APPENDIX A: Scoping Memo/Memorandum of Understanding

SCOPING FOR TRAFFIC STUDY

Project Name:	ACTON RETAIL CENTER

This Memorandum of Understanding (MOU) acknowledges Los Angeles County Department of Public Works, Traffic and Lighting Division (TLD) requirements of traffic impact analysis for the project and is subject to change:

Project Address:	TBD Sierra Highway, Acton, California		
Project Description:	Retail Center with a 6,000 SF retail use and 3,300 SF restaurant.		
City:	Acton, California, Los Angeles County		
Project Buildout Year:	2015	**Notice of Preparation/Start of Env. Analysis:**	N/A
Closest Intersection (Xtn) to the Project			
Xtn N/S Street Name:	Crown Valley Road		
Xtn E/W Street Name:	Sierra Highway		
Thomas Guide Pg+Grid:	4375 - A6, 4375 - B6	**Los Angeles County Supervisorial District:**	5

	Consultant	**Developer**
Company:	Hall & Foreman Inc.	Friedman Architects & Contractors
Name:	Robert A. Kilpatrick, PE, TE	Robert H. Friedman, AIA
Address:	14297 Cajon Avenue, Suite 101	2059 E Foothill Boulevard
City, State, Zip Code:	Victorville, California, 92392	Pasadena, California, 91107
Phone #:	(760) 524-9115	(626) 484-5251
Fax #:	(760) 5249101	
Email:	RKilpatrick@hfinc.com	robert@friedmanarchitects.com

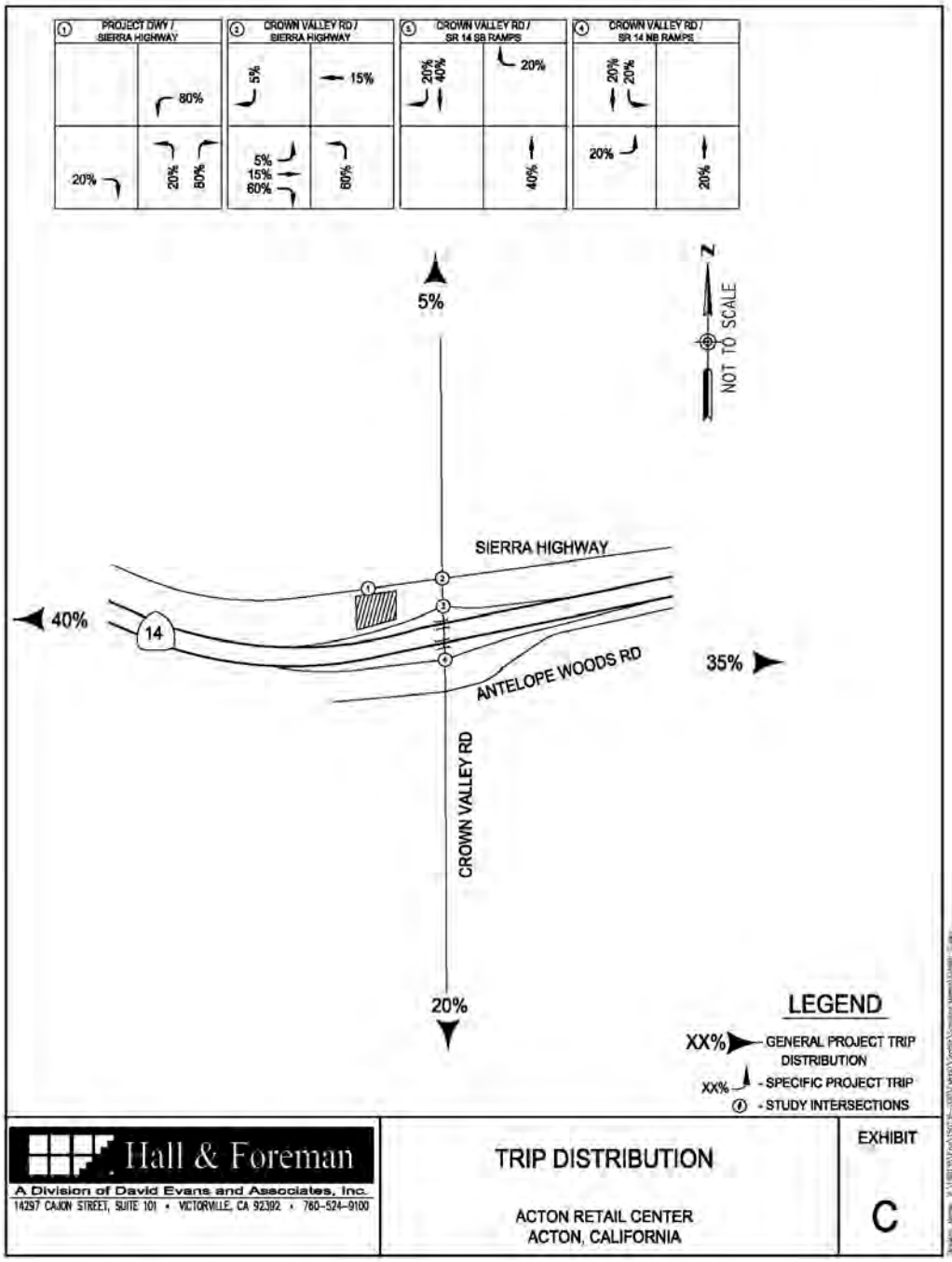
By:		**Reviewed By:**	
Print Name: Robert Kilpatrick		**Print Name:**	
Phone: (760) 524-9115			
Email: RKilpatrick@hfinc.com			
Consultant/Developer's Representative	**Date 12-24-14**	**TLD's Representative**	**Date**

For General Questions, please contact Traffic Studies Section at (626) 300-4740

By:_____
Date:_____

Project Name:	ACTON RETAIL CENTER

1. Traffic Distribution: Figure(s) illustrating project trip distribution in percentages and volumes at the studied intersections analyzed.



SCOPING FOR TRAFFIC STUDY

Project Name:	ACTON RETAIL CENTER

2. Trip Generation

Trip Generation Rate(s) Source: ITE Trip Generation	**I – Institute of Transportation Engineers; S – San Diego Traffic Generators; C – County; O – Other:**	**Edition:**	9th

Land Use Code	**Land Use**	**Rate Based on**	**Qty**	***AVTE vs**	**ADT**	Weekday a.m. peak		Weekday p.m. peak		Weekend peak hour	
						In	Out	In	Out	In	Out
826	Specialty Retail Center	Peak Hour Adj. Street	6,000	KSFGFA	266	7	9	20	21	-	-
934	Fast-Food Restaurant with Drive-Through Window	Peak Hour Adj. Street	3,300	KSFGFA	1,637	76	73	56	52	-	-
Subtotal Trips					1,903	84	83	76	73	-	-
Internal Trip Reduction (10%)					190	8	8	8	7	-	-
Total Primary Trips					1713	75	74	68	66	-	-

* - Average Vehicle Trip Ends.

For General Questions, please contact Traffic Studies Section at (626) 300-4740

By:_____
Date:_____

SCOPING FOR TRAFFIC STUDY

Project Name:	ACTON RETAIL CENTER

3. Study Intersections: At minimum, the study shall include the following intersections. The list is subject to change after related projects, trip generation and distribution are determined. Consultant should check with adjoining Cities regarding their requirements in addition to the following County/City intersections. Documentation of the consultation from these agencies shall be included in the traffic study.

Xtn #	Jurisdictional Split	Thomas Guide Page+Grid	N/S and E/W Street Names	Signalized	CMP
1	100	4375 - A6	PROJECT DWY + SIERRA HIGHWAY	**No**	**No**
2	100	4375 - B6	CROWN VALLEY RD + SIERRA HIGHWAY	**No**	**No**
3	100	4375 - B6	CROWN VALLEY RD + SR 14 SB RAMPS	**No**	**No**
4	100	4375 - B6	CROWN VALLEY RD + SR 14 NB RAMPS	**No**	**No**

For General Questions, please contact Traffic Studies Section at (626) 300-4740

By:_____
Date:_____

4. Related Projects: Project Consultant shall consultant with Los Angeles County Department of Regional Planning and planning departments of adjoining Cities to identify planned development in the vicinity of the project site.

5. Congested Management Program (CMP): Project Consultant shall conduct CMP analysis in accordance with the County's Traffic Impact Analysis Report Guidelines.

6. Freeway Analysis: Project Consultant shall consult with the State of California Department of Transportation (Caltrans) to determine the California Environmental Quality Act levels of significance with regard to traffic impacts on Caltrans' freeway facilities. This consultation shall also include a determination of Caltrans requirements for the study of traffic impacts to its facilities and the mitigation of any such impacts. This analysis must follow the most current Caltrans' Guide for the Preparation of Traffic Impact Studies (December 2002). If Caltrans finds that the project has a significant impact on the freeway, Caltrans shall be requested to include the basis for this finding in their response. If fees are proposed to mitigate the freeway impact, Caltrans shall be requested to identify the specific project to which the fees will apply. These written comments from Caltrans shall be included with the traffic study and submitted to Public Works for review and approval. If a documented good faith effort is made to consult with Caltrans and written comments cannot be obtained from within a reasonable amount of time, an analysis of the freeway impact shall be made using the County of Los Angeles' CMP Land Use Analysis Guidelines.

7. Site Access Analysis: Project's in rural areas shall conduct a site access analysis in accordance with the County's Access Management for Private Developments Guidelines Manual. All schools, waste/recycling collection or other projects as determined by TLD shall conduct a queuing analysis to ensure queues do not spill-over onto County roads. For schools, provide boundary map and information on neighboring schools including day care facilities. The traffic study will also document pick-up and drop-off procedures.

SCOPING FOR TRAFFIC STUDY

Project Name:	ACTON RETAIL CENTER

8. Other Instructions:

Traffic counts may be conducted immediately per the following:
Must be taken on Tuesdays, Wednesdays or Thursdays.
Must exclude holidays, and the first weekdays before and after the holiday.
Must be taken on days when local schools or colleges are in session.
Must be taken on days of good weather, and avoid atypical conditions (e.g., road construction, detours, or major traffic incidents).
Traffic counts used for other traffic studies in the area shall **NOT** be reused again, unless 25% of the counts conducted for that particular traffic study are validated with new counts. The difference in volumes between the old and new counts at each corresponding movement should not be more than 10%.
New traffic counts shall be checked to ensure the difference in volumes at corresponding approaches, if applicable, between two adjacent intersections is no more than 10% unless the difference can be justified.
For all proposed mitigation measures to address project specific impacts, the project shall include conceptual plans for the improvements in the traffic study which shall be made part of the review and approval of the traffic study. All proposed improvements shall be within public the right-of-way.
For all proposed mitigation measures to address cumulative impacts, the project shall include conceptual plans and cost estimates for the improvements in the traffic study which shall be made part of the review and approval of the traffic study.
Unless otherwise approved by TLD, level-of-service analysis shall be performed based on the following scenarios: (a) Traffic conditions in the vicinity of the project as they exist at the time the notice of preparation (NOP) is published, or if no NOP is published, at the time environmental analysis is commenced; (b) Traffic in (a) plus project traffic; (c) Traffic in (b) with the proposed mitigation measures (if necessary); (d) Traffic in (b) plus the cumulative traffic that includes project and other known developments at the time the notice of preparation (NOP) is published, or if no NOP is published, at the time environmental analysis is commenced; and (e) Traffic in (d) with the proposed mitigation measures (if necessary).

- If more information on the projects are required please contact DPW
- In addition to the related project list provided by Department of Regional Planning, please include the following projects.
    - Acton Taco Bell
- Project Consultant shall consult with the State of California Department of Transportation (Caltrans) to determine the California Environmental Quality Act levels of significance with regard to traffic impacts on Caltrans' freeway facilities.

By:_____
Date:_____

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS
TRAFFIC AND LIGHTING DIVISION
APPLICATION FOR ENVIRONMENTAL IMPACT REPORT
TRAFFIC STUDY REVIEW SERVICES, ORDINANCE NO. 91-0101

Road Fund No:	B03	Revenue Source	9254	Program No:	R291

Department Receipt No.:		**Date:**	12/24/14
Project No.:	T4000300	**Studies No.:**	
Project Name:	Acton Retail Center		
Applicant/Engineer:	Robert Kilpatrick	**Telephone No.:**	(760) 524-9115
Company:	Hall & Foreman Inc. a Division of David Evans	**Fax No.:**	(760) 524-9101
Address:	14297 Cajon Avenue		
City, State:	Victorville, California	**Zip:**	92395

The traffic study (TS), required as part of the environmental review process, has been received. **Before a traffic study review can begin, the indicated fee must be paid to this Department.** The fee may be paid in person or mailed to:

In Person	By Mail
Cashier, Mezzanine Level (626) 458-6399 **Los Angeles County Department of Public Works** **900 South Fremont Avenue** **Alhambra, CA 91803-1331**	**Cashier, Mezzanine Level** **Los Angeles County Department of Public Works** **P.O. Box 1460** **Alhambra, CA 91802-1460**

Please **return this form** along with your payment to insure proper credit to your account. Make check payable to the **Los Angeles County Department of Public Works.**

TS review fees are based on the number of Average Daily Trips (ADT's) generated by the project as follows:

ADT's		**FEE (Effective March 1, 2014)*	
1 - 1,000		**$1,713**	
1,001 - 5,000		**$3,425**	
5,001 - 10,000		**$4,282**	
10,001 and over		**$5,138**	
ADT For This Project:	**1,713**	Fee:	**$3,425**

* For additional information, go to http://planning.lacounty.gov/
** Additional fee is required for additional traffic conditions/phases

Cashier, upon processing of payment, please notify: _____
TLD Representative Email

SCOPING FOR TRAFFIC STUDY

Project Name:	

Updated 03/20/14

FOR PROJECTS IN MARINA DEL REY ONLY

Road Fund No:	B03	Revenue Source	9254	Program No:	R291

Department Receipt No.:		**Date:**	
Project No.:	T9420071	**Studies No.:**	
Project Name:			
Applicant/Engineer:		**Telephone No.:**	
Company:		**Fax No.:**	
Address:			
City, State:		**Zip:**	

The traffic study (TS), required as part of the environmental review process, has been received. **Before a traffic study review can begin, the indicated fee must be paid to this Department.** The fee may be paid in person or mailed to:

In Person	By Mail
Cashier, Mezzanine Level (626) 458-6399 **Los Angeles County Department of Public Works** **900 South Fremont Avenue** **Alhambra, CA 91803-1331**	**Cashier, Mezzanine Level** **Los Angeles County Department of Public Works** **P.O. Box 1460** **Alhambra, CA 91802-1460**

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ADT For This Project:		Fee:	

* For additional information, go to http://planning.lacounty.gov/
** Additional fee is required for additional traffic conditions/phases

Cashier, upon processing of payment, please notify: _____
TLD Representative Email

For General Questions, please contact Traffic Studies Section at (626) 300-4740

By:_____
Date:_____

Hall & Foreman
A Division of David Evans and Associates, Inc.

December 24, 2014 Job No. VV.150135.0000

MEMORANDUM

To: Robert H. Friedman, AIA
Friedman Architects & Contractors

From: Robert Kilpatrick, PE/TE
Vice President/Associate

RE: Traffic Scope Outline – Acton Retail Center Project - Acton, California

This memorandum presents the scope of the Traffic Study for a proposed Retail Center located in the unincorporated community of Acton, California, within unincorporated Los Angeles County. The Traffic Study for the proposed Acton Retail Center will be in compliance with the 2010 Congestion Management Program for Los Angeles County. The purpose of this scope is to assess the requirements of a detailed Traffic Study for the proposed project, for review and comment by the County of Los Angeles.

A. Project Description

The proposed project is located in the unincorporated community of Acton, approximately 47 miles northeast of the City of Los Angeles. The project is bound by Sierra Highway to the north, SR 14 (Antelope Valley Freeway) to the south, an existing Jack in the Box Restaurant to the west, and an Auto & Tire Retail to the east, as illustrated in *Exhibit A.* The main paved local roadways are Sierra Highway, Crown Valley Road, and SR 14 Freeway.

As presented, the proposed project is comprised of 6,000 square-foot retail building and a 3,300 square-foot restaurant. The project site lies on an approximate 85,250 square foot parcel. *Exhibit B* illustrates the proposed Site Plan. As illustrated, the primary access to the site will be obtained from two driveways on Sierra Highway.

B. Project Trip Generation

Table A summarizes the estimated trip generation for the project site during the AM and PM peak periods. The generation factors for Specialty Retail Center (ITE 826) were obtained from the ITE Trip Generation Manual, 9th Edition. It is estimated that the project will generate 1,713 daily trips, 150 trips during the AM peak hour trips and 134 trips during the PM peak hour.

Table A: Project Trip Generation
Traffic Scope – Acton Retail Center

Use		Daily	A.M. Peak Hour			P.M. Peak Hour		
			In	Out	Total	In	Out	Total
1	**Specialty Retail Center**							
	(ITE 826) Per 1,000 GSF	44.30	1.19	1.52	2.71	3.28	3.56	6.84
	6,000 GSF	266	7	9	16	20	21	41
2	**Fast-Food Restaurant with Drive-Through Window**							
	(ITE 934) Per 1,000 GSF	496.12	23.16	22.26	45.42	16.98	15.67	32.65
	3,300 GSF	1,637	76	73	150	56	52	108
	Subtotal Trips	1,903	84	83	166	76	73	149
	Internal Trip Reduction (10%)	190	8	8	17	8	7	15
	Total Primary Trips	1,713	75	74	150	68	66	134

Source: "Trip Generation Manual, Institute of Transportation Engineers", 9th Edition

C. Project Trip Distribution

The project trips are distributed based on the local area network streets. The distribution of the project trips are illustrated in *Exhibit C* and the assignment to the adjoining intersections in *Exhibit D*. The trip distribution is based on the existing street system.

D. Study Intersections

As presented, the project is bound by Sierra Highway to the north, SR 14 (Antelope Valley Freeway) to the south, and Crown Valley Road to the east. It is recommended that the four (4) intersections identified as study intersections be analyzed to determine if any specific mitigation is necessary. Based on our review of the proposed trip generation and distribution of the project trips, we are recommending four (4) intersections in the study area, be identified for analysis;

1. Project Driveway and Sierra Highway
2. Crown Valley Road and Sierra Highway
3. Crown Valley Road and SR 14 SB Ramps
4. Crown Valley Road and SR 14 NB Ramps

The 2010 Congestion Management Program for Los Angeles County Traffic Impact Guideline identifies that all intersections, where the proposed project will add 50 or more trips during either the AM or PM weekday peak hours (of adjacent street traffic) are to be included in intersection level of service analysis.

E. Traffic Study Scenarios

The following is an outline of the Traffic Study analysis scenarios;

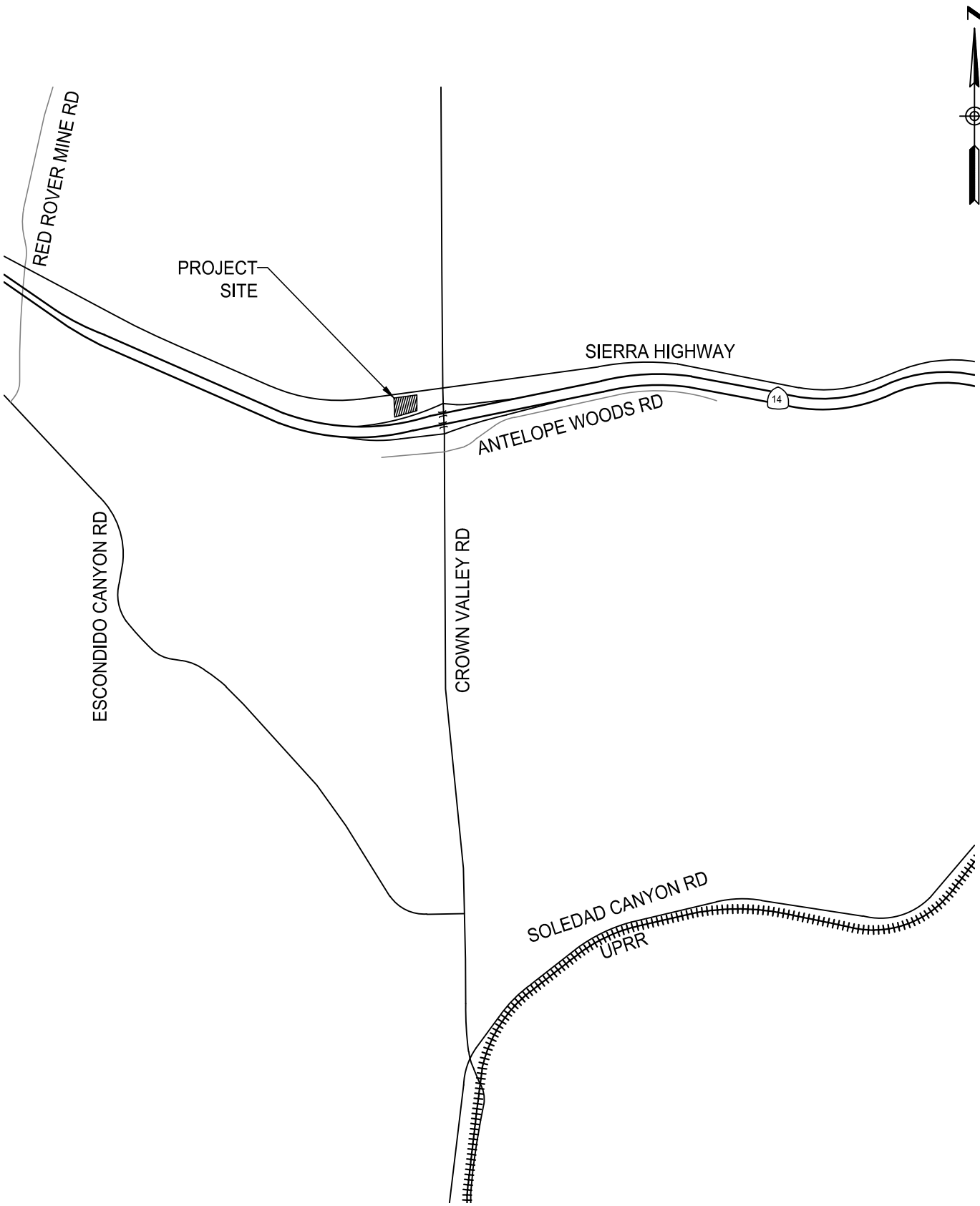
1. Existing Conditions

2. Existing Plus Project
    a. Proposed Project Traffic

3. Project Conditions (Year 2015)
    a. Proposed Project Traffic
    b. Other Area Traffic (to be provided by the County)

If you have any questions or comments, please feel free to contact us.

Attachments
1. Exhibit A - Vicinity Map
2. Exhibit B - Site Plan
3. Exhibit C - Trip Distribution
4. Exhibit D - Project Trips



Hall & Foreman

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VICINITY MAP

ACTON RETAIL CENTER
ACTON, CALIFORNIA

EXHIBIT

A

Drawing Name: V:\150135\Eng\150135-000\Exhibit\Traffic\Scoping Memo\Exhibit A.dwg
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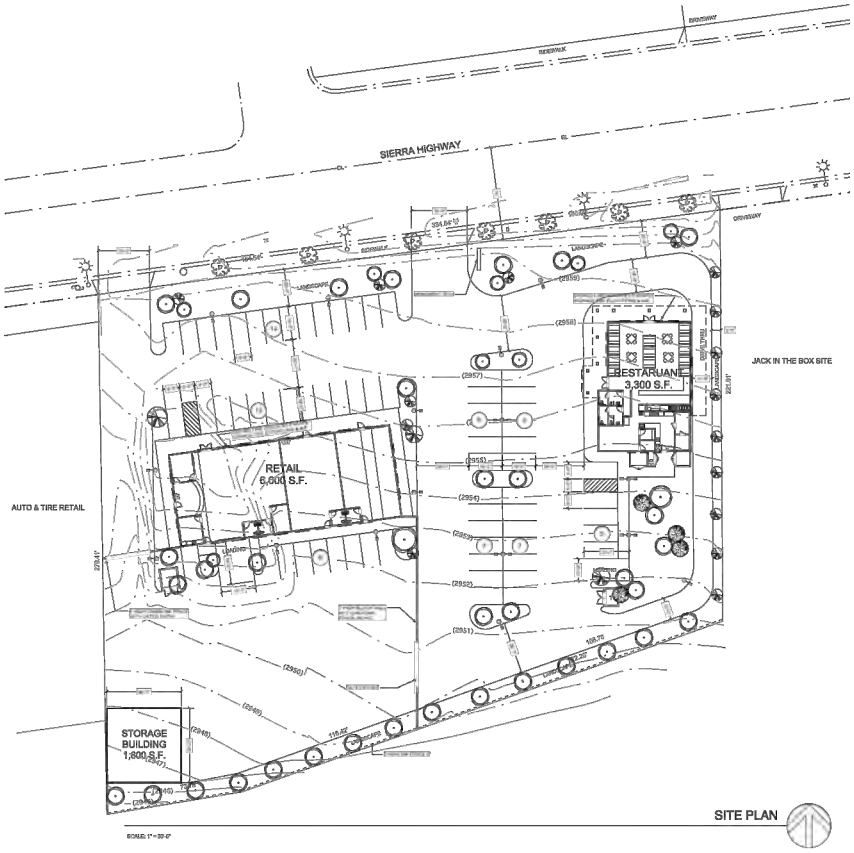
NOT TO SCALE



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SITE PLAN

ACTON RETAIL CENTER
ACTON, CALIFORNIA

EXHIBIT

B

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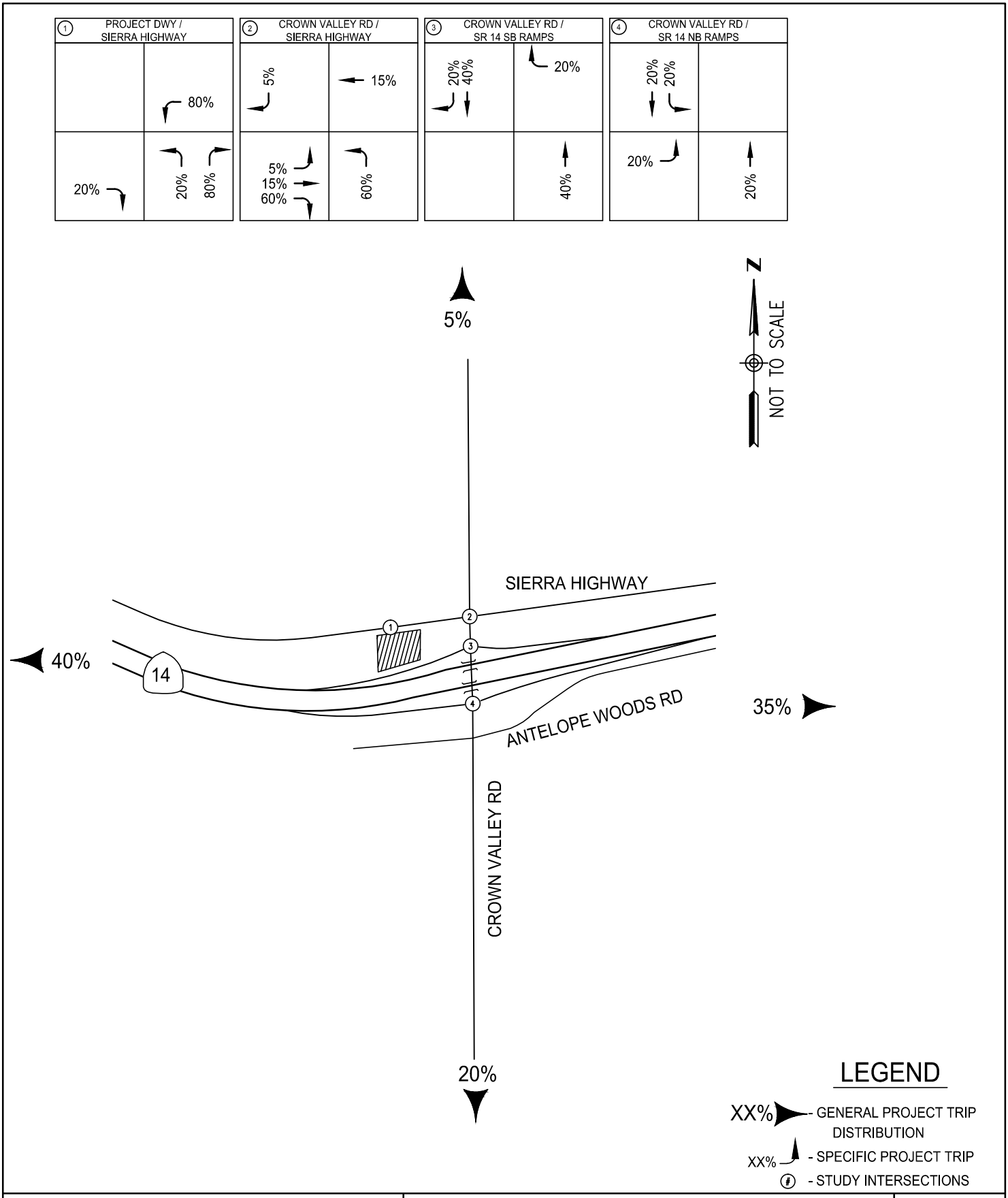

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TRIP DISTRIBUTION

ACTON RETAIL CENTER
ACTON, CALIFORNIA

EXHIBIT

C

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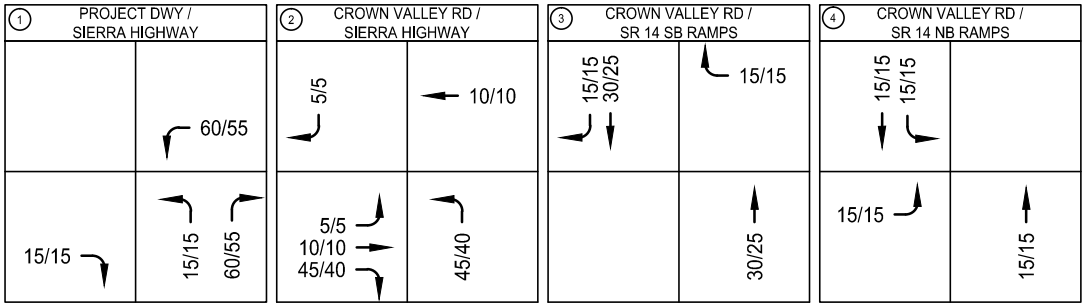

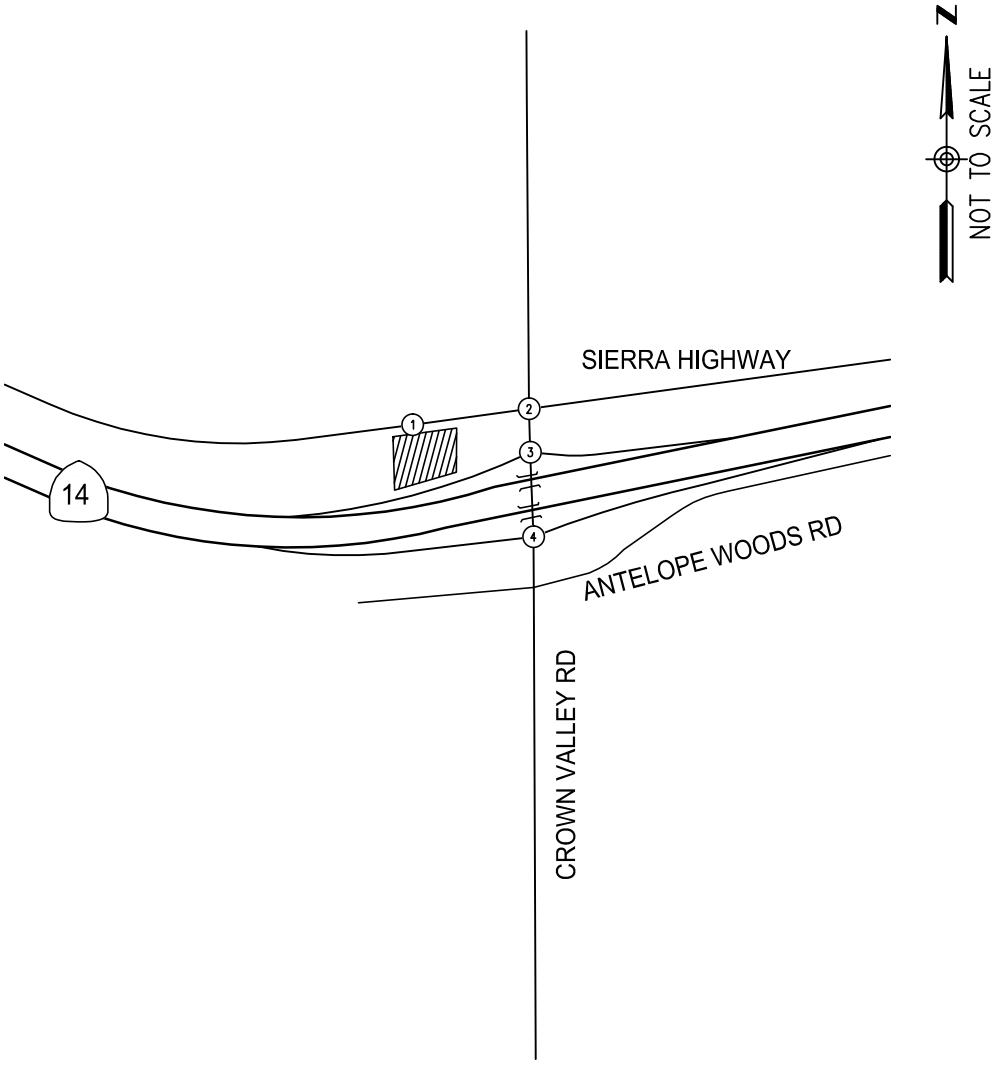

ADJUSTED TRIPS

AM PEAK PERIOD - 75 IN / 74 OUT
PM PEAK PERIOD - 68 IN / 66 OUT

LEGEND

XX/XX - AM/PM PROJECT TRIP
(#) - STUDY INTERSECTIONS

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PROJECT TRIPS

ACTON RETAIL CENTER
ACTON, CALIFORNIA

EXHIBIT

D

Drawing Name: V:\150135\Eng\150135-000\Exhibit\Traffic\Scoping Memo\Exhibit D.dwg
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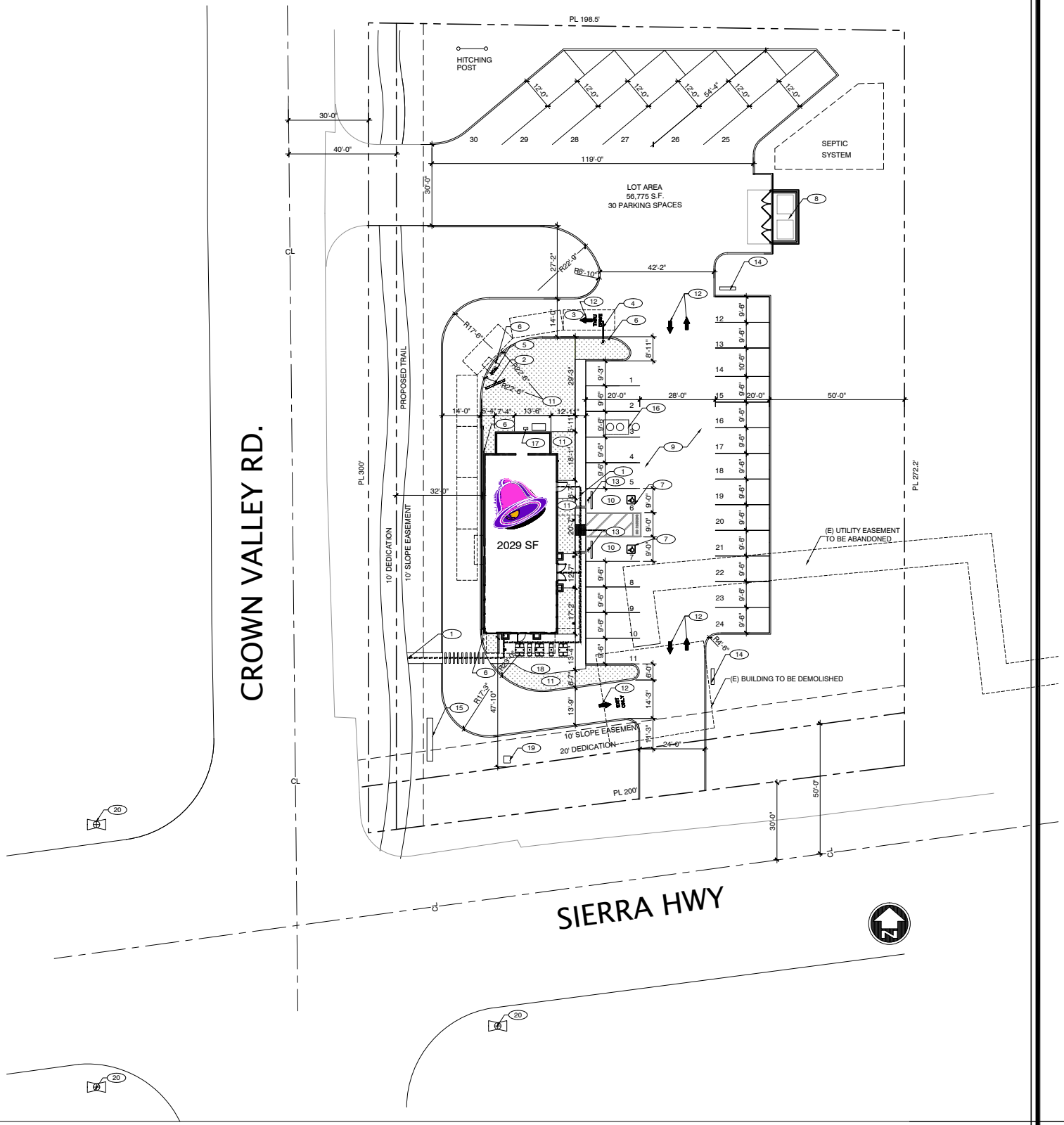
APPENDIX B: Other Area Projects

FIGURE 1-B
SITE PLAN



SITE PLAN 1"=20'

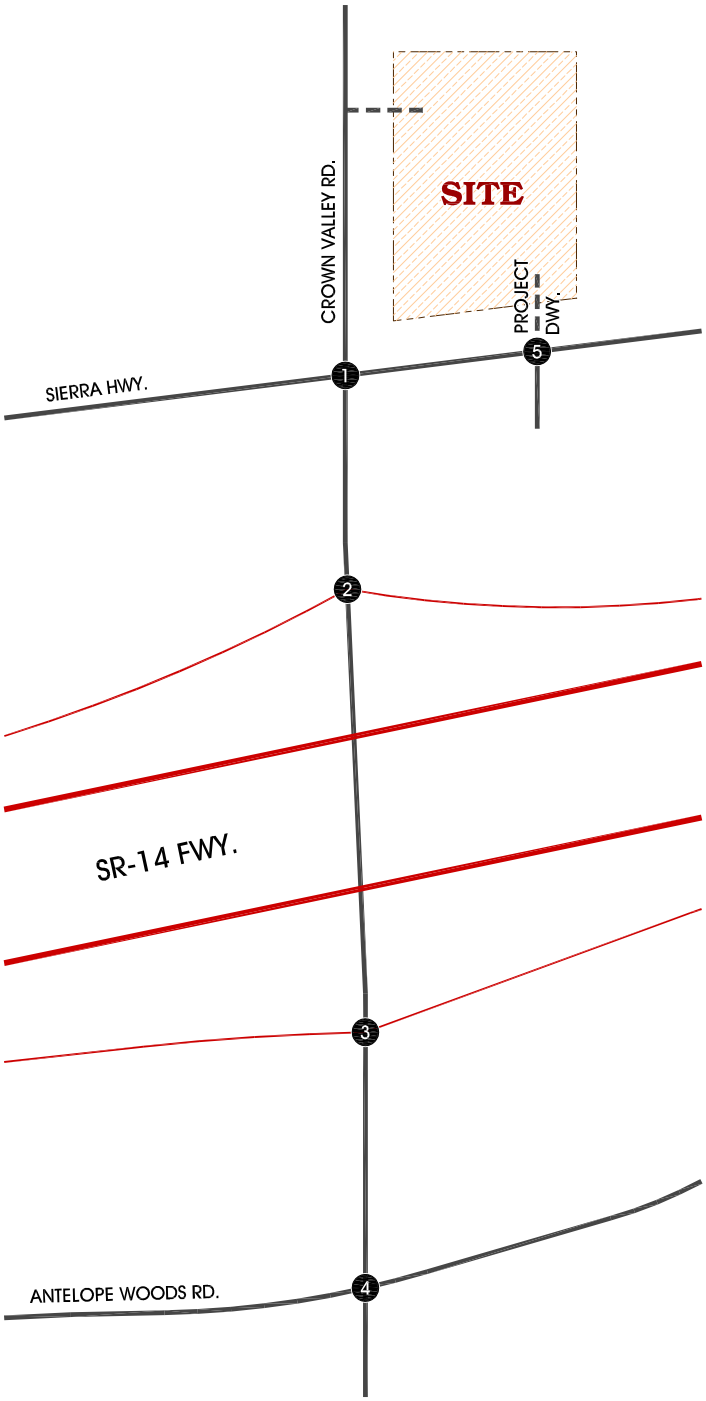
TABLE 3-2

PROJECT TRIP GENERATION SUMMARY

LAND USE	QUANTITY	UNITS[1]	PEAK HOUR						DAILY
			AM			PM			
			IN	OUT	TOTAL	IN	OUT	TOTAL	
Fast Food w/ Drive Thru	2.029	TSF	47	45	92	34	32	66	1,007
- Pass By Reduction (10%)			-5	-5	-9	-3	-3	-7	-101
TOTAL			**42**	**40**	**83**	**31**	**29**	**59**	**906**

[1] TSF = Thousand Square Feet

FIGURE 3-B
PROJECT ONLY AM PEAK HOUR INTERSECTION VOLUMES



1. Crown Valley Rd. / Sierra Hwy.	
↓0 ↓2 ↓0	←0 ←2 ↰32
↱0 →2 ↳0	↰0 ↑2 ↱34

5. Project Dwy. / Sierra Hwy.	
↓34 ↓0 ↓2	←2 ←0 ↰0
↱36 →0 ↳0	↰0 ↑0 ↱0

2. Crown Valley Rd. / SR-14 WB Ramps	
↓16 ↓18	↰17 ←0 ↰0
	↰0 ↑19

3. Crown Valley Rd. / SR-14 EB Ramps	
↓2 ↓16	
↱17 →0 ↳0	↑2 ↱0

4. Crown Valley Rd. / Antelope Woods Rd.	
↓0 ↓2 ↓0	↰0 ←0 ↰0
↱0 →0 ↳0	↰0 ↑2 ↱0

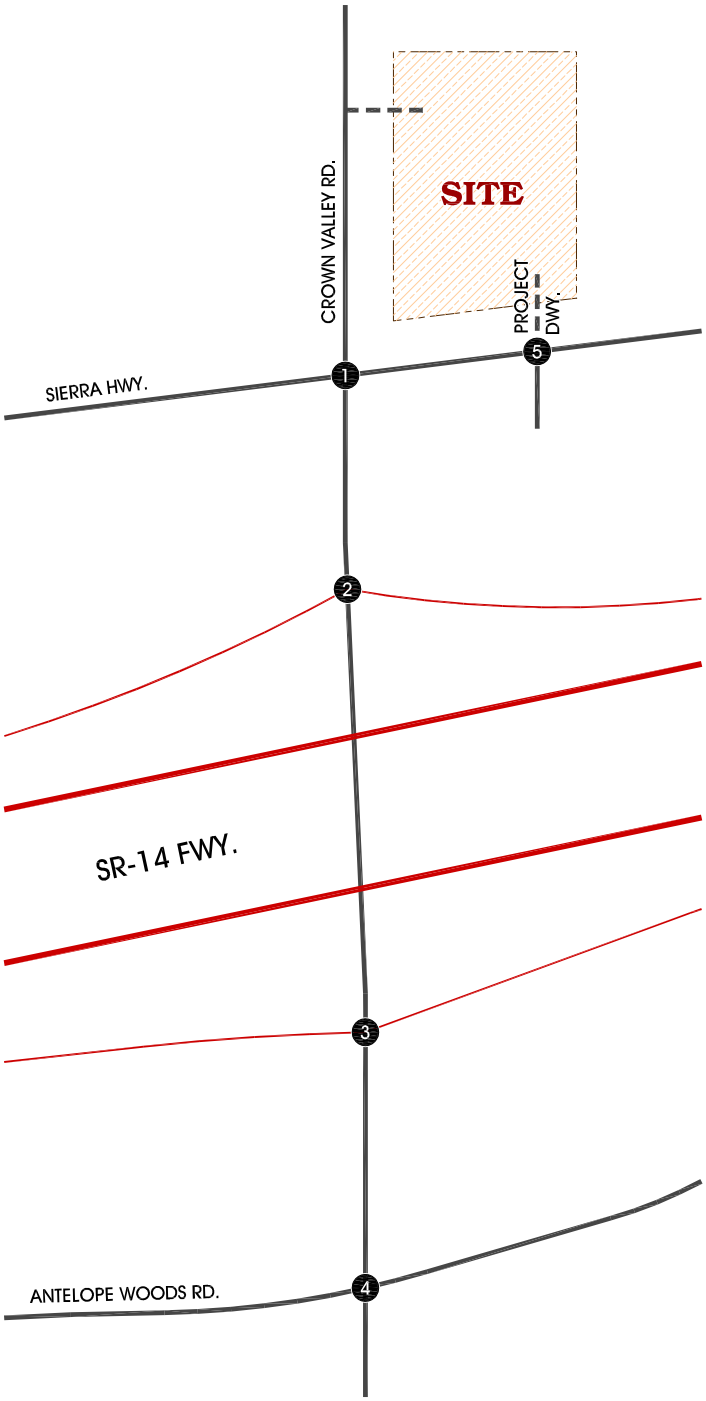
LEGEND:

1 = INTERSECTION ID

= PROJECT DRIVEWAY

N

FIGURE 3-C
PROJECT ONLY PM PEAK HOUR INTERSECTION VOLUMES



1. Crown Valley Rd. / Sierra Hwy.	
← 0, ↓ 1, ↓ 0	← 0, ← 1, ← 23
→ 0, → 2, → 0	↑ 0, ↑ 2, ↑ 25

5. Project Dwy. / Sierra Hwy.	
← 25, ↓ 0, ↓ 1	← 2, ← 0, ← 0
→ 26, → 0, → 0	↑ 0, ↑ 0, ↑ 0

2. Crown Valley Rd. / SR-14 WB Ramps	
← 12, ↓ 13	← 12, ← 0, ← 0
	↑ 0, ↑ 14

3. Crown Valley Rd. / SR-14 EB Ramps	
↓ 1, ↓ 12	
→ 12, → 0, → 0	↑ 2, ↑ 0

4. Crown Valley Rd. / Antelope Woods Rd.	
← 0, ↓ 1, ↓ 0	← 0, ← 0, ← 0
→ 0, → 0, → 0	↑ 0, ↑ 2, ↑ 0

LEGEND:

1 = INTERSECTION ID

= PROJECT DRIVEWAY

N

APPENDIX C: Intersection Capacity Analysis Calculations

Hall & Foreman, Inc.

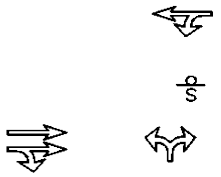
Engineering ▪ Surveying ▪ Planning ▪ Landscape Architecture

SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	14-Jan-15	VV.150135.0000	1 OF 2

E/W STREET : SIERRA HIGHWAY
N/S STREET : PROJECT DRIVEWAY
CONDITION : AM PEAK HOUR

INTERSECTION : 1
PROJECTED GROWTH PER YEAR : 2.0%

CONDITION DIAGRAMS



EXISTING GEOMETRICS

PROPOSED GEOMETRICS

TURN MOVEMENTS

CONDITION	EXISTING TRAFFIC	TRUCK PERCENTAGE	PROJECT TRIPS	EXISTING PLUS PROJECT TRAFFIC	AMBIENT GROWTH TRIPS	OTHER AREA PROJECT TRIPS	PROJECT CONDITION YEAR 2016 TRAFFIC
SCENARIO #:	1			3			5
SIERRA HIGHWAY							
EB LEFT	0	0%	0	0	0	0	0
EB THRU	165	5%	0	165	5	5	175
EB RIGHT	0	0%	15	15	0	0	15
WB LEFT	0	0%	60	60	0	0	60
WB THRU	260	5%	0	260	5	5	270
WB RIGHT	0	0%	0	0	0	0	0
PROJECT DRIVEWAY							
NB LEFT	0	0%	15	15	0	0	15
NB THRU	0	0%	0	0	0	0	0
NB RIGHT	0	0%	60	60	0	0	60
SB LEFT	0	0%	0	0	0	0	0
SB THRU	0	0%	0	0	0	0	0
SB RIGHT	0	0%	0	0	0	0	0
TOTALS	**425**	**0.1**	**150**	**575**	**10**	**10**	**595**

Tustin Office: 714.665.4500 Tel/ 714.665.4501 Fax
Santa Clarita Office: 661.284.7400 Tel/ 661.284.7401 Fax
Victorville Office: 760.524.9100 Tel/ 760.524.9101 Fax
Temecula Office: 951.294.9300 Tel/ 951.294.9301 Fax

Hall & Foreman, Inc.

Engineering • Surveying • Planning • Landscape Architecture

SUBJECT	BY	DATE	JOB NO.	SHEET	OF
TURN VOLUME SUMMARY	TM	14-Jan-15	VV.150135.0000	2	OF 2

E/W STREET : SIERRA HIGHWAY

N/S STREET : PROJECT DRIVEWAY

CONDITION : AM PEAK HOUR

PHF : 0.66

NORTH LEG

LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0

SOUTH LEG

LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0

EAST LEG

LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	0	0	0	0	0
0	1	0	0	0	0	0	2	0
0	2	0	0	0	0	0	2	0
0	1	0	0	0	0	0	1	0

WEST LEG

LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	1	0	0	0	0	0	0	0
0	3	0	0	0	0	0	0	0
0	1	0	0	1	0	0	2	0
0	0	0	0	0	0	0	0	0

NORTH LEG			SOUTH LEG			EAST LEG			WEST LEG		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	1	0	0	0	2	99	0	0	29	0
0	0	1	0	0	0	1	81	0	0	73	0
0	0	2	0	0	0	1	34	0	0	19	0
0	0	0	0	0	0	1	34	0	0	30	0

	TRUCK TOTAL	AUTO VOLUMES	TOTALS	ROUNDED TOTALS	TRUCK PERCENTAGE
SIERRA HIGHWAY					
EB LEFT	0	0	**0**	**0**	**0%**
EB THRU	8	155	**163**	**165**	**5%**
EB RIGHT	0	0	**0**	**0**	**0%**
WB LEFT	0	0	**0**	**0**	**0%**
WB THRU	9	253	**262**	**260**	**5%**
WB RIGHT	0	0	**0**	**0**	**0%**
PROJECT DRIVEWAY					
NB LEFT	0	0	**0**	**0**	**0%**
NB THRU	0	0	**0**	**0**	**0%**
NB RIGHT	0	0	**0**	**0**	**0%**
SB LEFT	0	0	**0**	**0**	**0%**
SB THRU	0	0	**0**	**0**	**0%**
SB RIGHT	0	0	**0**	**0**	**0%**

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INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: SIERRA VIEW DRWY
EAST-WEST STREET: SIERRA HWY
JURISDICTION: ACTON

DATE: 01-06-15

PEAK HOUR: 07:15AM

NORTH LEG

TOTAL: 11

Rt	Thru	Lt	
7		4	Total
2		1	1st
3		1	2nd
1		2	3rd
1		0	4th

EAST LEG TOTAL: 262

	1st	2nd	3rd	4th	Total
Rt	2	1	1	1	5
Thru	99	84	38	36	257
Lt					

Total	1st	2nd	3rd	4th	
6	1	3	1	1	Lt
159	30	76	23	30	Thru
					Rt

WEST LEG TOTAL: 165

PEAK HOUR FACTORS

NORTH LEG = 0.69
SOUTH LEG =
EAST LEG = 0.65
WEST LEG = 0.52

ALL LEGS = 0.65

	Lt	Thru	Rt
1st			
2nd			
3rd			
4th			
Total			

TOTAL: 0

SOUTH LEG

HOUR TOTAL: 438

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : SIERRA VIEW DRWY ACTON

EAST-WEST STREET : SIERRA HWY 01-06-15

BEGINNING TIME : 07:00AM

AUTOS			LARGE 2 AXLE			3 AXLE			4(+) AXLE			TOTALS
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	
						NORTH LEG						
2	0	1	0	0	0	0	0	0	0	0	0	3
2	0	1	0	0	0	0	0	0	0	0	0	3
3	0	1	0	0	0	0	0	0	0	0	0	4
1	0	2	0	0	0	0	0	0	0	0	0	3
1	0	0	0	0	0	0	0	0	0	0	0	1
2	0	2	0	0	0	0	0	0	0	0	0	4
0	0	1	0	0	0	0	0	0	0	0	0	1
0	0	4	0	0	0	0	0	0	0	0	0	4
11	0	12	0	0	0	0	0	0	0	0	0	23
						SOUTH LEG						
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
						EAST LEG						
1	38	0	0	2	0	0	1	0	0	0	0	42
2	99	0	0	0	0	0	0	0	0	0	0	101
1	81	0	0	1	0	0	0	0	0	2	0	85
1	34	0	0	2	0	0	0	0	0	2	0	39
1	34	0	0	1	0	0	0	0	0	1	0	37
1	24	0	0	0	0	0	0	0	0	0	0	25
1	37	0	0	2	0	0	2	0	0	1	0	43
1	29	0	0	2	0	0	1	0	0	2	0	35
9	376	0	0	10	0	0	4	0	0	8	0	407
						WEST LEG						
0	22	1	0	0	0	0	0	0	0	0	0	23
0	29	1	0	1	0	0	0	0	0	0	0	31
0	73	3	0	3	0	0	0	0	0	0	0	79
0	19	1	0	1	0	0	1	0	0	2	0	24
0	30	1	0	0	0	0	0	0	0	0	0	31
0	23	2	0	0	0	0	0	0	0	0	0	25
0	15	1	0	1	0	0	2	0	0	1	0	20
0	20	1	0	1	0	0	1	0	0	1	0	24
0	231	11	0	7	0	0	4	0	0	4	0	257

Prepared by Newport Traffic Studies

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: SIERRA VIEW DRWY

EAST-WEST STREET: SIERRA HWY

TIME: 07:00AM-08:00AM DATE: 01-06-15

NORTH LEG

Rt	Thru	Lt	
8		5	Total
2		1	1st
2		1	2nd
3		1	3rd
1		2	4th

	1st	2nd	3rd	4th	Total
Rt	1	2	1	1	5
Thru	41	99	84	38	262
Lt					

Total	1st	2nd	3rd	4th	
6	1	1	3	1	Lt
151	22	30	76	23	Thru
					Rt

	Lt	Thru	Rt
1st			
2nd			
3rd			
4th			
Total			

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: SIERRA VIEW DRWY

EAST-WEST STREET: SIERRA HWY

TIME: 08:00AM-09:00AM DATE: 01-06-15

NORTH LEG

Rt	Thru	Lt	
3		7	Total
1		0	1st
2		2	2nd
0		1	3rd
0		4	4th

	1st	2nd	3rd	4th	Total
Rt	1	1	1	1	4
Thru	36	24	42	34	136
Lt					

Total	1st	2nd	3rd	4th	
5	1	2	1	1	Lt
95	30	23	19	23	Thru
					Rt

	Lt	Thru	Rt
1st			
2nd			
3rd			
4th			
Total			

Prepared by NEWPORT TRAFFIC STUDIES

Intersection Capacity Utilization
1: SIERRA HWY

1/14/2015

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	165	15	60	260	15	60
Pedestrians						
Ped Button						
Pedestrian Timing (s)						
Free Right		No				No
Ideal Flow	1900	1900	1900	1900	1900	1900
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120
Volume Combined (vph)	180	0	0	320	75	0
Lane Utilization Factor	0.95	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.99	0.85	0.95	0.99	0.87	0.85
Saturated Flow (vph)	3572	0	0	1882	1655	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)	0.00			0.00	0.00	
Protected Option Allowed	No			No	No	
Reference Time (s)		0.0				0.0
Adj Reference Time (s)		0.0				0.0
Permitted Option						
Adj Saturation A (vph)	1786		0	490	110	
Reference Time A (s)	6.0		0.0	78.4	81.6	
Adj Saturation B (vph	NA		NA	NA	NA	
Reference Time B (s)	NA		NA	NA	NA	
Reference Time (s)	6.0			78.4		
Adj Reference Time (s)	10.0			82.4		
Split Option						
Ref Time Combined (s)	6.0		0.0	20.4	5.4	
Ref Time Seperate (s)	5.5		4.0	16.4	1.1	
Reference Time (s)	6.0		20.4	20.4	5.4	
Adj Reference Time (s)	10.0		24.4	24.4	9.4	

Summary	EB WB	NB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	82.4	Err	
Split Option (s)	34.4	9.4	
Minimum (s)	34.4	9.4	43.9

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	36.6%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Intersection	
Int Delay, s/veh	2.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	165	15	60	260	15	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	65	65	65	65	65	65
Heavy Vehicles, %	5	0	0	5	0	0
Mvmt Flow	254	23	92	400	23	92

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	277	0	850	138
Stage 1	-	-	-	-	265	-
Stage 2	-	-	-	-	585	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1298	-	318	891
Stage 1	-	-	-	-	761	-
Stage 2	-	-	-	-	561	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1298	-	289	891
Mov Cap-2 Maneuver	-	-	-	-	401	-
Stage 1	-	-	-	-	761	-
Stage 2	-	-	-	-	510	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.5	11
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	716	-	-	1298	-
HCM Lane V/C Ratio	0.161	-	-	0.071	-
HCM Control Delay (s)	11	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0.2	-

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	175	15	60	270	15	60
Pedestrians						
Ped Button						
Pedestrian Timing (s)						
Free Right		No				No
Ideal Flow	1900	1900	1900	1900	1900	1900
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120
Volume Combined (vph)	190	0	0	330	75	0
Lane Utilization Factor	0.95	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.99	0.85	0.95	0.99	0.87	0.85
Saturated Flow (vph)	3575	0	0	1883	1655	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)	0.00			0.00	0.00	
Protected Option Allowed	No			No	No	
Reference Time (s)		0.0				0.0
Adj Reference Time (s)		0.0				0.0
Permitted Option						
Adj Saturation A (vph)	1787		0	502	110	
Reference Time A (s)	6.4		0.0	78.9	81.6	
Adj Saturation B (vph	NA		NA	NA	NA	
Reference Time B (s)	NA		NA	NA	NA	
Reference Time (s)	6.4			78.9		
Adj Reference Time (s)	10.4			82.9		
Split Option						
Ref Time Combined (s)	6.4		0.0	21.0	5.4	
Ref Time Seperate (s)	5.9		4.0	17.1	1.1	
Reference Time (s)	6.4		21.0	21.0	5.4	
Adj Reference Time (s)	10.4		25.0	25.0	9.4	

Summary	EB WB	NB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	82.9	Err	
Split Option (s)	35.4	9.4	
Minimum (s)	35.4	9.4	44.8

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	37.4%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Intersection	
Int Delay, s/veh	2.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	175	15	60	270	15	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	65	65	65	65	65	65
Heavy Vehicles, %	5	0	0	5	0	0
Mvmt Flow	269	23	92	415	23	92

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	292	0	881	146
Stage 1	-	-	-	-	281	-
Stage 2	-	-	-	-	600	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1281	-	304	881
Stage 1	-	-	-	-	747	-
Stage 2	-	-	-	-	552	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1281	-	276	881
Mov Cap-2 Maneuver	-	-	-	-	391	-
Stage 1	-	-	-	-	747	-
Stage 2	-	-	-	-	501	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.5	11.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	704	-	-	1281	-
HCM Lane V/C Ratio	0.164	-	-	0.072	-
HCM Control Delay (s)	11.1	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0.2	-

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SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	14-Jan-15	VV.150135.0000	1 OF 2

E/W STREET : SIERRA HIGHWAY

N/S STREET : PROJECT DRIVEWAY

CONDITION : PM PEAK HOUR

INTERSECTION : 1

PROJECTED GROWTH PER YEAR : 2.0%

TURN MOVEMENTS

CONDITION	EXISTING TRAFFIC	TRUCK PERCENTAGE	PROJECT TRIPS	EXISTING PLUS PROJECT TRAFFIC	AMBIENT GROWTH TRIPS	OTHER AREA PROJECT TRIPS	PROJECT CONDITION YEAR 2015 TRAFFIC
SCENARIO #:	2			4			6
SIERRA HIGHWAY							
EB LEFT	0	0%	0	0	0	0	0
EB THRU	250	5%	0	250	5	5	260
EB RIGHT	0	0%	15	15	0	0	15
WB LEFT	0	0%	55	55	0	0	55
WB THRU	160	5%	0	160	5	5	170
WB RIGHT	0	0%	0	0	0	0	0
PROJECT DRIVEWAY							
NB LEFT	0	0%	15	15	0	0	15
NB THRU	0	0%	0	0	0	0	0
NB RIGHT	0	0%	55	55	0	0	55
SB LEFT	0	0%	0	0	0	0	0
SB THRU	0	0%	0	0	0	0	0
SB RIGHT	0	0%	0	0	0	0	0
TOTALS	**410**	**0.1**	**140**	**550**	**10**	**10**	**570**

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SUBJECT	BY	DATE	JOB NO.	SHEET	OF
TURN VOLUME SUMMARY	TM	1/14/2015	VV.150135.0000	2	OF 2

E/W STREET : SIERRA HIGHWAY

CONDITION : PM PEAK HOUR

N/S STREET : PROJECT DRIVEWAY

PHF : 0.87

NORTH LEG

LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0

SOUTH LEG

LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0

EAST LEG

LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	0	0	0	1	0
0	1	0	0	0	0	0	1	0
0	1	0	0	0	0	0	1	0
0	1	0	0	0	0	0	1	0

WEST LEG

LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	0	0	0	0	0
0	1	0	0	0	0	0	1	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1	0

NORTH LEG			SOUTH LEG			EAST LEG			WEST LEG		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	2	0	0	0	2	40	0	0	44	0
0	0	2	0	0	0	1	42	0	0	62	0
0	0	4	0	0	0	1	35	0	0	52	0
0	0	2	0	0	0	4	29	0	0	81	0

	TRUCK TOTAL	AUTO VOLUMES	TOTALS	ROUNDED TOTALS	TRUCK PERCENTAGE
SIERRA HIGHWAY					
EB LEFT	0	0	**0**	**0**	**0%**
EB THRU	3	249	**252**	**250**	**5%**
EB RIGHT	0	0	**0**	**0**	**0%**
WB LEFT	0	0	**0**	**0**	**0%**
WB THRU	7	154	**161**	**160**	**5%**
WB RIGHT	0	0	**0**	**0**	**0%**
PROJECT DRIVEWAY					
NB LEFT	0	0	**0**	**0**	**0%**
NB THRU	0	0	**0**	**0**	**0%**
NB RIGHT	0	0	**0**	**0**	**0%**
SB LEFT	0	0	**0**	**0**	**0%**
SB THRU	0	0	**0**	**0**	**0%**
SB RIGHT	0	0	**0**	**0**	**0%**

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INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: SIERRA VIEW DRWY
EAST-WEST STREET: SIERRA HWY
JURISDICTION: ACTON

DATE: 01-06-15

PEAK HOUR: 04:30PM

NORTH LEG

TOTAL: 17

Rt	Thru	Lt	
7		10	Total
4		2	1st
1		2	2nd
1		4	3rd
1		2	4th

EAST LEG TOTAL: 161

	1st	2nd	3rd	4th	Total
Rt	2	1	1	4	8
Thru	41	44	37	31	153
Lt					

Total	1st	2nd	3rd	4th	
6	1	1	2	2	Lt
242	44	64	52	82	Thru
					Rt

WEST LEG TOTAL: 248

PEAK HOUR FACTORS

NORTH LEG = 0.71
SOUTH LEG =
EAST LEG = 0.89
WEST LEG = 0.74

ALL LEGS = 0.87

	Lt	Thru	Rt
1st			
2nd			
3rd			
4th			
Total			

TOTAL: 0

SOUTH LEG

HOUR TOTAL: 426

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : SIERRA VIEW DRWY ACTON

EAST-WEST STREET : SIERRA HWY 01-06-15

BEGINNING TIME : 04:00PM

AUTOS			LARGE 2 AXLE			3 AXLE			4(+) AXLE			TOTALS
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	
						NORTH LEG						
2	0	2	0	0	0	0	0	0	0	0	0	4
2	0	2	0	0	0	0	0	0	0	0	0	4
4	0	2	0	0	0	0	0	0	0	0	0	6
1	0	2	0	0	0	0	0	0	0	0	0	3
1	0	4	0	0	0	0	0	0	0	0	0	5
1	0	2	0	0	0	0	0	0	0	0	0	3
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	14	0	0	0	0	0	0	0	0	0	25
						SOUTH LEG						
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
						EAST LEG						
1	18	0	0	1	0	0	0	0	0	0	0	20
3	29	0	0	0	0	0	0	0	0	0	0	32
2	40	0	0	0	0	0	0	0	0	1	0	43
1	42	0	0	1	0	0	0	0	0	1	0	45
1	35	0	0	1	0	0	0	0	0	1	0	38
4	29	0	0	1	0	0	0	0	0	1	0	35
1	26	0	0	0	0	0	0	0	0	0	0	27
2	22	0	0	0	0	0	0	0	0	1	0	25
15	241	0	0	4	0	0	0	0	0	5	0	265
						WEST LEG						
0	31	0	0	1	0	0	0	0	0	1	0	33
0	25	1	0	0	0	0	0	0	0	1	0	27
0	44	1	0	0	0	0	0	0	0	0	0	45
0	62	1	0	1	0	0	0	0	0	1	0	65
0	52	2	0	0	0	0	0	0	0	0	0	54
0	81	2	0	0	0	0	0	0	0	1	0	84
0	65	2	0	0	0	0	0	0	0	0	0	67
0	77	0	0	0	0	0	0	0	0	0	0	77
0	437	9	0	2	0	0	0	0	0	4	0	452

Prepared by Newport Traffic Studies

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: SIERRA VIEW DRWY

EAST-WEST STREET: SIERRA HWY

TIME: 04:00PM-05:00PM DATE: 01-06-15

NORTH LEG

Rt	Thru	Lt	
9		8	Total
2		2	1st
2		2	2nd
4		2	3rd
1		2	4th

	1st	2nd	3rd	4th	Total
Rt	1	3	2	1	7
Thru	19	29	41	44	133
Lt					

Total	1st	2nd	3rd	4th	
3	0	1	1	1	Lt
167	33	26	44	64	Thru
					Rt

	Lt	Thru	Rt
1st			
2nd			
3rd			
4th			
Total			

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: SIERRA VIEW DRWY

EAST-WEST STREET: SIERRA HWY

TIME: 05:00PM-06:00PM DATE: 01-06-15

NORTH LEG

Rt	Thru	Lt	
2		6	Total
1		4	1st
1		2	2nd
0		0	3rd
0		0	4th

	1st	2nd	3rd	4th	Total
Rt	1	4	1	2	8
Thru	37	31	26	23	117
Lt					

Total	1st	2nd	3rd	4th	
6	2	2	2	0	Lt
276	52	82	65	77	Thru
					Rt

	Lt	Thru	Rt
1st			
2nd			
3rd			
4th			
Total			

Prepared by NEWPORT TRAFFIC STUDIES

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	250	15	15	55	55	160
Pedestrians						
Ped Button						
Pedestrian Timing (s)						
Free Right		No				No
Ideal Flow	1900	1900	1900	1900	1900	1900
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120
Volume Combined (vph)	265	0	0	70	215	0
Lane Utilization Factor	0.95	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.99	0.85	0.95	0.99	0.88	0.85
Saturated Flow (vph)	3587	0	0	1880	1666	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)	0.00			0.00	0.00	
Protected Option Allowed	No			No	No	
Reference Time (s)		0.0				0.0
Adj Reference Time (s)		0.0				0.0
Permitted Option						
Adj Saturation A (vph)	1793		0	440	111	
Reference Time A (s)	8.9		0.0	19.1	232.2	
Adj Saturation B (vph	3587		NA	NA	NA	
Reference Time B (s)	8.9		NA	NA	NA	
Reference Time (s)	8.9			19.1		
Adj Reference Time (s)	12.9			23.1		
Split Option						
Ref Time Combined (s)	8.9		0.0	4.5	15.5	
Ref Time Seperate (s)	8.4		1.0	3.5	4.0	
Reference Time (s)	8.9		4.5	4.5	15.5	
Adj Reference Time (s)	12.9		8.5	8.5	19.5	

Summary	EB WB	NB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	23.1	Err	
Split Option (s)	21.3	19.5	
Minimum (s)	21.3	19.5	40.8

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	34.0%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Intersection	
Int Delay, s/veh	4.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	250	15	15	55	55	160
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	5	0	0	5	0	0
Mvmt Flow	287	17	17	63	63	184

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	305	0	394	152
Stage 1	-	-	-	-	296	-
Stage 2	-	-	-	-	98	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1267	-	601	873
Stage 1	-	-	-	-	735	-
Stage 2	-	-	-	-	931	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1267	-	593	873
Mov Cap-2 Maneuver	-	-	-	-	631	-
Stage 1	-	-	-	-	735	-
Stage 2	-	-	-	-	918	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	11.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	795	-	-	1267	-
HCM Lane V/C Ratio	0.311	-	-	0.014	-
HCM Control Delay (s)	11.6	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1.3	-	-	0	-

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	260	15	15	55	55	170
Pedestrians						
Ped Button						
Pedestrian Timing (s)						
Free Right		No				No
Ideal Flow	1900	1900	1900	1900	1900	1900
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120
Volume Combined (vph)	275	0	0	70	225	0
Lane Utilization Factor	0.95	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.99	0.85	0.95	0.99	0.88	0.85
Saturated Flow (vph)	3588	0	0	1880	1664	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)	0.00			0.00	0.00	
Protected Option Allowed	No			No	No	
Reference Time (s)		0.0				0.0
Adj Reference Time (s)		0.0				0.0
Permitted Option						
Adj Saturation A (vph)	1794		0	440	111	
Reference Time A (s)	9.2		0.0	19.1	243.4	
Adj Saturation B (vph	3588		NA	NA	NA	
Reference Time B (s)	9.2		NA	NA	NA	
Reference Time (s)	9.2			19.1		
Adj Reference Time (s)	13.2			23.1		
Split Option						
Ref Time Combined (s)	9.2		0.0	4.5	16.2	
Ref Time Seperate (s)	8.7		1.0	3.5	4.0	
Reference Time (s)	9.2		4.5	4.5	16.2	
Adj Reference Time (s)	13.2		8.5	8.5	20.2	

Summary	EB WB	NB	Combined
Protected Option (s)	NA	NA	
Permitted Option (s)	23.1	Err	
Split Option (s)	21.7	20.2	
Minimum (s)	21.7	20.2	41.9

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	34.9%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Intersection	
Int Delay, s/veh	4.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	260	15	15	55	55	170
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	5	0	0	5	0	0
Mvmt Flow	299	17	17	63	63	195

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	316	0	405	158
Stage 1	-	-	-	-	307	-
Stage 2	-	-	-	-	98	-
Critical Hdwy	-	-	4.1	-	6.6	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1256	-	592	866
Stage 1	-	-	-	-	725	-
Stage 2	-	-	-	-	931	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1256	-	584	866
Mov Cap-2 Maneuver	-	-	-	-	624	-
Stage 1	-	-	-	-	725	-
Stage 2	-	-	-	-	918	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	11.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	791	-	-	1256	-
HCM Lane V/C Ratio	0.327	-	-	0.014	-
HCM Control Delay (s)	11.7	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1.4	-	-	0	-

Hall & Foreman, Inc.

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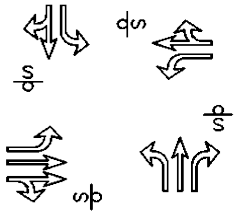
SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	14-Jan-15	VV.150135.0000	1 OF 2

E/W STREET : SIERRA HIGHWAY
N/S STREET : CROWN VALLEY ROAD
CONDITION : AM PEAK HOUR

INTERSECTION : 2
PROJECTED GROWTH PER YEAR : 2.0%

CONDITION DIAGRAMS



EXISTING GEOMETRICS **PROPOSED GEOMETRICS**

TURN MOVEMENTS

CONDITION	EXISTING TRAFFIC	TRUCK PERCENTAGE	PROJECT TRIPS	EXISTING PLUS PROJECT TRAFFIC	AMBIENT GROWTH TRIPS	OTHER AREA PROJECT TRIPS	PROJECT CONDITION YEAR 2016 TRAFFIC
SCENARIO #:	1			3			5
SIERRA HIGHWAY							
EB LEFT	10	20%	5	15	5	0	20
EB THRU	40	5%	10	50	5	5	60
EB RIGHT	105	10%	45	150	5	0	155
WB LEFT	130	5%	0	130	5	30	165
WB THRU	170	5%	10	180	5	5	190
WB RIGHT	5	35%	0	5	5	0	10
CROWN VALLEY ROAD							
NB LEFT	205	10%	45	250	5	0	255
NB THRU	30	15%	0	30	5	5	40
NB RIGHT	95	5%	0	95	5	35	135
SB LEFT	15	5%	0	15	5	0	20
SB THRU	50	10%	0	50	5	5	60
SB RIGHT	15	5%	5	20	5	0	25
TOTALS	**870**	**1.3**	**120**	**990**	**60**	**85**	**1135**

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Temecula Office: 951.294.9300 Tel/ 951.294.9301 Fax

Hall & Foreman, Inc.

Engineering • Surveying • Planning • Landscape Architecture

SUBJECT	BY	DATE	JOB NO.	SHEET	OF
TURN VOLUME SUMMARY	TM	14-Jan-15	VV.150135.0000	2	OF 2

E/W STREET : SIERRA HIGHWAY

CONDITION : AM PEAK HOUR

N/S STREET : CROWN VALLEY ROAD

PHF : 0.77

NORTH LEG								
LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	1	0	0	1	0	0	1	1
0	1	0	0	0	0	0	0	0
1	0	0	0	1	0	0	0	0
0	0	0	0	0	0	0	0	0

SOUTH LEG								
LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	2	0	0	1	0	0	1
0	1	0	0	1	0	1	0	2
0	0	2	0	0	1	1	0	2
2	1	3	0	1	3	0	0	4

EAST LEG								
LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	1	0	0	0	1	0	0	0
0	3	1	0	0	0	1	1	0
1	0	0	0	0	1	0	1	0
0	1	0	0	0	1	0	0	0

WEST LEG								
LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
2	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0
2	0	1	1	0	0	1	1	0
0	0	0	2	0	0	0	0	0

NORTH LEG			SOUTH LEG			EAST LEG			WEST LEG		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	10	0	14	2	46	0	44	24	13	3	0
6	12	3	26	4	57	1	52	37	18	10	3
4	6	6	35	13	56	0	40	40	43	19	4
3	17	5	18	9	24	3	25	27	24	7	1

	TRUCK TOTAL	AUTO VOLUMES	TOTALS	ROUNDED TOTALS	TRUCK PERCENTAGE
SIERRA HIGHWAY					
EB LEFT	2	8	**10**	**10**	**20%**
EB THRU	1	39	**40**	**40**	**5%**
EB RIGHT	8	98	**106**	**105**	**10%**
WB LEFT	4	128	**132**	**130**	**5%**
WB THRU	7	161	**168**	**170**	**5%**
WB RIGHT	2	4	**6**	**5**	**35%**
CROWN VALLEY ROAD					
NB LEFT	21	183	**204**	**205**	**10%**
NB THRU	4	28	**32**	**30**	**15%**
NB RIGHT	4	93	**97**	**95**	**5%**
SB LEFT	1	14	**15**	**15**	**5%**
SB THRU	5	45	**50**	**50**	**10%**
SB RIGHT	1	14	**15**	**15**	**5%**

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Temecula Office: 951.294.9300 Tel/ 951.294.9301 Fax

INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: CROWN VALLEY
EAST-WEST STREET: SIERRA HWY
JURISDICTION: ACTON

DATE: 01-06-15

PEAK HOUR: 07:00AM

NORTH LEG

TOTAL: 80

Rt	Thru	Lt	
15	50	15	Total
1	13	1	1st
6	13	3	2nd
5	7	6	3rd
3	17	5	4th

EAST LEG TOTAL: 306

	1st	2nd	3rd	4th	Total
Rt	0	2	1	3	6
Thru	45	56	41	26	168
Lt	25	38	41	28	132

WEST LEG TOTAL: 156

Total	1st	2nd	3rd	4th	
10	0	4	5	1	Lt
40	3	10	20	7	Thru
106	15	18	47	26	Rt

SOUTH LEG

TOTAL: 333

	Lt	Thru	Rt
1st	50	2	14
2nd	59	6	27
3rd	61	13	36
4th	34	11	20
Total	204	32	97

PEAK HOUR FACTORS

NORTH LEG = 0.80
SOUTH LEG = 0.76
EAST LEG = 0.80
WEST LEG = 0.54

ALL LEGS = 0.77

HOUR TOTAL: 875

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : CROWN VALLEY ACTON

EAST-WEST STREET : SIERRA HWY 01-06-15

BEGINNING TIME : 07:00AM

AUTOS			LARGE 2 AXLE			3 AXLE			4(+) AXLE			TOTALS
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	
						NORTH LEG						
1	10	0	0	1	0	0	1	0	0	1	1	15
6	12	3	0	1	0	0	0	0	0	0	0	22
4	6	6	1	0	0	0	1	0	0	0	0	18
3	17	5	0	0	0	0	0	0	0	0	0	25
0	15	0	1	0	0	0	0	0	0	0	0	16
9	13	7	0	0	0	0	1	0	0	0	0	30
3	24	1	0	0	0	0	0	0	0	0	0	28
1	10	6	1	0	0	0	1	0	0	0	0	19
27	107	28	3	2	0	0	4	0	0	1	1	173
						SOUTH LEG						
14	2	46	0	0	2	0	0	1	0	0	1	66
26	4	57	0	1	0	0	1	0	1	0	2	92
35	13	56	0	0	2	0	0	1	1	0	2	110
18	9	24	2	1	3	0	1	3	0	0	4	65
24	1	32	1	3	3	0	1	4	0	2	2	73
27	10	43	1	1	2	0	0	1	0	0	3	88
26	12	40	2	0	4	0	1	3	1	1	0	90
26	8	28	0	1	4	0	2	4	0	0	2	75
196	59	326	6	7	20	0	6	17	3	3	16	659
						EAST LEG						
0	44	24	0	1	0	0	0	1	0	0	0	70
1	52	37	0	3	1	0	0	0	1	1	0	96
0	40	40	1	0	0	0	0	1	0	1	0	83
3	25	27	0	1	0	0	0	1	0	0	0	57
1	12	19	0	1	2	0	1	0	0	0	0	36
2	29	21	0	0	0	0	0	0	0	1	0	53
1	18	24	0	1	3	0	1	1	0	0	1	50
3	16	19	0	1	0	0	0	1	0	0	2	42
11	236	211	1	8	6	0	2	5	1	3	3	487
						WEST LEG						
13	3	0	2	0	0	0	0	0	0	0	0	18
18	10	3	0	0	1	0	0	0	0	0	0	32
43	19	4	2	0	1	1	0	0	1	1	0	72
24	7	1	0	0	0	2	0	0	0	0	0	34
13	2	0	1	1	0	1	0	0	1	0	0	19
16	11	2	0	0	1	0	0	0	0	0	0	30
22	12	1	1	0	0	1	0	0	1	0	0	38
21	11	1	1	1	0	2	0	0	0	1	0	38
170	75	12	7	2	3	7	0	0	3	2	0	281

Prepared by Newport Traffic Studies

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CROWN VALLEY

EAST-WEST STREET: SIERRA HWY

TIME: 07:00AM-08:00AM DATE: 01-06-15

NORTH LEG

	Rt	Thru	Lt
Total	15	50	15
1st	1	13	1
2nd	6	13	3
3rd	5	7	6
4th	3	17	5

	1st	2nd	3rd	4th	Total
Rt	0	2	1	3	6
Thru	45	56	41	26	168
Lt	25	38	41	28	132

	Total	1st	2nd	3rd	4th
Lt	10	0	4	5	1
Thru	40	3	10	20	7
Rt	106	15	18	47	26

	Lt	Thru	Rt
1st	50	2	14
2nd	59	6	27
3rd	61	13	36
4th	34	11	20
Total	204	32	97

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CROWN VALLEY

EAST-WEST STREET: SIERRA HWY

TIME: 08:00AM-09:00AM DATE: 01-06-15

NORTH LEG

Rt	Thru	Lt	
15	64	14	Total
1	15	0	1st
9	14	7	2nd
3	24	1	3rd
2	11	6	4th

	1st	2nd	3rd	4th	Total
Rt	1	2	1	3	7
Thru	14	30	20	17	81
Lt	21	21	29	22	93

Total	1st	2nd	3rd	4th	
5	0	3	1	1	Lt
39	3	11	12	13	Thru
81	16	16	25	24	Rt

	Lt	Thru	Rt
1st	41	7	25
2nd	49	11	28
3rd	47	14	29
4th	38	11	26
Total	175	43	108

Prepared by NEWPORT TRAFFIC STUDIES

Intersection Capacity Utilization
2: CROWN VALLEY RD & SIERRA HWY

1/14/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	40	105	130	170	5	205	30	95	15	50	15
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	10	145	0	130	175	0	205	30	95	15	65	0
Lane Utilization Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.89	0.85	0.95	1.00	0.85	0.95	1.00	0.85	0.95	0.97	0.85
Saturated Flow (vph)	1805	3225	0	1805	1892	0	1805	1900	1615	1805	1834	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		Yes			Yes			Yes			Yes	
Reference Time (s)	0.7	5.4	0.0	8.6	11.1	0.0	13.6	1.9	7.1	1.0	4.3	0.0
Adj Reference Time (s)	8.0	9.4	0.0	12.6	15.1	0.0	17.6	8.0	11.1	8.0	8.3	0.0
Permitted Option												
Adj Saturation A (vph)	120	1612		120	1892		120	1900		120	1834	
Reference Time A (s)	10.0	5.4		129.6	11.1		204.4	1.9		15.0	4.3	
Adj Saturation B (vph	NA	NA		NA	NA		0	1900		0	1834	
Reference Time B (s)	NA	NA		NA	NA		21.6	1.9		9.0	4.3	
Reference Time (s)		10.0			129.6			21.6			9.0	
Adj Reference Time (s)		14.0			133.6			25.6			13.0	
Split Option												
Ref Time Combined (s)	0.7	5.4		8.6	11.1		13.6	1.9		1.0	4.3	
Ref Time Seperate (s)	0.7	1.5		8.6	10.8		13.6	1.9		1.0	3.3	
Reference Time (s)	5.4	5.4		11.1	11.1		13.6	13.6		4.3	4.3	
Adj Reference Time (s)	9.4	9.4		15.1	15.1		17.6	17.6		8.3	8.3	

Summary	EB WB	NB SB	Combined
Protected Option (s)	23.1	25.9	
Permitted Option (s)	133.6	25.6	
Split Option (s)	24.5	25.9	
Minimum (s)	23.1	25.6	48.7

Right Turns	NBR
Adj Reference Time (s)	11.1
Cross Thru Ref Time (s)	9.4
Oncoming Left Ref Time (s)	8.0
Combined (s)	28.5

Intersection Summary			
Intersection Capacity Utilization	40.6%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Intersection	
Intersection Delay, s/veh	14.8
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	10	40	105	0	130	170	5	0	205	30	95
Peak Hour Factor	0.92	0.77	0.77	0.77	0.92	0.77	0.77	0.77	0.92	0.77	0.77	0.77
Heavy Vehicles, %	0	20	5	10	0	5	5	35	0	10	15	5
Mvmt Flow	0	13	52	136	0	169	221	6	0	266	39	123
Number of Lanes	0	1	2	0	0	1	1	0	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	3	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	3	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	2	2
HCM Control Delay	12.5	15	16.4
HCM LOS	B	B	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	11%	0%	97%	0%	77%
Vol Right, %	0%	0%	100%	0%	0%	89%	0%	3%	0%	23%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	205	30	95	10	27	118	130	175	15	65
LT Vol	205	0	0	10	0	0	130	0	15	0
Through Vol	0	30	0	0	27	13	0	170	0	50
RT Vol	0	0	95	0	0	105	0	5	0	15
Lane Flow Rate	266	39	123	13	35	154	169	227	19	84
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.565	0.078	0.217	0.03	0.074	0.303	0.356	0.447	0.046	0.183
Departure Headway (Hd)	7.642	7.222	6.342	8.419	7.651	7.106	7.601	7.074	8.41	7.823
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	474	497	566	426	469	506	474	509	426	459
Service Time	5.376	4.956	4.076	6.158	5.39	4.844	5.334	4.808	6.153	5.566
HCM Lane V/C Ratio	0.561	0.078	0.217	0.031	0.075	0.304	0.357	0.446	0.045	0.183
HCM Control Delay	19.9	10.6	10.8	11.4	11	12.9	14.5	15.4	11.6	12.3
HCM Lane LOS	C	B	B	B	B	B	B	C	B	B
HCM 95th-tile Q	3.4	0.3	0.8	0.1	0.2	1.3	1.6	2.3	0.1	0.7

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	15	50	15
Peak Hour Factor	0.92	0.77	0.77	0.77
Heavy Vehicles, %	0	5	10	5
Mvmt Flow	0	19	65	19
Number of Lanes	0	1	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	12.2
HCM LOS	B

Lane

Intersection Capacity Utilization
2: CROWN VALLEY RD & SIERRA HWY

1/14/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	50	150	130	180	5	250	30	95	15	50	20
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	15	200	0	130	185	0	250	30	95	15	70	0
Lane Utilization Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.89	0.85	0.95	1.00	0.85	0.95	1.00	0.85	0.95	0.96	0.85
Saturated Flow (vph)	1805	3211	0	1805	1892	0	1805	1900	1615	1805	1819	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		Yes			Yes			Yes			Yes	
Reference Time (s)	1.0	7.5	0.0	8.6	11.7	0.0	16.6	1.9	7.1	1.0	4.6	0.0
Adj Reference Time (s)	8.0	11.5	0.0	12.6	15.7	0.0	20.6	8.0	11.1	8.0	8.6	0.0
Permitted Option												
Adj Saturation A (vph)	120	1605		120	1892		120	1900		120	1819	
Reference Time A (s)	15.0	7.5		129.6	11.7		249.3	1.9		15.0	4.6	
Adj Saturation B (vph	NA	NA		NA	NA		0	1900		0	1819	
Reference Time B (s)	NA	NA		NA	NA		24.6	1.9		9.0	4.6	
Reference Time (s)		15.0			129.6			24.6			9.0	
Adj Reference Time (s)		19.0			133.6			28.6			13.0	
Split Option												
Ref Time Combined (s)	1.0	7.5		8.6	11.7		16.6	1.9		1.0	4.6	
Ref Time Seperate (s)	1.0	1.9		8.6	11.4		16.6	1.9		1.0	3.3	
Reference Time (s)	7.5	7.5		11.7	11.7		16.6	16.6		4.6	4.6	
Adj Reference Time (s)	11.5	11.5		15.7	15.7		20.6	20.6		8.6	8.6	

Summary	EB WB	NB SB	Combined
Protected Option (s)	24.1	29.2	
Permitted Option (s)	133.6	28.6	
Split Option (s)	27.2	29.2	
Minimum (s)	24.1	28.6	52.7

Right Turns	NBR
Adj Reference Time (s)	11.1
Cross Thru Ref Time (s)	11.5
Oncoming Left Ref Time (s)	8.0
Combined (s)	30.5

Intersection Summary			
Intersection Capacity Utilization	43.9%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Intersection	
Intersection Delay, s/veh	19.1
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	15	50	150	0	130	180	5	0	250	30	95
Peak Hour Factor	0.92	0.77	0.77	0.77	0.92	0.77	0.77	0.77	0.92	0.77	0.77	0.77
Heavy Vehicles, %	0	20	5	10	0	5	5	35	0	10	15	5
Mvmt Flow	0	19	65	195	0	169	234	6	0	325	39	123
Number of Lanes	0	1	2	0	0	1	1	0	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	3	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	3	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	2	2
HCM Control Delay	15.5	17.4	24
HCM LOS	C	C	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	10%	0%	97%	0%	71%
Vol Right, %	0%	0%	100%	0%	0%	90%	0%	3%	0%	29%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	250	30	95	15	33	167	130	185	15	70
LT Vol	250	0	0	15	0	0	130	0	15	0
Through Vol	0	30	0	0	33	17	0	180	0	50
RT Vol	0	0	95	0	0	150	0	5	0	20
Lane Flow Rate	325	39	123	19	43	216	169	240	19	91
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.733	0.083	0.234	0.048	0.098	0.455	0.385	0.513	0.049	0.214
Departure Headway (Hd)	8.126	7.705	6.821	8.891	8.12	7.564	8.21	7.683	9.122	8.492
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	445	464	526	402	440	476	437	469	392	421
Service Time	5.886	5.465	4.581	6.657	5.886	5.329	5.971	5.443	6.902	6.272
HCM Lane V/C Ratio	0.73	0.084	0.234	0.047	0.098	0.454	0.387	0.512	0.048	0.216
HCM Control Delay	30.2	11.2	11.7	12.1	11.8	16.5	16.1	18.3	12.4	13.6
HCM Lane LOS	D	B	B	B	B	C	C	C	B	B
HCM 95th-tile Q	5.9	0.3	0.9	0.2	0.3	2.3	1.8	2.9	0.2	0.8

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	15	50	20
Peak Hour Factor	0.92	0.77	0.77	0.77
Heavy Vehicles, %	0	5	10	5
Mvmt Flow	0	19	65	26
Number of Lanes	0	1	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	13.4
HCM LOS	B

Lane

Intersection Capacity Utilization
2: CROWN VALLEY RD & SIERRA HWY

1/14/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	60	155	165	190	10	255	40	135	20	60	25
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	20	215	0	165	200	0	255	40	135	20	85	0
Lane Utilization Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.89	0.85	0.95	0.99	0.85	0.95	1.00	0.85	0.95	0.96	0.85
Saturated Flow (vph)	1805	3226	0	1805	1886	0	1805	1900	1615	1805	1816	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		Yes			Yes			Yes			Yes	
Reference Time (s)	1.3	8.0	0.0	11.0	12.7	0.0	17.0	2.5	10.0	1.3	5.6	0.0
Adj Reference Time (s)	8.0	12.0	0.0	15.0	16.7	0.0	21.0	8.0	14.0	8.0	9.6	0.0
Permitted Option												
Adj Saturation A (vph)	120	1613		120	1886		120	1900		120	1816	
Reference Time A (s)	19.9	8.0		164.5	12.7		254.3	2.5		19.9	5.6	
Adj Saturation B (vph	NA	NA		NA	NA		0	1900		0	1816	
Reference Time B (s)	NA	NA		NA	NA		25.0	2.5		9.3	5.6	
Reference Time (s)		19.9			164.5			25.0			9.3	
Adj Reference Time (s)		23.9			168.5			29.0			13.3	
Split Option												
Ref Time Combined (s)	1.3	8.0		11.0	12.7		17.0	2.5		1.3	5.6	
Ref Time Seperate (s)	1.3	2.2		11.0	12.1		17.0	2.5		1.3	4.0	
Reference Time (s)	8.0	8.0		12.7	12.7		17.0	17.0		5.6	5.6	
Adj Reference Time (s)	12.0	12.0		16.7	16.7		21.0	21.0		9.6	9.6	

Summary	EB WB	NB SB	Combined
Protected Option (s)	27.0	30.6	
Permitted Option (s)	168.5	29.0	
Split Option (s)	28.7	30.6	
Minimum (s)	27.0	29.0	55.9

Right Turns	NBR
Adj Reference Time (s)	14.0
Cross Thru Ref Time (s)	12.0
Oncoming Left Ref Time (s)	8.0
Combined (s)	34.0

Intersection Summary			
Intersection Capacity Utilization	46.6%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Intersection	
Intersection Delay, s/veh	23
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	20	60	155	0	165	190	10	0	255	40	135
Peak Hour Factor	0.92	0.77	0.77	0.77	0.92	0.77	0.77	0.77	0.92	0.77	0.77	0.77
Heavy Vehicles, %	0	20	5	10	0	5	5	35	0	10	15	5
Mvmt Flow	0	26	78	201	0	214	247	13	0	331	52	175
Number of Lanes	0	1	2	0	0	1	1	0	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	3	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	3	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	2	2
HCM Control Delay	18.2	21.7	28.5
HCM LOS	C	C	D

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	11%	0%	95%	0%	71%
Vol Right, %	0%	0%	100%	0%	0%	89%	0%	5%	0%	29%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	255	40	135	20	40	175	165	200	20	85
LT Vol	255	0	0	20	0	0	165	0	20	0
Through Vol	0	40	0	0	40	20	0	190	0	60
RT Vol	0	0	135	0	0	155	0	10	0	25
Lane Flow Rate	331	52	175	26	52	227	214	260	26	110
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.8	0.119	0.36	0.07	0.128	0.527	0.521	0.592	0.072	0.286
Departure Headway (Hd)	8.814	8.39	7.501	9.675	8.899	8.35	8.872	8.326	9.952	9.313
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	414	430	482	372	405	434	409	436	362	387
Service Time	6.514	6.09	5.201	7.385	6.609	6.06	6.572	6.026	7.666	7.026
HCM Lane V/C Ratio	0.8	0.121	0.363	0.07	0.128	0.523	0.523	0.596	0.072	0.284
HCM Control Delay	38.6	12.2	14.4	13.1	12.9	20	20.8	22.4	13.4	15.7
HCM Lane LOS	E	B	B	B	B	C	C	C	B	C
HCM 95th-tile Q	7.1	0.4	1.6	0.2	0.4	3	2.9	3.7	0.2	1.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	20	60	25
Peak Hour Factor	0.92	0.77	0.77	0.77
Heavy Vehicles, %	0	5	10	5
Mvmt Flow	0	26	78	32
Number of Lanes	0	1	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	15.3
HCM LOS	C

Lane

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SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	14-Jan-15	VV.150135.0000	1 OF 2

E/W STREET : SIERRA HIGHWAY

N/S STREET : CROWN VALLEY ROAD

CONDITION : PM PEAK HOUR

INTERSECTION : 2

PROJECTED GROWTH PER YEAR : 2.0%

TURN MOVEMENTS

CONDITION	EXISTING TRAFFIC	TRUCK PERCENTAGE	PROJECT TRIPS	EXISTING PLUS PROJECT TRAFFIC	AMBIENT GROWTH TRIPS	OTHER AREA PROJECT TRIPS	PROJECT CONDITION YEAR 2016 TRAFFIC
SCENARIO #:	2			4			6
SIERRA HIGHWAY							
EB LEFT	15	0%	5	20	5	0	25
EB THRU	195	5%	10	205	5	5	215
EB RIGHT	105	0%	40	145	5	0	150
WB LEFT	80	5%	0	80	5	25	110
WB THRU	70	5%	10	80	5	5	90
WB RIGHT	15	0%	0	15	5	0	20
CROWN VALLEY ROAD							
NB LEFT	150	0%	40	190	5	0	195
NB THRU	90	5%	0	90	5	5	100
NB RIGHT	100	0%	0	100	5	25	130
SB LEFT	20	0%	0	20	5	0	25
SB THRU	65	5%	0	65	5	5	75
SB RIGHT	20	0%	5	25	5	0	30
TOTALS	**925**	**0.25**	**110**	**1035**	**60**	**70**	**1165**

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Santa Clarita Office: 661.284.7400 Tel/ 661.284.7401 Fax

Victorville Office: 760.524.9100 Tel/ 760.524.9101 Fax

Temecula Office: 951.294.9300 Tel/ 951.294.9301 Fax

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SUBJECT	BY	DATE	JOB NO.	SHEET	OF
TURN VOLUME SUMMARY	TM	1/14/2015	VV.150135.0000	2	OF 2

E/W STREET : SIERRA HIGHWAY

N/S STREET : CROWN VALLEY ROAD

CONDITION : PM PEAK HOUR

PHF : 0.96

NORTH LEG

LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	1	0	0	0	0
0	0	0	0	1	0	0	0	0
0	0	0	0	0	0	0	0	0
0	1	1	0	0	0	0	0	0

SOUTH LEG

LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	2	0	0	0	0	0	1
2	1	3	0	0	0	1	0	0
0	0	2	0	0	0	2	0	2
0	2	3	0	0	0	1	0	0

EAST LEG

LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0
0	0	0	0	0	0	0	1	0

WEST LEG

LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	0	0	0	1	1
1	1	1	0	0	0	1	2	0
1	1	0	0	0	0	1	1	1
3	0	0	0	1	0	0	1	0

NORTH LEG			SOUTH LEG			EAST LEG			WEST LEG		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
3	16	5	31	30	36	2	13	21	29	23	1
7	21	4	22	27	36	3	17	14	25	47	6
7	11	4	21	16	28	2	18	17	27	68	3
5	14	7	20	14	35	6	23	29	19	50	3

	TRUCK TOTAL	AUTO VOLUMES	TOTALS	ROUNDED TOTALS	TRUCK PERCENTAGE
SIERRA HIGHWAY					
EB LEFT	3	13	**16**	**15**	**0%**
EB THRU	8	188	**196**	**195**	**5%**
EB RIGHT	7	100	**107**	**105**	**0%**
WB LEFT	1	81	**82**	**80**	**5%**
WB THRU	1	71	**72**	**70**	**5%**
WB RIGHT	0	13	**13**	**15**	**0%**
CROWN VALLEY ROAD					
NB LEFT	13	135	**148**	**150**	**0%**
NB THRU	3	87	**90**	**90**	**5%**
NB RIGHT	6	94	**100**	**100**	**0%**
SB LEFT	1	20	**21**	**20**	**0%**
SB THRU	3	62	**65**	**65**	**5%**
SB RIGHT	0	22	**22**	**20**	**0%**

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INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: CROWN VALLEY
EAST-WEST STREET: SIERRA HWY
JURISDICTION: ACTON

DATE: 01-06-15

PEAK HOUR: 04:45PM

NORTH LEG

TOTAL: 108

	Rt	Thru	Lt
Total	22	65	21
1st	3	17	5
2nd	7	22	4
3rd	7	11	4
4th	5	15	8

EAST LEG TOTAL: 167

	1st	2nd	3rd	4th	Total
Rt	2	3	2	6	13
Thru	13	17	18	24	72
Lt	21	14	18	29	82

WEST LEG TOTAL: 319

	Total	1st	2nd	3rd	4th
Lt	16	2	7	4	3
Thru	196	24	50	70	52
Rt	107	29	27	29	22

SOUTH LEG

TOTAL: 338

	Lt	Thru	Rt
1st	39	30	31
2nd	39	28	25
3rd	32	16	23
4th	38	16	21
Total	148	90	100

PEAK HOUR FACTORS

NORTH LEG = 0.82
SOUTH LEG = 0.85
EAST LEG = 0.71
WEST LEG = 0.77

ALL LEGS = 0.96

HOUR TOTAL: 932

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : CROWN VALLEY ACTON

EAST-WEST STREET : SIERRA HWY 01-06-15

BEGINNING TIME : 04:00PM

AUTOS			LARGE 2 AXLE			3 AXLE			4(+) AXLE			TOTALS
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	
						NORTH LEG						
6	10	10	0	2	0	0	1	0	0	1	0	30
0	14	3	1	0	0	0	0	0	0	1	0	19
3	14	3	0	1	0	0	0	0	0	1	0	22
3	16	5	0	0	0	0	1	0	0	0	0	25
7	21	4	0	0	0	0	1	0	0	0	0	33
7	11	4	0	0	0	0	0	0	0	0	0	22
5	14	7	0	1	1	0	0	0	0	0	0	28
4	14	9	0	0	0	0	0	0	0	0	0	27
35	114	45	1	4	1	0	3	0	0	3	0	206
						SOUTH LEG						
29	13	47	0	1	2	0	0	0	0	0	4	96
27	16	48	0	0	4	0	0	0	0	2	1	98
24	16	41	1	3	1	0	0	0	0	0	0	86
31	30	36	0	0	2	0	0	0	0	0	1	100
22	27	36	2	1	3	0	0	0	1	0	0	92
21	16	28	0	0	2	0	0	0	2	0	2	71
20	14	35	0	2	3	0	0	0	1	0	0	75
20	20	23	0	3	5	0	0	0	0	0	0	71
194	152	294	3	10	22	0	0	0	4	2	8	689
						EAST LEG						
4	17	26	0	0	1	0	0	0	0	0	0	48
4	10	20	0	0	0	0	0	0	0	0	1	35
1	4	17	0	0	0	0	1	0	0	0	3	26
2	13	21	0	0	0	0	0	0	0	0	0	36
3	17	14	0	0	0	0	0	0	0	0	0	34
2	18	17	0	0	1	0	0	0	0	0	0	38
6	23	29	0	0	0	0	0	0	0	1	0	59
3	13	19	0	0	0	0	0	0	0	0	0	35
25	115	163	0	0	2	0	1	0	0	1	4	311
						WEST LEG						
21	35	7	2	1	0	0	1	0	0	0	0	67
29	33	6	0	1	0	0	0	0	0	0	1	70
33	42	2	1	0	1	0	0	0	0	0	0	79
29	23	1	0	0	0	0	0	0	0	1	1	55
25	47	6	1	1	1	0	0	0	1	2	0	84
27	68	3	1	1	0	0	0	0	1	1	1	103
19	50	3	3	0	0	0	1	0	0	1	0	77
19	52	7	0	2	0	0	0	0	0	0	0	80
202	350	35	8	6	2	0	2	0	2	5	3	615

Prepared by Newport Traffic Studies

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CROWN VALLEY

EAST-WEST STREET: SIERRA HWY

TIME: 04:00PM-05:00PM DATE: 01-06-15

NORTH LEG

Rt	Thru	Lt	
13	62	21	Total
6	14	10	1st
1	15	3	2nd
3	16	3	3rd
3	17	5	4th

	1st	2nd	3rd	4th	Total
Rt	4	4	1	2	11
Thru	17	10	5	13	45
Lt	27	21	20	21	89

Total	1st	2nd	3rd	4th	
19	7	7	3	2	Lt
137	37	34	42	24	Thru
115	23	29	34	29	Rt

	Lt	Thru	Rt
1st	53	14	29
2nd	53	18	27
3rd	42	19	25
4th	39	30	31
Total	187	81	112

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CROWN VALLEY

EAST-WEST STREET: SIERRA HWY

TIME: 05:00PM-06:00PM DATE: 01-06-15

NORTH LEG

Rt	Thru	Lt	
23	62	25	Total
7	22	4	1st
7	11	4	2nd
5	15	8	3rd
4	14	9	4th

	1st	2nd	3rd	4th	Total
Rt	3	2	6	3	14
Thru	17	18	24	13	72
Lt	14	18	29	19	80

Total	1st	2nd	3rd	4th	
21	7	4	3	7	Lt
226	50	70	52	54	Thru
97	27	29	22	19	Rt

	Lt	Thru	Rt
1st	39	28	25
2nd	32	16	23
3rd	38	16	21
4th	28	23	20
Total	137	83	89

Prepared by NEWPORT TRAFFIC STUDIES

Intersection Capacity Utilization
2: CROWN VALLEY RD & SIERRA HWY

1/14/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	195	105	80	70	15	150	90	100	20	65	20
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	15	300	0	80	85	0	150	90	100	20	85	0
Lane Utilization Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	0.97	0.85	0.95	1.00	0.85	0.95	0.96	0.85
Saturated Flow (vph)	1805	3428	0	1805	1850	0	1805	1900	1615	1805	1833	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		Yes			Yes			Yes			Yes	
Reference Time (s)	1.0	10.5	0.0	5.3	5.5	0.0	10.0	5.7	7.4	1.3	5.6	0.0
Adj Reference Time (s)	8.0	14.5	0.0	9.3	9.5	0.0	14.0	9.7	11.4	8.0	9.6	0.0
Permitted Option												
Adj Saturation A (vph)	120	1714		120	1850		120	1900		120	1833	
Reference Time A (s)	15.0	10.5		79.8	5.5		149.6	5.7		19.9	5.6	
Adj Saturation B (vph	0	3428		NA	NA		0	1900		0	1833	
Reference Time B (s)	9.0	10.5		NA	NA		18.0	5.7		9.3	5.6	
Reference Time (s)		10.5			79.8			18.0			9.3	
Adj Reference Time (s)		14.5			83.8			22.0			13.3	
Split Option												
Ref Time Combined (s)	1.0	10.5		5.3	5.5		10.0	5.7		1.3	5.6	
Ref Time Seperate (s)	1.0	6.8		5.3	4.5		10.0	5.7		1.3	4.3	
Reference Time (s)	10.5	10.5		5.5	5.5		10.0	10.0		5.6	5.6	
Adj Reference Time (s)	14.5	14.5		9.5	9.5		14.0	14.0		9.6	9.6	

Summary	EB WB	NB SB	Combined
Protected Option (s)	23.8	23.5	
Permitted Option (s)	83.8	22.0	
Split Option (s)	24.0	23.5	
Minimum (s)	23.8	22.0	45.8

Right Turns	NBR
Adj Reference Time (s)	11.4
Cross Thru Ref Time (s)	14.5
Oncoming Left Ref Time (s)	8.0
Combined (s)	33.9

Intersection Summary			
Intersection Capacity Utilization	38.2%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Intersection	
Intersection Delay, s/veh	11.3
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	15	195	105	0	80	70	15	0	150	90	100
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	0	0	5	0	0	5	5	0	0	0	5	0
Mvmt Flow	0	16	203	109	0	83	73	16	0	156	94	104
Number of Lanes	0	1	2	0	0	1	1	0	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	3	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	3	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	2	2
HCM Control Delay	11.4	11.3	11.2
HCM LOS	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	38%	0%	82%	0%	76%
Vol Right, %	0%	0%	100%	0%	0%	62%	0%	18%	0%	24%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	150	90	100	15	130	170	80	85	20	85
LT Vol	150	0	0	15	0	0	80	0	20	0
Through Vol	0	90	0	0	130	65	0	70	0	65
RT Vol	0	0	100	0	0	105	0	15	0	20
Lane Flow Rate	156	94	104	16	135	177	83	89	21	89
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.301	0.17	0.166	0.03	0.247	0.297	0.171	0.166	0.043	0.169
Departure Headway (Hd)	6.933	6.515	5.723	6.983	6.565	6.043	7.366	6.736	7.477	6.89
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	517	548	624	511	544	591	485	530	477	518
Service Time	4.695	4.276	3.484	4.749	4.33	3.808	5.139	4.509	5.258	4.671
HCM Lane V/C Ratio	0.302	0.172	0.167	0.031	0.248	0.299	0.171	0.168	0.044	0.172
HCM Control Delay	12.7	10.6	9.6	10	11.5	11.4	11.7	10.9	10.6	11.1
HCM Lane LOS	B	B	A	A	B	B	B	B	B	B
HCM 95th-tile Q	1.3	0.6	0.6	0.1	1	1.2	0.6	0.6	0.1	0.6

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	20	65	20
Peak Hour Factor	0.96	0.96	0.96	0.96
Heavy Vehicles, %	0	0	5	0
Mvmt Flow	0	21	68	21
Number of Lanes	0	1	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	11
HCM LOS	B

Lane

Intersection Capacity Utilization
2: CROWN VALLEY RD & SIERRA HWY

1/14/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	205	145	80	80	15	190	90	100	20	65	25
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	20	350	0	80	95	0	190	90	100	20	90	0
Lane Utilization Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.94	0.85	0.95	0.98	0.85	0.95	1.00	0.85	0.95	0.96	0.85
Saturated Flow (vph)	1805	3393	0	1805	1855	0	1805	1900	1615	1805	1821	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		Yes			Yes			Yes			Yes	
Reference Time (s)	1.3	12.4	0.0	5.3	6.1	0.0	12.6	5.7	7.4	1.3	5.9	0.0
Adj Reference Time (s)	8.0	16.4	0.0	9.3	10.1	0.0	16.6	9.7	11.4	8.0	9.9	0.0
Permitted Option												
Adj Saturation A (vph)	120	1696		120	1855		120	1900		120	1821	
Reference Time A (s)	19.9	12.4		79.8	6.1		189.5	5.7		19.9	5.9	
Adj Saturation B (vph	0	3393		NA	NA		0	1900		0	1821	
Reference Time B (s)	9.3	12.4		NA	NA		20.6	5.7		9.3	5.9	
Reference Time (s)		12.4			79.8			20.6			9.3	
Adj Reference Time (s)		16.4			83.8			24.6			13.3	
Split Option												
Ref Time Combined (s)	1.3	12.4		5.3	6.1		12.6	5.7		1.3	5.9	
Ref Time Seperate (s)	1.3	7.3		5.3	5.2		12.6	5.7		1.3	4.3	
Reference Time (s)	12.4	12.4		6.1	6.1		12.6	12.6		5.9	5.9	
Adj Reference Time (s)	16.4	16.4		10.1	10.1		16.6	16.6		9.9	9.9	

Summary	EB WB	NB SB	Combined
Protected Option (s)	25.7	26.6	
Permitted Option (s)	83.8	24.6	
Split Option (s)	26.5	26.6	
Minimum (s)	25.7	24.6	50.3

Right Turns	NBR
Adj Reference Time (s)	11.4
Cross Thru Ref Time (s)	16.4
Oncoming Left Ref Time (s)	8.0
Combined (s)	35.8

Intersection Summary			
Intersection Capacity Utilization	41.9%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Intersection	
Intersection Delay, s/veh	12.4
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	20	205	145	0	80	80	15	0	190	90	100
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	0	0	5	0	0	5	5	0	0	0	5	0
Mvmt Flow	0	21	214	151	0	83	83	16	0	198	94	104
Number of Lanes	0	1	2	0	0	1	1	0	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	3	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	3	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	2	2
HCM Control Delay	12.5	11.9	12.6
HCM LOS	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	32%	0%	84%	0%	72%
Vol Right, %	0%	0%	100%	0%	0%	68%	0%	16%	0%	28%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	190	90	100	20	137	213	80	95	20	90
LT Vol	190	0	0	20	0	0	80	0	20	0
Through Vol	0	90	0	0	137	68	0	80	0	65
RT Vol	0	0	100	0	0	145	0	15	0	25
Lane Flow Rate	198	94	104	21	142	222	83	99	21	94
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.395	0.176	0.173	0.042	0.269	0.385	0.181	0.195	0.046	0.191
Departure Headway (Hd)	7.193	6.774	5.981	7.224	6.804	6.238	7.807	7.196	7.955	7.336
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	497	525	594	492	524	571	462	502	453	492
Service Time	4.99	4.57	3.777	5.022	4.602	4.035	5.514	4.896	5.66	5.041
HCM Lane V/C Ratio	0.398	0.179	0.175	0.043	0.271	0.389	0.18	0.197	0.046	0.191
HCM Control Delay	14.7	11	10	10.3	12.1	12.9	12.2	11.6	11	11.8
HCM Lane LOS	B	B	A	B	B	B	B	B	B	B
HCM 95th-tile Q	1.9	0.6	0.6	0.1	1.1	1.8	0.7	0.7	0.1	0.7

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	20	65	25
Peak Hour Factor	0.96	0.96	0.96	0.96
Heavy Vehicles, %	0	0	5	0
Mvmt Flow	0	21	68	26
Number of Lanes	0	1	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	11.7
HCM LOS	B

Lane

Intersection Capacity Utilization
2: CROWN VALLEY RD & SIERRA HWY

1/14/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	215	150	110	90	20	195	100	130	25	75	30
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No			No			No			No
Ideal Flow	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	25	365	0	110	110	0	195	100	130	25	105	0
Lane Utilization Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.94	0.85	0.95	0.97	0.85	0.95	1.00	0.85	0.95	0.96	0.85
Saturated Flow (vph)	1805	3395	0	1805	1848	0	1805	1900	1615	1805	1819	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00			0.00			0.00	
Protected Option Allowed		Yes			Yes			Yes			Yes	
Reference Time (s)	1.7	12.9	0.0	7.3	7.1	0.0	13.0	6.3	9.7	1.7	6.9	0.0
Adj Reference Time (s)	8.0	16.9	0.0	11.3	11.1	0.0	17.0	10.3	13.7	8.0	10.9	0.0
Permitted Option												
Adj Saturation A (vph)	120	1697		120	1848		120	1900		120	1819	
Reference Time A (s)	24.9	12.9		109.7	7.1		194.5	6.3		24.9	6.9	
Adj Saturation B (vph	0	3395		NA	NA		0	1900		0	1819	
Reference Time B (s)	9.7	12.9		NA	NA		21.0	6.3		9.7	6.9	
Reference Time (s)		12.9			109.7			21.0			9.7	
Adj Reference Time (s)		16.9			113.7			25.0			13.7	
Split Option												
Ref Time Combined (s)	1.7	12.9		7.3	7.1		13.0	6.3		1.7	6.9	
Ref Time Seperate (s)	1.7	7.6		7.3	5.8		13.0	6.3		1.7	4.9	
Reference Time (s)	12.9	12.9		7.3	7.3		13.0	13.0		6.9	6.9	
Adj Reference Time (s)	16.9	16.9		11.3	11.3		17.0	17.0		10.9	10.9	

Summary	EB WB	NB SB	Combined
Protected Option (s)	28.2	27.9	
Permitted Option (s)	113.7	25.0	
Split Option (s)	28.2	27.9	
Minimum (s)	28.2	25.0	53.2

Right Turns	NBR
Adj Reference Time (s)	13.7
Cross Thru Ref Time (s)	16.9
Oncoming Left Ref Time (s)	8.0
Combined (s)	38.6

Intersection Summary			
Intersection Capacity Utilization	44.3%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Intersection	
Intersection Delay, s/veh	13.6
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	25	215	150	0	110	90	20	0	195	100	130
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	0	0	5	0	0	5	5	0	0	0	5	0
Mvmt Flow	0	26	224	156	0	115	94	21	0	203	104	135
Number of Lanes	0	1	2	0	0	1	1	0	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	3	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	3	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	3	2	2
HCM Control Delay	13.9	13.3	13.7
HCM LOS	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	32%	0%	82%	0%	71%
Vol Right, %	0%	0%	100%	0%	0%	68%	0%	18%	0%	29%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	195	100	130	25	143	222	110	110	25	105
LT Vol	195	0	0	25	0	0	110	0	25	0
Through Vol	0	100	0	0	143	72	0	90	0	75
RT Vol	0	0	130	0	0	150	0	20	0	30
Lane Flow Rate	203	104	135	26	149	231	115	115	26	109
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.434	0.21	0.244	0.056	0.305	0.435	0.261	0.241	0.061	0.238
Departure Headway (Hd)	7.694	7.274	6.478	7.773	7.352	6.785	8.206	7.569	8.445	7.818
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	469	494	554	461	488	531	438	474	424	459
Service Time	5.439	5.018	4.222	5.518	5.097	4.53	5.956	5.319	6.199	5.573
HCM Lane V/C Ratio	0.433	0.211	0.244	0.056	0.305	0.435	0.263	0.243	0.061	0.237
HCM Control Delay	16.2	12	11.3	11	13.3	14.7	13.8	12.7	11.8	13
HCM Lane LOS	C	B	B	B	B	B	B	B	B	B
HCM 95th-tile Q	2.2	0.8	1	0.2	1.3	2.2	1	0.9	0.2	0.9

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	25	75	30
Peak Hour Factor	0.96	0.96	0.96	0.96
Heavy Vehicles, %	0	0	5	0
Mvmt Flow	0	26	78	31
Number of Lanes	0	1	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	12.8
HCM LOS	B

Lane

Hall & Foreman, Inc.

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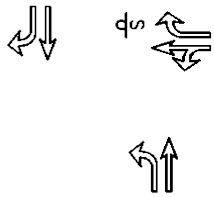
SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	14-Jan-15	VV.150135.0000	1 OF 2

E/W STREET : SR 14 SB RAMPS
N/S STREET : CROWN VALLEY ROAD
CONDITION : AM PEAK HOUR

INTERSECTION : 3
PROJECTED GROWTH PER YEAR : 2.0%

CONDITION DIAGRAMS



EXISTING GEOMETRICS **PROPOSED GEOMETRICS**

TURN MOVEMENTS

CONDITION	EXISTING TRAFFIC	TRUCK PERCENTAGE	PROJECT TRIPS	EXISTING PLUS PROJECT TRAFFIC	AMBIENT GROWTH TRIPS	OTHER AREA PROJECT TRIPS	PROJECT CONDITION YEAR 2016 TRAFFIC
SCENARIO #:	1			3			5
SR 14 SB RAMPS							
EB LEFT	0	0%	0	0	0	0	0
EB THRU	0	0%	0	0	0	0	0
EB RIGHT	0	0%	0	0	0	0	0
WB LEFT	50	5%	0	50	5	0	55
WB THRU	5	0%	0	5	5	0	10
WB RIGHT	185	10%	15	200	5	15	220
CROWN VALLEY ROAD							
NB LEFT	95	5%	0	95	5	0	100
NB THRU	180	5%	30	210	5	20	235
NB RIGHT	0	0%	0	0	0	0	0
SB LEFT	0	0%	0	0	0	0	0
SB THRU	195	10%	30	225	5	20	250
SB RIGHT	155	5%	15	170	5	15	190
TOTALS	**865**	**0.4**	**90**	**955**	**35**	**70**	**1060**

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Santa Clarita Office: 661.284.7400 Tel/ 661.284.7401 Fax
Victorville Office: 760.524.9100 Tel/ 760.524.9101 Fax
Temecula Office: 951.294.9300 Tel/ 951.294.9301 Fax

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SUBJECT	BY	DATE	JOB NO.	SHEET	OF
TURN VOLUME SUMMARY	TM	14-Jan-15	VV.150135.0000	2	OF 2

E/W STREET : SR 14 SB RAMPS

CONDITION : AM PEAK HOUR

N/S STREET : CROWN VALLEY ROAD

PHF : 0.66

NORTH LEG								
LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	2	0	0	0	0	0	1	0
1	4	0	0	3	0	1	2	0
0	5	0	0	1	0	1	0	0
0	2	0	0	1	0	0	1	0

SOUTH LEG								
LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	2	0	0	2	1	0	0	0
0	0	0	0	2	0	0	1	0
0	0	2	0	1	0	0	0	1
0	0	1	0	1	0	0	0	0

EAST LEG								
LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	1	1	0	0	2	0	0
2	0	0	1	0	0	2	0	0
2	0	0	4	0	0	2	0	0
2	0	0	0	0	1	2	0	0

WEST LEG								
LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0

NORTH LEG			SOUTH LEG			EAST LEG			WEST LEG		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
39	96	0	0	71	40	53	0	12	0	0	0
33	39	0	0	24	16	33	0	14	0	0	0
41	23	0	0	32	12	40	0	13	0	0	0
40	17	0	0	42	21	38	0	9	0	0	0

	TRUCK TOTAL	AUTO VOLUMES	TOTALS	ROUNDED TOTALS	TRUCK PERCENTAGE
SR 14 SB RAMPS					
EB LEFT	0	0	**0**	**0**	**0%**
EB THRU	0	0	**0**	**0**	**0%**
EB RIGHT	0	0	**0**	**0**	**0%**
WB LEFT	2	48	**50**	**50**	**5%**
WB THRU	0	0	**0**	**5**	**0%**
WB RIGHT	20	164	**184**	**185**	**10%**
CROWN VALLEY ROAD					
NB LEFT	5	89	**94**	**95**	**5%**
NB THRU	9	169	**178**	**180**	**5%**
NB RIGHT	0	0	**0**	**0**	**0%**
SB LEFT	0	0	**0**	**0**	**0%**
SB THRU	22	175	**197**	**195**	**10%**
SB RIGHT	3	153	**156**	**155**	**5%**

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INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: CROWN VALLEY
EAST-WEST STREET: I-14 SB(WB)
JURISDICTION: ACTON

DATE: 01-06-15

PEAK HOUR: 07:30AM

NORTH LEG

TOTAL: 353

	Rt	Thru	Lt
Total	156	197	
1st	39	99	
2nd	35	48	
3rd	42	29	
4th	40	21	

EAST LEG TOTAL: 234

	1st	2nd	3rd	4th	Total
Rt	56	38	48	42	184
Thru	0	0	0	0	
Lt	13	14	13	10	50

	Total	1st	2nd	3rd	4th
Lt					
Thru					
Rt					

WEST LEG TOTAL: 0

PEAK HOUR FACTORS

NORTH LEG = 0.64
SOUTH LEG = 0.59
EAST LEG = 0.85
WEST LEG =

ALL LEGS = 0.66

	Lt	Thru	Rt
1st	41	75	
2nd	16	27	
3rd	15	33	
4th	22	43	
Total	94	178	

TOTAL: 272

SOUTH LEG

HOUR TOTAL: 859

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : CROWN VALLEY ACTON

EAST-WEST STREET : I-14 SB(WB) 01-06-15

BEGINNING TIME : 07:00AM

AUTOS			LARGE 2 AXLE			3 AXLE			4(+) AXLE			TOTALS
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	
						NORTH LEG						
24	22	0	0	2	0	0	0	0	0	0	0	48
31	30	0	0	0	0	0	2	0	0	0	0	63
39	96	0	0	2	0	0	0	0	0	1	0	138
33	39	0	1	4	0	0	3	0	1	2	0	83
41	23	0	0	5	0	0	1	0	1	0	0	71
40	17	0	0	2	0	0	1	0	0	1	0	61
44	23	0	1	4	0	0	2	0	0	1	0	75
28	30	0	0	5	0	2	4	0	0	0	0	69
280	280	0	2	24	0	2	13	0	2	5	0	608
						SOUTH LEG						
0	16	19	0	3	0	0	2	0	0	1	0	41
0	28	25	0	2	0	0	0	0	0	0	0	55
0	71	40	0	2	0	0	2	1	0	0	0	116
0	24	16	0	0	0	0	2	0	0	1	0	43
0	32	12	0	0	2	0	1	0	0	0	1	48
0	42	21	0	0	1	0	1	0	0	0	0	65
0	38	24	0	3	0	0	1	1	0	2	0	69
0	28	19	0	0	1	0	3	1	0	0	2	54
0	279	176	0	10	4	0	12	3	0	4	3	491
						EAST LEG						
43	0	11	0	0	0	1	0	0	1	0	1	57
37	0	6	1	0	0	0	0	2	2	0	0	48
53	0	12	0	0	1	1	0	0	2	0	0	69
33	0	14	2	0	0	1	0	0	2	0	0	52
40	0	13	2	0	0	4	0	0	2	0	0	61
38	0	9	2	0	0	0	0	1	2	0	0	52
42	0	13	2	0	1	2	0	0	1	0	0	61
34	0	11	1	0	0	2	0	0	1	0	0	49
320	0	89	10	0	2	11	0	3	13	0	1	449
						WEST LEG						
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0

Prepared by Newport Traffic Studies

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CROWN VALLEY

EAST-WEST STREET: I-14 SB(WB)

TIME: 07:00AM-08:00AM DATE: 01-06-15

NORTH LEG

	Rt	Thru	Lt
Total	129	203	
1st	24	24	
2nd	31	32	
3rd	39	99	
4th	35	48	

	1st	2nd	3rd	4th	Total
Rt	45	40	56	38	179
Thru	0	0	0	0	0
Lt	12	8	13	14	47

	Total	1st	2nd	3rd	4th
Lt					
Thru					
Rt					

	Lt	Thru	Rt
1st	19	22	
2nd	25	30	
3rd	41	75	
4th	16	27	
Total	101	154	

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CROWN VALLEY

EAST-WEST STREET: I-14 SB(WB)

TIME: 08:00AM-09:00AM DATE: 01-06-15

NORTH LEG

	Rt	Thru	Lt
Total	157	119	
1st	42	29	
2nd	40	21	
3rd	45	30	
4th	30	39	

	1st	2nd	3rd	4th	Total
Rt	48	42	47	38	175
Thru	0	0	0	0	0
Lt	13	10	14	11	48

	Total	1st	2nd	3rd	4th
Lt					
Thru					
Rt					

	Lt	Thru	Rt
1st	15	33	
2nd	22	43	
3rd	25	44	
4th	23	31	
Total	85	151	

Prepared by NEWPORT TRAFFIC STUDIES

Diamond Interchange Capacity Utilization
3: CROWN VALLEY RD & I-10 WB ON RAMP/I-10 WB OFF RAMP

1/14/2015

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	EBL	EBT	EBR	NBT	NBR
Node	0	0	0	0	0	0	0	0	0	0	0	0
Lane Configurations												
Volume (vph)	50	5	185	95	180	195	155	45	5	95	230	80
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No				No			No		No
Ideal Flow	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Space				13.8	13.8							
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	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)												
Travel Time (s)	5.8		120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	55	185	95	180	195	155	45	100	0	310	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	1.00	1.00	0.85	0.95	0.86	0.85	0.96	0.85
Saturated Flow (vph)	0	1814	1615	1805	1900	1900	1615	1805	1629	0	1826	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00	0.00			0.00		0.00	
Reference Time (s)	0.0	3.6	13.7	6.3	11.4	12.3	11.5	3.0	7.4	0.0	20.4	0.0
Adj Reference Time (s)	0.0	8.0	17.7	10.3	15.4	16.3	15.5	8.0	11.4	0.0	24.4	0.0
Volume per cycle, 90th	3.3			5.4	9.1			3.1				
Volume to Storage	0.2			0.4	0.7			0.2				
Isolated Timings (s)	34.6							43.7				

Timing Options		
Leading Option (s)		58.4
Lagging Option (s)	OK	43.7
Lead-Lag Option (s)	OK	43.7

Interchange Summary			
Intersection Capacity Utilization	36.4%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	SBL	SBT		
Node	0	0		
Lane Configurations				
Volume (vph)	50	195		
Pedestrians				
Ped Button				
Pedestrian Timing (s)				
Free Right				
Ideal Flow	1900	1900		
Storage Space	13.8	13.8		
Lost Time (s)	4.0	4.0		
Minimum Green (s)	4.0	4.0		
Refr Cycle Length (s)				
Travel Time (s)	120	120	120	120
Volume Combined (vph)	50	195		
Lane Utilization Factor	1.00	1.00		
Turning Factor (vph)	0.95	1.00		
Saturated Flow (vph)	1805	1900		
Ped Intf Time (s)	0.0	0.0		
Pedestrian Frequency (%)		0.00		
Reference Time (s)	3.3	12.3		
Adj Reference Time (s)	8.0	16.3		
Volume per cycle, 90th	3.3	9.8		
Volume to Storage	0.2	0.7		
Isolated Timings (s)				

Timing Options

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	0	50	5	185	95	180	0	0	195	155
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	140	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	66	66	66	66	66	66	66	66	66	66	66	66
Heavy Vehicles, %	0	0	0	5	0	10	5	5	0	0	10	5
Mvmt Flow	0	0	0	76	8	280	144	273	0	0	295	235

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	856	856	273	295	0	0	273	0	0
Stage 1	561	561	-	-	-	-	-	-	-
Stage 2	295	295	-	-	-	-	-	-	-
Critical Hdwy	6.45	6.5	6.3	4.15	-	-	4.1	-	-
Critical Hdwy Stg 1	5.45	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.45	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4	3.39	2.245	-	-	2.2	-	-
Pot Cap-1 Maneuver	324	297	747	1249	-	-	1302	-	-
Stage 1	565	513	-	-	-	-	-	-	-
Stage 2	749	673	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	287	0	747	1249	-	-	1302	-	-
Mov Cap-2 Maneuver	378	0	-	-	-	-	-	-	-
Stage 1	500	0	-	-	-	-	-	-	-
Stage 2	749	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.7	2.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1249	-	-	378	747	1302	-	-
HCM Lane V/C Ratio	0.115	-	-	0.22	0.375	-	-	-
HCM Control Delay (s)	8.3	-	-	17.2	12.7	0	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	0.8	1.7	0	-	-

Diamond Interchange Capacity Utilization
3: CROWN VALLEY RD & I-10 WB ON RAMP/I-10 WB OFF RAMP

1/14/2015

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	EBL	EBT	EBR	NBT	NBR
Node	0	0	0	0	0	0	0	0	0	0	0	0
Lane Configurations												
Volume (vph)	50	5	200	95	210	225	170	60	5	95	245	80
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No				No			No		No
Ideal Flow	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Space				13.8	13.8							
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	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)												
Travel Time (s)	5.8		120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	55	200	95	210	225	170	60	100	0	325	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	1.00	1.00	0.85	0.95	0.86	0.85	0.96	0.85
Saturated Flow (vph)	0	1814	1615	1805	1900	1900	1615	1805	1629	0	1830	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00	0.00			0.00		0.00	
Reference Time (s)	0.0	3.6	14.9	6.3	13.3	14.2	12.6	4.0	7.4	0.0	21.3	0.0
Adj Reference Time (s)	0.0	8.0	18.9	10.3	17.3	18.2	16.6	8.0	11.4	0.0	25.3	0.0
Volume per cycle, 90th	3.3			5.4	10.4			3.8				
Volume to Storage	0.2			0.4	0.8			0.3				
Isolated Timings (s)	36.5							45.0				

Timing Options		
Leading Option (s)		62.4
Lagging Option (s)	OK	45.0
Lead-Lag Option (s)	OK	45.0

Interchange Summary			
Intersection Capacity Utilization	37.5%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	SBL	SBT		
Node	0	0		
Lane Configurations				
Volume (vph)	65	210		
Pedestrians				
Ped Button				
Pedestrian Timing (s)				
Free Right				
Ideal Flow	1900	1900		
Storage Space	13.8	13.8		
Lost Time (s)	4.0	4.0		
Minimum Green (s)	4.0	4.0		
Refr Cycle Length (s)				
Travel Time (s)	120	120	120	120
Volume Combined (vph)	65	210		
Lane Utilization Factor	1.00	1.00		
Turning Factor (vph)	0.95	1.00		
Saturated Flow (vph)	1805	1900		
Ped Intf Time (s)	0.0	0.0		
Pedestrian Frequency (%)		0.00		
Reference Time (s)	4.3	13.3		
Adj Reference Time (s)	8.3	17.3		
Volume per cycle, 90th	4.1	10.4		
Volume to Storage	0.3	0.8		
Isolated Timings (s)				

Timing Options

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	0	50	5	200	95	210	0	0	225	170
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	140	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	66	66	66	66	66	66	66	66	66	66	66	66
Heavy Vehicles, %	0	0	0	5	0	10	5	5	0	0	10	5
Mvmt Flow	0	0	0	76	8	303	144	318	0	0	341	258

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	947	947	318	341	0	0	318	0	0
Stage 1	606	606	-	-	-	-	-	-	-
Stage 2	341	341	-	-	-	-	-	-	-
Critical Hdwy	6.45	6.5	6.3	4.15	-	-	4.1	-	-
Critical Hdwy Stg 1	5.45	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.45	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4	3.39	2.245	-	-	2.2	-	-
Pot Cap-1 Maneuver	286	263	704	1202	-	-	1253	-	-
Stage 1	539	490	-	-	-	-	-	-	-
Stage 2	713	642	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	252	0	704	1202	-	-	1253	-	-
Mov Cap-2 Maneuver	349	0	-	-	-	-	-	-	-
Stage 1	474	0	-	-	-	-	-	-	-
Stage 2	713	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.9	2.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1202	-	-	349	704	1253	-	-
HCM Lane V/C Ratio	0.12	-	-	0.239	0.43	-	-	-
HCM Control Delay (s)	8.4	-	-	18.5	13.9	0	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	0.9	2.2	0	-	-

Diamond Interchange Capacity Utilization
3: CROWN VALLEY RD & I-10 WB ON RAMP/I-10 WB OFF RAMP

1/14/2015

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	EBL	EBT	EBR	NBT	NBR
Node	0	0	0	0	0	0	0	0	0	0	0	0
Lane Configurations												
Volume (vph)	55	10	220	100	235	250	190	80	10	100	255	85
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No				No			No		No
Ideal Flow	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Space				13.8	13.8							
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	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)												
Travel Time (s)	5.8		120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	65	220	100	235	250	190	80	110	0	340	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.96	0.85	0.95	1.00	1.00	0.85	0.95	0.86	0.85	0.96	0.85
Saturated Flow (vph)	0	1820	1615	1805	1900	1900	1615	1805	1641	0	1829	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00	0.00			0.00		0.00	
Reference Time (s)	0.0	4.3	16.3	6.6	14.8	15.8	14.1	5.3	8.0	0.0	22.3	0.0
Adj Reference Time (s)	0.0	8.3	20.3	10.6	18.8	19.8	18.1	9.3	12.0	0.0	26.3	0.0
Volume per cycle, 90th	3.6			5.7	11.4			4.8				
Volume to Storage	0.3			0.4	0.8			0.3				
Isolated Timings (s)	39.2							48.0				

Timing Options		
Leading Option (s)		66.9
Lagging Option (s)	OK	48.0
Lead-Lag Option (s)	OK	48.0

Interchange Summary			
Intersection Capacity Utilization	40.0%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	SBL	SBT		
Node	0	0		
Lane Configurations				
Volume (vph)	85	220		
Pedestrians				
Ped Button				
Pedestrian Timing (s)				
Free Right				
Ideal Flow	1900	1900		
Storage Space	13.8	13.8		
Lost Time (s)	4.0	4.0		
Minimum Green (s)	4.0	4.0		
Refr Cycle Length (s)				
Travel Time (s)	120	120	120	120
Volume Combined (vph)	85	220		
Lane Utilization Factor	1.00	1.00		
Turning Factor (vph)	0.95	1.00		
Saturated Flow (vph)	1805	1900		
Ped Intf Time (s)	0.0	0.0		
Pedestrian Frequency (%)		0.00		
Reference Time (s)	5.7	13.9		
Adj Reference Time (s)	9.7	17.9		
Volume per cycle, 90th	5.0	10.8		
Volume to Storage	0.4	0.8		
Isolated Timings (s)				

Timing Options

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	0	55	10	220	100	235	0	0	250	190
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	140	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	66	66	66	66	66	66	66	66	66	66	66	66
Heavy Vehicles, %	0	0	0	5	0	10	5	5	0	0	10	5
Mvmt Flow	0	0	0	83	15	333	152	356	0	0	379	288

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1038	1038	356	379	0	0	356	0	0
Stage 1	659	659	-	-	-	-	-	-	-
Stage 2	379	379	-	-	-	-	-	-	-
Critical Hdwy	6.45	6.5	6.3	4.15	-	-	4.1	-	-
Critical Hdwy Stg 1	5.45	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.45	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4	3.39	2.245	-	-	2.2	-	-
Pot Cap-1 Maneuver	252	233	670	1163	-	-	1214	-	-
Stage 1	509	464	-	-	-	-	-	-	-
Stage 2	686	618	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	219	0	670	1163	-	-	1214	-	-
Mov Cap-2 Maneuver	319	0	-	-	-	-	-	-	-
Stage 1	442	0	-	-	-	-	-	-	-
Stage 2	686	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.9	2.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1163	-	-	319	670	1214	-	-
HCM Lane V/C Ratio	0.13	-	-	0.309	0.498	-	-	-
HCM Control Delay (s)	8.6	-	-	21.2	15.6	0	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	1.3	2.8	0	-	-

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SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	14-Jan-15	VV.150135.0000	1 OF 2

E/W STREET : SR 14 SB RAMPS

N/S STREET : CROWN VALLEY ROAD

CONDITION : PM PEAK HOUR

INTERSECTION : 3

PROJECTED GROWTH PER YEAR : 2.0%

TURN MOVEMENTS

CONDITION	EXISTING TRAFFIC	TRUCK PERCENTAGE	PROJECT TRIPS	EXISTING PLUS PROJECT TRAFFIC	AMBIENT GROWTH TRIPS	OTHER AREA PROJECT TRIPS	PROJECT CONDITION YEAR 2016 TRAFFIC
SCENARIO #:	2			4			6
SR 14 SB RAMPS							
EB LEFT	0	0%	0	0	0	0	0
EB THRU	0	0%	0	0	0	0	0
EB RIGHT	0	0%	0	0	0	0	0
WB LEFT	55	0%	0	55	5	0	60
WB THRU	5	0%	0	5	5	0	10
WB RIGHT	135	5%	15	150	5	10	165
CROWN VALLEY ROAD							
NB LEFT	50	10%	0	50	5	0	55
NB THRU	235	5%	25	260	5	15	280
NB RIGHT	0	0%	0	0	0	0	0
SB LEFT	0	0%	0	0	0	0	0
SB THRU	220	5%	25	245	5	15	265
SB RIGHT	95	5%	15	110	5	10	125
TOTALS	**795**	**0.3**	**80**	**875**	**35**	**50**	**960**

Tustin Office: 714.665.4500 Tel/ 714.665.4501 Fax

Santa Clarita Office: 661.284.7400 Tel/ 661.284.7401 Fax

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Temecula Office: 951.294.9300 Tel/ 951.294.9301 Fax

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SUBJECT	BY	DATE	JOB NO.	SHEET	OF
TURN VOLUME SUMMARY	TM	1/14/2015	VV.150135.0000	2	OF 2

E/W STREET : SR 14 SB RAMPS

CONDITION : PM PEAK HOUR

N/S STREET : CROWN VALLEY ROAD

PHF : 0.99

NORTH LEG								
LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	2	0	0	1	0	0	0	0
0	1	0	1	1	0	1	0	0
1	2	0	0	2	0	0	0	0
1	0	0	0	0	0	0	1	0

SOUTH LEG								
LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	0	0	0	2	0
0	0	1	0	0	1	0	1	3
0	1	0	0	1	0	0	0	0
0	1	0	0	1	0	0	1	0

EAST LEG								
LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	0	0	3	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	1	0	0
0	0	0	0	0	0	0	0	0

WEST LEG								
LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0

NORTH LEG			SOUTH LEG			EAST LEG			WEST LEG		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
28	52	0	0	59	11	26	0	11	0	0	0
19	44	0	0	70	7	39	0	10	0	0	0
23	68	0	0	50	11	32	0	7	0	0	0
19	47	0	0	48	18	33	0	28	0	0	0

	TRUCK TOTAL	AUTO VOLUMES	TOTALS	ROUNDED TOTALS	TRUCK PERCENTAGE
SR 14 SB RAMPS					
EB LEFT	0	0	**0**	**0**	**0%**
EB THRU	0	0	**0**	**0**	**0%**
EB RIGHT	0	0	**0**	**0**	**0%**
WB LEFT	0	56	**56**	**55**	**0%**
WB THRU	0	0	**0**	**5**	**0%**
WB RIGHT	4	130	**134**	**135**	**5%**
CROWN VALLEY ROAD					
NB LEFT	5	47	**52**	**50**	**10%**
NB THRU	8	227	**235**	**235**	**5%**
NB RIGHT	0	0	**0**	**0**	**0%**
SB LEFT	0	0	**0**	**0**	**0%**
SB THRU	10	211	**221**	**220**	**5%**
SB RIGHT	4	89	**93**	**95**	**5%**

Tustin Office: 714.665.4500 Tel/ 714.665.4501 Fax

Santa Clarita Office: 661.284.7400 Tel/ 661.284.7401 Fax

Victorville Office: 760.524.9100 Tel/ 760.524.9101 Fax

Temecula Office: 951.294.9300 Tel/ 951.294.9301 Fax

INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: CROWN VALLEY
EAST-WEST STREET: I-14 SB(WB)
JURISDICTION: ACTON

DATE: 01-06-15

PEAK HOUR: 04:15PM

NORTH LEG

TOTAL: 314

	Rt	Thru	Lt
Total	93	221	
1st	28	55	
2nd	21	46	
3rd	24	72	
4th	20	48	

EAST LEG

EAST LEG TOTAL: 190

	1st	2nd	3rd	4th	Total
Rt	29	39	33	33	134
Thru	0	0	0	0	
Lt	11	10	7	28	56

WEST LEG

	Total	1st	2nd	3rd	4th
Lt					
Thru					
Rt					

WEST LEG TOTAL: 0

SOUTH LEG

	Lt	Thru	Rt
1st	11	61	
2nd	12	71	
3rd	11	52	
4th	18	51	
Total	52	235	

TOTAL: 287

PEAK HOUR FACTORS

NORTH LEG = 0.82
SOUTH LEG = 0.86
EAST LEG = 0.78
WEST LEG =

ALL LEGS = 0.99

HOUR TOTAL: 791

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : CROWN VALLEY ACTON

EAST-WEST STREET : I-14 SB(WB) 01-06-15

BEGINNING TIME : 04:00PM

AUTOS			LARGE 2 AXLE			3 AXLE			4(+) AXLE			TOTALS
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	
						NORTH LEG						
26	38	0	1	1	0	0	1	0	0	1	0	68
28	52	0	0	2	0	0	1	0	0	0	0	83
19	44	0	0	1	0	1	1	0	1	0	0	67
23	68	0	1	2	0	0	2	0	0	0	0	96
19	47	0	1	0	0	0	0	0	0	1	0	68
28	30	0	0	1	0	1	2	0	0	0	0	62
15	41	0	0	1	0	0	2	0	1	0	0	60
27	40	0	0	2	0	0	0	0	0	0	0	69
185	360	0	3	10	0	2	9	0	2	2	0	573
						SOUTH LEG						
0	53	12	0	3	2	0	1	1	0	1	0	73
0	59	11	0	0	0	0	0	0	0	2	0	72
0	70	7	0	0	1	0	0	1	0	1	3	83
0	50	11	0	1	0	0	1	0	0	0	0	63
0	48	18	0	1	0	0	1	0	0	1	0	69
0	57	15	0	1	0	0	0	0	0	0	1	74
0	41	11	0	2	2	0	0	0	0	0	0	56
0	61	13	0	0	0	0	0	0	0	0	0	74
0	439	98	0	8	5	0	3	2	0	5	4	564
						EAST LEG						
36	0	13	1	0	0	0	0	0	0	0	0	50
26	0	11	0	0	0	0	0	0	3	0	0	40
39	0	10	0	0	0	0	0	0	0	0	0	49
32	0	7	0	0	0	0	0	0	1	0	0	40
33	0	28	0	0	0	0	0	0	0	0	0	61
19	0	20	0	0	0	0	0	0	0	0	0	39
25	0	24	0	0	0	0	0	0	0	0	0	49
18	0	18	0	0	0	0	0	0	0	0	1	37
228	0	131	1	0	0	0	0	0	4	0	1	365
						WEST LEG						
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0

Prepared by Newport Traffic Studies

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CROWN VALLEY

EAST-WEST STREET: I-14 SB(WB)

TIME: 04:00PM-05:00PM DATE: 01-06-15

NORTH LEG

	Rt	Thru	Lt
Total	100	214	
1st	27	41	
2nd	28	55	
3rd	21	46	
4th	24	72	

	1st	2nd	3rd	4th	Total
Rt	37	29	39	33	138
Thru	0	0	0	0	0
Lt	13	11	10	7	41

	Total	1st	2nd	3rd	4th
Lt					
Thru					
Rt					

	Lt	Thru	Rt
1st	15	58	
2nd	11	61	
3rd	12	71	
4th	11	52	
Total	49	242	

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CROWN VALLEY

EAST-WEST STREET: I-14 SB(WB)

TIME: 05:00PM-06:00PM DATE: 01-06-15

NORTH LEG

	Rt	Thru	Lt
Total	92	167	
1st	20	48	
2nd	29	33	
3rd	16	44	
4th	27	42	

	1st	2nd	3rd	4th	Total
Rt	33	19	25	18	95
Thru	0	0	0	0	0
Lt	28	20	24	19	91

	Total	1st	2nd	3rd	4th
Lt					
Thru					
Rt					

	Lt	Thru	Rt
1st	18	51	
2nd	16	58	
3rd	13	43	
4th	13	61	
Total	60	213	

Prepared by NEWPORT TRAFFIC STUDIES

Diamond Interchange Capacity Utilization
3: CROWN VALLEY RD & I-10 WB ON RAMP/I-10 WB OFF RAMP

1/14/2015

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	EBL	EBT	EBR	NBT	NBR
Node	0	0	0	0	0	0	0	0	0	0	0	0
Lane Configurations												
Volume (vph)	55	5	135	50	235	220	95	125	5	150	170	125
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No				No			No		No
Ideal Flow	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Space				13.8	13.8							
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	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)												
Travel Time (s)	5.8		120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	60	135	50	235	220	95	125	155	0	295	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	1.00	1.00	0.85	0.95	0.85	0.85	0.94	0.85
Saturated Flow (vph)	0	1813	1615	1805	1900	1900	1615	1805	1624	0	1779	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00	0.00			0.00		0.00	
Reference Time (s)	0.0	4.0	10.0	3.3	14.8	13.9	7.1	8.3	11.5	0.0	19.9	0.0
Adj Reference Time (s)	0.0	8.0	14.0	8.0	18.8	17.9	11.1	12.3	15.5	0.0	23.9	0.0
Volume per cycle, 90th	3.6			3.3	11.4			6.8				
Volume to Storage	0.3			0.2	0.8			0.5				
Isolated Timings (s)	33.9							50.0				

Timing Options		
Leading Option (s)		59.7
Lagging Option (s)	OK	50.0
Lead-Lag Option (s)	OK	50.0

Interchange Summary			
Intersection Capacity Utilization	41.7%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	SBL	SBT		
Node	0	0		
Lane Configurations				
Volume (vph)	100	170		
Pedestrians				
Ped Button				
Pedestrian Timing (s)				
Free Right				
Ideal Flow	1900	1900		
Storage Space	13.8	13.8		
Lost Time (s)	4.0	4.0		
Minimum Green (s)	4.0	4.0		
Refr Cycle Length (s)				
Travel Time (s)	120	120	120	120
Volume Combined (vph)	100	170		
Lane Utilization Factor	1.00	1.00		
Turning Factor (vph)	0.95	1.00		
Saturated Flow (vph)	1805	1900		
Ped Intf Time (s)	0.0	0.0		
Pedestrian Frequency (%)		0.00		
Reference Time (s)	6.6	10.7		
Adj Reference Time (s)	10.6	14.7		
Volume per cycle, 90th	5.7	8.7		
Volume to Storage	0.4	0.6		
Isolated Timings (s)				

Timing Options

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	0	55	5	135	50	235	0	0	220	95
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	140	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	0	0	0	0	0	5	10	5	0	0	5	5
Mvmt Flow	0	0	0	56	5	136	51	237	0	0	222	96

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	560	560	237	222	0	0	237	0	0
Stage 1	338	338	-	-	-	-	-	-	-
Stage 2	222	222	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.25	4.2	-	-	4.1	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.345	2.29	-	-	2.2	-	-
Pot Cap-1 Maneuver	493	440	795	1301	-	-	1342	-	-
Stage 1	727	644	-	-	-	-	-	-	-
Stage 2	820	723	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	474	0	795	1301	-	-	1342	-	-
Mov Cap-2 Maneuver	549	0	-	-	-	-	-	-	-
Stage 1	699	0	-	-	-	-	-	-	-
Stage 2	820	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.1	1.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1301	-	-	549	795	1342	-	-
HCM Lane V/C Ratio	0.039	-	-	0.11	0.172	-	-	-
HCM Control Delay (s)	7.9	-	-	12.4	10.5	0	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.6	0	-	-

Diamond Interchange Capacity Utilization
3: CROWN VALLEY RD & I-10 WB ON RAMP/I-10 WB OFF RAMP

1/14/2015

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	EBL	EBT	EBR	NBT	NBR
Node	0	0	0	0	0	0	0	0	0	0	0	0
Lane Configurations												
Volume (vph)	55	5	150	50	260	245	110	140	5	150	185	125
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No				No			No		No
Ideal Flow	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Space				13.8	13.8							
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	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)												
Travel Time (s)	5.8		120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	60	150	50	260	245	110	140	155	0	310	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.95	0.85	0.95	1.00	1.00	0.85	0.95	0.85	0.85	0.94	0.85
Saturated Flow (vph)	0	1813	1615	1805	1900	1900	1615	1805	1624	0	1785	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00	0.00			0.00		0.00	
Reference Time (s)	0.0	4.0	11.1	3.3	16.4	15.5	8.2	9.3	11.5	0.0	20.8	0.0
Adj Reference Time (s)	0.0	8.0	15.1	8.0	20.4	19.5	12.2	13.3	15.5	0.0	24.8	0.0
Volume per cycle, 90th	3.6			3.3	12.4			7.4				
Volume to Storage	0.3			0.2	0.9			0.5				
Isolated Timings (s)	35.6							51.9				

Timing Options		
Leading Option (s)		63.3
Lagging Option (s)	OK	51.9
Lead-Lag Option (s)	OK	51.9

Interchange Summary			
Intersection Capacity Utilization	43.3%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	SBL	SBT		
Node	0	0		
Lane Configurations				
Volume (vph)	115	185		
Pedestrians				
Ped Button				
Pedestrian Timing (s)				
Free Right				
Ideal Flow	1900	1900		
Storage Space	13.8	13.8		
Lost Time (s)	4.0	4.0		
Minimum Green (s)	4.0	4.0		
Refr Cycle Length (s)				
Travel Time (s)	120	120	120	120
Volume Combined (vph)	115	185		
Lane Utilization Factor	1.00	1.00		
Turning Factor (vph)	0.95	1.00		
Saturated Flow (vph)	1805	1900		
Ped Intf Time (s)	0.0	0.0		
Pedestrian Frequency (%)		0.00		
Reference Time (s)	7.6	11.7		
Adj Reference Time (s)	11.6	15.7		
Volume per cycle, 90th	6.3	9.3		
Volume to Storage	0.5	0.7		
Isolated Timings (s)				

Timing Options

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	0	55	5	150	50	260	0	0	245	110
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	140	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	0	0	0	0	0	5	10	5	0	0	5	5
Mvmt Flow	0	0	0	56	5	152	51	263	0	0	247	111

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	611	611	263	247	0	0	263	0	0
Stage 1	364	364	-	-	-	-	-	-	-
Stage 2	247	247	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.25	4.2	-	-	4.1	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.345	2.29	-	-	2.2	-	-
Pot Cap-1 Maneuver	460	411	768	1273	-	-	1313	-	-
Stage 1	707	627	-	-	-	-	-	-	-
Stage 2	799	706	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	442	0	768	1273	-	-	1313	-	-
Mov Cap-2 Maneuver	525	0	-	-	-	-	-	-	-
Stage 1	679	0	-	-	-	-	-	-	-
Stage 2	799	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.4	1.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1273	-	-	525	768	1313	-	-
HCM Lane V/C Ratio	0.04	-	-	0.115	0.197	-	-	-
HCM Control Delay (s)	7.9	-	-	12.8	10.8	0	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.7	0	-	-

Diamond Interchange Capacity Utilization
3: CROWN VALLEY RD & I-10 WB ON RAMP/I-10 WB OFF RAMP

1/14/2015

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	EBL	EBT	EBR	NBT	NBR
Node	0	0	0	0	0	0	0	0	0	0	0	0
Lane Configurations												
Volume (vph)	60	10	165	55	280	265	125	155	10	155	195	130
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No				No			No		No
Ideal Flow	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Space				13.8	13.8							
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	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)												
Travel Time (s)	5.8		120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	70	165	55	280	265	125	155	165	0	325	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.96	0.85	0.95	1.00	1.00	0.85	0.95	0.86	0.85	0.94	0.85
Saturated Flow (vph)	0	1819	1615	1805	1900	1900	1615	1805	1632	0	1786	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.00	0.00			0.00		0.00	
Reference Time (s)	0.0	4.6	12.3	3.7	17.7	16.7	9.3	10.3	12.1	0.0	21.8	0.0
Adj Reference Time (s)	0.0	8.6	16.3	8.0	21.7	20.7	13.3	14.3	16.1	0.0	25.8	0.0
Volume per cycle, 90th	3.8			3.6	13.2			8.1				
Volume to Storage	0.3			0.3	1.0			0.6				
Isolated Timings (s)	37.9							54.6				

Timing Options		
Leading Option (s)		67.4
Lagging Option (s)	OK	54.6
Lead-Lag Option (s)	OK	54.6

Interchange Summary			
Intersection Capacity Utilization	45.5%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	SBL	SBT		
Node	0	0		
Lane Configurations				
Volume (vph)	130	195		
Pedestrians				
Ped Button				
Pedestrian Timing (s)				
Free Right				
Ideal Flow	1900	1900		
Storage Space	13.8	13.8		
Lost Time (s)	4.0	4.0		
Minimum Green (s)	4.0	4.0		
Refr Cycle Length (s)				
Travel Time (s)	120	120	120	120
Volume Combined (vph)	130	195		
Lane Utilization Factor	1.00	1.00		
Turning Factor (vph)	0.95	1.00		
Saturated Flow (vph)	1805	1900		
Ped Intf Time (s)	0.0	0.0		
Pedestrian Frequency (%)		0.00		
Reference Time (s)	8.6	12.3		
Adj Reference Time (s)	12.6	16.3		
Volume per cycle, 90th	7.0	9.8		
Volume to Storage	0.5	0.7		
Isolated Timings (s)				

Timing Options

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	0	60	10	165	55	280	0	0	265	125
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	140	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	0	0	0	0	0	5	10	5	0	0	5	5
Mvmt Flow	0	0	0	61	10	167	56	283	0	0	268	126

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	662	662	283	268	0	0	283	0	0
Stage 1	394	394	-	-	-	-	-	-	-
Stage 2	268	268	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.25	4.2	-	-	4.1	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.345	2.29	-	-	2.2	-	-
Pot Cap-1 Maneuver	430	385	749	1251	-	-	1291	-	-
Stage 1	686	609	-	-	-	-	-	-	-
Stage 2	782	691	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	411	0	749	1251	-	-	1291	-	-
Mov Cap-2 Maneuver	501	0	-	-	-	-	-	-	-
Stage 1	655	0	-	-	-	-	-	-	-
Stage 2	782	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.9	1.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1251	-	-	501	749	1291	-	-
HCM Lane V/C Ratio	0.044	-	-	0.141	0.223	-	-	-
HCM Control Delay (s)	8	-	-	13.4	11.2	0	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	0.8	0	-	-

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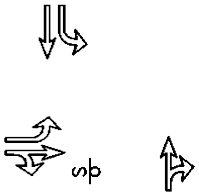
SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	14-Jan-15	VV.150135.0000	1 OF 2

E/W STREET : SR 14 NB RAMPS
N/S STREET : CROWN VALLEY ROAD
CONDITION : AM PEAK HOUR

INTERSECTION : 4
PROJECTED GROWTH PER YEAR : 2.0%

CONDITION DIAGRAMS



EXISTING GEOMETRICS **PROPOSED GEOMETRICS**

TURN MOVEMENTS

CONDITION	EXISTING TRAFFIC	TRUCK PERCENTAGE	PROJECT TRIPS	EXISTING PLUS PROJECT TRAFFIC	AMBIENT GROWTH TRIPS	OTHER AREA PROJECT TRIPS	PROJECT CONDITION YEAR 2016 TRAFFIC
SCENARIO #:	1			3			5
SR 14 NB RAMPS							
EB LEFT	45	15%	15	60	5	15	80
EB THRU	5	0%	0	5	5	0	10
EB RIGHT	95	10%	0	95	5	0	100
WB LEFT	0	0%	0	0	0	0	0
WB THRU	0	0%	0	0	0	0	0
WB RIGHT	0	0%	0	0	0	0	0
CROWN VALLEY ROAD							
NB LEFT	0	0%	0	0	0	0	0
NB THRU	230	5%	15	245	5	5	255
NB RIGHT	80	10%	0	80	5	0	85
SB LEFT	50	10%	15	65	5	15	85
SB THRU	195	5%	15	210	5	5	220
SB RIGHT	0	0%	0	0	0	0	0
TOTALS	**700**	**0.55**	**60**	**760**	**35**	**40**	**835**

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Temecula Office: 951.294.9300 Tel/ 951.294.9301 Fax

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SUBJECT	BY	DATE	JOB NO.	SHEET	OF
TURN VOLUME SUMMARY	TM	14-Jan-15	VV.150135.0000	2	OF 2

E/W STREET : SR 14 NB RAMPS

CONDITION : AM PEAK HOUR

N/S STREET : CROWN VALLEY ROAD

PHF : 0.65

NORTH LEG

LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	2	2	0	0	0	0	1	0
0	0	2	0	0	0	0	0	1
0	2	0	0	1	0	0	1	0
0	2	0	0	0	0	0	1	0

SOUTH LEG

LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	4	0	3	1	0	0	0	0
0	0	0	2	0	0	0	1	0
3	1	0	0	1	0	0	0	0
0	0	0	0	1	0	1	1	0

EAST LEG

LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0

WEST LEG

LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
1	0	0	0	0	0	2	0	0
0	0	2	0	0	1	1	0	0
1	0	2	1	0	0	0	0	0
1	0	1	0	0	0	1	0	1

NORTH LEG			SOUTH LEG			EAST LEG			WEST LEG		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	76	17	30	86	0	0	0	0	37	0	9
0	49	6	18	47	0	0	0	0	26	0	8
0	29	12	13	30	0	0	0	0	15	0	9
0	32	12	9	58	0	0	0	0	11	0	14

	TRUCK TOTAL	AUTO VOLUMES	TOTALS	ROUNDED TOTALS	TRUCK PERCENTAGE
SR 14 NB RAMPS					
EB LEFT	7	40	**47**	**45**	**15%**
EB THRU	0	0	**0**	**5**	**0%**
EB RIGHT	8	89	**97**	**95**	**10%**
WB LEFT	0	0	**0**	**0**	**0%**
WB THRU	0	0	**0**	**0**	**0%**
WB RIGHT	0	0	**0**	**0**	**0%**
CROWN VALLEY ROAD					
NB LEFT	0	0	**0**	**0**	**0%**
NB THRU	10	221	**231**	**230**	**5%**
NB RIGHT	9	70	**79**	**80**	**10%**
SB LEFT	5	47	**52**	**50**	**10%**
SB THRU	10	186	**196**	**195**	**5%**
SB RIGHT	0	0	**0**	**0**	**0%**

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INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: CROWN VALLEY
EAST-WEST STREET: I-14 NB(EB)
JURISDICTION: ACTON

DATE: 01-06-15

PEAK HOUR: 07:30AM

NORTH LEG

TOTAL: 248

	Rt	Thru	Lt
Total		196	52
1st		79	19
2nd		49	9
3rd		33	12
4th		35	12

EAST LEG TOTAL: 0

	1st	2nd	3rd	4th	Total
Rt					
Thru					
Lt					

	Total	1st	2nd	3rd	4th
Lt	47	9	11	11	16
Thru		0	0	0	0
Rt	97	40	27	17	13

WEST LEG TOTAL: 144

PEAK HOUR FACTORS

NORTH LEG = 0.63
SOUTH LEG = 0.63
EAST LEG =
WEST LEG = 0.73

ALL LEGS = 0.65

	Lt	Thru	Rt
1st		91	33
2nd		48	20
3rd		32	16
4th		60	10
Total		231	79

TOTAL: 310

SOUTH LEG

HOUR TOTAL: 702

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : CROWN VALLEY ACTON

EAST-WEST STREET : I-14 NB(EB) 01-06-15

BEGINNING TIME : 07:00AM

AUTOS			LARGE 2 AXLE			3 AXLE			4(+) AXLE			TOTALS
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	
						NORTH LEG						
0	21	14	0	1	1	0	0	0	0	1	0	38
0	40	10	0	0	0	0	2	3	0	1	0	56
0	76	17	0	2	2	0	0	0	0	1	0	98
0	49	6	0	0	2	0	0	0	0	0	1	58
0	29	12	0	2	0	0	1	0	0	1	0	45
0	32	12	0	2	0	0	0	0	0	1	0	47
0	20	18	0	2	1	0	2	0	0	0	1	44
0	18	9	0	0	2	0	2	0	0	0	0	31
0	285	98	0	9	8	0	7	3	0	5	2	417
						SOUTH LEG						
9	31	0	1	0	0	0	0	0	0	0	0	41
8	39	0	0	1	0	0	0	0	0	1	0	49
30	86	0	0	4	0	3	1	0	0	0	0	124
18	47	0	0	0	0	2	0	0	0	1	0	68
13	30	0	3	1	0	0	1	0	0	0	0	48
9	58	0	0	0	0	0	1	0	1	1	0	70
11	49	0	1	3	0	0	1	0	0	1	0	66
8	29	0	2	1	0	1	3	0	1	0	0	45
106	369	0	7	10	0	6	7	0	2	4	0	511
						EAST LEG						
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
						WEST LEG						
10	0	9	0	0	1	3	0	1	1	0	2	27
18	0	11	0	0	0	0	0	0	1	0	0	30
37	0	9	1	0	0	0	0	0	2	0	0	49
26	0	8	0	0	2	0	0	1	1	0	0	38
15	0	9	1	0	2	1	0	0	0	0	0	28
11	0	14	1	0	1	0	0	0	1	0	1	29
10	0	15	0	0	1	0	0	0	0	0	2	28
12	0	12	0	0	0	1	0	0	0	0	0	25
139	0	87	3	0	7	5	0	2	6	0	5	254

Prepared by Newport Traffic Studies

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CROWN VALLEY

EAST-WEST STREET: I-14 NB(EB)

TIME: 07:00AM-08:00AM DATE: 01-06-15

NORTH LEG

	Rt	Thru	Lt	
		194	56	Total
		23	15	1st
		43	13	2nd
		79	19	3rd
		49	9	4th

	1st	2nd	3rd	4th	Total
Rt					
Thru					
Lt					

Total	1st	2nd	3rd	4th	
44	13	11	9	11	Lt
0	0	0	0	0	Thru
100	14	19	40	27	Rt

	Lt	Thru	Rt
1st		31	10
2nd		41	8
3rd		91	33
4th		48	20
Total		211	71

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CROWN VALLEY

EAST-WEST STREET: I-14 NB(EB)

TIME: 08:00AM-09:00AM DATE: 01-06-15

NORTH LEG

	Rt	Thru	Lt
Total		112	55
1st		33	12
2nd		35	12
3rd		24	20
4th		20	11

	1st	2nd	3rd	4th	Total
Rt					
Thru					
Lt					

	Total	1st	2nd	3rd	4th
Lt	57	11	16	18	12
Thru	0	0	0	0	0
Rt	53	17	13	10	13

	Lt	Thru	Rt
1st		32	16
2nd		60	10
3rd		54	12
4th		33	12
Total		179	50

Prepared by NEWPORT TRAFFIC STUDIES

Diamond Interchange Capacity Utilization
4: CROWN VALLEY RD & I-10 EB OFF RAMP/I-10 EB ON RAMP

1/14/2015

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	WBL	WBT	WBR	NBL	NBT
Node	0	0	0	0	0	0	0	0	0	0	0	0
Lane Configurations												
Volume (vph)	45	5	95	230	80	50	195	50	5	185	95	180
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No		No					No		
Ideal Flow	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Space						13.8	13.8				13.8	13.8
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	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)												
Travel Time (s)	5.8		120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	45	100	0	310	0	50	195	0	55	185	95	180
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.86	0.85	0.96	0.85	0.95	1.00	0.95	0.95	0.85	0.95	1.00
Saturated Flow (vph)	1805	1629	0	1826	0	1805	1900	0	1814	1615	1805	1900
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00		0.00			0.00		0.00			0.00
Reference Time (s)	3.0	7.4	0.0	20.4	0.0	3.3	12.3	0.0	3.6	13.7	6.3	11.4
Adj Reference Time (s)	8.0	11.4	0.0	24.4	0.0	8.0	16.3	0.0	8.0	17.7	10.3	15.4
Volume per cycle, 90th	3.1					3.3	9.8	3.3			5.4	9.1
Volume to Storage	0.2					0.2	0.7	0.2			0.4	0.7
Isolated Timings (s)	43.7							34.6				

Timing Options		
Leading Option (s)		58.4
Lagging Option (s)	OK	43.7
Lead-Lag Option (s)	OK	43.7

Interchange Summary			
Intersection Capacity Utilization	36.4%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	SBT	SBR		
Node	0	0		
Lane Configurations				
Volume (vph)	195	155		
Pedestrians				
Ped Button				
Pedestrian Timing (s)				
Free Right		No		
Ideal Flow	1900	1900		
Storage Space				
Lost Time (s)	4.0	4.0		
Minimum Green (s)	4.0	4.0		
Refr Cycle Length (s)				
Travel Time (s)	120	120	120	120
Volume Combined (vph)	195	155		
Lane Utilization Factor	1.00	1.00		
Turning Factor (vph)	1.00	0.85		
Saturated Flow (vph)	1900	1615		
Ped Intf Time (s)	0.0	0.0		
Pedestrian Frequency (%)	0.00			
Reference Time (s)	12.3	11.5		
Adj Reference Time (s)	16.3	15.5		
Volume per cycle, 90th				
Volume to Storage				
Isolated Timings (s)				

Timing Options

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	45	5	95	0	0	0	0	230	80	50	195	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	-	-	-	140	-	-
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	65	65	65	65	65	65	65	65	65	65	65	65
Heavy Vehicles, %	15	0	10	0	0	0	0	5	10	10	5	0
Mvmt Flow	69	8	146	0	0	0	0	354	123	77	300	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	869	931	300	300	0	0	477	0	0
Stage 1	454	454	-	-	-	-	-	-	-
Stage 2	415	477	-	-	-	-	-	-	-
Critical Hdwy	6.55	6.5	6.3	4.1	-	-	4.2	-	-
Critical Hdwy Stg 1	5.55	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.55	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.635	4	3.39	2.2	-	-	2.29	-	-
Pot Cap-1 Maneuver	306	269	721	1273	-	-	1045	-	-
Stage 1	613	573	-	-	-	-	-	-	-
Stage 2	639	559	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	283	0	721	1273	-	-	1045	-	-
Mov Cap-2 Maneuver	387	0	-	-	-	-	-	-	-
Stage 1	568	0	-	-	-	-	-	-	-
Stage 2	639	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.9	0	1.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	SBL	SBT	SBR
Capacity (veh/h)	1273	-	-	387	721	1045	-	-
HCM Lane V/C Ratio	-	-	-	0.179	0.213	0.074	-	-
HCM Control Delay (s)	0	-	-	16.3	11.3	8.7	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.8	0.2	-	-

Diamond Interchange Capacity Utilization
4: CROWN VALLEY RD & I-10 EB OFF RAMP/I-10 EB ON RAMP

1/14/2015

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	WBL	WBT	WBR	NBL	NBT
Node	0	0	0	0	0	0	0	0	0	0	0	0
Lane Configurations												
Volume (vph)	60	5	95	245	80	65	210	50	5	200	95	210
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No		No					No		
Ideal Flow	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Space						13.8	13.8				13.8	13.8
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	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)												
Travel Time (s)	5.8		120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	60	100	0	325	0	65	210	0	55	200	95	210
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.86	0.85	0.96	0.85	0.95	1.00	0.95	0.95	0.85	0.95	1.00
Saturated Flow (vph)	1805	1629	0	1830	0	1805	1900	0	1814	1615	1805	1900
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00		0.00			0.00		0.00			0.00
Reference Time (s)	4.0	7.4	0.0	21.3	0.0	4.3	13.3	0.0	3.6	14.9	6.3	13.3
Adj Reference Time (s)	8.0	11.4	0.0	25.3	0.0	8.3	17.3	0.0	8.0	18.9	10.3	17.3
Volume per cycle, 90th	3.8					4.1	10.4	3.3			5.4	10.4
Volume to Storage	0.3					0.3	0.8	0.2			0.4	0.8
Isolated Timings (s)	45.0							36.5				

Timing Options		
Leading Option (s)		62.4
Lagging Option (s)	OK	45.0
Lead-Lag Option (s)	OK	45.0

Interchange Summary			
Intersection Capacity Utilization	37.5%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	SBT	SBR		
Node	0	0		
Lane Configurations				
Volume (vph)	225	170		
Pedestrians				
Ped Button				
Pedestrian Timing (s)				
Free Right		No		
Ideal Flow	1900	1900		
Storage Space				
Lost Time (s)	4.0	4.0		
Minimum Green (s)	4.0	4.0		
Refr Cycle Length (s)				
Travel Time (s)	120	120	120	120
Volume Combined (vph)	225	170		
Lane Utilization Factor	1.00	1.00		
Turning Factor (vph)	1.00	0.85		
Saturated Flow (vph)	1900	1615		
Ped Intf Time (s)	0.0	0.0		
Pedestrian Frequency (%)	0.00			
Reference Time (s)	14.2	12.6		
Adj Reference Time (s)	18.2	16.6		
Volume per cycle, 90th				
Volume to Storage				
Isolated Timings (s)				

Timing Options

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	60	5	95	0	0	0	0	245	80	65	210	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	-	-	-	140	-	-
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	65	65	65	65	65	65	65	65	65	65	65	65
Heavy Vehicles, %	15	0	10	0	0	0	0	5	10	10	5	0
Mvmt Flow	92	8	146	0	0	0	0	377	123	100	323	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	961	1023	323	323	0	0	500	0	0
Stage 1	523	523	-	-	-	-	-	-	-
Stage 2	438	500	-	-	-	-	-	-	-
Critical Hdwy	6.55	6.5	6.3	4.1	-	-	4.2	-	-
Critical Hdwy Stg 1	5.55	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.55	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.635	4	3.39	2.2	-	-	2.29	-	-
Pot Cap-1 Maneuver	269	238	700	1248	-	-	1024	-	-
Stage 1	569	534	-	-	-	-	-	-	-
Stage 2	624	546	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	243	0	700	1248	-	-	1024	-	-
Mov Cap-2 Maneuver	347	0	-	-	-	-	-	-	-
Stage 1	513	0	-	-	-	-	-	-	-
Stage 2	624	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.4	0	2.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	SBL	SBT	SBR
Capacity (veh/h)	1248	-	-	347	700	1024	-	-
HCM Lane V/C Ratio	-	-	-	0.266	0.22	0.098	-	-
HCM Control Delay (s)	0	-	-	19.1	11.6	8.9	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.1	0.8	0.3	-	-

Diamond Interchange Capacity Utilization
4: CROWN VALLEY RD & I-10 EB OFF RAMP/I-10 EB ON RAMP

1/14/2015

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	WBL	WBT	WBR	NBL	NBT
Node	0	0	0	0	0	0	0	0	0	0	0	0
Lane Configurations												
Volume (vph)	80	10	100	255	85	85	220	55	10	220	100	235
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No		No					No		
Ideal Flow	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Space						13.8	13.8				13.8	13.8
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	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)												
Travel Time (s)	5.8		120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	80	110	0	340	0	85	220	0	65	220	100	235
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.86	0.85	0.96	0.85	0.95	1.00	0.95	0.96	0.85	0.95	1.00
Saturated Flow (vph)	1805	1641	0	1829	0	1805	1900	0	1820	1615	1805	1900
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00		0.00			0.00		0.00			0.00
Reference Time (s)	5.3	8.0	0.0	22.3	0.0	5.7	13.9	0.0	4.3	16.3	6.6	14.8
Adj Reference Time (s)	9.3	12.0	0.0	26.3	0.0	9.7	17.9	0.0	8.3	20.3	10.6	18.8
Volume per cycle, 90th	4.8					5.0	10.8	3.6			5.7	11.4
Volume to Storage	0.3					0.4	0.8	0.3			0.4	0.8
Isolated Timings (s)	48.0							39.2				

Timing Options		
Leading Option (s)		66.9
Lagging Option (s)	OK	48.0
Lead-Lag Option (s)	OK	48.0

Interchange Summary			
Intersection Capacity Utilization	40.0%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	SBT	SBR		
Node	0	0		
Lane Configurations				
Volume (vph)	250	190		
Pedestrians				
Ped Button				
Pedestrian Timing (s)				
Free Right		No		
Ideal Flow	1900	1900		
Storage Space				
Lost Time (s)	4.0	4.0		
Minimum Green (s)	4.0	4.0		
Refr Cycle Length (s)				
Travel Time (s)	120	120	120	120
Volume Combined (vph)	250	190		
Lane Utilization Factor	1.00	1.00		
Turning Factor (vph)	1.00	0.85		
Saturated Flow (vph)	1900	1615		
Ped Intf Time (s)	0.0	0.0		
Pedestrian Frequency (%)	0.00			
Reference Time (s)	15.8	14.1		
Adj Reference Time (s)	19.8	18.1		
Volume per cycle, 90th				
Volume to Storage				
Isolated Timings (s)				

Timing Options

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	80	10	100	0	0	0	0	255	85	85	220	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	-	-	-	140	-	-
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	65	65	65	65	65	65	65	65	65	65	65	65
Heavy Vehicles, %	15	0	10	0	0	0	0	5	10	10	5	0
Mvmt Flow	123	15	154	0	0	0	0	392	131	131	338	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1058	1123	338	338	0	0	523	0	0
Stage 1	600	600	-	-	-	-	-	-	-
Stage 2	458	523	-	-	-	-	-	-	-
Critical Hdwy	6.55	6.5	6.3	4.1	-	-	4.2	-	-
Critical Hdwy Stg 1	5.55	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.55	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.635	4	3.39	2.2	-	-	2.29	-	-
Pot Cap-1 Maneuver	235	207	686	1232	-	-	1004	-	-
Stage 1	524	493	-	-	-	-	-	-	-
Stage 2	611	534	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	204	0	686	1232	-	-	1004	-	-
Mov Cap-2 Maneuver	306	0	-	-	-	-	-	-	-
Stage 1	456	0	-	-	-	-	-	-	-
Stage 2	611	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.3	0	2.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	SBL	SBT	SBR
Capacity (veh/h)	1232	-	-	306	686	1004	-	-
HCM Lane V/C Ratio	-	-	-	0.402	0.247	0.13	-	-
HCM Control Delay (s)	0	-	-	24.5	12	9.1	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.9	1	0.4	-	-

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SUBJECT	BY	DATE	JOB NO.	SHEET OF
TURN MOVEMENTS	TM	14-Jan-15	VV.150135.0000	1 OF 2

E/W STREET : SR 14 NB RAMPS

N/S STREET : CROWN VALLEY ROAD

CONDITION : PM PEAK HOUR

INTERSECTION : 4

PROJECTED GROWTH PER YEAR : 2.0%

TURN MOVEMENTS

CONDITION	EXISTING TRAFFIC	TRUCK PERCENTAGE	PROJECT TRIPS	EXISTING PLUS PROJECT TRAFFIC	AMBIENT GROWTH TRIPS	OTHER AREA PROJECT TRIPS	PROJECT CONDITION YEAR 2016 TRAFFIC
SCENARIO #:	2			4			6
SR 14 NB RAMPS							
EB LEFT	125	5%	15	140	5	10	155
EB THRU	5	0%	0	5	5	0	10
EB RIGHT	150	5%	0	150	5	0	155
WB LEFT	0	0%	0	0	0	0	0
WB THRU	0	0%	0	0	0	0	0
WB RIGHT	0	0%	0	0	0	0	0
CROWN VALLEY ROAD							
NB LEFT	0	0%	0	0	0	0	0
NB THRU	170	5%	15	185	5	5	195
NB RIGHT	125	5%	0	125	5	0	130
SB LEFT	100	5%	15	115	5	10	130
SB THRU	170	5%	15	185	5	5	195
SB RIGHT	0	0%	0	0	0	0	0
TOTALS	**845**	**0.3**	**60**	**905**	**35**	**30**	**970**

Tustin Office: 714.665.4500 Tel/ 714.665.4501 Fax

Santa Clarita Office: 661.284.7400 Tel/ 661.284.7401 Fax

Victorville Office: 760.524.9100 Tel/ 760.524.9101 Fax

Temecula Office: 951.294.9300 Tel/ 951.294.9301 Fax

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SUBJECT	BY	DATE	JOB NO.	SHEET	OF
TURN VOLUME SUMMARY	TM	1/14/2015	VV.150135.0000	2	OF 2

E/W STREET : SR 14 NB RAMPS

CONDITION : PM PEAK HOUR

N/S STREET : CROWN VALLEY ROAD

PHF : 0.93

NORTH LEG								
LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	2	0	0	0	1	0	0	0
0	0	0	0	0	2	0	0	0
0	0	0	0	0	0	0	0	0
0	1	0	0	1	0	0	0	0

SOUTH LEG								
LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	3	0	0	0	0	1	0	0
1	0	0	0	1	0	1	0	0
2	0	0	0	1	0	1	1	0
1	4	0	0	1	0	0	0	0

EAST LEG								
LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0

WEST LEG								
LARGE 2 AXLE			LARGE 3 AXLE			LARGE 4(+) AXLE		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	0	0	0	0	0	0	0	0
1	0	0	0	0	1	0	0	0
0	0	1	0	0	0	0	0	1
0	0	0	0	0	0	0	0	1

NORTH LEG			SOUTH LEG			EAST LEG			WEST LEG		
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT
0	41	24	31	41	0	0	0	0	30	0	40
0	50	22	35	43	0	0	0	0	47	2	21
0	37	19	25	37	0	0	0	0	43	1	26
0	40	30	25	39	0	0	0	0	28	3	34

	TRUCK TOTAL	AUTO VOLUMES	TOTALS	ROUNDED TOTALS	TRUCK PERCENTAGE
SR 14 NB RAMPS					
EB LEFT	4	121	**125**	**125**	**5%**
EB THRU	0	6	**6**	**5**	**0%**
EB RIGHT	1	148	**149**	**150**	**5%**
WB LEFT	0	0	**0**	**0**	**0%**
WB THRU	0	0	**0**	**0**	**0%**
WB RIGHT	0	0	**0**	**0**	**0%**
CROWN VALLEY ROAD					
NB LEFT	0	0	**0**	**0**	**0%**
NB THRU	11	160	**171**	**170**	**5%**
NB RIGHT	7	116	**123**	**125**	**5%**
SB LEFT	3	95	**98**	**100**	**5%**
SB THRU	4	168	**172**	**170**	**5%**
SB RIGHT	0	0	**0**	**0**	**0%**

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INTERSECTION TURN COUNT

PEAK HOUR

NORTH-SOUTH STREET: CROWN VALLEY
EAST-WEST STREET: I-14 NB(EB)
JURISDICTION: ACTON

DATE: 01-06-15

PEAK HOUR: 04:15PM

NORTH LEG

TOTAL: 270

	Rt	Thru	Lt	
Total		172	98	
1st		43	25	
2nd		50	24	
3rd		37	19	
4th		42	30	

EAST LEG TOTAL: 0

	1st	2nd	3rd	4th	Total
Rt					
Thru					
Lt					

	Total	1st	2nd	3rd	4th
Lt	125	40	22	27	36
Thru	6	0	2	1	3
Rt	149	30	48	43	28

WEST LEG TOTAL: 280

PEAK HOUR FACTORS

NORTH LEG = 0.91
SOUTH LEG = 0.91
EAST LEG =
WEST LEG = 0.97

ALL LEGS = 0.93

	Lt	Thru	Rt
1st		44	32
2nd		44	37
3rd		39	28
4th		44	26
Total		171	123

TOTAL: 294

SOUTH LEG

HOUR TOTAL: 844

Prepared by NEWPORT TRAFFIC STUDIES

SANBAG CLASSIFICATION SUMMARY

NORTH-SOUTH STREET : CROWN VALLEY ACTON

EAST-WEST STREET : I-14 NB(EB) 01-06-15

BEGINNING TIME : 04:00PM

AUTOS			LARGE 2 AXLE			3 AXLE			4(+) AXLE			TOTALS
RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	RT	THRU	LT	
						NORTH LEG						
0	27	27	0	1	1	0	0	0	0	0	1	57
0	41	24	0	2	0	0	0	1	0	0	0	68
0	50	22	0	0	0	0	0	2	0	0	0	74
0	37	19	0	0	0	0	0	0	0	0	0	56
0	40	30	0	1	0	0	1	0	0	0	0	72
0	33	26	0	1	0	0	1	0	0	0	0	61
0	40	25	0	0	0	0	1	1	0	0	0	67
0	34	20	0	1	2	0	1	0	0	0	0	58
0	302	193	0	6	3	0	4	4	0	0	1	513
						SOUTH LEG						
23	42	0	0	0	0	0	1	0	1	0	0	67
31	41	0	0	3	0	0	0	0	1	0	0	76
35	43	0	1	0	0	0	1	0	1	0	0	81
25	37	0	2	0	0	0	1	0	1	1	0	67
25	39	0	1	4	0	0	1	0	0	0	0	70
22	39	0	0	1	0	0	0	0	0	0	0	62
18	31	0	0	0	0	2	0	0	0	1	0	52
16	31	0	0	1	0	0	0	0	1	0	0	49
195	303	0	4	9	0	2	4	0	5	2	0	524
						EAST LEG						
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
						WEST LEG						
36	1	30	0	0	1	1	0	0	0	0	1	70
30	0	40	0	0	0	0	0	0	0	0	0	70
47	2	21	1	0	0	0	0	1	0	0	0	72
43	1	26	0	0	0	0	0	0	0	0	1	71
28	3	34	0	0	1	0	0	0	0	0	1	67
21	1	33	0	0	0	0	0	0	0	0	0	55
30	0	17	1	0	0	0	0	1	0	0	2	51
34	1	34	0	0	0	0	0	1	0	0	1	71
269	9	235	2	0	2	1	0	3	0	0	6	527

Prepared by Newport Traffic Studies

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CROWN VALLEY

EAST-WEST STREET: I-14 NB(EB)

TIME: 04:00PM-05:00PM DATE: 01-06-15

NORTH LEG

	Rt	Thru	Lt	
		158	97	Total
		28	29	1st
		43	25	2nd
		50	24	3rd
		37	19	4th

	1st	2nd	3rd	4th	Total
Rt					
Thru					
Lt					

Total	1st	2nd	3rd	4th	
121	32	40	22	27	Lt
4	1	0	2	1	Thru
158	37	30	48	43	Rt

	Lt	Thru	Rt
1st		43	24
2nd		44	32
3rd		44	37
4th		39	28
Total		170	121

Prepared by NEWPORT TRAFFIC STUDIES

INTERSECTION TURNING COUNT

NORTH-SOUTH STREET: CROWN VALLEY

EAST-WEST STREET: I-14 NB(EB)

TIME: 05:00PM-06:00PM DATE: 01-06-15

NORTH LEG

	Rt	Thru	Lt	
Total		154	104	
1st		42	30	
2nd		35	26	
3rd		41	26	
4th		36	22	

	1st	2nd	3rd	4th	Total
Rt					
Thru					
Lt					

Total	1st	2nd	3rd	4th	
125	36	33	20	36	Lt
5	3	1	0	1	Thru
114	28	21	31	34	Rt

	Lt	Thru	Rt
1st		44	26
2nd		40	22
3rd		32	20
4th		32	17
Total		148	85

Prepared by NEWPORT TRAFFIC STUDIES

Diamond Interchange Capacity Utilization
4: CROWN VALLEY RD & I-10 EB OFF RAMP/I-10 EB ON RAMP

1/14/2015

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	WBL	WBT	WBR	NBL	NBT
Node	0	0	0	0	0	0	0	0	0	0	0	0
Lane Configurations												
Volume (vph)	125	5	150	170	125	100	170	55	5	135	50	235
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No		No					No		
Ideal Flow	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Space						13.8	13.8				13.8	13.8
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	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)												
Travel Time (s)	5.8		120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	125	155	0	295	0	100	170	0	60	135	50	235
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.85	0.85	0.94	0.85	0.95	1.00	0.95	0.95	0.85	0.95	1.00
Saturated Flow (vph)	1805	1624	0	1779	0	1805	1900	0	1813	1615	1805	1900
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00		0.00			0.00		0.00			0.00
Reference Time (s)	8.3	11.5	0.0	19.9	0.0	6.6	10.7	0.0	4.0	10.0	3.3	14.8
Adj Reference Time (s)	12.3	15.5	0.0	23.9	0.0	10.6	14.7	0.0	8.0	14.0	8.0	18.8
Volume per cycle, 90th	6.8					5.7	8.7	3.6			3.3	11.4
Volume to Storage	0.5					0.4	0.6	0.3			0.2	0.8
Isolated Timings (s)	50.0							33.9				

Timing Options		
Leading Option (s)		59.7
Lagging Option (s)	OK	50.0
Lead-Lag Option (s)	OK	50.0

Interchange Summary			
Intersection Capacity Utilization	41.7%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	SBT	SBR		
Node	0	0		
Lane Configurations				
Volume (vph)	220	95		
Pedestrians				
Ped Button				
Pedestrian Timing (s)				
Free Right		No		
Ideal Flow	1900	1900		
Storage Space				
Lost Time (s)	4.0	4.0		
Minimum Green (s)	4.0	4.0		
Refr Cycle Length (s)				
Travel Time (s)	120	120	120	120
Volume Combined (vph)	220	95		
Lane Utilization Factor	1.00	1.00		
Turning Factor (vph)	1.00	0.85		
Saturated Flow (vph)	1900	1615		
Ped Intf Time (s)	0.0	0.0		
Pedestrian Frequency (%)	0.00			
Reference Time (s)	13.9	7.1		
Adj Reference Time (s)	17.9	11.1		
Volume per cycle, 90th				
Volume to Storage				
Isolated Timings (s)				

Timing Options

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	125	5	150	0	0	0	0	170	125	100	170	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	-	-	-	140	-	-
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	5	0	5	0	0	0	0	5	5	5	5	0
Mvmt Flow	134	5	161	0	0	0	0	183	134	108	183	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	648	715	183	183	0	0	317	0	0
Stage 1	398	398	-	-	-	-	-	-	-
Stage 2	250	317	-	-	-	-	-	-	-
Critical Hdwy	6.45	6.5	6.25	4.1	-	-	4.15	-	-
Critical Hdwy Stg 1	5.45	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.45	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4	3.345	2.2	-	-	2.245	-	-
Pot Cap-1 Maneuver	430	359	852	1404	-	-	1226	-	-
Stage 1	672	606	-	-	-	-	-	-	-
Stage 2	785	658	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	392	0	852	1404	-	-	1226	-	-
Mov Cap-2 Maneuver	471	0	-	-	-	-	-	-	-
Stage 1	613	0	-	-	-	-	-	-	-
Stage 2	785	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.7	0	3
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	SBL	SBT	SBR
Capacity (veh/h)	1404	-	-	471	852	1226	-	-
HCM Lane V/C Ratio	-	-	-	0.285	0.196	0.088	-	-
HCM Control Delay (s)	0	-	-	15.7	10.3	8.2	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.2	0.7	0.3	-	-

Diamond Interchange Capacity Utilization
4: CROWN VALLEY RD & I-10 EB OFF RAMP/I-10 EB ON RAMP

1/14/2015

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	WBL	WBT	WBR	NBL	NBT
Node	0	0	0	0	0	0	0	0	0	0	0	0
Lane Configurations												
Volume (vph)	140	5	150	185	125	115	185	55	5	150	50	260
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No		No					No		
Ideal Flow	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Space						13.8	13.8				13.8	13.8
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	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)												
Travel Time (s)	5.8		120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	140	155	0	310	0	115	185	0	60	150	50	260
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.85	0.85	0.94	0.85	0.95	1.00	0.95	0.95	0.85	0.95	1.00
Saturated Flow (vph)	1805	1624	0	1785	0	1805	1900	0	1813	1615	1805	1900
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00		0.00			0.00		0.00			0.00
Reference Time (s)	9.3	11.5	0.0	20.8	0.0	7.6	11.7	0.0	4.0	11.1	3.3	16.4
Adj Reference Time (s)	13.3	15.5	0.0	24.8	0.0	11.6	15.7	0.0	8.0	15.1	8.0	20.4
Volume per cycle, 90th	7.4					6.3	9.3	3.6			3.3	12.4
Volume to Storage	0.5					0.5	0.7	0.3			0.2	0.9
Isolated Timings (s)	51.9							35.6				

Timing Options		
Leading Option (s)		63.3
Lagging Option (s)	OK	51.9
Lead-Lag Option (s)	OK	51.9

Interchange Summary			
Intersection Capacity Utilization	43.3%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	SBT	SBR		
Node	0	0		
Lane Configurations				
Volume (vph)	245	110		
Pedestrians				
Ped Button				
Pedestrian Timing (s)				
Free Right		No		
Ideal Flow	1900	1900		
Storage Space				
Lost Time (s)	4.0	4.0		
Minimum Green (s)	4.0	4.0		
Refr Cycle Length (s)				
Travel Time (s)	120	120	120	120
Volume Combined (vph)	245	110		
Lane Utilization Factor	1.00	1.00		
Turning Factor (vph)	1.00	0.85		
Saturated Flow (vph)	1900	1615		
Ped Intf Time (s)	0.0	0.0		
Pedestrian Frequency (%)	0.00			
Reference Time (s)	15.5	8.2		
Adj Reference Time (s)	19.5	12.2		
Volume per cycle, 90th				
Volume to Storage				
Isolated Timings (s)				

Timing Options

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	140	5	150	0	0	0	0	185	125	115	185	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	-	-	-	140	-	-
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	5	0	5	0	0	0	0	5	5	5	5	0
Mvmt Flow	151	5	161	0	0	0	0	199	134	124	199	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	712	779	199	199	0	0	333	0	0
Stage 1	446	446	-	-	-	-	-	-	-
Stage 2	266	333	-	-	-	-	-	-	-
Critical Hdwy	6.45	6.5	6.25	4.1	-	-	4.15	-	-
Critical Hdwy Stg 1	5.45	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.45	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4	3.345	2.2	-	-	2.245	-	-
Pot Cap-1 Maneuver	395	330	834	1385	-	-	1210	-	-
Stage 1	639	577	-	-	-	-	-	-	-
Stage 2	772	647	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	355	0	834	1385	-	-	1210	-	-
Mov Cap-2 Maneuver	438	0	-	-	-	-	-	-	-
Stage 1	574	0	-	-	-	-	-	-	-
Stage 2	772	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.8	0	3.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	SBL	SBT	SBR
Capacity (veh/h)	1385	-	-	438	834	1210	-	-
HCM Lane V/C Ratio	-	-	-	0.344	0.2	0.102	-	-
HCM Control Delay (s)	0	-	-	17.5	10.4	8.3	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.5	0.7	0.3	-	-

Diamond Interchange Capacity Utilization
4: CROWN VALLEY RD & I-10 EB OFF RAMP/I-10 EB ON RAMP

1/14/2015

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	WBL	WBT	WBR	NBL	NBT
Node	0	0	0	0	0	0	0	0	0	0	0	0
Lane Configurations												
Volume (vph)	155	10	155	195	130	130	195	60	10	165	55	280
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No		No					No		
Ideal Flow	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Space						13.8	13.8				13.8	13.8
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	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)												
Travel Time (s)	5.8		120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	155	165	0	325	0	130	195	0	70	165	55	280
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.86	0.85	0.94	0.85	0.95	1.00	0.95	0.96	0.85	0.95	1.00
Saturated Flow (vph)	1805	1632	0	1786	0	1805	1900	0	1819	1615	1805	1900
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00		0.00			0.00		0.00			0.00
Reference Time (s)	10.3	12.1	0.0	21.8	0.0	8.6	12.3	0.0	4.6	12.3	3.7	17.7
Adj Reference Time (s)	14.3	16.1	0.0	25.8	0.0	12.6	16.3	0.0	8.6	16.3	8.0	21.7
Volume per cycle, 90th	8.1					7.0	9.8	3.8			3.6	13.2
Volume to Storage	0.6					0.5	0.7	0.3			0.3	1.0
Isolated Timings (s)	54.6							37.9				

Timing Options		
Leading Option (s)		67.4
Lagging Option (s)	OK	54.6
Lead-Lag Option (s)	OK	54.6

Interchange Summary			
Intersection Capacity Utilization	45.5%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	SBT	SBR		
Node	0	0		
Lane Configurations				
Volume (vph)	265	125		
Pedestrians				
Ped Button				
Pedestrian Timing (s)				
Free Right		No		
Ideal Flow	1900	1900		
Storage Space				
Lost Time (s)	4.0	4.0		
Minimum Green (s)	4.0	4.0		
Refr Cycle Length (s)				
Travel Time (s)	120	120	120	120
Volume Combined (vph)	265	125		
Lane Utilization Factor	1.00	1.00		
Turning Factor (vph)	1.00	0.85		
Saturated Flow (vph)	1900	1615		
Ped Intf Time (s)	0.0	0.0		
Pedestrian Frequency (%)	0.00			
Reference Time (s)	16.7	9.3		
Adj Reference Time (s)	20.7	13.3		
Volume per cycle, 90th				
Volume to Storage				
Isolated Timings (s)				

Timing Options

Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	155	10	155	0	0	0	0	195	130	130	195	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	-	-	-	140	-	-
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	5	0	5	0	0	0	0	5	5	5	5	0
Mvmt Flow	167	11	167	0	0	0	0	210	140	140	210	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	769	838	210	210	0	0	349	0	0
Stage 1	489	489	-	-	-	-	-	-	-
Stage 2	280	349	-	-	-	-	-	-	-
Critical Hdwy	6.45	6.5	6.25	4.1	-	-	4.15	-	-
Critical Hdwy Stg 1	5.45	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.45	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4	3.345	2.2	-	-	2.245	-	-
Pot Cap-1 Maneuver	365	305	823	1373	-	-	1193	-	-
Stage 1	610	553	-	-	-	-	-	-	-
Stage 2	760	637	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	322	0	823	1373	-	-	1193	-	-
Mov Cap-2 Maneuver	408	0	-	-	-	-	-	-	-
Stage 1	538	0	-	-	-	-	-	-	-
Stage 2	760	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.1	0	3.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	SBL	SBT	SBR
Capacity (veh/h)	1373	-	-	408	823	1193	-	-
HCM Lane V/C Ratio	-	-	-	0.408	0.216	0.117	-	-
HCM Control Delay (s)	0	-	-	19.8	10.6	8.4	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.9	0.8	0.4	-	-