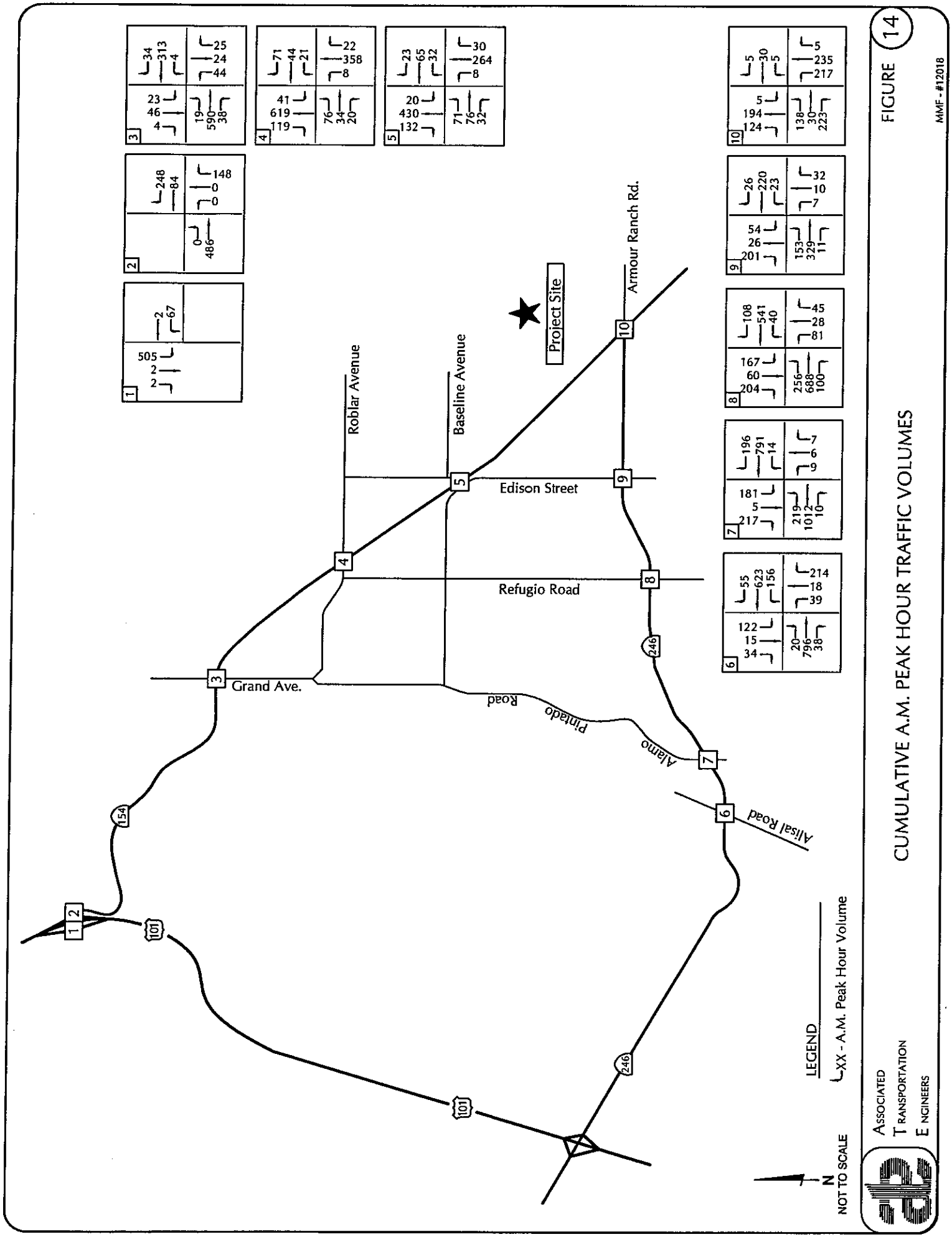


FIGURE 14
CUMULATIVE A.M. PEAK HOUR TRAFFIC VOLUMES
MMF - #12018
Project Site
Armour Ranch Rd.
Roblar Avenue
Baseline Avenue
Edison Street
Refugio Road
Grand Ave.
Pitlado Road
Alamo
Allisal Road
LEGEND
XX - A.M. Peak Hour Volume
NOT TO SCALE
N
ASSOCIATED TRANSPORTATION ENGINEERS

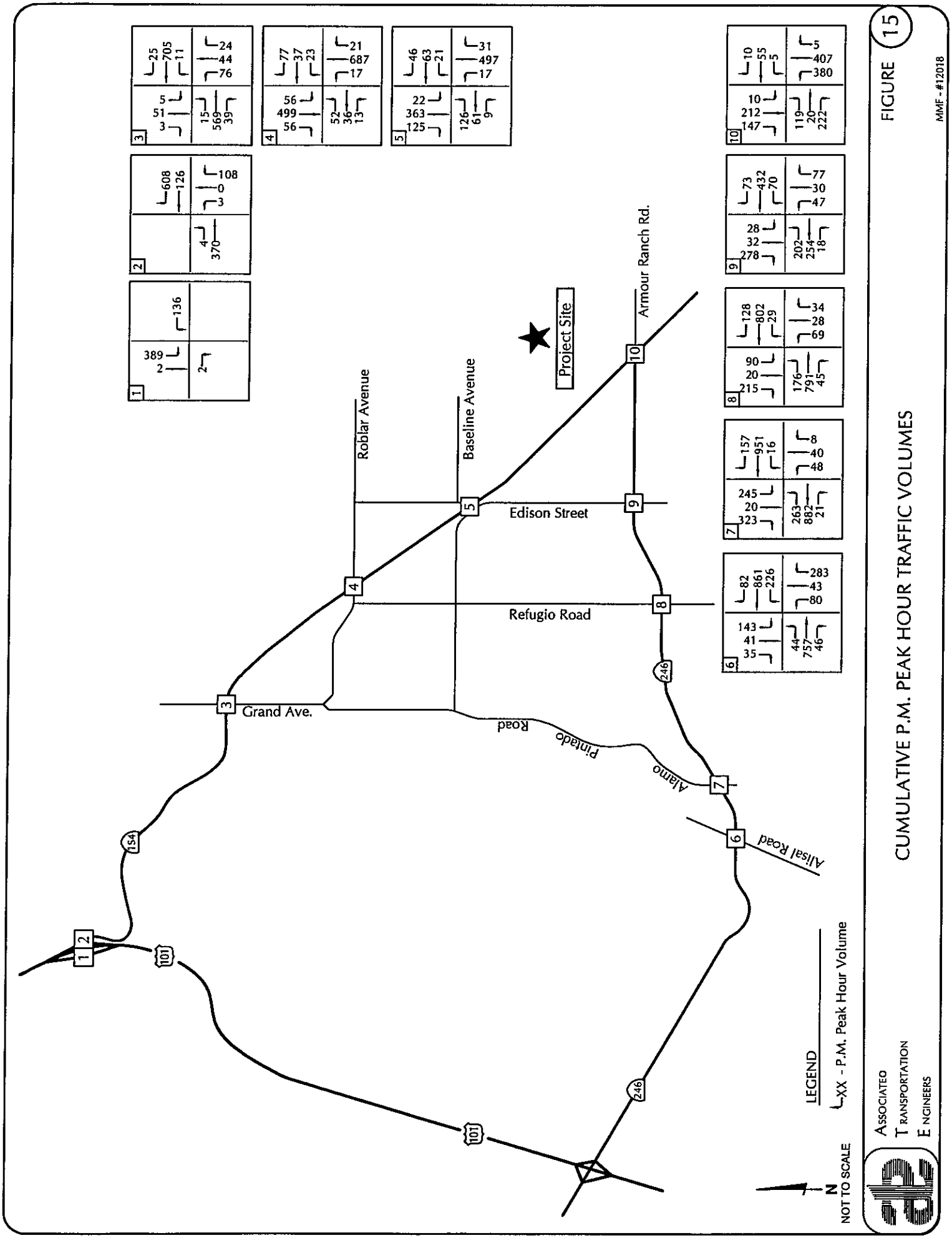


FIGURE 15
CUMULATIVE P.M. PEAK HOUR TRAFFIC VOLUMES
MMF - #12018
Project Site
Armour Ranch Rd.
Roblar Avenue
Baseline Avenue
Edison Street
Refugio Road
Grand Ave.
Pintado Road
Alamo
Alisal Road
101
154
246
LEGEND
XX - P.M. Peak Hour Volume
NOT TO SCALE
N
Associated Transportation Engineers

CUMULATIVE PROJECT + CONDITIONS

Alternative A

Alternative A traffic was added to the Cumulative traffic forecasts in order to assess potential impacts. Figures 16 and 17 show the Cumulative + Alternative A traffic forecasts.

County Roadway Impacts. Cumulative and Cumulative + Alternative A forecasts for the County roadways adjacent to the Project site are shown in Table 13. As shown, the County roadway segments are forecast to carry volumes within their Acceptable Capacity ratings under Cumulative + Alternative A Conditions - indicating that they would operate at LOS B or better - which meets County's adopted standard. Thus, Alternative A would not significantly impact the County roadways adjacent to the Project site.

Table 13
Cumulative + Alternative A - County Roadway Operations

Roadway	ADT Volume			
	Cumulative	Project Added	Cumulative + Project	Acceptable Capacity(a)
Baseline Avenue e/o Edison Street	1,800	205	2,005	5,530
Armour Ranch Road e/o SR 154	900	1,164	2,064	5,530

(a) Acceptable Capacity rating equates to County's LOS B standard adopted for the Santa Ynez area.

State Highway Impacts. Cumulative and Cumulative + Alternative A level of service forecasts for SR 154 and SR 246 are shown in Tables 14 and 15. As shown in Table 14, operations on SR 154 are forecast to degrade to LOS E in the northbound direction during the peak hour period, which exceeds the Caltrans LOS D standard. Furthermore, as shown in Table 15, several of the key intersections along SR 154 and SR 246 are forecast to degrade to LOS E or LOS F, also exceeding the Caltrans LOS D standard. Improvements required to accommodate the Cumulative + Alternative A traffic forecasts are presented in the Mitigation Measures section of the report.

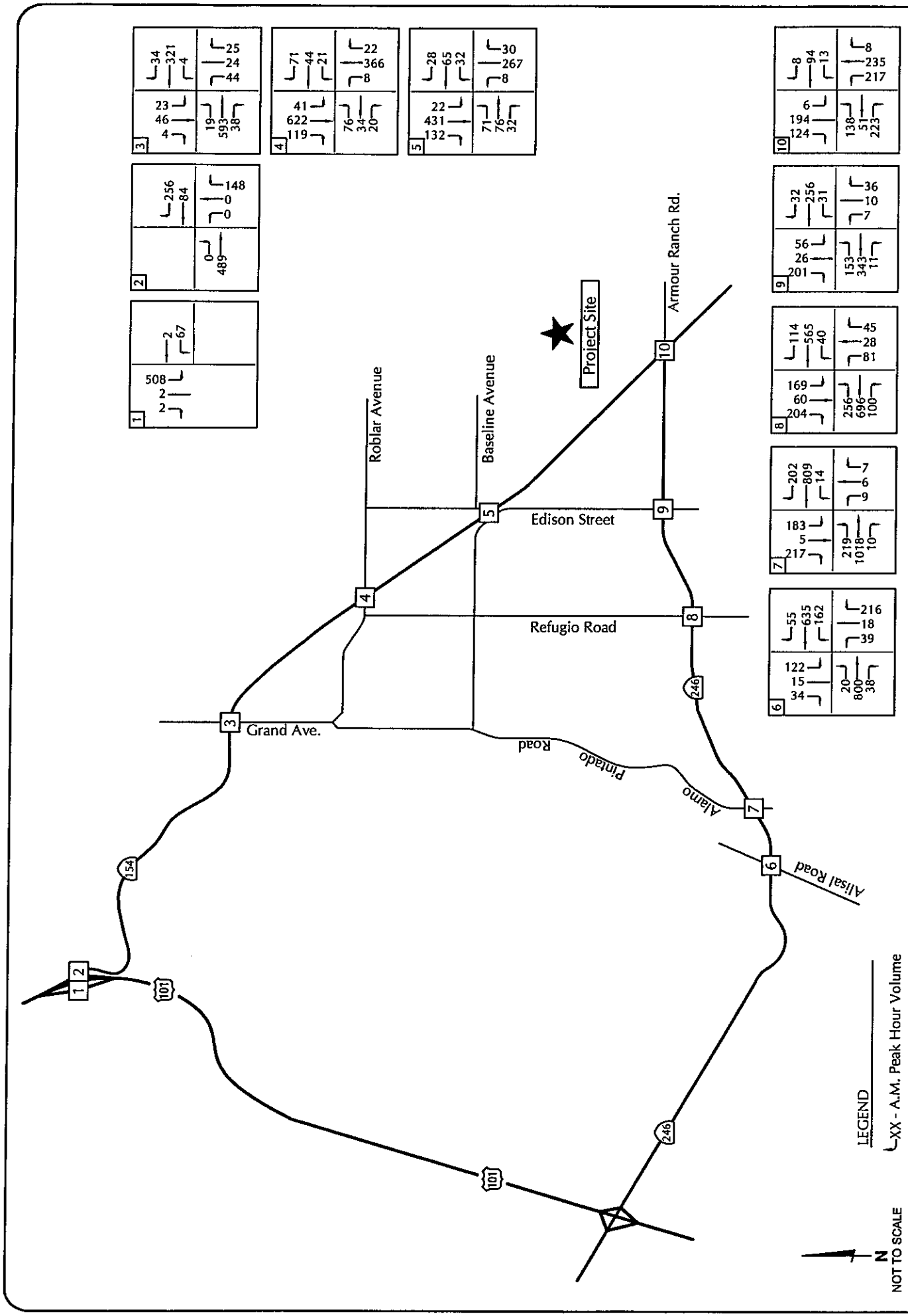


FIGURE 16

CUMULATIVE + PROJECT A.M. PEAK HOUR TRAFFIC VOLUMES - ALTERNATIVE A

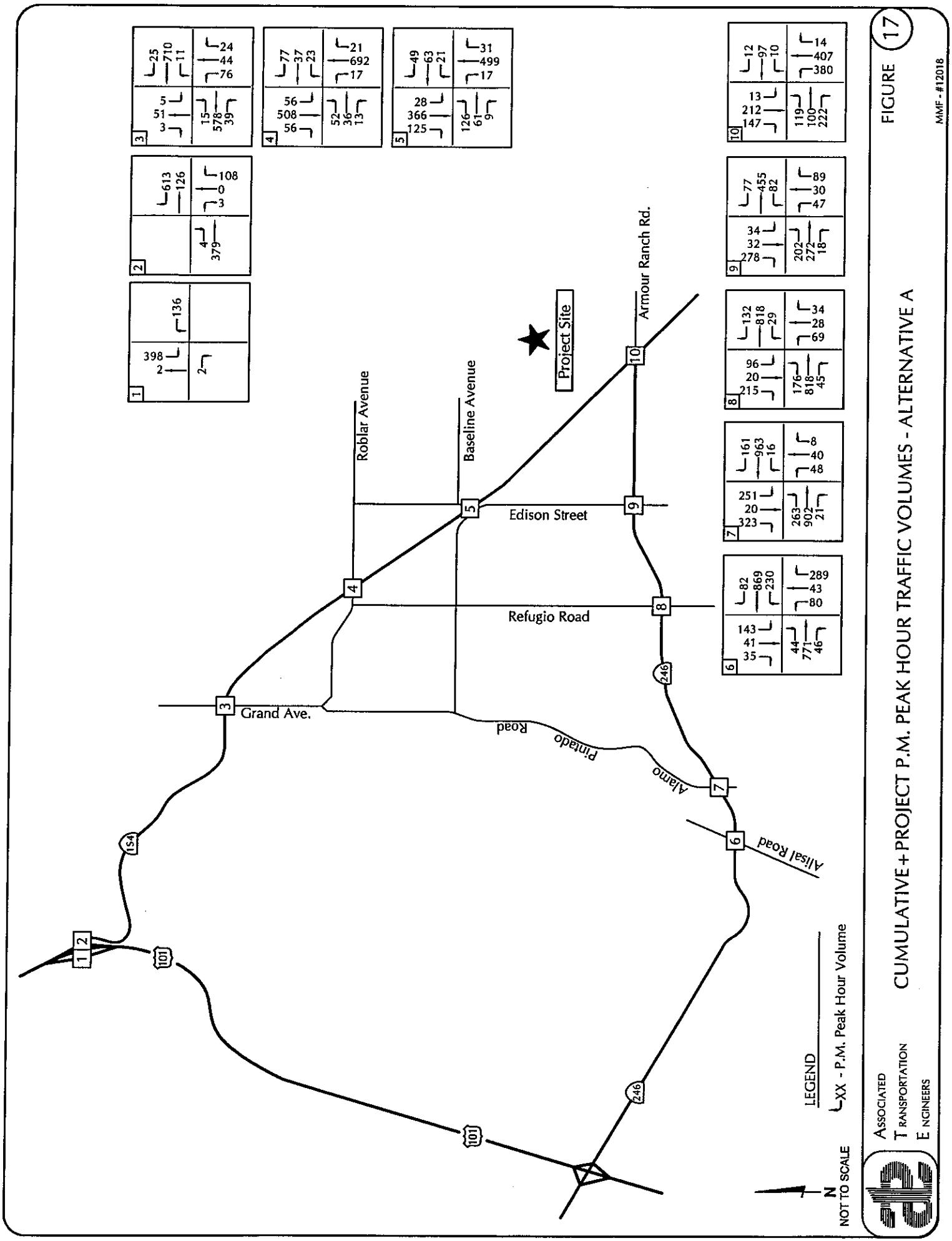


FIGURE 17
CUMULATIVE+PROJECT P.M. PEAK HOUR TRAFFIC VOLUMES - ALTERNATIVE A
MMF - #12018
Project Site
Armour Ranch Rd.
Roblar Avenue
Baseline Avenue
Edison Street
Refugio Road
Grand Ave.
Pintado Road
Alamo
Alisal Road
101
154
246
LEGEND
XX - P.M. Peak Hour Volume
NOT TO SCALE
N
ASSOCIATED TRANSPORTATION ENGINEERS

Table 14
Cumulative + Alternative A - State Highway Segment Operations

Highway Segment	Peak Hour LOS	
	Cumulative	Cumulative + Project
SR 154 n/o Edison Street(a)	**LOS E/LOS D**	**LOS E/LOS D**
SR 154 s/o SR 246-Armour Ranch Road(a)	**LOS E/LOS C**	**LOS E/LOS C**
SR 246 from SR 154 to Solvang(b)	LOS B-**LOS F**	LOS B-**LOS F**

Bolded values exceed Caltrans LOS D standard.

(a) Northbound/Southbound LOS based on travel speeds and ability to pass using P.M. peak hour flows.

(b) Signalized segment - LOS based on delays at intersections (See Table 15).

Table 15
Cumulative + Alternative A - State Highway Intersection Operations

Intersection	Delay / LOS			
	Cumulative		Cumulative + Project	
	A.M. Peak	P.M. Peak	A.M. Peak	P.M. Peak
SR 154/U.S. 101 SB	13.7 Sec/LOS B	11.3 Sec/LOS B	13.8 Sec/LOS B	11.5 Sec/LOS B
SR 154/U.S. 101 NB	13.4 Sec/LOS B	11.5 Sec/LOS B	13.4 Sec/LOS B	11.5 Sec/LOS B
SR 154/Grand Ave	23.0 Sec/LOS C	**>50.0 Sec/LOS F**	23.7 Sec/LOS C	**>50.0 Sec/LOS F**
SR 154/Roblar Ave	**>50.0 Sec/LOS F**	**>50.0 Sec/LOS F**	**>50.0 Sec/LOS F**	**>50.0 Sec/LOS F**
SR 154/Edison St	**39.0 Sec/LOS E**	**>50.0 Sec/LOS F**	**40.8 Sec/LOS E**	**>50.0 Sec/LOS F**
SR 246/Alisal Rd	29.7 Sec/LOS C	46.6 Sec/LOS D	30.9 Sec/LOS C	49.4 Sec/LOS D
SR 246/Alamo Pintado Rd	46.7 Sec/LOS D	**74.6 Sec/LOS E**	48.9 Sec/LOS D	**77.7 Sec/LOS E**
SR 246/Refugio Rd	34.2 Sec/LOS C	**68.4 Sec/LOS E**	33.7 Sec/LOS C	**66.9 Sec/LOS E**
SR 246/Edison St	16.6 Sec/LOS B	22.1 Sec/LOS C	16.6 Sec/LOS B	22.1 Sec/LOS C
SR 246/SR 154	28.7 Sec/LOS D	**>50.0 Sec/LOS F**	**>50.0 Sec/LOS F**	**>50.0 Sec/LOS F**

Bolded values exceed Caltrans LOS D standard.

Alternative B

Alternative B traffic was added to the Cumulative traffic forecasts in order to assess potential impacts. Figures 18 and 19 show the Cumulative + Alternative B traffic forecasts.

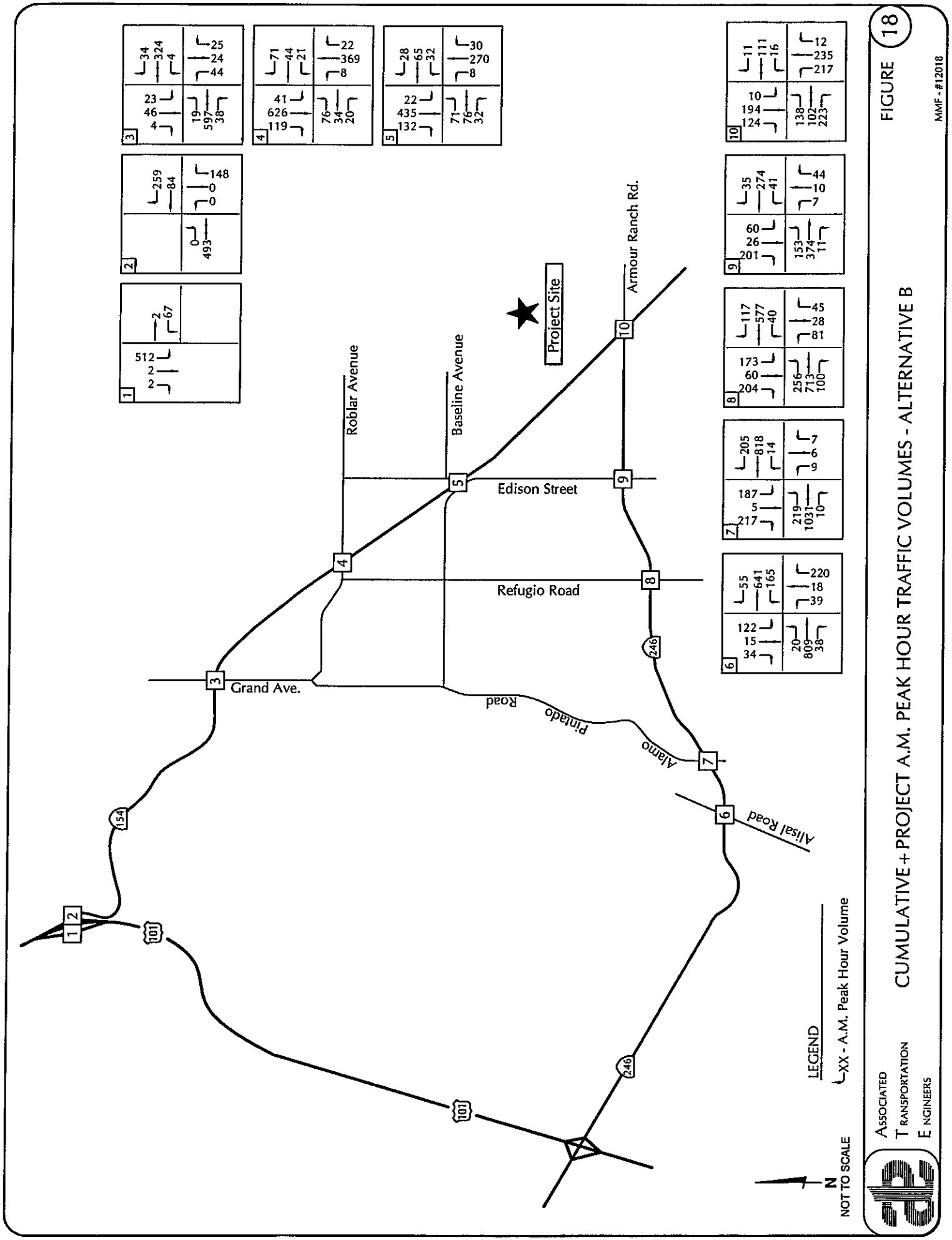
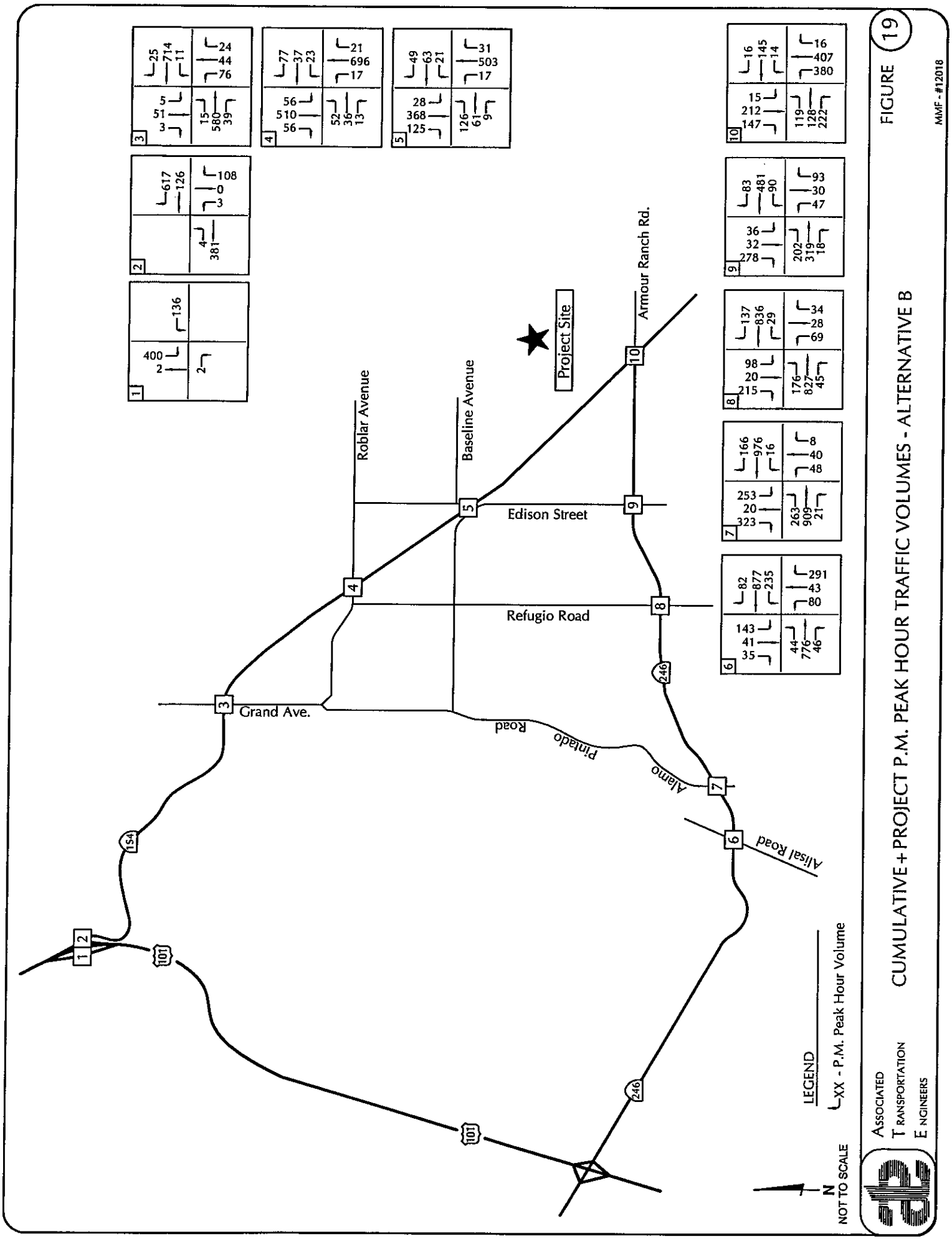


FIGURE 18

CUMULATIVE + PROJECT A.M. PEAK HOUR TRAFFIC VOLUMES - ALTERNATIVE B


Project Site
Roblar Avenue
Baseline Avenue
Armour Ranch Rd.
Edison Street
Refugio Road
Grand Ave.
Pintado Road
Alamo
Alisal Road
LEGEND
XX - P.M. Peak Hour Volume
NOT TO SCALE
N
ASSOCIATED TRANSPORTATION ENGINEERS
CUMULATIVE + PROJECT P.M. PEAK HOUR TRAFFIC VOLUMES - ALTERNATIVE B
FIGURE 19
MMF - #12018

County Roadway Impacts. Cumulative and Cumulative + Alternative B forecasts for the County roadways adjacent to the Project site are shown in Table 16. As shown, the County roadway segments are forecast to carry volumes within their Acceptable Capacity ratings under Cumulative + Alternative B Conditions - indicating that they would operate at LOS B or better - which meets County's adopted standard. Thus, Alternative B would not significantly impact the County roadways adjacent to the Project site.

Table 16
Cumulative + Alternative B - County Roadway Operations

Roadway	ADT Volume			
	Cumulative	Project Added	Cumulative + Project	Acceptable Capacity(a)
Baseline Avenue e/o Edison Street	1,800	411	2,211	5,530
Armour Ranch Road e/o SR 154	900	2,330	3,230	5,530

(a) Acceptable Capacity rating equates to County's LOS B standard adopted for the Santa Ynez area.

State Highway Impacts. Cumulative and Cumulative + Alternative B level of service forecasts for SR 154 and SR 246 are shown in Tables 17 and 18. Operations on SR 154 are forecast to degrade to LOS E in the northbound direction during the peak hour period, which exceeds the Caltrans LOS D standard (see Table 17). Additionally, several of the key intersections along SR 154 and SR 246 are forecast to degrade to LOS E or LOS F, also exceeding the Caltrans LOS D standard (see Table 18).

Table 17
Cumulative + Alternative B - State Highway Segment Operations

Highway Segment	Peak Hour LOS	
	Cumulative	Cumulative + Project
SR 154 n/o Edison Street(a)	**LOS E**/LOS D	**LOS E**/LOS D
SR 154 s/o SR 246-Armour Ranch Road(a)	**LOS E**/LOS C	**LOS E**/LOS C
SR 246 from SR 154 to Solvang(b)	LOS B-**LOS F**	LOS B-**LOS F**

Bolded values exceed Caltrans LOS D standard.
(a) Northbound/Southbound LOS based on travel speeds and ability to pass using P.M. peak hour flows.
(b) Signalized segment - LOS based on delays at intersections (See Table 15).

Table 18
Cumulative + Alternative B - State Highway Intersection Operations

Intersection	Delay / LOS			
	Cumulative		Cumulative + Project	
	A.M. Peak	P.M. Peak	A.M. Peak	P.M. Peak
SR 154/U.S. 101 5B	13.7 Sec/LOS B	11.3 Sec/LOS B	13.9 Sec/LOS B	11.5 Sec/LOS B
SR 154/U.S. 101 NB	13.4 Sec/LOS B	11.5 Sec/LOS B	13.5 Sec/LOS B	11.6 Sec/LOS B
SR 154/Grand Ave	23.0 Sec/LOS C	**>50.0 Sec/LOS F**	24.0 Sec/LOS C	**>50.0 Sec/LOS F**
SR 154/Roblar Ave	**>50.0 Sec/LOS F**	**>50.0 Sec/LOS F**	**>50.0 Sec/LOS F**	**>50.0 Sec/LOS F**
SR 154/Edison St	**39.0 Sec/LOS E**	**>50.0 Sec/LOS F**	**43.2 Sec/LOS E**	**>50.0 Sec/LOS F**
SR 246/Alisal Rd	29.7 Sec/LOS C	46.6 Sec/LOS D	32.3 Sec/LOS C	51.5 Sec/LO5 D
SR 246/Alamo Pintado Rd	46.7 Sec/LOS D	**74.6 Sec/LOS E**	51.2 Sec/LOS D	**79.9 Sec/LOS E**
SR 246/Refugio Rd	34.2 Sec/LOS C	**68.4 Sec/LOS E**	35.1 Sec/LOS D	**72.0 Sec/LOS E**
SR 246/Edison St	16.6 Sec/LOS B	22.1 Sec/LOS C	18.7 Sec/LOS B	23.7 Sec/LOS C
SR 246/SR 154	28.7 Sec/LOS D	**>50.0 Sec/LOS F**	**>50.0 Sec/LOS F**	**>50.0 Sec/LOS F**

Bolded values exceed Caltrans LOS D standard.

MITIGATION MEASURES

Near Term Measures

SR 246/SR 154. The SR 246/SR 154 intersection is forecast to degrade to LOS F during the P.M. peak hour under Near-Term + Project conditions (both alternatives). Caltrans is planning a safety improvement project for the intersection. The two alternatives being studied are 1) reconstructing the intersection into a modern roundabout, and 2) revising the lane geometry and signalizing the intersection. The Caltrans improvement project is currently in the "Project Approval/Environmental Document" (PA/ED) phase. The preferred alternative is the roundabout since it would bring down speeds at the intersection and significantly reduce injury accidents. According to Caltrans' operational analyses, the roundabout alternative would provide LOS A operations during A.M. and P.M. peak hour periods assuming Year 2035 traffic and the signalized alternative would provide LOS B-C operations during A.M. and P.M. peak hour periods assuming Year 2035 traffic. Either of the two improvements would be required to accommodate Near-Term + Project traffic.

Cumulative Measures

The Cumulative analysis found that traffic operations along SR 154 and SR 246 are forecast to degrade to LOS E or LOS F, as listed below. It is important to note that these locations would operate at LOS E/LOS F with and without the Project.

Cumulative Impacts
SR 154 north of Edison Street (LOS E)
SR 154 south of SR 246-Armour Ranch Road (LOS E)
SR 154/Grand Avenue (P.M. Peak Hour = LOS F)
SR 154/Roblar Avenue (A.M. & P.M. Peak Hour = LOS F)
SR 154/Edison Street (A.M. Peak Hour = LOS E / P.M. Peak Hour = LOS F)
SR 246/Alamo Pintado Road (P.M. Peak Hour = LOS E)
SR 246/Refugio Road (P.M. Peak Hour = LOS E)
SR 246/SR 154 (A.M. & P.M. Peak Hour = LOS F)

The following mitigations are consistent with what is being planned by the County for the Santa Ynez area since they were derived from the adopted Santa Ynez Community Plan. The Project's contribution to the mitigation measures are listed in Table 19 at the end of this section.

SR 154 Corridor

Roundabout Intersections. The first option for the SR 154 corridor is the installation of modern roundabouts at the major cross street intersections. Evenly spaced single-lane roundabouts would provide acceptable levels of service along the corridor. Based on future traffic volume forecasts, intersection spacing, and forecasted levels of service, single-lane roundabouts would be provided at the following four locations:

SR 154/Grand Avenue
SR 154/Roblar Avenue
SR 154/Edison Street
SR 154/SR 246-Armour Ranch Road

The operational analyses found that the single-lane roundabouts will operate at LOS A during the P.M. peak hour period with the 20-Year Buildout traffic forecast, thus meeting the Caltrans LOS D standard. The roundabouts would provide relatively free-flow operations along SR 154 with minor delays for traffic entering or crossing SR 154 at the collector road connections.

Signalized Intersections. The second option for the SR 154 corridor is installing signals at evenly spaced intersections. Based on future traffic volumes, intersection spacing, forecasted levels of service, and signal warrants, signalized intersections would be provided at:

SR 154/Grand Avenue
SR 154/Roblar Avenue
SR 154/Edison Street
SR 154/SR 246-Armour Ranch Road

The operational analysis found that the SR 154 corridor will operate at LOS B under 20-Year Buildout conditions during the P.M. peak hour period with the signalized option, thus meeting the Caltrans LOS D standard. The signalized corridor would provide relatively free-flow operations along SR 154 with minor delays for traffic entering or crossing SR 154 at the signalized collector road connections.

SR 246 Corridor

Roundabout Intersections. The first option for the SR 246 corridor is the installation of evenly spaced roundabouts. Based on future traffic volume forecasts, intersection spacing, and forecasted levels of service, two-lane roundabouts should be provided at the following locations:

SR 246/Alamo Pintado Road
SR 246/Edison Street
SR 246/Refugio Road
SR 246-Armour Ranch Road/SR 154

It is noted that the SR 246/Alamo Pintado Road intersection lies within the City of Solvang. The City prepared a Project Study Report to address the future deficiency. The project is now in the PA/ED phase and preferred alternative is to convert the intersections into a modern roundabout. The project is anticipated to be constructed in Year 2015.

The operational analyses found that the two-lane roundabouts will operate at LOS A during the P.M. peak hour period with the 20-Year Buildout traffic forecast, thus meeting the Caltrans LOS D standard. The roundabouts would provide relatively free-flow operations along SR 154 with minor delays for traffic entering or crossing SR 246 at the roundabouts.

Signalized Intersections. This mitigation option found that SR 246 would need to be widened to provide 2 eastbound and 2 westbound lanes on the signalized approaches at the following intersections in order to accommodate the 20-Year Buildout peak hour flows.

SR 246/Alamo Pintado Road
SR 246/Edison Street
SR 246/Refugio Road
SR 246-Armour Ranch Road/SR 154

The operational analyses found that the signalized option would provide LOS B, thus meeting the Caltrans LOS D standard. Evenly spaced signals along the SR 246 corridor would also provide gaps in the SR 246 traffic stream and thereby also reduce delays for traffic to enter or cross SR 246 at the local road connections between the signalized intersections.

Project Contributions

Table 19 shows the Project's contribution to the cumulative mitigations. The Project's contribution to the mitigations were calculated using the Caltrans formula derived from the Caltrans traffic study guidelines.[5]

Table 19
Proportionate Share Percentages

Intersection	Proportionate Share % (A.M./P.M.)	
	Alternative A	Alternative B
SR 154/Grand Ave	3.1% / 2.1%	4.9% / 3.0%
SR 154/Roblar Ave	1.9% / 2.5%	3.1% / 3.5%
SR 154/Edison St	2.6% / 3.1%	4.2% / 4.4%
SR 154/SR 246	15.7% / 23.0%	25.3% / 32.7%
SR 246/Alamo Pintado Rd	3.6% / 5.6%	6.7% / 8.9%
SR 246/Edison St	21.6% / 33.0%	36.2% / 44.1%
SR 246/Refugio Rd	4.4% / 7.1%	8.1% / 11.1%

Proportionate Share Percentage = Project Trips / Cumulative+Project Volume - Existing Volume

SITE ACCESS AND CIRCULATION

Alternative A

Access for Alternative A is proposed via 2 connections to Baseline Avenue and 1 connection to Armour Ranch Road (see Figure 2). Traffic signals would not be warranted at access connections. Instead, Stop signs should be provided on the northbound roadway connections to Baseline Avenue and on the southbound roadway connection to Armour Ranch Road. Review of the on-site circulation system found that traffic signals would not be warranted. The interior roads system would provide adequate access to the residential lots.

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

Alternative B

Access for Alternative B would be provided via 2 connections to Baseline Avenue and 1 connection to Armour Ranch Road (see Figure 3). Traffic signals would not be warranted at access connections. Instead, Stop signs should be provided on the northbound roadway connections to Baseline Avenue and on the southbound roadway connection to Armour Ranch Road. Review of the on-site circulation system found that traffic signals would not be warranted. The interior roads system would provide adequate access to the residential lots.

■ ■ ■

REFERENCES AND PERSONS CONTACTED

Associated Transportation Engineers

Richard L. Pool, PE, Principal Engineer
Dan Dawson, PTP, Supervising Transportation Planner
Matthew Farrington, Transportation Planner I

References

2010 Highway Capacity Manual, Transportation Research Board, 2010.

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

Traffic and Circulation Study for the Santa Ynez Valley Community Plan, Associated Transportation Engineers, April, 2008.

Transportation Concept Report State Route 154, California Department of Transportation District 5, February 2007.

Transportation Concept Report State Route 246, California Department of Transportation District 5, May 2004.

Trip Generation, Institute of Transportation Engineers, 8th Edition, 2008.

Trip Generation Handbook, an ITE Recommended Practice, 2nd Edition, 2004.

Persons Contacted

William Robertson, County of Santa Barbara
Paul McClintic, Caltrans
Frank Boyle, Caltrans
Chris Shaeffer, Caltrans
Larry Newland, Caltrans

TECHNICAL APPENDIX

CONTENTS:

LEVEL OF SERVICE DEFINITIONS

PROJECT TRIP GENERATION CALCULATIONS

CUMULATIVE PROJECT LIST - TRIP GENERATION WORKSHEET

TWO-LANE HIGHWAY LEVEL OF SERVICE CALCULATION WORKSHEETS

Reference 1 SR 154 n/o Edison Street
Reference 2 SR 154 s/o SR 246-Armour Ranch Road

INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS

Reference 1 SR 154/U.S. 101 SB
Reference 2 SR 154/U.S. 101 NB
Reference 3 SR 154/Grand Avenue
Reference 4 SR 154/Roblar Avenue
Reference 5 SR 154/Edison Street
Reference 6 SR 246/Alisal Road
Reference 7 SR 246/Alamo Pintado Road
Reference 8 SR 246/Refugio Road
Reference 9 SR 246/Edison Street
Reference 10 SR 246/SR 154

TRAFFIC COUNT DATA

LEVEL OF SERVICE DEFINITIONS

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

Table A
Level of Service Definitions

LOS	Definition
A	Conditions of free unobstructed flow, no delays and all signal phases sufficient in duration to clear all approaching vehicles.
B	Conditions of stable flow, very little delay, a few phases are unable to handle all approaching vehicles.
C	Conditions of stable flow, delays are low to moderate, full use of peak direction signal phases is experienced.
D	Conditions approaching unstable flow, delays are moderate to heavy, significant signal time deficiencies are experienced for short durations during the peak traffic period.
E	Conditions of unstable flow, delays are significant, signal phase timing is generally insufficient, congestion exists for extended duration throughout the peak period.
F	Conditions of forced flow, travel speeds are low and volumes are well above capacity. This condition is often caused when vehicles released by an upstream signal are unable to proceed because of back-ups from a downstream signal.

Table B
Levels of Service Delay Ranges

LOS	Unsignalized Delay	Signalized V/C Ratio
A	< 10.0	< 10.0
B	10.1-15.0	10.1-20.0
C	15.1-25.0	20.1-35.0
D	25.1-35.0	35.1-55.0
E	35.1-50.0	55.1-80.0
F	> 50.0	> 80.0

PROJECT TRIP GENERATION CALCULATIONS

Associated Transportation Engineers
Trip Generation Worksheet With In/Out Splits

CHUMASH CAMP 4 PROJECT (#12018)

ALTERNATIVE A

LAND-USE	SIZE	ADT		A.M. PEAK HOUR						P.M. PEAK HOUR					
		RATE	TRIPS	RATE	TRIPS	IN%	TRIPS	OUT%	TRIPS	RATE	TRIPS	IN%	TRIPS	OUT%	TRIPS
SINGLE FAMILY HOUSING (a)	143	9.57	1,369	0.750	107	25%	27	75%	80	1.01	144	64%	92	36%	52
PROJECT TOTAL:			**1,369**		**107**		**27**		**80**		**144**		**92**		**52**

ALTERNATIVE B

LAND-USE	Size	ADT		A.M. PEAK HOUR						P.M. PEAK HOUR					
		RATE	TRIPS	RATE	TRIPS	IN%	TRIPS	OUT%	TRIPS	RATE	TRIPS	IN%	TRIPS	OUT%	TRIPS
SINGLE FAMILY HOUSING (a)	143	9.57	1,369	0.750	107	25%	27	75%	60	1.01	144	64%	92	36%	52
COMMUNITY CENTER/TRIBAL RETREAT (b)	80,000	22.88	1,830	1.620	130	61%	79	39%	51	1.45	116	37%	43	63%	73
PROJECT TOTAL:			**3,199**		**237**		**106**		**131**		**260**		**135**		**125**

(a) ITE 8TH EDITION RATES FOR SINGLE FAMILY HOMES (LAND USE #210)
(b) ITE 8TH EOITION RATES FOR RECREATIONAL COMMUNITY CENTER (LAND USE #495)

3

CUMULATIVE PROJECT LIST - TRIP GENERATION WORKSHEET

Associated Transportation Engineers
Trip Generation Worksheet - With In/Out Splits

CUMULATIVE PROJECT TRIP GENERATION - WEEKDAY

Land Use	Size	Multi-Trip	ADT		A.M.						P.M.					
			Rate	Trips	Rate	Trips	In %	Trips	Out %	Trips	Rate	Trips	In %	Trips	Out %	Trips
Thomson Parcel	3	1.00	9.57	29	0.750	2	25%	1	75%	1	1.01	3	63%	2	37%	1
Marcelino Springs	3	1.00	9.57	29	0.750	2	25%	1	75%	1	1.01	3	63%	2	37%	1
Kalsow Lot Split	1	1.00	9.57	10	0.750	1	25%	0	75%	1	1.01	1	63%	1	37%	0
Valley Sand & Soil				20												
Stull Lot Split	1	1.00	9.57	10	0.750	1	25%	0	75%	1	1.01	1	63%	1	37%	0
Coffey Lot Split	1	1.00	9.57	10	0.750	1	25%	0	75%	1	1.01	1	63%	1	37%	0
Ricci Lot Split	1	1.00	9.57	10	0.750	1	25%	0	75%	1	1.01	1	63%	1	37%	0
McCombs Lot Split	1	1.00	9.57	10	0.750	1	25%	0	75%	1	1.01	1	63%	1	37%	0
Higgins/Martino Lot Split	1	1.00	9.57	10	0.750	1	25%	0	75%	1	1.01	1	63%	1	37%	0
Lorenzen Lot Split	1	1.00	9.57	10	0.750	1	25%	0	75%	1	1.01	1	63%	1	37%	0
Meyer Lot Split	1	1.00	9.57	10	0.750	1	25%	0	75%	1	1.01	1	63%	1	37%	0
Lash Commercial	5,645	1.00	46.55	263	1.400	8	61%	5	39%	3	4.55	26	44%	11	56%	15
Granite Mining (ATE #10016)				70		7		3		4		0				
Skytt Family Lot Split	3	1.00	9.57	29	0.750	2	25%	1	75%	1	1.01	3	63%	2	37%	1
Hanson Parcel (SFD)	2	1.00	9.57	19	0.750	2	25%	1	75%	1	1.01	2	63%	1	37%	1
Estelle Vineyard Estates	11	1.00	9.57	105	0.750	8	25%	2	75%	6	1.01	11	63%	7	37%	4
Haas Tract	8	1.00	9.57	77	0.750	6	25%	2	75%	4	1.01	8	63%	5	37%	3
Edison St. Service Ctr/Car Wash	10	0.38	152.84	581	11.930	45	51%	23	49%	22	13.94	53	51%	27	49%	26
Tumbull Tract	3	1.00	9.57	29	0.750	2	25%	1	75%	1	1.01	3	63%	2	37%	1
Gavlak Lot Split	1	1.00	9.57	10	0.750	1	25%	0	75%	1	1.01	1	63%	1	37%	0
SY Valley Airport	8	1.00	1.97	16	0.000	0	25%	0	75%	0	0.00	0	63%	0	37%	0
SY Valley SR. Housing	22	1.00	3.48	77	0.130	3	38%	1	62%	2	0.16	4	63%	3	37%	1
Bar Z Lot Split	2	1.00	9.57	19	0.750	2	25%	1	75%	1	1.01	2	63%	1	37%	1
Valley Compost Facility	10	1.00	2.00	20	0.000	0	25%	0	75%	0	0.00	0	63%	0	37%	0
Mattel's Tavern (ATE #07084)	64	1.00	8.17	1	0.560	36	51%	18	49%	18	0.59	38	53%	20	47%	18
Cottages (To Be Removed)	-3	1.00	9.57	-29	0.750	-2	25%	-1	75%	-1	1.01	-3	63%	-2	37%	-1
Duplex/Triplex (to Be Removed)	-5	1.00	6.65	-33	0.510	-3	25%	-1	75%	-2	0.62	-3	63%	-2	37%	-1
Vincent Winery				24								4	25%	1	75%	3
Da Werd Winery				25								7	25%	2	75%	5
TTT Winery				16								3	25%	1	75%	2
Lamer Winery				35								9	25%	2	75%	7
Claxton Wnery				41								9	25%	2	75%	7
El Camino Real Winery				40								9	25%	2	75%	7
Bridlewood Winery				14								1	25%	0	75%	1
Project Total:				**1,607**		**129**		**58**		**71**		**201**		**98**		**103**

S/O SR246

Thomson Parcel	3	1.00	9.57	29	0.750	2	25%	1	75%	1	1.01	3	63%	2	37%	1
SUB-TOTAL:				***29***		***2***		***1***		***1***		***3***		***2***		***1***

SANTA YNEZ AREA

Coffay Lot Split	1	1.00	9.57	10	0.750	1	25%	0	75%	1	1.01	1	63%	1	37%	0
Ricci Lot Split	1	1.00	9.57	10	0.750	1	25%	0	75%	1	1.01	1	63%	1	37%	0
McCombs Lot Split	1	1.00	9.57	10	0.750	1	25%	0	75%	1	1.01	1	63%	1	37%	0
Edison St. Service Ctr/Car Wash	10	0.38	152.84	581	11.930	45	51%	23	49%	22	13.94	53	51%	27	49%	26
SY Valley Airport	8	1.00	1.97	16	0.000	0	25%	0	75%	0	0.00	0	63%	0	37%	0
SY Valley SR. Housing	22	1.00	3.48	77	0.130	3	38%	1	62%	2	0.16	4	63%	3	37%	1
Claxton Wnery				41								9	25%	2	75%	7
SUB-TOTAL:				***745***		***51***		***24***		***27***		***69***		***35***		***34***

BASELINE RD. E/O SR154

Stull Lot Split	1	1.00	9.57	10	0.750	1	25%	0	75%	1	1.01	1	63%	1	37%	0
Hanson Parcel (SFD)	2	1.00	9.57	19	0.750	2	25%	1	75%	1	1.01	2	63%	1	37%	1
SUB-TOTAL:				***29***		***3***		***1***		***2***		***3***		***2***		***1***

ROBLAR AVE. E/O SR154

Estelle Vineyard Estates	11	1.00	9.57	105	0.750	8	25%	2	75%	6	1.01	11	63%	7	37%	4
Vincent Winery				24								4	25%	1	75%	3
TTT Winery				16								3	25%	1	75%	2
Bridlewood Winery				26								3	25%	1	75%	2
Tumbull Tract	3	1.00	9.57	29	0.750	2	25%	1	75%	1	1.01	3	63%	2	37%	1
SUB-TOTAL:				***200***		***10***		***3***		***7***		***24***		***12***		***12***

BAILLARD AREA

Kalsow Lot Split	1	1.00	9.57	10	0.750	1	25%	0	75%	1	1.01	1	63%	1	37%	0
Higgins/Martino Lot Split	1	1.00	9.57	10	0.750	1	25%	0	75%	1	1.01	1	63%	1	37%	0
Gavlak Lot Split	2	1.00	9.57	19	0.750	2	25%	1	75%	1	1.01	2	63%	1	37%	1
SUB-TOTAL:				***39***		***4***		***1***		***3***		***4***		***3***		***1***

LOS OLIVOS AREA

Valley Sand & Soil				20												
Lash Commercial	5,645	1.00	46.55	263	1.400	8	61%	5	39%	3	4.55	26	44%	11	56%	15
De Werd Winery	9,856	1.00		25								7	25%	2	75%	5
El Camino Real Winery				40								9	25%	2	75%	7
Mattel's Tavern				461		36		18		18		32		16		16
SUB-TOTAL:				***809***		***44***		***23***		***21***		***74***		***31***		***43***

TWO-LANE HIGHWAY LEVEL OF SERVICE CALCULATION WORKSHEETS

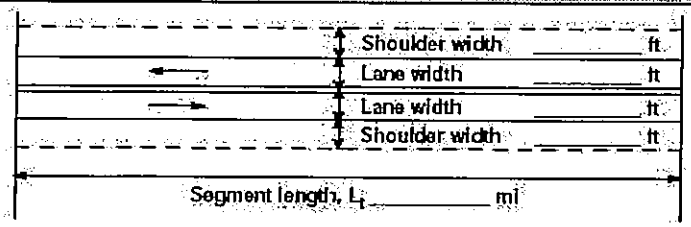
Reference 1 SR 154 n/o Edison Street
Reference 2 SR 154 s/o SR 246-Armour Ranch Road

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 NORTHBOUND
Agency or Company	ATE	From/To	N/O BASELINE
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	EXISTING

Project Description:

Input Data



☒ Class I highway ☒ Class II highway
☒ Class III highway

Terrain ☒ Level ☒ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF 0.88
No-passing zone 90%
% Trucks and Buses, P_T 4 %
% Recreational vehicles, P_R 2%
Access points mi 1/mi

Analysis direction vol., V_d 412veh/h
Opposing direction vol., V_o 320veh/h
Shoulder width ft 6.0
Lane Width ft 12.0
Segment Length mi 1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.2	1.3
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.992	0.988
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	472	368

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	3.4 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	49.8 mi/h
		Percent free flow speed, PFFS	83.4 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.0	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	0.996
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	468	365
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	47.6	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	41.7	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	71.0	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	D
Volume to capacity ratio, v/c	0.28
Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1680
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1693

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*83.4*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*468.2*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.00*
Bicycle level of service (Exhibit 15-4)	*C*

Notes

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

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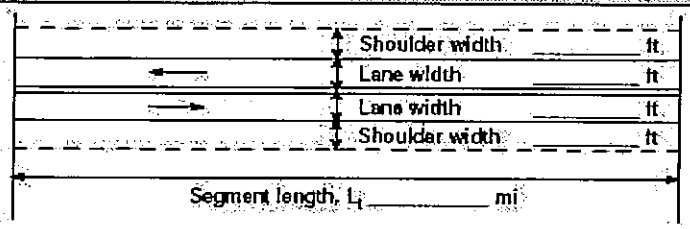
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 SOUTHBOUND
Agency or Company	ATE	From/To	N/O BASELINE
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	EXISTING

Project Description:

Input Data



☒ Class I highway ☒ Class II highway

☒ Class III highway

Terrain ☒ Level ☒ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF 0.88

No-passing zone 90%

% Trucks and Buses, P_T 4 %

% Recreational vehicles, P_R 2%

Access points mi 1/mi

Analysis direction vol., V_d	320veh/h
Opposing direction vol., V_o	412veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.3	1.2
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.988	0.992
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	368	472

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	2.8 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	50.4 mi/h
		Percent free flow speed, PFFS	84.4 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.1	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.996	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	365	468
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	41.8	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	41.7	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	60.1	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	C
Volume to capacity ratio, v/c	0.22
Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1686
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*84.4*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*363.6*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.87*
Bicycle level of service (Exhibit 15-4)	*C*

Notes

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

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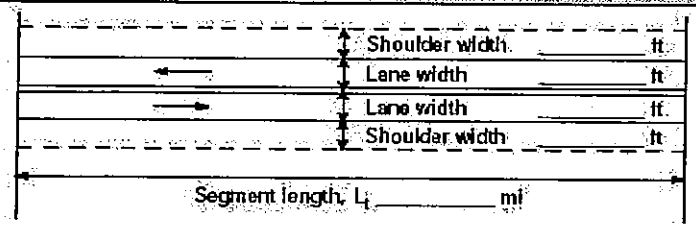
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 NORTHBOUND
Agency or Company	ATE	From/To	N/O BASELINE
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	2014

Project Description:

Input Data



☒ Class I highway ☒ Class II highway

☐ Class III highway

Terrain ☒ Level ☒ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF 0.88

No-passing zone 90%

% Trucks and Buses, P_T 4 %

% Recreational vehicles, P_R 2%

Access points mi 1/mi

Analysis direction vol., V_d	449veh/h
Opposing direction vol., V_o	360veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.2	1.3
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.992	0.988
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	514	414

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS} (Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	3.2 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	49.4 mi/h
		Percent free flow speed, PFFS	82.8 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	510	409
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	49.6	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	39.8	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	71.7	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	D
Volume to capacity ratio, v/c	0.31
Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1680
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*82.6*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*510.2*
Effective width, Ww (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.04*
Bicycle level of service (Exhibit 15-4)	*C*

Notes

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

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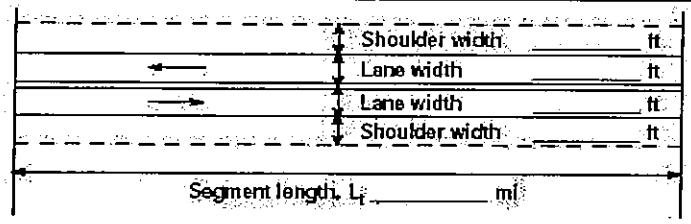
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 SOUTHBOUND
Agency or Company	ATE	From/To	N/O BASELINE
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	2014

Project Description:

Input Data



☒ Class I highway ☒ Class II highway

☒ Class III highway

Terrain ☒ Level ☒ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF 0.88

No-passing zone 90%

% Trucks and Buses, P_T 4 %

% Recreational vehicles, P_R 2%

Access points mi 1/mi

Analysis direction vol., V_d	360veh/h
Opposing direction vol., V_o	449veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.3	1.2
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.988	0.992
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	414	514

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	2.5 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	50.0 mi/h
		Percent free flow speed, PFFS	83.7 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	409	510
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	45.4	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	39.8	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	63.1	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	C
Volume to capacity ratio, v/c	0.25
Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1686
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*83.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*409.1*
Effective width, Ww (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.93*
Bicycle level of service (Exhibit 15-4)	C

Notes:

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

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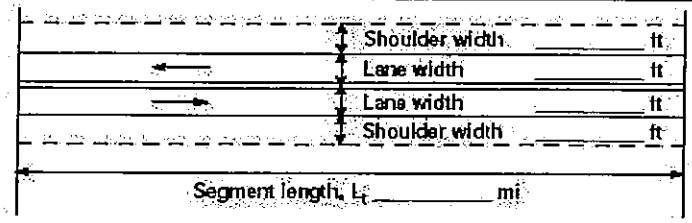
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 NORTHBOUND
Agency or Company	ATE	From/To	N/O BASELINE
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	2014 + PROJECT (ALT 1)

Project Description:

Input Data



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

Terrain ☐ Level ☐ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF 0.88
No-passing zone 90%
% Trucks and Buses, P_T 4 %
% Recreational vehicles, P_R 2%
Access points mi 1/mi

Analysis direction vol., V_d 454veh/h
Opposing direction vol., V_o 369veh/h
Shoulder width ft 6.0
Lane Width ft 12.0
Segment Length mi 1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.2	1.3
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.992	0.988
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	520	424

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS} (Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	3.1 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	49.3 mi/h
		Percent free flow speed, PFFS	82.5 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	516	419
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	50.9	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	39.5	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	72.7	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	D
Volume to capacity ratio, v/c	0.31
Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1680
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*82.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*515.9*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.05*
Bicycle level of service (Exhibit 15-4)	*C*

Notes

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

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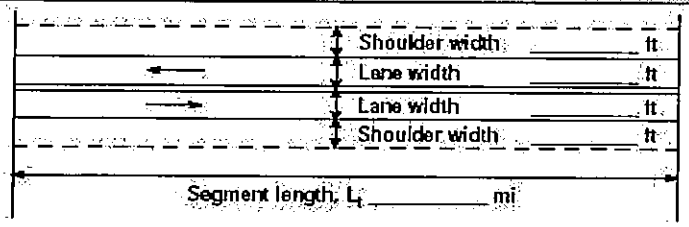
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 SOUTHBOUND
Agency or Company	ATE	From/To	N/O BASELINE
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	2014 + PROJECT (ALT 1)

Project Description:

Input Data



☒ Class I highway ☒ Class II highway

☒ Class III highway

Terrain ☒ Level ☒ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF 0.88

No-passing zone 90%

% Trucks and Buses, P_T 4 %

% Recreational vehicles, P_R 2%

Access points *ml* 1/mi

Analysis direction vol., V_d	369veh/h
Opposing direction vol., V_o	454veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.3	1.2
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.988	0.992
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	424	520

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS} (Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	2.5 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	49.9 mi/h
		Percent free flow speed, PFFS	83.6 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	419	516
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	45.7	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	39.5	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	63.4	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	C
Volume to capacity ratio, *v/c*	0.25
Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1686
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*83.6*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*419.3*
Effective width, Ww (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.94*
Bicycle level of service (Exhibit 15-4)	*C*

Notes

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

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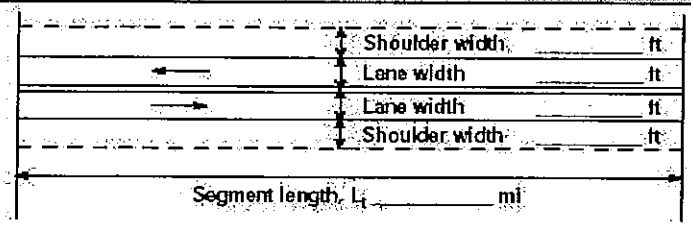
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 NORTHBOUND
Agency or Company	ATE	From/To	N/O BASELINE
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	2014 + PROJECT (ALT 2)

Project Description:

Input Data



☒ Class I highway ☒ Class II highway
☒ Class III highway

Terrain ☒ Level ☒ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF 0.88
No-passing zone 90%
% Trucks and Buses, P_T 4 %
% Recreational vehicles, P_R 2%
Access points *ml* 1/ml

Analysis direction vol., V_d	458veh/h
Opposing direction vol., V_o	371veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length ml	1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.2	1.3
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.992	0.988
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	525	427

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed[4], BFFS	60.0 mi/h
Mean speed of sample[3], S_{FM}		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	0.0 mi/h
Total demand flow rate, both directions, v		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.8 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	3.1 mi/h	Averaga travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	49.3 mi/h
		Percent free flow speed, PFFS	82.5 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex t5-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	520	422
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	50.9	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	39.3	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	72.6	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	D
Volume to capacity ratio, *v/c*	0.31
Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1680
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*82.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*520.5*
Effective width, Ww (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.05*
Bicycle level of service (Exhibit 15-4)	*C*

Notes

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

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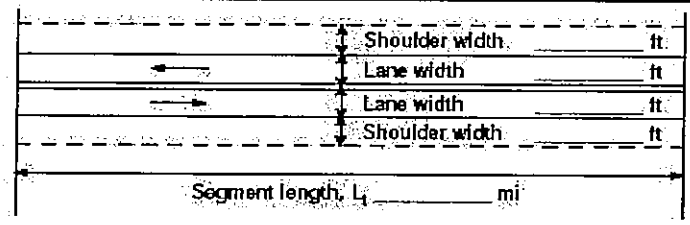
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 SOUTHBOUND
Agency or Company	ATE	From/To	N/O BASELINE
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	2014 + PROJECT (ALT 2)

Project Description:

Input Data



☒ Class I highway ☒ Class II highway
☒ Class III highway

Terrain ☒ Level ☒ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF 0.88
No-passing zone 90%
% Trucks and Buses, P_T 4 %
% Recreational vehicles, P_R 2%
Access points mi 1/mi

Analysis direction vol., V_d	371veh/h
Opposing direction vol., V_o	458veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.3	1.2
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.988	0.992
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	427	525

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	2.4 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	49.9 mi/h
		Percent free flow speed, PFFS	83.5 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	422	520
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	46.9	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	39.3	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	64.5	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	C
Volume to capacity ratio, v/c	0.25
Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1888
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*83.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*421.6*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.95*
Bicycle level of service (Exhibit 15-4)	*C*

Notes

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

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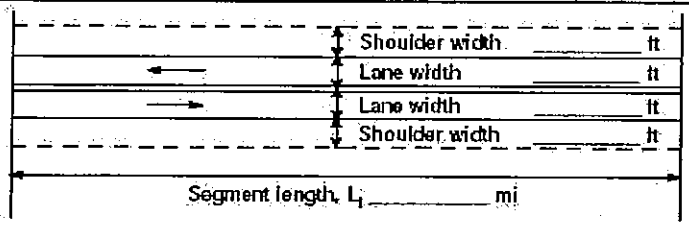
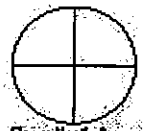
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 NORTHBOUND
Agency or Company	ATE	From/To	S/O SR 246
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	EXISTING

Project Description:

Input Data





☒ Class I highway ☒ Class II highway
☒ Class III highway

Terrain ☒ Level ☒ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF 0.88
No-passing zone 90%
% Trucks and Buses, P_T 4 %
% Recreational vehicles, P_R 2%
Access points mi 1/mi

Analysis direction vol., V_d	555veh/h
Opposing direction vol., V_o	412veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.1	1.2
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.996	0.992
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	633	472

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS} (Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	2.8 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	48.4 mi/h
		Percent free flow speed, PFFS	81.0 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	631	468
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	58.9	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	34.6	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	78.8	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	D
Volume to capacity ratio, v/c	0.38
Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1686
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*81.0*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*630.7*
Effective width, Ww (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.15*
Bicycle level of service (Exhibit 15-4)	*C*
Notes	

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

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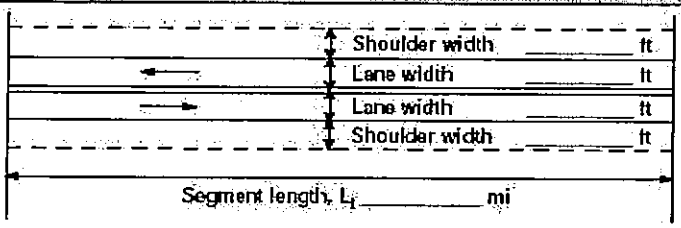
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 NORTHBOUND
Agency or Company	ATE	From/To	N/O BASELINE
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	CUMULATIVE

Project Description:

Input Data



☒ Class I highway ☒ Class II highway

☒ Class III highway

Terrain ☒ Level ☒ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF 0.88

No-passing zone 90%

% Trucks and Buses, P_T 4 %

% Recreational vehicles, P_R 2%

Access points mi 1/mi

Analysis direction vol., V_d	669veh/h
Opposing direction vol., V_o	510veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.1	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.996	0.996
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	763	582

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	2.1 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	47.2 mi/h
		Percent free flow speed, PFFS	79.1 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	760	580
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	65.4	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	28.7	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	81.7	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	E
Volume to capacity ratio, v/c	0.45
Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1693
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*79.1*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*760.2*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.24*
Bicycle level of service (Exhibit 15-4)	*C*

Notes

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

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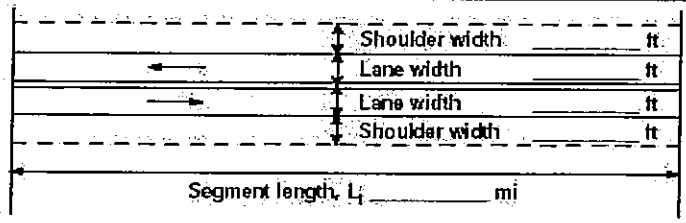
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 NORTHBOUND
Agency or Company	ATE	From/To	N/O BASELINE
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	CUMULATIVE+PROJECT (ALT 1)

Project Description:

Input Data



☒ Class I highway ☒ Class II highway

☒ Class III highway

Terrain ☒ Level ☒ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF 0.88

No-passing zone 90%

% Trucks and Buses, P_T 4 %

% Recreational vehicles, P_R 2%

Access points mi 1/mi

Analysis direction vol., V_d	674veh/h
Opposing direction vol., V_o	519veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.1	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.996	0.996
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	769	592

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	2.0 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	47.2 mi/h
		Percent free flow speed, PFFS	79.0 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	766	590
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	65.2	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	28.4	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	81.2	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	E
Volume to capacity ratio, v/c	0.45
Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1693
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*79.0*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*765.9*
Effective width, Ww (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.25*
Bicycle level of service (Exhibit 15-4)	*C*

Notes

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

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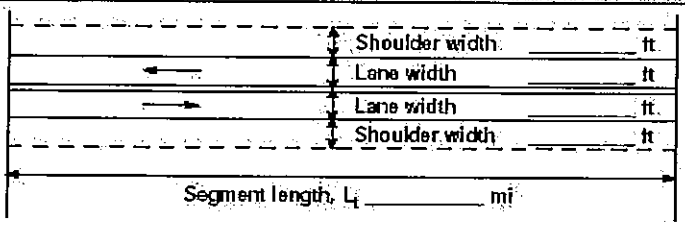
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 NORTHBOUND
Agency or Company	ATE	From/To	N/O BASELINE
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	CUMULATIVE+PROJECT (ALT 2)

Project Description:

Input Data



☒ Class I highway ☒ Class II highway
☒ Class III highway

Terrain ☒ Level ☒ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF 0.88
No-passing zone 90%
% Trucks and Buses, P_T 4 %
% Recreational vehicles, P_R 2%
Access points mi 1/mi

Analysis direction vol., V_d	678veh/h
Opposing direction vol., V_o	521veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.1	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.996	0.996
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	774	594

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	2.0 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	47.1 mi/h
		Percent free flow speed, PFFS	78.9 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	770	592
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	66.2	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	28.2	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	82.1	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	E
Volume to capacity ratio, v/c	0.46
Capacity, $C_{d,ATS}$ (Equation t5-12) pc/h	1693
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*78.9*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*770.5*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.25*
Bicycle level of service (Exhibit 15-4)	*C*

Notes

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

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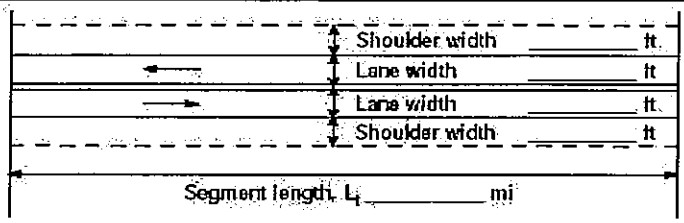
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 SOUTHBOUND
Agency or Company	ATE	From/To	N/O BASELINE
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	CUMULATIVE

Project Description:

Input Data



☒ Class I highway ☒ Class II highway
☒ Class III highway

Terrain ☒ Level ☒ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF 0.88
No-passing zone 90%
% Trucks and Buses, P_T 4 %
% Recreational vehicles, P_R 2%
Access points *mi* 1/mi

Analysis direction vol., V_d	510veh/h
Opposing direction vol., V_o	869veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.1	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.996	0.998
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	582	763

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS} (Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.5 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	47.9 mi/h
		Percent free flow speed, PFFS	80.1 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	580	760
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	59.4	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	28.7	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	71.8	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	D
Volume to capacity ratio, *v/c*	0.34
Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1693
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*80.1*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*579.5*
Effective width, Ww (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.11*
Bicycle level of service (Exhibit 15-4)	*C*

Notes

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

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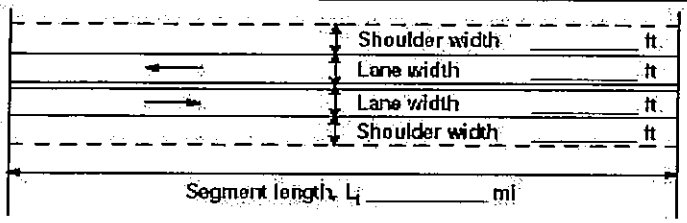
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 SOUTHBOUND
Agency or Company	ATE	From/To	N/O BASELINE
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	CUMULATIVE+PROJECT (ALT 1)

Project Description:

Input Data



☒ Class I highway ☐ Class II highway
☐ Class III highway

Terrain ☒ Level ☐ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF 0.88
No-passing zone 90%
% Trucks and Buses, P_T 4 %
% Recreational vehicles, P_R 2%
Access points mi 1/mi

Analysis direction vol., V_d	519veh/h
Opposing direction vol., V_o	674veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.1	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.996	0.996
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	592	769

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.4 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	47.7 mi/h
		Percent free flow speed, PFFS	79.9 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	590	766
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	59.7	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	28.4	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	72.1	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	D
Volume to capacity ratio, v/c	0.35
Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1693
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*79.9*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*589.8*
Effective width, Ww (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.12*
Bicycle level of service (Exhibit 15-4)	*C*

Notes

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

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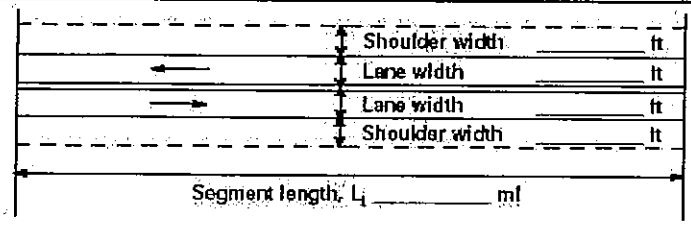
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 SOUTHBOUND
Agency or Company	ATE	From/To	N/O BASELINE
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	CUMULATIVE+PROJECT (ALT 2)

Project Description:

Input Data



☒ Class I highway ☒ Class II highway
☒ Class III highway

Terrain ☒ Level ☒ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF 0.88
No-passing zone 90%
% Trucks and Buses, P_T 4 %
% Recreational vehicles, P_R 2%
Access points mi 1/mi

Analysis direction vol., V_d	521veh/h
Opposing direction vol., V_o	678veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.1	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.996	0.996
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	594	774

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS} (Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.4 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	47.7 mi/h
		Percent free flow speed, PFFS	79.8 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	592	770
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	59.8	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	28.2	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	72.1	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	D
Volume to capacity ratio, v/c	0.35
Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1693
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*79.8*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*592.0*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.12*
Bicycle level of service (Exhibit 15-4)	*C*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit t5-14 if some trucks operate at crawl speeds on a specific downgrade.

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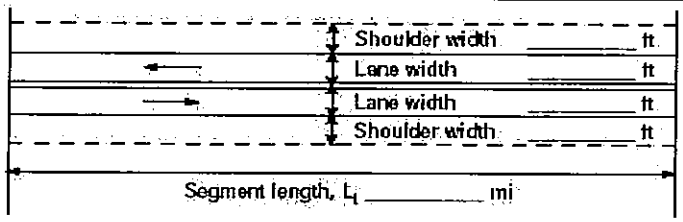
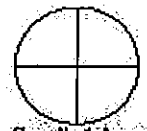
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 SOUTHBOUND
Agency or Company	ATE	From/To	S/O SR 246
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	EXISTING

Project Description:

Input Data





☒ Class I highway ☒ Class II highway
☒ Class III highway

Terrain ☒ Level ☒ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF 0.88
No-passing zone 90%
% Trucks and Buses, P_T 4 %
% Recreational vehicles, P_R 2%
Access points mi 1/mi

Analysis direction vol., V_d	412veh/h
Opposing direction vol., V_o	555veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.2	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.992	0.996
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	472	633

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.8 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	49.3 mi/h
		Percent free flow speed, PFFS	82.6 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	468	631
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	50.8	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	34.6	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	65.5	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	D
Volume to capacity ratio, v/c	0.28
Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1693
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*82.6*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*468.2*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.00*
Bicycle level of service (Exhibit 15-4)	*C*
Notes	

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

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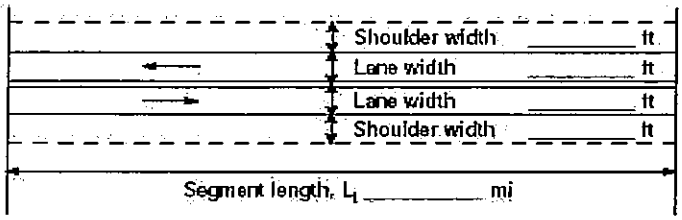
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 NORTHBOUND
Agency or Company	ATE	From/To	S/O SR 246
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	YEAR 2014

Project Description:

Input Data



☒ Class I highway ☒ Class II highway

☒ Class III highway

Terrain ☒ Level ☒ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF 0.88

No-passing zone 90%

% Trucks and Buses, P_T 4 %

% Recreational vehicles, P_R 2%

Access points mi 1/mi

Analysis direction vol., V_d	594veh/h
Opposing direction vol., V_o	460veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.1	1.2
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.996	0.992
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	678	527

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	2.4 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	48.0 mi/h
		Percent free flow speed, PFFS	80.3 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	675	523
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	61.6	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	32.4	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	79.9	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	D
Volume to capacity ratio, v/c	0.40
Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1686
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*80.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*675.0*
Effective width, Ww (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.18*
Bicycle level of service (Exhibit 15-4)	*C*
Notes	

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

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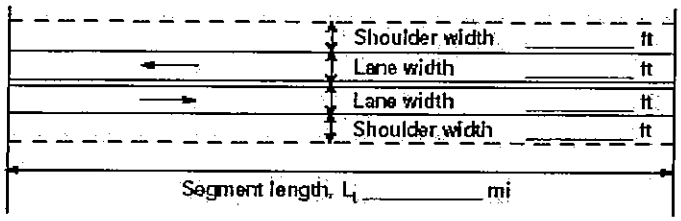
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 SOUTHBOUND
Agency or Company	ATE	From/To	S/O SR 246
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	YEAR 2014

Project Description:

Input Data



☒ Class I highway ☒ Class II highway
☒ Class III highway

Terrain ☒ Level ☒ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF 0.88
No-passing zone 90%
% Trucks and Buses , P_T 4 %
% Recreational vehicles, P_R 2%
Access points *mi* 1/mi

Analysis direction vol., V_d	460veh/h
Opposing direction vol., V_o	594veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.2	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 15-t1 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.992	0.996
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	527	676

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit t5-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.7 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	48.7 mi/h
		Percent free flow speed, PFFS	81.5 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	523	675
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	54.4	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	32.4	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	68.5	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	D
Volume to capacity ratio, *v/c*	0.31
Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1693
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*81.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*522.7*
Effective width, Ww (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.05*
Bicycle level of service (Exhibit 15-4)	*C*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level1errain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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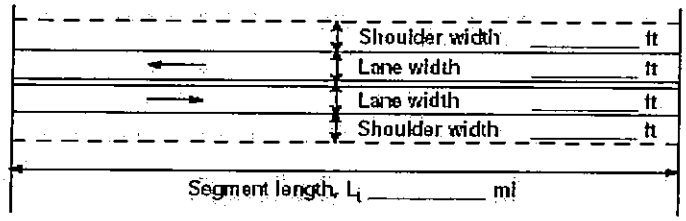
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 NORTHBOUND
Agency or Company	ATE	From/To	S/O SR 246
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	YEAR 2014 + PROJECT (ALT 1)

Project Description:

Input Data



☒ Class I highway ☒ Class II highway
☒ Class III highway

Terrain ☒ Level ☒ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF 0.88
No-passing zone 90%
% Trucks and Buses, P_T 4 %
% Recreational vehicles, P_R 2%
Access points *mi* 1/mi

Analysis direction vol., V_d	603veh/h
Opposing direction vol., V_o	465veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.1	1.2
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.998	0.992
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	688	533

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit t5-15)	2.4 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	47.9 mi/h
		Percent free flow speed, PFFS	80.1 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit t5-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit t5-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	685	528
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	61.8	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	32.0	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	79.9	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	D
Volume to capacity ratio, *v/c*	0.41
Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1686
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*80.1*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*685.2*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.19*
Bicycle level of service (Exhibit 15-4)	*C*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit t5-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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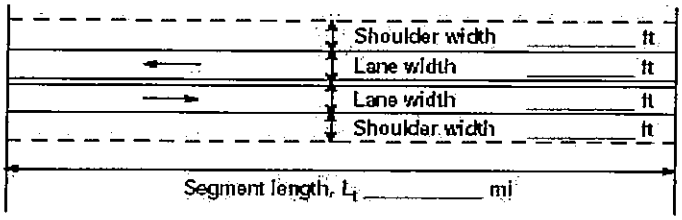
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 SOUTHBOUND
Agency or Company	ATE	From/To	S/O SR 246
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	YEAR 2014 + PROJECT (ALT 1)

Project Description:

Input Data



☒ Class I highway ☒ Class II highway

☒ Class III highway

Terrain ☒ Level ☒ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF 0.88

No-passing zone 90%

% Trucks and Buses, P_T 4 %

% Recreational vehicles, P_R 2%

Access points mi 1/mi

Analysis direction vol., V_d	465veh/h
Opposing direction vol., V_o	603veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.2	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.992	0.996
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	533	688

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS} (Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.7 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.6 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	48.6 mi/h
		Percent free flow speed, PFFS	81.3 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	528	685
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	55.2	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	32.0	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	69.1	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	D
Volume to capacity ratio, v/c	0.31
Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1693
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*81.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*528.4*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.06*
Bicycle level of service (Exhibit 15-4)	*C*

Notes

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

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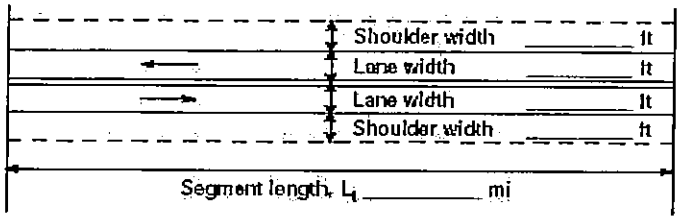
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 NORTHBOUND
Agency or Company	ATE	From/To	S/O SR 246
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	YEAR 2014 + PROJECT (ALT 2)

Project Description:

Input Data



☒ Class I highway ☒ Class II highway
☒ Class III highway

Terrain ☒ Level ☒ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF 0.88
No-passing zone 90%
% Trucks and Buses, P_T 4 %
% Recreational vehicles, P_R 2%
Access points mi 1/mi

Analysis direction vol., V_d	605veh/h
Opposing direction vol., V_o	469veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.1	1.2
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.996	0.992
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	690	537

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	2.4 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	47.9 mi/h
		Percent free flow speed, PFFS	80.1 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	688	533
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	61.7	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	31.8	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	79.6	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	D
Volume to capacity ratio, v/c	0.41
Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1686
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*80.1*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*687.5*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.19*
Bicycle level of service (Exhibit 15-4)	*C*

Notes

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

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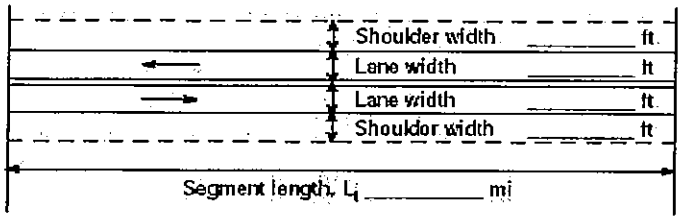
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 SOUTHBOUND
Agency or Company	ATE	From/To	S/O SR 246
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	YEAR 2014 + PROJECT (ALT 2)

Project Description:

Input Data



☒ Class I highway ☐ Class II highway

☐ Class III highway

Terrain ☒ Level ☐ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF 0.88

No-passing zone 90%

% Trucks and Buses, P_T 4 %

% Recreational vehicles, P_R 2%

Access points mi 1/mi

Analysis direction vol., V_d	469veh/h
Opposing direction vol., V_o	605veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.2	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.992	0.996
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	537	690

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS} (Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.7 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	48.6 mi/h
		Percent free flow speed, PFFS	81.3 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	533	688
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	55.5	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	31.8	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	69.4	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	D
Volume to capacity ratio, v/c	0.32
Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1693
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*81.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*533.0*
Effective width, Ww (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.06*
Bicycle level of service (Exhibit 15-4)	*C*

Notes

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

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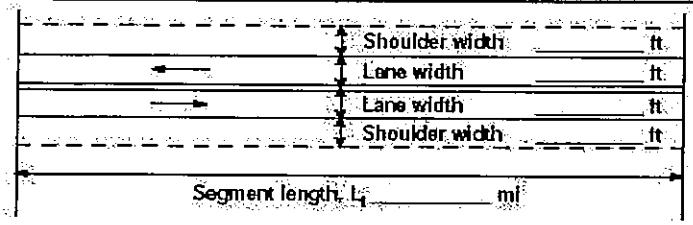
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 NORTHBOUND
Agency or Company	ATE	From/To	S/O SR 246
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	CUMULATIVE

Project Description:

Input Data



☒ Class I highway ☐ Class II highway

☐ Class III highway

Terrain ☒ Level ☐ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF 0.88

No-passing zone 90%

% Trucks and Buses, P_T 4 %

% Recreational vehicles, P_R 2%

Access points ml 1/ml

Analysis direction vol., V_d	792veh/h
Opposing direction vol., V_o	439veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.0	1.2
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	0.992
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	900	503

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	2.6 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	46.3 mi/h
		Percent free flow speed, PFFS	77.4 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	900	499
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	70.1	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	24.7	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	86.0	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	E
Volume to capacity ratio, v/c	0.53
Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1686
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*77.4*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*900.0*
Effective width, Ww (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.33*
Bicycle level of service (Exhibit 15-4)	*C*
Notes:	

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

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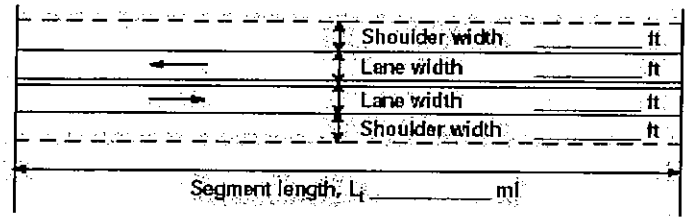
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 NORTHBOUND
Agency or Company	ATE	From/To	S/O SR 246
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	CUMULATIVE + PROJECT (ALT 1)

Project Description:

Input Data



☒ Class I highway ☒ Class II highway
☒ Class III highway

Terrain ☒ Level ☒ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF 0.88
No-passing zone 90%
% Trucks and Buses, P_T 4 %
% Recreational vehicles, P_R 2%
Access points mi 1/mi

Analysis direction vol., V_d	801veh/h
Opposing direction vol., V_o	444veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.0	1.2
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	0.992
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	910	509

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS} (Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	2.5 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	46.2 mi/h
		Percent free flow speed, PFFS	77.3 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	910	505
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	71.2	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	24.5	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	87.0	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	E
Volume to capacity ratio, v/c	0.54
Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1686
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*77.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*910.2*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.34*
Bicycle level of service (Exhibit 15-4)	*C*

Notes

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

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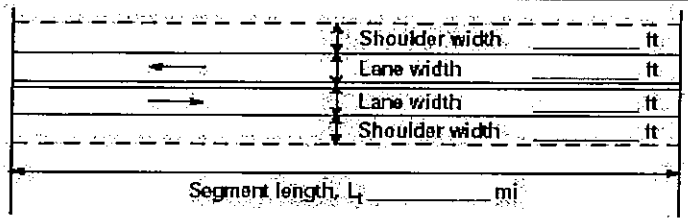
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 NORTHBOUND
Agency or Company	ATE	From/To	S/O SR 246
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	CUMULATIVE + PROJECT (ALT 2)

Project Description:

Input Data



☒ Class I highway ☒ Class II highway
☒ Class III highway

Terrain ☒ Level ☒ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF 0.88
No-passing zone 90%
% Trucks and Buses, P_T 4 %
% Recreational vehicles, P_R 2%
Access points mi 1/mi

Analysis direction vol., V_d	803veh/h
Opposing direction vol., V_o	448veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.0	1.2
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	0.992
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	913	513

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	2.5 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	46.2 mi/h
		Percent free flow speed, PFFS	77.3 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	913	509
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	71.1	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	24.5	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	86.8	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	E
Volume to capacity ratio, v/c	0.54
Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1686
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*77.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*912.5*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.34*
Bicycle level of service (Exhibit 15-4)	*C*

Notes

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

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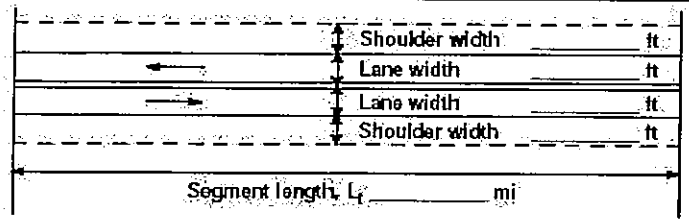
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 SOUTHBOUND
Agency or Company	ATE	From/To	S/O SR 246
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	CUMULATIVE

Project Description:

Input Data



☒ Class I highway ☒ Class II highway

☒ Class III highway

Terrain ☒ Level ☒ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF 0.88

No-passing zone 90%

% Trucks and Buses, P_T 4 %

% Recreational vehicles, P_R 2%

Access points mi 1/mi

Analysis direction vol., V_d	439veh/h
Opposing direction vol., V_o	792veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length mi	1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.2	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.992	1.000
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	503	900

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.2 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	47.6 mi/h
		Percent free flow speed, PFFS	79.7 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	499	900
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	56.0	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	24.7	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	64.8	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	C
Volume to capacity ratio, v/c	0.30
Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1700
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*79.7*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*498.9*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.03*
Bicycle level of service (Exhibit 15-4)	*C*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level1errain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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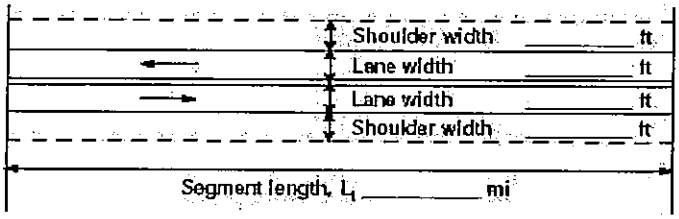
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 SOUTHBOUND
Agency or Company	ATE	From/To	S/O SR 246
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	CUMULATIVE+PROJECT (ALT 1)

Project Description:

Input Data



☒ Class I highway ☒ Class II highway
☒ Class III highway

Terrain ☒ Level ☒ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF 0.88
No-passing zone 90%
% Trucks and Buses, P_T 4 %
% Recreational vehicles, P_R 2%
Access points *ml* 1/ml

Analysis direction vol., V_d	444veh/h
Opposing direction vol., V_o	801veh/h
Shoulder width ft	6.0
Lane Width ft	12.0
Segment Length ml	1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.2	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.992	1.000
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	509	910

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.2 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.6 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	47.5 mi/h
		Percent free flow speed, PFFS	79.5 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	505	910
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	56.3	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	24.5	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	65.0	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	C
Volume to capacity ratio, *v/c*	0.30
Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1700
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*79.5*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*504.5*
Effective width, Wv (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.04*
Bicycle level of service (Exhibit 15-4)	*C*

Notes

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

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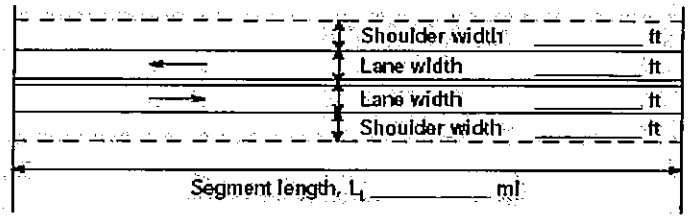
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	DLD	Highway / Direction of Travel	SR 154 SOUTHBOUND
Agency or Company	ATE	From/To	S/O SR 246
Date Performed	4/5/2012	Jurisdiction	CALTRANS
Analysis Time Period	P.M. PEAK	Analysis Year	CUMULATIVE+PROJECT (ALT 2)

Project Description:

Input Data



☒ Class I highway ☒ Class II highway
☒ Class III highway

Terrain ☒ Level ☒ Rolling
Grade Length mi Up/down
Peak-hour factor, PHF 0.88
No-passing zone 90%
% Trucks and Buses, P_T 4 %
% Recreational vehicles, P_R 2%
Access points mi 1/mi

Analysis direction vol., V_d 448veh/h
Opposing direction vol., V_o 803veh/h
Shoulder width ft 6.0
Lane Width ft 12.0
Segment Length mi 1.0

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	1.2	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	0.992	1.000
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	1.00	1.00
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	513	913

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	60.0 mi/h
Total demand flow rate, both directions, v		Adj. for lane and shoulder width,[4] f_{LS} (Exhibit 15-7)	0.0 mi/h
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	0.3 mi/h
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	1.2 mi/h	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	59.8 mi/h
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	47.5 mi/h
		Percent free flow speed, PFFS	79.4 %

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-18 or 15-19)	1.0	1.0
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	1.0	1.0
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	1.000	1.000
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	1.00	1.00
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	509	913
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	56.6	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	24.5	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	85.4	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	D
Volume to capacity ratio, v/c	0.30
Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	1700
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	1700

Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*79.4*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*509.1*
Effective width, Ww (Eq. 15-29) ft	*24.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.04*
Bicycle level of service (Exhibit 15-4)	*C*

Notes

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

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INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS

Reference 1	SR 154/U.S. 101 SB
Reference 2	SR 154/U.S. 101 NB
Reference 3	SR 154/Grand Avenue
Reference 4	SR 154/Roblar Avenue
Reference 5	SR 154/Edison Street
Reference 6	SR 246/Alisal Road
Reference 7	SR 246/Alamo Pintado Road
Reference 8	SR 246/Refugio Road
Reference 9	SR 246/Edison Street
Reference 10	SR 246/SR 154

ALL-WAY STOP CONTROL ANALYSIS

General Information

Analyst	MMF
Agency/Co.	ATE
Date Performed	3/21/2012
Analysis Time Period	A.M. PEAK HOUR

Site Information

Intersection	01_EX_AM
Jurisdiction	SANTA BARBARA COUNTY
Analysis Year	EXISTING

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154

North/South Street: U.S. 101 SB RAMPS

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	67	0	0
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	408	2	0
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration			L				LT	
PHF			1.00				1.00	
Flow Rate (veh/h)			67				410	
% Heavy Vehicles			4				4	
No. Lanes	0		1		0		1	
Geometry Group			1				1	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns			1.0				1.0	
Prop. Right-Turns			0.0				0.0	
Prop. Heavy Vehicle			0.0				0.0	
hLT-adj			0.2	0.2			0.2	0.2
hRT-adj			-0.6	-0.6			-0.6	-0.6
hHV-adj			1.7	1.7			1.7	1.7
hadj, computed			0.3				0.3	

Departure Headway and Service Time

hd, initial value (s)			3.20				3.20	
x, initial			0.06				0.36	
hd, final value (s)			5.14				4.35	
x, final value			0.10				0.50	
Move-up time, m (s)	2.0				2.0			
Service Time, t_s (s)			3.1				2.4	

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)			317				660	
Delay (s/veh)			8.68				11.62	
LOS			A				B	
Approach: Delay (s/veh)	8.68				11.62			
LOS	A				B			
Intersection Delay (s/veh)	11.20							
Intersection LOS	B							

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ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	MMF	Intersection	01_2014_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	NEAR-TERM (YEAR 2014)
Analysis Time Period	A.M. PEAK HOUR		

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154 | North/South Street: U.S. 101 SB RAMPS

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	69	0	0
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	424	2	0
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration			L				LT	
PHF			1.00				1.00	
Flow Rate (veh/h)			69				426	
% Heavy Vehicles			4				4	
No. Lanes	0		1		0		1	
Geometry Group			1				1	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns			1.0				1.0	
Prop. Right-Turns			0.0				0.0	
Prop. Heavy Vehicle			0.0				0.0	
hLT-adj			0.2	0.2			0.2	0.2
hRT-adj			-0.6	-0.6			-0.6	-0.6
hHV-adj			1.7	1.7			1.7	1.7
hadj, computed			0.3				0.3	

Departure Headway and Service Time

hd, initial value (s)			3.20				3.20	
x, initial			0.06				0.38	
hd, final value (s)			5.18				4.36	
x, final value			0.10				0.52	
Move-up time, m (s)	2.0				2.0			
Service Time, t_s (s)			3.2				2.4	

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)			319				676	
Delay (s/veh)			8.75				11.99	
LOS			A				B	
Approach: Delay (s/veh)			8.75				11.99	
LOS			A				B	
Intersection Delay (s/veh)	11.53							
Intersection LOS	B							

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ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	MMF	Intersection	01_2014+ALT 1_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	2014+PROJECT (ALT. 1)
Analysis Time Period	A.M. PEAK HOUR		

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154 | North/South Street: U.S. 101 SB RAMPS

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	69	0	0
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	427	2	0
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration			L				LT	
PHF			1.00				1.00	
Flow Rate (veh/h)			69				429	
% Heavy Vehicles			4				4	
No. Lanes	0		1		0		1	
Geometry Group			1				1	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns			1.0				1.0	
Prop. Right-Turns			0.0				0.0	
Prop. Heavy Vehicle			0.0				0.0	
hLT-adj			0.2	0.2			0.2	0.2
hRT-adj			-0.6	-0.6			-0.6	-0.6
hHV-adj			1.7	1.7			1.7	1.7
hadj, computed			0.3				0.3	

Departure Headway and Service Time

hd, initial value (s)			3.20				3.20	
x, initial			0.06				0.38	
hd, final value (s)			5.18				4.36	
x, final value			0.10				0.52	
Move-up time, m (s)			2.0				2.0	
Service Time, t_s (s)			3.2				2.4	

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)			319				679	
Delay (s/veh)			8.75				12.05	
LOS			A				B	
Approach: Delay (s/veh)			8.75				12.05	
LOS			A				B	
Intersection Delay (s/veh)	11.60							
Intersection LOS	B							

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ALL-WAY STOP CONTROL ANALYSIS

General Information

Analyst	MMF
Agency/Co.	ATE
Date Performed	3/21/2012
Analysis Time Period	A.M. PEAK HOUR

Site Information

Intersection	01_2014+ALT 2_AM
Jurisdiction	SANTA BARBARA COUNTY
Analysis Year	2014+PROJECT (ALT. 2)

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154 | North/South Street: U.S. 101 SB RAMPS

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	69	0	0
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	431	2	0
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration			L				LT	
PHF			1.00				1.00	
Flow Rate (veh/h)			69				433	
% Heavy Vehicles			4				4	
No. Lanes	0		1		0		1	
Geometry Group			1				1	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns			1.0				1.0	
Prop. Right-Turns			0.0				0.0	
Prop. Heavy Vehicle			0.0				0.0	
hLT-adj			0.2	0.2			0.2	0.2
hRT-adj			-0.6	-0.6			-0.6	-0.6
hHV-adj			1.7	1.7			1.7	1.7
hadj, computed			0.3				0.3	

Departure Headway and Service Time

hd, initial value (s)			3.20				3.20	
x, initial			0.06				0.38	
hd, final value (s)			5.19				4.36	
x, final value			0.10				0.52	
Move-up time, m (s)	2.0				2.0			
Service Time, t_s (s)			3.2				2.4	

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)			319				683	
Delay (s/veh)			8.77				12.15	
LOS			A				B	
Approach: Delay (s/veh)			8.77				12.15	
LOS			A				B	
Intersection Delay (s/veh)	11.68							
Intersection LOS	B							

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ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	MMF	Intersection	01_CU_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE (YEAR 2030)
Analysis Time Period	A.M. PEAK HOUR		

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154 | North/South Street: U.S. 101 SB RAMPS

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	67	2	0
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	505	2	2
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration			L				LTR	
PHF			1.00				1.00	
Flow Rate (veh/h)			67				509	
% Heavy Vehicles			4				4	
No. Lanes	0		1		0		1	
Geometry Group			1				1	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns			1.0				1.0	
Prop. Right-Turns			0.0				0.0	
Prop. Heavy Vehicle			0.0				0.0	
hLT-adj			0.2	0.2			0.2	0.2
hRT-adj			-0.6	-0.6			-0.6	-0.6
hHV-adj			1.7	1.7			1.7	1.7
hadj, computed			0.3				0.3	

Departure Headway and Service Time

hd, Initial value (s)			3.20				3.20	
x, Initial			0.06				0.45	
hd, final value (s)			5.37				4.36	
x, final value			0.10				0.62	
Move-up time, m (s)			2.0				2.0	
Service Time, t_s (s)			3.4				2.4	

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)			317				759	
Delay (s/veh)			8.97				14.29	
LOS			A				B	
Approach: Delay (s/veh)			8.97				14.29	
LOS			A				B	
Intersection Delay (s/veh)	13.67							
Intersection LOS	B							

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ALL-WAY STOP CONTROL ANALYSIS

General Information

Analyst	MMF
Agency/Co.	ATE
Date Performed	3/21/2012
Analysis Time Period	A.M. PEAK HOUR

Site Information

Intersection	01_CU+PR (ALT. 1)_AM
Jurisdiction	SANTA BARBARA COUNTY
Analysis Year	CUMULATIVE+PR (ALT.1)

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154 | North/South Street: U.S. 101 SB RAMPS

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	67	2	0
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	508	2	2
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration			L				LTR	
PHF			1.00				1.00	
Flow Rate (veh/h)			67				512	
% Heavy Vehicles			4				4	
No. Lanes	0		1		0		1	
Geometry Group			1				1	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns			1.0				1.0	
Prop. Right-Turns			0.0				0.0	
Prop. Heavy Vehicle			0.0				0.0	
hLT-adj			0.2	0.2			0.2	0.2
hRT-adj			-0.6	-0.6			-0.6	-0.6
hHV-adj			1.7	1.7			1.7	1.7
hadj, computed			0.3				0.3	

Departure Headway and Service Time

hd, initial value (s)			3.20				3.20	
x, initial			0.06				0.46	
hd, final value (s)			5.38				4.36	
x, final value			0.10				0.62	
Move-up time, m (s)	2.0				2.0			
Service Time, t_s (s)			3.4				2.4	

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)			317				762	
Delay (s/veh)			8.98				14.40	
LOS			A				B	
Approach: Delay (s/veh)	8.98				14.40			
LOS	A				B			
Intersection Delay (s/veh)	13.77							
Intersection LOS	B							

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ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	MMF	Intersection	01_CU+PR (ALT. 2)_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE+PR (ALT. 2)
Analysis Time Period	A.M. PEAK HOUR		

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154 | North/South Street: U.S. 101 SB RAMPS

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	67	2	0
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	512	2	2
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration			L				LTR	
PHF			1.00				1.00	
Flow Rate (veh/h)			67				516	
% Heavy Vehicles			4				4	
No. Lanes	0		1		0		1	
Geometry Group			1				1	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns			1.0				1.0	
Prop. Right-Turns			0.0				0.0	
Prop. Heavy Vehicle			0.0				0.0	
hLT-adj			0.2	0.2			0.2	0.2
hRT-adj			-0.6	-0.6			-0.6	-0.6
hHV-adj			1.7	1.7			1.7	1.7
hadj, computed			0.3				0.3	

Departure Headway and Service Time

hd, initial value (s)			3.20				3.20	
x, initial			0.06				0.46	
hd, final value (s)			5.39				4.36	
x, final value			0.10				0.62	
Move-up time, m (s)	2.0				2.0			
Service Time, t_s (s)			3.4				2.4	

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)			317				766	
Delay (s/veh)			8.99				14.55	
LOS			A				B	
Approach: Delay (s/veh)			8.99				14.55	
LOS			A				B	
Intersection Delay (s/veh)	13.91							
Intersection LOS	B							

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ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	MMF	Intersection	01_EX_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	EXISTING
Analysis Time Period	P.M. PEAK HOUR		

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154 | North/South Street: U.S. 101 SB RAMPS

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	146	0	0
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	304	1	0
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration			L				LT	
PHF			1.00				1.00	
Flow Rate (veh/h)			146				305	
% Heavy Vehicles			4				4	
No. Lanes	0		1		0		1	
Geometry Group			1				1	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns			1.0				1.0	
Prop. Right-Turns			0.0				0.0	
Prop. Heavy Vehicle			0.0				0.0	
hLT-adj			0.2	0.2			0.2	0.2
hRT-adj			-0.6	-0.6			-0.6	-0.6
hHV-adj			1.7	1.7			1.7	1.7
hadj, computed			0.3				0.3	

Departure Headway and Service Time

hd, initial value (s)			3.20				3.20	
x, initial			0.13				0.27	
hd, final value (s)			4.92				4.56	
x, final value			0.20				0.39	
Move-up time, m (s)			2.0				2.0	
Service Time, t_s (s)			2.9				2.6	

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)			396				555	
Delay (s/veh)			9.15				10.42	
LOS			A				B	
Approach: Delay (s/veh)			9.15				10.42	
LOS			A				B	
Intersection Delay (s/veh)	10.01							
Intersection LOS	B							

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ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	MMF	Intersection	01_2014_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	NEAR-TERM (YEAR 2014)
Analysis Time Period	P.M. PEAK HOUR		

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154 | North/South Street: U.S. 101 SB RAMPS

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	150	0	0
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	329	1	0
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration			L				LT	
PHF			1.00				1.00	
Flow Rate (veh/h)			150				330	
% Heavy Vehicles			4				4	
No. Lanes	0		1		0		1	
Geometry Group			1				1	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns			1.0				1.0	
Prop. Right-Turns			0.0				0.0	
Prop. Heavy Vehicle			0.0				0.0	
hLT-adj			0.2	0.2			0.2	0.2
hRT-adj			-0.6	-0.6			-0.6	-0.6
hHV-adj			1.7	1.7			1.7	1.7
hadj, computed			0.3				0.3	

Departure Headway and Service Time

hd, initial value (s)			3.20				3.20	
x, initial			0.13				0.29	
hd, final value (s)			4.99				4.57	
x, final value			0.21				0.42	
Move-up time, m (s)	2.0				2.0			
Service Time, t_s (s)			3.0				2.6	

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)			400				580	
Delay (s/veh)			9.29				10.86	
LOS			A				B	
Approach: Delay (s/veh)			9.29				10.86	
LOS			A				B	
Intersection Delay (s/veh)	10.37							
Intersection LOS	B							

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ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	MMF	Intersection	01_2014+ALT. 1_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	2014+PROJECT (ALT. 1)
Analysis Time Period	P.M. PEAK HOUR		

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154 | North/South Street: U.S. 101 SB RAMPS

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	150	0	0
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	338	1	0
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	Lt	L2	Lt	L2	L1	L2	Lt	L2
Configuration			L				LT	
PHF			1.00				1.00	
Flow Rate (veh/h)			150				339	
% Heavy Vehicles			4				4	
No. Lanes	0		1		0		1	
Geometry Group			1				1	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns			1.0				1.0	
Prop. Right-Turns			0.0				0.0	
Prop. Heavy Vehicle			0.0				0.0	
hLT-adj			0.2	0.2			0.2	0.2
hRT-adj			-0.6	-0.6			-0.6	-0.6
hHV-adj			1.7	1.7			1.7	1.7
hedj, computed			0.3				0.3	

Departure Headway and Service Time

hd, initial value (s)			3.20				3.20	
x, initial			0.13				0.30	
hd, final value (s)			5.01				4.57	
x, final value			0.21				0.43	
Move-up time, m (s)			2.0				2.0	
Service Time, t_s (s)			3.0				2.6	

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	Lt	L2	L1	L2
Capacity (veh/h)			400				589	
Delay (s/veh)			9.33				11.03	
LOS			A				B	
Approach: Delay (s/veh)			9.33				11.03	
LOS			A				B	
Intersection Delay (s/veh)	10.50							
Intersection LOS	B							

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ALL-WAY STOP CONTROL ANALYSIS

General Information

Analyst	MMF
Agency/Co.	ATE
Date Performed	3/21/2012
Analysis Time Period	P.M. PEAK HOUR

Site Information

Intersection	01_2014+ALT. 2_PM
Jurisdiction	SANTA BARBARA COUNTY
Analysis Year	2014+PROJECT (ALT. 2)

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154 | North/South Street: U.S. 101 SB RAMPS

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	150	0	0
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	340	1	0
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	Lt	L2
Configuration			L				LT	
PHF			1.00				1.00	
Flow Rate (veh/h)			150				341	
% Heavy Vehicles			4				4	
No. Lanes	0		1		0		1	
Geometry Group			1				1	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns			1.0				1.0	
Prop. Right-Turns			0.0				0.0	
Prop. Heavy Vehicle			0.0				0.0	
hLT-adj			0.2	0.2			0.2	0.2
hRT-adj			-0.6	-0.6			-0.6	-0.6
hHV-adj			1.7	1.7			1.7	1.7
hadj, computed			0.3				0.3	

Departure Headway and Service Time

hd, initial value (s)			3.20				3.20	
x, initial			0.13				0.30	
hd, final value (s)			5.01				4.58	
x, final value			0.21				0.43	
Move-up time, m (s)	2.0				2.0			
Service Time, t_s (s)			3.0				2.6	

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	Lt	L2	L1	L2	Lt	L2
Capacity (veh/h)			400				591	
Delay (s/veh)			9.34				11.06	
LOS			A				B	
Approach: Delay (s/veh)			9.34				11.06	
LOS			A				B	
Intersection Delay (s/veh)	10.54							
Intersection LOS	B							

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ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	MMF	Intersection	01_CU_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE (YEAR 2030)
Analysis Time Period	P.M. PEAK HOUR		

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154 | North/South Street: U.S. 101 SB RAMPS

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	2	136	0	0
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	389	2	0
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		L				LT	
PHF	1.00		1.00				1.00	
Flow Rate (veh/h)	2		136				391	
% Heavy Vehicles	0		4				4	
No. Lanes	1		1		0		1	
Geometry Group	1		1				1	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	0.0		1.0				1.0	
Prop. Right-Turns	1.0		0.0				0.0	
Prop. Heavy Vehicle	0.0		0.0				0.0	
hLT-adj	0.2	0.2	0.2	0.2			0.2	0.2
hRT-adj	-0.6	-0.6	-0.6	-0.6			-0.6	-0.6
hHV-adj	1.7	1.7	1.7	1.7			1.7	1.7
hadj, computed	-0.6		0.3				0.3	

Departure Headway and Service Time

hd, initial value (s)	3.20		3.20				3.20	
x, initial	0.00		0.12				0.35	
hd, final value (s)	4.47		5.14				4.54	
x, final value	0.00		0.19				0.49	
Move-up time, m (s)	2.0		2.0				2.0	
Service Time, t_s (s)	2.5		3.1				2.5	

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	Lt	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	252		386				641	
Delay (s/veh)	7.48		9.38				11.95	
LOS	A		A				B	
Approach: Delay (s/veh)	7.48		9.38				11.95	
LOS	A		A				B	
Intersection Delay (s/veh)	11.27							
Intersection LOS	B							

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ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	MMF	Intersection	01_CU+PR (ALT. 1)_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE+PR (ALT.1)
Analysis Time Period	P.M. PEAK HOUR		

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154 | North/South Street: U.S. 101 SB RAMPS

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	2	136	0	0
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	398	2	0
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		L				LT	
PHF	1.00		1.00				1.00	
Flow Rate (veh/h)	2		136				400	
% Heavy Vehicles	0		4				4	
No. Lanes	1		1		0		1	
Geometry Group	1		1				1	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	0.0		1.0				1.0	
Prop. Right-Turns	1.0		0.0				0.0	
Prop. Heavy Vehicle	0.0		0.0				0.0	
hLT-adj	0.2	0.2	0.2	0.2			0.2	0.2
hRT-adj	-0.6	-0.6	-0.6	-0.6			-0.6	-0.6
hHV-adj	1.7	1.7	1.7	1.7			1.7	1.7
hadj, computed	-0.6		0.3				0.3	

Departure Headway and Service Time

hd, Initial value (s)	3.20		3.20				3.20	
x, Initial	0.00		0.12				0.36	
hd, final value (s)	4.49		5.17				4.55	
x, final value	0.00		0.20				0.51	
Move-up time, m (s)	2.0		2.0				2.0	
Service Time, t_s (s)	2.5		3.2				2.5	

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	252		386				650	
Delay (s/veh)	7.50		9.42				12.16	
LOS	A		A				B	
Approach: Delay (s/veh)	7.50		9.42				12.16	
LOS	A		A				B	
Intersection Delay (s/veh)	11.45							
Intersection LOS	B							

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ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	MMF	Intersection	01_CU+PR (ALT. 2)_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE+PR (ALT. 2)
Analysis Time Period	P.M. PEAK HOUR		

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154 | North/South Street: U.S. 101 SB RAMPS

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	2	136	0	0
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	0	0	0	400	2	0
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	Lt	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		L				LT	
PHF	1.00		1.00				1.00	
Flow Rate (veh/h)	2		136				402	
% Heavy Vehicles	0		4				4	
No. Lanes	1		1		0		1	
Geometry Group	1		1				1	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	0.0		1.0				1.0	
Prop. Right-Turns	1.0		0.0				0.0	
Prop. Heavy Vehicle	0.0		0.0				0.0	
hLT-adj	0.2	0.2	0.2	0.2			0.2	0.2
hRT-adj	-0.6	-0.6	-0.6	-0.6			-0.6	-0.6
hHV-adj	1.7	1.7	1.7	1.7			1.7	1.7
hadj, computed	-0.6		0.3				0.3	

Departure Headway and Service Time

hd, initial value (s)	3.20		3.20				3.20	
x, initial	0.00		0.12				0.36	
hd, final value (s)	4.50		5.17				4.55	
x, final value	0.00		0.20				0.51	
Move-up time, m (s)	2.0		2.0				2.0	
Service Time, t_s (s)	2.5		3.2				2.5	

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	252		386				652	
Delay (s/veh)	7.51		9.42				12.21	
LOS	A		A				B	
Approach: Delay (s/veh)	7.51		9.42				12.21	
LOS	A		A				B	
Intersection Delay (s/veh)	11.49							
Intersection LOS	B							

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	02_EX_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	EXISTING
Analysis Time Period	A.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154 | North/South Street: U.S. 101 NB RAMPS

Intersection Orientation: East-West | Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	1	405			66	192
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	1	405	0	0	66	192
Percent Heavy Vehicles	4	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	105			
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	105	0	0	0
Percent Heavy Vehicles	4	4	4	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LTR				
v (veh/h)	1			105				
C (m) (veh/h)	1295			641				
v/c	0.00			0.16				
95% queue length	0.00			0.59				
Control Delay (s/veh)	7.8			11.7				
LOS	A			B				
Approach Delay (s/veh)	--	--	11.7					
Approach LOS	--	--	B					

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AWD = 11.7 sec. / LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	02_2014_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	NEAR-TERM (YEAR 2014)
Analysis Time Period	A.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154	North/South Street: U.S. 101 NB RAMPS
Intersection Orientation: East-West	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	1	421			68	210
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	1	421	0	0	68	210
Percent Heavy Vehicles	4	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	107			
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	107	0	0	0
Percent Heavy Vehicles	4	4	4	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LTR				
v (veh/h)	1			107				
C (m) (veh/h)	1273			628				
v/c	0.00			0.17				
95% queue length	0.00			0.61				
Control Delay (s/veh)	7.8			11.9				
LOS	A			B				
Approach Delay (s/veh)	--	--	11.9					
Approach LOS	--	--	B					

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AWD = 11.9 sec. / LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	02_2014+ALT. 1_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	2014+PROJECT (ALT. 1)
Analysis Time Period	A.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154 | North/South Street: U.S. 101 NB RAMPS

Intersection Orientation: East-West | Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	1	424			68	218
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	1	424	0	0	68	218
Percent Heavy Vehicles	4	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	107			
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	107	0	0	0
Percent Heavy Vehicles	4	4	4	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LTR				
v (veh/h)	1			107				
C (m) (veh/h)	1265			626				
v/c	0.00			0.17				
95% queue length	0.00			0.62				
Control Delay (s/veh)	7.8			11.9				
LOS	A			B				
Approach Delay (s/veh)	--	--	11.9					
Approach LOS	--	--	B					

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AWD = 11.9 sec. / LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	02_2014+ALT. 2_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	2014+PROJECT (ALT. 2)
Analysis Time Period	A.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154 | North/South Street: U.S. 101 NB RAMPS

Intersection Orientation: East-West | Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	1	428			68	221
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	1	428	0	0	68	221
Percent Heavy Vehicles	4	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	107			
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	107	0	0	0
Percent Heavy Vehicles	4	4	4	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LTR				
v (veh/h)	1			107				
C (m) (veh/h)	1262			623				
v/c	0.00			0.17				
95% queue length	0.00			0.62				
Control Delay (s/veh)	7.9			12.0				
LOS	A			B				
Approach Delay (s/veh)	--	--	12.0					
Approach LOS	--	--	B					

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AWD = 12.0 sec. / LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*MMF*	Intersection	*02_CU_AM*
Agency/Co.	*ATE*	Jurisdiction	*SANTA BARBARA COUNTY*
Date Performed	*3/21/2012*	Analysis Year	*CUMULATIVE (YEAR 2030)*
Analysis Time Period	*A.M. PEAK HOUR*		

Project Description *#12018 - CHUMASH CAMP 4 PROJECT*

East/West Street: *SR 154* | North/South Street: *U.S. 101 NB RAMPS*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	0	486			84	248
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	486	0	0	84	248
Percent Heavy Vehicles	4	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	148			
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	148	0	0	0
Percent Heavy Vehicles	4	4	4	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LTR				
v (veh/h)	0			148				
C (m) (veh/h)	1216			577				
v/c	0.00			0.26				
95% queue length	0.00			1.03				
Control Delay (s/veh)	8.0			13.4				
LOS	A			B				
Approach Delay (s/veh)	--	--	13.4					
Approach LOS	--	--	B					

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AWD = 13.4 sec. / LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	02_CU+PR (ALT. 1)_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE+PR (ALT.1)
Analysis Time Period	A.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154 | North/South Street: U.S. 101 NB RAMPS

Intersection Orientation: East-West | Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	0	489			84	256
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	489	0	0	84	256
Percent Heavy Vehicles	4	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	148			
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	148	0	0	0
Percent Heavy Vehicles	4	4	4	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LTR				
v (veh/h)	0			148				
C (m) (veh/h)	1208			575				
v/c	0.00			0.26				
95% queue length	0.00			1.03				
Control Delay (s/veh)	8.0			13.4				
LOS	A			B				
Approach Delay (s/veh)	--	--	13.4					
Approach LOS	--	--	B					

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AWD = 13.4 sec. / LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	02_CU+PR (ALT. 2)_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE+PR (ALT. 2)
Analysis Time Period	A.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154 | North/South Street: U.S. 101 NB RAMPS

Intersection Orientation: East-West | Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	0	493			84	259
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	493	0	0	84	259
Percent Heavy Vehicles	4	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	148			
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	148	0	0	0
Percent Heavy Vehicles	4	4	4	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LTR				
v (veh/h)	0			148				
C (m) (veh/h)	1205			572				
v/c	0.00			0.26				
95% queue length	0.00			1.04				
Control Delay (s/veh)	8.0			13.5				
LOS	A			B				
Approach Delay (s/veh)	--	--	13.5					
Approach LOS	--	--	B					

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AWD= 13.5 sec / LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*MMF*	Intersection	*02_EX_PM*
Agency/Co.	*ATE*	Jurisdiction	*SANTA BARBARA COUNTY*
Date Performed	*3/21/2012*	Analysis Year	*EXISTING*
Analysis Time Period	*P.M. PEAK HOUR*		

Project Description *#12018 - CHUMASH CAMP 4 PROJECT*

East/West Street: *SR 154* | North/South Street: *U.S. 101 NB RAMPS*

Intersection Orientation: *East-West* | Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	3	293			137	450
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	3	293	0	0	137	450
Percent Heavy Vehicles	4	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	1	0	70			
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	1	0	70	0	0	0
Percent Heavy Vehicles	4	4	4	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LTR				
v (veh/h)	3			71				
C (m) (veh/h)	978			734				
v/c	0.00			0.10				
95% queue length	0.01			0.32				
Control Delay (s/veh)	8.7			10.4				
LOS	A			B				
Approach Delay (s/veh)	--	--	10.4					
Approach LOS	--	--	B					

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AWD = 10.3 sec. / LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	02_2014_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	NEAR-TERM (YEAR 2014)
Analysis Time Period	P.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154	North/South Street: U.S. 101 NB RAMPS
Intersection Orientation: East-West	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	3	318			141	487
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	3	318	0	0	141	487
Percent Heavy Vehicles	4	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	1	0	73			
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	1	0	73	0	0	0
Percent Heavy Vehicles	4	4	4	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LTR				
v (veh/h)	3			74				
C (m) (veh/h)	944			710				
v/c	0.00			0.10				
95% queue length	0.01			0.35				
Control Delay (s/veh)	8.8			10.7				
LOS	A			B				
Approach Delay (s/veh)	--	--	10.7					
Approach LOS	--	--	B					

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AWD = 10.6 sec. / LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	02_2014+ALT. 1_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	2014+PROJECT (ALT. 1)
Analysis Time Period	P.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154	North/South Street: U.S. 101 NB RAMPS
Intersection Orientation: East-West	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	3	327			141	492
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	3	327	0	0	141	492
Percent Heavy Vehicles	4	–	–	0	–	–
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	1	0	73			
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	1	0	73	0	0	0
Percent Heavy Vehicles	4	4	4	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LTR				
v (veh/h)	3			74				
C (m) (veh/h)	940			702				
v/c	0.00			0.11				
95% queue length	0.01			0.35				
Control Delay (s/veh)	8.8			10.7				
LOS	A			B				
Approach Delay (s/veh)	–	–	10.7					
Approach LOS	–	–	B					

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AWD = 10.6 sec. / LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	02_2014+ALT. 2_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	2014+PROJECT (ALT. 2)
Analysis Time Period	P.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT	
East/West Street: SR 154	North/South Street: U.S. 101 NB RAMPS
Intersection Orientation: East-West	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	3	329			141	496
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	3	329	0	0	141	496
Percent Heavy Vehicles	4	–	–	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	1	0	73			
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	1	0	73	0	0	0
Percent Heavy Vehicles	4	4	4	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LTR				
v (veh/h)	3			74				
C (m) (veh/h)	937			700				
v/c	0.00			0.11				
95% queue length	0.01			0.35				
Control Delay (s/veh)	8.9			10.8				
LOS	A			B				
Approach Delay (s/veh)	–	–	10.8					
Approach LOS	--	--	B					

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AWD = 10.7 sec. / LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	02_CU_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE (YEAR 2030)
Analysis Time Period	P.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154	North/South Street: U.S. 101 NB RAMPS
Intersection Orientation: East-West	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	4	370			126	608
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	4	370	0	0	126	608
Percent Heavy Vehicles	4	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	3	0	108			
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	3	0	108	0	0	0
Percent Heavy Vehicles	4	4	4	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LTR				
v (veh/h)	4			111				
C (m) (veh/h)	862			654				
v/c	0.00			0.17				
95% queue length	0.01			0.61				
Control Delay (s/veh)	9.2			11.6				
LOS	A			B				
Approach Delay (s/veh)	--	--	11.6					
Approach LOS	--	--	B					

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AWD = 11.5 sec. / LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	02_CU+PR (ALT. 1)_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE+PR (ALT.1)
Analysis Time Period	P.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154 | North/South Street: U.S. 101 NB RAMPS

Intersection Orientation: East-West | Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	4	379			126	613
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	4	379	0	0	126	613
Percent Heavy Vehicles	4	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	3	0	108			
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	3	0	108	0	0	0
Percent Heavy Vehicles	4	4	4	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LTR				
v (veh/h)	4			111				
C (m) (veh/h)	858			646				
v/c	0.00			0.17				
95% queue length	0.01			0.62				
Control Delay (s/veh)	9.2			11.7				
LOS	A			B				
Approach Delay (s/veh)	--	--	11.7					
Approach LOS	--	--	B					

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AWD = 11.6 sec. / LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	02_CU+PR (ALT. 2)_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE+PR (ALT. 2)
Analysis Time Period	P.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154 | North/South Street: U.S. 101 NB RAMPS

Intersection Orientation: East-West | Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	4	381			126	617
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	4	381	0	0	126	617
Percent Heavy Vehicles	4	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	3	0	108			
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	3	0	108	0	0	0
Percent Heavy Vehicles	4	4	4	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LTR				
v (veh/h)	4			111				
C (m) (veh/h)	855			645				
v/c	0.00			0.17				
95% queue length	0.01			0.62				
Control Delay (s/veh)	9.2			11.7				
LOS	A			B				
Approach Delay (s/veh)	--	--	11.7					
Approach LOS	--	--	B					

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AWD = 11.6 sec./ LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	03_EX_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	EXISTING
Analysis Time Period	A.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154	North/South Street: GRAND AVENUE
Intersection Orientation: East-West	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	15	358	49	9	209	32
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	15	358	49	9	209	32
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	33	29	29	23	25	4
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	33	29	29	23	25	4
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		2			2	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	15	9		91			52	
C (m) (veh/h)	1314	1141		520			369	
v/c	0.01	0.01		0.17			0.14	
95% queue length	0.03	0.02		0.63			0.49	
Control Delay (s/veh)	7.8	8.2		15.2			16.7	
LOS	A	A		C			C	
Approach Delay (s/veh)	–	–	15.2			16.7		
Approach LOS	–	–	C			C		

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AWD = 14.6 sec. / LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	03_2014_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	NEAR-TERM (YEAR 2014)
Analysis Time Period	A.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154	North/South Street: GRAND AVENUE
Intersection Orientation: East-West	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	15	367	58	18	220	32
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	15	367	58	18	220	32
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	41	29	37	23	25	4
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	41	29	37	23	25	4
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		2			2	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	15	18		107			52	
C (m) (veh/h)	1302	1124		501			339	
v/c	0.01	0.02		0.21			0.15	
95% queue length	0.03	0.05		0.81			0.54	
Control Delay (s/veh)	7.8	8.3		16.2			17.9	
LOS	A	A		C			C	
Approach Delay (s/veh)	--	--	16.2			17.9		
Approach LOS	--	--	C			C		

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AWD = 15.3 SEC. / LOS C

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	03_2014+ALT. 1_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	2014+PROJECT (ALT. 1)
Analysis Time Period	A.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154	North/South Street: GRAND AVENUE
Intersection Orientation: East-West	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	15	370	58	18	228	32
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	15	370	58	18	228	32
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	41	29	37	23	25	4
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	41	29	37	23	25	4
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		2			2	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	15	18		107			52	
C (m) (veh/h)	1293	1121		492			334	
v/c	0.01	0.02		0.22			0.16	
95% queue length	0.04	0.05		0.83			0.55	
Control Delay (s/veh)	7.8	8.3		16.4			18.1	
LOS	A	A		C			C	
Approach Delay (s/veh)	--	--	16.4			18.1		
Approach LOS	--	--	C			C		

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AWD = 15.4 sec. / LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	03_2014+ALT. 2_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	2014+PROJECT (ALT. 2)
Analysis Time Period	A.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154	North/South Street: GRAND AVENUE
Intersection Orientation: East-West	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	15	374	58	18	231	32
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	15	374	58	18	231	32
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	41	29	37	23	25	4
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	41	29	37	23	25	4
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		2			2	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	15	18		107			52	
C (m) (veh/h)	1290	1117		488			330	
v/c	0.01	0.02		0.22			0.16	
95% queue length	0.04	0.05		0.84			0.56	
Control Delay (s/veh)	7.8	8.3		16.5			18.3	
LOS	A	A		C			C	
Approach Delay (s/veh)	--	--	16.5			18.3		
Approach LOS	--	--	C			C		

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AWD = 15.5 sec. / LOS C

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	03_CU_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE (YEAR 2030)
Analysis Time Period	A.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154 | North/South Street: GRAND AVENUE

Intersection Orientation: East-West | Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	19	590	38	4	313	34
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	19	590	38	4	313	34
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	44	24	25	23	25	4
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	44	24	25	23	25	4
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		2			2	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	19	4		93			52	
C (m) (veh/h)	1201	944		287			226	
v/c	0.02	0.00		0.32			0.23	
95% queue length	0.05	0.01		1.42			0.89	
Control Delay (s/veh)	8.0	8.8		25.6			26.0	
LOS	A	A		D			D	
Approach Delay (s/veh)	--	--	25.6			26.0		
Approach LOS	--	--	D			D		

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AWD = 23.0 sec. / LOS C

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	03_CU+PR (ALT. 1)_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE+PR (ALT.1)
Analysis Time Period	A.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154 | North/South Street: GRAND AVENUE

Intersection Orientation: East-West | Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	19	593	38	4	321	34
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	19	593	38	4	321	34
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	44	24	25	23	25	4
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	44	24	25	23	25	4
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		2			2	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	19	4		93			52	
C (m) (veh/h)	1193	942		283			222	
v/c	0.02	0.00		0.33			0.23	
95% queue length	0.05	0.01		1.45			0.91	
Control Delay (s/veh)	8.1	8.8		26.0			26.5	
LOS	A	A		D			D	
Approach Delay (s/veh)	--	--	26.0			26.5		
Approach LOS	--	--	D			D		

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AWD = 23.7 sec. / LOS C

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	03_CU+PR (ALT. 2)_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE+PR (ALT. 2)
Analysis Time Period	A.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154 | North/South Street: GRAND AVENUE

Intersection Orientation: East-West | Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	19	597	38	4	324	34
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	19	597	38	4	324	34
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	44	24	25	23	25	4
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	44	24	25	23	25	4
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		2			2	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	19	4		93			52	
C (m) (veh/h)	1190	939		279			220	
v/c	0.02	0.00		0.33			0.24	
95% queue length	0.05	0.01		1.48			0.92	
Control Delay (s/veh)	8.1	8.9		26.4			26.8	
LOS	A	A		D			D	
Approach Delay (s/veh)	--	--	26.4			26.8		
Approach LOS	--	--	D			D		

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AWD = 24.0 sec. / LOS C

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	03_EX_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	EXISTING
Analysis Time Period	P.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154 | North/South Street: GRAND AVENUE

Intersection Orientation: East-West | Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	9	267	51	18	409	16
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	9	267	51	18	409	16
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	47	20	23	11	28	13
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	47	20	23	11	28	13
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		2			2	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	9	18		90			52	
C (m) (veh/h)	1124	1231		387			404	
v/c	0.01	0.01		0.23			0.13	
95% queue length	0.02	0.04		0.90			0.44	
Control Delay (s/veh)	8.2	8.0		18.4			16.7	
LOS	A	A		C			C	
Approach Delay (s/veh)	--	--	18.4			16.7		
Approach LOS	--	--	C			C		

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AWD = 16.2 sec. / LOS C

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	03_2014_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	NEAR-TERM (YEAR 2014)
Analysis Time Period	P.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154	North/South Street: GRAND AVENUE
Intersection Orientation: East-West	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	9	283	64	30	428	16
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	9	283	64	30	428	16
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	64	20	40	11	28	13
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	64	20	40	11	28	13
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		2			2	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	9	30		124			52	
C (m) (veh/h)	1106	1201		376			357	
v/c	0.01	0.02		0.33			0.15	
95% queue length	0.02	0.08		1.46			0.51	
Control Delay (s/veh)	8.3	8.1		20.9			18.3	
LOS	A	A		C			C	
Approach Delay (s/veh)	--	--	20.9			18.3		
Approach LOS	--	--	C			C		

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AWD = 18.0 sec. / LOS C

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	03_2014+ALT. 1_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	2014+PROJECT (ALT. 1)
Analysis Time Period	P.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154	North/South Street: GRAND AVENUE
Intersection Orientation: East-West	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	9	292	64	30	433	16
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	9	292	64	30	433	16
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	64	20	40	11	28	13
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	64	20	40	11	28	13
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		2			2	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	9	30		124			52	
C (m) (veh/h)	1101	1192		368			351	
v/c	0.01	0.03		0.34			0.15	
95% queue length	0.02	0.08		1.51			0.52	
Control Delay (s/veh)	8.3	8.1		21.5			18.6	
LOS	A	A		C			C	
Approach Delay (s/veh)	--	--	21.5			18.6		
Approach LOS	--	--	C			C		

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AWD = 18.4 sec./ LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	03_2014+ALT. 2_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	2014+PROJECT (ALT. 2)
Analysis Time Period	P.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154	North/South Street: GRAND AVENUE
Intersection Orientation: East-West	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	9	294	64	30	437	16
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	9	294	64	30	437	16
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	64	20	40	11	28	13
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	64	20	40	11	28	13
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		2			2	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	9	30		124			52	
C (m) (veh/h)	1097	1190		365			348	
v/c	0.01	0.03		0.34			0.15	
95% queue length	0.02	0.08		1.52			0.53	
Control Delay (s/veh)	8.3	8.1		21.7			18.7	
LOS	A	A		C			C	
Approach Delay (s/veh)	--	--	21.7			18.7		
Approach LOS	--	--	C			C		

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AWD = 18.5 sec. / LOS C

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	03_CU_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE (YEAR 2030)
Analysis Time Period	P.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154	North/South Street: GRAND AVENUE
Intersection Orientation: East-West	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	15	569	39	11	705	25
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	15	569	39	11	705	25
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	76	44	24	5	51	3
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	76	44	24	5	51	3
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		2			2	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	15	11		144			59	
C (m) (veh/h)	865	961		115			138	
v/c	0.02	0.01		1.25			0.43	
95% queue length	0.05	0.03		23.64			2.13	
Control Delay (s/veh)	9.2	8.8		612.6			50.6	
LOS	A	A		F			F	
Approach Delay (s/veh)	--	--	612.6			50.6		
Approach LOS	--	--	F			F		

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AWD = >50 SEC. / LOS F

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	03_CU+PR (ALT. 1)_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE+PR (ALT.1)
Analysis Time Period	P.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 154	North/South Street: GRAND AVENUE
Intersection Orientation: East-West	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	15	578	39	11	710	25
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	15	578	39	11	710	25
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	76	44	24	5	51	3
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	76	44	24	5	51	3
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		2			2	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	15	11		144			59	
C (m) (veh/h)	861	953		111			136	
v/c	0.02	0.01		1.30			0.43	
95% queue length	0.05	0.04		25.10			2.18	
Control Delay (s/veh)	9.3	8.8		688.8			51.8	
LOS	A	A		F			F	
Approach Delay (s/veh)	--	--	688.8			51.8		
Approach LOS	--	--	F			F		

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AWD = >50. sec. / LOS F

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	03_CU+PR (ALT. 2)_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE+PR (ALT. 2)
Analysis Time Period	P.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT	
East/West Street: SR 154	North/South Street: GRAND AVENUE
Intersection Orientation: East-West	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	15	580	39	11	714	25
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	15	580	39	11	714	25
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	76	44	24	5	51	3
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	76	44	24	5	51	3
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		2			2	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	15	11		144			59	
C (m) (veh/h)	858	952		110			135	
v/c	0.02	0.01		1.31			0.44	
95% queue length	0.05	0.04		25.48			2.20	
Control Delay (s/veh)	9.3	8.8		709.0			52.5	
LOS	A	A		F			F	
Approach Delay (s/veh)	--	--	709.0			52.5		
Approach LOS	--	--	F			F		

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AWD = >50 sec. / LOS F

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	04_EX_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	EXISTING
Analysis Time Period	A.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: ROBLAR AVENUE | North/South Street: SR 154

Intersection Orientation: North-South | Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	11	210	5	49	280	88
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	11	210	5	49	280	88
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	67	33	23	7	40	48
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	67	33	23	7	40	48
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		1			1	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	11	49		95			123	
C (m) (veh/h)	1180	1343		687			384	
v/c	0.01	0.04		0.14			0.32	
95% queue length	0.03	0.11		0.48			1.40	
Control Delay (s/veh)	8.1	7.8		13.4			19.8	
LOS	A	A		B			C	
Approach Delay (s/veh)	--	--	13.4			19.8		
Approach LOS	--	--	B			C		

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AWD = 15.0 sec. / LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	04_2014_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	NEAR-TERM (YEAR 2014)
Analysis Time Period	A.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: ROBLAR AVENUE	North/South Street: SR 154
Intersection Orientation: North-South	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	11	228	7	50	296	88
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	11	228	7	50	296	88
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	67	33	23	12	40	50
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	67	33	23	12	40	50
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		1			1	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	11	50		102			123	
C (m) (veh/h)	1164	1321		624			359	
v/c	0.01	0.04		0.16			0.34	
95% queue length	0.03	0.12		0.58			1.54	
Control Delay (s/veh)	8.1	7.8		14.2			21.2	
LOS	A	A		B			C	
Approach Delay (s/veh)	--	--	14.2			21.2		
Approach LOS	--	--	B			C		

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AWD = 15.9 SEC. / LOS C

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	04_2014+ALT. 1_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	2014+PROJECT (ALT. 1)
Analysis Time Period	A.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: ROBLAR AVENUE	North/South Street: SR 154
Intersection Orientation: North-South	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	11	236	7	50	299	88
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	11	236	7	50	299	88
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	67	33	23	12	40	50
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	67	33	23	12	40	50
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		1			1	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	11	50		102			123	
C (m) (veh/h)	1161	1312		614			353	
v/c	0.01	0.04		0.17			0.35	
95% queue length	0.03	0.12		0.60			1.58	
Control Delay (s/veh)	8.1	7.9		14.4			21.6	
LOS	A	A		B			C	
Approach Delay (s/veh)	--	--	14.4			21.6		
Approach LOS	--	--	B			C		

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AWD = 16.1 sec. / LOS C

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	04_2014+ALT. 2_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	2014+PROJECT (ALT. 2)
Analysis Time Period	A.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: ROBLAR AVENUE	North/South Street: SR 154
Intersection Orientation: North-South	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	11	239	7	50	303	88
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	11	239	7	50	303	88
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	67	33	23	12	40	50
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	67	33	23	12	40	50
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		1			1	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	11	50		102			123	
C (m) (veh/h)	1157	1308		608			349	
v/c	0.01	0.04		0.17			0.35	
95% queue length	0.03	0.12		0.60			1.61	
Control Delay (s/veh)	8.1	7.9		14.5			21.9	
LOS	A	A		B			C	
Approach Delay (s/veh)	--	--	14.5			21.9		
Approach LOS	--	--	B			C		

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AWD = 16.3 sec. / LOS C

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	04_CU_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE (YEAR 2030)
Analysis Time Period	A.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: ROBLAR AVENUE | North/South Street: SR 154

Intersection Orientation: North-South | Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	8	358	22	41	619	119
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	8	358	22	41	619	119
Percent Heavy Vehicles	4	–	–	4	–	–
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	76	34	20	21	44	71
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	76	34	20	21	44	71
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		1			1	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	8	41		136			130	
C (m) (veh/h)	859	1168		331			145	
v/c	0.01	0.04		0.41			0.90	
95% queue length	0.03	0.11		2.05			10.71	
Control Delay (s/veh)	9.2	8.2		26.5			157.5	
LOS	A	A		D			F	
Approach Delay (s/veh)	–	–	26.5			157.5		
Approach LOS	–	–	D			F		

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AWD = > 50 SEC. / LOS F

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	04_CU+PR (ALT. 1)_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE+PR (ALT.1)
Analysis Time Period	A.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: ROBLAR AVENUE | North/South Street: SR 154

Intersection Orientation: North-South | Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	8	366	22	41	622	119
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	8	366	22	41	622	119
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	76	34	20	21	44	71
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	76	34	20	21	44	71
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		1			1	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	8	41		136			130	
C (m) (veh/h)	857	1160		326			143	
v/c	0.01	0.04		0.42			0.91	
95% queue length	0.03	0.11		2.10			11.09	
Control Delay (s/veh)	9.2	8.2		27.0			167.2	
LOS	A	A		D			F	
Approach Delay (s/veh)	--	--	27.0			167.2		
Approach LOS	--	--	D			F		

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AWD = >50 sec. / LOS F

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	04_CU+PR (ALT. 2)_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE+PR (ALT. 2)
Analysis Time Period	A.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: ROBLAR AVENUE | North/South Street: SR 154

Intersection Orientation: North-South | Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	8	369	22	41	626	119
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	8	369	22	41	626	119
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	76	34	20	21	44	71
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	76	34	20	21	44	71
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		1			1	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	8	41		136			130	
C (m) (veh/h)	854	1157		322			140	
v/c	0.01	0.04		0.42			0.93	
95% queue length	0.03	0.11		2.14			11.69	
Control Delay (s/veh)	9.3	8.2		27.4			183.5	
LOS	A	A		D			F	
Approach Delay (s/veh)	--	--	27.4			183.5		
Approach LOS	--	--	D			F		

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WD = >50 sec. / LOS F

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*MMF*	Intersection	*04_EX_PM*
Agency/Co.	*ATE*	Jurisdiction	*SANTA BARBARA COUNTY*
Date Performed	*3/21/2012*	Analysis Year	*EXISTING*
Analysis Time Period	*P.M. PEAK HOUR*		

Project Description *#12018 - CHUMASH CAMP 4 PROJECT*	
East/West Street: *ROBLAR AVENUE*	North/South Street: *SR 154*
Intersection Orientation: *North-South*	Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	16	402	11	32	291	28
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	16	402	11	32	291	28
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	49	37	22	13	38	83
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	49	37	22	13	38	83
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		1			1	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	16	32		134			108	
C (m) (veh/h)	1230	1135		730			298	
v/c	0.01	0.03		0.18			0.36	
95% queue length	0.04	0.09		0.67			1.68	
Control Delay (s/veh)	8.0	8.3		15.0			25.0	
LOS	A	A		C			C	
Approach Delay (s/veh)	--	--	15.0			25.0		
Approach LOS	--	--	C			C		

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AWD = 17.6 sec. / LOS C

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	04_2014_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	NEAR-TERM (YEAR 2014)
Analysis Time Period	P.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: ROBLAR AVENUE	North/South Street: SR 154
Intersection Orientation: North-South	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	16	430	13	35	321	28
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	16	430	13	35	321	28
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	49	37	22	22	38	86
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	49	37	22	22	38	86
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		1			1	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	16	35		146			108	
C (m) (veh/h)	1199	1107		599			265	
v/c	0.01	0.03		0.24			0.41	
95% queue length	0.04	0.10		0.96			2.01	
Control Delay (s/veh)	8.0	8.4		17.0			28.9	
LOS	A	A		C			D	
Approach Delay (s/veh)	--	--	17.0			28.9		
Approach LOS	--	--	C			D		

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AWD = 19.8 sec. / LOS C

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	04_2014+ALT.1_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	2014+PROJECT (ALT. 1)
Analysis Time Period	P.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: ROBLAR AVENUE | North/South Street: SR 154

Intersection Orientation: North-South | Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	16	435	13	35	330	28
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	16	435	13	35	330	28
Percent Heavy Vehicles	4	–	–	4	–	–
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	49	37	22	22	38	86
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	49	37	22	22	38	86
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		1			1	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	16	35		146			108	
C (m) (veh/h)	1190	1102		584			259	
v/c	0.01	0.03		0.25			0.42	
95% queue length	0.04	0.10		1.00			2.09	
Control Delay (s/veh)	8.1	8.4		17.2			29.9	
LOS	A	A		C			D	
Approach Delay (s/veh)	--	--	17.2			29.9		
Approach LOS	–	–	C			D		

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AWD = 20.2 sec. / LOS C

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	04_2014+ALT.2_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	2014+PROJECT (ALT. 2)
Analysis Time Period	P.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: ROBLAR AVENUE | North/South Street: SR 154

Intersection Orientation: North-South | Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	16	439	13	35	332	28
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	16	439	13	35	332	28
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	49	37	22	22	38	86
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	49	37	22	22	38	86
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		1			1	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	16	35		146			108	
C (m) (veh/h)	1188	1098		579			256	
v/c	0.01	0.03		0.25			0.42	
95% queue length	0.04	0.10		1.01			2.13	
Control Delay (s/veh)	8.1	8.4		17.4			30.3	
LOS	A	A		C			D	
Approach Delay (s/veh)	--	--	17.4			30.3		
Approach LOS	--	--	C			D		

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AWD = 20.4 sec. / LOS C

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	04_CU_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE (YEAR 2030)
Analysis Time Period	P.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: ROBLAR AVENUE	North/South Street: SR 154
Intersection Orientation: North-South	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	17	687	21	56	499	56
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	17	687	21	56	499	56
Percent Heavy Vehicles	4	–	–	4	–	–
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	52	36	13	23	37	77
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	52	36	13	23	37	77
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		1			1	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	17	56		137			101	
C (m) (veh/h)	1005	882		244			96	
v/c	0.02	0.06		0.56			1.05	
95% queue length	0.05	0.20		3.60			13.62	
Control Delay (s/veh)	8.6	9.4		43.2			360.0	
LOS	A	A		E			F	
Approach Delay (s/veh)	–	–	43.2			360.0		
Approach LOS	–	--	E			F		

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AWD = >50 SEC. / LOS F

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	04_CU+PR (ALT. 1)_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE+PR (ALT.1)
Analysis Time Period	P.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: ROBLAR AVENUE	North/South Street: SR 154
Intersection Orientation: North-South	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	17	692	21	56	508	56
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	17	692	21	56	508	56
Percent Heavy Vehicles	4	–	–	4	–	–
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	52	36	13	23	37	77
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	52	36	13	23	37	77
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		1			1	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	17	56		137			101	
C (m) (veh/h)	998	878		240			92	
v/c	0.02	0.06		0.57			1.10	
95% queue length	0.05	0.20		3.72			14.76	
Control Delay (s/veh)	8.7	9.4		44.6			423.9	
LOS	A	A		E			F	
Approach Delay (s/veh)	--	–	44.6			423.9		
Approach LOS	–	–	E			F		

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WD = > 50 sec. / LOS F

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	04_CU+PR (ALT. 2)_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE+PR (ALT. 2)
Analysis Time Period	P.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT	
East/West Street: ROBLAR AVENUE	North/South Street: SR 154
Intersection Orientation: North-South	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	17	696	21	56	510	56
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	17	696	21	56	510	56
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	1	1	0
Configuration	L		TR	L		TR
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	52	36	13	23	37	77
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	52	36	13	23	37	77
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		Y			Y	
Storage		1			1	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	17	56		137			101	
C (m) (veh/h)	996	875		237			90	
v/c	0.02	0.06		0.58			1.12	
95% queue length	0.05	0.21		3.82			15.36	
Control Delay (s/veh)	8.7	9.4		45.4			459.8	
LOS	A	A		E			F	
Approach Delay (s/veh)	--	--	45.4			459.8		
Approach LOS	--	--	E			F		

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WD = >50 sec / LOS F

ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	MMF	Intersection	05_EX_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	EXISTING
Analysis Time Period	A.M. PEAK HOUR		

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: EDISON STREET | North/South Street: SR 154

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	107	67	29	13	71	23
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	10	127	5	15	158	150
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		L	TR	L	TR
PHF	1.00		1.00		1.00	1.00	1.00	1.00
Flow Rate (veh/h)	203		107		10	132	15	308
% Heavy Vehicles	4		4		4	4	4	4
No. Lanes	1		1		2		2	
Geometry Group	2		2		5		5	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	0.5		0.1		1.0	0.0	1.0	0.0
Prop. Right-Turns	0.1		0.2		0.0	0.0	0.0	0.5
Prop. Heavy Vehicle	0.0		0.0		0.0	0.0	0.0	0.0
hLT-adj	0.2	0.2	0.2	0.2	0.5	0.5	0.5	0.5
hRT-adj	-0.6	-0.6	-0.6	-0.6	-0.7	-0.7	-0.7	-0.7
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed	0.1		-0.0		0.6	0.0	0.6	-0.3

Departure Headway and Service Time

hd, initial value (s)	3.20		3.20		3.20	3.20	3.20	3.20
x, initial	0.18		0.10		0.01	0.12	0.01	0.27
hd, final value (s)	5.39		5.44		6.37	5.84	6.16	5.31
x, final value	0.30		0.16		0.02	0.21	0.03	0.45
Move-up time, m (s)	2.0		2.0		2.3		2.3	
Service Time, t_s (s)	3.4		3.4		4.1	3.5	3.9	3.0

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	453		357		260	382	265	558
Delay (s/veh)	10.74		9.49		9.19	10.13	9.02	12.41
LOS	B		A		A	B	A	B
Approach: Delay (s/veh)	10.74		9.49		10.06		12.25	
LOS	B		A		B		B	
Intersection Delay (s/veh)	11.07							
Intersection LOS	B							

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ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	MMF	Intersection	05_2014_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	NEAR-TERM (YEAR 2014)
Analysis Time Period	A.M. PEAK HOUR		

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: EDISON STREET | North/South Street: SR 154

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	111	67	29	14	71	24
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	10	142	5	15	175	154
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		L	TR	L	TR
PHF	1.00		1.00		1.00	1.00	1.00	1.00
Flow Rate (veh/h)	207		109		10	147	15	329
% Heavy Vehicles	4		4		4	4	4	4
No. Lanes	1		1		2		2	
Geometry Group	2		2		5		5	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	0.5		0.1		1.0	0.0	1.0	0.0
Prop. Right-Turns	0.1		0.2		0.0	0.0	0.0	0.5
Prop. Heavy Vehicle	0.0		0.0		0.0	0.0	0.0	0.0
hLT-adj	0.2	0.2	0.2	0.2	0.5	0.5	0.5	0.5
hRT-adj	-0.6	-0.6	-0.6	-0.6	-0.7	-0.7	-0.7	-0.7
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed	0.1		-0.0		0.6	0.0	0.6	-0.3

Departure Headway and Service Time

hd, initial value (s)	3.20		3.20		3.20	3.20	3.20	3.20
x, initial	0.18		0.10		0.01	0.13	0.01	0.29
hd, final value (s)	5.52		5.58		6.45	5.92	6.22	5.39
x, final value	0.32		0.17		0.02	0.24	0.03	0.49
Move-up time, m (s)	2.0		2.0		2.3		2.3	
Service Time, t_s (s)	3.5		3.6		4.2	3.6	3.9	3.1

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	457		359		260	397	265	579
Delay (s/veh)	11.07		9.71		9.27	10.51	9.09	13.28
LOS	B		A		A	B	A	B
Approach: Delay (s/veh)	11.07		9.71		10.43		13.10	
LOS	B		A		B		B	
Intersection Delay (s/veh)	11.62							
Intersection LOS	B							

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ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	MMF	Intersection	05_2014+ALT. 1_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	2014+PROJECT (ALT. 1)
Analysis Time Period	A.M. PEAK HOUR		

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: EDISON STREET | North/South Street: SR 154

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	111	67	29	14	71	29
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	10	145	5	17	176	154
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		L	TR	L	TR
PHF	1.00		1.00		1.00	1.00	1.00	1.00
Flow Rate (veh/h)	207		114		10	150	17	330
% Heavy Vehicles	4		4		4	4	4	4
No. Lanes	1		1		2		2	
Geometry Group	2		2		5		5	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	0.5		0.1		1.0	0.0	1.0	0.0
Prop. Right-Turns	0.1		0.3		0.0	0.0	0.0	0.5
Prop. Heavy Vehicle	0.0		0.0		0.0	0.0	0.0	0.0
hLT-adj	0.2	0.2	0.2	0.2	0.5	0.5	0.5	0.5
hRT-adj	-0.6	-0.6	-0.6	-0.6	-0.7	-0.7	-0.7	-0.7
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed	0.1		-0.1		0.6	0.0	0.6	-0.3

Departure Headway and Service Time

hd, Initial value (s)	3.20		3.20		3.20	3.20	3.20	3.20
x, Initial	0.18		0.10		0.01	0.13	0.02	0.29
hd, final value (s)	5.55		5.58		6.48	5.95	6.25	5.41
x, final value	0.32		0.18		0.02	0.25	0.03	0.50
Move-up time, m (s)	2.0		2.0		2.3		2.3	
Service Time, t_s (s)	3.5		3.6		4.2	3.6	3.9	3.1

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	457		364		260	400	267	580
Delay (s/veh)	11.14		9.77		9.30	10.60	9.14	13.41
LOS	B		A		A	B	A	B
Approach: Delay (s/veh)	11.14		9.77		10.52		13.20	
LOS	B		A		B		B	
Intersection Delay (s/veh)	11.70							
Intersection LOS	B							

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ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	MMF	Intersection	05_2014+ALT. 2_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	2014+PROJECT (ALT. 2)
Analysis Time Period	A.M. PEAK HOUR		

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: EDISON STREET | North/South Street: SR 154

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	111	67	29	14	71	29
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	10	148	5	17	180	154
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		L	TR	L	TR
PHF	1.00		1.00		1.00	1.00	1.00	1.00
Flow Rate (veh/h)	207		114		10	153	17	334
% Heevy Vehicles	4		4		4	4	4	4
No. Lanes	1		1		2		2	
Geometry Group	2		2		5		5	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	0.5		0.1		1.0	0.0	1.0	0.0
Prop. Right-Turns	0.1		0.3		0.0	0.0	0.0	0.5
Prop. Heavy Vehicle	0.0		0.0		0.0	0.0	0.0	0.0
hLT-adj	0.2	0.2	0.2	0.2	0.5	0.5	0.5	0.5
hRT-adj	-0.6	-0.6	-0.6	-0.6	-0.7	-0.7	-0.7	-0.7
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed	0.1		-0.1		0.6	0.0	0.6	-0.3

Departure Headway and Service Time

hd, initial value (s)	3.20		3.20		3.20	3.20	3.20	3.20
x, initial	0.18		0.10		0.01	0.14	0.02	0.30
hd, final value (s)	5.57		5.60		6.49	5.96	6.26	5.43
x, final value	0.32		0.18		0.02	0.25	0.03	0.50
Move-up time, m (s)	2.0		2.0		2.3		2.3	
Service Time, t_s (s)	3.6		3.6		4.2	3.7	4.0	3.1

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	457		364		260	403	267	584
Delay (s/veh)	11.19		9.81		9.31	10.68	9.15	13.60
LOS	B		A		A	B	A	B
Approach: Delay (s/veh)	11.19		9.81		10.60		13.38	
LOS	B		A		B		B	
Intersection Delay (s/veh)	11.81							
Intersection LOS	B							

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ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	MMF	Intersection	05_CU_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE (YEAR 2030)
Analysis Time Period	A.M. PEAK HOUR		

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: EDISON STREET | North/South Street: SR 154

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	71	76	32	32	65	23
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	8	264	30	20	430	132
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		L	TR	L	TR
PHF	1.00		1.00		1.00	1.00	1.00	1.00
Flow Rate (veh/h)	179		120		8	294	20	562
% Heavy Vehicles	4		4		4	4	4	4
No. Lanes	1		1		2		2	
Geometry Group	2		2		5		5	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	0.4		0.3		1.0	0.0	1.0	0.0
Prop. Right-Turns	0.2		0.2		0.0	0.1	0.0	0.2
Prop. Heevy Vehicle	0.0		0.0		0.0	0.0	0.0	0.0
hLT-adj	0.2	0.2	0.2	0.2	0.5	0.5	0.5	0.5
hRT-adj	-0.6	-0.6	-0.6	-0.6	-0.7	-0.7	-0.7	-0.7
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed	0.0		0.0		0.6	-0.0	0.6	-0.1

Departure Headway and Service Time

hd, initial value (a)	3.20		3.20		3.20	3.20	3.20	3.20
x, initial	0.16		0.11		0.01	0.26	0.02	0.50
hd, final value (s)	6.79		6.96		7.06	6.48	6.66	5.99
x, final value	0.34		0.23		0.02	0.53	0.04	0.93
Move-up time, m (s)	2.0		2.0		2.3		2.3	
Service Time, t_s (s)	4.8		5.0		4.8	4.2	4.4	3.7

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	429		370		258	534	270	599
Delay (s/veh)	13.23		12.06		9.87	16.40	9.62	66.16
LOS	B		B		A	C	A	F
Approach: Delay (s/veh)	13.23		12.06		16.22		64.22	
LOS	B		B		C		F	
Intersection Delay (s/veh)	38.96							
Intersection LOS	E							

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ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	MMF	Intersection	05_CU+PR (ALT. 1)_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE+PR (ALT.1)
Analysis Time Period	A.M. PEAK HOUR		

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: EDISON STREET | North/South Street: SR 154

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	71	76	32	32	65	28
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	8	267	30	22	431	132
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		L	TR	L	TR
PHF	1.00		1.00		1.00	1.00	1.00	1.00
Flow Rate (veh/h)	179		125		8	297	22	563
% Heavy Vehicles	4		4		4	4	4	4
No. Lanes	1		1		2		2	
Geometry Group	2		2		5		5	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	0.4		0.3		1.0	0.0	1.0	0.0
Prop. Right-Turns	0.2		0.2		0.0	0.1	0.0	0.2
Prop. Heavy Vehicle	0.0		0.0		0.0	0.0	0.0	0.0
hLT-adj	0.2	0.2	0.2	0.2	0.5	0.5	0.5	0.5
hRT-adj	-0.6	-0.6	-0.6	-0.6	-0.7	-0.7	-0.7	-0.7
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed	0.0		-0.0		0.6	-0.0	0.6	-0.1

Departure Headway and Service Time

hd, initial value (s)	3.20		3.20		3.20	3.20	3.20	3.20
x, initial	0.16		0.11		0.01	0.26	0.02	0.50
hd, final value (s)	6.83		6.97		7.10	6.52	6.70	6.02
x, final value	0.34		0.24		0.02	0.54	0.04	0.94
Move-up time, m (s)	2.0		2.0		2.3		2.3	
Service Time, t_s (s)	4.8		5.0		4.8	4.2	4.4	3.7

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	429		375		258	531	272	595
Delay (s/veh)	13.34		12.19		9.92	16.74	9.68	70.16
LOS	B		B		A	C	A	F
Approach: Delay (s/veh)	13.34		12.19		16.56		67.89	
LOS	B		B		C		F	
Intersection Delay (s/veh)	40.77							
Intersection LOS	E							

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ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	MMF	Intersection	05_CU+PR (ALT. 2)_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE+PR (ALT. 2)
Analysis Time Period	A.M. PEAK HOUR		

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: EDISON STREET | North/South Street: SR 154

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	71	76	32	32	65	28
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	8	270	30	22	435	132
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		L	TR	L	TR
PHF	1.00		1.00		1.00	1.00	1.00	1.00
Flow Rate (veh/h)	179		125		8	300	22	567
% Heavy Vehicles	4		4		4	4	4	4
No. Lanes	1		1		2		2	
Geometry Group	2		2		5		5	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	0.4		0.3		1.0	0.0	1.0	0.0
Prop. Right-Turns	0.2		0.2		0.0	0.1	0.0	0.2
Prop. Heavy Vehicle	0.0		0.0		0.0	0.0	0.0	0.0
hLT-adj	0.2	0.2	0.2	0.2	0.5	0.5	0.5	0.5
hRT-adj	-0.6	-0.6	-0.6	-0.6	-0.7	-0.7	-0.7	-0.7
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed	0.0		-0.0		0.6	-0.0	0.6	-0.1

Departure Headway and Service Time

hd, Initial value (s)	3.20		3.20		3.20	3.20	3.20	3.20
x, Initial	0.16		0.11		0.01	0.27	0.02	0.50
hd, final value (s)	6.86		7.00		7.12	6.53	6.71	6.04
x, final value	0.34		0.24		0.02	0.54	0.04	0.95
Move-up time, m (s)	2.0		2.0		2.3		2.3	
Service Time, t_s (s)	4.9		5.0		4.8	4.2	4.4	3.7

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	429		375		258	531	272	594
Delay (s/veh)	13.40		12.24		9.93	16.98	9.70	75.15
LOS	B		B		A	C	A	F
Approach: Delay (s/veh)	13.40		12.24		16.79		72.71	
LOS	B		B		C		F	
Intersection Delay (s/veh)	43.24							
Intersection LOS	E							

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ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	MMF	Intersection	05_EX_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	EXISTING
Analysis Time Period	P.M. PEAK HOUR		

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: EDISON STREET | North/South Street: SR 154

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	124	84	7	5	76	27
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	25	261	19	11	211	98
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		L	TR	L	TR
PHF	1.00		1.00		1.00	1.00	1.00	1.00
Flow Rate (veh/h)	215		108		25	280	11	309
% Heavy Vehicles	4		4		4	4	4	4
No. Lanes	1		1		2		2	
Geometry Group	2		2		5		5	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	0.6		0.0		1.0	0.0	1.0	0.0
Prop. Right-Turns	0.0		0.3		0.0	0.1	0.0	0.3
Prop. Heavy Vehicle	0.0		0.0		0.0	0.0	0.0	0.0
hLT-adj	0.2	0.2	0.2	0.2	0.5	0.5	0.5	0.5
hRT-adj	-0.6	-0.6	-0.6	-0.6	-0.7	-0.7	-0.7	-0.7
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hedj, computed	0.2		-0.1		0.6	0.0	0.6	-0.2

Departure Headway and Service Time

hd, initial value (s)	3.20		3.20		3.20	3.20	3.20	3.20
x, initial	0.19		0.10		0.02	0.25	0.01	0.27
hd, final value (s)	6.02		6.05		6.58	6.02	6.57	5.84
x, final value	0.36		0.18		0.05	0.47	0.02	0.50
Move-up time, m (s)	2.0		2.0		2.3		2.3	
Service Time, t_s (s)	4.0		4.0		4.3	3.7	4.3	3.5

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	465		358		275	530	261	559
Delay (s/veh)	12.39		10.39		9.59	14.00	9.40	14.36
LOS	B		B		A	B	A	B
Approach: Delay (s/veh)	12.39		10.39		13.64		14.19	
LOS	B		B		B		B	
Intersection Delay (s/veh)	13.17							
Intersection LOS	B							

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ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	MMF	Intersection	05_2014_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	NEAR-TERM (YEAR 2014)
Analysis Time Period	P.M. PEAK HOUR		

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: EDISON STREET | North/South Street: SR 154

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	132	84	7	6	76	28
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	27	289	20	12	243	105
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		L	TR	L	TR
PHF	1.00		1.00		1.00	1.00	1.00	1.00
Flow Rate (veh/h)	223		110		27	309	12	348
% Heavy Vehicles	4		4		4	4	4	4
No. Lanes	1		1		2		2	
Geometry Group	2		2		5		5	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	0.6		0.1		1.0	0.0	1.0	0.0
Prop. Right-Turns	0.0		0.3		0.0	0.1	0.0	0.3
Prop. Heavy Vehicle	0.0		0.0		0.0	0.0	0.0	0.0
hLT-adj	0.2	0.2	0.2	0.2	0.5	0.5	0.5	0.5
hRT-adj	-0.6	-0.6	-0.6	-0.6	-0.7	-0.7	-0.7	-0.7
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
had, computed	0.2		-0.1		0.6	0.0	0.6	-0.1

Departure Headway and Service Time

hd, initial value (s)	3.20		3.20		3.20	3.20	3.20	3.20
x, initial	0.20		0.10		0.02	0.27	0.01	0.31
hd, final value (s)	6.28		6.36		6.75	6.20	6.73	6.01
x, final value	0.39		0.19		0.05	0.53	0.02	0.58
Move-up time, m (s)	2.0		2.0		2.3		2.3	
Service Time, t_s (s)	4.3		4.4		4.5	3.9	4.4	3.7

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	473		360		277	557	262	577
Delay (s/veh)	13.28		10.89		9.81	15.89	9.58	16.93
LOS	B		B		A	C	A	C
Approach: Delay (s/veh)	13.28		10.89		15.40		16.69	
LOS	B		B		C		C	
Intersection Delay (s/veh)	14.91							
Intersection LOS	B							

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ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	MMF	Intersection	05_2014+ALT. 1_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	2014+PROJECT (ALT. 1)
Analysis Time Period	P.M. PEAK HOUR		

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: EDISON STREET | North/South Street: SR 154

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	132	84	7	6	76	31
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	27	291	20	18	246	105
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		L	TR	L	TR
PHF	1.00		1.00		1.00	1.00	1.00	1.00
Flow Rate (veh/h)	223		113		27	311	18	351
% Heavy Vehicles	4		4		4	4	4	4
No. Lanes	1		1		2		2	
Geometry Group	2		2		5		5	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	0.6		0.1		1.0	0.0	1.0	0.0
Prop. Right-Turns	0.0		0.3		0.0	0.1	0.0	0.3
Prop. Heavy Vehicle	0.0		0.0		0.0	0.0	0.0	0.0
hLT-adj	0.2	0.2	0.2	0.2	0.5	0.5	0.5	0.5
hRT-adj	-0.6	-0.6	-0.6	-0.6	-0.7	-0.7	-0.7	-0.7
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hedj, computed	0.2		-0.1		0.6	0.0	0.6	-0.1

Departure Headway and Service Time

hd, Initial value (s)	3.20		3.20		3.20	3.20	3.20	3.20
x, Initial	0.20		0.10		0.02	0.28	0.02	0.31
hd, final value (s)	6.33		6.39		6.79	6.23	6.76	6.03
x, final value	0.39		0.20		0.05	0.54	0.03	0.59
Move-up time, m (s)	2.0		2.0		2.3		2.3	
Service Time, t_s (s)	4.3		4.4		4.5	3.9	4.5	3.7

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	473		363		277	554	268	575
Delay (s/veh)	13.39		10.99		9.85	16.15	9.69	17.26
LOS	B		B		A	C	A	C
Approach: Delay (s/veh)	13.39		10.99		15.65		16.89	
LOS	B		B		C		C	
Intersection Delay (s/veh)	15.10							
Intersection LOS	C							

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ALL-WAY STOP CONTROL ANALYSIS

General Information

Analyst	MMF
Agency/Co.	ATE
Date Performed	3/21/2012
Analysis Time Period	P.M. PEAK HOUR

Site Information

Intersection	05_2014+ALT. 2_PM
Jurisdiction	SANTA BARBARA COUNTY
Analysis Year	2014+PROJECT (ALT. 2)

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: EDISON STREET | North/South Street: SR 154

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	132	84	7	6	76	31
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	27	295	20	18	248	105
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		L	TR	L	TR
PHF	1.00		1.00		1.00	1.00	1.00	1.00
Flow Rate (veh/h)	223		113		27	315	18	353
% Heavy Vehicles	4		4		4	4	4	4
No. Lanes	1		1		2		2	
Geometry Group	2		2		5		5	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	0.6		0.1		1.0	0.0	1.0	0.0
Prop. Right-Turns	0.0		0.3		0.0	0.1	0.0	0.3
Prop. Heavy Vehicle	0.0		0.0		0.0	0.0	0.0	0.0
hLT-adj	0.2	0.2	0.2	0.2	0.5	0.5	0.5	0.5
hRT-adj	-0.6	-0.6	-0.6	-0.6	-0.7	-0.7	-0.7	-0.7
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed	0.2		-0.1		0.6	0.0	0.6	-0.1

Departure Headway and Service Time

hd, initial value (s)	3.20		3.20		3.20	3.20	3.20	3.20
x, initial	0.20		0.10		0.02	0.28	0.02	0.31
hd, final value (s)	6.35		6.41		6.80	6.24	6.77	6.05
x, final value	0.39		0.20		0.05	0.55	0.03	0.59
Move-up time, m (s)	2.0		2.0		2.3		2.3	
Service Time, t_s (s)	4.3		4.4		4.5	3.9	4.5	3.7

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	473		363		277	553	268	574
Delay (s/veh)	13.45		11.03		9.86	16.40	9.70	17.45
LOS	B		B		A	C	A	C
Approach: Delay (s/veh)	13.45		11.03		15.88		17.08	
LOS	B		B		C		C	
Intersection Delay (s/veh)	15.26							
Intersection LOS	C							

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ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	MMF	Intersection	05_CU_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE (YEAR 2030)
Analysis Time Period	P.M. PEAK HOUR		

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: EDISON STREET | North/South Street: SR 154

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	126	61	9	21	63	46
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	17	497	31	22	363	125
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		L	TR	L	TR
PHF	1.00		1.00		1.00	1.00	1.00	1.00
Flow Rate (veh/h)	196		130		17	528	22	488
% Heavy Vehicles	4		4		4	4	4	4
No. Lanes	1		1		2		2	
Geometry Group	2		2		5		5	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	0.6		0.2		1.0	0.0	1.0	0.0
Prop. Right-Turns	0.0		0.4		0.0	0.1	0.0	0.3
Prop. Heavy Vehicle	0.0		0.0		0.0	0.0	0.0	0.0
hLT-adj	0.2	0.2	0.2	0.2	0.5	0.5	0.5	0.5
hRT-adj	-0.6	-0.6	-0.6	-0.6	-0.7	-0.7	-0.7	-0.7
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed	0.2		-0.1		0.6	0.0	0.6	-0.1

Departure Headway and Service Time

hd, initial value (s)	3.20		3.20		3.20	3.20	3.20	3.20
x, initial	0.17		0.12		0.02	0.47	0.02	0.43
hd, final value (s)	7.77		7.84		7.40	6.84	7.48	6.78
x, final value	0.42		0.28		0.03	1.00	0.05	0.92
Move-up time, m (s)	2.0		2.0		2.3		2.3	
Service Time, t_s (s)	5.8		5.8		5.1	4.5	5.2	4.5

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	446		380		267	528	272	529
Delay (s/veh)	16.44		13.93		10.37	124.25	10.54	65.24
LOS	C		B		B	F	B	F
Approach: Delay (s/veh)	16.44		13.93		120.69		62.88	
LOS	C		B		F		F	
Intersection Delay (s/veh)	74.50							
Intersection LOS	F							

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ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	MMF	Intersection	05_CU+PR (ALT. 1)_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE+PR (ALT.1)
Analysis Time Period	P.M. PEAK HOUR		

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: EDISON STREET | North/South Street: SR 154

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	126	61	9	21	63	49
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	17	499	31	28	366	125
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		L	TR	L	TR
PHF	1.00		1.00		1.00	1.00	1.00	1.00
Flow Rate (veh/h)	196		133		17	530	28	491
% Heavy Vehicles	4		4		4	4	4	4
No. Lanes	1		1		2		2	
Geometry Group	2		2		5		5	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	0.6		0.2		1.0	0.0	1.0	0.0
Prop. Right-Turns	0.0		0.4		0.0	0.1	0.0	0.3
Prop. Heavy Vehicle	0.0		0.0		0.0	0.0	0.0	0.0
hLT-adj	0.2	0.2	0.2	0.2	0.5	0.5	0.5	0.5
hRT-adj	-0.6	-0.6	-0.6	-0.6	-0.7	-0.7	-0.7	-0.7
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed	0.2		-0.1		0.6	0.0	0.6	-0.1

Departure Headway and Service Time

hd, initial value (s)	3.20		3.20		3.20	3.20	3.20	3.20
x, initial	0.17		0.12		0.02	0.47	0.02	0.44
hd, final value (s)	7.81		7.85		7.44	6.88	7.50	6.81
x, final value	0.42		0.29		0.04	1.01	0.06	0.93
Move-up time, m (s)	2.0		2.0		2.3		2.3	
Service Time, t_s (s)	5.8		5.9		5.1	4.6	5.2	4.5

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (vsh/h)	446		383		267	530	278	527
Delay (s/veh)	16.54		14.06		10.41	134.50	10.67	69.55
LOS	C		B		B	F	B	F
Approach: Delay (s/veh)	16.54		14.06		130.64		66.37	
LOS	C		B		F		F	
Intersection Delay (s/veh)	79.59							
Intersection LOS	F							

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ALL-WAY STOP CONTROL ANALYSIS

General Information		Site Information	
Analyst	MMF	Intersection	05_CU+PR (ALT. 2)_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE+PR (ALT. 2)
Analysis Time Period	P.M. PEAK HOUR		

Project ID #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: EDISON STREET | North/South Street: SR 154

Volume Adjustments and Site Characteristics

Approach	Eastbound			Westbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	126	61	9	21	63	49
%Thrus Left Lane						

Approach	Northbound			Southbound		
Movement	L	T	R	L	T	R
Volume (veh/h)	17	503	31	28	368	125
%Thrus Left Lane						

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Configuration	LTR		LTR		L	TR	L	TR
PHF	1.00		1.00		1.00	1.00	1.00	1.00
Flow Rate (veh/h)	196		133		17	534	28	493
% Heavy Vehicles	4		4		4	4	4	4
No. Lanes	1		1		2		2	
Geometry Group	2		2		5		5	
Duration, T	1.00							

Saturation Headway Adjustment Worksheet

Prop. Left-Turns	0.6		0.2		1.0	0.0	1.0	0.0
Prop. Right-Turns	0.0		0.4		0.0	0.1	0.0	0.3
Prop. Heevy Vehicle	0.0		0.0		0.0	0.0	0.0	0.0
hLT-adj	0.2	0.2	0.2	0.2	0.5	0.5	0.5	0.5
hRT-adj	-0.6	-0.6	-0.6	-0.6	-0.7	-0.7	-0.7	-0.7
hHV-adj	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hadj, computed	0.2		-0.1		0.6	0.0	0.6	-0.1

Departure Headway and Service Time

hd, initial value (s)	3.20		3.20		3.20	3.20	3.20	3.20
x, initial	0.17		0.12		0.02	0.47	0.02	0.44
hd, final value (s)	7.81		7.86		7.45	6.89	7.50	6.81
x, finel value	0.43		0.29		0.04	1.02	0.06	0.93
Move-up time, m (s)	2.0		2.0		2.3		2.3	
Service Time, t_s (s)	5.8		5.9		5.1	4.6	5.2	4.5

Capacity and Level of Service

	Eastbound		Westbound		Northbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	446		383		267	534	278	527
Delay (s/veh)	16.56		14.07		10.42	143.92	10.67	71.63
LOS	C		B		B	F	B	F
Approach: Delay (s/veh)	16.56		14.07		139.80		68.35	
LOS	C		B		F		F	
Intersection Delay (s/veh)	84.06							
Intersection LOS	F							

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1736	1827	1553	1736	1816		1736	1827	1553	1736	1661	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.73	1.00	1.00	0.75	1.00	
Satd. Flow (perm)	1736	1827	1553	1736	1816		1338	1827	1553	1362	1661	
Volume (vph)	12	592	30	120	453	19	28	18	170	78	15	23
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	12	592	30	120	453	19	28	18	170	78	15	23
RTOR Reduction (vph)	0	0	18	0	3	0	0	0	157	0	16	0
Lane Group Flow (vph)	12	592	12	120	469	0	28	18	13	78	22	0
Turn Type	Prot		Perm	Prot			Perm		Over	Perm		
Protected Phases	7	4		3	8			2	3		6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	0.7	23.2	23.2	4.4	26.9		17.6	17.6	4.4	17.6	17.6	
Effective Green, g (s)	0.7	23.2	23.2	4.4	26.9		17.6	17.6	4.4	17.6	17.6	
Actuated g/C Ratio	0.01	0.41	0.41	0.08	0.47		0.31	0.31	0.08	0.31	0.31	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	21	741	630	134	854		412	562	119	419	511	
v/s Ratio Prot	0.01	c0.32		c0.07	c0.26			0.01	0.01		0.01	
v/s Ratio Perm			0.01				0.02			c0.06		
v/c Ratio	0.57	0.80	0.02	0.90	0.55		0.07	0.03	0.11	0.19	0.04	
Uniform Delay, d1	28.1	14.9	10.2	26.2	10.8		14.0	13.8	24.6	14.5	13.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	32.5	6.0	0.0	47.3	0.7		0.3	0.1	0.4	1.0	0.2	
Delay (s)	60.6	21.0	10.2	73.5	11.6		14.3	14.0	25.0	15.5	14.1	
Level of Service	E	C	B	E	B		B	B	C	B	B	
Approach Delay (s)		21.2			24.1			22.7			15.0	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM Average Control Delay	22.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	57.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	58.8%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1736	1827	1553	1736	1816		1736	1827	1553	1736	1661	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.73	1.00	1.00	0.75	1.00	
Satd. Flow (perm)	1736	1827	1553	1736	1816		1338	1827	1553	1362	1661	
Volume (vph)	12	603	30	120	466	19	28	18	170	78	15	23
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	12	603	30	120	466	19	28	18	170	78	15	23
RTOR Reduction (vph)	0	0	18	0	2	0	0	0	157	0	16	0
Lane Group Flow (vph)	12	603	12	120	483	0	28	18	13	78	22	0
Turn Type	Prot		Perm	Prot			Perm		Over	Perm		
Protected Phases	7	4		3	8			2	3		6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	0.7	23.4	23.4	4.4	27.1		17.6	17.6	4.4	17.6	17.6	
Effective Green, g (s)	0.7	23.4	23.4	4.4	27.1		17.6	17.6	4.4	17.6	17.6	
Actuated g/C Ratio	0.01	0.41	0.41	0.08	0.47		0.31	0.31	0.08	0.31	0.31	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	21	745	633	133	857		410	560	119	418	509	
v/s Ratio Prot	0.01	c0.33		0.07	c0.27			0.01	c0.11		0.02	
v/s Ratio Perm			0.02				0.02			c0.06		
v/c Ratio	0.57	0.81	0.02	0.90	0.56		0.07	0.03	0.11	0.19	0.04	
Uniform Delay, d1	28.2	15.0	10.1	26.3	10.9		14.1	13.9	24.7	14.6	14.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	32.5	6.5	0.0	49.4	0.9		0.3	0.1	0.4	1.0	0.2	
Delay (s)	60.7	21.5	10.2	75.7	11.7		14.4	14.0	25.1	15.6	14.1	
Level of Service	E	C	B	E	B		B	B	C	B	B	
Approach Delay (s)		21.7			24.4			22.8			15.1	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM Average Control Delay	22.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	57.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	59.4%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1736	1827	1553	1736	1816		1736	1827	1553	1736	1661	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.73	1.00	1.00	0.75	1.00	
Satd. Flow (perm)	1736	1827	1553	1736	1816		1338	1827	1553	1362	1661	
Volume (vph)	12	607	30	126	478	19	28	18	172	78	15	23
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	12	607	30	126	478	19	28	18	172	78	15	23
RTOR Reduction (vph)	0	0	18	0	2	0	0	0	157	0	16	0
Lane Group Flow (vph)	12	607	12	126	495	0	28	18	15	78	22	0
Turn Type	Prot		Perm	Prot			Perm		Over	Perm		
Protected Phases	7*	4		3	8			2	3		6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	0.7	23.1	23.1	5.2	27.6		17.6	17.6	5.2	17.6	17.6	
Effective Green, g (s)	0.7	23.1	23.1	5.2	27.6		17.6	17.6	5.2	17.6	17.6	
Actuated g/C Ratio	0.01	0.40	0.40	0.09	0.48		0.30	0.30	0.09	0.30	0.30	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	21	729	620	156	866		407	555	139	414	505	
v/s Ratio Prot	0.01	c0.33		0.07	0.27			0.01	c0.11		0.02	
v/s Ratio Perm			0.02				0.02			c0.06		
v/c Ratio	0.57	0.83	0.02	0.81	0.57		0.07	0.03	0.11	0.19	0.04	
Uniform Delay, d1	28.5	15.7	10.5	25.9	10.9		14.3	14.2	24.2	14.9	14.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	32.5	8.1	0.0	25.5	0.9		0.3	0.1	0.4	1.0	0.2	
Delay (s)	60.9	23.7	10.6	51.3	11.8		14.7	14.3	24.6	15.9	14.4	
Level of Service	E	C	B	D	B		B	B	C	B	B	
Approach Delay (s)		23.8			19.8			22.5			15.4	
Approach LOS		C			B			C			B	

Intersection Summary			
HCM Average Control Delay	21.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	57.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.9%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1736	1827	1553	1736	1817		1736	1827	1553	1736	1661	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.73	1.00	1.00	0.75	1.00	
Satd. Flow (perm)	1736	1827	1553	1736	1817		1338	1827	1553	1362	1661	
Volume (vph)	12	616	30	129	484	19	28	18	176	78	15	23
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	12	616	30	129	484	19	28	18	176	78	15	23
RTOR Reduction (vph)	0	0	18	0	2	0	0	0	160	0	16	0
Lane Group Flow (vph)	12	616	12	129	501	0	28	18	16	78	22	0
Turn Type	Prot		Perm	Prot			Perm		Over	Perm		
Protected Phases	7	4		3	8		1	2	3		6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	0.7	23.5	23.5	5.2	28.0		16.6	16.6	5.2	16.6	16.6	
Effective Green, g (s)	0.7	23.5	23.5	5.2	28.0		16.6	16.6	5.2	16.6	16.6	
Actuated g/C Ratio	0.01	0.41	0.41	0.09	0.49		0.29	0.29	0.09	0.29	0.29	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	21	749	637	158	888		388	529	141	395	481	
v/s Ratio Prot	0.01	c0.34		0.07	0.28			0.01	c0.11		0.02	
v/s Ratio Perm			0.02				0.02			c0.06		
v/c Ratio	0.57	0.82	0.02	0.82	0.56		0.07	0.03	0.11	0.20	0.05	
Uniform Delay, d1	28.2	15.0	10.0	25.6	10.3		14.8	14.6	23.9	15.3	14.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	32.5	7.3	0.0	26.7	0.8		0.4	0.1	0.4	1.1	0.2	
Delay (s)	60.6	22.3	10.1	52.2	11.2		15.1	14.7	24.3	16.4	14.8	
Level of Service	E	C	B	D	B		B	B	C	B	B	
Approach Delay (s)		22.4			19.6			22.4			15.9	
Approach LOS		C			B			C			B	

Intersection Summary			
HCM Average Control Delay	20.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	57.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.6%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1736	1827	1553	1736	1805		1736	1827	1553	1736	1637	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.73	1.00	1.00	0.75	1.00	
Satd. Flow (perm)	1736	1827	1553	1736	1805		1325	1827	1553	1362	1637	
Volume (vph)	20	796	38	156	623	55	39	18	214	122	15	34
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	796	38	156	623	55	39	18	214	122	15	34
RTOR Reduction (vph)	0	0	20	0	5	0	0	0	194	0	25	0
Lane Group Flow (vph)	20	796	18	156	673	0	39	18	20	122	24	0
Turn Type	Prot		Perm	Prot			Perm		Over	Perm		
Protected Phases	7	4		3	8			2	3		6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	0.8	29.2	29.2	6.0	34.4		16.0	16.0	6.0	16.0	16.0	
Effective Green, g (s)	0.8	29.2	29.2	6.0	34.4		16.0	16.0	6.0	16.0	16.0	
Actuated g/C Ratio	0.01	0.46	0.46	0.09	0.54		0.25	0.25	0.09	0.25	0.25	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	22	844	718	165	982		335	463	147	345	414	
v/s Ratio Prot	0.01	c0.44		0.09	0.38			0.01	c0.14		0.03	
v/s Ratio Perm			0.02				0.03			c0.09		
v/c Ratio	0.91	0.94	0.02	0.95	0.69		0.12	0.04	0.14	0.35	0.06	
Uniform Delay, d1	31.2	16.2	9.3	28.4	10.5		18.2	17.8	26.2	19.4	17.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	148.5	18.5	0.0	53.7	2.0		0.7	0.2	0.4	2.8	0.3	
Delay (s)	179.6	34.7	9.3	82.1	12.5		18.9	18.0	26.7	22.2	18.1	
Level of Service	F	C	A	F	B		B	B	C	C	B	
Approach Delay (s)		37.0			25.5			25.0			21.0	
Approach LOS		D			C			C			C	

Intersection Summary

HCM Average Control Delay	29.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	63.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1736	1827	1553	1736	1805		1736	1827	1553	1736	1637	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.73	1.00	1.00	0.75	1.00	
Satd. Flow (perm)	1736	1827	1553	1736	1805		1325	1827	1553	1362	1637	
Volume (vph)	20	800	38	162	635	55	39	18	216	122	15	34
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	800	38	162	635	55	39	18	216	122	15	34
RTOR Reduction (vph)	0	0	20	0	5	0	0	0	195	0	25	0
Lane Group Flow (vph)	20	800	18	162	685	0	39	18	21	122	24	0
Turn Type	Prot		Perm	Prot			Perm		Over	Perm		
Protected Phases	7	4		3	8			2	3		6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	0.8	29.2	29.2	6.0	34.4		16.0	16.0	6.0	16.0	16.0	
Effective Green, g (s)	0.8	29.2	29.2	6.0	34.4		16.0	16.0	6.0	16.0	16.0	
Actuated g/C Ratio	0.01	0.46	0.46	0.09	0.54		0.25	0.25	0.09	0.25	0.25	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	22	844	718	165	982		335	463	147	345	414	
v/s Ratio Prot	0.01	c0.44		0.09	0.38			0.01	c0.14		0.03	
v/s Ratio Perm			0.02				0.03			c0.09		
v/c Ratio	0.91	0.95	0.02	0.98	0.70		0.12	0.04	0.14	0.35	0.06	
Uniform Delay, d1	31.2	16.3	9.3	28.5	10.6		18.2	17.8	26.2	19.4	17.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	148.5	19.3	0.0	64.3	2.2		0.7	0.2	0.4	2.8	0.3	
Delay (s)	179.6	35.5	9.3	92.9	12.8		18.9	18.0	26.7	22.2	18.1	
Level of Service	F	D	A	F	B		B	B	C	C	B	
Approach Delay (s)		37.7			28.0			25.0			21.0	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM Average Control Delay	30.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	63.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1736	1827	1553	1736	1805		1736	1827	1553	1736	1637	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.73	1.00	1.00	0.75	1.00	
Satd. Flow (perm)	1736	1827	1553	1736	1805		1325	1827	1553	1362	1637	
Volume (vph)	20	809	38	165	641	55	39	18	220	122	15	34
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	809	38	165	641	55	39	18	220	122	15	34
RTOR Reduction (vph)	0	0	20	0	5	0	0	0	199	0	25	0
Lane Group Flow (vph)	20	809	18	165	691	0	39	18	21	122	24	0
Turn Type	Prot		Perm	Prot			Perm		Over	Perm		
Protected Phases	7	4		3	8			2	3		6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	0.8	29.2	29.2	6.0	34.4		16.0	16.0	6.0	16.0	16.0	
Effective Green, g (s)	0.8	29.2	29.2	6.0	34.4		16.0	16.0	6.0	16.0	16.0	
Actuated g/C Ratio	0.01	0.46	0.46	0.09	0.54		0.25	0.25	0.09	0.25	0.25	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	22	844	718	165	982		335	463	147	345	414	
v/s Ratio Prot	0.01	c0.44		0.10	0.39			0.01	c0.14		0.03	
v/s Ratio Perm			0.02				0.03			c0.09		
v/c Ratio	0.91	0.96	0.02	1.00	0.70		0.12	0.04	0.14	0.35	0.06	
Uniform Delay, d1	31.2	16.4	9.3	28.6	10.6		18.2	17.8	26.2	19.4	17.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	148.5	21.2	0.0	70.1	2.3		0.7	0.2	0.4	2.8	0.3	
Delay (s)	179.6	37.6	9.3	98.7	13.0		18.9	18.0	26.7	22.2	18.1	
Level of Service	F	D	A	F	B		B	B	C	C	B	
Approach Delay (s)		39.7			29.4			25.0			21.0	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM Average Control Delay	32.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	63.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1736	1827	1553	1736	1814		1736	1827	1553	1736	1726	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.71	1.00	1.00	0.73	1.00	
Satd. Flow (perm)	1736	1827	1553	1736	1814		1306	1827	1553	1332	1726	
Volume (vph)	36	553	38	177	667	33	69	43	239	99	41	24
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	36	553	38	177	667	33	69	43	239	99	41	24
RTOR Reduction (vph)	0	0	23	0	3	0	0	0	205	0	17	0
Lane Group Flow (vph)	36	553	15	177	697	0	69	43	34	99	48	0
Turn Type	Prot		Perm	Prot			Perm		Over	Perm		
Protected Phases	7	4		3	8			2	3		6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	1.5	22.7	22.7	8.5	29.7		16.1	16.1	8.5	16.1	16.1	
Effective Green, g (s)	1.5	22.7	22.7	8.5	29.7		16.1	16.1	8.5	16.1	16.1	
Actuated g/C Ratio	0.03	0.38	0.38	0.14	0.50		0.27	0.27	0.14	0.27	0.27	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	44	699	594	249	909		355	496	223	362	469	
v/s Ratio Prot	0.02	0.30		c0.10	c0.38			0.02	0.02		0.03	
v/s Ratio Perm			0.01				0.05			c0.07		
v/c Ratio	0.82	0.79	0.02	0.71	0.77		0.19	0.09	0.15	0.27	0.10	
Uniform Delay, d1	28.8	16.2	11.4	24.2	12.0		16.6	16.1	22.2	17.0	16.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	69.3	6.1	0.0	9.2	3.9		1.2	0.3	0.3	1.9	0.4	
Delay (s)	98.1	22.3	11.4	33.4	15.9		17.8	16.5	22.6	18.9	16.6	
Level of Service	F	C	B	C	B		B	B	C	B	B	
Approach Delay (s)		26.0			19.4			20.9			18.0	
Approach LOS		C			B			C			B	

HCM Average Control Delay	21.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	59.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	62.6%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1736	1827	1553	1736	1814		1736	1827	1553	1736	1726	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.71	1.00	1.00	0.73	1.00	
Satd. Flow (perm)	1736	1827	1553	1736	1814		1306	1827	1553	1332	1726	
Volume (vph)	36	573	38	177	686	33	69	43	239	99	41	24
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	36	573	38	177	686	33	69	43	239	99	41	24
RTOR Reduction (vph)	0	0	23	0	2	0	0	0	205	0	18	0
Lane Group Flow (vph)	36	573	15	177	717	0	69	43	34	99	47	0
Turn Type	Prot		Perm	Prot			Perm		Over	Perm		
Protected Phases	7	4		3	8			2	3		6	7
Permitted Phases			4				2			6		
Actuated Green, G (s)	1.5	23.1	23.1	8.5	30.1		16.1	16.1	8.5	16.1	16.1	
Effective Green, g (s)	1.5	23.1	23.1	8.5	30.1		16.1	16.1	8.5	16.1	16.1	
Actuated g/C Ratio	0.03	0.39	0.39	0.14	0.50		0.27	0.27	0.14	0.27	0.27	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	44	707	601	247	915		352	493	221	359	465	
v/s Ratio Prot	0.02	0.31		0.10	c0.40			0.02	c0.15		0.04	
v/s Ratio Perm			0.02				0.05			c0.07		
v/c Ratio	0.82	0.81	0.02	0.72	0.78		0.20	0.09	0.15	0.28	0.10	
Uniform Delay, d1	29.0	16.3	11.3	24.4	12.1		16.8	16.3	22.4	17.2	16.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	69.3	7.0	0.0	9.5	4.4		1.2	0.3	0.3	1.9	0.4	
Delay (s)	98.3	23.3	11.3	34.0	16.6		18.1	16.7	22.8	19.1	16.8	
Level of Service	F	C	B	C	B		B	B	C	B	B	
Approach Delay (s)		26.8			20.0			21.1			18.2	
Approach LOS		C			B			C			B	

Intersection Summary			
HCM Average Control Delay	22.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	59.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.6%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1736	1827	1553	1736	1814		1736	1827	1553	1736	1726	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.71	1.00	1.00	0.73	1.00	
Satd. Flow (perm)	1736	1827	1553	1736	1814		1306	1827	1553	1332	1726	
Volume (vph)	36	587	38	181	694	33	69	43	245	99	41	24
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	36	587	38	181	694	33	69	43	245	99	41	24
RTOR Reduction (vph)	0	0	23	0	2	0	0	0	213	0	18	0
Lane Group Flow (vph)	36	587	15	181	725	0	69	43	32	99	47	0
Turn Type	Prot		Perm	Prot			Perm		Over	Perm		
Protected Phases	7	4		3	8			2	3		6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	1.5	23.7	23.7	7.9	30.1		16.1	16.1	7.9	16.1	16.1	
Effective Green, g (s)	1.5	23.7	23.7	7.9	30.1		16.1	16.1	7.9	16.1	16.1	
Actuated g/C Ratio	0.03	0.40	0.40	0.13	0.50		0.27	0.27	0.13	0.27	0.27	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	44	725	617	230	915		352	493	206	359	465	
v/s Ratio Prot	0.02	0.32		0.10	c0.40			0.02	c0.16		0.04	
v/s Ratio Perm			0.02				0.05			c0.07		
v/c Ratio	0.82	0.81	0.02	0.79	0.79		0.20	0.09	0.16	0.28	0.10	
Uniform Delay, d1	29.0	16.0	11.0	25.1	12.2		16.8	16.3	23.0	17.2	16.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	69.3	6.7	0.0	16.1	4.7		1.2	0.3	0.4	1.9	0.4	
Delay (s)	98.3	22.7	11.0	41.2	17.0		18.1	16.7	23.3	19.1	16.8	
Level of Service	F	C	B	D	B		B	B	C	B	B	
Approach Delay (s)		26.1			21.8			21.5			18.2	
Approach LOS		C			C			C			B	

Intersection Summary

HCM Average Control Delay	22.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	59.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1736	1827	1553	1736	1815		1736	1827	1553	1736	1726	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.71	1.00	1.00	0.73	1.00	
Satd. Flow (perm)	1736	1827	1553	1736	1815		1306	1827	1553	1332	1726	
Volume (vph)	36	592	38	186	702	33	69	43	247	99	41	24
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	36	592	38	186	702	33	69	43	247	99	41	24
RTOR Reduction (vph)	0	0	23	0	2	0	0	0	214	0	18	0
Lane Group Flow (vph)	36	592	15	186	733	0	69	43	33	99	47	0
Turn Type	Prot		Perm	Prot			Perm		Over	Perm		
Protected Phases	7	4		3	8			2	3		6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	1.5	23.8	23.8	8.0	30.3		16.1	16.1	8.0	16.1	16.1	
Effective Green, g (s)	1.5	23.8	23.8	8.0	30.3		16.1	16.1	8.0	16.1	16.1	
Actuated g/C Ratio	0.03	0.40	0.40	0.13	0.51		0.27	0.27	0.13	0.27	0.27	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	43	726	617	232	918		351	491	207	358	464	
v/s Ratio Prot	0.02	0.32		0.11	c0.41			0.02	c0.16		0.04	
v/s Ratio Perm			0.02				0.05			c0.07		
v/c Ratio	0.84	0.82	0.02	0.80	0.80		0.20	0.09	0.16	0.28	0.10	
Uniform Delay, d1	29.1	16.1	11.0	25.2	12.3		16.9	16.4	23.0	17.3	16.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	76.6	7.0	0.0	17.8	4.9		1.3	0.4	0.4	1.9	0.4	
Delay (s)	105.7	23.1	11.0	43.0	17.2		18.2	16.8	23.3	19.2	16.9	
Level of Service	F	C	B	D	B		B	B	C	B	B	
Approach Delay (s)		26.9			22.4			21.6			18.3	
Approach LOS		C			C			C			B	

Intersection Summary

HCM Average Control Delay	23.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	59.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1736	1827	1553	1736	1803		1736	1827	1553	1736	1701	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.71	1.00	1.00	0.73	1.00	
Satd. Flow (perm)	1736	1827	1553	1736	1803		1293	1827	1553	1332	1701	
Volume (vph)	44	757	46	226	861	82	80	43	283	143	41	35
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	44	757	46	226	861	82	80	43	283	143	41	35
RTOR Reduction (vph)	0	0	27	0	5	0	0	0	237	0	26	0
Lane Group Flow (vph)	44	757	19	226	938	0	80	43	46	143	50	0
Turn Type	Prot		Perm	Prot			Perm		Over	Perm		
Protected Phases	7	4		3	8			2	3		6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	2.4	25.6	25.6	8.0	31.2		16.0	16.0	8.0	16.0	16.0	
Effective Green, g (s)	2.4	25.6	25.6	8.0	31.2		16.0	16.0	8.0	16.0	16.0	
Actuated g/C Ratio	0.04	0.42	0.42	0.13	0.51		0.26	0.26	0.13	0.26	0.26	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	68	759	645	225	913		336	475	202	346	442	
v/s Ratio Prot	0.03	0.41		0.13	c0.52			0.02	c0.18		0.04	
v/s Ratio Perm			0.03				0.06			c0.11		
v/c Ratio	0.65	1.00	0.03	1.00	1.03		0.24	0.09	0.23	0.41	0.11	
Uniform Delay, d1	29.2	18.0	10.7	26.8	15.2		18.0	17.3	24.0	18.9	17.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	19.2	31.8	0.0	61.1	36.8		1.7	0.4	0.6	3.6	0.5	
Delay (s)	48.4	49.7	10.7	87.9	52.0		19.7	17.7	24.6	22.5	17.9	
Level of Service	D	D	B	F	D		B	B	C	C	B	
Approach Delay (s)		47.6			59.0			22.9			20.9	
Approach LOS		D			E			C			C	

Intersection Summary

HCM Average Control Delay	46.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	61.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1736	1827	1553	1736	1803		1736	1827	1553	1736	1701	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.71	1.00	1.00	0.73	1.00	
Satd. Flow (perm)	1736	1827	1553	1736	1803		1293	1827	1553	1332	1701	
Volume (vph)	44	771	46	230	869	82	80	43	289	143	41	35
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	44	771	46	230	869	82	80	43	289	143	41	35
RTOR Reduction (vph)	0	0	27	0	5	0	0	0	235	0	26	0
Lane Group Flow (vph)	44	771	19	230	946	0	80	43	54	143	50	0
Turn Type	Prot		Perm	Prot			Perm		Over	Perm		
Protected Phases	7	4		3	8			2	3		6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	2.4	25.6	25.6	8.0	31.2		16.0	16.0	8.0	16.0	16.0	
Effective Green, g (s)	2.4	25.6	25.6	8.0	31.2		16.0	16.0	8.0	16.0	16.0	
Actuated g/C Ratio	0.04	0.42	0.42	0.13	0.51		0.26	0.26	0.13	0.26	0.26	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	68	759	645	225	913		336	475	202	346	442	
v/s Ratio Prot	0.03	0.42		0.13	c0.53			0.02	c0.19		0.04	
v/s Ratio Perm			0.03				0.06			c0.11		
v/c Ratio	0.65	1.02	0.03	1.02	1.04		0.24	0.09	0.27	0.41	0.11	
Uniform Delay, d1	29.2	18.0	10.7	26.8	15.2		18.0	17.3	24.2	18.9	17.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	19.2	36.7	0.0	65.9	39.4		1.7	0.4	0.7	3.6	0.5	
Delay (s)	48.4	54.7	10.7	92.7	54.6		19.7	17.7	24.9	22.5	17.9	
Level of Service	D	D	B	F	D		B	B	C	C	B	
Approach Delay (s)		52.0			62.0			23.1			20.9	
Approach LOS		D			E			C			C	

Intersection Summary

HCM Average Control Delay	49.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	61.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1736	1827	1553	1736	1803		1736	1827	1553	1736	1701	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.71	1.00	1.00	0.73	1.00	
Satd. Flow (perm)	1736	1827	1553	1736	1803		1293	1827	1553	1332	1701	
Volume (vph)	44	776	46	235	877	82	80	43	291	143	41	35
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	44	776	46	235	877	82	80	43	291	143	41	35
RTOR Reduction (vph)	0	0	27	0	5	0	0	0	234	0	26	0
Lane Group Flow (vph)	44	776	19	235	954	0	80	43	57	143	50	0
Turn Type	Prot		Perm	Prot			Perm		Over	Perm		
Protected Phases	7	4		3	8			2	3		6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	2.4	25.6	25.6	8.0	31.2		16.0	16.0	8.0	16.0	16.0	
Effective Green, g (s)	2.4	25.6	25.6	8.0	31.2		16.0	16.0	8.0	16.0	16.0	
Actuated g/C Ratio	0.04	0.42	0.42	0.13	0.51		0.26	0.26	0.13	0.26	0.26	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	68	759	645	225	913		336	475	202	346	442	
v/s Ratio Prot	0.03	0.42		0.14	c0.53			0.02	c0.19		0.04	
v/s Ratio Perm			0.03				0.06			c0.11		
v/c Ratio	0.65	1.02	0.03	1.04	1.04		0.24	0.09	0.28	0.41	0.11	
Uniform Delay, d1	29.2	18.0	10.7	26.8	15.2		18.0	17.3	24.2	18.9	17.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	19.2	38.5	0.0	72.1	42.0		1.7	0.4	0.8	3.6	0.5	
Delay (s)	48.4	56.5	10.7	98.9	57.2		19.7	17.7	25.0	22.5	17.9	
Level of Service	D	E	B	F	E		B	B	C	C	B	
Approach Delay (s)		53.6			65.4			23.2			20.9	
Approach LOS		D			E			C			C	

Intersection Summary

HCM Average Control Delay	51.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	61.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	1709		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.75	1.00		0.75	1.00	1.00
Satd. Flow (perm)	1736	1827	1553	1736	1827	1553	1376	1709		1367	1827	1553
Volume (vph)	230	591	15	8	459	156	6	8	6	131	7	194
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	230	591	15	8	459	156	6	8	6	131	7	194
RTOR Reduction (vph)	0	0	7	0	0	102	0	4	0	0	0	161
Lane Group Flow (vph)	230	591	8	8	459	54	6	10	0	131	7	33
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		Over
Protected Phases	7	4		3	8			2			6	7
Permitted Phases			4			8	2			6		
Actuated Green, G (s)	10.3	30.3	30.3	0.8	20.8	20.8	17.1	17.1		17.1	17.1	10.3
Effective Green, g (s)	10.3	30.3	30.3	0.8	20.8	20.8	17.1	17.1		17.1	17.1	10.3
Actuated g/C Ratio	0.17	0.50	0.50	0.01	0.35	0.35	0.28	0.28		0.28	0.28	0.17
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	297	920	782	23	631	537	391	485		388	519	266
v/s Ratio Prot	c0.13	0.32		0.00	c0.25			0.01			0.00	0.02
v/s Ratio Perm			0.00			0.03	0.00			c0.10		
v/c Ratio	0.77	0.64	0.01	0.35	0.73	0.10	0.02	0.02		0.34	0.01	0.12
Uniform Delay, d1	23.8	11.0	7.5	29.4	17.2	13.4	15.5	15.5		17.1	15.5	21.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	11.9	1.5	0.0	8.9	4.2	0.1	0.1	0.1		2.3	0.0	0.2
Delay (s)	35.7	12.5	7.5	38.4	21.4	13.4	15.6	15.6		19.4	15.5	21.3
Level of Service	D	B	A	D	C	B	B	B		B	B	C
Approach Delay (s)		18.8			19.6			15.6			20.5	
Approach LOS		B			B			B			C	

HCM Average Control Delay	19.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	60.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.8%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	1709		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.75	1.00		0.75	1.00	1.00
Satd. Flow (perm)	1736	1827	1553	1736	1827	1553	1376	1709		1367	1827	1553
Volume (vph)	235	597	15	8	467	156	6	8	6	132	7	199
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	235	597	15	8	467	156	6	8	6	132	7	199
RTOR Reduction (vph)	0	0	7	0	0	102	0	4	0	0	0	165
Lane Group Flow (vph)	235	597	8	8	467	54	6	10	0	132	7	34
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		Over
Protected Phases	7	4		3	8			2			6	7
Permitted Phases			4			8	2			6		
Actuated Green, G (s)	10.3	30.5	30.5	0.8	21.0	21.0	17.1	17.1		17.1	17.1	10.3
Effective Green, g (s)	10.3	30.5	30.5	0.8	21.0	21.0	17.1	17.1		17.1	17.1	10.3
Actuated g/C Ratio	0.17	0.50	0.50	0.01	0.35	0.35	0.28	0.28		0.28	0.28	0.17
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	296	923	784	23	635	540	390	484		387	517	265
v/s Ratio Prot	c0.14	0.33		0.00	c0.26			0.01			0.00	0.13
v/s Ratio Perm			0.01			0.10	0.00			c0.10		
v/c Ratio	0.79	0.65	0.01	0.35	0.74	0.10	0.02	0.02		0.34	0.01	0.13
Uniform Delay, d1	24.0	11.0	7.4	29.5	17.3	13.3	15.6	15.6		17.2	15.6	21.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	13.6	1.6	0.0	8.9	4.4	0.1	0.1	0.1		2.4	0.0	0.2
Delay (s)	37.6	12.6	7.4	38.5	21.7	13.4	15.7	15.7		19.6	15.6	21.5
Level of Service	D	B	A	D	C	B	B	B		B	B	C
Approach Delay (s)		19.4			19.9			15.7			20.6	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM Average Control Delay	19.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	60.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.6%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	1709		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.75	1.00		0.75	1.00	1.00
Satd. Flow (perm)	1736	1827	1553	1736	1827	1553	1376	1709		1367	1827	1553
Volume (vph)	235	603	15	8	485	162	6	8	6	134	7	199
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	235	603	15	8	485	162	6	8	6	134	7	199
RTOR Reduction (vph)	0	0	7	0	0	105	0	4	0	0	0	165
Lane Group Flow (vph)	235	603	8	8	485	57	6	10	0	134	7	34
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		Over
Protected Phases	7	4		3	8		5	2			6	7
Permitted Phases			4			8	2			6		
Actuated Green, G (s)	10.3	30.8	30.8	0.8	21.3	21.3	17.1	17.1		17.1	17.1	10.3
Effective Green, g (s)	10.3	30.8	30.8	0.8	21.3	21.3	17.1	17.1		17.1	17.1	10.3
Actuated g/C Ratio	0.17	0.51	0.51	0.01	0.35	0.35	0.28	0.28		0.28	0.28	0.17
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	295	927	788	23	641	545	388	481		385	515	264
v/s Ratio Prot	c0.14	0.33		0.00	c0.27			0.01			0.00	0.13
v/s Ratio Perm			0.01			0.10	0.00			c0.10		
v/c Ratio	0.80	0.65	0.01	0.35	0.76	0.10	0.02	0.02		0.35	0.01	0.13
Uniform Delay, d1	24.2	11.0	7.4	29.7	17.4	13.3	15.7	15.7		17.4	15.7	21.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	13.8	1.6	0.0	8.9	5.1	0.1	0.1	0.1		2.5	0.0	0.2
Delay (s)	38.0	12.6	7.4	38.6	22.5	13.4	15.8	15.8		19.8	15.8	21.6
Level of Service	D	B	A	D	C	B	B	B		B	B	C
Approach Delay (s)		19.5			20.4			15.8			20.8	
Approach LOS		B			C			B			C	

Intersection Summary			
HCM Average Control Delay	20.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	60.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.6%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	1709		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.75	1.00		0.75	1.00	1.00
Satd. Flow (perm)	1736	1827	1553	1736	1827	1553	1376	1709		1367	1827	1553
Volume (vph)	235	616	15	8	494	165	6	8	6	138	7	199
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	235	616	15	8	494	165	6	8	6	138	7	199
RTOR Reduction (vph)	0	0	7	0	0	107	0	4	0	0	0	165
Lane Group Flow (vph)	235	616	8	8	494	58	6	10	0	138	7	34
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		Over
Protected Phases	7	4		3	8			2			6	7
Permitted Phases			4			8	2			6		
Actuated Green, G (s)	10.3	31.0	31.0	0.8	21.5	21.5	17.1	17.1		17.1	17.1	10.3
Effective Green, g (s)	10.3	31.0	31.0	0.8	21.5	21.5	17.1	17.1		17.1	17.1	10.3
Actuated g/C Ratio	0.17	0.51	0.51	0.01	0.35	0.35	0.28	0.28		0.28	0.28	0.17
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	294	930	791	23	645	548	386	480		384	513	263
v/s Ratio Prot	c0.14	0.34		0.00	c0.27			0.01			0.00	0.13
v/s Ratio Perm			0.01			0.11	0.00			c0.10		
v/c Ratio	0.80	0.66	0.01	0.35	0.77	0.11	0.02	0.02		0.36	0.01	0.13
Uniform Delay, d1	24.3	11.1	7.4	29.8	17.5	13.2	15.8	15.8		17.5	15.8	21.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	14.1	1.8	0.0	8.9	5.4	0.1	0.1	0.1		2.6	0.0	0.2
Delay (s)	38.4	12.9	7.4	38.7	22.9	13.3	15.9	15.9		20.1	15.9	21.7
Level of Service	D	B	A	D	C	B	B	B		C	B	C
Approach Delay (s)		19.7			20.7			15.9			21.0	
Approach LOS		B			C			B			C	

Intersection Summary

HCM Average Control Delay	20.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	60.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.3%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	1679		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.75	1.00		0.75	1.00	1.00
Satd. Flow (perm)	1736	1827	1553	1736	1827	1553	1378	1679		1368	1827	1553
Volume (vph)	219	1012	10	14	791	196	9	6	7	181	5	217
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	219	1012	10	14	791	196	9	6	7	181	5	217
RTOR Reduction (vph)	0	0	5	0	0	109	0	5	0	0	0	193
Lane Group Flow (vph)	219	1012	5	14	791	87	9	8	0	181	5	24
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		Over
Protected Phases	7	4		3	8			2			6	7
Permitted Phases			4			8	2			6		
Actuated Green, G (s)	7.0	34.4	34.4	0.8	28.2	28.2	16.0	16.0		16.0	16.0	7.0
Effective Green, g (s)	7.0	34.4	34.4	0.8	28.2	28.2	16.0	16.0		16.0	16.0	7.0
Actuated g/C Ratio	0.11	0.54	0.54	0.01	0.45	0.45	0.25	0.25		0.25	0.25	0.11
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	192	994	845	22	815	693	349	425		346	463	172
v/s Ratio Prot	0.13	c0.55		0.01	0.43			0.01			0.00	c0.14
v/s Ratio Perm			0.01			0.13	0.01			c0.13		
v/c Ratio	1.14	1.02	0.01	0.64	0.97	0.13	0.03	0.02		0.52	0.01	0.14
Uniform Delay, d1	28.1	14.4	6.6	31.1	17.1	10.3	17.7	17.7		20.3	17.7	25.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	107.9	33.2	0.0	47.5	24.4	0.1	0.1	0.1		5.6	0.0	0.4
Delay (s)	136.0	47.6	6.6	78.6	41.5	10.4	17.9	17.8		25.9	17.7	25.8
Level of Service	F	D	A	E	D	B	B	B		C	B	C
Approach Delay (s)		62.8			35.9			17.8			25.7	
Approach LOS		E			D			B			C	

Intersection Summary

HCM Average Control Delay	46.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	63.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	1679		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.75	1.00		0.75	1.00	1.00
Satd. Flow (perm)	1736	1827	1553	1736	1827	1553	1378	1679		1368	1827	1553
Volume (vph)	219	1018	10	14	809	202	9	6	7	183	5	217
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	219	1018	10	14	809	202	9	6	7	183	5	217
RTOR Reduction (vph)	0	0	5	0	0	112	0	5	0	0	0	193
Lane Group Flow (vph)	219	1018	5	14	809	90	9	8	0	183	5	24
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		Over
Protected Phases	7	4		3	8			2			6	7
Permitted Phases			4			8	2			6		
Actuated Green, G (s)	7.0	34.4	34.4	0.8	28.2	28.2	16.0	16.0		16.0	16.0	7.0
Effective Green, g (s)	7.0	34.4	34.4	0.8	28.2	28.2	16.0	16.0		16.0	16.0	7.0
Actuated g/C Ratio	0.11	0.54	0.54	0.01	0.45	0.45	0.25	0.25		0.25	0.25	0.11
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	192	994	845	22	815	693	349	425		346	463	172
v/s Ratio Prot	0.13	c0.56		0.01	0.44			0.01			0.00	c0.14
v/s Ratio Perm			0.01			0.13	0.01			c0.13		
v/c Ratio	1.14	1.02	0.01	0.64	0.99	0.13	0.03	0.02		0.53	0.01	0.14
Uniform Delay, d1	28.1	14.4	6.6	31.1	17.4	10.3	17.7	17.7		20.4	17.7	25.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	107.9	34.8	0.0	47.5	29.5	0.1	0.1	0.1		5.7	0.0	0.4
Delay (s)	136.0	49.2	6.6	78.6	46.9	10.4	17.9	17.8		26.0	17.7	25.8
Level of Service	F	D	A	E	D	B	B	B		C	B	C
Approach Delay (s)		64.1			40.2			17.8			25.8	
Approach LOS		E			D			B			C	

Intersection Summary

HCM Average Control Delay	48.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	63.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	1679		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.75	1.00		0.75	1.00	1.00
Satd. Flow (perm)	1736	1827	1553	1736	1827	1553	1378	1679		1368	1827	1553
Volume (vph)	219	1031	10	14	818	205	9	6	7	187	5	217
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	219	1031	10	14	818	205	9	6	7	187	5	217
RTOR Reduction (vph)	0	0	5	0	0	114	0	5	0	0	0	193
Lane Group Flow (vph)	219	1031	5	14	818	91	9	8	0	187	5	24
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		Over
Protected Phases	7	4		3	8			2			6	7
Permitted Phases			4			8	2			6		
Actuated Green, G (s)	7.0	34.4	34.4	0.8	28.2	28.2	16.0	16.0		16.0	16.0	7.0
Effective Green, g (s)	7.0	34.4	34.4	0.8	28.2	28.2	16.0	16.0		16.0	16.0	7.0
Actuated g/C Ratio	0.11	0.54	0.54	0.01	0.45	0.45	0.25	0.25		0.25	0.25	0.11
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	192	994	845	22	815	693	349	425		346	463	172
v/s Ratio Prot	0.13	c0.56		0.01	0.45			0.01			0.00	c0.14
v/s Ratio Perm			0.01			0.13	0.01			c0.14		
v/c Ratio	1.14	1.04	0.01	0.64	1.00	0.13	0.03	0.02		0.54	0.01	0.14
Uniform Delay, d1	28.1	14.4	6.6	31.1	17.5	10.3	17.7	17.7		20.4	17.7	25.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	107.9	38.6	0.0	47.5	32.4	0.1	0.1	0.1		5.9	0.0	0.4
Delay (s)	136.0	53.0	6.6	78.6	49.9	10.4	17.9	17.8		26.4	17.7	25.8
Level of Service	F	D	A	E	D	B	B	B		C	B	C
Approach Delay (s)		67.1			42.5			17.8			25.9	
Approach LOS		E			D			B			C	

Intersection Summary

HCM Average Control Delay	51.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	63.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	1716		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.75	1.00		0.72	1.00	1.00
Satd. Flow (perm)	1736	1827	1553	1736	1827	1553	1362	1716		1315	1827	1553
Volume (vph)	264	563	25	8	574	181	37	34	23	188	18	356
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	264	563	25	8	574	181	37	34	23	188	18	356
RTOR Reduction (vph)	0	0	12	0	0	113	0	17	0	0	0	295
Lane Group Flow (vph)	264	563	13	8	574	68	37	40	0	188	18	61
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		Over
Protected Phases	7	4		5	6			2			6	7
Permitted Phases			4			8	2			6		
Actuated Green, G (s)	10.7	30.4	33.4	0.8	23.5	23.5	16.0	16.0		16.0	16.0	10.7
Effective Green, g (s)	10.7	33.4	33.4	0.8	23.5	23.5	16.0	16.0		16.0	16.0	10.7
Actuated g/C Ratio	0.17	0.54	0.54	0.01	0.38	0.38	0.26	0.26		0.26	0.26	0.17
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	299	981	834	22	690	587	350	441		338	470	267
v/s Ratio Prot	c0.15	0.31		0.00	c0.31			0.02			0.01	0.04
v/s Ratio Perm			0.01			0.04	0.03			c0.14		
v/c Ratio	0.88	0.57	0.02	0.36	0.83	0.12	0.11	0.09		0.56	0.04	0.23
Uniform Delay, d1	25.1	9.6	6.7	30.4	17.6	12.6	17.6	17.6		20.0	17.3	22.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	24.9	0.8	0.0	9.9	8.5	0.1	0.6	0.4		6.5	0.2	0.4
Delay (s)	50.0	10.5	6.7	40.4	26.0	12.7	18.2	18.0		26.5	17.5	22.6
Level of Service	D	B	A	D	C	B	B	B		C	B	C
Approach Delay (s)		22.6			23.0			18.1			23.8	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM Average Control Delay	22.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	62.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		

c - Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	1716		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.75	1.00		0.72	1.00	1.00
Satd. Flow (perm)	1736	1827	1553	1736	1827	1553	1362	1716		1315	1827	1553
Volume (vph)	271	576	25	8	584	183	37	34	23	188	18	365
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	271	576	25	8	584	183	37	34	23	188	18	365
RTOR Reduction (vph)	0	0	12	0	0	114	0	17	0	0	0	307
Lane Group Flow (vph)	271	576	13	8	584	69	37	40	0	188	18	58
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		Over
Protected Phases	7	4		3	8			2			6	7
Permitted Phases			4			8	2			6		
Actuated Green, G (s)	10.0	32.9	32.9	0.8	23.7	23.7	17.0	17.0		17.0	17.0	10.0
Effective Green, g (s)	10.0	32.9	32.9	0.8	23.7	23.7	17.0	17.0		17.0	17.0	10.0
Actuated g/C Ratio	0.16	0.52	0.52	0.01	0.38	0.38	0.27	0.27		0.27	0.27	0.16
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	277	959	815	22	691	587	369	465		357	495	248
v/s Ratio Prot	0.16	0.32		0.00	c0.32			0.03			0.01	c0.24
v/s Ratio Perm			0.02			0.12	0.03			c0.14		
v/c Ratio	0.98	0.60	0.02	0.36	0.85	0.12	0.10	0.09		0.53	0.04	0.23
Uniform Delay, d1	26.2	10.3	7.1	30.7	17.8	12.7	17.1	17.1		19.4	16.8	23.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	47.5	1.1	0.0	9.9	9.3	0.1	0.5	0.4		5.5	0.1	0.5
Delay (s)	73.8	11.4	7.1	40.6	27.2	12.8	17.7	17.4		24.9	17.0	23.5
Level of Service	E	B	A	D	C	B	B	B		C	B	C
Approach Delay (s)		30.7			23.9			17.5			23.8	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM Average Control Delay	26.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	62.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	1716		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.75	1.00		0.72	1.00	1.00
Satd. Flow (perm)	1736	1827	1553	1736	1827	1553	1362	1716		1315	1827	1553
Volume (vph)	271	596	25	8	596	187	37	34	23	194	18	365
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	271	596	25	8	596	187	37	34	23	194	18	365
RTOR Reduction (vph)	0	0	12	0	0	116	0	17	0	0	0	307
Lane Group Flow (vph)	271	596	13	8	596	71	37	40	0	194	18	58
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		Over
Protected Phases	7	4		3	8			2			6	7
Permitted Phases			4			8	2			6		
Actuated Green, G (s)	10.0	33.1	33.1	0.8	23.9	23.9	17.0	17.0		17.0	17.0	10.0
Effective Green, g (s)	10.0	33.1	33.1	0.8	23.9	23.9	17.0	17.0		17.0	17.0	10.0
Actuated g/C Ratio	0.16	0.53	0.53	0.01	0.38	0.38	0.27	0.27		0.27	0.27	0.16
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	276	961	817	22	694	590	368	464		355	494	247
v/s Ratio Prot	0.16	0.33		0.00	c0.33			0.03			0.01	c0.24
v/s Ratio Perm			0.02			0.12	0.03			c0.15		
v/c Ratio	0.98	0.62	0.02	0.36	0.86	0.12	0.10	0.09		0.55	0.04	0.23
Uniform Delay, d1	26.4	10.5	7.1	30.8	17.9	12.7	17.2	17.1		19.6	16.9	23.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	48.9	1.3	0.0	9.9	10.3	0.1	0.5	0.4		5.9	0.1	0.5
Delay (s)	75.3	11.7	7.1	40.7	28.3	12.8	17.8	17.5		25.6	17.1	23.6
Level of Service	E	B	A	D	C	B	B	B		C	B	C
Approach Delay (s)		30.9			24.7			17.6			24.1	
Approach LOS		C			C			B			C	

Intersection Summary

HCM Average Control Delay	26.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	62.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	1716		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.75	1.00		0.72	1.00	1.00
Satd. Flow (perm)	1736	1827	1553	1736	1827	1553	1362	1716		1315	1827	1553
Volume (vph)	271	603	25	8	609	192	37	34	23	196	18	365
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	271	603	25	8	609	192	37	34	23	196	18	365
RTOR Reduction (vph)	0	0	12	0	0	118	0	17	0	0	0	307
Lane Group Flow (vph)	271	603	13	8	609	74	37	40	0	196	18	58
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		Over
Protected Phases	7	4		3	8			2			6	7
Permitted Phases			4			8	2			6		
Actuated Green, G (s)	10.0	33.4	33.4	0.8	24.2	24.2	17.0	17.0		17.0	17.0	10.0
Effective Green, g (s)	10.0	33.4	33.4	0.8	24.2	24.2	17.0	17.0		17.0	17.0	10.0
Actuated g/C Ratio	0.16	0.53	0.53	0.01	0.38	0.38	0.27	0.27		0.27	0.27	0.16
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	275	966	821	22	700	595	366	462		354	491	246
v/s Ratio Prot	0.16	0.33		0.00	c0.33			0.03			0.01	c0.24
v/s Ratio Perm			0.02			0.12	0.03			c0.15		
v/c Ratio	0.99	0.62	0.02	0.36	0.87	0.12	0.10	0.09		0.55	0.04	0.23
Uniform Delay, d1	26.5	10.5	7.1	30.9	18.0	12.6	17.4	17.3		19.8	17.1	23.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	49.8	1.3	0.0	9.9	11.4	0.1	0.6	0.4		6.1	0.1	0.5
Delay (s)	76.4	11.8	7.1	40.9	29.5	12.7	17.9	17.7		26.0	17.2	23.7
Level of Service	E	B	A	D	C	B	B	B		C	B	C
Approach Delay (s)		31.1			25.6			17.8			24.3	
Approach LOS		C			C			B			C	

Intersection Summary

HCM Average Control Delay	27.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	63.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	1781		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.74	1.00		0.73	1.00	1.00
Satd. Flow (perm)	1736	1827	1553	1736	1827	1553	1360	1781		1326	1827	1553
Volume (vph)	263	882	21	16	951	157	48	40	8	245	20	323
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	263	882	21	16	951	157	48	40	8	245	20	323
RTOR Reduction (vph)	0	0	10	0	0	89	0	6	0	0	0	287
Lane Group Flow (vph)	263	882	11	16	951	68	48	42	0	245	20	36
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		Over
Protected Phases	7	4		3	8			2			6	7
Permitted Phases			4			8	2			6		
Actuated Green, G (s)	7.0	33.4	33.4	0.8	27.2	27.2	17.0	17.0		17.0	17.0	7.0
Effective Green, g (s)	7.0	33.4	33.4	0.8	27.2	27.2	17.0	17.0		17.0	17.0	7.0
Actuated g/C Ratio	0.11	0.53	0.53	0.01	0.43	0.43	0.27	0.27		0.27	0.27	0.11
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	192	966	821	22	786	668	366	479		357	491	172
v/s Ratio Prot	0.15	0.48		0.01	c0.52			0.03			0.01	c0.21
v/s Ratio Perm			0.01			0.10	0.04			c0.18		
v/c Ratio	1.37	0.91	0.01	0.73	1.21	0.10	0.13	0.09		0.69	0.04	0.21
Uniform Delay, d1	28.1	13.6	7.1	31.1	18.0	10.7	17.5	17.3		20.7	17.1	25.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	195.9	12.7	0.0	76.4	106.2	0.1	0.7	0.4		10.3	0.2	0.6
Delay (s)	224.0	26.2	7.1	107.5	124.2	10.8	18.2	17.7		31.0	17.2	26.2
Level of Service	F	C	A	F	F	B	B	B		C	B	C
Approach Delay (s)		70.5			108.1			18.0			27.9	
Approach LOS		E			F			B			C	

Intersection Summary

HCM Average Control Delay	74.6	HCM Level of Service	E
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	63.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	94.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	1781		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.74	1.00		0.73	1.00	1.00
Satd. Flow (perm)	1736	1827	1553	1736	1827	1553	1360	1781		1326	1827	1553
Volume (vph)	263	902	21	16	963	161	48	40	8	251	20	323
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	263	902	21	16	963	161	48	40	8	251	20	323
RTOR Reduction (vph)	0	0	10	0	0	92	0	6	0	0	0	287
Lane Group Flow (vph)	263	902	11	16	963	69	48	42	0	251	20	36
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		Over
Protected Phases	7	4		3	8			2			6	7
Permitted Phases			4			8	2			6		
Actuated Green, G (s)	7.0	33.4	33.4	0.8	27.2	27.2	17.0	17.0		17.0	17.0	7.0
Effective Green, g (s)	7.0	33.4	33.4	0.8	27.2	27.2	17.0	17.0		17.0	17.0	7.0
Actuated g/C Ratio	0.11	0.53	0.53	0.01	0.43	0.43	0.27	0.27		0.27	0.27	0.11
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	192	966	821	22	786	668	366	479		357	491	172
v/s Ratio Prot	0.15	0.49		0.01	c0.53			0.03			0.01	c0.21
v/s Ratio Perm			0.01			0.10	0.04			c0.19		
v/c Ratio	1.37	0.93	0.01	0.73	1.23	0.10	0.13	0.09		0.70	0.04	0.21
Uniform Delay, d1	28.1	13.9	7.1	31.1	18.0	10.7	17.5	17.3		20.8	17.1	25.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	195.9	15.4	0.0	76.4	112.6	0.1	0.7	0.4		11.0	0.2	0.6
Delay (s)	224.0	29.3	7.1	107.5	130.6	10.8	18.2	17.7		31.9	17.2	26.2
Level of Service	F	C	A	F	F	B	B	B		C	B	C
Approach Delay (s)		72.0			113.3			18.0			28.3	
Approach LOS		E			F			B			C	

Intersection Summary

HCM Average Control Delay	77.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	63.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	95.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	1781		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.74	1.00		0.73	1.00	1.00
Satd. Flow (perm)	1736	1827	1553	1736	1827	1553	1360	1781		1326	1827	1553
Volume (vph)	263	909	21	16	976	166	48	40	8	253	20	323
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	263	909	21	16	976	166	48	40	8	253	20	323
RTOR Reduction (vph)	0	0	10	0	0	95	0	6	0	0	0	287
Lane Group Flow (vph)	263	909	11	16	976	71	48	42	0	253	20	36
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		Over
Protected Phases	7	4		3	8			2			6	7
Permitted Phases			4			8	2			6		
Actuated Green, G (s)	7.0	33.4	33.4	0.8	27.2	27.2	17.0	17.0		17.0	17.0	7.0
Effective Green, g (s)	7.0	33.4	33.4	0.8	27.2	27.2	17.0	17.0		17.0	17.0	7.0
Actuated g/C Ratio	0.11	0.53	0.53	0.01	0.43	0.43	0.27	0.27		0.27	0.27	0.11
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	192	966	821	22	786	668	366	479		357	491	172
v/s Ratio Prot	0.15	0.50		0.01	c0.53			0.03			0.01	c0.21
v/s Ratio Perm			0.01			0.11	0.04			c0.19		
v/c Ratio	1.37	0.94	0.01	0.73	1.24	0.11	0.13	0.09		0.71	0.04	0.21
Uniform Delay, d1	28.1	14.0	7.1	31.1	18.0	10.7	17.5	17.3		20.9	17.1	25.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	195.9	16.5	0.0	76.4	119.5	0.1	0.7	0.4		11.3	0.2	0.6
Delay (s)	224.0	30.5	7.1	107.5	137.5	10.8	18.2	17.7		32.2	17.2	26.2
Level of Service	F	C	A	F	F	B	B	B		C	B	C
Approach Delay (s)		72.8			118.9			18.0			28.4	
Approach LOS		E			F			B			C	

Intersection Summary

HCM Average Control Delay	79.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	63.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	96.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.91		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1800		1736	1788		1736	1671		1736	1597	
Flt Permitted	0.95	1.00		0.95	1.00		0.58	1.00		0.71	1.00	
Satd. Flow (perm)	1736	1800		1736	1788		1055	1671		1306	1597	
Volume (vph)	140	423	47	28	318	52	49	28	37	109	37	191
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	140	423	47	28	318	52	49	28	37	109	37	191
RTOR Reduction (vph)	0	7	0	0	10	0	0	24	0	0	125	0
Lane Group Flow (vph)	140	463	0	28	360	0	49	41	0	109	103	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	6.9	22.3		1.4	16.8		18.7	18.7		18.7	18.7	
Effective Green, g (s)	6.9	22.3		1.4	16.8		18.7	18.7		18.7	18.7	
Actuated g/C Ratio	0.13	0.41		0.03	0.31		0.34	0.34		0.34	0.34	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	220	738		45	552		363	574		449	549	
v/s Ratio Prot	c0.08	c0.26		0.02	0.20			0.02			0.06	
v/s Ratio Perm							0.05			c0.08		
v/c Ratio	0.64	0.63		0.62	0.65		0.13	0.07		0.24	0.19	
Uniform Delay, d1	22.6	12.7		26.2	16.3		12.3	12.0		12.8	12.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.9	1.7		23.8	2.8		0.8	0.2		1.3	0.8	
Delay (s)	28.5	14.4		50.0	19.0		13.1	12.2		14.1	13.3	
Level of Service	C	B		D	B		B	B		B	B	
Approach Delay (s)		17.6			21.2			12.6			13.5	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM Average Control Delay	17.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	54.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.8%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.91		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1800		1736	1789		1736	1671		1736	1597	
Flt Permitted	0.95	1.00		0.95	1.00		0.57	1.00		0.71	1.00	
Satd. Flow (perm)	1736	1800		1736	1789		1050	1671		1306	1597	
Volume (vph)	140	431	47	28	326	52	49	28	37	109	37	191
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	140	431	47	28	326	52	49	28	37	109	37	191
RTOR Reduction (vph)	0	7	0	0	10	0	0	25	0	0	128	0
Lane Group Flow (vph)	140	471	0	28	368	0	49	40	0	109	100	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	6.9	22.4		1.4	16.9		17.7	17.7		17.7	17.7	
Effective Green, g (s)	6.9	22.4		1.4	16.9		17.7	17.7		17.7	17.7	
Actuated g/C Ratio	0.13	0.42		0.03	0.32		0.33	0.33		0.33	0.33	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	224	754		45	565		347	553		432	528	
v/s Ratio Prot	c0.08	c0.27		0.02	0.21			0.04			c0.14	
v/s Ratio Perm							0.05			0.08		
v/c Ratio	0.62	0.62		0.62	0.65		0.14	0.07		0.25	0.19	
Uniform Delay, d1	22.1	12.2		25.8	15.8		12.6	12.3		13.1	12.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.3	1.6		23.8	2.7		0.9	0.3		1.4	0.8	
Delay (s)	27.4	13.9		49.6	18.4		13.4	12.5		14.5	13.6	
Level of Service	C	B		D	B		B	B		B	B	
Approach Delay (s)		16.9			20.6			12.9			13.9	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM Average Control Delay	16.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	53.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.3%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.91		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1800		1736	1788		1736	1671		1736	1597	
Flt Permitted	0.95	1.00		0.95	1.00		0.57	1.00		0.71	1.00	
Satd. Flow (perm)	1736	1800		1736	1788		1040	1671		1306	1597	
Volume (vph)	140	439	47	28	350	58	49	28	37	111	37	191
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	140	439	47	28	350	58	49	28	37	111	37	191
RTOR Reduction (vph)	0	7	0	0	11	0	0	25	0	0	131	0
Lane Group Flow (vph)	140	479	0	28	397	0	49	40	0	111	97	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	6.9	23.0		1.4	17.5		16.8	16.8		16.8	16.8	
Effective Green, g (s)	6.9	23.0		1.4	17.5		16.8	16.8		16.8	16.8	
Actuated g/C Ratio	0.13	0.43		0.03	0.33		0.32	0.32		0.32	0.32	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	225	778		46	588		328	528		412	504	
v/s Ratio Prot	c0.08	c0.27		0.02	0.23			0.04			c0.14	
v/s Ratio Perm							0.05			0.09		
v/c Ratio	0.62	0.62		0.61	0.68		0.15	0.08		0.27	0.19	
Uniform Delay, d1	21.9	11.7		25.6	15.4		13.1	12.8		13.6	13.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.3	1.5		20.7	3.1		1.0	0.3		1.6	0.9	
Delay (s)	27.2	13.1		46.3	18.5		14.0	13.0		15.2	14.1	
Level of Service	C	B		D	B		B	B		B	B	
Approach Delay (s)		16.3			20.3			13.5			14.5	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM Average Control Delay	16.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	53.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.1%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.91		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1801		1736	1787		1736	1671		1736	1597	
Flt Permitted	0.95	1.00		0.95	1.00		0.57	1.00		0.71	1.00	
Satd. Flow (perm)	1736	1801		1736	1787		1044	1671		1306	1597	
Volume (vph)	140	456	47	28	362	61	49	28	37	115	37	191
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	140	456	47	28	362	61	49	28	37	115	37	191
RTOR Reduction (vph)	0	6	0	0	11	0	0	25	0	0	129	0
Lane Group Flow (vph)	140	497	0	28	412	0	49	40	0	115	99	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	6.4	23.1		1.4	18.1		17.7	17.7		17.7	17.7	
Effective Green, g (s)	6.4	23.1		1.4	18.1		17.7	17.7		17.7	17.7	
Actuated g/C Ratio	0.12	0.43		0.03	0.33		0.33	0.33		0.33	0.33	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	205	768		45	597		341	546		426	522	
v/s Ratio Prot	c0.08	c0.28		0.02	0.24			0.04			c0.14	
v/s Ratio Perm							0.05			0.09		
v/c Ratio	0.68	0.65		0.62	0.69		0.14	0.07		0.27	0.19	
Uniform Delay, d1	22.9	12.3		26.1	15.6		12.9	12.6		13.5	13.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.0	1.9		23.8	3.4		0.9	0.3		1.6	0.8	
Delay (s)	32.0	14.2		49.9	19.1		13.8	12.9		15.0	13.9	
Level of Service	C	B		D	B		B	B		B	B	
Approach Delay (s)		18.1			21.0			13.3			14.3	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM Average Control Delay	17.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	54.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.9%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.91		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1792		1736	1781		1736	1658		1736	1615	
Flt Permitted	0.95	1.00		0.95	1.00		0.46	1.00		0.71	1.00	
Satd. Flow (perm)	1736	1792		1736	1781		846	1658		1296	1615	
Volume (vph)	256	688	100	40	541	108	81	28	45	167	60	204
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	256	688	100	40	541	108	81	28	45	167	60	204
RTOR Reduction (vph)	0	8	0	0	12	0	0	33	0	0	148	0
Lane Group Flow (vph)	256	780	0	40	637	0	81	40	0	167	116	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	9.0	31.8		1.6	24.4		17.0	17.0		17.0	17.0	
Effective Green, g (s)	9.0	31.8		1.6	24.4		17.0	17.0		17.0	17.0	
Actuated g/C Ratio	0.14	0.51		0.03	0.39		0.27	0.27		0.27	0.27	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	250	913		45	696		230	452		353	440	
v/s Ratio Prot	c0.15	c0.44		0.02	0.36			0.04			c0.16	
v/s Ratio Perm							0.10			0.13		
v/c Ratio	1.02	0.85		0.89	0.92		0.35	0.09		0.47	0.26	
Uniform Delay, d1	26.7	13.3		30.3	18.0		18.3	16.9		19.0	17.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	63.3	7.9		91.4	16.7		4.2	0.4		4.5	1.5	
Delay (s)	90.0	21.1		121.7	34.7		22.5	17.3		23.5	19.2	
Level of Service	F	C		F	C		C	B		C	B	
Approach Delay (s)		38.0			39.8			20.0			20.9	
Approach LOS		D			D			C			C	

Intersection Summary

HCM Average Control Delay	34.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	62.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	0.91		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1792		1736	1781		1736	1658		1736	1615	
Flt Permitted	0.95	1.00		0.95	1.00		0.45	1.00		0.71	1.00	
Satd. Flow (perm)	1736	1792		1736	1781		819	1658		1296	1615	
Volume (vph)	256	696	100	40	565	114	81	28	45	169	60	204
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	256	696	100	40	565	114	81	28	45	169	60	204
RTOR Reduction (vph)	0	8	0	0	12	0	0	33	0	0	152	0
Lane Group Flow (vph)	256	788	0	40	667	0	81	40	0	169	112	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	9.0	32.8		1.6	25.4		16.0	16.0		16.0	16.0	
Effective Green, g (s)	9.0	32.8		1.6	25.4		16.0	16.0		16.0	16.0	
Actuated g/C Ratio	0.14	0.53		0.03	0.41		0.26	0.26		0.26	0.26	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	250	942		45	725		210	425		332	414	
v/s Ratio Prot	c0.15	0.44		0.02	c0.38			0.04			c0.16	
v/s Ratio Perm							0.10			0.13		
v/c Ratio	1.02	0.84		0.89	0.92		0.39	0.09		0.51	0.27	
Uniform Delay, d1	26.7	12.5		30.3	17.5		19.1	17.7		19.8	18.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	63.3	6.6		91.4	17.0		5.3	0.4		5.5	1.6	
Delay (s)	90.0	19.1		121.7	34.5		24.4	18.1		25.3	20.2	
Level of Service	F	B		F	C		C	B		C	C	
Approach Delay (s)		36.3			39.3			21.4			22.2	
Approach LOS		D			D			C			C	

Intersection Summary

HCM Average Control Delay	33.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	62.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	0.91		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1793		1736	1781		1736	1658		1736	1615	
Flt Permitted	0.95	1.00		0.95	1.00		0.45	1.00		0.71	1.00	
Satd. Flow (perm)	1736	1793		1736	1781		819	1658		1296	1615	
Volume (vph)	256	713	100	40	577	117	81	28	45	173	60	204
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	256	713	100	40	577	117	81	28	45	173	60	204
RTOR Reduction (vph)	0	8	0	0	12	0	0	33	0	0	152	0
Lane Group Flow (vph)	256	805	0	40	682	0	81	40	0	173	112	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	9.0	32.8		1.6	25.4		16.0	16.0		16.0	16.0	
Effective Green, g (s)	9.0	32.8		1.6	25.4		16.0	16.0		16.0	16.0	
Actuated g/C Ratio	0.14	0.53		0.03	0.41		0.26	0.26		0.26	0.26	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	250	942		45	725		210	425		332	414	
v/s Ratio Prot	c0.15	0.45		0.02	c0.39			0.04			c0.16	
v/s Ratio Perm							0.10			0.13		
v/c Ratio	1.02	0.86		0.89	0.94		0.39	0.09		0.52	0.27	
Uniform Delay, d1	26.7	12.8		30.3	17.8		19.1	17.7		19.9	18.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	63.3	7.7		91.4	20.3		5.3	0.4		5.7	1.6	
Delay (s)	90.0	20.4		121.7	38.1		24.4	18.1		25.7	20.2	
Level of Service	F	C		F	D		C	B		C	C	
Approach Delay (s)		37.1			42.6			21.4			22.3	
Approach LOS		D			D			C			C	

Intersection Summary

HCM Average Control Delay	35.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	62.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	85.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.92		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1814		1736	1791		1736	1675		1736	1574	
Flt Permitted	0.95	1.00		0.95	1.00		0.62	1.00		0.73	1.00	
Satd. Flow (perm)	1736	1814		1736	1791		1128	1675		1340	1574	
Volume (vph)	173	546	28	23	584	89	32	16	20	52	13	159
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	173	546	28	23	584	89	32	16	20	52	13	159
RTOR Reduction (vph)	0	3	0	0	9	0	0	15	0	0	116	0
Lane Group Flow (vph)	173	571	0	23	664	0	32	21	0	52	56	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	7.0	32.8		0.8	26.6		17.0	17.0		17.0	17.0	
Effective Green, g (s)	7.0	32.8		0.8	26.6		17.0	17.0		17.0	17.0	
Actuated g/C Ratio	0.11	0.52		0.01	0.42		0.27	0.27		0.27	0.27	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	194	950		22	761		306	455		364	427	
v/s Ratio Prot	c0.10	0.31		0.01	c0.37			0.01			0.04	
v/s Ratio Perm							0.03			c0.04		
v/c Ratio	0.89	0.60		1.05	0.87		0.10	0.05		0.14	0.13	
Uniform Delay, d1	27.4	10.4		30.9	16.5		17.1	16.8		17.3	17.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	36.2	1.1		206.7	10.8		0.7	0.2		0.8	0.6	
Delay (s)	63.6	11.4		237.6	27.3		17.8	17.0		18.1	17.9	
Level of Service	E	B		F	C		B	B		B	B	
Approach Delay (s)		23.5			34.2			17.4			17.9	
Approach LOS		C			C			B			B	

HCM Average Control Delay	26.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	62.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.92		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1814		1736	1791		1736	1675		1736	1574	
Flt Permitted	0.95	1.00		0.95	1.00		0.62	1.00		0.73	1.00	
Satd. Flow (perm)	1736	1814		1736	1791		1126	1675		1340	1574	
Volume (vph)	173	559	28	23	596	89	32	16	20	52	13	159
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	173	559	28	23	596	89	32	16	20	52	13	159
RTOR Reduction (vph)	0	2	0	0	9	0	0	15	0	0	116	0
Lane Group Flow (vph)	173	585	0	23	676	0	32	21	0	52	56	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	7.0	33.0		0.8	26.8		17.0	17.0		17.0	17.0	
Effective Green, g (s)	7.0	33.0		0.8	26.8		17.0	17.0		17.0	17.0	
Actuated g/C Ratio	0.11	0.53		0.01	0.43		0.27	0.27		0.27	0.27	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	194	953		22	764		305	453		363	426	
v/s Ratio Prot	c0.10	0.32		0.01	c0.38			0.02			c0.11	
v/s Ratio Perm							0.03			0.04		
v/c Ratio	0.89	0.61		1.05	0.89		0.10	0.05		0.14	0.13	
Uniform Delay, d1	27.5	10.4		31.0	16.6		17.2	16.9		17.4	17.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	36.2	1.2		206.7	11.9		0.7	0.2		0.8	0.6	
Delay (s)	63.7	11.6		237.7	28.5		17.9	17.1		18.2	18.0	
Level of Service	E	B		F	C		B	B		B	B	
Approach Delay (s)		23.5			35.3			17.5			18.0	
Approach LOS		C			D			B			B	

Intersection Summary

HCM Average Control Delay	27.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	62.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.92		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1814		1736	1792		1736	1675		1736	1574	
Flt Permitted	0.95	1.00		0.95	1.00		0.61	1.00		0.73	1.00	
Satd. Flow (perm)	1736	1814		1736	1792		1123	1675		1340	1574	
Volume (vph)	173	586	28	23	612	90	32	16	20	58	13	159
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	173	586	28	23	612	90	32	16	20	58	13	159
RTOR Reduction (vph)	0	2	0	0	9	0	0	15	0	0	116	0
Lane Group Flow (vph)	173	612	0	23	693	0	32	21	0	58	56	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	7.0	33.4		0.8	27.2		17.0	17.0		17.0	17.0	
Effective Green, g (s)	7.0	33.4		0.8	27.2		17.0	17.0		17.0	17.0	
Actuated g/C Ratio	0.11	0.53		0.01	0.43		0.27	0.27		0.27	0.27	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	192	959		22	771		302	451		360	423	
v/s Ratio Prot	c0.10	0.34		0.01	c0.39			0.02			c0.11	
v/s Ratio Perm							0.03			0.04		
v/c Ratio	0.90	0.64		1.05	0.90		0.11	0.05		0.16	0.13	
Uniform Delay, d1	27.8	10.6		31.2	16.7		17.4	17.1		17.7	17.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	38.5	1.4		206.7	13.3		0.7	0.2		1.0	0.6	
Delay (s)	66.2	12.0		237.9	30.0		18.1	17.3		18.6	18.2	
Level of Service	E	B		F	C		B	B		B	B	
Approach Delay (s)		23.9			36.6			17.7			18.3	
Approach LOS		C			D			B			B	

Intersection Summary

HCM Average Control Delay	28.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	63.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.92		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1815		1736	1791		1736	1675		1736	1574	
Flt Permitted	0.95	1.00		0.95	1.00		0.61	1.00		0.73	1.00	
Satd. Flow (perm)	1736	1815		1736	1791		1112	1675		1340	1574	
Volume (vph)	173	595	28	23	630	95	32	16	20	60	13	159
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	173	595	28	23	630	95	32	16	20	60	13	159
RTOR Reduction (vph)	0	2	0	0	9	0	0	15	0	0	119	0
Lane Group Flow (vph)	173	621	0	23	716	0	32	21	0	60	53	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	7.0	34.3		0.8	28.1		16.0	16.0		16.0	16.0	
Effective Green, g (s)	7.0	34.3		0.8	28.1		16.0	16.0		16.0	16.0	
Actuated g/C Ratio	0.11	0.54		0.01	0.45		0.25	0.25		0.25	0.25	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	193	987		22	798		282	425		340	399	
v/s Ratio Prot	c0.10	0.34		0.01	c0.40			0.02			c0.11	
v/s Ratio Perm							0.03			0.04		
v/c Ratio	0.90	0.63		1.05	0.90		0.11	0.05		0.18	0.13	
Uniform Delay, d1	27.7	10.0		31.2	16.2		18.1	17.8		18.4	18.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	37.0	1.3		206.7	12.7		0.8	0.2		1.1	0.7	
Delay (s)	64.7	11.3		237.8	28.9		18.9	18.0		19.5	18.9	
Level of Service	E	B		F	C		B	B		B	B	
Approach Delay (s)		22.9			35.3			18.4			19.1	
Approach LOS		C			D			B			B	

Intersection Summary

HCM Average Control Delay	27.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	63.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.92		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1815		1736	1789		1736	1677		1736	1576	
Flt Permitted	0.95	1.00		0.95	1.00		0.50	1.00		0.72	1.00	
Satd. Flow (perm)	1736	1815		1736	1789		911	1677		1309	1576	
Volume (vph)	176	971	45	29	802	128	69	28	34	90	20	215
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	176	971	45	29	802	128	69	28	34	90	20	215
RTOR Reduction (vph)	0	2	0	0	9	0	0	25	0	0	160	0
Lane Group Flow (vph)	176	1014	0	29	921	0	69	37	0	90	75	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	5.0	32.8		1.6	29.4		16.0	16.0		16.0	16.0	
Effective Green, g (s)	5.0	32.8		1.6	29.4		16.0	16.0		16.0	16.0	
Actuated g/C Ratio	0.08	0.53		0.03	0.47		0.26	0.26		0.26	0.26	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	139	954		45	843		234	430		336	404	
v/s Ratio Prot	c0.10	c0.56		0.02	0.52			0.04			c0.15	
v/s Ratio Perm							0.08			0.07		
v/c Ratio	1.27	1.06		0.64	1.09		0.29	0.09		0.27	0.19	
Uniform Delay, d1	28.7	14.8		30.1	16.5		18.7	17.6		18.5	18.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	164.6	47.2		27.5	59.3		3.2	0.4		1.9	1.0	
Delay (s)	193.3	62.0		57.6	75.8		21.8	18.0		20.5	19.1	
Level of Service	F	E		E	E		C	B		C	B	
Approach Delay (s)		81.4			75.3			20.0			19.5	
Approach LOS		F			E			C			B	

Intersection Summary

HCM Average Control Delay	68.4	HCM Level of Service	E
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	62.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.92		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1813		1736	1789		1736	1677		1736	1576	
Flt Permitted	0.95	1.00		0.95	1.00		0.51	1.00		0.72	1.00	
Satd. Flow (perm)	1736	1813		1736	1789		933	1677		1309	1576	
Volume (vph)	176	818	45	29	818	132	69	28	34	96	20	215
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	176	818	45	29	818	132	69	28	34	96	20	215
RTOR Reduction (vph)	0	3	0	0	9	0	0	25	0	0	156	0
Lane Group Flow (vph)	176	860	0	29	941	0	69	37	0	96	79	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	5.0	31.8		1.6	28.4		17.0	17.0		17.0	17.0	
Effective Green, g (s)	5.0	31.8		1.6	28.4		17.0	17.0		17.0	17.0	
Actuated g/C Ratio	0.08	0.51		0.03	0.46		0.27	0.27		0.27	0.27	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	139	924		45	814		254	457		357	429	
v/s Ratio Prot	c0.10	c0.48		0.02	c0.53			0.04			c0.15	
v/s Ratio Perm							0.07			0.07		
v/c Ratio	1.27	0.93		0.64	1.16		0.27	0.08		0.27	0.18	
Uniform Delay, d1	28.7	14.3		30.1	17.0		17.8	16.9		17.8	17.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	164.6	15.5		27.5	83.8		2.6	0.3		1.8	0.9	
Delay (s)	193.3	29.8		57.6	100.8		20.5	17.2		19.7	18.3	
Level of Service	F	C		E	F		C	B		B	B	
Approach Delay (s)		57.5			99.5			18.9			18.7	
Approach LOS		E			F			B			B	

Intersection Summary

HCM Average Control Delay	66.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	62.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	92.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.92		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1813		1736	1788		1736	1677		1736	1576	
Flt Permitted	0.95	1.00		0.95	1.00		0.51	1.00		0.72	1.00	
Satd. Flow (perm)	1736	1813		1736	1788		933	1677		1309	1576	
Volume (vph)	176	827	45	29	836	137	69	28	34	98	20	215
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	176	827	45	29	836	137	69	28	34	98	20	215
RTOR Reduction (vph)	0	3	0	0	9	0	0	25	0	0	156	0
Lane Group Flow (vph)	176	869	0	29	964	0	69	37	0	98	79	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	5.0	31.8		1.6	28.4		17.0	17.0		17.0	17.0	
Effective Green, g (s)	5.0	31.8		1.6	28.4		17.0	17.0		17.0	17.0	
Actuated g/C Ratio	0.08	0.51		0.03	0.46		0.27	0.27		0.27	0.27	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	139	924		45	814		254	457		357	429	
v/s Ratio Prot	c0.10	c0.48		0.02	c0.54			0.04			c0.15	
v/s Ratio Perm							0.07			0.07		
v/c Ratio	1.27	0.94		0.64	1.18		0.27	0.08		0.27	0.18	
Uniform Delay, d1	28.7	14.4		30.1	17.0		17.8	16.9		17.9	17.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	164.6	17.0		27.5	95.2		2.6	0.3		1.9	0.9	
Delay (s)	193.3	31.4		57.6	112.2		20.5	17.2		19.7	18.3	
Level of Service	F	C		E	F		C	B		B	B	
Approach Delay (s)		58.6			110.6			18.9			18.7	
Approach LOS		E			F			B			B	

Intersection Summary

HCM Average Control Delay	72.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	62.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	93.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.98			0.96			0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1736	1810		1736	1794			1737			1678	
Flt Permitted	0.95	1.00		0.95	1.00			0.96			0.92	
Satd. Flow (perm)	1736	1810		1736	1794			1680			1568	
Volume (vph)	121	213	14	52	137	19	8	26	15	62	51	120
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	121	213	14	52	137	19	8	26	15	62	51	120
RTOR Reduction (vph)	0	4	0	0	10	0	0	8	0	0	50	0
Lane Group Flow (vph)	121	223	0	52	146	0	0	41	0	0	183	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	7.8	14.7		3.3	10.2			23.8			23.8	
Effective Green, g (s)	7.8	14.7		3.3	10.2			23.8			23.8	
Actuated g/C Ratio	0.14	0.27		0.06	0.19			0.44			0.44	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	252	495		106	340			743			694	
v/s Ratio Prot	c0.07	c0.12		0.03	0.08							
v/s Ratio Perm								0.02			c0.12	
v/c Ratio	0.48	0.45		0.49	0.43			0.05			0.26	
Uniform Delay, d1	21.1	16.2		24.4	19.2			8.6			9.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.4	0.7		3.5	0.9			0.1			0.9	
Delay (s)	22.6	16.9		28.0	20.1			8.7			10.4	
Level of Service	C	B		C	C			A			B	
Approach Delay (s)		18.8			22.1			8.7			10.4	
Approach LOS		B			C			A			B	

Intersection Summary			
HCM Average Control Delay	16.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	53.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	45.5%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.97			0.96			0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.98	
Satd. Flow (prot)	1736	1810		1736	1769			1737			1680	
Flt Permitted	0.95	1.00		0.95	1.00			0.96			0.90	
Satd. Flow (perm)	1736	1810		1736	1769			1676			1538	
Volume (vph)	127	215	14	52	139	37	8	26	15	82	51	126
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	127	215	14	52	139	37	8	26	15	82	51	126
RTOR Reduction (vph)	0	4	0	0	19	0	0	8	0	0	44	0
Lane Group Flow (vph)	127	225	0	52	157	0	0	41	0	0	215	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	7.8	15.0		3.2	10.4			23.5			23.5	
Effective Green, g (s)	7.8	15.0		3.2	10.4			23.5			23.5	
Actuated g/C Ratio	0.15	0.28		0.06	0.19			0.44			0.44	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	252	506		103	343			733			673	
v/s Ratio Prot	c0.07	c0.13		0.03	0.10							
v/s Ratio Perm								0.03			c0.17	
v/c Ratio	0.50	0.44		0.50	0.46			0.06			0.32	
Uniform Delay, d1	21.2	15.9		24.5	19.2			8.7			9.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.6	0.6		3.9	1.0			0.1			1.2	
Delay (s)	22.8	16.5		28.3	20.1			8.8			11.1	
Level of Service	C	B		C	C			A			B	
Approach Delay (s)		18.8			22.0			8.8			11.1	
Approach LOS		B			C			A			B	

Intersection Summary			
HCM Average Control Delay	16.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	53.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	48.2%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.97			0.95			0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.98	
Satd. Flow (prot)	1736	1811		1736	1773			1725			1681	
Flt Permitted	0.95	1.00		0.95	1.00			0.96			0.90	
Satd. Flow (perm)	1736	1811		1736	1773			1668			1534	
Volume (vph)	127	229	14	60	175	43	8	26	19	84	51	126
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	127	229	14	60	175	43	8	26	19	84	51	126
RTOR Reduction (vph)	0	4	0	0	17	0	0	11	0	0	45	0
Lane Group Flow (vph)	127	239	0	60	201	0	0	42	0	0	216	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	7.4	13.3		4.3	10.2			23.1			23.1	
Effective Green, g (s)	7.4	13.3		4.3	10.2			23.1			23.1	
Actuated g/C Ratio	0.14	0.25		0.08	0.19			0.44			0.44	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	244	457		142	343			731			672	
v/s Ratio Prot	c0.07	c0.13		0.03	0.12							
v/s Ratio Perm								0.03			c0.17	
v/c Ratio	0.52	0.52		0.42	0.59			0.06			0.32	
Uniform Delay, d1	21.0	17.0		23.0	19.3			8.5			9.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	2.0	1.1		2.0	2.6			0.2			1.3	
Delay (s)	23.0	18.0		25.0	21.9			8.7			10.9	
Level of Service	C	B		C	C			A			B	
Approach Delay (s)		19.7			22.6			8.7			10.9	
Approach LOS		B			C			A			B	

Intersection Summary

HCM Average Control Delay	17.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	52.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.6%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.97			0.94			0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.98	
Satd. Flow (prot)	1736	1813		1736	1774			1707			1682	
Flt Permitted	0.95	1.00		0.95	1.00			0.96			0.89	
Satd. Flow (perm)	1736	1813		1736	1774			1657			1524	
Volume (vph)	127	260	14	70	193	46	8	26	27	88	51	126
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	127	260	14	70	193	46	8	26	27	88	51	126
RTOR Reduction (vph)	0	4	0	0	16	0	0	15	0	0	45	0
Lane Group Flow (vph)	127	270	0	70	223	0	0	46	0	0	220	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	7.2	13.9		3.8	10.5			24.3			24.3	
Effective Green, g (s)	7.2	13.9		3.8	10.5			24.3			24.3	
Actuated g/C Ratio	0.13	0.26		0.07	0.19			0.45			0.45	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	231	467		122	345			746			686	
v/s Ratio Prot	c0.07	c0.15		0.04	0.13							
v/s Ratio Perm								0.04			c0.17	
v/c Ratio	0.55	0.58		0.57	0.65			0.06			0.32	
Uniform Delay, d1	21.9	17.5		24.3	20.0			8.4			9.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	2.7	1.7		6.4	4.1			0.2			1.2	
Delay (s)	24.6	19.2		30.7	24.2			8.6			10.8	
Level of Service	C	B		C	C			A			B	
Approach Delay (s)		20.9			25.6			8.6			10.8	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM Average Control Delay	19.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	54.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	51.9%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.91			0.90	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1736	1818		1736	1798			1654			1635	
Flt Permitted	0.95	1.00		0.95	1.00			0.96			0.94	
Satd. Flow (perm)	1736	1818		1736	1798			1594			1554	
Volume (vph)	153	329	11	23	220	26	7	10	32	54	26	201
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	153	329	11	23	220	26	7	10	32	54	26	201
RTOR Reduction (vph)	0	2	0	0	7	0	0	21	0	0	130	0
Lane Group Flow (vph)	153	338	0	23	239	0	0	28	0	0	151	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	7.8	21.1		1.0	14.3			18.6			18.6	
Effective Green, g (s)	7.8	21.1		1.0	14.3			18.6			18.6	
Actuated g/C Ratio	0.15	0.40		0.02	0.27			0.35			0.35	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	257	728		33	488			563			548	
v/s Ratio Prot	c0.09	c0.19		0.01	0.14							
v/s Ratio Perm								0.03			c0.18	
v/c Ratio	0.60	0.46		0.70	0.49			0.05			0.28	
Uniform Delay, d1	21.0	11.6		25.7	16.1			11.2			12.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	3.7	0.5		48.5	0.8			0.2			1.2	
Delay (s)	24.7	12.1		74.2	16.9			11.4			13.5	
Level of Service	C	B		E	B			B			B	
Approach Delay (s)		16.0			21.8			11.4			13.5	
Approach LOS		B			C			B			B	

Intersection Summary

HCM Average Control Delay	16.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	52.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.0%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.91			0.90	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1736	1818		1736	1796			1649			1636	
Flt Permitted	0.95	1.00		0.95	1.00			0.96			0.94	
Satd. Flow (perm)	1736	1818		1736	1796			1593			1550	
Volume (vph)	153	343	11	31	256	32	7	10	36	56	26	201
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	153	343	11	31	256	32	7	10	36	56	26	201
RTOR Reduction (vph)	0	2	0	0	8	0	0	23	0	0	129	0
Lane Group Flow (vph)	153	352	0	31	280	0	0	30	0	0	154	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	7.7	20.1		2.1	14.5			19.1			19.1	
Effective Green, g (s)	7.7	20.1		2.1	14.5			19.1			19.1	
Actuated g/C Ratio	0.14	0.38		0.04	0.27			0.36			0.36	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	251	686		68	489			571			555	
v/s Ratio Prot	c0.09	c0.19		0.02	0.16							
v/s Ratio Perm								0.03			c0.18	
v/c Ratio	0.61	0.51		0.46	0.57			0.05			0.28	
Uniform Delay, d1	21.4	12.8		25.0	16.7			11.2			12.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	4.2	0.7		4.8	1.6			0.2			1.2	
Delay (s)	25.5	13.5		29.8	18.4			11.4			13.4	
Level of Service	C	B		C	B			B			B	
Approach Delay (s)		17.1			19.5			11.4			13.4	
Approach LOS		B			B			B			B	

Intersection Summary

HCM Average Control Delay	16.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	53.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.4%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.90			0.91	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1736	1819		1736	1796			1640			1637	
Flt Permitted	0.95	1.00		0.95	1.00			0.97			0.93	
Satd. Flow (perm)	1736	1819		1736	1796			1591			1543	
Volume (vph)	153	374	11	41	274	35	7	10	44	60	26	201
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	153	374	11	41	274	35	7	10	44	60	26	201
RTOR Reduction (vph)	0	2	0	0	8	0	0	28	0	0	128	0
Lane Group Flow (vph)	153	383	0	41	301	0	0	33	0	0	159	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	7.4	20.8		1.7	15.1			19.8			19.8	
Effective Green, g (s)	7.4	20.8		1.7	15.1			19.8			19.8	
Actuated g/C Ratio	0.14	0.38		0.03	0.28			0.36			0.36	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	237	697		54	499			580			563	
v/s Ratio Prot	c0.09	c0.21		0.02	0.17							
v/s Ratio Perm								0.04			c0.19	
v/c Ratio	0.65	0.55		0.76	0.60			0.06			0.28	
Uniform Delay, d1	22.2	13.1		26.1	17.0			11.2			12.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	5.9	0.9		45.2	2.1			0.2			1.3	
Delay (s)	28.1	14.0		71.3	19.1			11.4			13.5	
Level of Service	C	B		E	B			B			B	
Approach Delay (s)		18.0			25.2			11.4			13.5	
Approach LOS		B			C			B			B	

Intersection Summary

HCM Average Control Delay	18.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	54.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.7%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.97			0.94			0.91	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1736	1801		1736	1775			1700			1653	
Flt Permitted	0.95	1.00		0.95	1.00			0.89			0.94	
Satd. Flow (perm)	1736	1801		1736	1775			1536			1569	
Volume (vph)	194	179	19	71	308	72	37	56	72	42	58	190
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	194	179	19	71	308	72	37	56	72	42	58	190
RTOR Reduction (vph)	0	7	0	0	15	0	0	43	0	0	106	0
Lane Group Flow (vph)	194	191	0	71	365	0	0	122	0	0	184	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	7.8	20.2		3.2	15.6			19.2			19.2	
Effective Green, g (s)	7.8	20.2		3.2	15.6			19.2			19.2	
Actuated g/C Ratio	0.14	0.37		0.06	0.29			0.35			0.35	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	248	666		102	507			540			552	
v/s Ratio Prot	c0.11	0.11		0.04	c0.21							
v/s Ratio Perm								0.08			c0.12	
v/c Ratio	0.78	0.29		0.70	0.72			0.23			0.33	
Uniform Delay, d1	22.6	12.1		25.2	17.5			12.5			13.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	14.8	0.2		18.6	4.9			1.0			1.6	
Delay (s)	37.4	12.3		43.9	22.4			13.4			14.6	
Level of Service	D	B		D	C			B			B	
Approach Delay (s)		24.7			25.8			13.4			14.6	
Approach LOS		C			C			B			B	

HCM Average Control Delay	21.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	54.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.7%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.96			0.94			0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1736	1801		1736	1761			1700			1661	
Flt Permitted	0.95	1.00		0.95	1.00			0.89			0.90	
Satd. Flow (perm)	1736	1801		1736	1761			1524			1509	
Volume (vph)	194	179	19	71	314	100	37	56	72	74	58	196
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	194	179	19	71	314	100	37	56	72	74	58	196
RTOR Reduction (vph)	0	6	0	0	20	0	0	44	0	0	84	0
Lane Group Flow (vph)	194	192	0	71	394	0	0	121	0	0	244	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	7.4	20.6		3.3	16.5			19.9			19.9	
Effective Green, g (s)	7.4	20.6		3.3	16.5			19.9			19.9	
Actuated g/C Ratio	0.13	0.37		0.06	0.30			0.36			0.36	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	230	665		103	521			544			538	
v/s Ratio Prot	c0.11	0.11		0.04	c0.24							
v/s Ratio Perm								0.11			c0.22	
v/c Ratio	0.84	0.29		0.69	0.76			0.22			0.45	
Uniform Delay, d1	23.6	12.4		25.7	17.8			12.5			13.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	23.5	0.2		17.5	6.2			0.9			2.8	
Delay (s)	47.2	12.7		43.3	24.0			13.5			16.5	
Level of Service	D	B		D	C			B			B	
Approach Delay (s)		29.7			26.8			13.5			16.5	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	23.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	55.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.96			0.94			0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1736	1806		1736	1762			1692			1662	
Flt Permitted	0.95	1.00		0.95	1.00			0.90			0.89	
Satd. Flow (perm)	1736	1806		1736	1762			1543			1490	
Volume (vph)	194	227	19	83	337	104	37	56	84	80	58	196
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	194	227	19	83	337	104	37	56	84	80	58	196
RTOR Reduction (vph)	0	5	0	0	19	0	0	51	0	0	81	0
Lane Group Flow (vph)	194	241	0	83	422	0	0	126	0	0	253	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	7.3	20.7		3.8	17.2			18.8			18.8	
Effective Green, g (s)	7.3	20.7		3.8	17.2			18.8			18.8	
Actuated g/C Ratio	0.13	0.37		0.07	0.31			0.34			0.34	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	229	676		119	548			525			507	
v/s Ratio Prot	c0.11	c0.14		0.05	c0.25							
v/s Ratio Perm								0.11			c0.22	
v/c Ratio	0.85	0.36		0.70	0.77			0.24			0.50	
Uniform Delay, d1	23.5	12.5		25.2	17.3			13.1			14.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	24.0	0.3		16.3	6.4			1.1			3.5	
Delay (s)	47.5	12.8		41.5	23.7			14.2			18.0	
Level of Service	D	B		D	C			B			B	
Approach Delay (s)		28.1			26.5			14.2			18.0	
Approach LOS		C			C			B			B	

Intersection Summary

HCM Average Control Delay	23.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	55.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.97			0.93			0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1736	1807		1736	1763			1690			1663	
Flt Permitted	0.95	1.00		0.95	1.00			0.91			0.89	
Satd. Flow (perm)	1736	1807		1736	1763			1548			1505	
Volume (vph)	194	244	19	91	363	110	37	56	88	82	58	196
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	194	244	19	91	363	110	37	56	88	82	58	196
RTOR Reduction (vph)	0	4	0	0	19	0	0	56	0	0	82	0
Lane Group Flow (vph)	194	259	0	91	454	0	0	125	0	0	254	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	8.7	21.5		6.0	18.8			18.1			18.1	
Effective Green, g (s)	8.7	21.5		6.0	18.8			18.1			18.1	
Actuated g/C Ratio	0.15	0.37		0.10	0.33			0.31			0.31	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	262	674		181	575			486			473	
v/s Ratio Prot	c0.11	c0.15		0.05	c0.27							
v/s Ratio Perm								0.12			c0.22	
v/c Ratio	0.74	0.38		0.50	0.79			0.26			0.54	
Uniform Delay, d1	23.4	13.2		24.4	17.6			14.7			16.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	10.7	0.4		2.2	7.1			1.3			4.3	
Delay (s)	34.1	13.6		26.6	24.7			16.0			20.6	
Level of Service	C	B		C	C			B			C	
Approach Delay (s)		22.3			25.0			16.0			20.6	
Approach LOS		C			C			B			C	

Intersection Summary

HCM Average Control Delay	22.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	57.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.98			0.93			0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.98			1.00	
Satd. Flow (prot)	1736	1809		1736	1787			1678			1617	
Flt Permitted	0.95	1.00		0.95	1.00			0.82			0.97	
Satd. Flow (perm)	1736	1809		1736	1787			1405			1573	
Volume (vph)	202	254	18	70	432	73	47	30	77	28	32	278
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	202	254	18	70	432	73	47	30	77	28	32	278
RTOR Reduction (vph)	0	4	0	0	10	0	0	55	0	0	197	0
Lane Group Flow (vph)	202	268	0	70	495	0	0	99	0	0	141	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	9.4	26.3		3.4	20.3			17.1			17.1	
Effective Green, g (s)	9.4	26.3		3.4	20.3			17.1			17.1	
Actuated g/C Ratio	0.16	0.45		0.06	0.35			0.29			0.29	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	278	809		100	617			409			457	
v/s Ratio Prot	c0.12	0.15		0.04	c0.28							
v/s Ratio Perm								0.11			c0.21	
v/c Ratio	0.73	0.33		0.70	0.80			0.24			0.31	
Uniform Delay, d1	23.5	10.5		27.2	17.4			15.9			16.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	9.1	0.2		19.8	7.4			1.4			1.7	
Delay (s)	32.6	10.8		47.0	24.8			17.3			18.0	
Level of Service	C	B		D	C			B			B	
Approach Delay (s)		20.1			27.5			17.3			18.0	
Approach LOS		C			C			B			B	

Intersection Summary

HCM Average Control Delay	22.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	58.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.98			0.93			0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.99			1.00	
Satd. Flow (prot)	1736	1810		1736	1787			1671			1620	
Flt Permitted	0.95	1.00		0.95	1.00			0.81			0.96	
Satd. Flow (perm)	1736	1810		1736	1787			1374			1560	
Volume (vph)	202	272	18	82	455	77	47	30	89	34	32	278
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	202	272	18	82	455	77	47	30	89	34	32	278
RTOR Reduction (vph)	0	4	0	0	10	0	0	65	0	0	202	0
Lane Group Flow (vph)	202	286	0	82	522	0	0	101	0	0	142	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	9.4	26.6		4.0	21.2			16.1			16.1	
Effective Green, g (s)	9.4	26.6		4.0	21.2			16.1			16.1	
Actuated g/C Ratio	0.16	0.45		0.07	0.36			0.27			0.27	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	278	820		118	645			377			428	
v/s Ratio Prot	c0.12	0.16		0.05	c0.30							
v/s Ratio Perm								0.12			c0.22	
v/c Ratio	0.73	0.35		0.69	0.81			0.27			0.33	
Uniform Delay, d1	23.4	10.4		26.8	16.9			16.7			17.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	9.1	0.3		16.3	7.4			1.7			2.1	
Delay (s)	32.5	10.7		43.0	24.3			18.4			19.1	
Level of Service	C	B		D	C			B			B	
Approach Delay (s)		19.7			26.8			18.4			19.1	
Approach LOS		B			C			B			B	

Intersection Summary

HCM Average Control Delay	22.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	58.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.98			0.93			0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1736	1812		1736	1787			1669			1620	
Flt Permitted	0.95	1.00		0.95	1.00			0.83			0.96	
Satd. Flow (perm)	1736	1812		1736	1787			1405			1557	
Volume (vph)	202	319	18	90	481	83	47	30	93	36	32	278
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	202	319	18	90	481	83	47	30	93	36	32	278
RTOR Reduction (vph)	0	3	0	0	10	0	0	66	0	0	198	0
Lane Group Flow (vph)	202	334	0	90	554	0	0	104	0	0	148	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	8.8	24.0		6.1	21.3			17.1			17.1	
Effective Green, g (s)	8.8	24.0		6.1	21.3			17.1			17.1	
Actuated g/C Ratio	0.15	0.41		0.10	0.36			0.29			0.29	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	258	735		179	643			406			450	
v/s Ratio Prot	c0.12	c0.19		0.05	c0.32							
v/s Ratio Perm								0.12			c0.22	
v/c Ratio	0.78	0.45		0.50	0.86			0.26			0.33	
Uniform Delay, d1	24.3	12.8		25.1	17.6			16.2			16.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	14.3	0.4		2.2	11.4			1.5			2.0	
Delay (s)	38.6	13.3		27.3	29.0			17.7			18.5	
Level of Service	D	B		C	C			B			B	
Approach Delay (s)		22.8			28.8			17.7			18.5	
Approach LOS		C			C			B			B	

Intersection Summary

HCM Average Control Delay	23.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	59.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	10_EX_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	EXISTING
Analysis Time Period	A.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 246-ARMOUR RANCH RD. | North/South Street: SR 154

Intersection Orientation: North-South | Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	136	102	2	2	193	20
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	136	102	2	2	193	20
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			1
Lanes	1	1	0	1	1	1
Configuration	L		TR	L	T	R
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	8	25	276	0	24	2
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	8	25	276	0	24	2
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		N			Y	
Storage		0			2	
RT Channelized			1			0
Lanes	0	1	1	0	1	0
Configuration	LT		R		LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR		LT		R
v (veh/h)	136	2		26		33		276
C (m) (veh/h)	1368	1475		416		380		843
v/c	0.10	0.00		0.06		0.09		0.33
95% queue length	0.33	0.00		0.20		0.28		1.45
Control Delay (s/veh)	7.9	7.4		14.5		15.4		11.3
LOS	A	A		B		C		B
Approach Delay (s/veh)	--	--	14.5			11.8		
Approach LOS	--	--	B			B		

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AWD = 10.8 SEC - LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	10_2014_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	NEAR-TERM (YEAR 2014)
Analysis Time Period	A.M. PEAK HOUR		
Project Description	#12018 - CHUMASH CAMP 4 PROJECT		
East/West Street:	SR 246-ARMOUR RANCH RD.	North/South Street:	SR 154
Intersection Orientation:	North-South	Study Period (hrs):	1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	150	113	2	2	207	26
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	150	113	2	2	207	26
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			1
Lanes	1	1	0	1	1	1
Configuration	L		TR	L	T	R
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	12	25	294	0	24	2
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	12	25	294	0	24	2
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)	0			0		
Flared Approach		N			Y	
Storage		0			2	
RT Channelized			1			0
Lanes	0	1	1	0	1	0
Configuration	LT		R		LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR		LT		R
v (veh/h)	150	2		26		37		294
C (m) (veh/h)	1352	1462		384		347		828
v/c	0.11	0.00		0.07		0.11		0.36
95% queue length	0.37	0.00		0.22		0.36		1.64
Control Delay (s/veh)	8.0	7.5		15.4		16.6		11.7
LOS	A	A		C		C		B
Approach Delay (s/veh)	--	--	15.4			12.3		
Approach LOS	--	--	C			B		

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AWD = 11.1 sec. / LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	10_2014+ALT. 1_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	2014+PROJECT (ALT. 1)
Analysis Time Period	A.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 246-ARMOUR RANCH RD. | North/South Street: SR 154

Intersection Orientation: North-South | Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	150	113	5	3	207	26
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	150	113	5	3	207	26
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			1
Lanes	1	1	0	1	1	1
Configuration	L		TR	L	T	R
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	12	46	294	8	88	5
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	12	46	294	8	88	5
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		N			Y	
Storage		0			2	
RT Channelized			1			0
Lanes	0	1	1	0	1	0
Configuration	LT		R		LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR		LT		R
v (veh/h)	150	3		101		58		294
C (m) (veh/h)	1352	1458		347		329		828
v/c	0.11	0.00		0.29		0.18		0.36
95% queue length	0.37	0.01		1.22		0.64		1.64
Control Delay (s/veh)	8.0	7.5		19.8		18.3		11.7
LOS	A	A		C		C		B
Approach Delay (s/veh)	--	--	19.8			12.8		
Approach LOS	--	--	C			B		

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AWD = 12.7 sec. / LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	10_2014+ALT. 2_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	2014+PROJECT (ALT. 2)
Analysis Time Period	A.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT	
East/West Street: SR 246-ARMOUR RANCH RD.	North/South Street: SR 154
Intersection Orientation: North-South	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	150	113	9	7	207	26
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	150	113	9	7	207	26
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			1
Lanes	1	1	0	1	1	1
Configuration	L		TR	L	T	R
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	12	97	294	11	105	8
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	12	97	294	11	105	8
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		N			Y	
Storage		0			2	
RT Channelized			1			0
Lanes	0	1	1	0	1	0
Configuration	LT		R		LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR		LT		R
v (veh/h)	150	7		124		109		294
C (m) (veh/h)	1352	1453		334		330		828
v/c	0.11	0.00		0.37		0.33		0.36
95% queue length	0.37	0.01		1.74		1.46		1.64
Control Delay (s/veh)	8.0	7.5		22.4		21.3		11.7
LOS	A	A		C		C		B
Approach Delay (s/veh)	--	--	22.4			14.3		
Approach LOS	--	--	C			B		

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AWD = 14.3 sec./LOS B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*MMF*	Intersection	*10_CU_AM*
Agency/Co.	*ATE*	Jurisdiction	*SANTA BARBARA COUNTY*
Date Performed	*3/21/2012*	Analysis Year	*CUMULATIVE (YEAR 2030)*
Analysis Time Period	*A.M. PEAK HOUR*		

Project Description *#12018 - CHUMASH CAMP 4 PROJECT*	
East/West Street: *SR 246-ARMOUR RANCH RD.*	North/South Street: *SR 154*
Intersection Orientation: *North-South*	Study Period (hrs): *1.00*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	217	235	5	5	194	124
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	217	235	5	5	194	124
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			1
Lanes	1	1	0	1	1	1
Configuration	L		TR	L	T	R
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	138	30	223	5	30	5
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	138	30	223	5	30	5
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		N			Y	
Storage		0			2	
RT Channelized			1			0
Lanes	0	1	1	0	1	0
Configuration	LT		R		LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR		LT		R
v (veh/h)	217	5		40		168		223
C (m) (veh/h)	1367	1315		247		210		842
v/c	0.16	0.00		0.16		0.80		0.26
95% queue length	0.57	0.01		0.58		8.53		1.08
Control Delay (s/veh)	8.1	7.7		23.0		81.1		10.8
LOS	A	A		C		F		B
Approach Delay (s/veh)	--	--	23.0			41.0		
Approach LOS	--	--	C			E		

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AWD = 28.7 sec. / LOS D

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	10_CU+PR (ALT. 1)_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE+PR (ALT.1)
Analysis Time Period	A.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 246-ARMOUR RANCH RD. | North/South Street: SR 154

Intersection Orientation: North-South | Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	217	235	8	6	194	124
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	217	235	8	6	194	124
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			1
Lanes	1	1	0	1	1	1
Configuration	L		TR	L	T	R
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	138	51	223	13	94	8
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	138	51	223	13	94	8
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		N			Y	
Storage		0			2	
RT Channelized			1			0
Lanes	0	1	1	0	1	0
Configuration	LT		R		LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR		LT		R
v (veh/h)	217	6		115		189		223
C (m) (veh/h)	1367	1312		230		166		842
v/c	0.16	0.00		0.50		1.14		0.26
95% queue length	0.57	0.01		2.86		23.54		1.08
Control Delay (s/veh)	8.1	7.8		36.3		396.3		10.8
LOS	A	A		E		F		B
Approach Delay (s/veh)	--	--	36.3			187.7		
Approach LOS	--	--	E			F		

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WD = >50 sec. / LOS F

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	10_CU+PR (ALT. 2)_AM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE+PR (ALT. 2)
Analysis Time Period	A.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 246-ARMOUR RANCH RD. | North/South Street: SR 154

Intersection Orientation: North-South | Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	217	235	12	10	194	124
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	217	235	12	10	194	124
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			1
Lanes	1	1	0	1	1	1
Configuration	L		TR	L	T	R
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	138	102	223	16	111	11
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	138	102	223	16	111	11
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		N			Y	
Storage		0			2	
RT Channelized			1			0
Lanes	0	1	1	0	1	0
Configuration	LT		R		LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR		LT		R
v (veh/h)	217	10		138		240		223
C (m) (veh/h)	1367	1307		213		160		842
v/c	0.16	0.01		0.65		1.50		0.26
95% queue length	0.57	0.02		4.88		47.57		1.08
Control Delay (s/veh)	8.1	7.8		51.7		990.6		10.8
LOS	A	A		F		F		B
Approach Delay (s/veh)	--	--	51.7			518.7		
Approach LOS	--	--	F			F		

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AWD = >50 sec. / LOS F

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	10_EX_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	EXISTING
Analysis Time Period	P.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT	
East/West Street: SR 246-ARMOUR RANCH RD.	North/South Street: SR 154
Intersection Orientation: North-South	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	348	207	0	7	186	39
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	348	207	0	7	186	39
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			1
Lanes	1	1	0	1	1	1
Configuration	L		TR	L	T	R
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	29	18	226	0	53	7
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	29	18	226	0	53	7
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		N			Y	
Storage		0			2	
RT Channelized			1			0
Lanes	0	1	1	0	1	0
Configuration	LT		R		LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR		LT		R
v (veh/h)	348	7		60		47		226
C (m) (veh/h)	1377	1352		177		121		851
v/c	0.25	0.01		0.34		0.39		0.27
95% queue length	1.01	0.02		1.50		1.82		1.08
Control Delay (s/veh)	8.5	7.7		36.3		53.3		10.8
LOS	A	A		E		F		B
Approach Delay (s/veh)	–	–	36.3			18.1		
Approach LOS	–	–	E			C		

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AWD = 14.7 = Cos B

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	10_2014_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	NEAR-TERM (YEAR 2014)
Analysis Time Period	P.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 246-ARMOUR RANCH RD. | North/South Street: SR 154

Intersection Orientation: North-South | Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	370	224	0	7	209	49
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	370	224	0	7	209	49
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			1
Lanes	1	1	0	1	1	1
Configuration	L		TR	L	T	R
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	40	18	251	0	53	7
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	40	18	251	0	53	7
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		N			Y	
Storage		0			2	
RT Channelized			1			0
Lanes	0	1	1	0	1	0
Configuration	LT		R		LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR		LT		R
v (veh/h)	370	7		60		58		251
C (m) (veh/h)	1350	1333		153		97		826
v/c	0.27	0.01		0.39		0.60		0.30
95% queue length	1.13	0.02		1.86		3.74		1.30
Control Delay (s/veh)	8.7	7.7		44.1		93.6		11.3
LOS	A	A		E		F		B
Approach Delay (s/veh)	--	--	44.1			26.7		
Approach LOS	--	--	E			D		

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AWD = 19.0 SEC. / LOS C

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	10_2014+ALT. 1_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	2014+PROJECT (ALT. 1)
Analysis Time Period	P.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT	
East/West Street: SR 246-ARMOUR RANCH RD.	North/South Street: SR 154
Intersection Orientation: North-South	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	370	224	9	10	209	49
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	370	224	9	10	209	49
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			1
Lanes	1	1	0	1	1	1
Configuration	L		TR	L	T	R
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	40	98	251	5	95	9
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	40	98	251	5	95	9
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		N			Y	
Storage		0			2	
RT Channelized			1			0
Lanes	0	1	1	0	1	0
Configuration	LT		R		LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR		LT		R
v (veh/h)	370	10		109		138		251
C (m) (veh/h)	1350	1323		125		89		826
v/c	0.27	0.01		0.87		1.55		0.30
95% queue length	1.13	0.02		9.40		31.15		1.30
Control Delay (s/veh)	8.7	7.7		160.4		1140		11.3
LOS	A	A		F		F		B
Approach Delay (s/veh)	--	--	160.4			411.6		
Approach LOS	--	--	F			F		

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AWD = >50 SEC. / LOS F

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	10_2014+ALT. 2_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	2014+PROJECT (ALT. 2)
Analysis Time Period	P.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT	
East/West Street: SR 246-ARMOUR RANCH RD.	North/South Street: SR 154
Intersection Orientation: North-South	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	370	224	11	12	209	49
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	370	224	11	12	209	49
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			1
Lanes	1	1	0	1	1	1
Configuration	L		TR	L	T	R
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	40	126	251	9	143	13
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	40	126	251	9	143	13
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)	0			0		
Flared Approach		N			Y	
Storage		0			2	
RT Channelized			1			0
Lanes	0	1	1	0	1	0
Configuration	LT		R		LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR		LT		R
v (veh/h)	370	12		165		166		251
C (m) (veh/h)	1350	1321		79		0		826
v/c	0.27	0.01		2.09				0.30
95% queue length	1.13	0.03		48.14				1.30
Control Delay (s/veh)	8.7	7.8		2094				11.3
LOS	A	A		F		F		B
Approach Delay (s/veh)	--	--	2094					
Approach LOS	--	--	F					

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AWD = > 50. sec. / LOS F

200

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	10_CU_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE (YEAR 2030)
Analysis Time Period	P.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 246-ARMOUR RANCH RD. | North/South Street: SR 154

Intersection Orientation: North-South | Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	380	407	5	10	212	147
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	380	407	5	10	212	147
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			1
Lanes	1	1	0	1	1	1
Configuration	L		TR	L	T	R
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	119	20	222	5	55	10
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	119	20	222	5	55	10
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		N			Y	
Storage		0			2	
RT Channelized			1			0
Lanes	0	1	1	0	1	0
Configuration	LT		R		LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR		LT		R
v (veh/h)	380	10		70		139		222
C (m) (veh/h)	1347	1136		106		52		823
v/c	0.28	0.01		0.66		2.67		0.27
95% queue length	1.18	0.03		4.64		47.86		1.10
Control Delay (s/veh)	8.7	8.2		98.3		3193		11.0
LOS	A	A		F		F		B
Approach Delay (s/veh)	--	--	98.3			1236		
Approach LOS	--	--	F			F		

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AWD = > 50 sec. / LOS F

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	10_CU+PR (ALT. 1)_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE+PR (ALT.1)
Analysis Time Period	P.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 246-ARMOUR RANCH RD.	North/South Street: SR 154
Intersection Orientation: North-South	Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	380	407	14	13	212	147
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	380	407	14	13	212	147
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			1
Lanes	1	1	0	1	1	1
Configuration	L		TR	L	T	R
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	119	100	222	10	97	12
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	119	100	222	10	97	12
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		N			Y	
Storage		0			2	
RT Channelized			1			0
Lanes	0	1	1	0	1	0
Configuration	LT		R		LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR		LT		R
v (veh/h)	380	13		119		219		222
C (m) (veh/h)	1347	1127				0		823
v/c	0.28	0.01						0.27
95% queue length	1.18	0.04						1.10
Control Delay (s/veh)	8.7	8.2						11.0
LOS	A	A				F		B
Approach Delay (s/veh)	–	–						
Approach LOS	–	--						

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AWD = > 50 sec. / LOS F

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MMF	Intersection	10_CU+PR (ALT. 2)_PM
Agency/Co.	ATE	Jurisdiction	SANTA BARBARA COUNTY
Date Performed	3/21/2012	Analysis Year	CUMULATIVE+PR (ALT. 2)
Analysis Time Period	P.M. PEAK HOUR		

Project Description #12018 - CHUMASH CAMP 4 PROJECT

East/West Street: SR 246-ARMOUR RANCH RD. | North/South Street: SR 154

Intersection Orientation: North-South | Study Period (hrs): 1.00

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	380	407	16	15	212	147
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	380	407	16	15	212	147
Percent Heavy Vehicles	4	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			1
Lanes	1	1	0	1	1	1
Configuration	L		TR	L	T	R
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	119	128	222	14	145	16
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	119	128	222	14	145	16
Percent Heavy Vehicles	4	4	4	4	4	4
Percent Grade (%)		0			0	
Flared Approach		N			Y	
Storage		0			2	
RT Channelized			1			0
Lanes	0	1	1	0	1	0
Configuration	LT		R		LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L		LTR		LT		R
v (veh/h)	380	15		175		247		222
C (m) (veh/h)	1347	1126				0		823
v/c	0.28	0.01						0.27
95% queue length	1.18	0.04						1.10
Control Delay (s/veh)	8.7	8.2						11.0
LOS	A	A				F		B
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

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WD = >50 sec. / LOS F

TRAFFIC COUNT DATA

Prepared by NDS/ATD

VOLUME

Armour Ranch Rd E/o SR-154

Day: Tuesday
Date: 3/13/2012

City: Santa Ynez
Project #: CA12_8021_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	358	333	691

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			0		0		0		12:00			6		9		15	
00:15			0		0		0		12:15			10		7		17	
00:30			0		0		0		12:30			3		5		8	
00:45			0		0		0		12:45			4	23	5	26	9	49
01:00			0		0		0		13:00			6		4		10	
01:15			0		0		0		13:15			2		5		7	
01:30			0		0		0		13:30			7		5		12	
01:45			0		0		0		13:45			8	23	11	25	19	48
02:00			0		0		0		14:00			8		8		16	
02:15			0		0		0		14:15			10		4		14	
02:30			0		0		0		14:30			6		6		12	
02:45			0		0		0		14:45			6	30	9	27	15	57
03:00			0		0		0		15:00			4		4		8	
03:15			0		0		0		15:15			4		4		8	
03:30			0		0		0		15:30			6		7		13	
03:45			0		0		0		15:45			6	20	7	22	13	42
04:00			0		0		0		16:00			2		10		12	
04:15			0		0		0		16:15			8		18		26	
04:30			0		0		0		16:30			5		20		25	
04:45			0		0		0		16:45			9	24	12	60	21	84
05:00			1		0		1		17:00			4		3		7	
05:15			1		0		1		17:15			2		4		6	
05:30			2		0		2		17:30			7		6		13	
05:45			3	7	0		3	7	17:45			6	19	7	20	13	39
06:00			2		0		2		18:00			3		5		8	
06:15			3		0		3		18:15			1		10		11	
06:30			15		3		18		18:30			3		4		7	
06:45			14	34	2	5	16	39	18:45			1	8	1	20	2	28
07:00			6		3		9		19:00			1		3		4	
07:15			13		4		17		19:15			8		2		10	
07:30			5		3		8		19:30			5		3		8	
07:45			10	34	13	23	23	57	19:45			4	18	1	9	5	27
08:00			5		5		10		20:00			0		3		3	
08:15			10		6		16		20:15			3		4		7	
08:30			7		4		11		20:30			7		3		10	
08:45			3	25	6	21	9	46	20:45			3	13	0	10	3	23
09:00			5		1		6		21:00			1		1		2	
09:15			9		5		14		21:15			1		0		1	
09:30			2		3		5		21:30			2		2		4	
09:45			3	19	2	11	5	30	21:45			0	4	0	3	0	7
10:00			13		6		19		22:00			2		0		2	
10:15			6		9		15		22:15			0		0		0	
10:30			3		5		8		22:30			1		0		1	
10:45			2	24	3	23	5	47	22:45			2	5	0		2	5
11:00			5		11		16		23:00			1		0		1	
11:15			6		4		10		23:15			0		0		0	
11:30			8		7		15		23:30			1		0		1	
11:45			7	26	6	28	13	54	23:45			0	2	0		0	2
TOTALS				169		111		280	TOTALS				189		222		411
SPLIT %				60.4%		39.6%		40.5%	SPLIT %				46.0%		54.0%		59.5%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	358	333	691

AM Peak Hour	06:30	11:30	06:30	PM Peak Hour	13:30	16:00	16:00
AM Pk Volume	48	29	60	PM Pk Volume	33	60	84
Pk Hr Factor	0.800	0.806	0.833	Pk Hr Factor	0.825	0.750	0.808
7 - 9 Volume	59	44	103	4 - 6 Volume	43	80	123
7 - 9 Peak Hour	07:00	07:45	07:45	4 - 6 Peak Hour	16:15	16:00	16:00
7 - 9 Pk Volume	34	28	60	4 - 6 Pk Volume	26	60	84
Pk Hr Factor	0.654	0.538	0.652	Pk Hr Factor	0.722	0.750	0.808

Prepared by NDS/ATD

VOLUME

Baseline Ave E/o SR-154

Day: Tuesday
Date: 3/13/2012

City: Santa Ynez
Project #: CA12_8021_002

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	755	802	1,557

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00					0		0		0		12:00					13		19		32	
00:15					0		0		0		12:15					13		10		23	
00:30					2		0		2		12:30					16		14		30	
00:45					0	2	0		0	2	12:45					17	59	12	55	29	114
01:00					0		0		0		13:00					17		14		31	
01:15					0		0		0		13:15					18		15		33	
01:30					0		0		0		13:30					8		8		16	
01:45					0		0		0		13:45					8	51	20	57	28	108
02:00					0		0		0		14:00					10		10		20	
02:15					0		0		0		14:15					8		17		25	
02:30					0		0		0		14:30					9		16		25	
02:45					0		0		0		14:45					8	35	17	60	25	95
03:00					0		0		0		15:00					11		21		32	
03:15					0		0		0		15:15					18		18		36	
03:30					0		0		0		15:30					12		16		28	
03:45					0		0		0		15:45					30	71	22	77	52	148
04:00					0		0		0		16:00					30		20		50	
04:15					0		0		0		16:15					15		24		39	
04:30					0		0		0		16:30					22		20		42	
04:45					0		1	1	1	1	16:45					9	76	14	78	23	154
05:00					2		1		3		17:00					15		23		38	
05:15					1		0		1		17:15					18		32		50	
05:30					3		2		5		17:30					13		5		18	
05:45					7	13	1	4	8	17	17:45					9	55	21	81	30	136
06:00					1		5		6		18:00					12		5		17	
06:15					10		3		13		18:15					3		5		8	
06:30					9		4		13		18:30					12		9		21	
06:45					16	36	8	20	24	56	18:45					4	31	7	26	11	57
07:00					11		7		18		19:00					5		16		21	
07:15					7		13		20		19:15					7		2		9	
07:30					7		10		17		19:30					5		4		9	
07:45					12	37	28	58	40	95	19:45					5	22	4	26	9	48
08:00					15		19		34		20:00					3		4		7	
08:15					8		13		21		20:15					6		1		7	
08:30					7		11		18		20:30					1		6		7	
08:45					9	39	11	54	20	93	20:45					4	14	1	12	5	26
09:00					21		10		31		21:00					2		0		2	
09:15					30		13		43		21:15					4		1		5	
09:30					12		13		25		21:30					3		0		3	
09:45					16	79	17	53	33	132	21:45					4	13	4	5	8	18
10:00					14		13		27		22:00					3		3		6	
10:15					15		25		40		22:15					1		0		1	
10:30					17		11		28		22:30					1		1		2	
10:45					17	63	18	67	35	130	22:45					2	7	1	5	3	12
11:00					10		15		25		23:00					1		1		2	
11:15					10		19		29		23:15					0		0		0	
11:30					15		7		22		23:30					1		0		1	
11:45					15	50	21	62	36	112	23:45					0	2	0	1	0	3
TOTALS						319		319		638	TOTALS						436		483		919
SPLIT %						50.0%		50.0%		41.0%	SPLIT %						47.4%		52.6%		59.0%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	755	802	1,557

AM Peak Hour	09:00	07:45	09:00	PM Peak Hour	15:45	16:30	15:45
AM Pk Volume	79	71	132	PM Pk Volume	97	89	183
Pk Hr Factor	0.658	0.634	0.767	Pk Hr Factor	0.808	0.695	0.880
7 - 9 Volume	76	112	188	4 - 6 Volume	131	159	290
7 - 9 Peak Hour	07:30	07:45	07:45	4 - 6 Peak Hour	16:00	16:30	16:00
7 - 9 Pk Volume	42	71	113	4 - 6 Pk Volume	76	89	154
Pk Hr Factor	0.700	0.634	0.706	Pk Hr Factor	0.633	0.695	0.770

2016

ITM Peak Hour Summary

Prepared by:

NDS

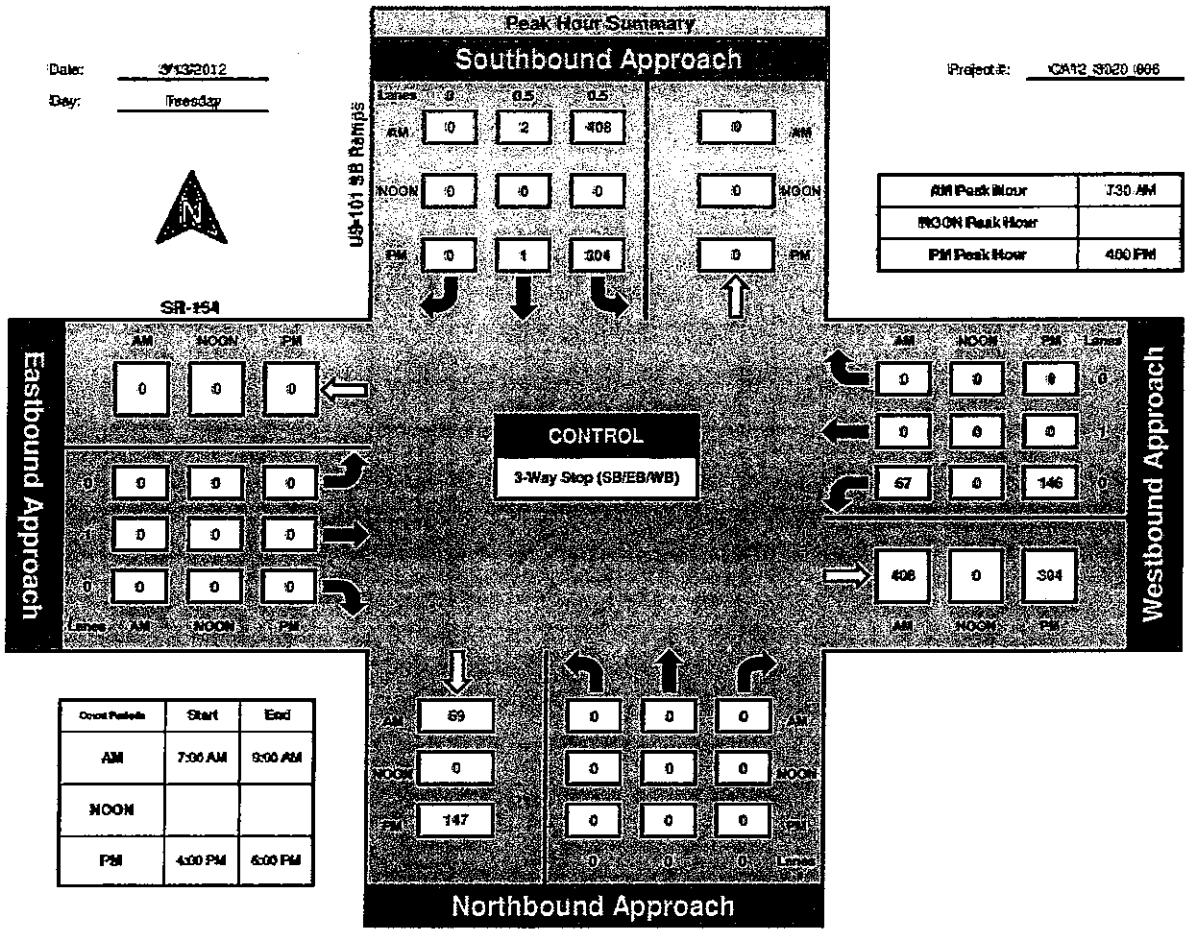
National Data & Surveying Services

US-101 SB Ramps and SR-154 , City of Los Olivos

Date: 3/13/2012

Day: Tuesday

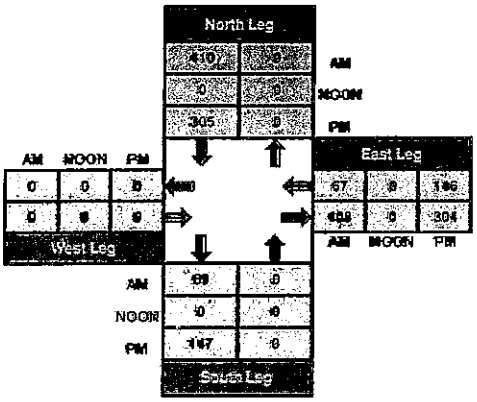
Project #: CA12_3020_006



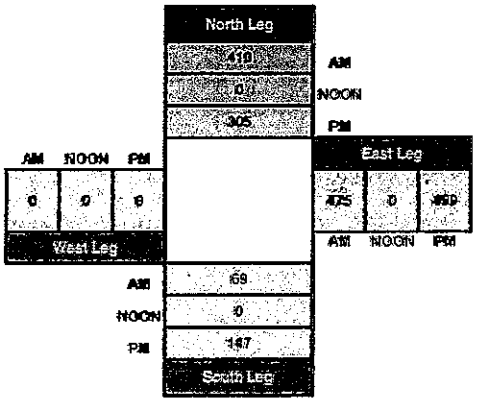
AM Peak Hour	7:30 AM
NOON Peak Hour	
PM Peak Hour	4:00 PM

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

Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared By:

NDS

National Data & Surveying Services

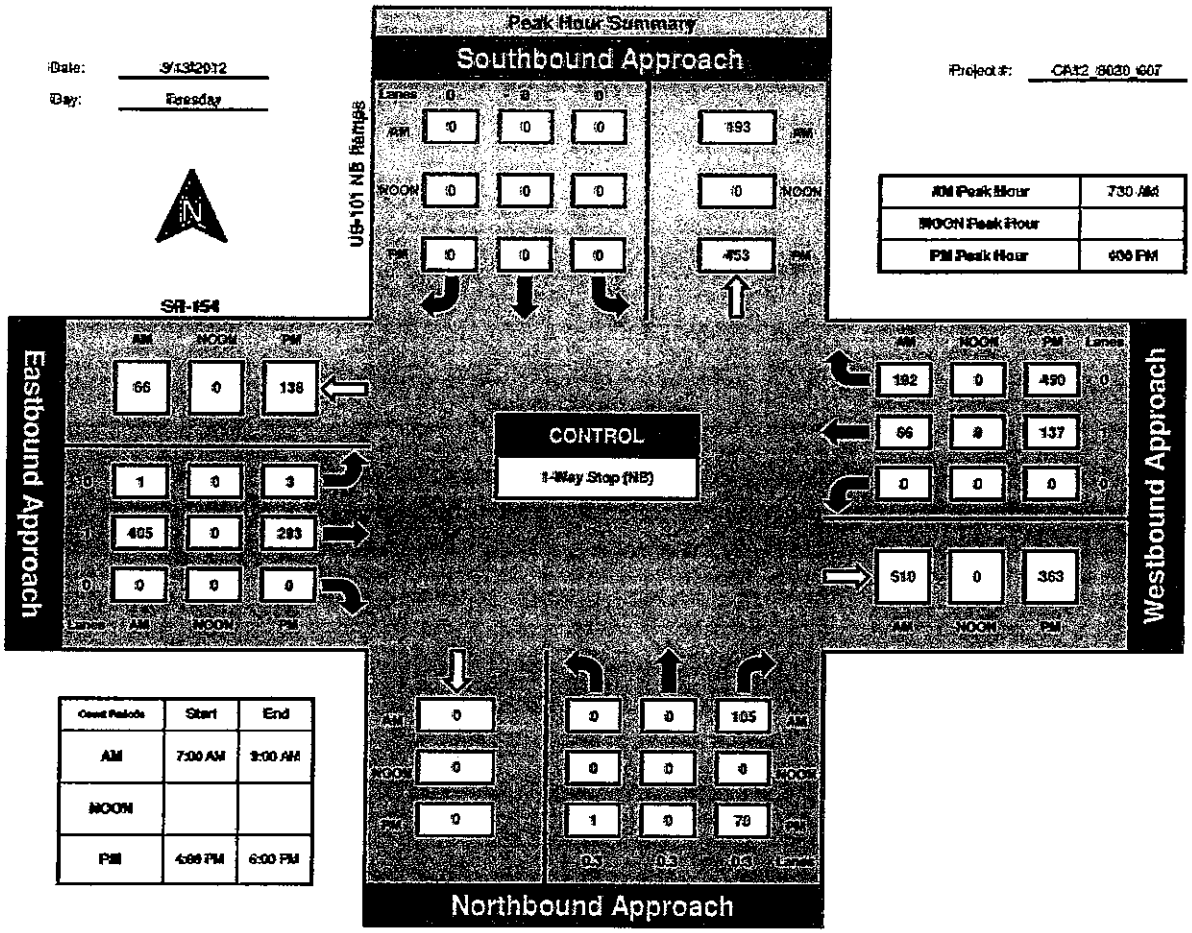
US-101 NB Ramps and SR-154 , City of Los Olivos

Date: 9/13/2012

Day: Tuesday

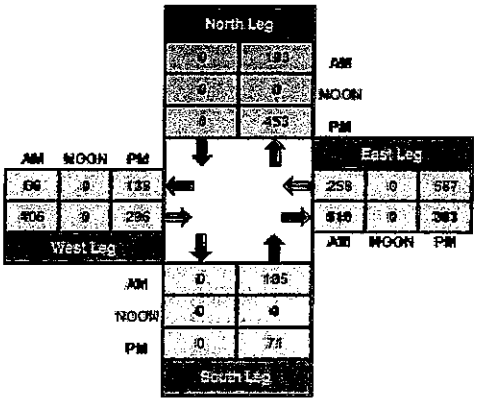
Project #: CA12-8020-007

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	600 PM

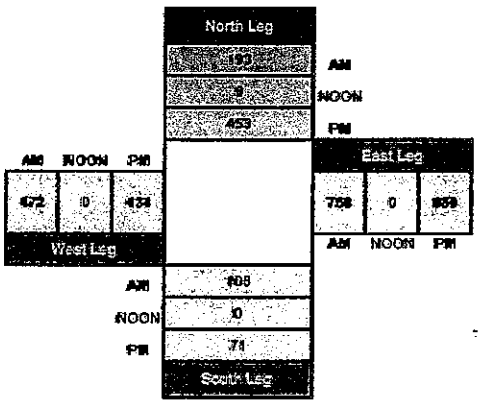


Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg

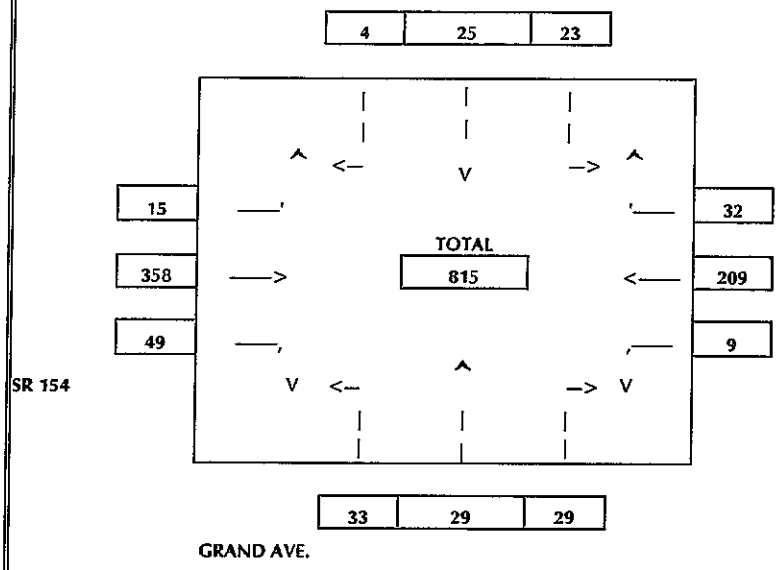


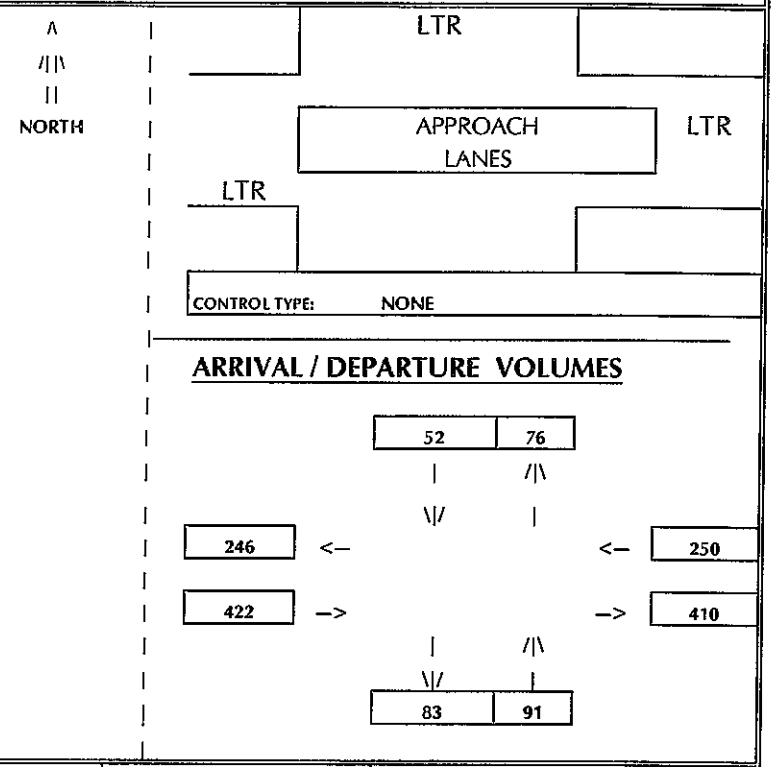
ASSOCIATED TRANSPORTATION ENGINEERS

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: MATTEI'S TAVERN | PROJECT #: 07084 | COUNT DATE: 03-15-11 | FILE NAME: 02AM
N-S Approach: GRAND AVE. | COUNT TIME: 04:00 P.M. TO 6:00
E-W Approach: SR 154 | CITY: LOS OLIVOS | WEATHER: CLEAR

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





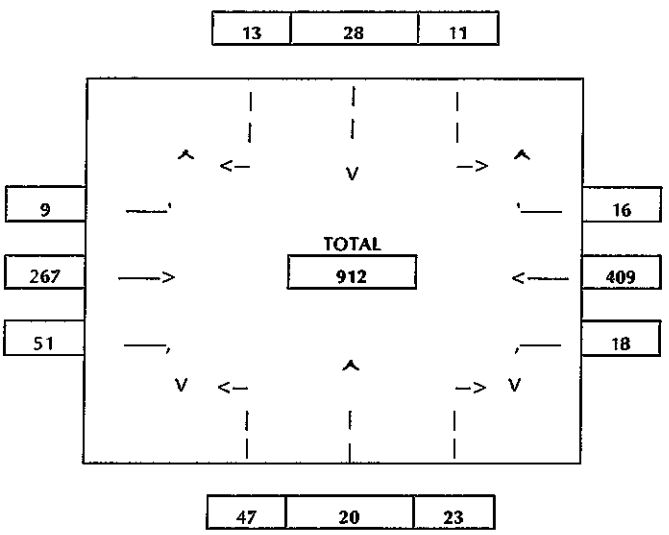
TIME PERIOD From	—	To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL VOLUMES
COUNT DATA															
07:00 AM	—	07:15 AM	1	3	1	3	0	2	1	52	7	0	27	1	98
07:15 AM	—	07:30 AM	10	5	2	4	1	2	4	116	15	1	67	2	229
07:30 AM	—	07:45 AM	17	7	6	6	5	5	7	207	24	4	118	4	410
07:45 AM	—	08:00 AM	24	7	7	10	10	5	10	328	36	7	154	6	604
08:00 AM	—	08:15 AM	32	12	12	15	16	6	15	421	46	11	212	11	809
08:15 AM	—	08:30 AM	37	22	22	21	17	8	18	509	54	12	246	26	992
08:30 AM	—	08:45 AM	47	28	28	28	24	8	22	596	66	13	290	30	1180
08:45 AM	—	09:00 AM	57	36	36	33	35	9	25	686	85	16	363	38	1419
TOTAL BY PERIOD															
07:00 AM	—	07:15 AM	1	3	1	3	0	2	1	52	7	0	27	1	98
07:15 AM	—	07:30 AM	9	2	1	1	1	0	3	64	8	1	40	1	131
07:30 AM	—	07:45 AM	7	2	4	2	4	3	3	91	9	3	51	2	181
07:45 AM	—	08:00 AM	7	0	1	4	5	0	3	121	12	3	36	2	194
08:00 AM	—	08:15 AM	8	5	5	5	6	1	5	93	10	4	58	5	205
08:15 AM	—	08:30 AM	5	10	10	6	1	2	3	88	8	1	34	15	183
08:30 AM	—	08:45 AM	10	6	6	7	7	0	4	87	12	1	44	4	188
08:45 AM	—	09:00 AM	10	8	8	5	11	1	3	90	19	3	73	8	239
HOURLY TOTALS															
07:00 AM	—	08:00 AM	24	7	7	10	10	5	10	328	36	7	154	6	604
07:15 AM	—	08:15 AM	31	9	11	12	16	4	14	369	39	11	185	10	711
07:30 AM	—	08:30 AM	27	17	20	17	16	6	14	393	39	11	179	24	763
07:45 AM	—	08:45 AM	30	21	22	22	19	3	15	389	42	9	172	26	770
08:00 AM	—	09:00 AM	33	29	29	23	25	4	15	358	49	9	209	32	815

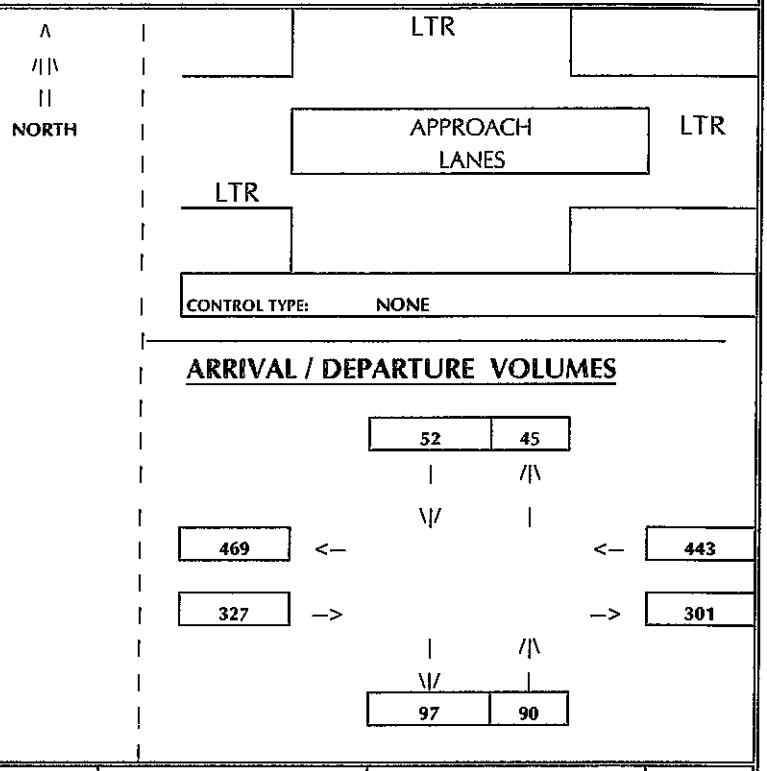
ASSOCIATED TRANSPORTATION ENGINEERS

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: MATTEI'S TAVERN	PROJECT #: 07084	COUNT DATE: 03-10-11	FILE NAME: 02PM
N-S Approach: GRAND AVE.		COUNT TIME: 04:00 P.M. TO 6:00	
E-W Approach: SR 154		CITY: LOS OLIVOS	WEATHER: SUNNY

PEAK HOUR: 04:15 PM TO 05:15 PM





TIME PERIOD From	—	To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL VOLUMES
COUNT DATA															
04:00 PM	—	04:15 PM	9	3	5	4	4	0	2	72	11	2	108	5	225
04:15 PM	—	04:30 PM	23	7	8	5	9	3	2	130	27	8	221	10	453
04:30 PM	—	04:45 PM	35	15	23	9	16	5	7	194	40	12	327	12	695
04:45 PM	—	05:00 PM	43	21	24	11	20	7	9	274	50	15	410	16	900
05:00 PM	—	05:15 PM	56	23	28	15	32	13	11	339	62	20	517	21	1137
05:15 PM	—	05:30 PM	72	25	30	15	36	17	12	409	69	24	597	30	1336
05:30 PM	—	05:45 PM	87	30	38	17	38	17	15	492	78	30	694	33	1569
05:45 PM	—	06:00 PM	96	38	44	17	38	19	15	549	86	33	772	39	1746
TOTAL BY PERIOD															
04:00 PM	—	04:15 PM	9	3	5	4	4	0	2	72	11	2	108	5	225
04:15 PM	—	04:30 PM	14	4	3	1	5	3	0	58	16	6	113	5	228
04:30 PM	—	04:45 PM	12	8	15	4	7	2	5	64	13	4	106	2	242
04:45 PM	—	05:00 PM	8	6	1	2	4	2	2	80	10	3	83	4	205
05:00 PM	—	05:15 PM	13	2	4	4	12	6	2	65	12	5	107	5	237
05:15 PM	—	05:30 PM	16	2	2	0	4	4	1	70	7	4	80	9	199
05:30 PM	—	05:45 PM	15	5	8	2	2	0	3	83	9	6	97	3	233
05:45 PM	—	06:00 PM	9	8	6	0	0	2	0	57	8	3	78	6	177
HOURLY TOTALS															
04:00 PM	—	05:00 PM	43	21	24	11	20	7	9	274	50	15	410	16	900
04:15 PM	—	05:15 PM	47	20	23	11	28	13	9	267	51	18	409	16	912
04:30 PM	—	05:30 PM	49	18	22	10	27	14	10	279	42	16	376	20	883
04:45 PM	—	05:45 PM	52	15	15	8	22	12	8	298	38	18	367	21	874
05:00 PM	—	06:00 PM	53	17	20	6	18	12	6	275	36	18	362	23	846

TM Peak Hour Summary

Prepared by:

NDS

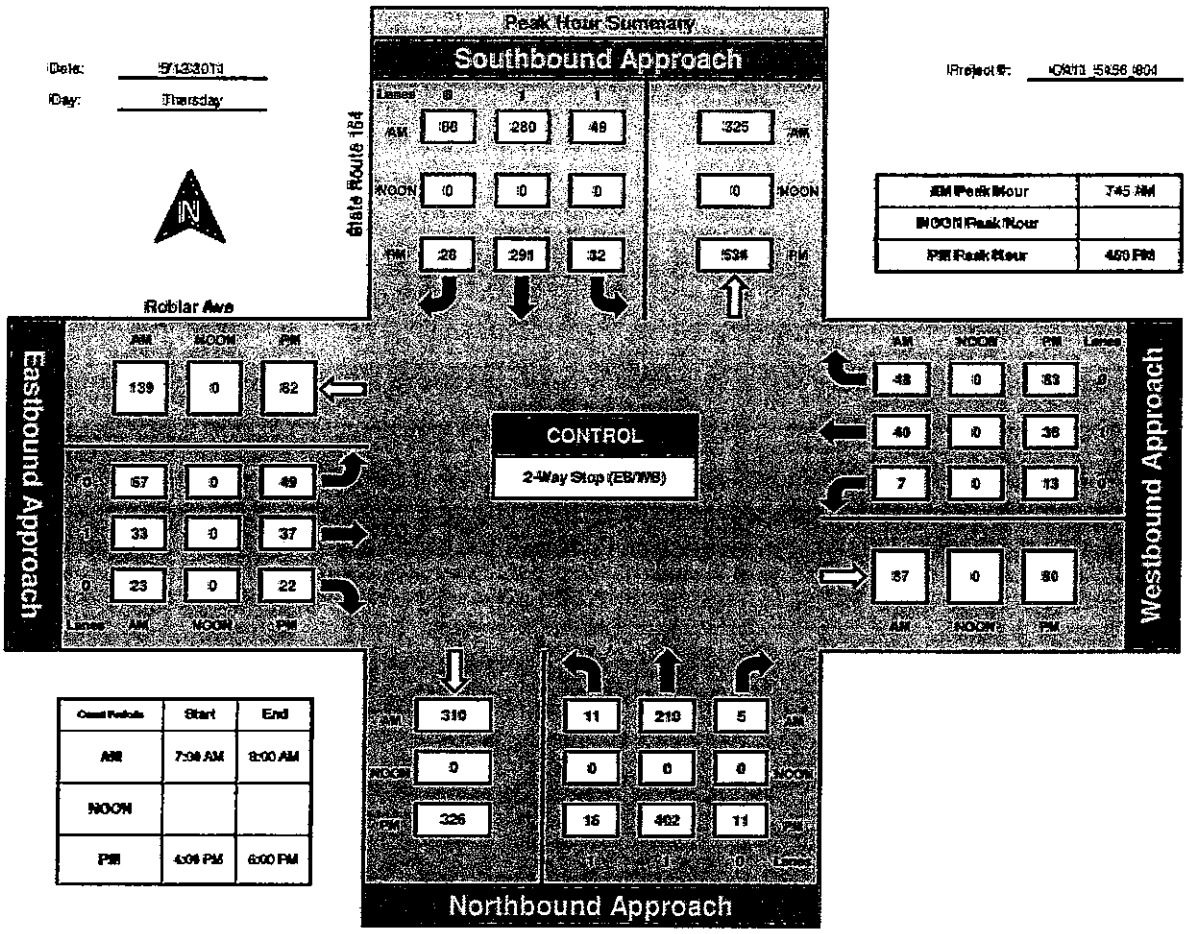
National Data & Surveying Services

State Route 154 and Roblar Ave., City of Santa Ynez

Date: 5/12/2011

Day: Thursday

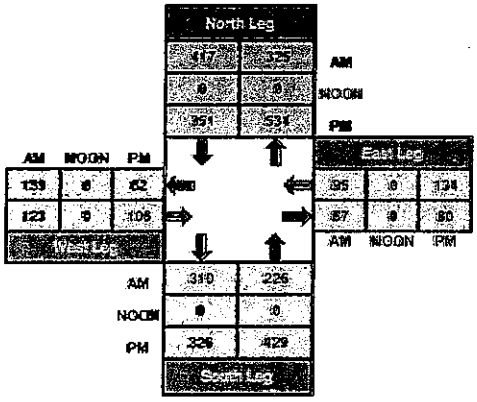
Project #: 10911 5356 804



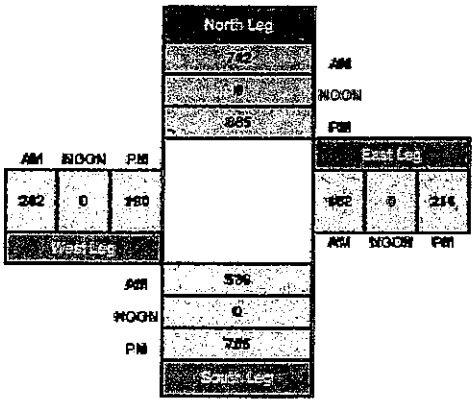
AM Peak Hour	7:45 AM
NOON Peak Hour	
PM Peak Hour	4:00 PM

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

Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

NDS

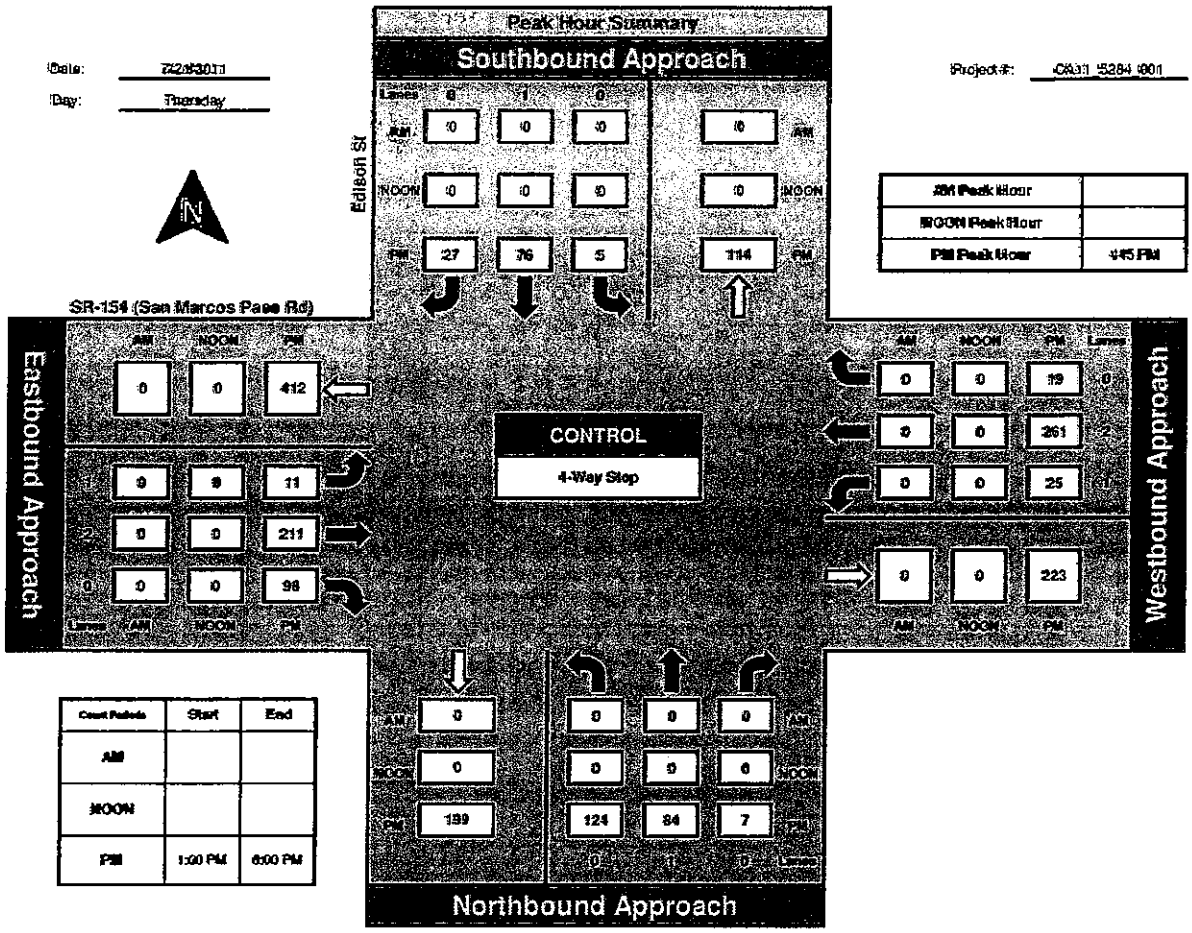
National Data & Surveying Services

Edison St and SR-154 (San Marcos Pass Rd)

Date: 7/2/2013

Day: Thursday

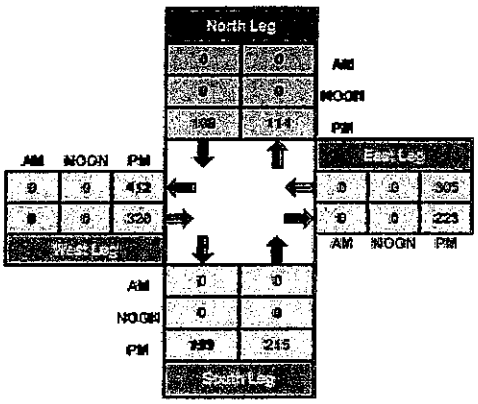
Project #: CA31 5284 001



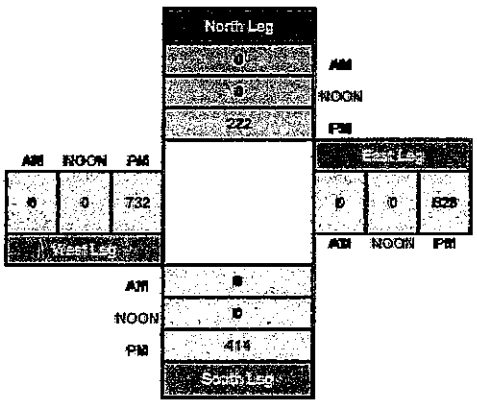
AM Peak Hour	
NOON Peak Hour	
PM Peak Hour	4:45 PM

Count Periods	Start	End
AM		
NOON		
PM	1:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

NDS

National Data & Surveying Services

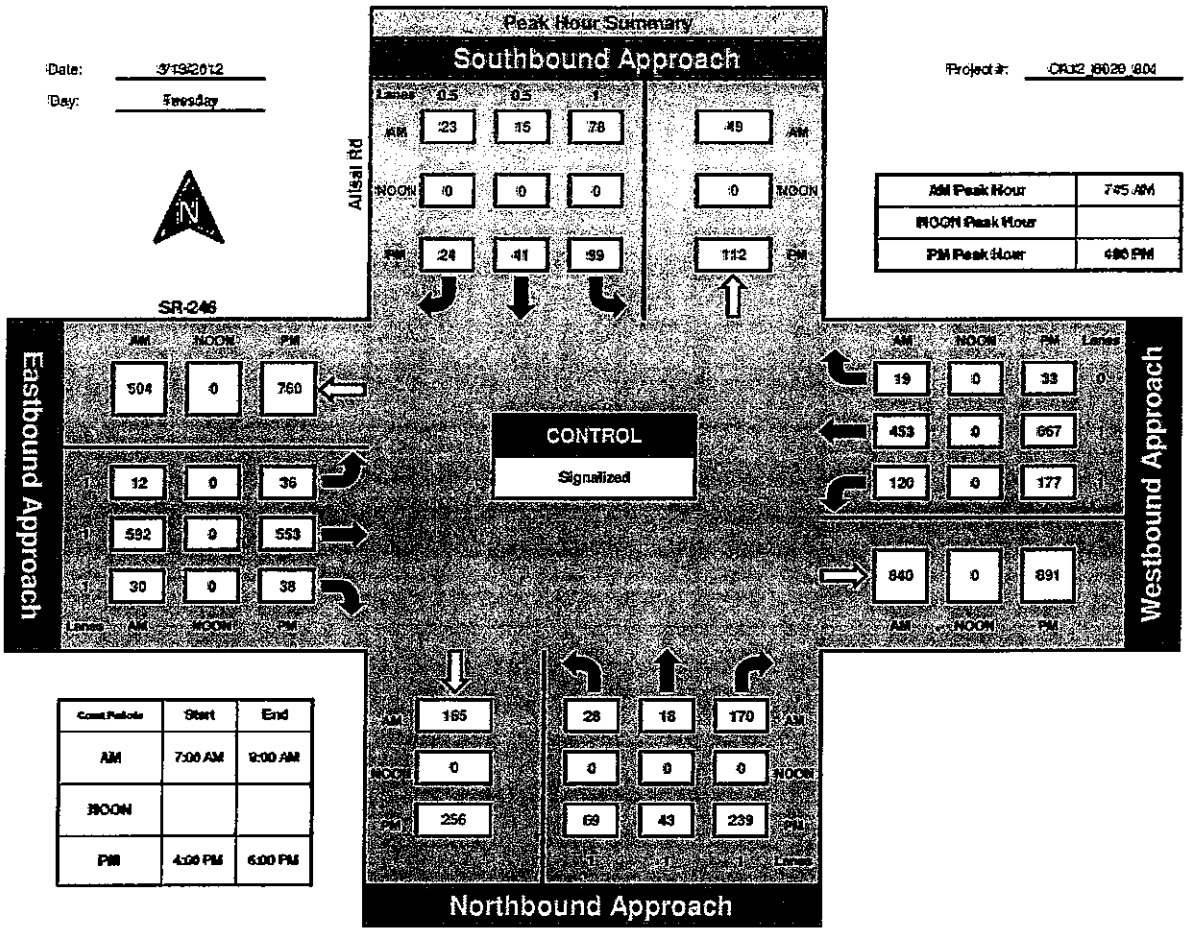
Allisal Rd and SR-246 , City of Solvang

Date: 3/19/2012

Day: Tuesday

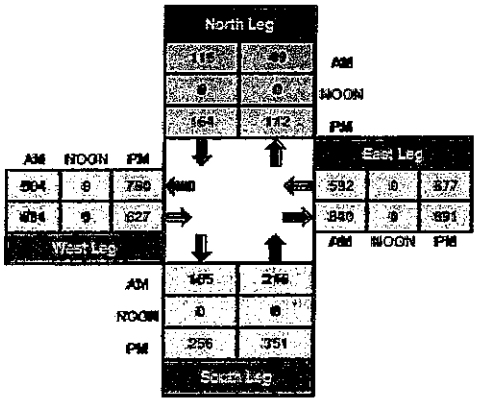
Project #: CR12_6020_004

AM Peak Hour	745 AM
NOON Peak Hour	
PM Peak Hour	4:00 PM

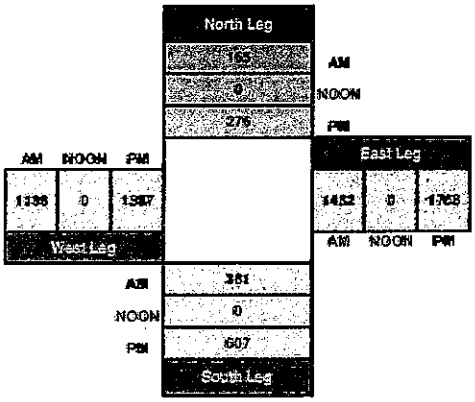


Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

NDS

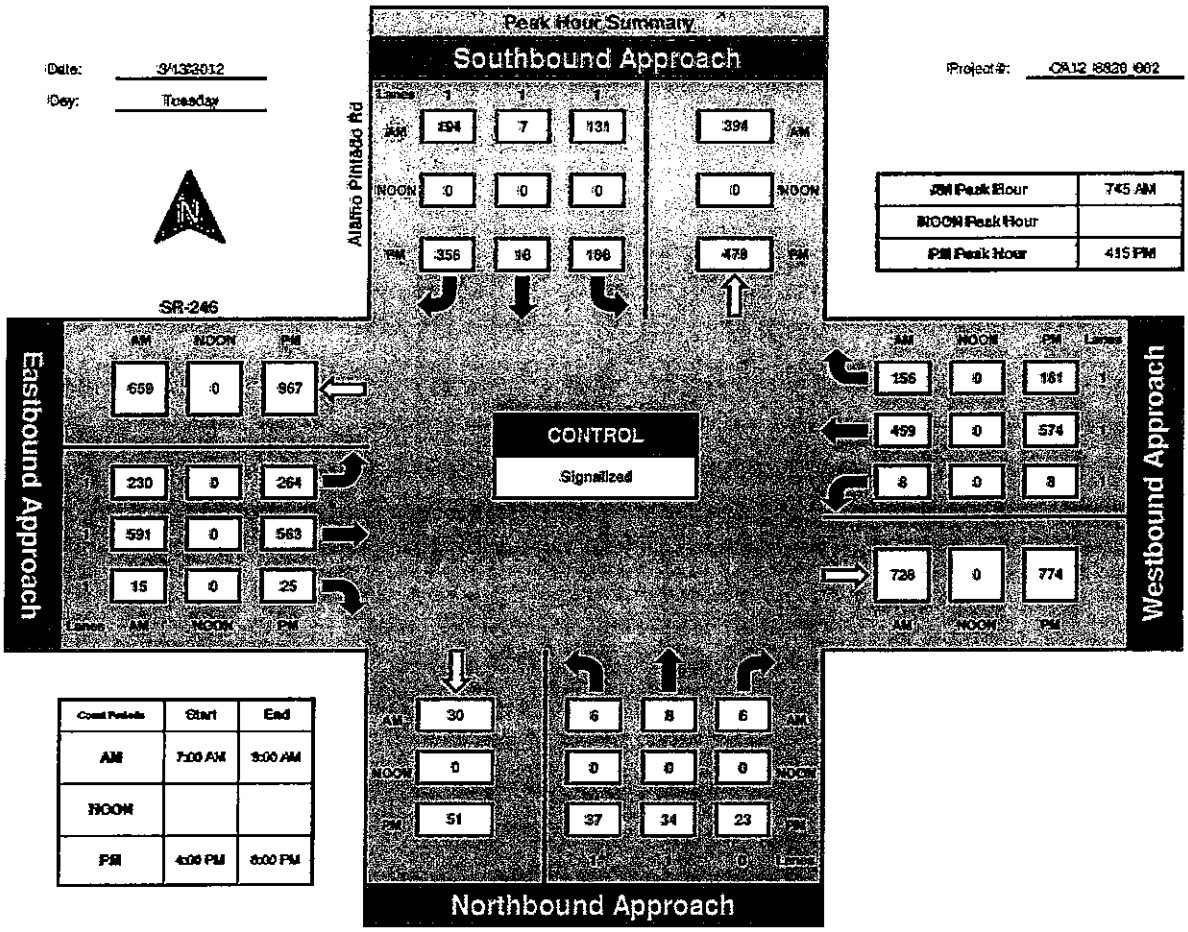
National Data & Surveying Services

Alamo Pintado Rd and SR-246 , City of Solvang

Date: 3/13/2012

Day: Tuesday

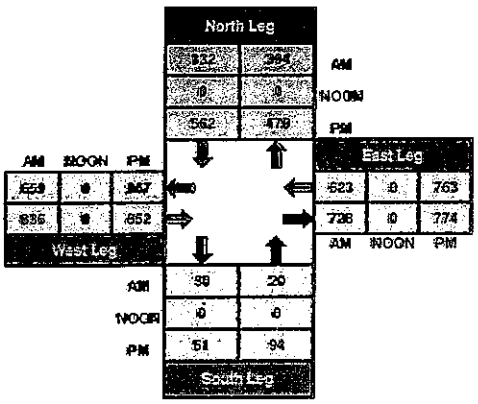
Project #: CA12_8820_002



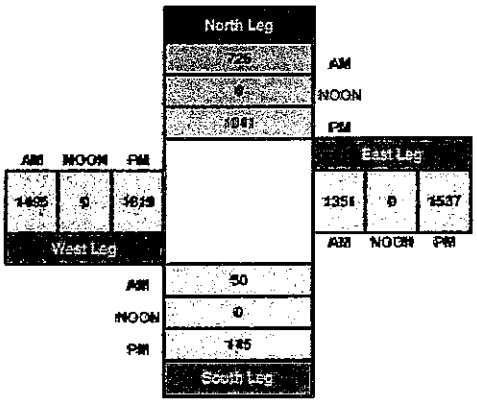
AM Peak Hour	7:45 AM
NOON Peak Hour	
PM Peak Hour	4:15 PM

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

Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

NDS

National Data & Surveying Services

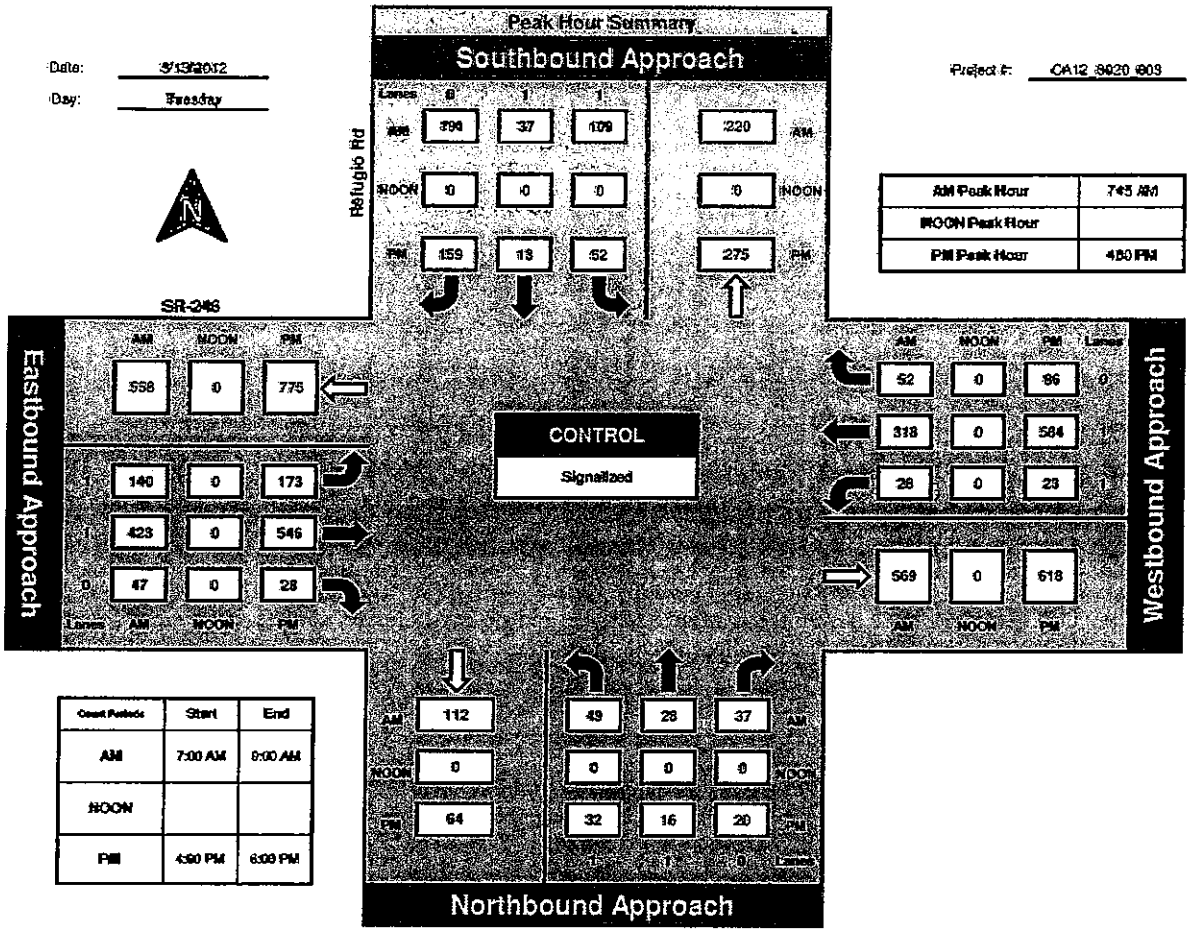
Refugio Rd and SR-246 , City of Solvang

Date: 3/13/2012

Day: Tuesday

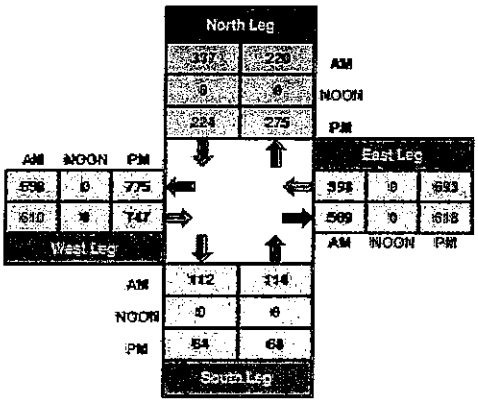
Project #: CA12_8920_003

AM Peak Hour	745 AM
NOON Peak Hour	
PM Peak Hour	450 PM

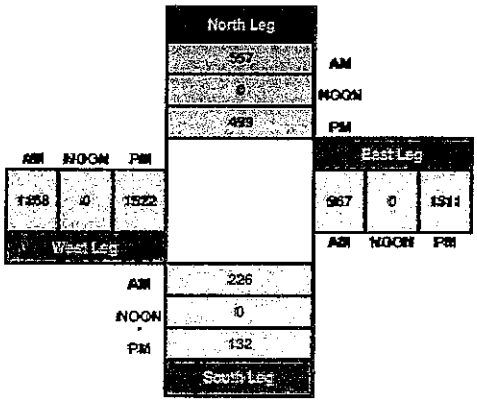


Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

NDS

National Data & Surveying Services

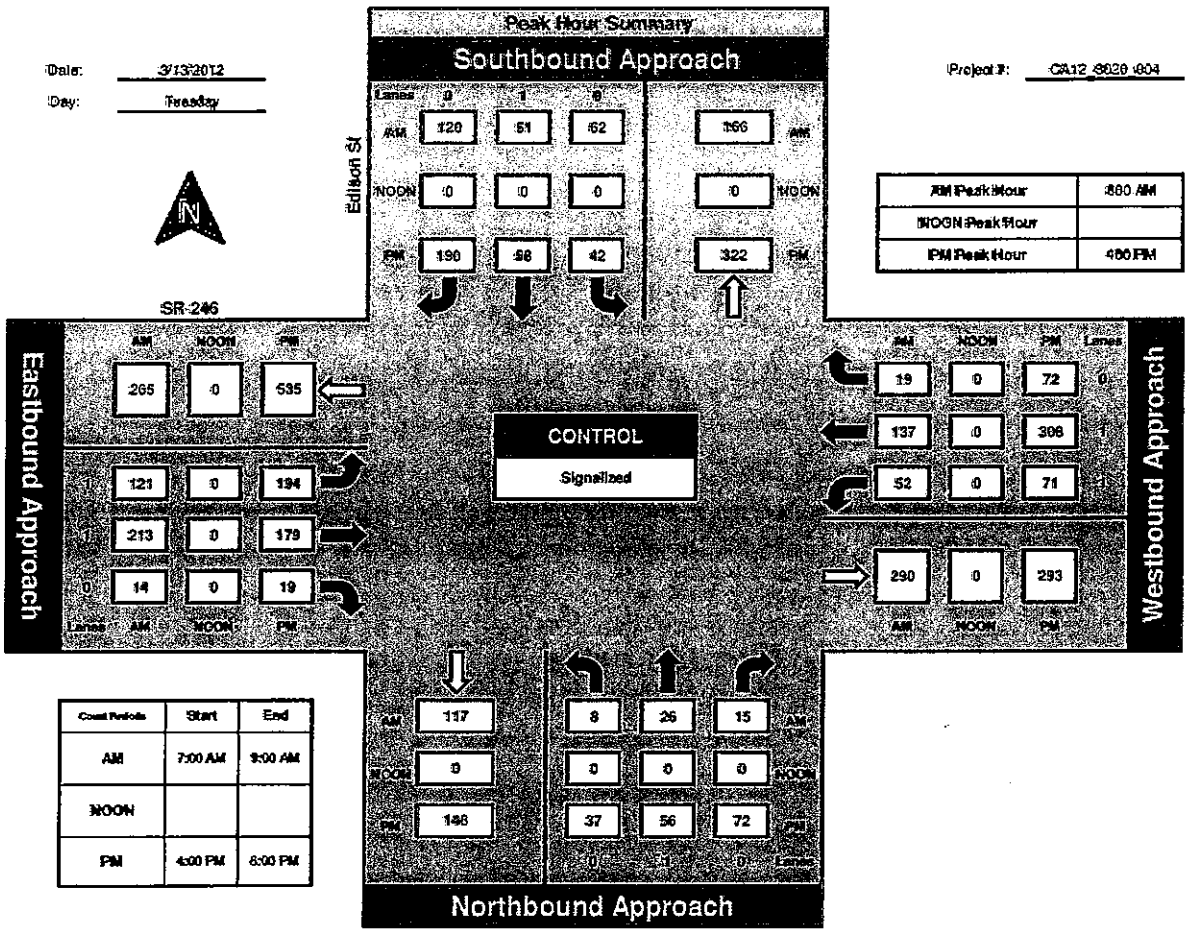
Edison St and SR-246, City of Santa Ynez

Date: 3/13/2012

Day: Tuesday

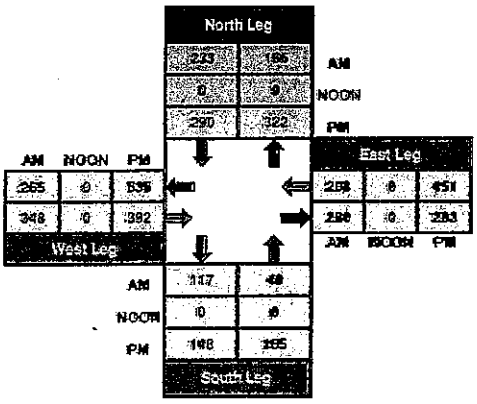
Project #: CA12_8020_004

AM Peak Hour	800 AM
NOON Peak Hour	
PM Peak Hour	400 PM

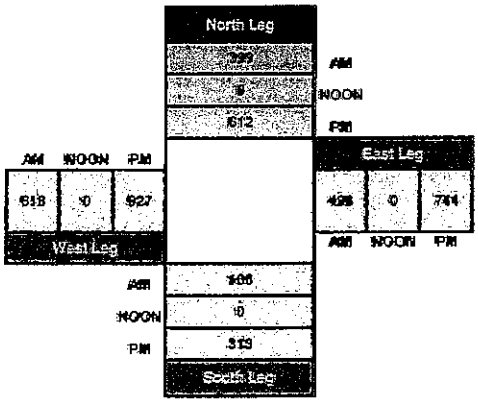


Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

NDS

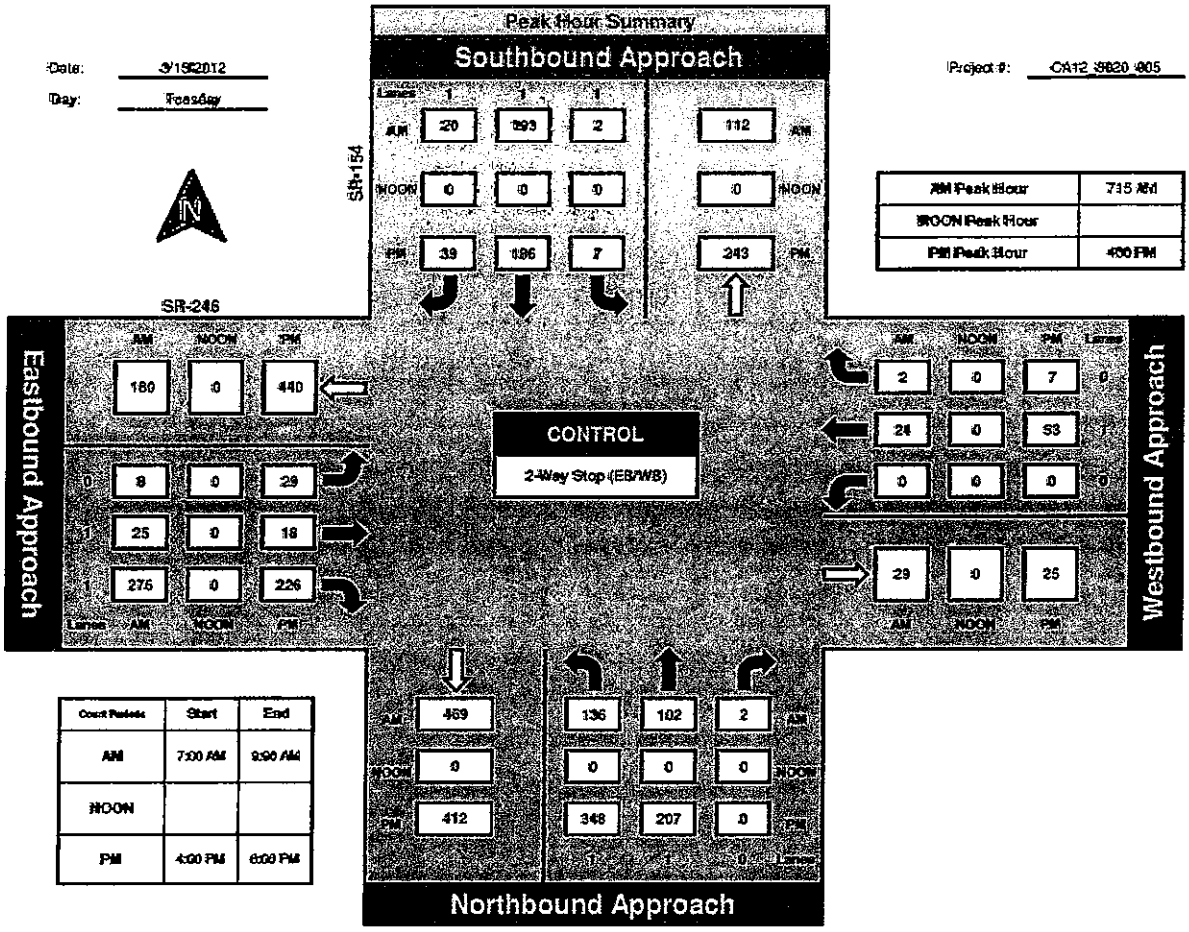
National Data & Surveying Services

SR-154 and SR-246 , City of Santa Ynez

Date: 3/15/2012

Day: Tuesday

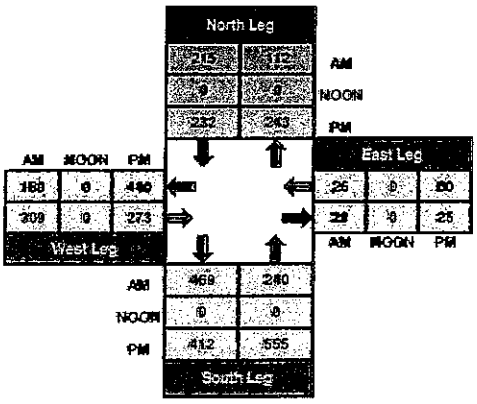
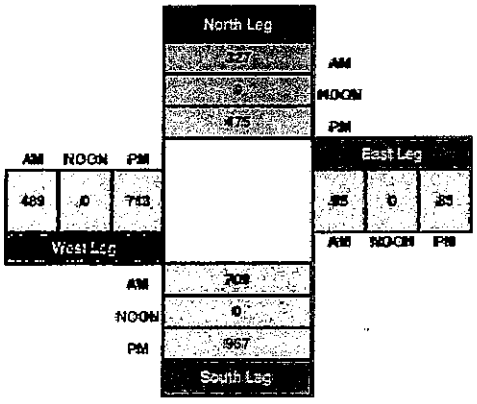
Project #: CA12_3820_005



AM Peak Hour	715 AM
NOON Peak Hour	
PM Peak Hour	400 PM

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

Total Ins & Outs



Total Volume Per Leg