Final Report

US 101/Palo Comado Canyon Road PA/ED

Traffic Impact Analysis

Kimley-Horn
and Associates, Inc.

FINAL REPORT
TRAFFIC IMPACT ANALYSIS

US 101/Palo Comado Canyon Road PA/ED

Prepared for:

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May 2011
099083012

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Kimley-Horn and Associates, Inc.

PALO COMADO INTERCHANGE PA/ED – TRAFFIC STUDY

The information presented herein comprises a Project Approval and Environmental Document (PA&ED) Traffic Study to identify improvements of the US 101/Palo Comado Canyon Road interchange in the City of Agoura Hills, California. The scope and methodology for this traffic analysis was defined in coordination with and approved by the City of Agoura Hills and California Department of Transportation (Caltrans).

1. Project Description

Palo Comado Canyon Road is a two lane north-south collector street located at the easterly City limits and provides access to the residential neighborhoods and schools to the north and the US 101 freeway and Agoura Road to the south. Palo Comado Canyon Road has seen significant increase in traffic levels due to the increased development in the area. The recent General Plan Update (2010) has identified Palo Comado Canyon Road and the intersections in the vicinity of US 101 freeway as deficient under existing as well as future forecast conditions.

This traffic study was completed to evaluate the current and future traffic operations and identify the specific improvements to the US 101 Freeway interchange (US 101 Northbound Ramps) with Palo Comado Canyon Road in the City of Agoura Hills.

The following five intersections were analyzed for existing (2010), opening year (2015), and forecast year (2035) as part of this analysis as identified in the approved methodology:

1. Canwood Street/ Chesebro Road at Driver Avenue/ Palo Comado Canyon Road;
2. Palo Comado Canyon Road at US-101 northbound ramps;
3. Chesebro Road and US-101 southbound ramps at Dorothy Drive;
4. Chesebro Road and Palo Comado Canyon Road at Chesebro Road; and
5. Chesebro Road at Agoura Road

Roadway segment analyses were also completed for Palo Comado Canyon Road. Based upon the definitions provided in the Highway Capacity Manual (HCM), Palo Comado Canyon Road is considered to be a Class II suburban minor arterial. Freeway mainline and ramp merge/diverge areas analyses were also completed for the on- and off-ramps, as well as the US-101 freeway segment in the vicinity of Palo Comado Canyon interchange.

2. Study Methodology

Weekday AM and PM peak period Level of Service (LOS) analyses were completed for the following scenarios based upon the methodology that was approved by City of Agoura Hills as well as Caltrans staff:

1. Existing (2010) Conditions
2. Opening Year (2015) Conditions
3. Opening Year (2015) Conditions with Improvements
4. Build-out Year (2035) Conditions
5. Build-out Year (2035) Conditions with Improvements

Level of Service Analysis Criteria

Consistent with the *2000 Highway Capacity Manual (HCM)*, HCM methodology was used to calculate the LOS for the study facilities. The HCM methodology uses delay (seconds/vehicle) values to determine level of service (LOS) for intersections, service volumes (vph) for arterials, and density (passenger cars/mile/lane) for ramps and freeway segments. The delay ranges and corresponding LOS for both signalized and unsignalized intersections are provided in **Table 1**. The service volume thresholds and correlated LOS for Class II arterials are provided in **Table 2**. The maximum density (passenger cars/mile/lane) and corresponding LOS for ramps and freeway segments are provided in **Table 3**.

Table 1: Level of Service Criteria for Intersections

Unsignalized Intersection Delay (sec/veh)	Signalized Intersection Delay (sec/veh)	Level of Service (LOS)
≤10.0	≤10.0	A
>10.0 and ≤15.0	>10.0 and ≤20.0	B
>15.0 and ≤25.0	>20.0 and ≤35.0	C
>25.0 and ≤35.0	>35.0 and ≤55.0	D
>35.0 and ≤50.0	>55.0 and ≤80.0	E
>50.0	>80.0	F

Source: 2000 Highway Capacity Manual

Table 2: Level of Service Criteria for Class II Arterials

Lanes	Service Volumes (veh/h)		
	LOS C	LOS D	LOS E
1	670	850	890
2	1470	1700	1780

Source: 2000 Highway Capacity Manual

Table 3: Level of Service Criteria for Ramps and Freeway Segments

Ramps Maximum Density (pc/mi/ln)	Freeway Segments Maximum Density (pc/mi/ln)*	Level of Service (LOS)
10	11	A
20	18	B
28	26	C
35	35	D
>35	45	E
Exceed HCM Exhibit 25-4 Limits	>45	F

Source: 2000 Highway Capacity Manual
* passenger cars / mile / lane

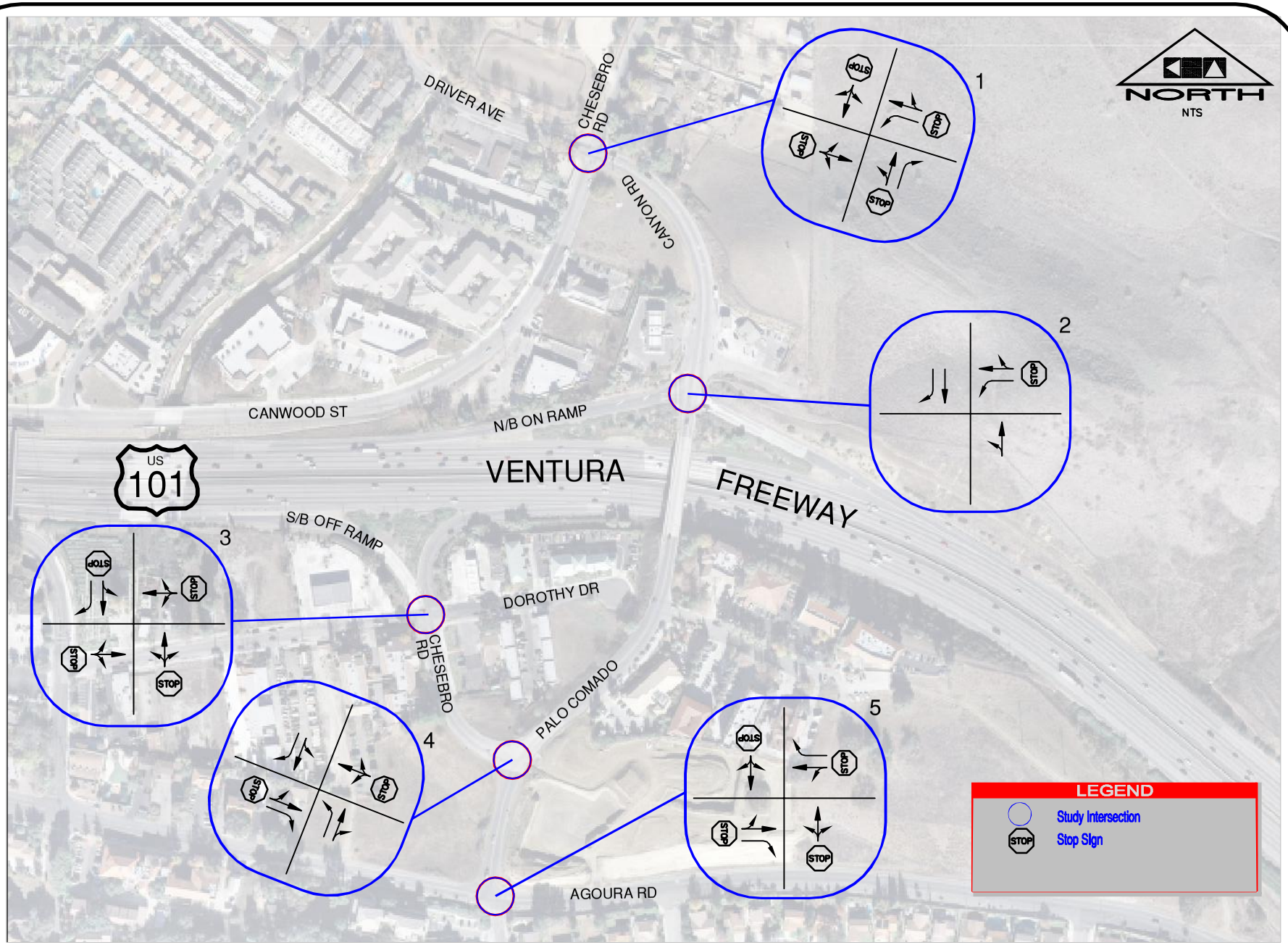
3. Existing (2010) Conditions

Weekday AM and PM peak period intersection turning movement counts, average daily traffic (ADT), and vehicle classification counts were collected in November 2009 and May 2010, for the purpose of this analysis. The traffic count datasheets are attached in **Appendix A**. **Figure 1** illustrates the existing lane configuration and traffic control for each study intersection. **Figure 2** illustrates the existing weekday peak hour traffic volumes at the study intersections, peak hour traffic volumes and ADT on Palo Comado Canyon Road, peak hour traffic volumes and ADT on the freeway ramps, and peak hour traffic volumes and ADT on US-101 (freeway mainline data was obtained from *2008 Traffic Volumes on California State Highways,* Caltrans 2008). **Table 4** presents the intersection controls for each study intersection and the existing (2010) peak-hour intersection operating conditions. The freeway, ramp, and arterial analyses for existing, opening year, and build-out year conditions are presented in Sections 9 and 10 of this report.

Table 4: Intersection LOS Summary for Existing (2010) Conditions

No.	Intersection	Intersection Control	Existing			
			AM		PM	
			Delay*	LOS	Delay*	LOS
1	Driver @ Chesebro	All-way Stop	50.9	F	36.5	E
2	Palo Comado @101 NB Ramps	Two-way stop (stop sign on ramp)	33.3	D	37.6	E
3	Dorothy Dr @ 101 SB Ramps	All-way stop	19.1	C	12.6	B
4	Palo Comado @Chesebro	Two-way stop (stop signs on Chesebro)	17.6	C	19.0	C
5	Agoura @ Chesebro	All-way Stop	9.1	A	11.5	B

*Delay refers to the average delay for the entire intersection. At a two-way stop, delay refers to the worst approach delay.



PALO COMADO INTERCHANGE PA&ED
LANE CONFIGURATION AND TRAFFIC CONTROL

FIGURE 1

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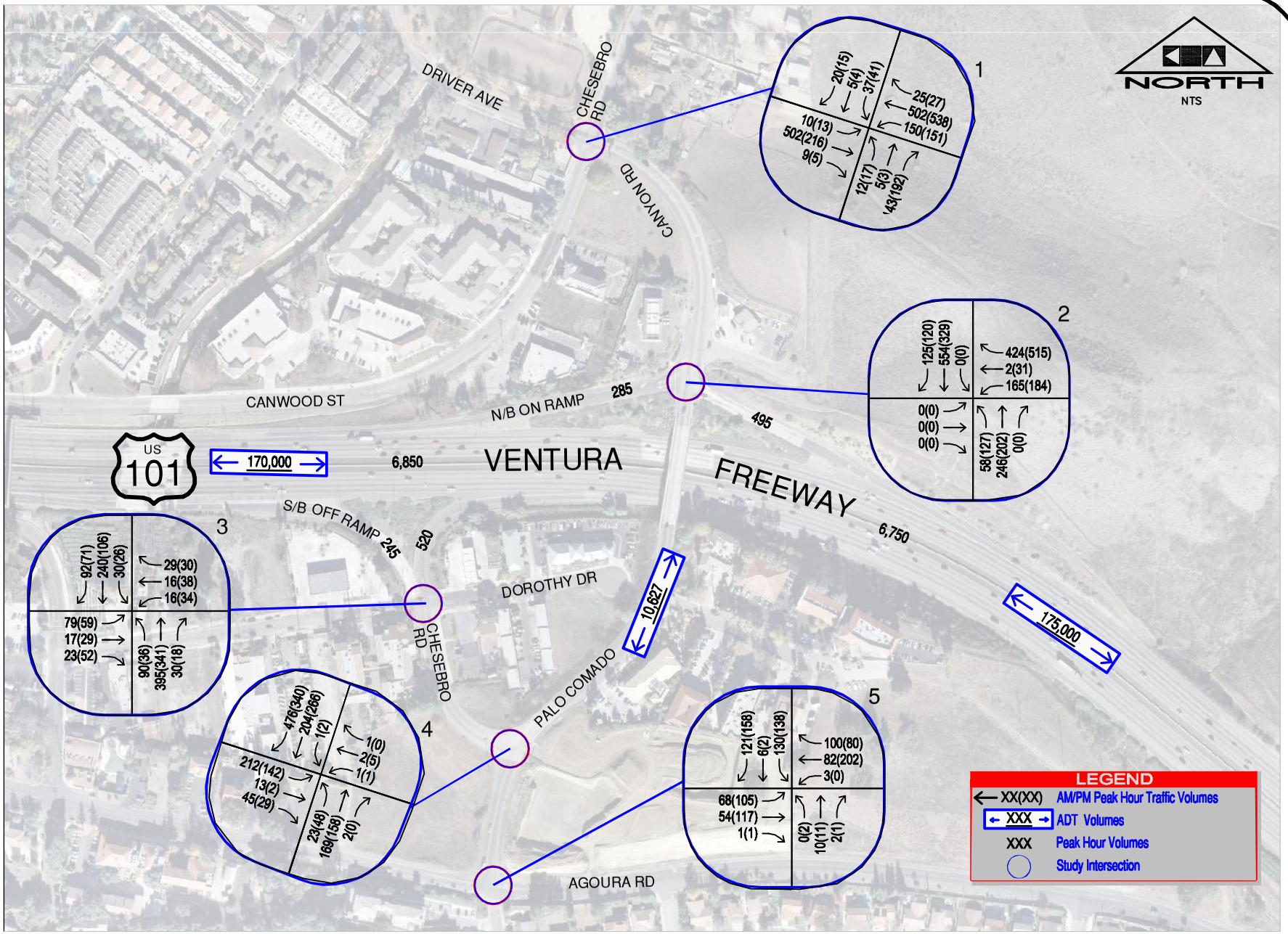

PALO COMADO INTERCHANGE PA&ED
EXISTING (2010) CONDITIONS

FIGURE 2

May 24, 2012 – 6:15pm – USER rafael.chavez
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Table 4 indicates that all study intersections currently operate at LOS C or better in both the AM and PM peak periods with the exception of Driver Avenue at Chesebro Road and Palo Comado Canyon Road at US 101 NB Ramps that operate at LOS D, E, or F in both the AM and PM peak hours. The technical worksheets are attached in **Appendix B**.

4. Opening Year (2015) Conditions without Improvements – No Build

This scenario analyzed the expected opening year of the Palo Comado interchange, projected for the Year 2015. Existing traffic is expected to increase between years 2010 and 2015 as a result of general area wide and regional growth and development. Based on a review of the growth projections from the Southern California Association of Governments (SCAG) regional transportation demand forecasting model (TDFM), the average annual growth rate in the Agoura Hills sub-area over the duration of this analysis is estimated to be approximately 0.75% per year. These SCAG future traffic forecasts include the effects of specific projects, called cumulative or related projects.

Figure 3 illustrates the weekday peak hour traffic volumes at the study intersections, peak hour traffic volume and ADT on Palo Comado Canyon Road, peak hour traffic volume and ADT on the on and off ramps, and peak hour traffic volumes and ADT on US 101 for the year 2015. **Table 5** presents the Opening Year (2015) peak-hour intersection operating conditions.

Table 5: Intersection LOS Summary for Opening Year (2015) Conditions without Improvements

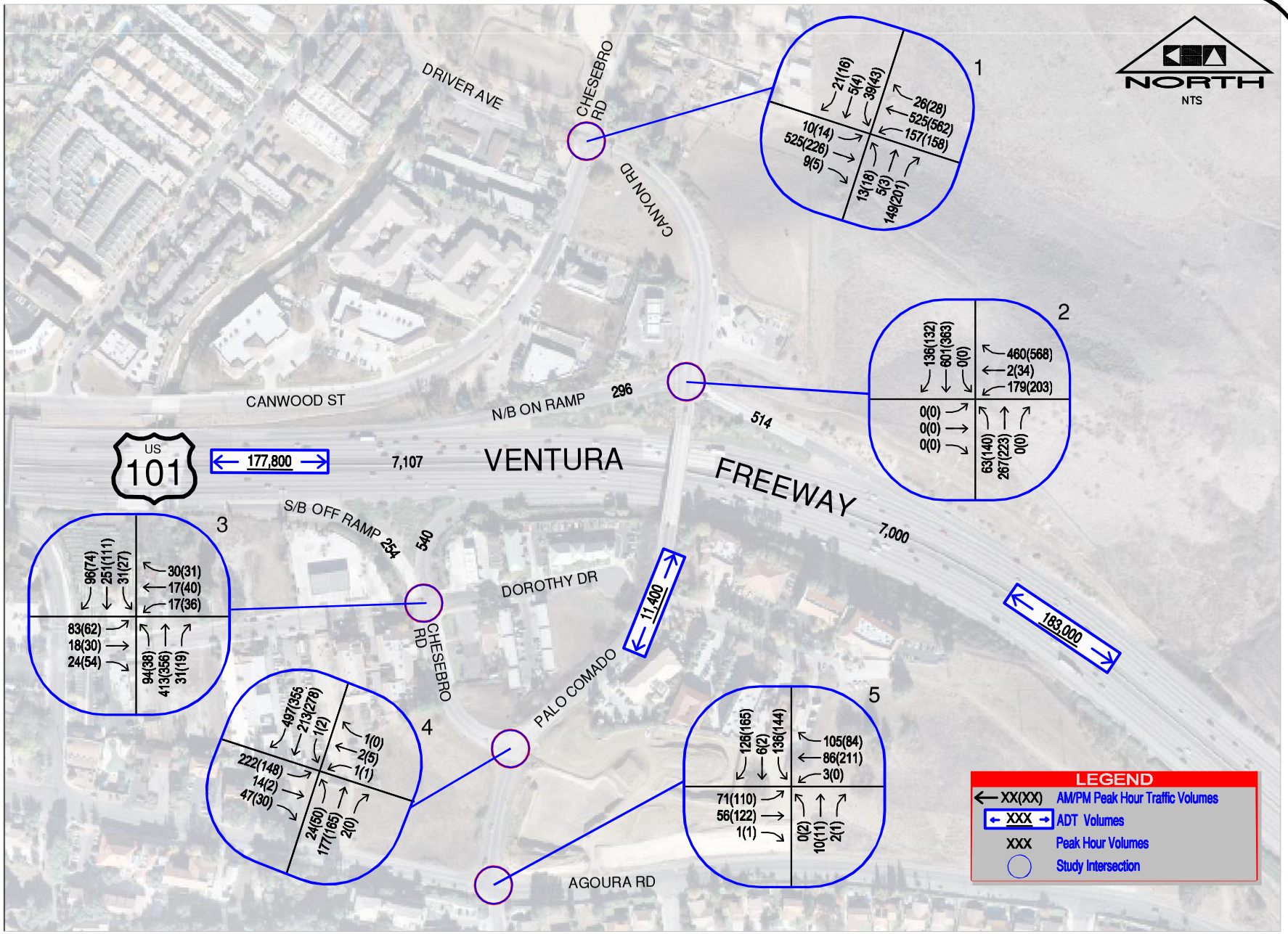
No.	Intersection	Intersection Control	2015 Baseline			
			AM		PM	
			Delay*	LOS	Delay*	LOS
1	Driver @ Chesebro	All-way Stop	61.2	F	44.9	E
2	Palo Comado @101 NB Ramps	One-way stop (stop sign on Off-Ramp)	52.3	F	69.1	F
3	Dorothy Dr @ 101 SB Ramps	All-way stop	22.1	C	13.4	B
4	Palo Comado @Chesebro	Two-way stop (stop signs on Chesebro)	19.0	C	19.8	C
5	Agoura @ Chesebro	All-way Stop	9.3	A	12.0	B

*Delay refers to the average delay for the entire intersection. At a two-way stop, delay refers to the worst approach delay.

Table 5 indicates that all study intersections would continue to operate at an LOS C or better in both the AM and PM peak period with the exception of Driver Avenue at Chesebro Road and Palo Comado Canyon Road at US 101 NB Ramps that operate at LOS F in both the AM and PM peak hours. The technical worksheets are attached to the end of this report in **Appendix C**.

5. Opening Year (2015) Conditions with Improvements – Build

Based upon the analysis presented in the previous section, improvements were identified to the Palo Comado Canyon Road interchange to improve the LOS for the opening year (2015) conditions. No improvements were identified at the other study intersections as part of this project. The Palo Comado Canyon Road interchange improvements include widening the overpass to four lanes,



PALO COMADO INTERCHANGE PA&ED
FUTURE (2015) CONDITIONS

FIGURE 3

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installation of a traffic signal, adding turn lanes to the northbound off-ramp (one left turn lane, a shared left-through lane, and a right turn lane), and improving the southbound approach to one though lane and one shared through-right lane. The improvements are illustrated in **Figure 4**. The results of the analysis with delay in seconds are presented in **Table 6**.

Table 6: Intersection LOS Summary for Opening Year (2015) Conditions with Improvements

No.	Intersection	Intersection Control	2015 With Improvements			
			AM		PM	
			Delay*	LOS	Delay*	LOS
1	Driver @ Chesebro	All-way Stop	61.2	F	44.9	E
2	Palo Comado @101 NB Ramps	Traffic Signal	7.6	A	8.0	A
3	Dorothy Dr @ 101 SB Ramps	All-way stop	22.1	C	13.4	B
4	Palo Comado @Chesebro	Two-way stop (stop signs on Chesebro)	19.0	C	19.8	C
5	Agoura @ Chesebro	All-way Stop	9.3	A	12.0	B

*Delay refers to the average delay for the entire intersection. At a two-way stop, delay refers to the worst approach delay. Delay values for intersections that are not subject to improvements were obtained from 'without improvements' conditions.

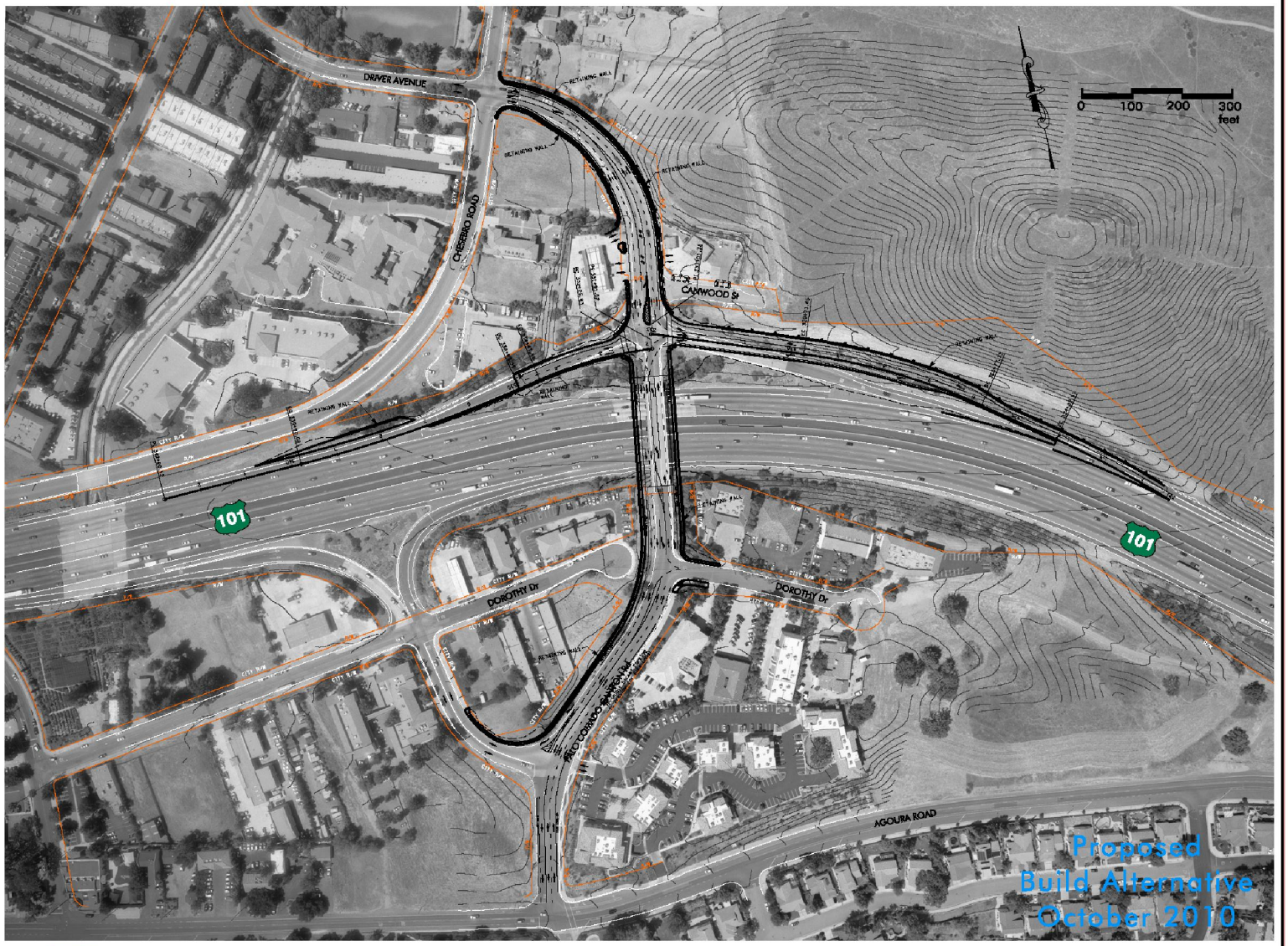
Table 6 indicates that the proposed improvements would improve the LOS at the intersection of Palo Camado Canyon Road at 101 NB Ramps from LOS F to LOS A for both the AM and PM peak period. The remaining intersections would continue to operate at LOS C or better during both AM and PM peak periods with the exception of Driver Avenue and Chesebro Road which continues to operate at LOS F in the AM peak period and LOS E in the PM peak period. The technical worksheets are attached in **Appendix C**.

6. Build-out Year (2035) Conditions without Improvements – No Build

This scenario analyzed the build-out year conditions of the Palo Comado interchange, projected for the Year 2035. As previously discussed, existing traffic is expected to increase between years 2010 and 2035 as a result of general area wide and regional growth and development. A growth rate of 0.75% per year was used to forecast the year 2035 traffic volumes. These future traffic forecasts include the effects of cumulative or related projects, expected to be implemented in the vicinity of the project in the City.

Figure 5 illustrates the weekday peak hour traffic volumes at the study intersections, peak hour traffic volume and ADT on Palo Comado Canyon Road, peak hour traffic volume and ADT on the on and off ramps, and peak hour traffic volumes and ADT on the US 101 for the year 2035. **Table 7** presents the Build-out Year (2035) peak-hour intersection operating conditions.

CITY OF AGOURA HILLS



PALO COMADO INTERCHANGE PA&ED
PROPOSED IMPROVEMENTS

FIGURE 4

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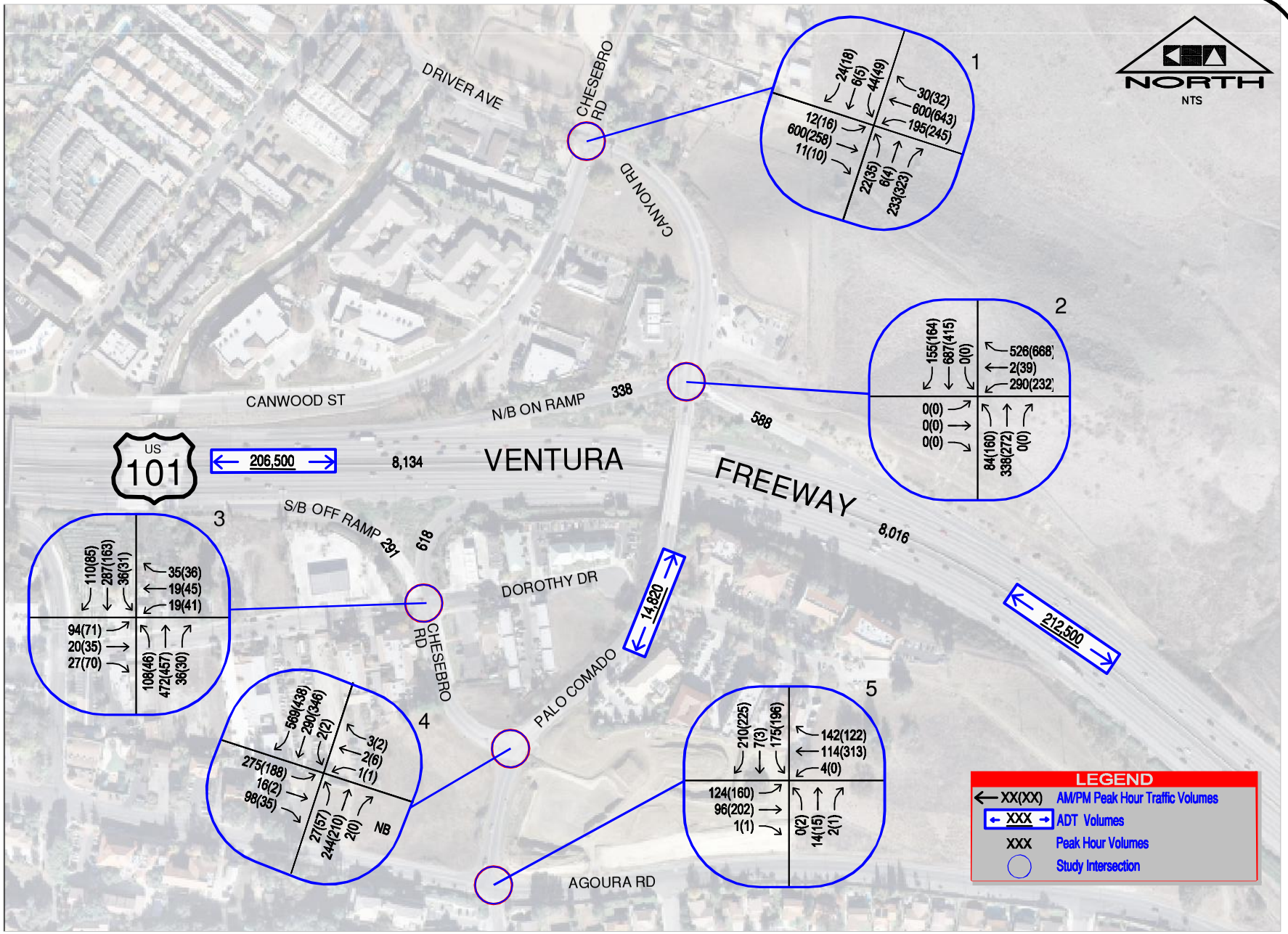

PALO COMADO INTERCHANGE PA&ED
FUTURE (2035) CONDITIONS

FIGURE 5

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Table 7: Intersection LOS Summary for Buildout Year (2035) Conditions without Improvements

No.	Intersection	Intersection Control	2035 Baseline			
			AM		PM	
			Delay*	LOS	Delay*	LOS
1	Driver @ Chesebro	All-way Stop	128.1	F	99.3	F
2	Palo Comado @101 NB Ramps	One-way stop (stop sign on Off-Ramp)	290.3	F	218.2	F
3	Dorothy Dr @ 101 SB Ramps	All-way stop	41.7	E	26.3	D
4	Palo Comado @Chesebro	Two-way stop (stop signs on Chesebro)	63.2	F	36.0	E
5	Agoura @ Chesebro	All-way Stop	13.2	B	26.3	D

*Delay refers to the average delay for the entire intersection. At a two-way stop, delay refers to the worst approach delay.

Table 7 indicates that all the study intersections would operate at LOS D or worse with the exception of Agoura Road at Chesebro Road (LOS B in the AM peak period). The technical worksheets are attached to the end of this report in **Appendix D**.

6. Build-out Year (2035) Condition with Improvements – Build

Improvements that were identified to the Palo Comado Canyon Road interchange to improve the LOS were analyzed for the buildout year (2035) conditions. As described in section 5, the improvements include widening the overpass to four lanes, installation of a traffic signal, adding turn lanes to the northbound ramp (one left turn lane, a shared left-through lane, and a right turn lane), and improving the southbound approach to one though lane and one shared through-right lane. In addition, LOS at the intersection of Dorothy Drive/101 SB Ramps would be improved to LOS D during the AM peak period and LOS C during the PM peak period with the re-striping of the northbound movement to include an exclusive left turn lane and a shared through-right lane. No widening of the roadway would be required. This improvement would result in a 3-lane cross-section for the northbound movement that has already been identified in the City General Plan Update 2010. The results of the analysis with delay in seconds are presented in **Table 8**.

Table 8: Intersection LOS Summary for Build-out Year (2035) Conditions with Improvements

No.	Intersection	Intersection Control	2035 With Improvements			
			AM		AM	
			Delay*	LOS	Delay*	LOS
1	Driver @ Chesebro	All-way Stop	128.1	F	99.3	F
2	Palo Comado @101 NB Ramps	Traffic Signal	9.8	A	11.5	B
3	Dorothy Dr @ 101 SB Ramps	All-way stop	26.0	D	24.3	C
4	Palo Comado @Chesebro	Two-way stop (stop signs on Chesebro)	63.2	F	36.0	E
5	Agoura @ Chesebro	All-way Stop	13.2	B	26.3	D

*Delay refers to the average delay for the entire intersection. At a two-way stop, delay refers to the worst approach delay. Delay values for intersections that are not subject to improvements were obtained from 'without improvements' conditions.

Table 8 indicates that the proposed improvements would improve the LOS at the intersection of Palo Camado Canyon Road at 101 NB Ramps from LOS F to LOS A for the AM peak period and LOS F to B for the PM peak period. The remaining intersections would continue to operate at LOS D or worse during both AM and PM peak periods, except the intersection of Agoura Road at Chesebro Road that operates at LOS B during the AM peak period. The technical worksheets are attached to the end of this report in Appendix D.

7. Queuing Analysis

Caltrans requested that a queuing analysis be completed for the westbound direction at the intersection of Palo Comado Canyon Road and US 101 NB Off-Ramp. Queue lengths were determined based upon a queuing analysis for the westbound direction. **Table 9** presents the queue lengths in feet for each forecast year with and without the proposed improvements.

Table 9: 95th Percentile Queue Lengths (feet) for NB Off Ramp at Palo Comado Canyon Road

	Existing AM (stop sign)	Existing PM (stop sign)	2015 Base AM (stop sign)	2015 Base PM (stop sign)	2015 W/ improvements AM (traffic signal)	2015 W/ improvements PM (traffic signal)	2035 Base AM (stop sign)	2035 Base PM (stop sign)	2035 W/ Improvements AM (traffic signal)	2035 W/ Improvements PM (traffic signal)
Left	238	419	232	235	46	58	698	439	70	66
Through	153	691	135	367	47	60	251	789	71	66
Right	153	691	135	367	57	82	251	789	136	236

Table 9 indicates that the queue lengths are expected to be significantly reduced with the proposed improvements to the Palo Comado Canyon Road interchange. The technical worksheets are attached to the end of this report in **Appendix E**.

8. Roadway Analysis

A roadway segment LOS analysis was completed for Palo Comado Canyon Road overpass based upon the HCM methodology. Based upon the definitions provided in the HCM, Palo Comado Canyon Road is considered to be a Class II suburban minor arterial. Existing volumes were obtained from the ADT data collected in 2010 (traffic count data is presented in Appendix A). To obtain the future 2015 and 2035 anticipated traffic volumes, a regional growth factor of 0.75% per year was applied to the existing (2010) traffic volumes to account for the general area wide and regional growth and development. **Table 10** presents the service volumes (vehicle/hour) for AM and PM peak periods for Palo Comado Canyon Road for Existing Conditions (2010), Opening Year Conditions (2015), and Build-out Conditions (2035) and the corresponding LOS for two lanes and four lanes in both directions.

Table 10: Palo Comado Canyon Road Service Volumes (veh/hr)

	Peak Period	Service Volumes (vph)	LOS with 1 lane	LOS with 2 lanes
Existing (2010)	AM	1,013	F	N/A
	PM	936	F	N/A
Opening Year (2015)	AM	1,051	F	C or better
	PM	971	F	C or better
Buildout Year (2035)	AM	1,203	F	C or better
	PM	1,112	F	C or better

N/A - not applicable

Table 10 indicates that Palo Comado Canyon Road currently operates at LOS F or worse during both AM and PM peak hours under existing conditions. The widening of the Palo Comado Canyon Road overpass from two to four lanes would improve the operation to LOS C or better during both AM and PM peak hours under opening year (2015) and build-out (2035) year conditions.

9. Freeway Analysis

Both freeway mainline and ramp analysis were conducted for this study as requested by Caltrans based upon the HCM methodology. The freeway mainline analysis was conducted for the US 101 freeway segment in the project study area. The ramp analysis was conducted for the on and off ramps at the Palo Comado Canyon interchange.

Freeway Mainline and Ramp Analysis

Freeway mainline and ramp analysis for US-101 was conducted using the HCS+ software. Freeway analysis results are expressed in terms of density, which measures the number of passenger cars per lane mile (pc/mi/ln) on the freeway mainline. Analysis results for Existing (2010), Opening Year (2015), and Buildout Year (2035) conditions are summarized in **Table 11**.

Table 11: Freeway Mainline Operations for 101 Freeway

Existing (2010)				Opening Year (2015)				Buildout Year (2035)			
Northbound		Southbound		Northbound		Southbound		Northbound		Southbound	
Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS
30.3	D	29.8	D	31.9	D	31.2	D	40.4	E	39.2	E

Table 11 indicates that the freeway segment would operate at LOS D or worse in both northbound and southbound directions for all scenarios. The result worksheets from the HCS+ software are provided in **Appendix F**.

Ramp operations were similar to the freeway analysis. The northbound and southbound on and off ramps at this interchange currently have auxiliary lanes that provide additional storage for vehicles and also facilitate better operations at the merge and diverge areas in the vicinity of the interchange.

10. Summary of Findings

- A level-of-service analysis was performed for the study intersections for Existing (2010) Conditions, Opening Year (2015) Conditions, and Buildout (2035) Conditions using HCM methodology. Improvements were identified for the Palo Comado Canyon interchange to improve the LOS for the future conditions. Scenarios reflecting the improvements were conducted for both Opening Year (2015) Conditions and Buildout Year (2035) Conditions.

- Under Existing Conditions, the study intersections currently operate at LOS C or better in both the AM and PM peak periods with the exception of Driver Avenue at Chesebro Road and Palo Comado Canyon Road at US 101 NB Ramps that operate at LOS D, E, or F in the AM and PM peak hours.

- Under Opening Year (2015) Conditions, the study intersections would continue to operate at an LOS C or better in both the AM and PM peak period with the exception of Driver Avenue at Chesebro Road and Palo Comado Canyon Road at US 101 NB Ramps that operate at LOS F in both the AM and PM peak hours. The improvements identified for the Palo Comado Canyon interchange would improve the LOS at the intersection of Palo Camado Canyon Road at 101 NB Ramps from LOS F to LOS A for both the AM and PM peak period. The remaining intersections would continue to operate at LOS C or better during both AM and PM peak periods.

- Under Build-out Year Conditions, the study intersection would operate at LOS D or worse with the exception of Agoura Road at Chesebro Road (LOS D in the PM peak period). The improvements identified for the Palo Comado Canyon interchange would improve the LOS at the intersection of Palo Camado Canyon Road at 101 NB Ramps from LOS F to LOS A for the AM peak period and LOS F to B for the PM peak period. The remaining intersections would continue to operate at LOS D or worse during both AM and PM peak periods, except the intersection of Agoura Road at Chesebro Road that operates at LOS B during the AM peak period. The LOS at the intersection of Dorothy Drive/101 SB Ramps would be improved to LOS D during the AM peak period and LOS C during the PM peak period by re-striping the northbound movement to include an exclusive left turn lane and a shared through-right lane. No widening of the roadway would be required. This improvement would result in a 3-lane cross-section for the northbound movement that has already been identified in the City's General Plan Update 2010.

- Queue lengths were documented for the off-ramp at the intersection of Palo Comado Canyon Road and US 101 NB Off-Ramp for each scenario. The queue lengths are expected to be significantly reduced with the proposed improvements to the Palo Comado Canyon Road interchange.

- The roadway analysis indicates that widening the overpass from two to four lanes would improve the roadway operation from LOS F to LOS C.

- The freeway mainline analysis indicates that the US 101 freeway segment in the study area would operate at LOS D under existing (2010) and opening year (2015) conditions and LOS E under the buildout (2035) conditions. Ramp operations were similar to the freeway operations. The presence of auxiliary lanes at both on and off ramps for northbound and southbound directions facilitates better operations at the merge and diverge areas.

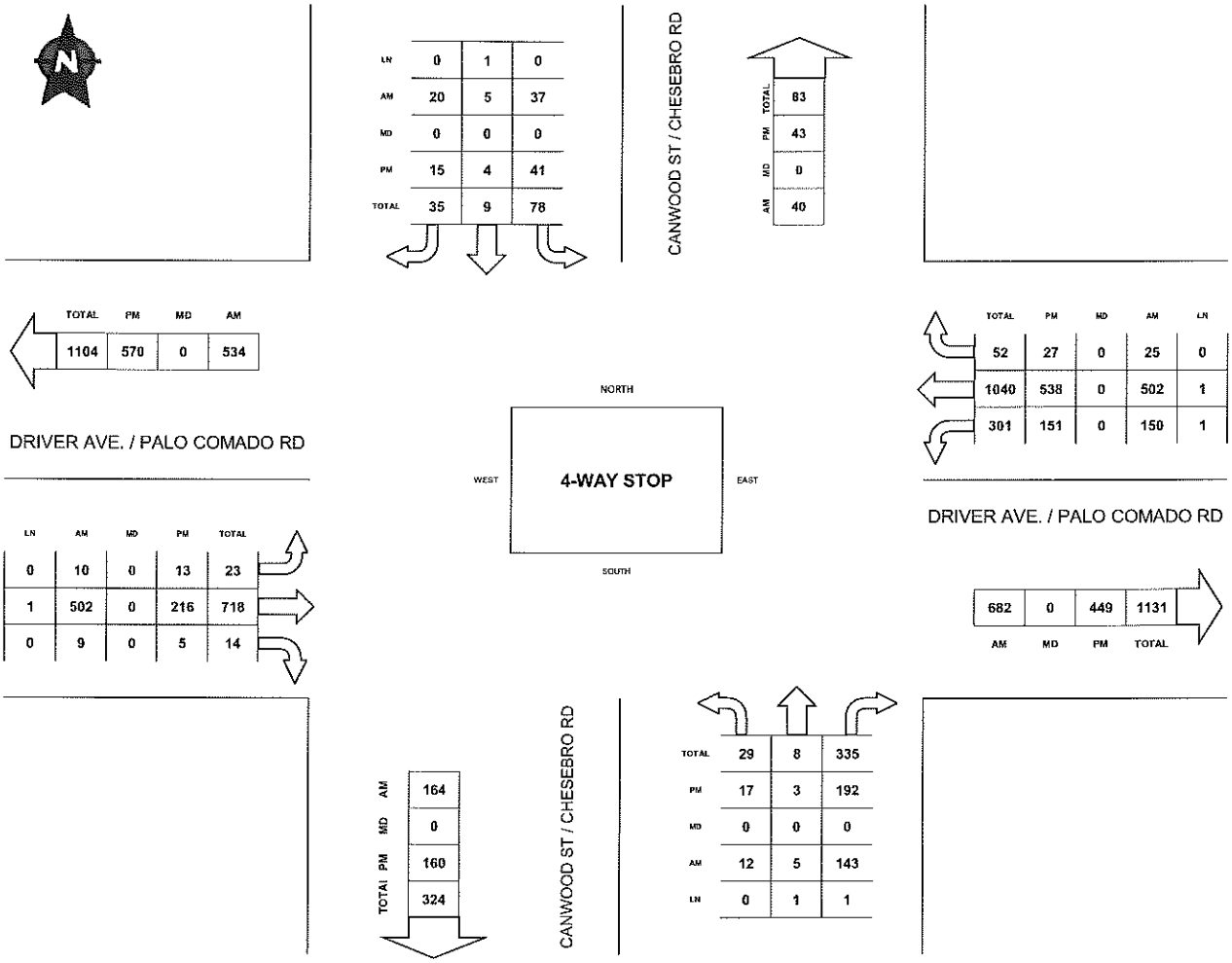
Kimley-Horn and Associates, Inc.

Appendix A – Traffic Datasheets

PEAK HOUR ITM SUMMARY

#001 CANWOOD ST / CHESEBRO RD & DRIVER AVE. / PALO COMADO RD

LOCATION#:	001	QTD PROJ#:	090163	AM PEAK:	745 AM
NORTH / SOUTH:	CANWOOD ST / CHESEBRO RD	DATE:	Tuesday, November 10, 2009	MD PEAK:	
EAST / WEST:	DRIVER AVE. / PALO COMADO RD	VICINITY:	AGOURA HILLS, CA	PM PEAK:	500 PM



AM COUNT 7:00 AM TO 9:00 AM **MD COUNT** - TO - **PM COUNT** 4:00 PM TO 6:00 PM

QUALITY TRAFFIC DATA, LLC
9701 W Pico Blvd, Suite 205, Los Angeles, CA 90035
Phone: 310-341-0019 Fax: 310-807-9247 Info@QualityTrafficData.com

VEHICLE TURNING MOVEMENT COUNT

#001 CANWOOD ST / CHESEBRO RD & DRIVER AVE. / PALO COMADO RD - AM PEAK

LOCATION#:	**001**	**QTD PROJ#:**	**090163**
NORTH / SOUTH:	**CANWOOD ST / CHESEBRO RD**	**DATE:**	**Tuesday, November 10, 2009**
EAST / WEST:	**DRIVER AVE. / PALO COMADO RD**	**VICINITY:**	**AGOURA HILLS, CA**

DIRECTION:	**NL**	**NT**	**NR**	**SL**	**ST**	**SR**	**EL**	**ET**	**ER**	**WL**	**WT**	**WR**	**TOTALS**
LANES:	0	1	1	0	1	0	0	1	0	1	1	0	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	0	29	13	0	1	0	61	1	25	26	6	162
7:15 AM	1	0	22	3	2	3	3	61	0	29	29	5	158
7:30 AM	3	0	28	10	1	2	0	73	1	24	56	5	203
7:45 AM	2	1	27	15	1	5	1	110	1	40	130	3	336
8:00 AM	2	1	36	3	1	6	1	136	3	42	123	10	364
8:15 AM	5	3	31	9	1	3	4	122	1	31	138	5	353
8:30 AM	3	0	49	10	2	6	4	134	4	37	111	7	367
8:45 AM	3	2	35	11	1	4	3	108	2	40	52	13	274
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													

VOLUME STATS:	**NL**	**NT**	**NR**	**SL**	**ST**	**SR**	**EL**	**ET**	**ER**	**WL**	**WT**	**WR**	
TOTAL:	19	7	257	74	9	30	16	805	13	268	665	54	2217
P.H.V: (1)	12	5	143	37	5	20	10	502	9	150	502	25	1420
P.H.F: (2)		0.769			0.738			0.917			0.967		0.967

(1) Peak Hour Volume (Peak Hour Begins At 745 AM)
(2) Peak Hour Factor (directional aggregate)

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VEHICLE TURNING MOVEMENT COUNT

#001 CANWOOD ST / CHESEBRO RD & DRIVER AVE. / PALO COMADO RD - PM PEAK

LOCATION#:	**001**	**QTD PROJ#:**	**090163**
NORTH / SOUTH:	**CANWOOD ST / CHESEBRO RD**	**DATE:**	**Tuesday, November 10, 2009**
EAST / WEST:	**DRIVER AVE. / PALO COMADO RD**	**VICINITY:**	**AGOURA HILLS, CA**

DIRECTION:	**NL**	**NT**	**NR**	**SL**	**ST**	**SR**	**EL**	**ET**	**ER**	**WL**	**WT**	**WR**	**TOTALS**
LANES:	0	1	1	0	1	0	0	1	0	1	1	0	
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	4	0	60	7	0	1	1	42	2	31	51	14	213
4:15 PM	2	3	40	10	2	3	0	47	2	45	70	9	233
4:30 PM	3	4	68	12	1	3	1	50	1	37	84	9	273
4:45 PM	7	2	50	7	2	3	2	50	2	49	103	9	286
5:00 PM	2	3	71	8	2	4	4	84	1	33	101	9	322
5:15 PM	5	0	48	10	2	6	2	55	1	33	131	5	298
5:30 PM	2	0	38	9	0	2	6	24	0	40	156	9	286
5:45 PM	8	0	35	14	0	3	1	53	3	45	150	4	316
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

VOLUME STATS:	**NL**	**NT**	**NR**	**SL**	**ST**	**SR**	**EL**	**ET**	**ER**	**WL**	**WT**	**WR**	
TOTAL:	33	12	410	77	9	25	17	405	12	313	846	68	2227
P.H.V: [1]	17	3	192	41	4	15	13	216	5	151	538	27	1222
P.H.F: [2]		0.697			0.833			0.657			0.873		0.949

(1) Peak Hour Volume (Peak Hour Begins At 500 PM)
(2) Peak Hour Factor (directional aggregate)

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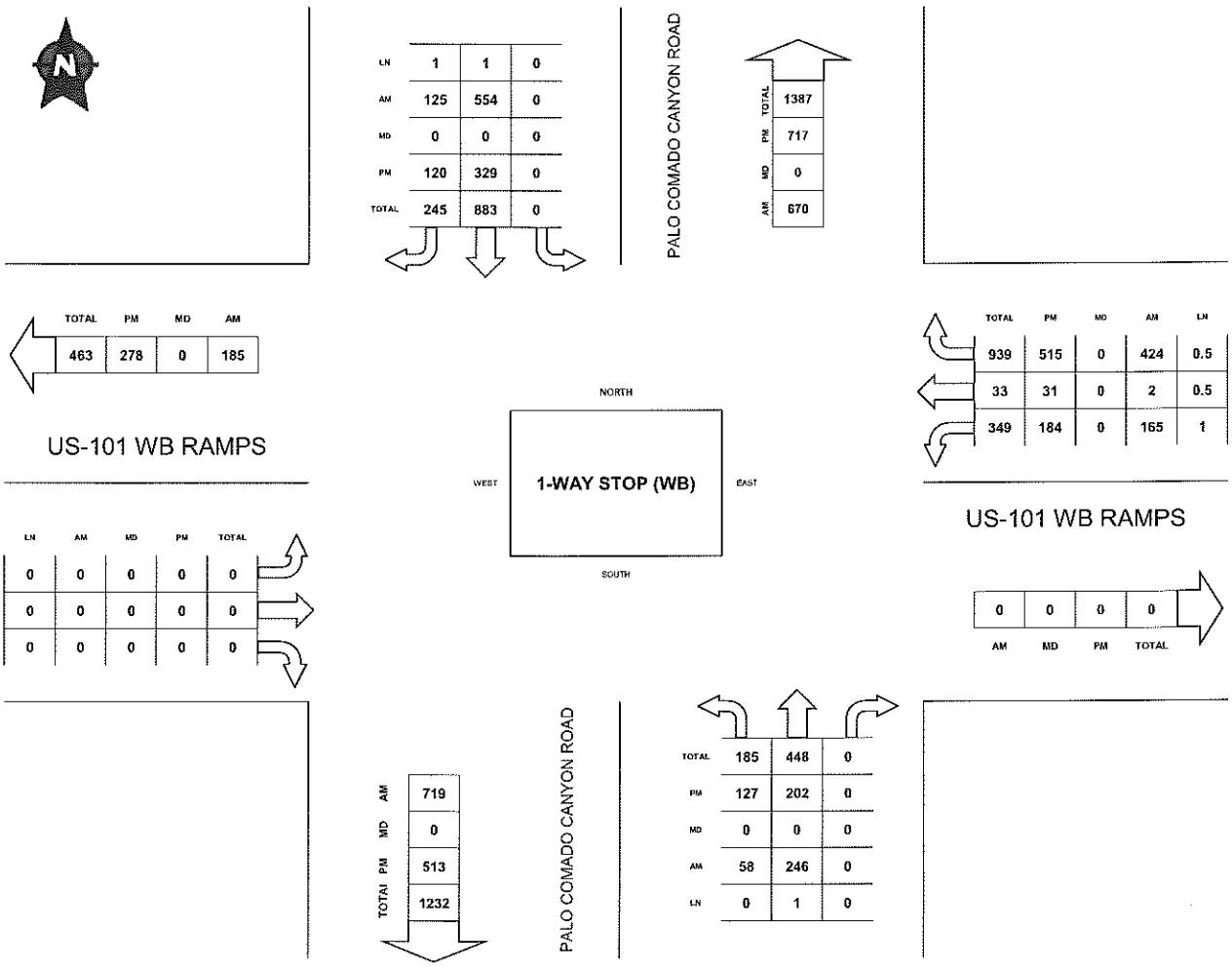
PEAK HOUR ITM SUMMARY

#002 PALO COMADO CANYON ROAD & US-101 WB RAMPS

LOCATION#:	002	QTD PROJ#:	090163	AM PEAK:	745 AM
NORTH / SOUTH:	PALO COMADO CANYON ROAD	DATE:	Tuesday, November 10, 2009	MD PEAK:	
EAST / WEST:	US-101 WB RAMPS	VICINITY:	AGOURA HILLS, CA	PM PEAK:	500 PM



AM COUNT 7:00 AM TO 9:00 AM **MD COUNT** - TO - **PM COUNT** 4:00 PM TO 6:00 PM

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VEHICLE TURNING MOVEMENT COUNT

#002 PALO COMADO CANYON ROAD & US-101 WB RAMPS - AM PEAK

LOCATION#:	**002**	**QTD PROJ#:**	**090163**
NORTH / SOUTH:	**PALO COMADO CANYON ROAD**	**DATE:**	**Tuesday, November 10, 2009**
EAST / WEST:	**US-101 WB RAMPS**	**VICINITY:**	**AGOURA HILLS, CA**

DIRECTION:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTALS
LANES:	0	1	0	0	1	1	0	0	0	1	0.5	0.5	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	17	0	0	83	22	0	0	0	16	1	38	177
7:15 AM	4	10	0	0	67	18	0	0	0	28	0	53	180
7:30 AM	8	33	0	0	91	25	0	0	0	38	0	53	248
7:45 AM	9	61	0	0	117	33	0	0	0	42	1	110	373
8:00 AM	12	47	0	0	142	35	0	0	0	51	1	128	416
8:15 AM	20	74	0	0	137	26	0	0	0	32	0	98	387
8:30 AM	17	64	0	0	158	31	0	0	0	40	0	88	398
8:45 AM	17	50	0	0	109	39	0	0	0	55	1	52	323
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													

VOLUME STATS:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
TOTAL:	87	356	0	0	904	229	0	0	0	302	4	620	2502
P.H.V: [1]	58	246	0	0	554	125	0	0	0	165	2	424	1574
P.H.F: [2]		0.809			0.898			0.000			0.821		0.946

(1) Peak Hour Volume (Peak Hour Begins At 745 AM)
(2) Peak Hour Factor (directional aggregate)

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VEHICLE TURNING MOVEMENT COUNT

#002 PALO COMADO CANYON ROAD & US-101 WB RAMPS - PM PEAK

LOCATION#:	**002**	**QTD PROJ#:**	**090163**
NORTH / SOUTH:	**PALO COMADO CANYON ROAD**	**DATE:**	**Tuesday, November 10, 2009**
EAST / WEST:	**US-101 WB RAMPS**	**VICINITY:**	**AGOURA HILLS, CA**

DIRECTION:	**NL**	**NT**	**NR**	**SL**	**ST**	**SR**	**EL**	**ET**	**ER**	**WL**	**WT**	**WR**	**TOTALS**
LANES:	0	1	0	0	1	1	0	0	0	1	0.5	0.5	
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	33	36	0	0	74	36	0	0	0	30	1	62	272
4:15 PM	29	37	0	0	58	38	0	0	0	23	2	85	272
4:30 PM	34	42	0	0	95	33	0	0	0	30	2	88	324
4:45 PM	33	49	0	0	77	30	0	0	0	30	2	110	331
5:00 PM	66	49	0	0	118	42	0	0	0	13	1	92	381
5:15 PM	25	54	0	0	83	31	0	0	0	41	2	116	352
5:30 PM	26	47	0	0	54	17	0	0	0	76	12	159	391
5:45 PM	10	52	0	0	74	30	0	0	0	54	16	148	384
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

VOLUME STATS:	**NL**	**NT**	**NR**	**SL**	**ST**	**SR**	**EL**	**ET**	**ER**	**WL**	**WT**	**WR**	
TOTAL:	256	366	0	0	633	257	0	0	0	297	38	860	2707
P.H.V: [1]	127	202	0	0	329	120	0	0	0	184	31	515	1508
P.H.F: [2]		0.715			0.702			0.000			0.739		0.964

(1) Peak Hour Volume (Peak Hour Begins At 500 PM)
(2) Peak Hour Factor (directional aggregate)

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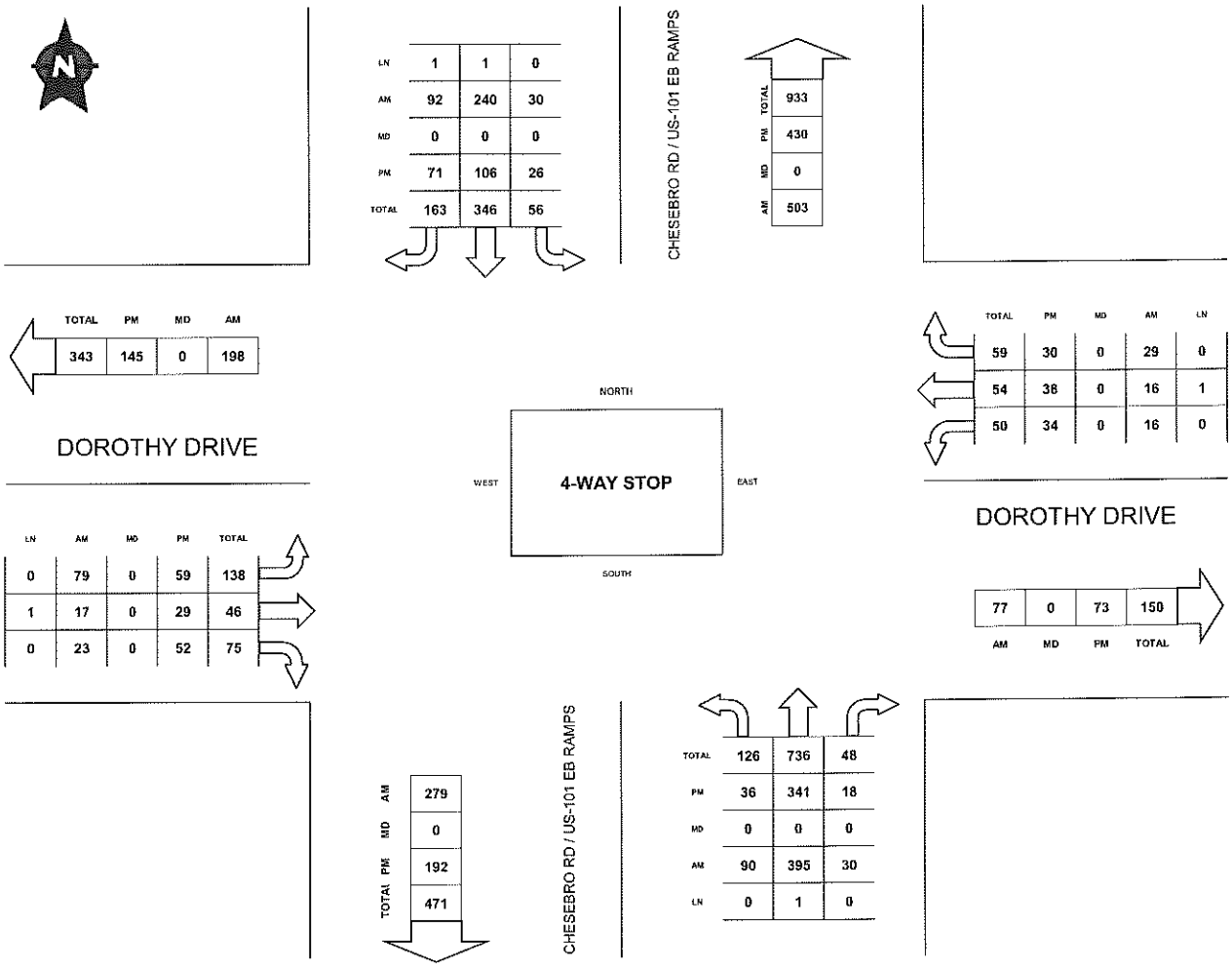
PEAK HOUR ITM SUMMARY

#003 CHESEBRO RD / US-101 EB RAMPS & DOROTHY DRIVE

LOCATION#:	003	QTD PROJ#:	090163	AM PEAK:	745 AM
NORTH / SOUTH:	CHESEBRO RD / US-101 EB RAMPS	DATE:	Tuesday, November 10, 2009	MD PEAK:	
EAST / WEST:	DOROTHY DRIVE	VICINITY:	AGOURA HILLS, CA	PM PEAK:	445 PM



AM COUNT 7:00 AM TO 9:00 AM **MD COUNT** - TO - **PM COUNT** 4:00 PM TO 6:00 PM

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VEHICLE TURNING MOVEMENT COUNT

#003 CHESEBRO RD / US-101 EB RAMPS & DOROTHY DRIVE - AM PEAK

LOCATION#: 003
NORTH / SOUTH: CHESEBRO RD / US-101 EB RAMPS
EAST / WEST: DOROTHY DRIVE

QTD PROJ#: 090163
DATE: Tuesday, November 10, 2009
VICINITY: AGOURA HILLS, CA

DIRECTION:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTALS
LANES:	0	1	0	0	1	1	0	1	0	0	1	0	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	8	79	2	1	25	1	13	0	1	2	0	4	136
7:15 AM	13	50	7	10	23	8	10	1	1	3	2	8	136
7:30 AM	20	79	5	8	34	18	15	3	3	3	4	9	201
7:45 AM	23	85	10	10	74	25	21	2	4	4	3	7	268
8:00 AM	20	98	7	3	41	23	16	5	5	2	4	4	228
8:15 AM	23	103	4	7	70	15	18	3	6	2	5	5	261
8:30 AM	24	109	9	10	55	29	24	7	8	8	4	13	300
8:45 AM	30	75	4	5	59	20	22	6	6	7	4	5	243
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													

VOLUME STATS:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
TOTAL:	161	678	48	54	381	139	139	27	34	31	26	55	1773
P.H.V: (1)	90	395	30	30	240	92	79	17	23	16	16	29	1057
P.H.F: (2)		0.907			0.830			0.763			0.610		0.881

(1) Peak Hour Volume (Peak Hour Begins At 745 AM)
(2) Peak Hour Factor (directional aggregate)

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VEHICLE TURNING MOVEMENT COUNT

#003 CHESEBRO RD / US-101 EB RAMPS & DOROTHY DRIVE - PM PEAK

LOCATION#: 003
NORTH / SOUTH: CHESEBRO RD / US-101 EB RAMPS
EAST / WEST: DOROTHY DRIVE

QTD PROJ#: 090163
DATE: Tuesday, November 10, 2009
VICINITY: AGOURA HILLS, CA

DIRECTION:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTALS
LANES:	0	1	0	0	1	1	0	1	0	0	1	0	
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	11	68	2	6	12	9	19	7	15	8	4	6	
4:15 PM	12	66	4	4	19	11	16	4	12	8	5	3	167
4:30 PM	12	76	4	2	32	8	17	3	16	5	3	3	164
4:45 PM	7	73	8	8	22	13	13	3	19	4	7	7	181
5:00 PM	13	115	7	6	30	18	19	5	14	12	9	7	184
5:15 PM	8	82	2	7	29	21	15	9	8	9	9	11	255
5:30 PM	8	71	1	5	25	19	12	12	11	9	13	5	210
5:45 PM	10	70	6	5	20	15	14	4	8	8	5	8	191
6:00 PM													173
6:15 PM													
6:30 PM													
6:45 PM													

VOLUME STATS:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
TOTAL:	81	621	34	43	189	114	125	47	103	63	55	50	1525
P.H.V: [1]	36	341	18	26	106	71	59	29	52	34	38	30	840
P.H.F: [2]		0.731			0.890			0.921			0.879		0.824

(1) Peak Hour Volume (Peak Hour Begins At 445 PM)
(2) Peak Hour Factor (directional aggregate)

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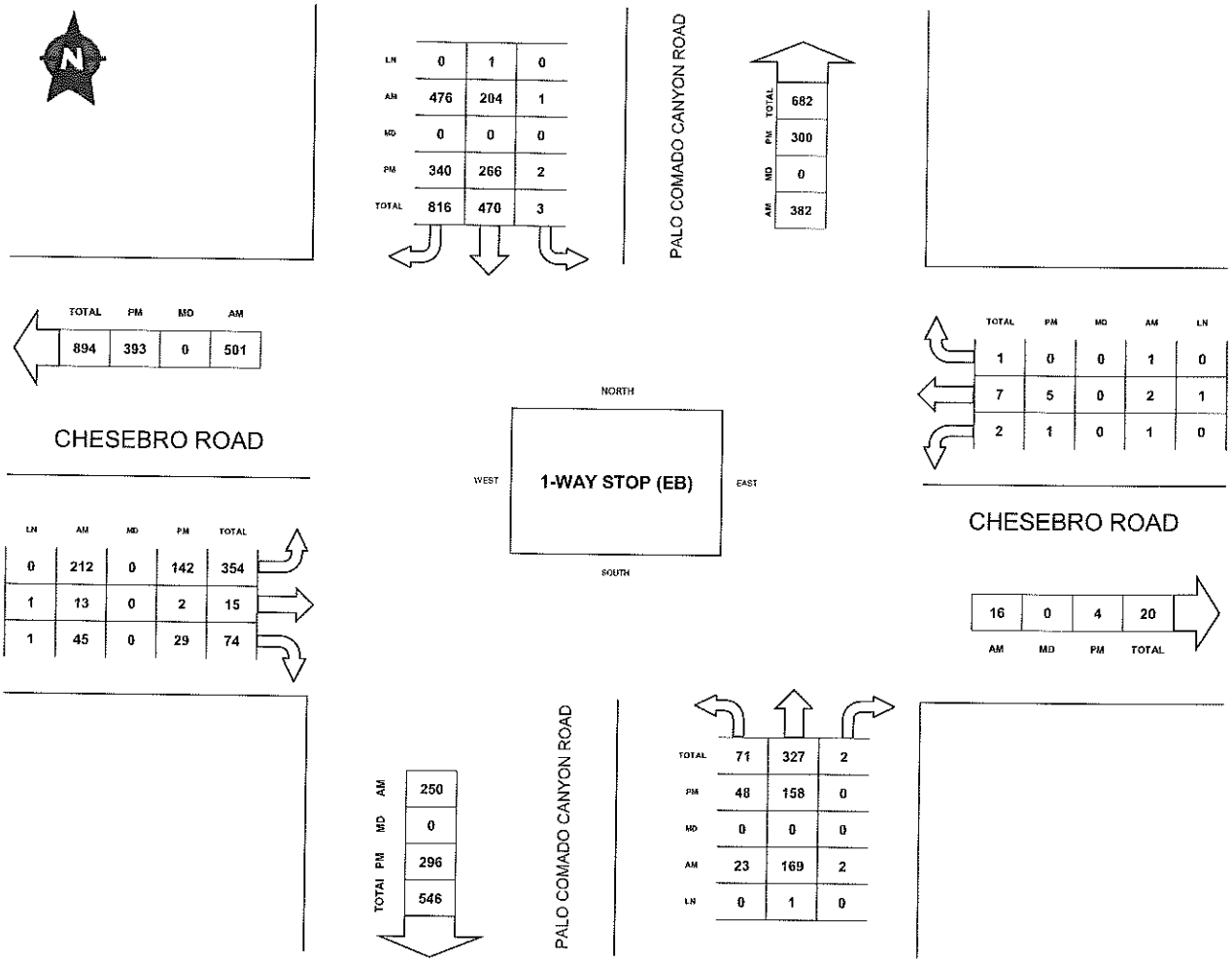
PEAK HOUR ITM SUMMARY

#004 PALO COMADO CANYON ROAD & CHESEBRO ROAD

LOCATION#:	004	QTD PROJ#:	090163	AM PEAK:	745 AM
NORTH / SOUTH:	PALO COMADO CANYON ROAD	DATE:	Tuesday, November 10, 2009	MD PEAK:	
EAST / WEST:	CHESEBRO ROAD	VICINITY:	AGOURA HILLS, CA	PM PEAK:	500 PM



AM COUNT 7:00 AM TO 9:00 AM **MD COUNT** - TO - **PM COUNT** 4:00 PM TO 6:00 PM

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VEHICLE TURNING MOVEMENT COUNT

#004 PALO COMADO CANYON ROAD & CHESEBRO ROAD - AM PEAK

LOCATION#: 004
NORTH / SOUTH: PALO COMADO CANYON ROAD
EAST / WEST: CHESEBRO ROAD

QTD PROJ#: 090163
DATE: Tuesday, November 10, 2009
VICINITY: AGOURA HILLS, CA

DIRECTION:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTALS
LANES:	0	1	0	0	1	0	0	1	1	0	1	0	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	2	6	0	1	23	89	18	4	5	0	1	1	150
7:15 AM	3	7	1	0	29	68	20	2	4	0	0	0	134
7:30 AM	4	24	0	0	42	95	40	0	4	0	1	1	211
7:45 AM	8	37	0	0	47	102	61	5	15	1	2	1	279
8:00 AM	3	36	0	1	63	118	43	1	6	0	0	0	271
8:15 AM	7	47	2	0	44	123	57	1	11	0	0	0	292
8:30 AM	5	49	0	0	50	133	51	6	13	0	0	0	307
8:45 AM	7	31	1	2	48	101	53	6	22	2	1	0	274
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													

VOLUME STATS:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
TOTAL:	39	237	4	4	346	829	343	25	80	3	5	3	1918
P.H.V: (1)	23	169	2	1	204	476	212	13	45	1	2	1	1149
P.H.F: (2)		0.866			0.930			0.833			0.250		0.936

(1) Peak Hour Volume (Peak Hour Begins At 745 AM)
(2) Peak Hour Factor (directional aggregate)

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VEHICLE TURNING MOVEMENT COUNT

#004 PALO COMADO CANYON ROAD & CHESEBRO ROAD - PM PEAK

LOCATION#: 004
NORTH / SOUTH: PALO COMADO CANYON ROAD
EAST / WEST: CHESEBRO ROAD

QTD PROJ#: 090163
DATE: Tuesday, November 10, 2009
VICINITY: AGOURA HILLS, CA

DIRECTION:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTALS
LANES:	0	1	0	0	1	0	0	1	1	0	1	0	
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	2	33	1	0	34	80	28	1	8	0	1	0	188
4:15 PM	13	46	1	2	36	66	31	2	6	0	1	0	204
4:30 PM	9	36	0	0	41	88	46	2	7	0	0	0	229
4:45 PM	8	38	1	1	40	86	34	0	11	0	0	0	219
5:00 PM	10	44	0	0	41	125	46	1	8	1	2	0	278
5:15 PM	12	40	0	0	69	78	36	0	4	0	0	0	239
5:30 PM	17	39	0	2	89	62	34	1	8	0	2	0	254
5:45 PM	9	35	0	0	67	75	26	0	9	0	1	0	222
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

VOLUME STATS:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
TOTAL:	80	311	3	5	417	660	281	7	61	1	7	0	1833
P.H.V: [1]	48	158	0	2	266	340	142	2	29	1	5	0	993
P.H.F: [2]		0.920			0.916			0.786			0.500		0.893

(1) Peak Hour Volume (Peak Hour Begins At 500 PM)
(2) Peak Hour Factor (directional aggregate)

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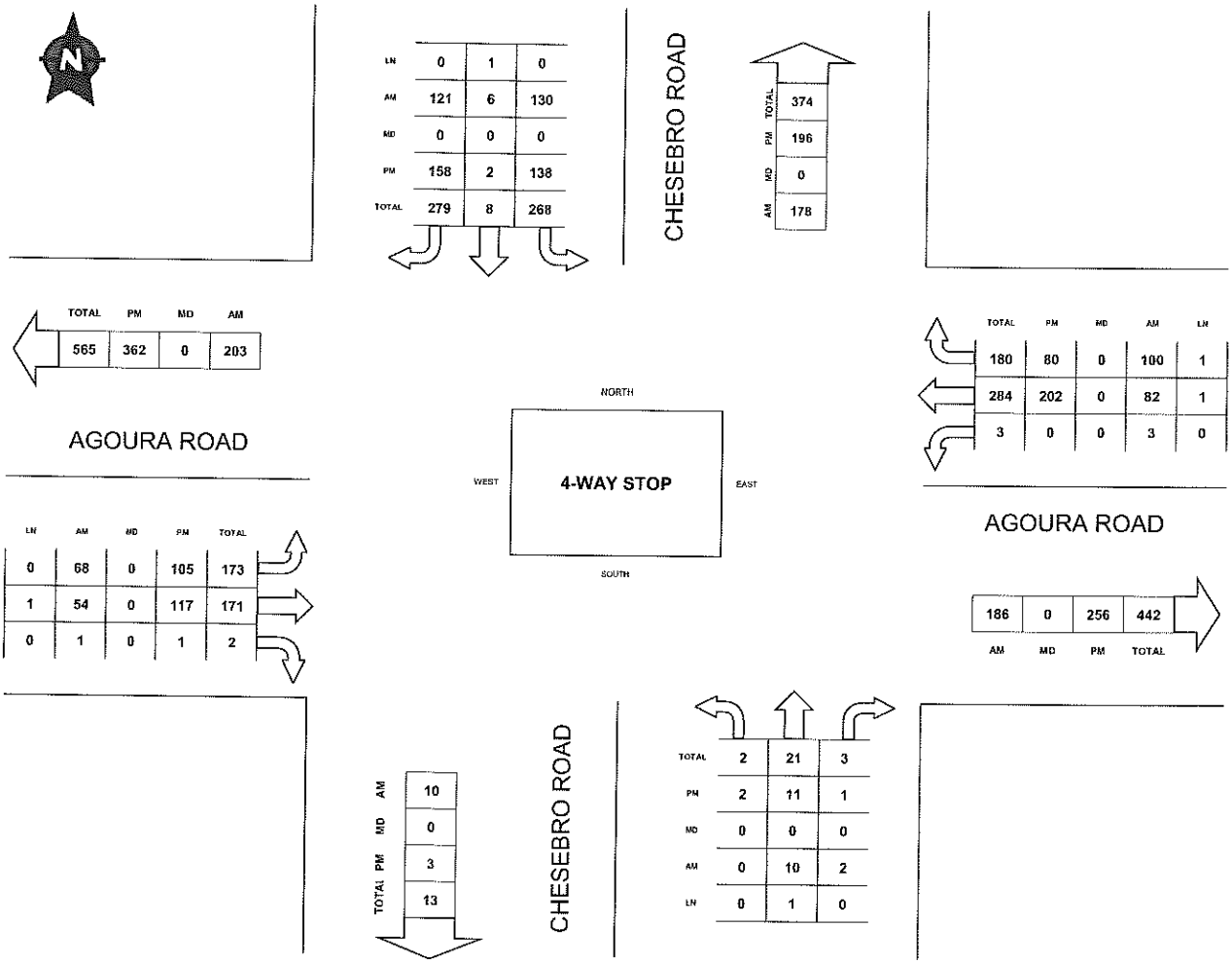
PEAK HOUR ITM SUMMARY

#005 CHESEBRO ROAD & AGOURA ROAD

LOCATION#:	005	QTD PROJ#:	090163	AM PEAK:	800 AM
NORTH / SOUTH:	CHESEBRO ROAD	DATE:	Tuesday, November 10, 2009	MD PEAK:	
EAST / WEST:	AGOURA ROAD	VICINITY:	AGOURA HILLS, CA	PM PEAK:	500 PM



AM COUNT 7:00 AM TO 9:00 AM **MD COUNT** - TO - **PM COUNT** 4:00 PM TO 6:00 PM

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VEHICLE TURNING MOVEMENT COUNT

#005 CHESEBRO ROAD & AGOURA ROAD - AM PEAK

LOCATION#:	005	QTD PROJ#:	090163
NORTH / SOUTH:	CHESEBRO ROAD	DATE:	Tuesday, November 10, 2009
EAST / WEST:	AGOURA ROAD	VICINITY:	AGOURA HILLS, CA

DIRECTION:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTALS
LANES:	0	1	0	0	1	0	0	1	0	0	1	1	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	0	0	15	2	11	2	4	0	0	13	3	50
7:15 AM	0	2	0	15	4	15	2	7	0	0	19	7	71
7:30 AM	0	0	0	29	0	21	6	9	1	0	15	18	99
7:45 AM	0	0	0	35	1	26	16	16	2	0	17	29	142
8:00 AM	0	2	1	32	1	35	11	12	0	2	16	22	134
8:15 AM	0	3	1	28	3	22	21	17	0	0	19	29	143
8:30 AM	0	3	0	40	1	21	19	12	1	0	28	31	156
8:45 AM	0	2	0	30	1	43	17	13	0	1	19	18	144
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													

VOLUME STATS:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
TOTAL:	0	12	2	224	13	194	94	90	4	3	146	157	939
P.H.V: [1]	0	10	2	130	6	121	68	54	1	3	82	100	577
P.H.F: [2]		0.750			0.868			0.809			0.784		0.925

(1) Peak Hour Volume (Peak Hour Begins At 800 AM)
(2) Peak Hour Factor (directional aggregate)

QUALITY TRAFFIC DATA, LLC
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VEHICLE TURNING MOVEMENT COUNT

#005 CHESEBRO ROAD & AGOURA ROAD - PM PEAK

LOCATION#: 005
NORTH / SOUTH: CHESEBRO ROAD
EAST / WEST: AGOURA ROAD

QTD PROJ#: 090163
DATE: Tuesday, November 10, 2009
VICINITY: AGOURA HILLS, CA

DIRECTION:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTALS
LANES:	0	1	0	0	1	0	0	1	0	0	1	1	
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	0	3	0	28	1	15	15	25	0	0	12	13	112
4:15 PM	1	9	0	25	0	16	26	13	1	0	20	23	134
4:30 PM	0	2	0	22	0	24	29	28	0	0	29	13	147
4:45 PM	0	1	2	19	1	32	27	25	0	1	31	23	162
5:00 PM	0	4	0	32	0	18	22	17	0	0	30	23	146
5:15 PM	2	1	0	38	0	37	36	43	0	0	39	16	212
5:30 PM	0	6	0	26	0	70	26	35	1	0	66	17	247
5:45 PM	0	0	1	42	2	33	21	22	0	0	67	24	212
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

VOLUME STATS:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
TOTAL:	3	26	3	232	4	245	202	208	2	1	294	152	1372
P.H.V: [1]	2	11	1	138	2	158	105	117	1	0	202	80	817
P.H.F: [2]		0.583			0.776			0.706			0.775		0.827

(1) Peak Hour Volume (Peak Hour Begins At 500 PM)
(2) Peak Hour Factor (directional aggregate)

QUALITY TRAFFIC DATA, LLC
9701 W Pico Blvd, Suite 205, Los Angeles, CA 90035
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Day: TUESDAY
Date: 05/11/2010

Classification Report / Prepared by: National Data & Surveying Services
Location: Palo Comado Interchange

City: Agoura Hills
Project #: 10-5193-001n

North Bound

Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
00:00 AM	0	6	4	0	1	0	0	0	0	0	0	0	0	11
01:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
02:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
05:00	0	6	3	0	2	1	0	0	1	0	0	0	0	13
06:00	0	44	12	0	4	1	0	1	0	0	0	0	0	62
07:00	0	116	44	1	8	1	0	1	0	0	0	0	0	171
08:00	0	246	48	2	6	1	0	0	0	0	0	0	0	303
09:00	2	146	26	0	11	3	0	1	0	0	0	0	0	189
10:00	5	146	25	1	10	0	0	0	1	0	0	0	0	188
11:00	1	180	39	3	15	2	0	4	0	0	0	0	0	244
12:00 PM	2	238	40	1	10	0	0	1	0	0	0	0	0	292
13:00	4	179	25	2	7	0	0	2	0	0	0	0	0	219
14:00	5	181	48	0	5	1	0	2	0	0	0	0	0	242
15:00	0	240	47	1	10	0	0	0	0	0	0	0	0	298
16:00	1	274	48	1	16	0	0	1	0	0	0	0	0	341
17:00	3	338	43	0	4	0	0	0	0	0	0	0	0	388
18:00	3	213	31	0	8	1	0	0	0	0	0	0	0	256
19:00	2	135	22	0	5	0	0	0	0	0	0	0	0	164
20:00	0	91	17	0	5	0	0	0	0	0	0	0	0	113
21:00	0	69	6	0	2	0	0	0	0	0	0	0	0	77
22:00	0	39	4	0	1	0	0	0	0	0	0	0	0	44
23:00	0	13	3	0	0	0	0	0	0	0	0	0	0	16
Totals	**28**	**2913**	**535**	**12**	**130**	**11**		**13**	**2**					**3644**
% of Totals	1%	80%	15%	0%	4%	0%		0%	0%					100%
	8	903	201	7	57	9	0	7	2	0	0	0	0	1194
% AM	0%	25%	6%	0%	2%	0%		0%	0%					33%
AM Peak Hour	10:00	08:00	08:00	11:00	11:00	09:00		11:00	05:00					08:00
Volume	5	246	48	3	15	3		4	1					303
	20	2010	334	5	73	2	0	6	0	0	0	0	0	2450
% PM	1%	55%	9%	0%	2%	0%		0%						67%
PM Peak Hour	14:00	17:00	14:00	13:00	16:00	14:00		13:00						17:00
Volume	5	338	48	2	16	1		2						388

Directional Peak Periods	AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
All Classes	Volume	%	Volume	%	Volume	%	Volume	%
	474 ⟷	13%	511 ⟷	14%	729 ⟷	20%	1930 ⟷	53%

Day: TUESDAY
Date: 5/11/10

Classification Report / Prepared by: National Data & Surveying Services
Location: Palo Comado Interchange

City: Agoura Hills
Project #: 10-5193-001s

South Bound

Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
00:00 AM	0	8	3	0	1	0	0	0	0	0	0	0	0	12
01:00	0	9	1	0	0	0	0	0	0	0	0	0	0	10
02:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
03:00	0	4	1	0	0	0	0	0	0	0	0	0	0	5
04:00	0	22	3	0	1	0	0	0	0	0	0	0	0	26
05:00	0	52	9	0	4	1	0	0	0	0	0	0	0	66
06:00	2	210	35	1	10	2	0	1	0	0	0	0	0	261
07:00	3	413	76	2	17	2	0	2	0	0	0	0	0	515
08:00	3	591	90	3	19	2	0	2	0	0	0	0	0	710
09:00	4	362	51	1	18	4	0	2	1	0	0	0	0	443
10:00	6	291	42	2	15	1	0	1	0	0	0	0	0	358
11:00	2	277	46	3	18	2	0	4	0	0	0	0	0	352
12:00 PM	4	413	59	2	14	1	0	2	0	0	0	0	0	495
13:00	6	368	49	3	13	1	0	3	0	0	0	0	0	443
14:00	6	378	62	1	11	2	0	3	0	0	0	0	0	463
15:00	3	531	80	2	19	1	0	1	1	0	0	0	0	638
16:00	2	432	59	2	20	1	0	2	0	0	0	0	0	518
17:00	3	375	42	0	7	0	0	0	0	0	0	0	0	427
18:00	5	409	54	1	13	2	0	1	0	0	0	0	0	485
19:00	3	273	38	1	10	0	0	1	0	0	0	0	0	326
20:00	1	154	24	0	7	0	0	0	0	0	0	0	0	186
21:00	0	121	13	0	4	0	0	0	0	0	0	0	0	138
22:00	0	57	6	0	2	0	0	0	0	0	0	0	0	65
23:00	0	32	5	0	1	0	0	0	0	0	0	0	0	38
Totals	**53**	**5785**	**848**	**24**	**224**	**22**		**25**	**2**					**6983**
% of Totals	1%	83%	12%	0%	3%	0%		0%	0%					100%
	20	2242	357	12	103	14	0	12	1	0	0	0	0	2761
% AM	0%	32%	5%	0%	1%	0%		0%	0%					40%
AM Peak Hour	10:00	08:00	08:00	08:00	08:00	09:00		11:00	09:00					08:00
Volume	6	591	90	3	19	4		4	1					710
	33	3543	491	12	121	8	0	13	1	0	0	0	0	4222
% PM	0%	51%	7%	0%	2%	0%		0%	0%					60%
PM Peak Hour	13:00	15:00	15:00	13:00	16:00	14:00		13:00	15:00					15:00
Volume	6	531	80	3	20	2		3	1					638

Directional Peak Periods	AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
All Classes	Volume	%	Volume	%	Volume	%	Volume	%
	1225 ⟷	18%	938 ⟷	13%	945 ⟷	14%	3875 ⟷	55%

Day: TUESDAY
Date: 5/11/10

Classification Report / Prepared by: National Data & Surveying Services
Location: Palo Comado Interchange

City: Agoura Hills
Project #: 10-5193-001

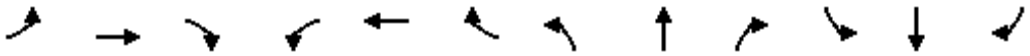
SUMMARY

Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
00:00 AM	0	14	7	0	2	0	0	0	0	0	0	0	0	23
01:00	0	13	1	0	0	0	0	0	0	0	0	0	0	14
02:00	0	7	0	0	0	0	0	0	0	0	0	0	0	7
03:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
04:00	0	26	3	0	1	0	0	0	0	0	0	0	0	30
05:00	0	58	12	0	6	2	0	0	1	0	0	0	0	79
06:00	2	254	47	1	14	3	0	2	0	0	0	0	0	323
07:00	3	529	120	3	25	3	0	3	0	0	0	0	0	686
08:00	3	837	138	5	25	3	0	2	0	0	0	0	0	1013
09:00	6	508	77	1	29	7	0	3	1	0	0	0	0	632
10:00	11	437	67	3	25	1	0	1	1	0	0	0	0	546
11:00	3	457	85	6	33	4	0	8	0	0	0	0	0	596
12:00 PM	6	651	99	3	24	1	0	3	0	0	0	0	0	787
13:00	10	547	74	5	20	1	0	5	0	0	0	0	0	662
14:00	11	559	110	1	16	3	0	5	0	0	0	0	0	705
15:00	3	771	127	3	29	1	0	1	1	0	0	0	0	936
16:00	3	706	107	3	36	1	0	3	0	0	0	0	0	859
17:00	6	713	85	0	11	0	0	0	0	0	0	0	0	815
18:00	8	622	85	1	21	3	0	1	0	0	0	0	0	741
19:00	5	408	60	1	15	0	0	1	0	0	0	0	0	490
20:00	1	245	41	0	12	0	0	0	0	0	0	0	0	299
21:00	0	190	19	0	6	0	0	0	0	0	0	0	0	215
22:00	0	96	10	0	3	0	0	0	0	0	0	0	0	109
23:00	0	45	8	0	1	0	0	0	0	0	0	0	0	54
Totals	**81**	**8698**	**1383**	**36**	**354**	**33**		**38**	**4**					**10627**
% of Totals	1%	82%	13%	0%	3%	0%		0%	0%					100%
	28	3145	558	19	160	23	0	19	3	0	0	0	0	3955
% AM	0%	30%	5%	0%	2%	0%		0%	0%					37%
AM Peak Hour	10:00	08:00	08:00	11:00	11:00	09:00		11:00	05:00					08:00
Volume	11	837	138	6	33	7		8	1					1013
	53	5553	825	17	194	10	0	19	1	0	0	0	0	6672
% PM	0%	52%	8%	0%	2%	0%		0%	0%					63%
PM Peak Hour	14:00	15:00	15:00	13:00	16:00	14:00		13:00	15:00					15:00
Volume	11	771	127	5	36	3		5	1					936

Peak Period Totals	AM 7-9		NOON 12-2		PM 4-6		Off Peak Volumes	
	Volume	%	Volume	%	Volume	%	Volume	%
	1699 ⟷	16%	1449 ⟷	14%	1674 ⟷	16%	5805 ⟷	55%

Kimley-Horn
and Associates, Inc.

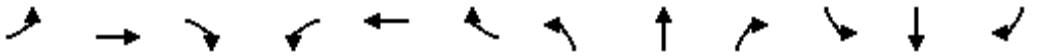
Appendix B – Technical Worksheets - Existing Conditions



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	10	502	9	150	502	25	12	5	143	37	5	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	546	10	163	546	27	13	5	155	40	5	22

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total (vph)	566	163	573	18	155	67
Volume Left (vph)	11	163	0	13	0	40
Volume Right (vph)	10	0	27	0	155	22
Hadj (s)	0.03	0.53	0.00	0.39	-0.67	-0.04
Departure Headway (s)	6.5	6.8	6.3	8.3	7.3	8.3
Degree Utilization, x	1.02	0.31	0.99	0.04	0.31	0.16
Capacity (veh/h)	548	524	573	423	485	415
Control Delay (s)	69.8	11.6	59.8	10.5	12.3	12.8
Approach Delay (s)	69.8	49.1		12.1		12.8
Approach LOS	F	E		B		B

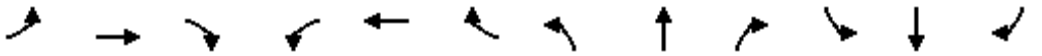
Intersection Summary				
Delay	50.9			
HCM Level of Service	F			
Intersection Capacity Utilization	75.7%	ICU Level of Service		D
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	165	2	424	58	246	0	0	554	125
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	179	2	461	63	267	0	0	602	136
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1458	996	602	996	1132	267	738			267		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1458	996	602	996	1132	267	738			267		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	15	99	40	93			100		
cM capacity (veh/h)	40	227	499	211	188	771	868			1296		

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	179	463	330	602	136
Volume Left	179	0	63	0	0
Volume Right	0	461	0	0	136
cSH	211	760	868	1700	1700
Volume to Capacity	0.85	0.61	0.07	0.35	0.08
Queue Length 95th (ft)	161	105	6	0	0
Control Delay (s)	75.9	16.8	2.5	0.0	0.0
Lane LOS	F	C	A		
Approach Delay (s)	33.3		2.5	0.0	
Approach LOS	D				

Intersection Summary				
Average Delay	13.0			
Intersection Capacity Utilization	81.7%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	79	17	23	16	16	29	90	395	30	30	240	92
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	86	18	25	17	17	32	98	429	33	33	261	100

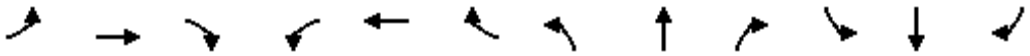
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	129	66	560	293	100
Volume Left (vph)	86	17	98	33	0
Volume Right (vph)	25	32	33	0	100
Hadj (s)	0.05	-0.20	0.03	0.09	-0.67
Departure Headway (s)	6.5	6.4	5.2	5.9	5.1
Degree Utilization, x	0.23	0.12	0.81	0.48	0.14
Capacity (veh/h)	508	497	675	588	669
Control Delay (s)	11.4	10.3	27.0	13.0	7.8
Approach Delay (s)	11.4	10.3	27.0	11.7	
Approach LOS	B	B	D	B	

Intersection Summary				
Delay	19.1			
HCM Level of Service	C			
Intersection Capacity Utilization	65.2%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	212	13	45	1	2	1	23	169	2	1	204	476
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	230	14	49	1	2	1	25	184	2	1	222	517
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	460	460	222	490	976	185	739			186		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	460	460	222	490	976	185	739			186		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	54	97	94	100	99	100	97			100		
cM capacity (veh/h)	496	483	818	439	244	857	867			1389		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	293	4	25	186	223	517
Volume Left	230	1	25	0	1	0
Volume Right	49	1	0	2	0	517
cSH	594	343	867	1700	1389	1700
Volume to Capacity	0.49	0.01	0.03	0.11	0.00	0.30
Queue Length 95th (ft)	68	1	2	0	0	0
Control Delay (s)	17.6	15.6	9.3	0.0	0.0	0.0
Lane LOS	C	C	A		A	
Approach Delay (s)	17.6	15.6	1.1		0.0	
Approach LOS	C	C				

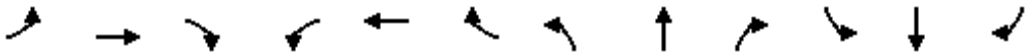
Intersection Summary				
Average Delay	4.4			
Intersection Capacity Utilization	51.8%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	68	54	1	3	82	100	0	10	2	130	6	121
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	74	59	1	3	89	109	0	11	2	141	7	132

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	133	1	92	109	13	279
Volume Left (vph)	74	0	3	0	0	141
Volume Right (vph)	0	1	0	109	2	132
Hadj (s)	0.31	-0.67	0.05	-0.67	-0.07	-0.15
Departure Headway (s)	5.8	4.8	5.4	4.7	5.0	4.6
Degree Utilization, x	0.21	0.00	0.14	0.14	0.02	0.36
Capacity (veh/h)	587	702	622	716	647	739
Control Delay (s)	9.1	6.6	8.1	7.3	8.1	10.1
Approach Delay (s)	9.1		7.7		8.1	10.1
Approach LOS	A		A		A	B

Intersection Summary				
Delay	9.1			
HCM Level of Service	A			
Intersection Capacity Utilization	41.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	13	216	5	151	538	27	17	3	192	41	4	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	235	5	164	585	29	18	3	209	45	4	16

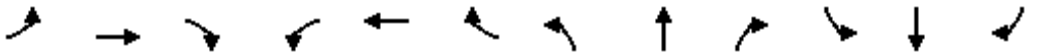
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total (vph)	254	164	614	22	209	65
Volume Left (vph)	14	164	0	18	0	45
Volume Right (vph)	5	0	29	0	209	16
Hadj (s)	0.03	0.53	0.00	0.46	-0.67	0.02
Departure Headway (s)	6.6	6.5	6.0	7.7	6.6	7.6
Degree Utilization, x	0.46	0.30	1.02	0.05	0.38	0.14
Capacity (veh/h)	530	542	603	450	527	440
Control Delay (s)	15.1	11.0	63.9	9.9	12.4	11.9
Approach Delay (s)	15.1	52.8		12.2		11.9
Approach LOS	C	F		B		B

Intersection Summary				
Delay	36.5			
HCM Level of Service	E			
Intersection Capacity Utilization	62.4%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	184	31	515	127	202	0	0	329	120
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	200	34	560	138	220	0	0	358	130
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1430	853	358	853	984	220	488			220		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1430	853	358	853	984	220	488			220		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	20	84	32	87			100		
cM capacity (veh/h)	28	258	687	252	217	820	1075			1350		

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	200	593	358	358	130
Volume Left	200	0	138	0	0
Volume Right	0	560	0	0	130
cSH	252	708	1075	1700	1700
Volume to Capacity	0.80	0.84	0.13	0.21	0.08
Queue Length 95th (ft)	150	235	11	0	0
Control Delay (s)	58.3	30.6	4.2	0.0	0.0
Lane LOS	F	D	A		
Approach Delay (s)	37.6		4.2	0.0	
Approach LOS	E				

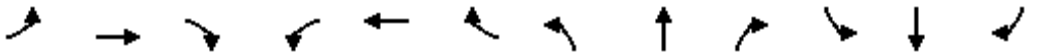
Intersection Summary				
Average Delay	19.1			
Intersection Capacity Utilization	78.4%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	59	29	52	34	38	30	36	341	18	26	106	71
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	64	32	57	37	41	33	39	371	20	28	115	77

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	152	111	429	143	77
Volume Left (vph)	64	37	39	28	0
Volume Right (vph)	57	33	20	0	77
Hadj (s)	-0.10	-0.08	0.02	0.13	-0.67
Departure Headway (s)	5.7	5.8	5.1	5.9	5.1
Degree Utilization, x	0.24	0.18	0.61	0.24	0.11
Capacity (veh/h)	564	544	673	569	652
Control Delay (s)	10.5	10.1	15.9	9.6	7.6
Approach Delay (s)	10.5	10.1	15.9	8.9	
Approach LOS	B	B	C	A	

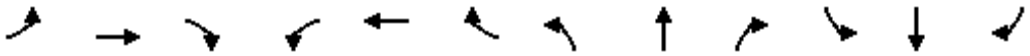
Intersection Summary				
Delay	12.6			
HCM Level of Service	B			
Intersection Capacity Utilization	45.9%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	142	2	29	1	5	0	48	158	0	2	266	340
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	154	2	32	1	5	0	52	172	0	2	289	370
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	572	570	289	586	939	172	659			172		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	572	570	289	586	939	172	659			172		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	62	99	96	100	98	100	94			100		
cM capacity (veh/h)	405	407	750	384	249	872	929			1405		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	188	7	52	172	291	370
Volume Left	154	1	52	0	2	0
Volume Right	32	0	0	0	0	370
cSH	487	264	929	1700	1405	1700
Volume to Capacity	0.39	0.02	0.06	0.10	0.00	0.22
Queue Length 95th (ft)	45	2	4	0	0	0
Control Delay (s)	17.8	19.0	9.1	0.0	0.1	0.0
Lane LOS	C	C	A		A	
Approach Delay (s)	17.8	19.0	2.1		0.0	
Approach LOS	C	C				

Intersection Summary				
Average Delay	3.7			
Intersection Capacity Utilization	47.1%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	105	117	1	0	202	80	2	11	1	138	2	158
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	114	127	1	0	220	87	2	12	1	150	2	172

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	241	1	220	87	15	324
Volume Left (vph)	114	0	0	0	2	150
Volume Right (vph)	0	1	0	87	1	172
Hadj (s)	0.27	-0.67	0.03	-0.67	0.02	-0.19
Departure Headway (s)	6.1	5.2	5.9	5.1	6.0	5.2
Degree Utilization, x	0.41	0.00	0.36	0.12	0.03	0.47
Capacity (veh/h)	556	648	583	658	510	653
Control Delay (s)	12.2	7.0	10.9	7.7	9.1	12.6
Approach Delay (s)	12.2		10.0		9.1	12.6
Approach LOS	B		A		A	B

Intersection Summary				
Delay	11.5			
HCM Level of Service	B			
Intersection Capacity Utilization	56.7%	ICU Level of Service	B	
Analysis Period (min)	15			

Kimley-Horn
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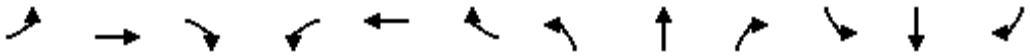
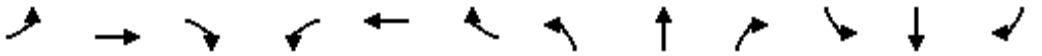
Appendix C – Technical Worksheets – Opening Year Conditions



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	10	525	9	157	525	26	13	5	149	39	5	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	571	10	171	571	28	14	5	162	42	5	23

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total (vph)	591	171	599	20	162	71
Volume Left (vph)	11	171	0	14	0	42
Volume Right (vph)	10	0	28	0	162	23
Hadj (s)	0.03	0.53	0.00	0.40	-0.67	-0.04
Departure Headway (s)	6.5	6.8	6.3	8.4	7.3	8.4
Degree Utilization, x	1.07	0.32	1.05	0.05	0.33	0.16
Capacity (veh/h)	549	520	577	421	484	413
Control Delay (s)	82.4	11.9	74.8	10.5	12.6	13.0
Approach Delay (s)	82.4	60.9		12.4		13.0
Approach LOS	F	F		B		B

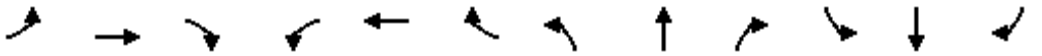
Intersection Summary				
Delay	61.2			
HCM Level of Service	F			
Intersection Capacity Utilization	78.3%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	179	2	460	63	267	0	0	601	136
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	195	2	500	68	290	0	0	653	148
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1582	1080	653	1080	1228	290	801			290		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1582	1080	653	1080	1228	290	801			290		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	0	99	33	92			100		
cM capacity (veh/h)	27	200	467	183	163	749	822			1272		

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	195	502	359	653	148
Volume Left	195	0	68	0	0
Volume Right	0	500	0	0	148
cSH	183	737	822	1700	1700
Volume to Capacity	1.06	0.68	0.08	0.38	0.09
Queue Length 95th (ft)	232	135	7	0	0
Control Delay (s)	136.7	19.6	2.7	0.0	0.0
Lane LOS	F	C	A		
Approach Delay (s)	52.3		2.7	0.0	
Approach LOS	F				

Intersection Summary			
Average Delay	20.2		
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	83	18	24	17	17	30	94	413	31	31	251	96
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	90	20	26	18	18	33	102	449	34	34	273	104

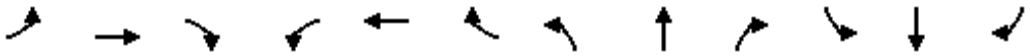
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	136	70	585	307	104
Volume Left (vph)	90	18	102	34	0
Volume Right (vph)	26	33	34	0	104
Hadj (s)	0.05	-0.19	0.03	0.09	-0.67
Departure Headway (s)	6.6	6.6	5.3	6.0	5.2
Degree Utilization, x	0.25	0.13	0.87	0.51	0.15
Capacity (veh/h)	504	491	667	578	655
Control Delay (s)	11.8	10.6	32.7	13.9	8.0
Approach Delay (s)	11.8	10.6	32.7	12.4	
Approach LOS	B	B	D	B	

Intersection Summary				
Delay	22.1			
HCM Level of Service	C			
Intersection Capacity Utilization	67.4%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	222	14	47	1	2	1	24	177	2	1	213	497
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	241	15	51	1	2	1	26	192	2	1	232	540
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	480	480	232	512	1020	193	772			195		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	480	480	232	512	1020	193	772			195		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	50	97	94	100	99	100	97			100		
cM capacity (veh/h)	480	470	808	421	229	848	843			1379		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	308	4	26	195	233	540
Volume Left	241	1	26	0	1	0
Volume Right	51	1	0	2	0	540
cSH	575	326	843	1700	1379	1700
Volume to Capacity	0.54	0.01	0.03	0.11	0.00	0.32
Queue Length 95th (ft)	79	1	2	0	0	0
Control Delay (s)	19.0	16.2	9.4	0.0	0.0	0.0
Lane LOS	C	C	A		A	
Approach Delay (s)	19.0	16.2	1.1		0.0	
Approach LOS	C	C				

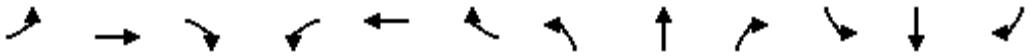
Intersection Summary				
Average Delay	4.7			
Intersection Capacity Utilization	53.5%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	71	56	1	3	86	105	0	10	2	136	6	126
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	77	61	1	3	93	114	0	11	2	148	7	137

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	138	1	97	114	13	291
Volume Left (vph)	77	0	3	0	0	148
Volume Right (vph)	0	1	0	114	2	137
Hadj (s)	0.31	-0.67	0.05	-0.67	-0.07	-0.15
Departure Headway (s)	5.8	4.8	5.5	4.8	5.1	4.6
Degree Utilization, x	0.22	0.00	0.15	0.15	0.02	0.38
Capacity (veh/h)	581	694	616	709	636	733
Control Delay (s)	9.3	6.6	8.2	7.4	8.2	10.4
Approach Delay (s)	9.3		7.8		8.2	10.4
Approach LOS	A		A		A	B

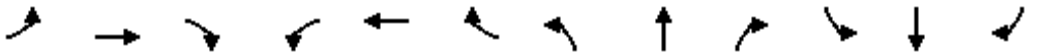
Intersection Summary				
Delay	9.3			
HCM Level of Service	A			
Intersection Capacity Utilization	42.4%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	14	226	5	158	562	28	18	3	201	43	4	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	246	5	172	611	30	20	3	218	47	4	17

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total (vph)	266	172	641	23	218	68
Volume Left (vph)	15	172	0	20	0	47
Volume Right (vph)	5	0	30	0	218	17
Hadj (s)	0.03	0.53	0.00	0.46	-0.67	0.02
Departure Headway (s)	6.6	6.6	6.0	7.8	6.7	7.7
Degree Utilization, x	0.49	0.31	1.08	0.05	0.40	0.15
Capacity (veh/h)	525	536	604	447	523	434
Control Delay (s)	15.8	11.4	81.7	10.0	12.9	12.0
Approach Delay (s)	15.8	66.9		12.6		12.0
Approach LOS	C	F		B		B

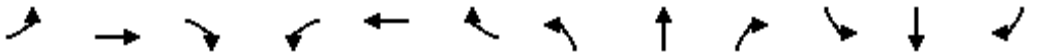
Intersection Summary				
Delay	44.9			
HCM Level of Service	E			
Intersection Capacity Utilization	64.5%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	203	34	568	140	223	0	0	363	132
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	221	37	617	152	242	0	0	395	143
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1577	941	395	941	1085	242	538			242		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1577	941	395	941	1085	242	538			242		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	0	80	22	85			100		
cM capacity (veh/h)	15	224	655	216	185	796	1030			1324		

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	221	654	395	395	143
Volume Left	221	0	152	0	0
Volume Right	0	617	0	0	143
cSH	216	671	1030	1700	1700
Volume to Capacity	1.02	0.98	0.15	0.23	0.08
Queue Length 95th (ft)	235	367	13	0	0
Control Delay (s)	114.7	53.7	4.5	0.0	0.0
Lane LOS	F	F	A		
Approach Delay (s)	69.1		4.5	0.0	
Approach LOS	F				

Intersection Summary			
Average Delay	34.4		
Intersection Capacity Utilization	85.5%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	62	30	54	36	40	31	38	356	19	27	111	74
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	67	33	59	39	43	34	41	387	21	29	121	80

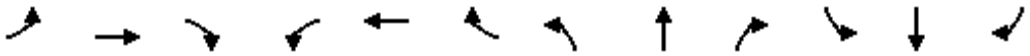
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	159	116	449	150	80
Volume Left (vph)	67	39	41	29	0
Volume Right (vph)	59	34	21	0	80
Hadj (s)	-0.10	-0.07	0.02	0.13	-0.67
Departure Headway (s)	5.8	5.9	5.2	6.0	5.2
Degree Utilization, x	0.26	0.19	0.65	0.25	0.12
Capacity (veh/h)	552	530	665	559	639
Control Delay (s)	10.8	10.3	17.4	9.8	7.7
Approach Delay (s)	10.8	10.3	17.4	9.1	
Approach LOS	B	B	C	A	

Intersection Summary				
Delay	13.4			
HCM Level of Service	B			
Intersection Capacity Utilization	47.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	148	2	30	1	5	0	50	165	0	2	278	355
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	161	2	33	1	5	0	54	179	0	2	302	386
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	597	595	302	612	980	179	688			179		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	597	595	302	612	980	179	688			179		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	59	99	96	100	98	100	94			100		
cM capacity (veh/h)	388	392	737	368	234	863	906			1396		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	196	7	54	179	304	386
Volume Left	161	1	54	0	2	0
Volume Right	33	0	0	0	0	386
cSH	466	249	906	1700	1396	1700
Volume to Capacity	0.42	0.03	0.06	0.11	0.00	0.23
Queue Length 95th (ft)	51	2	5	0	0	0
Control Delay (s)	19.0	19.8	9.2	0.0	0.1	0.0
Lane LOS	C	C	A		A	
Approach Delay (s)	19.0	19.8	2.1		0.0	
Approach LOS	C	C				

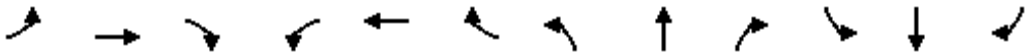
Intersection Summary				
Average Delay	3.9			
Intersection Capacity Utilization	48.4%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	110	122	1	0	211	84	2	11	1	144	2	165
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	120	133	1	0	229	91	2	12	1	157	2	179

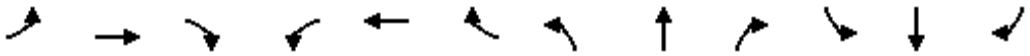
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	252	1	229	91	15	338
Volume Left (vph)	120	0	0	0	2	157
Volume Right (vph)	0	1	0	91	1	179
Hadj (s)	0.27	-0.67	0.03	-0.67	0.02	-0.19
Departure Headway (s)	6.2	5.3	5.9	5.2	6.1	5.3
Degree Utilization, x	0.44	0.00	0.38	0.13	0.03	0.49
Capacity (veh/h)	548	637	575	647	496	644
Control Delay (s)	12.8	7.1	11.3	7.8	9.3	13.3
Approach Delay (s)	12.7		10.3		9.3	13.3
Approach LOS	B		B		A	B

Intersection Summary				
Delay	12.0			
HCM Level of Service	B			
Intersection Capacity Utilization	58.5%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	179	2	460	63	267	0	0	601	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor				0.95	0.95	1.00	1.00	0.95			0.95	
Frt				1.00	1.00	0.85	1.00	1.00			0.97	
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1665	1671	1568	1752	3505			3408	
Flt Permitted				0.95	0.95	1.00	0.31	1.00			1.00	
Satd. Flow (perm)				1665	1671	1568	570	3505			3408	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	195	2	500	68	290	0	0	653	148
RTOR Reduction (vph)	0	0	0	0	0	315	0	0	0	0	31	0
Lane Group Flow (vph)	0	0	0	97	100	185	68	290	0	0	770	0
Turn Type				Perm		Perm	Perm					
Protected Phases					8			2			6	
Permitted Phases				8		8	2					
Actuated Green, G (s)				10.9	10.9	10.9	15.5	15.5			15.5	
Effective Green, g (s)				10.9	10.9	10.9	15.5	15.5			15.5	
Actuated g/C Ratio				0.32	0.32	0.32	0.45	0.45			0.45	
Clearance Time (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)				528	529	497	257	1579			1536	
v/s Ratio Prot								0.08			c0.23	
v/s Ratio Perm				0.06	0.06	c0.12	0.12					
v/c Ratio				0.18	0.19	0.37	0.26	0.18			0.50	
Uniform Delay, d1				8.5	8.5	9.1	5.9	5.7			6.7	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				0.2	0.2	0.5	0.6	0.1			0.3	
Delay (s)				8.7	8.7	9.6	6.4	5.7			7.0	
Level of Service				A	A	A	A	A			A	
Approach Delay (s)		0.0			9.3			5.9			7.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	7.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	34.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	42.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

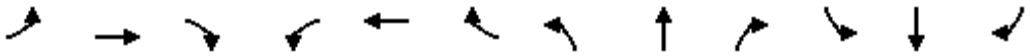


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	203	34	568	140	223	0	0	363	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor				0.95	0.95	1.00	1.00	0.95			0.95	
Frt				1.00	1.00	0.85	1.00	1.00			0.96	
Flt Protected				0.95	0.97	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1665	1692	1568	1752	3505			3365	
Flt Permitted				0.95	0.97	1.00	0.45	1.00			1.00	
Satd. Flow (perm)				1665	1692	1568	833	3505			3365	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	221	37	617	152	242	0	0	395	143
RTOR Reduction (vph)	0	0	0	0	0	331	0	0	0	0	66	0
Lane Group Flow (vph)	0	0	0	128	130	286	152	242	0	0	472	0
Turn Type				Perm		Perm	Perm					
Protected Phases					8			2			6	
Permitted Phases				8		8	2					
Actuated Green, G (s)				12.9	12.9	12.9	13.2	13.2			13.2	
Effective Green, g (s)				12.9	12.9	12.9	13.2	13.2			13.2	
Actuated g/C Ratio				0.38	0.38	0.38	0.39	0.39			0.39	
Clearance Time (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)				630	640	593	322	1357			1303	
v/s Ratio Prot								0.07			0.14	
v/s Ratio Perm				0.08	0.08	c0.18	c0.18					
v/c Ratio				0.20	0.20	0.48	0.47	0.18			0.36	
Uniform Delay, d1				7.1	7.1	8.1	7.8	6.9			7.4	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				0.2	0.2	0.6	1.1	0.1			0.2	
Delay (s)				7.3	7.3	8.7	8.9	6.9			7.6	
Level of Service				A	A	A	A	A			A	
Approach Delay (s)		0.0			8.3			7.7			7.6	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	8.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	34.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Kimley-Horn and Associates, Inc.

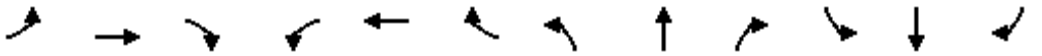
Appendix D – Technical Worksheets – Build-out Year Conditions



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	12	600	11	195	600	30	22	6	233	44	6	24
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	652	12	212	652	33	24	7	253	48	7	26

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total (vph)	677	212	685	30	253	80
Volume Left (vph)	13	212	0	24	0	48
Volume Right (vph)	12	0	33	0	253	26
Hadj (s)	0.03	0.53	0.00	0.43	-0.67	-0.04
Departure Headway (s)	7.0	7.4	6.9	8.5	7.4	8.9
Degree Utilization, x	1.32	0.44	1.31	0.07	0.52	0.20
Capacity (veh/h)	502	481	534	416	481	390
Control Delay (s)	179.6	14.8	171.9	10.9	16.9	14.0
Approach Delay (s)	179.6	134.7		16.2		14.0
Approach LOS	F	F		C		B

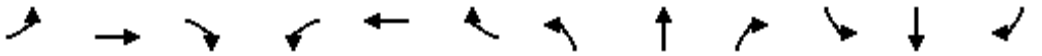
Intersection Summary				
Delay	128.1			
HCM Level of Service	F			
Intersection Capacity Utilization	87.2%	ICU Level of Service	E	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	290	2	526	84	338	0	0	687	155
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	315	2	572	91	367	0	0	747	168
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1870	1297	747	1297	1465	367	915			367		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1870	1297	747	1297	1465	367	915			367		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	0	98	16	88			100		
cM capacity (veh/h)	8	142	413	126	112	678	745			1191		

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	315	574	459	747	168
Volume Left	315	0	91	0	0
Volume Right	0	572	0	0	168
cSH	126	665	745	1700	1700
Volume to Capacity	2.50	0.86	0.12	0.44	0.10
Queue Length 95th (ft)	698	251	10	0	0
Control Delay (s)	755.4	34.8	3.4	0.0	0.0
Lane LOS	F	D	A		
Approach Delay (s)	290.3		3.4	0.0	
Approach LOS	F				

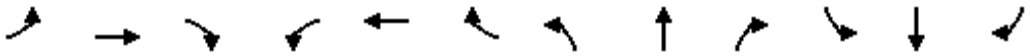
Intersection Summary				
Average Delay	114.7			
Intersection Capacity Utilization	101.3%	ICU Level of Service	G	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	94	20	27	19	19	35	108	472	36	36	287	110
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	102	22	29	21	21	38	117	513	39	39	312	120

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	153	79	670	351	120
Volume Left (vph)	102	21	117	39	0
Volume Right (vph)	29	38	39	0	120
Hadj (s)	0.05	-0.20	0.03	0.09	-0.67
Departure Headway (s)	7.0	7.0	5.6	6.2	5.5
Degree Utilization, x	0.30	0.15	1.04	0.61	0.18
Capacity (veh/h)	492	474	649	560	641
Control Delay (s)	12.9	11.3	70.6	17.2	8.5
Approach Delay (s)	12.9	11.3	70.6	15.0	
Approach LOS	B	B	F	C	

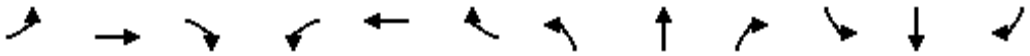
Intersection Summary				
Delay	41.7			
HCM Level of Service	E			
Intersection Capacity Utilization	74.7%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	275	16	98	1	2	3	27	244	2	2	290	569
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	299	17	107	1	2	3	29	265	2	2	315	618
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	648	646	315	707	1263	266	934			267		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	648	646	315	707	1263	266	934			267		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	18	95	85	100	99	100	96			100		
cM capacity (veh/h)	366	374	725	279	163	772	733			1296		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	423	7	29	267	317	618
Volume Left	299	1	29	0	2	0
Volume Right	107	3	0	2	0	618
cSH	442	304	733	1700	1296	1700
Volume to Capacity	0.96	0.02	0.04	0.16	0.00	0.36
Queue Length 95th (ft)	286	2	3	0	0	0
Control Delay (s)	63.2	17.1	10.1	0.0	0.1	0.0
Lane LOS	F	C	B		A	
Approach Delay (s)	63.2	17.1	1.0		0.0	
Approach LOS	F	C				

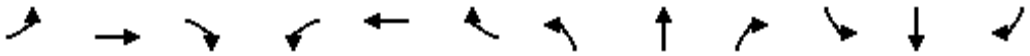
Intersection Summary				
Average Delay	16.3			
Intersection Capacity Utilization	61.5%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	124	96	1	4	114	142	0	14	2	175	7	210
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	135	104	1	4	124	154	0	15	2	190	8	228

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	239	1	128	154	17	426
Volume Left (vph)	135	0	4	0	0	190
Volume Right (vph)	0	1	0	154	2	228
Hadj (s)	0.32	-0.67	0.05	-0.67	-0.04	-0.20
Departure Headway (s)	6.5	5.5	6.2	5.5	6.1	5.2
Degree Utilization, x	0.43	0.00	0.22	0.24	0.03	0.61
Capacity (veh/h)	523	608	540	610	499	666
Control Delay (s)	13.1	7.3	9.8	9.0	9.3	15.9
Approach Delay (s)	13.1		9.3		9.3	15.9
Approach LOS	B		A		A	C

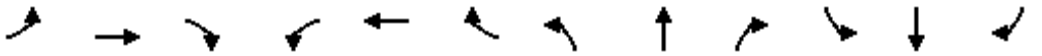
Intersection Summary				
Delay	13.2			
HCM Level of Service	B			
Intersection Capacity Utilization	54.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	16	258	10	245	643	32	35	4	323	49	5	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	280	11	266	699	35	38	4	351	53	5	20

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total (vph)	309	266	734	42	351	78
Volume Left (vph)	17	266	0	38	0	53
Volume Right (vph)	11	0	35	0	351	20
Hadj (s)	0.02	0.53	0.00	0.48	-0.67	0.02
Departure Headway (s)	7.3	7.4	6.9	8.1	7.0	8.5
Degree Utilization, x	0.63	0.55	1.41	0.10	0.68	0.18
Capacity (veh/h)	475	477	534	433	500	375
Control Delay (s)	22.0	18.0	212.5	10.8	22.2	13.4
Approach Delay (s)	22.0	160.7		21.0		13.4
Approach LOS	C	F		C		B

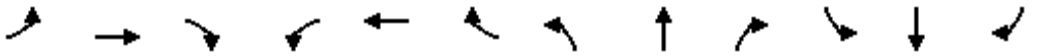
Intersection Summary				
Delay	99.3			
HCM Level of Service	F			
Intersection Capacity Utilization	71.6%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	232	39	668	160	272	0	15	415	164
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	252	42	726	174	296	0	16	451	178
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1874	1127	451	1127	1305	296	629			296		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1874	1127	451	1127	1305	296	629			296		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	0	67	2	82			99		
cM capacity (veh/h)	1	165	608	155	129	744	953			1266		

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	252	768	470	467	178
Volume Left	252	0	174	16	0
Volume Right	0	726	0	0	178
cSH	155	589	953	1266	1700
Volume to Capacity	1.63	1.30	0.18	0.01	0.10
Queue Length 95th (ft)	439	789	17	1	0
Control Delay (s)	362.8	170.7	4.9	0.4	0.0
Lane LOS	F	F	A	A	
Approach Delay (s)	218.2		4.9	0.3	
Approach LOS	F				

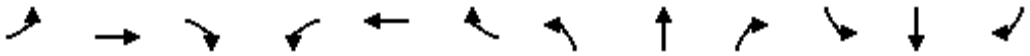
Intersection Summary				
Average Delay	105.4			
Intersection Capacity Utilization	99.2%	ICU Level of Service	F	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	71	35	70	41	45	36	46	457	30	31	163	85
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	77	38	76	45	49	39	50	497	33	34	177	92

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total (vph)	191	133	579	211	92
Volume Left (vph)	77	45	50	34	0
Volume Right (vph)	76	39	33	0	92
Hadj (s)	-0.12	-0.08	0.02	0.11	-0.67
Departure Headway (s)	6.6	6.8	5.7	6.6	5.8
Degree Utilization, x	0.35	0.25	0.92	0.39	0.15
Capacity (veh/h)	514	489	620	522	587
Control Delay (s)	13.1	12.1	41.6	12.6	8.7
Approach Delay (s)	13.1	12.1	41.6	11.4	
Approach LOS	B	B	E	B	

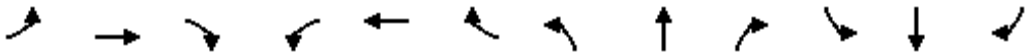
Intersection Summary				
Delay	26.3			
HCM Level of Service	D			
Intersection Capacity Utilization	62.9%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	188	2	35	1	6	2	57	210	0	2	346	438
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	204	2	38	1	7	2	62	228	0	2	376	476
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	738	733	376	753	1209	228	852			228		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	738	733	376	753	1209	228	852			228		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	33	99	94	100	96	100	92			100		
cM capacity (veh/h)	303	320	670	287	168	811	787			1340		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	245	10	62	228	378	476
Volume Left	204	1	62	0	2	0
Volume Right	38	2	0	0	0	476
cSH	350	216	787	1700	1340	1700
Volume to Capacity	0.70	0.05	0.08	0.13	0.00	0.28
Queue Length 95th (ft)	126	4	6	0	0	0
Control Delay (s)	36.0	22.4	10.0	0.0	0.1	0.0
Lane LOS	E	C	A		A	
Approach Delay (s)	36.0	22.4	2.1		0.0	
Approach LOS	E	C				

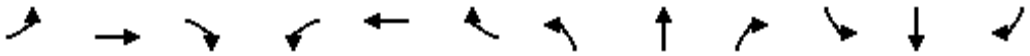
Intersection Summary				
Average Delay	6.9			
Intersection Capacity Utilization	56.6%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	160	202	1	0	313	122	2	15	1	196	3	225
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	174	220	1	0	340	133	2	16	1	213	3	245

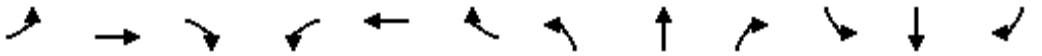
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	393	1	340	133	20	461
Volume Left (vph)	174	0	0	0	2	213
Volume Right (vph)	0	1	0	133	1	245
Hadj (s)	0.25	-0.67	0.03	-0.67	0.02	-0.19
Departure Headway (s)	7.3	6.4	7.1	6.4	8.0	6.3
Degree Utilization, x	0.80	0.00	0.67	0.23	0.04	0.80
Capacity (veh/h)	475	541	482	540	378	557
Control Delay (s)	32.3	8.2	22.1	10.1	11.4	29.7
Approach Delay (s)	32.2		18.7		11.4	29.7
Approach LOS	D		C		B	D

Intersection Summary				
Delay	26.3			
HCM Level of Service	D			
Intersection Capacity Utilization	77.4%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	290	2	526	84	338	0	0	687	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor				0.95	0.95	1.00	1.00	0.95			0.95	
Frt				1.00	1.00	0.85	1.00	1.00			0.97	
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1665	1670	1568	1752	3505			3408	
Flt Permitted				0.95	0.95	1.00	0.24	1.00			1.00	
Satd. Flow (perm)				1665	1670	1568	436	3505			3408	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	315	2	572	91	367	0	0	747	168
RTOR Reduction (vph)	0	0	0	0	0	232	0	0	0	0	32	0
Lane Group Flow (vph)	0	0	0	157	160	340	91	367	0	0	883	0
Turn Type				Perm		Perm	Perm					
Protected Phases					8			2			6	
Permitted Phases				8		8	2					
Actuated Green, G (s)				15.2	15.2	15.2	18.5	18.5			18.5	
Effective Green, g (s)				15.2	15.2	15.2	18.5	18.5			18.5	
Actuated g/C Ratio				0.36	0.36	0.36	0.44	0.44			0.44	
Clearance Time (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)				607	609	572	193	1555			1512	
v/s Ratio Prot								0.10			c0.26	
v/s Ratio Perm				0.09	0.10	c0.22	0.21					
v/c Ratio				0.26	0.26	0.59	0.47	0.24			0.58	
Uniform Delay, d1				9.3	9.3	10.7	8.2	7.2			8.7	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				0.2	0.2	1.7	1.8	0.1			0.6	
Delay (s)				9.5	9.5	12.4	10.0	7.3			9.3	
Level of Service				A	A	B	A	A			A	
Approach Delay (s)		0.0			11.4			7.8			9.3	
Approach LOS		A			B			A			A	

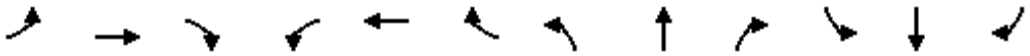
Intersection Summary			
HCM Average Control Delay	9.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	41.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	48.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	94	20	27	19	19	35	108	472	36	36	287	110
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	102	22	29	21	21	38	117	513	39	39	312	120

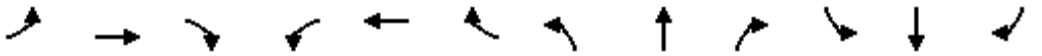
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	153	79	117	552	351	120
Volume Left (vph)	102	21	117	0	39	0
Volume Right (vph)	29	38	0	39	0	120
Hadj (s)	0.07	-0.18	0.55	0.00	0.11	-0.65
Departure Headway (s)	6.9	6.9	6.6	6.0	6.4	5.6
Degree Utilization, x	0.29	0.15	0.21	0.92	0.62	0.19
Capacity (veh/h)	494	476	534	592	540	620
Control Delay (s)	12.7	11.2	10.2	43.7	18.3	8.7
Approach Delay (s)	12.7	11.2	37.8		15.8	
Approach LOS	B	B	E		C	

Intersection Summary				
Delay	26.0			
HCM Level of Service	D			
Intersection Capacity Utilization	68.7%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	232	39	668	160	272	0	15	415	164
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor				0.95	0.95	1.00	1.00	0.95			0.95	
Frt				1.00	1.00	0.85	1.00	1.00			0.96	
Flt Protected				0.95	0.97	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1665	1692	1568	1752	3505			3356	
Flt Permitted				0.95	0.97	1.00	0.36	1.00			0.95	
Satd. Flow (perm)				1665	1692	1568	660	3505			3175	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	252	42	726	174	296	0	16	451	178
RTOR Reduction (vph)	0	0	0	0	0	264	0	0	0	0	70	0
Lane Group Flow (vph)	0	0	0	146	148	462	174	296	0	0	575	0
Turn Type				Perm		Perm	Perm			Perm		
Protected Phases					8			2			6	
Permitted Phases				8		8	2			6		
Actuated Green, G (s)				18.4	18.4	18.4	17.8	17.8			17.8	
Effective Green, g (s)				18.4	18.4	18.4	17.8	17.8			17.8	
Actuated g/C Ratio				0.42	0.42	0.42	0.40	0.40			0.40	
Clearance Time (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)				693	704	653	266	1412			1279	
v/s Ratio Prot								0.08				
v/s Ratio Perm				0.09	0.09	c0.29	c0.26				0.18	
v/c Ratio				0.21	0.21	0.71	0.65	0.21			0.45	
Uniform Delay, d1				8.3	8.3	10.7	10.7	8.6			9.6	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				0.2	0.1	3.5	5.7	0.1			0.3	
Delay (s)				8.4	8.4	14.2	16.4	8.7			9.9	
Level of Service				A	A	B	B	A			A	
Approach Delay (s)		0.0			12.5			11.5			9.9	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM Average Control Delay	11.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	44.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



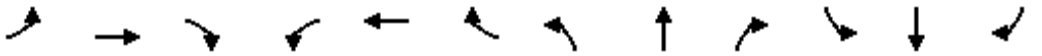
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	71	35	70	41	45	36	46	457	30	31	163	85
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	77	38	76	45	49	39	50	497	33	34	177	92

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	191	133	50	529	211	92
Volume Left (vph)	77	45	50	0	34	0
Volume Right (vph)	76	39	0	33	0	92
Hadj (s)	-0.11	-0.06	0.55	0.01	0.13	-0.65
Departure Headway (s)	6.5	6.8	6.7	6.1	6.7	5.9
Degree Utilization, x	0.35	0.25	0.09	0.90	0.39	0.15
Capacity (veh/h)	516	491	525	580	516	579
Control Delay (s)	13.0	12.0	9.2	40.2	12.7	8.7
Approach Delay (s)	13.0	12.0	37.5		11.5	
Approach LOS	B	B	E		B	

Intersection Summary				
Delay	24.3			
HCM Level of Service	C			
Intersection Capacity Utilization	59.1%	ICU Level of Service	B	
Analysis Period (min)	15			

Kimley-Horn
and Associates, Inc.

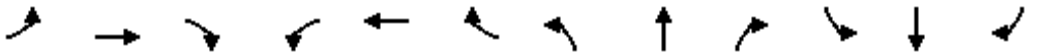
Appendix E – Queuing Analysis Worksheets



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	165	2	424	58	246	0	0	554	125
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.82	0.82	0.82	0.81	0.81	0.81	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	201	2	517	72	304	0	0	616	139
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1581	1062	616	1062	1201	304	754			304		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1581	1062	616	1062	1201	304	754			304		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	0	99	30	92			100		
cM capacity (veh/h)	24	205	491	188	169	736	856			1257		

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	201	520	375	616	139
Volume Left	201	0	72	0	0
Volume Right	0	517	0	0	139
cSH	188	725	856	1700	1700
Volume to Capacity	1.07	0.72	0.08	0.36	0.08
Queue Length 95th (ft)	238	153	7	0	0
Control Delay (s)	136.7	21.5	2.6	0.0	0.0
Lane LOS	F	C	A		
Approach Delay (s)	53.7		2.6	0.0	
Approach LOS	F				

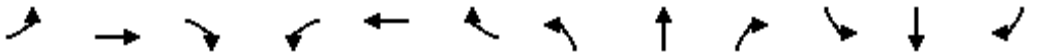
Intersection Summary				
Average Delay	21.4			
Intersection Capacity Utilization	81.7%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	184	31	515	127	202	0	0	329	120
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.74	0.74	0.74	0.71	0.71	0.71	0.70	0.70	0.70
Hourly flow rate (vph)	0	0	0	249	42	696	179	285	0	0	470	171
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1829	1112	470	1112	1284	285	641			285		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1829	1112	470	1112	1284	285	641			285		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	0	69	8	81			100		
cM capacity (veh/h)	3	169	594	159	134	754	943			1278		

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	249	738	463	470	171
Volume Left	249	0	179	0	0
Volume Right	0	696	0	0	171
cSH	159	597	943	1700	1700
Volume to Capacity	1.57	1.24	0.19	0.28	0.10
Queue Length 95th (ft)	419	691	17	0	0
Control Delay (s)	334.1	142.7	5.1	0.0	0.0
Lane LOS	F	F	A		
Approach Delay (s)	190.9		5.1	0.0	
Approach LOS	F				

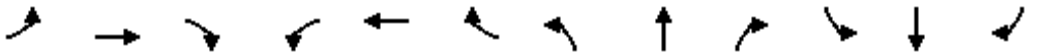
Intersection Summary				
Average Delay	91.2			
Intersection Capacity Utilization	78.4%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	179	2	460	63	267	0	0	601	136
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	195	2	500	68	290	0	0	653	148
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1582	1080	653	1080	1228	290	801			290		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1582	1080	653	1080	1228	290	801			290		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	0	99	33	92			100		
cM capacity (veh/h)	27	200	467	183	163	749	822			1272		

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	195	502	359	653	148
Volume Left	195	0	68	0	0
Volume Right	0	500	0	0	148
cSH	183	737	822	1700	1700
Volume to Capacity	1.06	0.68	0.08	0.38	0.09
Queue Length 95th (ft)	232	135	7	0	0
Control Delay (s)	136.7	19.6	2.7	0.0	0.0
Lane LOS	F	C	A		
Approach Delay (s)	52.3		2.7	0.0	
Approach LOS	F				

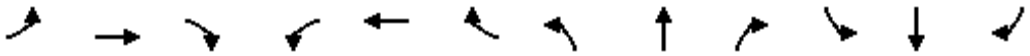
Intersection Summary			
Average Delay	20.2		
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	203	34	568	140	223	0	0	363	132
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	221	37	617	152	242	0	0	395	143
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1577	941	395	941	1085	242	538			242		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1577	941	395	941	1085	242	538			242		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	0	80	22	85			100		
cM capacity (veh/h)	15	224	655	216	185	796	1030			1324		

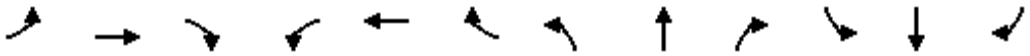
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	221	654	395	395	143
Volume Left	221	0	152	0	0
Volume Right	0	617	0	0	143
cSH	216	671	1030	1700	1700
Volume to Capacity	1.02	0.98	0.15	0.23	0.08
Queue Length 95th (ft)	235	367	13	0	0
Control Delay (s)	114.7	53.7	4.5	0.0	0.0
Lane LOS	F	F	A		
Approach Delay (s)	69.1		4.5	0.0	
Approach LOS	F				

Intersection Summary			
Average Delay	34.4		
Intersection Capacity Utilization	85.5%	ICU Level of Service	E
Analysis Period (min)	15		



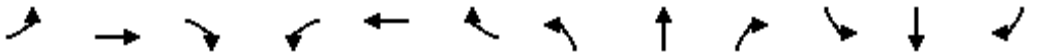
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	179	2	460	63	267	0	0	601	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor				0.95	0.95	1.00	1.00	0.95			0.95	
Frt				1.00	1.00	0.85	1.00	1.00			0.97	
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1665	1671	1568	1752	3505			3408	
Flt Permitted				0.95	0.95	1.00	0.31	1.00			1.00	
Satd. Flow (perm)				1665	1671	1568	570	3505			3408	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	195	2	500	68	290	0	0	653	148
RTOR Reduction (vph)	0	0	0	0	0	315	0	0	0	0	31	0
Lane Group Flow (vph)	0	0	0	97	100	185	68	290	0	0	770	0
Turn Type				Perm		Perm	Perm					
Protected Phases					8			2			6	
Permitted Phases				8		8	2					
Actuated Green, G (s)				10.9	10.9	10.9	15.5	15.5			15.5	
Effective Green, g (s)				10.9	10.9	10.9	15.5	15.5			15.5	
Actuated g/C Ratio				0.32	0.32	0.32	0.45	0.45			0.45	
Clearance Time (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)				528	529	497	257	1579			1536	
v/s Ratio Prot								0.08			c0.23	
v/s Ratio Perm				0.06	0.06	c0.12	0.12					
v/c Ratio				0.18	0.19	0.37	0.26	0.18			0.50	
Uniform Delay, d1				8.5	8.5	9.1	5.9	5.7			6.7	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				0.2	0.2	0.5	0.6	0.1			0.3	
Delay (s)				8.7	8.7	9.6	6.4	5.7			7.0	
Level of Service				A	A	A	A	A			A	
Approach Delay (s)		0.0			9.3			5.9			7.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	7.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	34.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	42.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	203	34	568	140	223	0	0	363	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor				0.95	0.95	1.00	1.00	0.95			0.95	
Frt				1.00	1.00	0.85	1.00	1.00			0.96	
Flt Protected				0.95	0.97	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1665	1692	1568	1752	3505			3365	
Flt Permitted				0.95	0.97	1.00	0.45	1.00			1.00	
Satd. Flow (perm)				1665	1692	1568	833	3505			3365	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	221	37	617	152	242	0	0	395	143
RTOR Reduction (vph)	0	0	0	0	0	331	0	0	0	0	66	0
Lane Group Flow (vph)	0	0	0	128	130	286	152	242	0	0	472	0
Turn Type				Perm		Perm	Perm					
Protected Phases					8			2			6	
Permitted Phases				8		8	2					
Actuated Green, G (s)				12.9	12.9	12.9	13.2	13.2			13.2	
Effective Green, g (s)				12.9	12.9	12.9	13.2	13.2			13.2	
Actuated g/C Ratio				0.38	0.38	0.38	0.39	0.39			0.39	
Clearance Time (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)				630	640	593	322	1357			1303	
v/s Ratio Prot								0.07			0.14	
v/s Ratio Perm				0.08	0.08	c0.18	c0.18					
v/c Ratio				0.20	0.20	0.48	0.47	0.18			0.36	
Uniform Delay, d1				7.1	7.1	8.1	7.8	6.9			7.4	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				0.2	0.2	0.6	1.1	0.1			0.2	
Delay (s)				7.3	7.3	8.7	8.9	6.9			7.6	
Level of Service				A	A	A	A	A			A	
Approach Delay (s)		0.0			8.3			7.7			7.6	
Approach LOS		A			A			A			A	

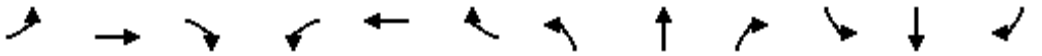
Intersection Summary			
HCM Average Control Delay	8.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	34.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	290	2	526	84	338	0	0	687	155
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	315	2	572	91	367	0	0	747	168
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1870	1297	747	1297	1465	367	915			367		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1870	1297	747	1297	1465	367	915			367		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	0	98	16	88			100		
cM capacity (veh/h)	8	142	413	126	112	678	745			1191		

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	315	574	459	747	168
Volume Left	315	0	91	0	0
Volume Right	0	572	0	0	168
cSH	126	665	745	1700	1700
Volume to Capacity	2.50	0.86	0.12	0.44	0.10
Queue Length 95th (ft)	698	251	10	0	0
Control Delay (s)	755.4	34.8	3.4	0.0	0.0
Lane LOS	F	D	A		
Approach Delay (s)	290.3		3.4	0.0	
Approach LOS	F				

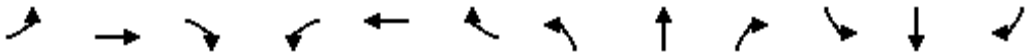
Intersection Summary				
Average Delay	114.7			
Intersection Capacity Utilization	101.3%	ICU Level of Service	G	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	232	39	668	160	272	0	15	415	164
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	252	42	726	174	296	0	16	451	178
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1874	1127	451	1127	1305	296	629			296		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1874	1127	451	1127	1305	296	629			296		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	0	67	2	82			99		
cM capacity (veh/h)	1	165	608	155	129	744	953			1266		

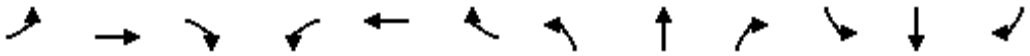
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	252	768	470	467	178
Volume Left	252	0	174	16	0
Volume Right	0	726	0	0	178
cSH	155	589	953	1266	1700
Volume to Capacity	1.63	1.30	0.18	0.01	0.10
Queue Length 95th (ft)	439	789	17	1	0
Control Delay (s)	362.8	170.7	4.9	0.4	0.0
Lane LOS	F	F	A	A	
Approach Delay (s)	218.2		4.9	0.3	
Approach LOS	F				

Intersection Summary				
Average Delay	105.4			
Intersection Capacity Utilization	99.2%	ICU Level of Service	F	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	290	2	526	84	338	0	0	687	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor				0.95	0.95	1.00	1.00	0.95			0.95	
Frt				1.00	1.00	0.85	1.00	1.00			0.97	
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1665	1670	1568	1752	3505			3408	
Flt Permitted				0.95	0.95	1.00	0.24	1.00			1.00	
Satd. Flow (perm)				1665	1670	1568	436	3505			3408	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	315	2	572	91	367	0	0	747	168
RTOR Reduction (vph)	0	0	0	0	0	232	0	0	0	0	32	0
Lane Group Flow (vph)	0	0	0	157	160	340	91	367	0	0	883	0
Turn Type				Perm		Perm	Perm					
Protected Phases					8			2			6	
Permitted Phases				8		8	2					
Actuated Green, G (s)				15.2	15.2	15.2	18.5	18.5			18.5	
Effective Green, g (s)				15.2	15.2	15.2	18.5	18.5			18.5	
Actuated g/C Ratio				0.36	0.36	0.36	0.44	0.44			0.44	
Clearance Time (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)				607	609	572	193	1555			1512	
v/s Ratio Prot								0.10			c0.26	
v/s Ratio Perm				0.09	0.10	c0.22	0.21					
v/c Ratio				0.26	0.26	0.59	0.47	0.24			0.58	
Uniform Delay, d1				9.3	9.3	10.7	8.2	7.2			8.7	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				0.2	0.2	1.7	1.8	0.1			0.6	
Delay (s)				9.5	9.5	12.4	10.0	7.3			9.3	
Level of Service				A	A	B	A	A			A	
Approach Delay (s)		0.0			11.4			7.8			9.3	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM Average Control Delay	9.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	41.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	48.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	232	39	668	160	272	0	15	415	164
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor				0.95	0.95	1.00	1.00	0.95			0.95	
Frt				1.00	1.00	0.85	1.00	1.00			0.96	
Flt Protected				0.95	0.97	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1665	1692	1568	1752	3505			3356	
Flt Permitted				0.95	0.97	1.00	0.36	1.00			0.95	
Satd. Flow (perm)				1665	1692	1568	660	3505			3175	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	252	42	726	174	296	0	16	451	178
RTOR Reduction (vph)	0	0	0	0	0	264	0	0	0	0	70	0
Lane Group Flow (vph)	0	0	0	146	148	462	174	296	0	0	575	0
Turn Type				Perm		Perm	Perm			Perm		
Protected Phases					8			2			6	
Permitted Phases				8		8	2			6		
Actuated Green, G (s)				18.4	18.4	18.4	17.8	17.8			17.8	
Effective Green, g (s)				18.4	18.4	18.4	17.8	17.8			17.8	
Actuated g/C Ratio				0.42	0.42	0.42	0.40	0.40			0.40	
Clearance Time (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)				693	704	653	266	1412			1279	
v/s Ratio Prot								0.08				
v/s Ratio Perm				0.09	0.09	c0.29	c0.26				0.18	
v/c Ratio				0.21	0.21	0.71	0.65	0.21			0.45	
Uniform Delay, d1				8.3	8.3	10.7	10.7	8.6			9.6	
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2				0.2	0.1	3.5	5.7	0.1			0.3	
Delay (s)				8.4	8.4	14.2	16.4	8.7			9.9	
Level of Service				A	A	B	B	A			A	
Approach Delay (s)		0.0			12.5			11.5			9.9	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM Average Control Delay	11.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	44.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Kimley-Horn
and Associates, Inc.

Appendix F – Freeway and Ramp Analysis Worksheets

HCS+: Basic Freeway Segments Release 5.4

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	RC
Agency or Company:	City of Agoura Hills
Date Performed:	9/14/2010
Analysis Time Period:	Peak
Freeway/Direction:	E/W
From/To:	US 101 FWY NB AT PALO COMADO
Jurisdiction:	City of Agoura Hills
Analysis Year:	2010
Description:	Freeway Analysis

Flow Inputs and Adjustments

Volume, V	6850	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1861	v
Trucks and buses	2	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.990	
Driver population factor, fp	1.00	
Flow rate, vp	1880	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	4	
Free-flow speed:	Base	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	1.5	mi/h
Free-flow speed, FFS	63.5	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1880	pc/h/ln
Free-flow speed, FFS	63.5	mi/h
Average passenger-car speed, S	62.0	mi/h
Number of lanes, N	4	
Density, D	30.3	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS+: Basic Freeway Segments Release 5.4

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	RC
Agency or Company:	City of Agoura Hills
Date Performed:	9/14/2010
Analysis Time Period:	Peak
Freeway/Direction:	E/W
From/To:	US 101 FWY SB AT PALO COMADO
Jurisdiction:	City of Agoura Hills
Analysis Year:	2010
Description:	Freeway Analysis

Flow Inputs and Adjustments

Volume, V	6750	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1834	v
Trucks and buses	2	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.990	
Driver population factor, fp	1.00	
Flow rate, vp	1853	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	4	
Free-flow speed:	Base	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	1.5	mi/h
Free-flow speed, FFS	63.5	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1853	pc/h/ln
Free-flow speed, FFS	63.5	mi/h
Average passenger-car speed, S	62.2	mi/h
Number of lanes, N	4	
Density, D	29.8	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS+: Basic Freeway Segments Release 5.4

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	RC
Agency or Company:	City of Agoura Hills
Date Performed:	9/14/2010
Analysis Time Period:	Peak
Freeway/Direction:	E/W
From/To:	US 101 FWY NB AT PALOMADO
Jurisdiction:	City of Agoura Hills
Analysis Year:	
Description:	Freeway Analysis

Flow Inputs and Adjustments

Volume, V	7107	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1931	v
Trucks and buses	2	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.990	
Driver population factor, fp	1.00	
Flow rate, vp	1951	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	4	
Free-flow speed:	Base	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	1.5	mi/h
Free-flow speed, FFS	63.5	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1951	pc/h/ln
Free-flow speed, FFS	63.5	mi/h
Average passenger-car speed, S	61.1	mi/h
Number of lanes, N	4	
Density, D	31.9	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS+: Basic Freeway Segments Release 5.2

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	RC
Agency or Company:	City of Agoura Hills
Date Performed:	9/14/2010
Analysis Time Period:	Peak
Freeway/Direction:	E/W
From/To:	US 101 FWY SB AT PALO COMADO
Jurisdiction:	City of Agoura Hills
Analysis Year:	2015
Description:	Freeway Analysis

Flow Inputs and Adjustments

Volume, V	7000	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1902	v
Trucks and buses	2	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.990	
Driver population factor, fp	1.00	
Flow rate, vp	1921	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	4	
Free-flow speed:	Base	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	1.5	mi/h
Free-flow speed, FFS	63.5	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	1921	pc/h/ln
Free-flow speed, FFS	63.5	mi/h
Average passenger-car speed, S	61.5	mi/h
Number of lanes, N	4	
Density, D	31.2	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS+: Basic Freeway Segments Release 5.4

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	RC
Agency or Company:	City of Agoura Hills
Date Performed:	9/14/2010
Analysis Time Period:	Peak
Freeway/Direction:	E/W
From/To:	US 101 FWY NB AT PALO COMADO
Jurisdiction:	City of Agoura Hills
Analysis Year:	2035
Description:	Freeway Analysis

Flow Inputs and Adjustments

Volume, V	8134	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	2210	v
Trucks and buses	2	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.990	
Driver population factor, fp	1.00	
Flow rate, vp	2232	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	4	
Free-flow speed:	Base	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	1.5	mi/h
Free-flow speed, FFS	63.5	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2232	pc/h/ln
Free-flow speed, FFS	63.5	mi/h
Average passenger-car speed, S	55.2	mi/h
Number of lanes, N	4	
Density, D	40.4	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

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Phone: Fax:
E-mail:

Operational Analysis

Analyst:	RC
Agency or Company:	City of Agoura Hills
Date Performed:	9/14/2010
Analysis Time Period:	Peak
Freeway/Direction:	E/W
From/To:	US 101 FWY SB AT PALO COMADO
Jurisdiction:	City of Agoura Hills
Analysis Year:	
Description:	Freeway Analysis

Flow Inputs and Adjustments

Volume, V	8016	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	2178	v
Trucks and buses	2	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.990	
Driver population factor, fp	1.00	
Flow rate, vp	2200	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	4	
Free-flow speed:	Base	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	1.5	mi/h
Free-flow speed, FFS	63.5	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2200	pc/h/ln
Free-flow speed, FFS	63.5	mi/h
Average passenger-car speed, S	56.1	mi/h
Number of lanes, N	4	
Density, D	39.2	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RC
Agency/Co.:	City of Agoura Hills
Date performed:	9/13/2010
Analysis time period:	Peak
Freeway/Dir of Travel:	E/W
Junction:	Palo Comado Rd NB On Ramp
Jurisdiction:	City of Agoura Hills
Analysis Year:	2010
Description:	Freeway Ramp Analysis

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	6750	vph

On Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	285	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	6750	285		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	1875	79		v
Trucks and buses	2	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		
Heavy vehicle adjustment, fHV	0.990	0.990		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	7575	320		pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.178 Using Equation 4

$v_{12} = v_F (P_{FM}) = 1347$ pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		7895	9400	No
$v_{3 \text{ or } av34}$		3114 pc/h	(Equation 25-4 or 25-5)	
Is $v_{3 \text{ or } av34}$	> 2700 pc/h?		Yes	
Is $v_{3 \text{ or } av34}$	$> 1.5\ v_{12}/2$		Yes	
If yes, v_{12A}	$= 3030$		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3030	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A = 29.9$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	$M_S = 0.411$	
Space mean speed in ramp influence area,	$S_R = 55.6$	mph
Space mean speed in outer lanes,	$S_O = 59.7$	mph
Space mean speed for all vehicles,	$S = 57.6$	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RC
Agency/Co.:	City of Agoura Hills
Date performed:	9/13/2010
Analysis time period:	Peak
Freeway/Dir of Travel:	E/W
Junction:	Rd NB Off Ramp
Jurisdiction:	City of Agoura Hills
Analysis Year:	2010
Description:	Freeway Ramp Analysis

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	6850	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	495	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	6850	495		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	1903	138		v
Trucks and buses	2	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		
Heavy vehicle adjustment, fHV	0.990	0.990		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	7687	556		pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.148 Using Equation 4

$v_{12} = v_F (P_{FM}) = 1140$ pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		8243	9400	No
$v_{3 \text{ or } av34}$		3273 pc/h	(Equation 25-4 or 25-5)	
Is $v_{3 \text{ or } av34}$	> 2700 pc/h?		Yes	
Is $v_{3 \text{ or } av34}$	> 1.5 $v_{12}/2$		Yes	
If yes, v_{12A}	= 3074		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3074	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 27.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.398	
Space mean speed in ramp influence area,	S_R = 55.8	mph
Space mean speed in outer lanes,	S_O = 58.4	mph
Space mean speed for all vehicles,	S = 57.3	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RC
Agency/Co.:	City of Agoura Hills
Date performed:	9/13/2010
Analysis time period:	Peak
Freeway/Dir of Travel:	E/W
Junction:	· Rd NB On Ramp
Jurisdiction:	City of Agoura Hills
Analysis Year:	2010
Description:	Freeway Ramp Analysis

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	6750	vph

On Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	520	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	6750	520		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	1875	144		v
Trucks and buses	2	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		
Heavy vehicle adjustment, fHV	0.990	0.990		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	7575	584		pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.145 Using Equation 4

$v_{12} = v_F (P_{FM}) = 1097$ pc/h

Capacity Checks

		Actual	Maximum	LOS F?
	v_{FO}	8159	9400	No
	$v_{3 \text{ or } av34}$	3239 pc/h	(Equation 25-4 or 25-5)	
Is	$v_{3 \text{ or } av34}$	> 2700 pc/h?	Yes	
Is	$v_{3 \text{ or } av34}$	> 1.5 v_{12} /2	Yes	
If yes,	v_{12A}	= 3030	(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3030	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A = 31.9$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	$M_S = 0.459$	
Space mean speed in ramp influence area,	$S_R = 54.4$	mph
Space mean speed in outer lanes,	$S_O = 59.7$	mph
Space mean speed for all vehicles,	$S = 56.9$	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RC
Agency/Co.:	City of Agoura Hills
Date performed:	9/13/2010
Analysis time period:	Peak
Freeway/Dir of Travel:	E/W
Junction:	Chesebro Rd SB Off Ramp
Jurisdiction:	City of Agoura Hills
Analysis Year:	2010
Description:	Freeway Ramp Analysis

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	6750	vph

On Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	245	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	6750	245		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	1875	68		v
Trucks and buses	2	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		
Heavy vehicle adjustment, fHV	0.990	0.990		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	7575	275		pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.183 Using Equation 4

$v_{12} = v_F (P_{FM}) = 1389$ pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		7850	9400	No
$v_{3 \text{ or } av34}$	$v_{3 \text{ or } av34}$	3093 pc/h	(Equation 25-4 or 25-5)	
Is $v_{3 \text{ or } av34}$	$v_{3 \text{ or } av34}$	> 2700 pc/h?	Yes	
Is $v_{3 \text{ or } av34}$	$v_{3 \text{ or } av34}$	> 1.5 v_{12} /2	Yes	
If yes, v_{12A}	= 3030		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3030	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A = 29.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	M_S = 0.404	
Space mean speed in ramp influence area,	S_R = 55.7	mph
Space mean speed in outer lanes,	S_0 = 59.7	mph
Space mean speed for all vehicles,	S = 57.7	mph

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Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RC
Agency/Co.:	City of Agoura Hills
Date performed:	9/13/2010
Analysis time period:	Peak
Freeway/Dir of Travel:	E/W
Junction:	Palo Comado Rd NB On Ramp
Jurisdiction:	City of Agoura Hills
Analysis Year:	2015
Description:	Freeway Ramp Analysis

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	7003	vph

On Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	296	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	7003	296		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	1945	82		v
Trucks and buses	2	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		
Heavy vehicle adjustment, fHV	0.990	0.990		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	7859	332		pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.176 Using Equation 4

$v_{12} = v_F (P_{FM}) = 1386$ pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		8191	9400	No
$v_{3 \text{ or } av34}$		3236 pc/h	(Equation 25-4 or 25-5)	
Is $v_{3 \text{ or } av34}$	> 2700 pc/h?		Yes	
Is $v_{3 \text{ or } av34}$	> 1.5 $v_{12}/2$		Yes	
If yes, v_{12A}	= 3143		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3143	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 31.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	M_S = 0.435	
Space mean speed in ramp influence area,	S_R = 55.0	mph
Space mean speed in outer lanes,	S_O = 59.4	mph
Space mean speed for all vehicles,	S = 57.2	mph

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Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RC
Agency/Co.:	City of Agoura Hills
Date performed:	9/13/2010
Analysis time period:	Peak
Freeway/Dir of Travel:	E/W
Junction:	Palo Comado Rd NB Off Ramp
Jurisdiction:	City of Agoura Hills
Analysis Year:	2015
Description:	Freeway Ramp Analysis

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	7107	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	514	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp	0	vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	7107	514	0	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1974	143	0	v
Trucks and buses	2	2	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.990	0.990	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	7976	577	0	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.146 Using Equation 4

$v_{12} = v_F (P_{FM}) = 1162$ pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		8553	9400	No
$v_{3 \text{ or } av34}$		3407 pc/h	(Equation 25-4 or 25-5)	
Is $v_{3 \text{ or } av34}$	> 2700 pc/h?		Yes	
Is $v_{3 \text{ or } av34}$	> 1.5 v_{12} /2		Yes	
If yes, v_{12A}	= 3190		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3190	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A = 28.3$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	$M_S = 0.420$	
Space mean speed in ramp influence area,	$S_R = 55.3$	mph
Space mean speed in outer lanes,	$S_O = 57.9$	mph
Space mean speed for all vehicles,	$S = 56.8$	mph

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Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RC
Agency/Co.:	City of Agoura Hills
Date performed:	9/13/2010
Analysis time period:	Peak
Freeway/Dir of Travel:	E/W
Junction:	Palo Comado Rd NB On Ramp
Jurisdiction:	City of Agoura Hills
Analysis Year:	2015
Description:	Freeway Ramp Analysis

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	7003	vph

On Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	540	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	7003	540		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	1945	150		v
Trucks and buses	2	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		
Heavy vehicle adjustment, fHV	0.990	0.990		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	7859	606		pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.142 Using Equation 4

$v_{12} = v_F (P_{FM}) = 1116$ pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		8465	9400	No
$v_{3 \text{ or } av34}$		3371 pc/h	(Equation 25-4 or 25-5)	
Is $v_{3 \text{ or } av34}$	> 2700 pc/h?		Yes	
Is $v_{3 \text{ or } av34}$	$> 1.5\ v_{12}/2$		Yes	
If yes, v_{12A}	$= 3143$		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3143	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A = 33.1$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	$M_S = 0.493$	
Space mean speed in ramp influence area,	$S_R = 53.7$	mph
Space mean speed in outer lanes,	$S_O = 59.4$	mph
Space mean speed for all vehicles,	$S = 56.4$	mph

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Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RC
Agency/Co.:	City of Agoura Hills
Date performed:	9/13/2010
Analysis time period:	Peak
Freeway/Dir of Travel:	E/W
Junction:	[illegible] Rd SB Off Ramp
Jurisdiction:	City of Agoura Hills
Analysis Year:	2015
Description:	Freeway Ramp Analysis

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	7003	vph

On Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	254	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	7003	254		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	1945	71		v
Trucks and buses	2	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		
Heavy vehicle adjustment, fHV	0.990	0.990		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	7859	285		pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.182 Using Equation 4

$v_{12} = v_F (P_{FM}) = 1432$ pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		8144	9400	No
$v_{3 \text{ or } av34}$		3213 pc/h	(Equation 25-4 or 25-5)	
Is $v_{3 \text{ or } av34}$	> 2700 pc/h?		Yes	
Is $v_{3 \text{ or } av34}$	> 1.5 v_{12} /2		Yes	
If yes, v_{12A}	= 3143		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3143	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A = 30.7$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	$M_S = 0.426$	
Space mean speed in ramp influence area,	$S_R = 55.2$	mph
Space mean speed in outer lanes,	$S_O = 59.4$	mph
Space mean speed for all vehicles,	$S = 57.3$	mph

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Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RC
Agency/Co.:	City of Agoura Hills
Date performed:	9/13/2010
Analysis time period:	Peak
Freeway/Dir of Travel:	E/W
Junction:	Palo Comado Rd NB On Ramp
Jurisdiction:	City of Agoura Hills
Analysis Year:	2035
Description:	Freeway Ramp Analysis

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	8016	vph

On Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	338	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	8016	338		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	2227	94		v
Trucks and buses	2	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		
Heavy vehicle adjustment, fHV	0.990	0.990		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	8996	379		pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.170 Using Equation 4

$v_{12} = v_F (P_{FM}) = 1533$ pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		9375	9400	No
$v_{3 \text{ or } av34}$		3731 pc/h	(Equation 25-4 or 25-5)	
Is $v_{3 \text{ or } av34}$	> 2700 pc/h?		Yes	
Is $v_{3 \text{ or } av34}$	> 1.5 $v_{12}/2$		Yes	
If yes, v_{12A}	= 3598		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3598	4600	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A = 35.7 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable,	$M_S = 0.571$	
Space mean speed in ramp influence area,	$S_R = 51.9$	mph
Space mean speed in outer lanes,	$S_O = 58.2$	mph
Space mean speed for all vehicles,	$S = 55.0$	mph

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Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RC
Agency/Co.:	City of Agoura Hills
Date performed:	9/13/2010
Analysis time period:	Peak
Freeway/Dir of Travel:	E/W
Junction:	Palo Comado 3d NB Off Ramp
Jurisdiction:	City of Agoura Hills
Analysis Year:	2035
Description:	Freeway Ramp Analysis

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	8134	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	588	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	8134	588		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	2259	163		v
Trucks and buses	2	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		
Heavy vehicle adjustment, fHV	0.990	0.990		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	9128	660		pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.135 Using Equation 4

$v_{12} = v_F (P_{FM}) = 1235$ pc/h

Capacity Checks

		Actual	Maximum	LOS F?
	v_{FO}	9788	9400	Yes
	v_{3} or v_{av34}	3946 pc/h	(Equation 25-4 or 25-5)	
Is	v_{3} or v_{av34}	> 2700 pc/h?	Yes	
Is	v_{3} or v_{av34}	> 1.5 $v_{12}/2$	Yes	
If yes,	$v_{12A} = 3651$		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3651	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A = 32.5$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable,	$M_S = 0.542$	
Space mean speed in ramp influence area,	$S_R = 52.5$	mph
Space mean speed in outer lanes,	$S_O = 55.8$	mph
Space mean speed for all vehicles,	$S = 54.3$	mph

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Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RC
Agency/Co.:	City of Agoura Hills
Date performed:	9/13/2010
Analysis time period:	Peak
Freeway/Dir of Travel:	E/W
Junction:	Palo Comado Rd NB On Ramp
Jurisdiction:	City of Agoura Hills
Analysis Year:	2035
Description:	Freeway Ramp Analysis

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	8016	vph

On Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	618	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	8016	618		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	2227	172		v
Trucks and buses	2	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		
Heavy vehicle adjustment, fHV	0.990	0.990		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	8996	694		pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.131 Using Equation 4

$v_{12} = v_F (P_{FM}) = 1179$ pc/h

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		9690	9400	Yes
$v_{3 \text{ or } av34}$		3908 pc/h	(Equation 25-4 or 25-5)	
Is $v_{3 \text{ or } av34}$	> 2700 pc/h?		Yes	
Is $v_{3 \text{ or } av34}$	> 1.5 v_{12} /2		Yes	
If yes, v_{12A}	= 3598		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3598	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 38.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable,	M_S = 0.690	
Space mean speed in ramp influence area,	S_R = 49.1	mph
Space mean speed in outer lanes,	S_O = 58.2	mph
Space mean speed for all vehicles,	S = 53.3	mph

HCS+: Ramps and Ramp Junctions Release 5.4

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	RC
Agency/Co.:	City of Agoura Hills
Date performed:	9/13/2010
Analysis time period:	Peak
Freeway/Dir of Travel:	E/W
Junction:	[illegible] Rd SB Off Ramp
Jurisdiction:	City of Agoura Hills
Analysis Year:	2035
Description:	Freeway Ramp Analysis

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	65.0	mph
Volume on freeway	8016	vph

On Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	291	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	8016	291		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	2227	81		v
Trucks and buses	2	2		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		
Heavy vehicle adjustment, fHV	0.990	0.990		
Driver population factor, fP	1.00	1.00		
Flow rate, vp	8996	327		pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.177 Using Equation 4

$v_{12} = v_F (P_{FM}) = 1592$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	9323	9400	No
v_3 or v_{av34}	3702 pc/h	(Equation 25-4 or 25-5)	
Is v_3 or v_{av34}	> 2700 pc/h?	Yes	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	Yes	
If yes, v_{12A}	= 3598	(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3598	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 35.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable,	M_S = 0.555	
Space mean speed in ramp influence area,	S_R = 52.2	mph
Space mean speed in outer lanes,	S_O = 58.2	mph
Space mean speed for all vehicles,	S = 55.2	mph