DRAFT

ENVIRONMENTAL IMPACT REPORT

VISALIA WALMART EXPANSION PROJECT

STATE CLEARINGHOUSE NO. 2008121133

CITY OF VISALIA

OCTOBER 2010

VOLUME IV OF IV
TECHNICAL APPENDIX TO TRAFFIC REPORT

APPENDIX

FIGURES

TURNING MOVEMENT VOLUMES

EXISTING CONDITIONS (INTERSECTION, ROADWAY SEGMENT, AND FREEWAY & RAMP SEGMENTS)

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NEAR-TERM 2010 TRAFFIC CONDITIONS (INTERSECTION, ROADWAY SEGMENT, AND FREEWAY & RAMP SEGMENTS)

NEAR-TERM 2010 + PROJECT TRAFFIC CONDITIONS (INTERSECTION, ROADWAY SEGMENT, AND FREEWAY & RAMP SEGMENTS)

NEAR-TERM 2010 + PROJECT (MITIGATED) TRAFFIC CONDITIONS (INTERSECTION)

NEAR-TERM 2015 TRAFFIC CONDITIONS (INTERSECTION, ROADWAY SEGMENT, AND FREEWAY & RAMP SEGMENTS)

NEAR-TERM 2015 + PROJECT TRAFFIC CONDITIONS (INTERSECTION, ROADWAY SEGMENT, AND FREEWAY & RAMP SEGMENTS)

NEAR-TERM 2015 + PROJECT (MITIGATED) TRAFFIC CONDITIONS (INTERSECTION)

LONG-TERM 2030 TRAFFIC CONDITIONS (INTERSECTION AND FREEWAY & RAMP SEGMENTS)

LONG-TERM 2030 + PROJECT TRAFFIC CONDITIONS (INTERSECTION AND FREEWAY & RAMP SEGMENTS)

LONG-TERM 2030 + PROJECT (MITIGATED) TRAFFIC CONDITIONS (INTERSECTION)

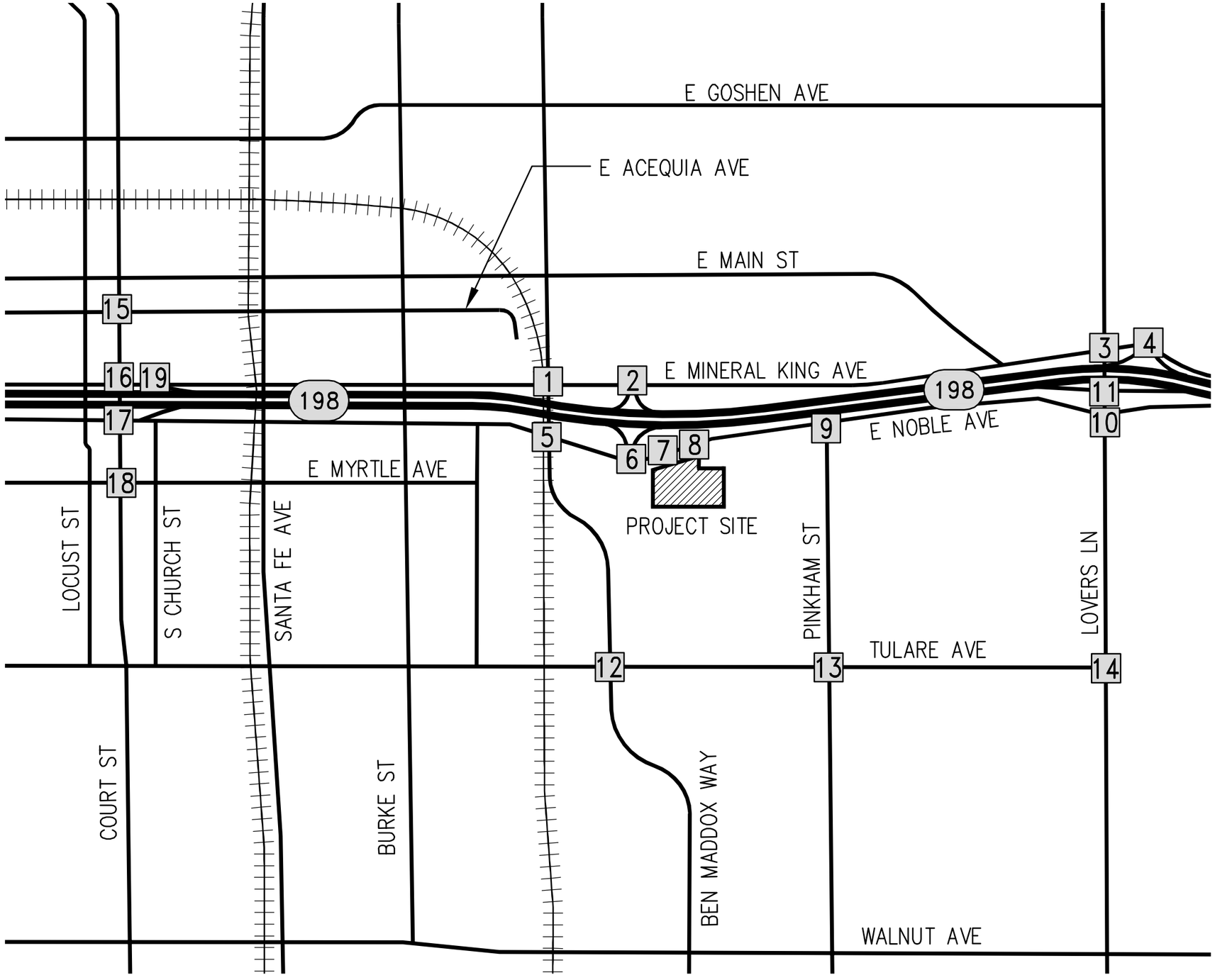
SIGNAL WARRANT ANALYSIS

QUEUING SUMMARY

SATURDAY TURNING MOVEMENT VOLUMES

SATURDAY TRIP GENERATION

FIGURES



NORTH
NOT TO SCALE

LEGEND

[X] STUDY AREA INTERSECTIONS

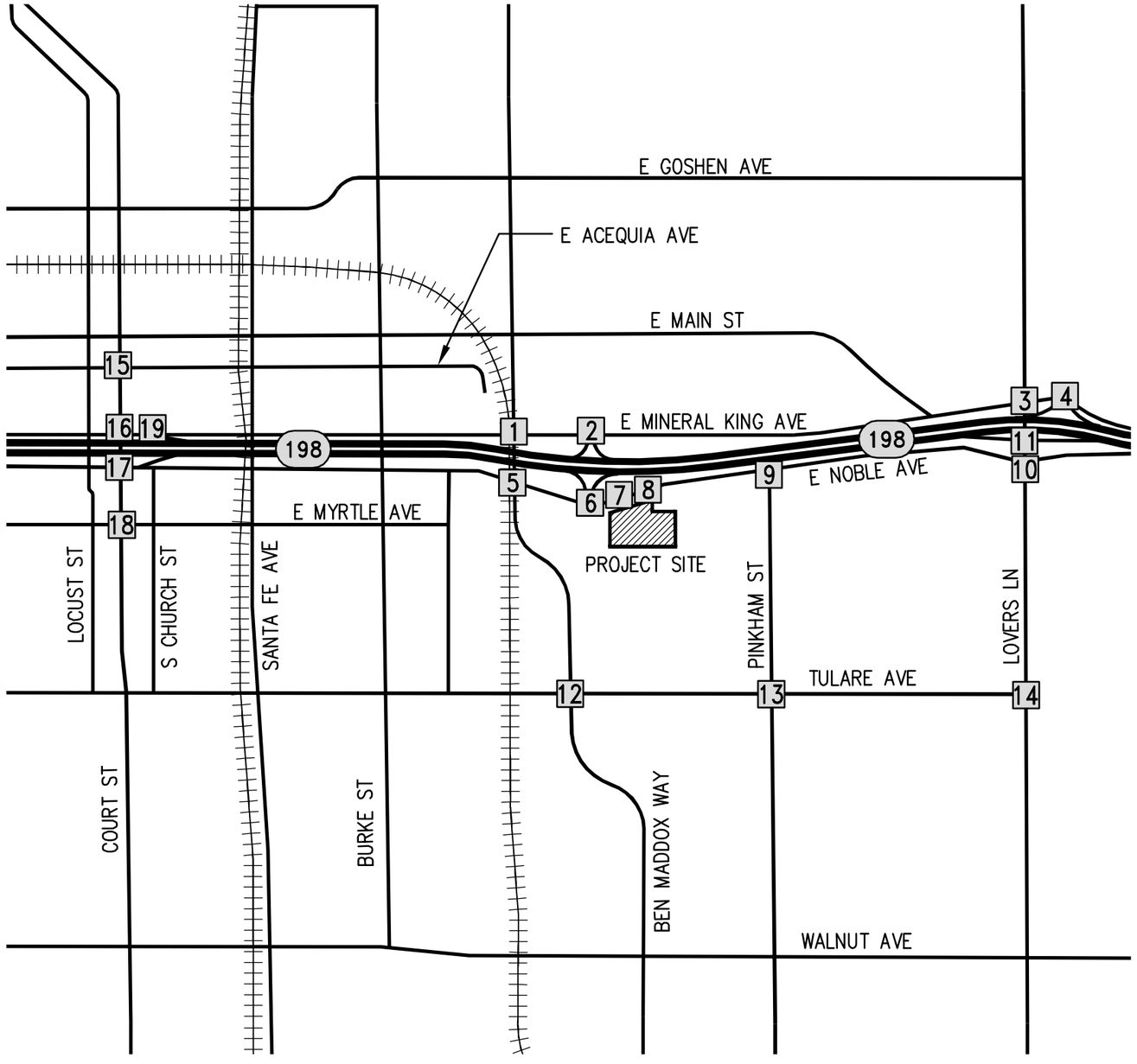
VISALIA WALMART EXPANSION

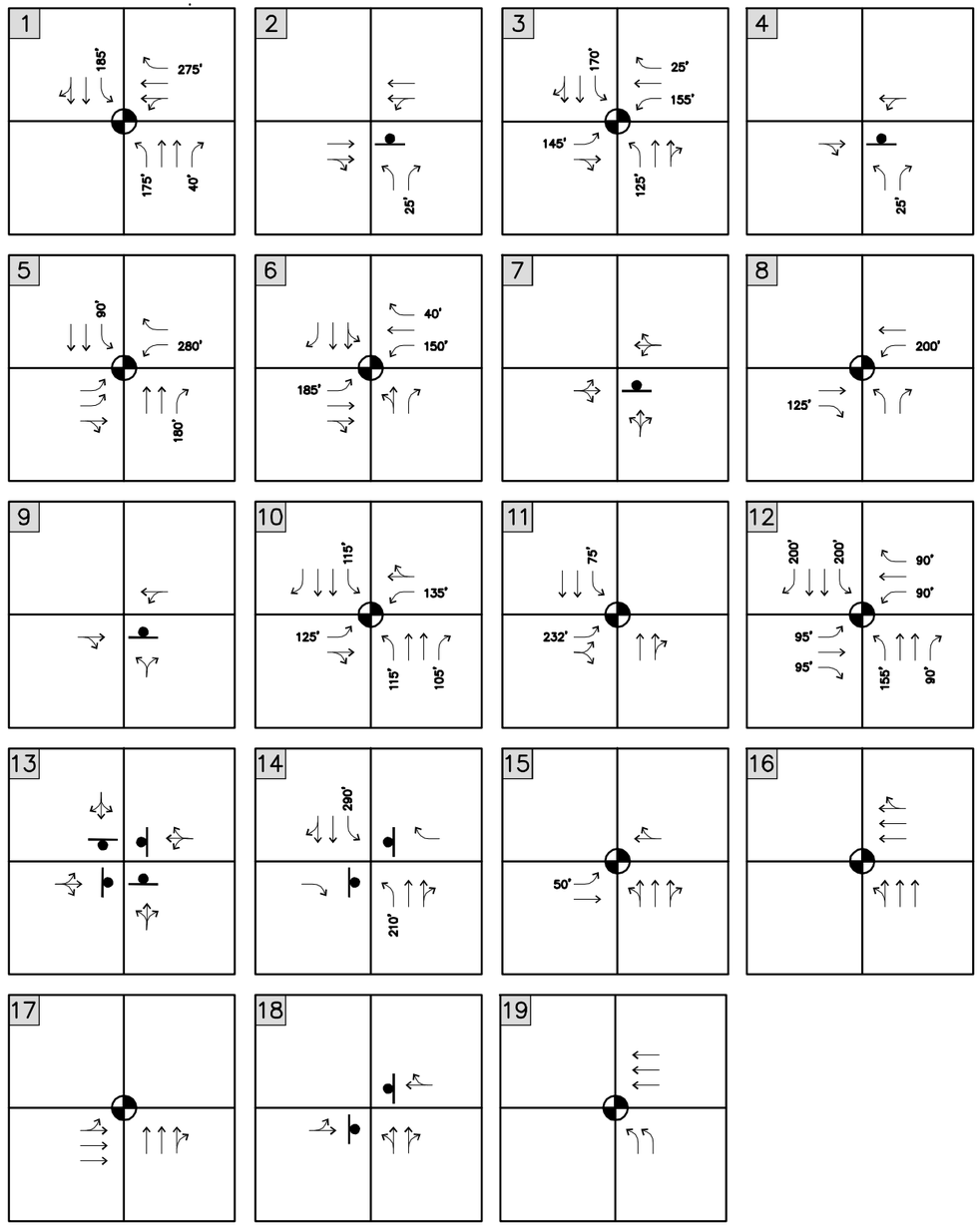
PROJECT LOCATION AND STUDY INTERSECTIONS

FIGURE 1

Kimley-Horn and Associates, Inc.

K:\BAY_TPTO\097311005 - ECS - Visalia Wal-Mart - JEW\CADD\311005-Figures.dwg Jan 05,2010 - 12:27pm ben.huie





LEGEND

- X STUDY AREA INTERSECTIONS
- TRAFFIC SIGNAL
- STOP SIGN
- XX' STORAGE LENGTH

NORTH
NOT TO SCALE

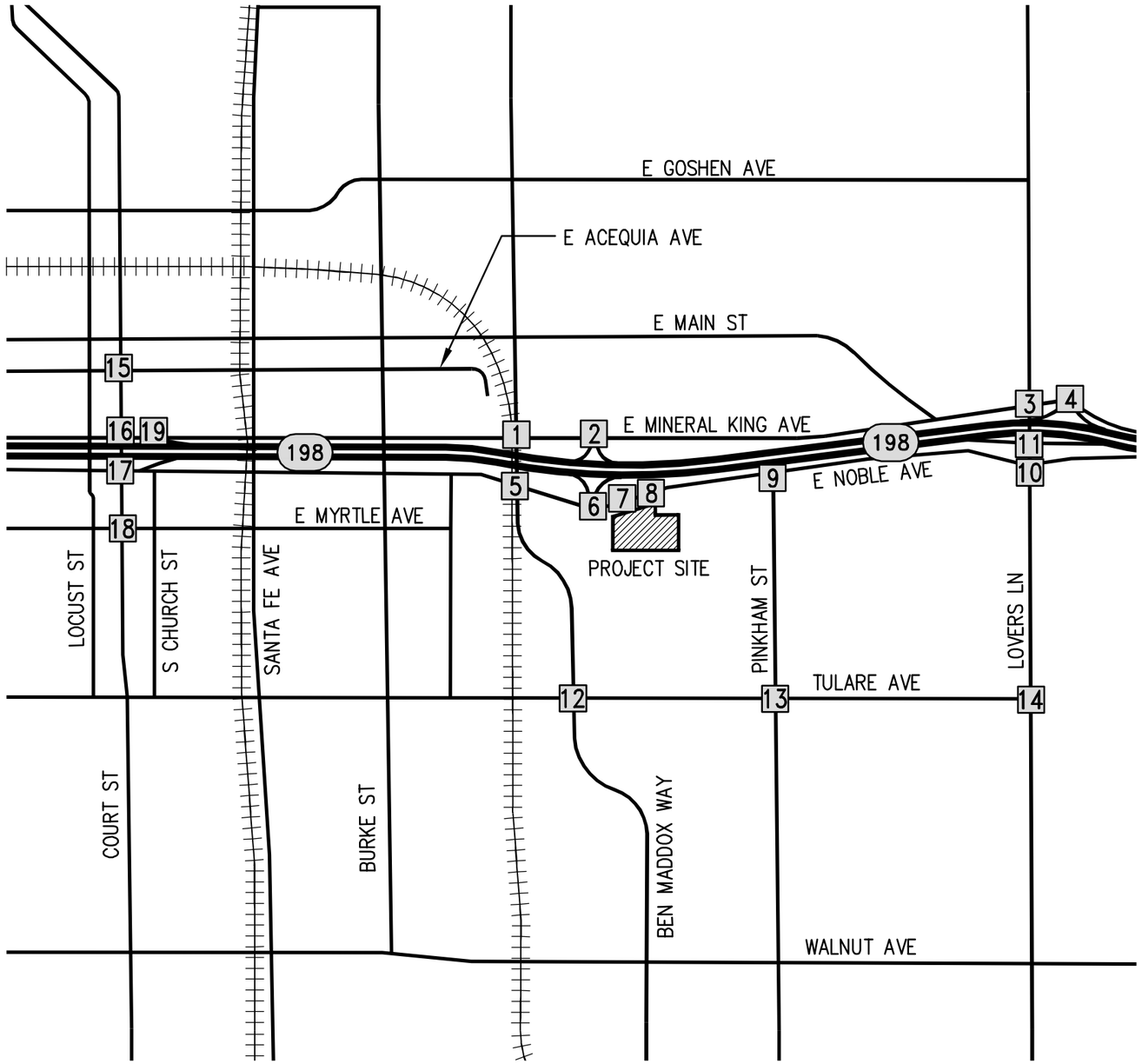
VISALIA WALMART EXPANSION

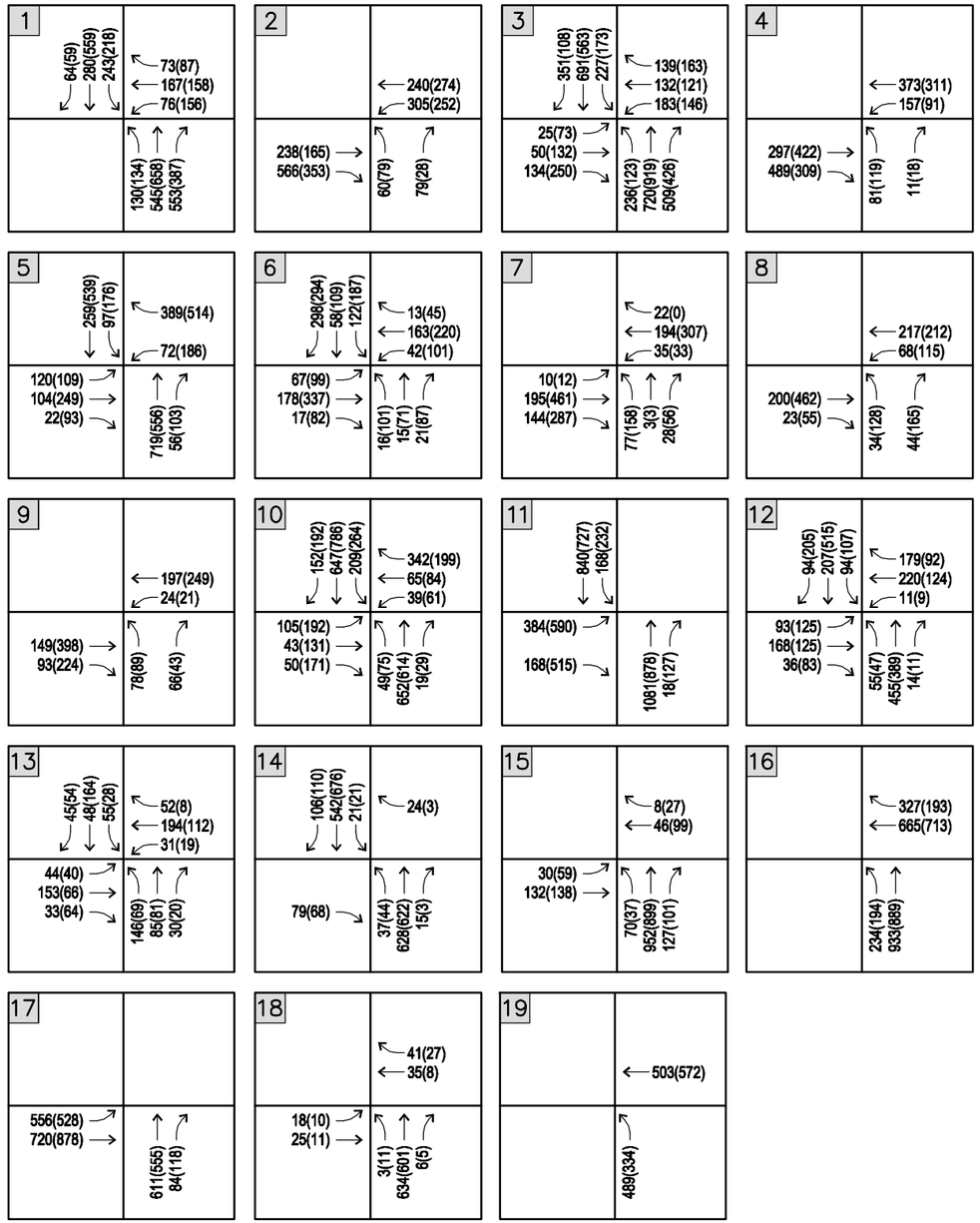
EXISTING LANE GEOMETRY AND TRAFFIC CONTROL

FIGURE 2

Kimley-Horn and Associates, Inc.

K:\BAY_TPTO\097311005 - ECS - Visalia Wal-Mart - JEW\CADD\311005-Figures.dwg Jan 05,2010 - 12:27pm ben.huie





VISALIA WALMART ✻ EXPANSION

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES

LEGEND

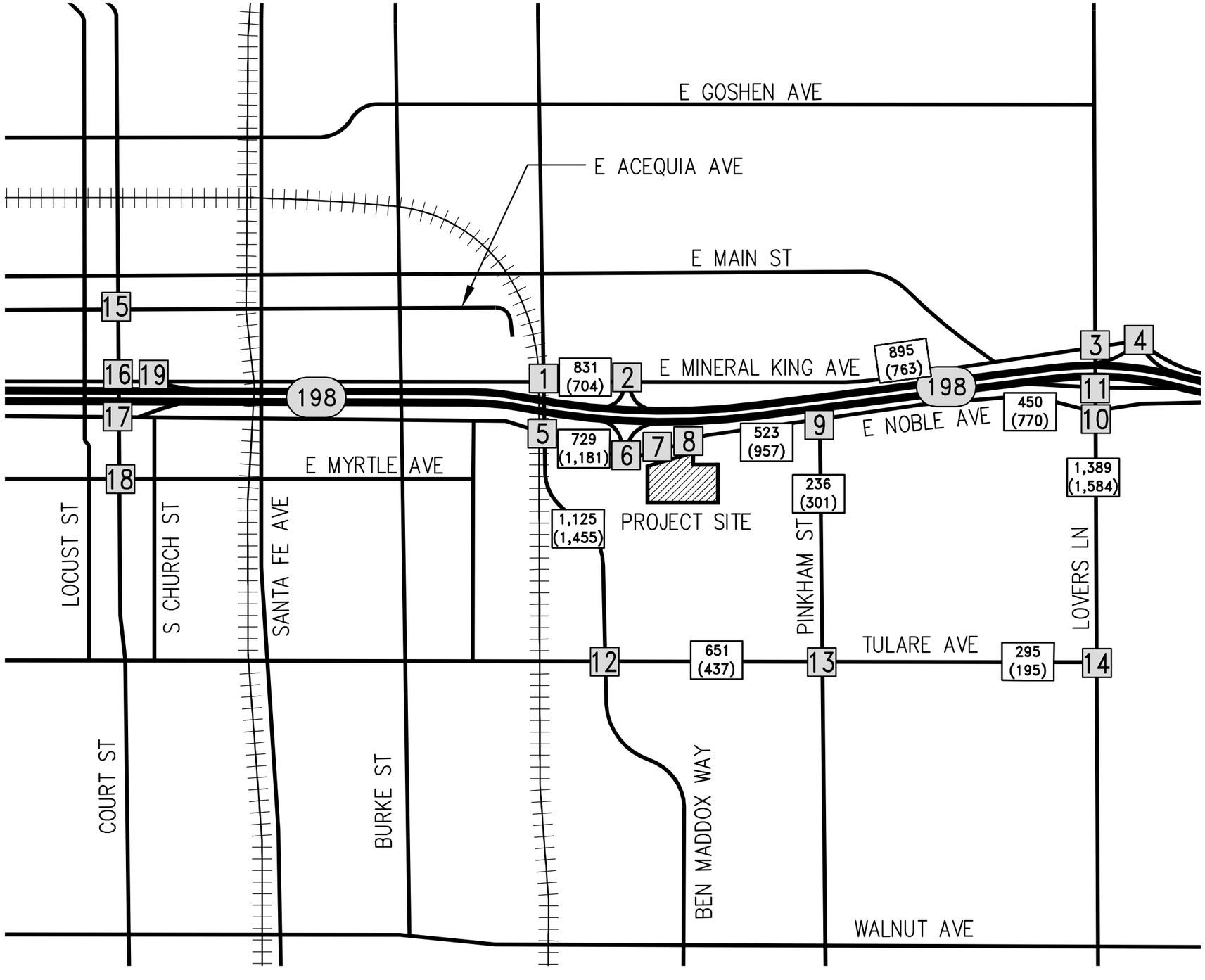
X	STUDY AREA INTERSECTIONS
XX (YY)	AM (PM) VOLUMES

NORTH
NOT TO SCALE

FIGURE 3

Kimley-Horn and Associates, Inc.

K:\BAY_TPTO\097311005 - ECS - Visalia Wal-Mart - JEW\CADD\311005-Figures.dwg Jan 05,2010 - 12:28pm ben.huie



NORTH
NOT TO SCALE

LEGEND

- X — STUDY AREA INTERSECTIONS
- PROJECT SITE
- X (Y) — TWO-WAY AM PEAK HOUR VOLUME / TWO-WAY PM PEAK HOUR VOLUME

VISALIA WALMART EXPANSION

EXISTING PEAK HOUR TWO-WAY ROADWAY SEGMENT VOLUMES

FIGURE 4

Kimley-Horn and Associates, Inc.

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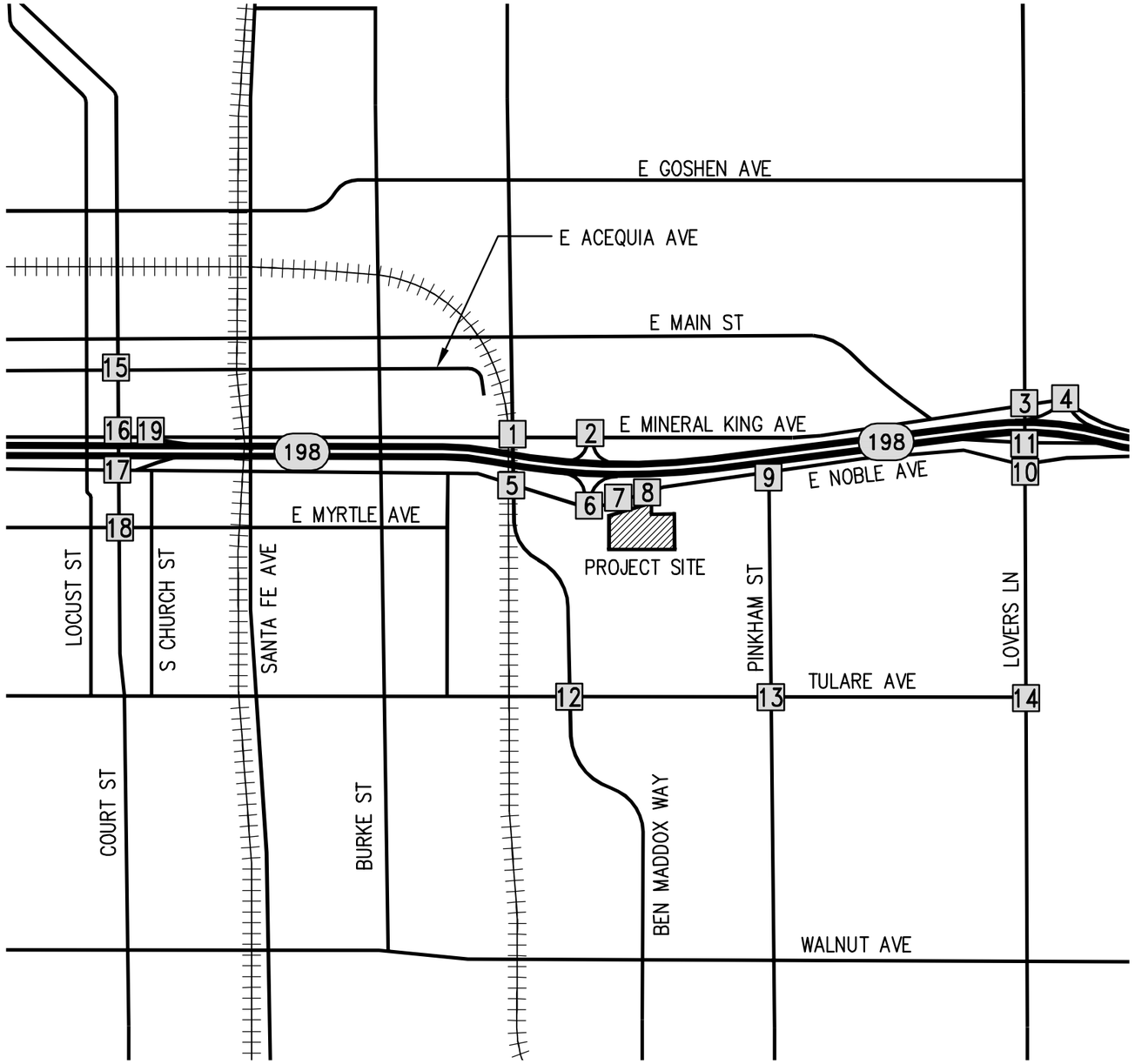

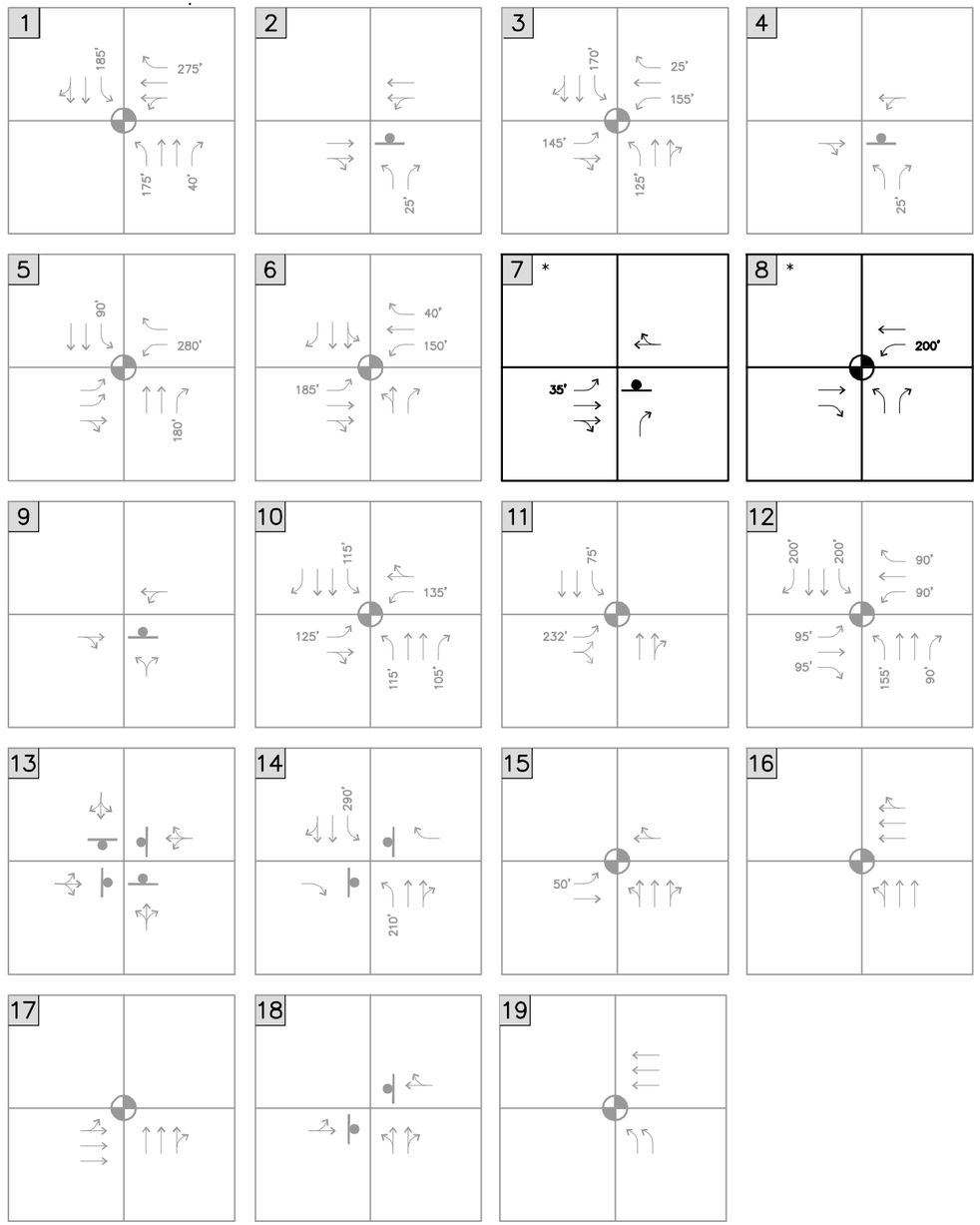

NOTE: SHADED INTERSECTIONS REFLECT UNCHANGED CONDITIONS FROM EXISTING CONDITIONS.

* WITH THE ADDITION OF THE PROJECT

LEGEND

- X — STUDY AREA INTERSECTIONS
- TRAFFIC SIGNAL
- STOP SIGN
- XX' STORAGE LENGTH

NORTH
NOT TO SCALE

VISALIA WALMART EXPANSION

NEAR-TERM 2010 LANE GEOMETRY AND TRAFFIC CONTROL

FIGURE 5

Kimley-Horn and Associates, Inc.

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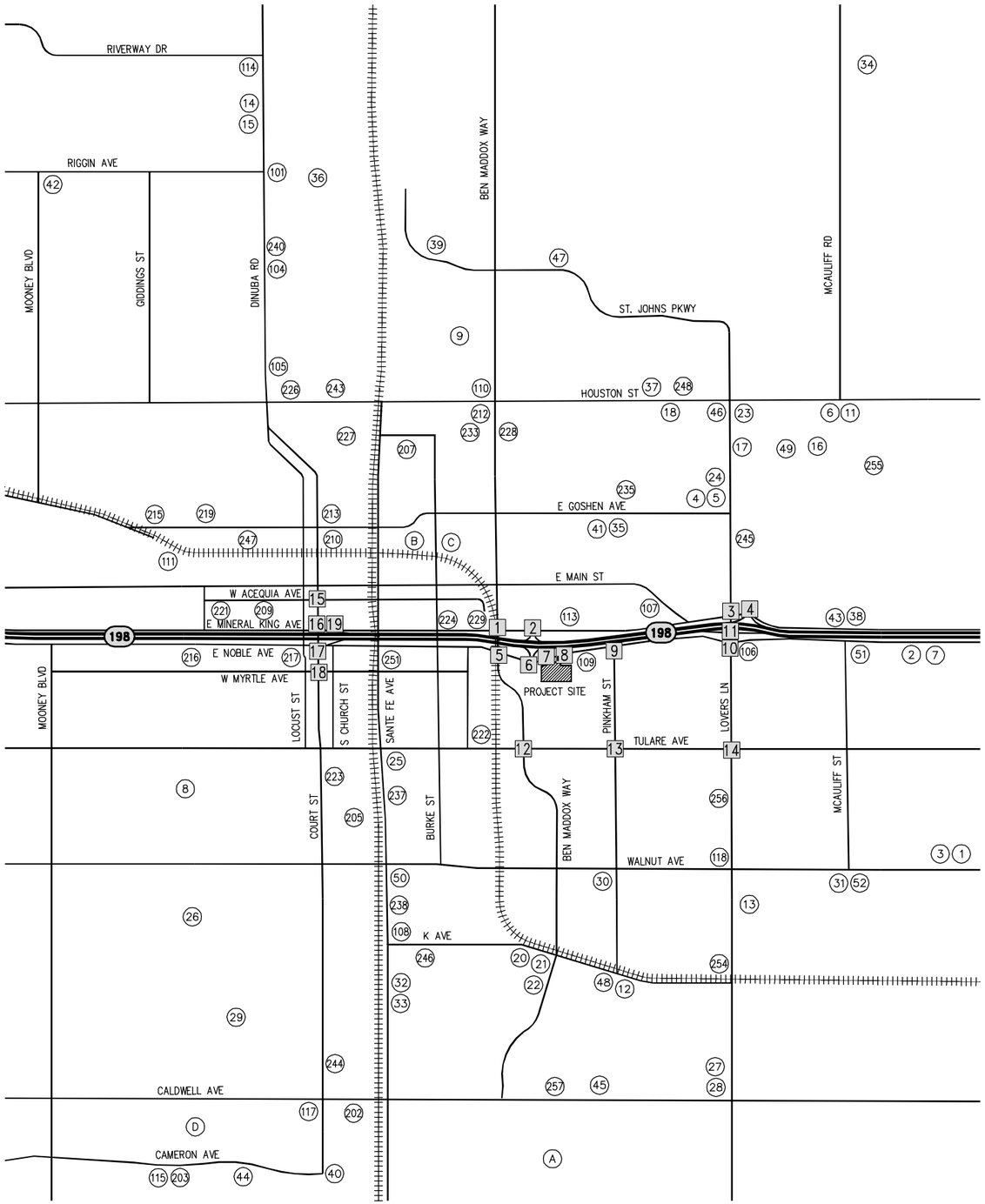
APPROVED AND PENDING DEVELOPMENTS

*REFER TO TABLE 6 – APPROVED AND PENDING DEVELOPMENTS LIST IN REPORT FOR PROJECT NAMES AND DESCRIPTION



NORTH
NOT TO SCALE

LEGEND

- [X] STUDY AREA INTERSECTIONS
- (X) APPROVED AND PENDING PROJECT LOCATIONS

VISALIA WALMART EXPANSION

APPROVED AND PENDING DEVELOPMENT LOCATIONS

FIGURE 6

Kimley-Horn and Associates, Inc.

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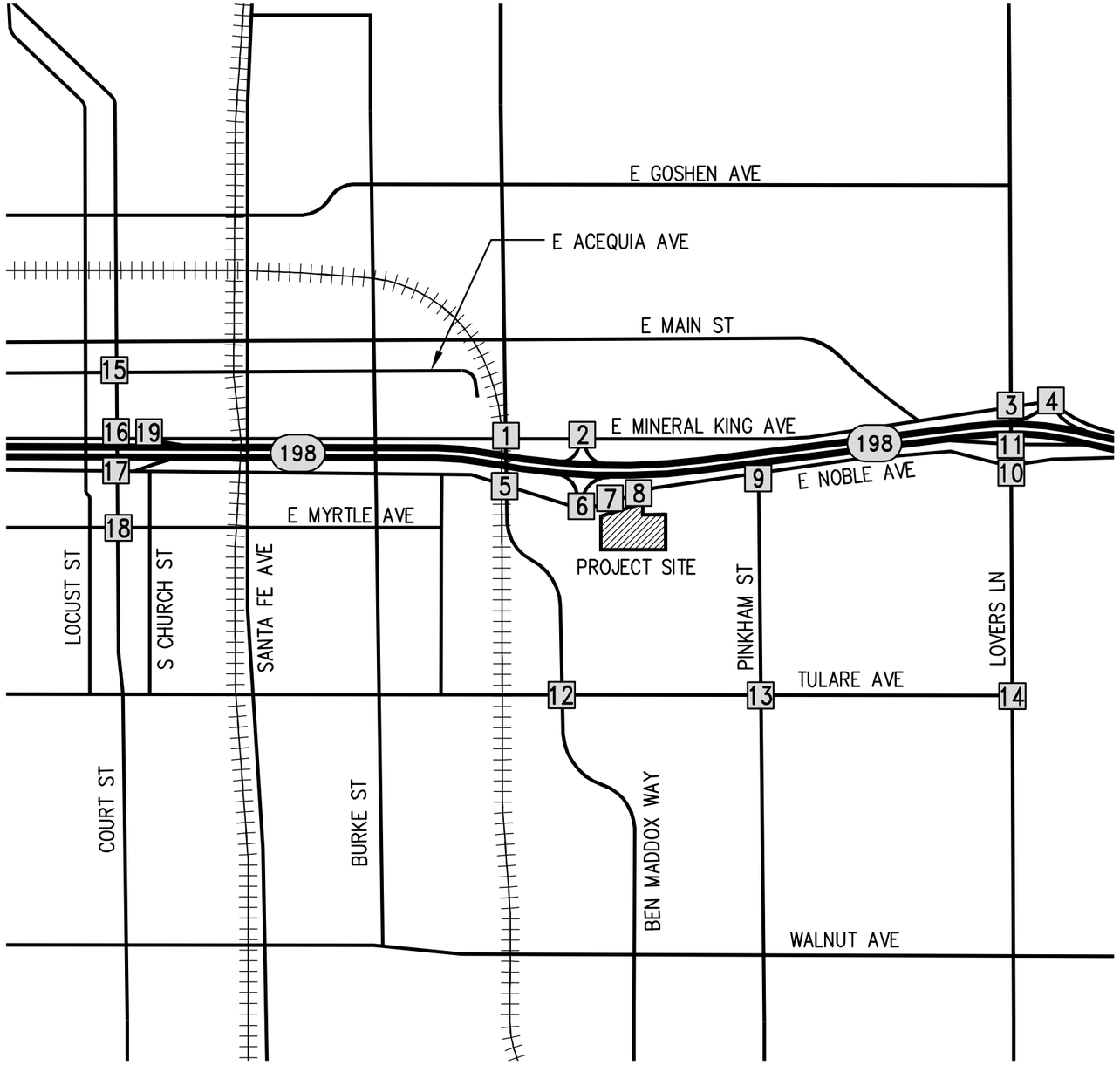
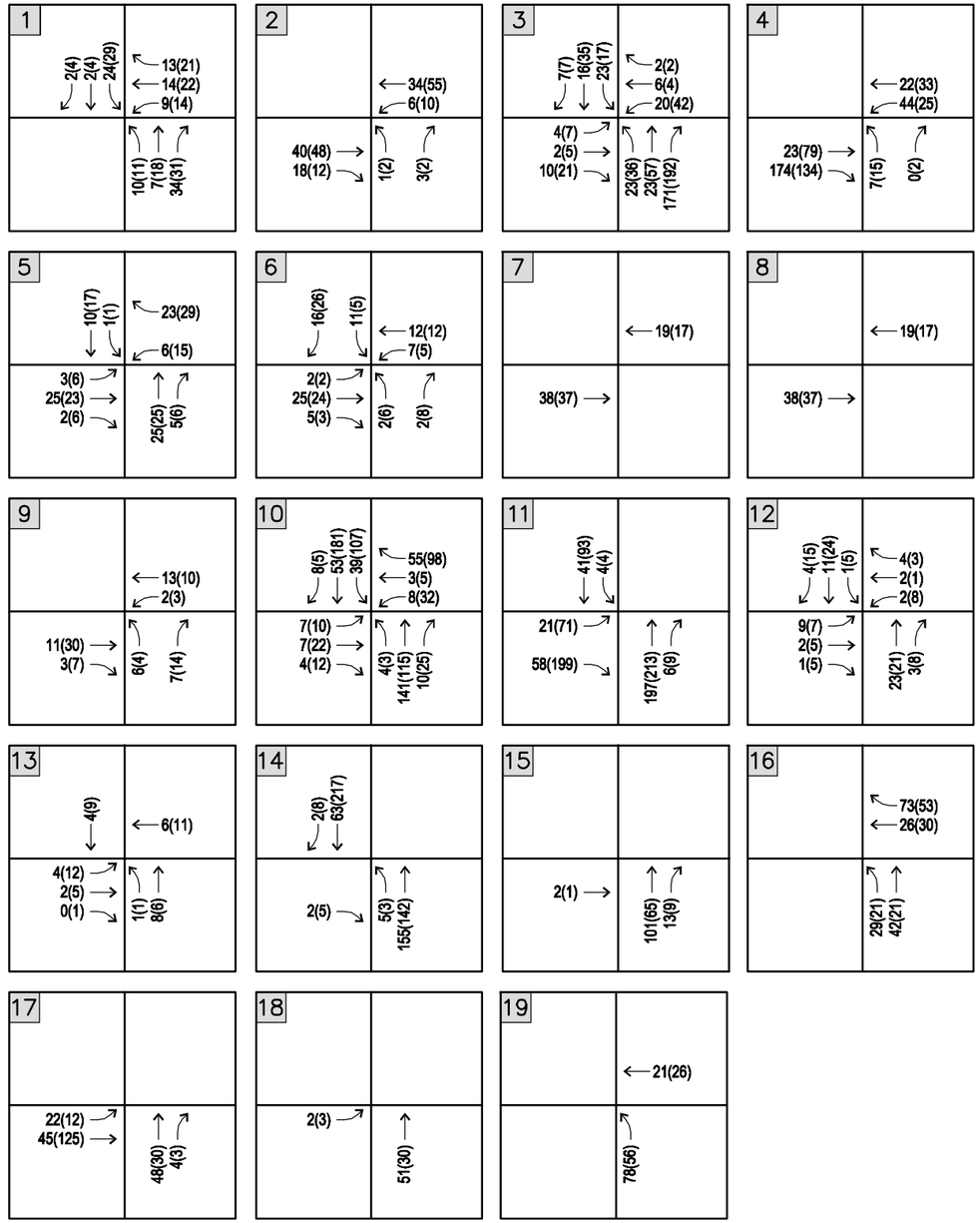




VISALIA WALMART EXPANSION

APPROVED DEVELOPMENT 2010 GENERATED TRAFFIC VOLUMES

LEGEND

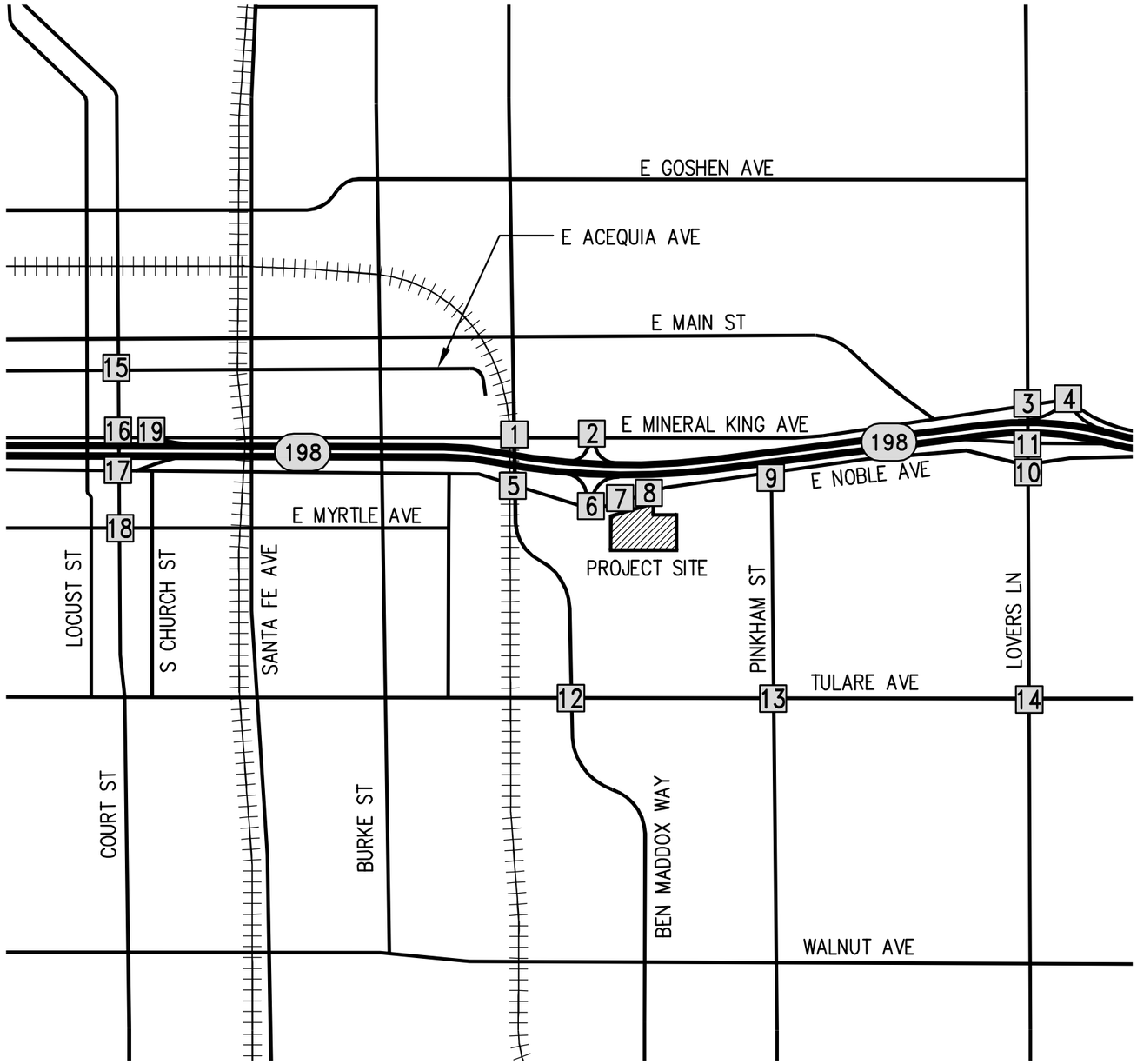
X	STUDY AREA INTERSECTIONS
XX (YY)	AM (PM) VOLUMES

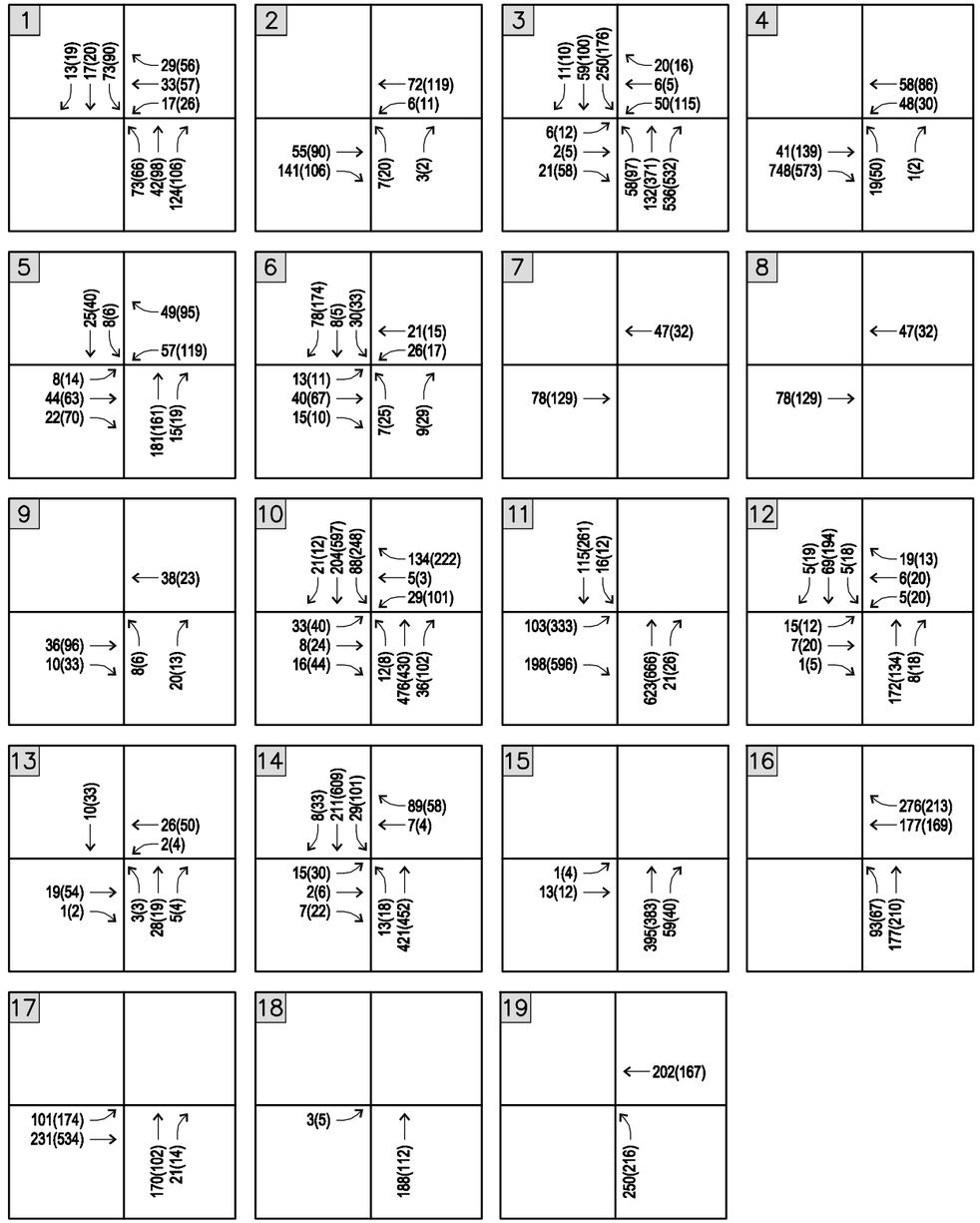
NORTH
NOT TO SCALE

FIGURE 7

Kimley-Horn and Associates, Inc.

K:\BAY_TPTO\097311005 - ECS - Visalia Wal-Mart - JEW\CADD\311005-Figures.dwg Apr 07,2010 - 5:07pm ben.huie





LEGEND

X	STUDY AREA INTERSECTIONS
XX (YY)	AM (PM) VOLUMES

NORTH
NOT TO SCALE

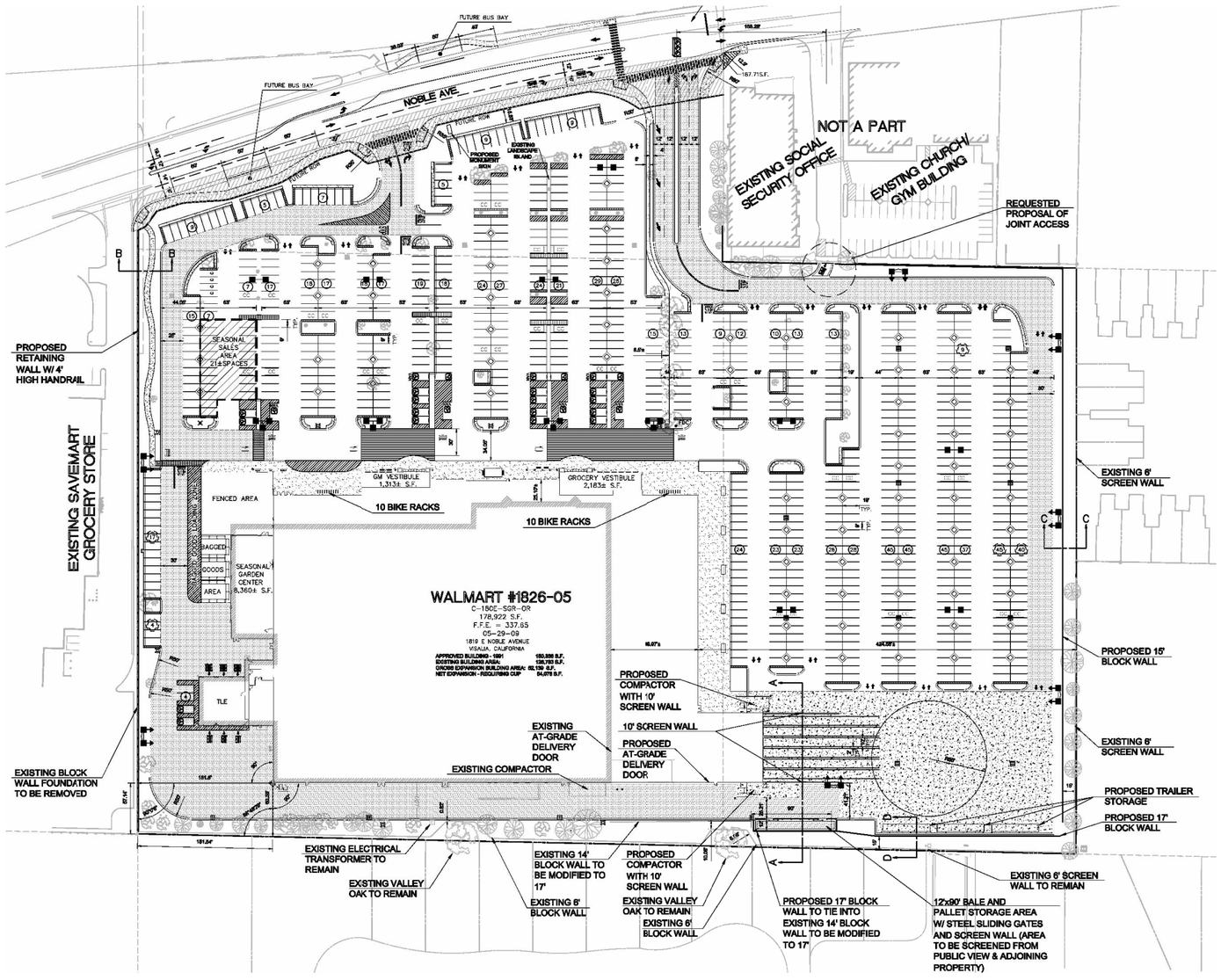
VISALIA WALMART EXPANSION

APPROVED DEVELOPMENT 2015 GENERATED TRAFFIC VOLUMES

FIGURE 8

Kimley-Horn and Associates, Inc.

K:\BAY_TPTO\097311005 - ECS - Visalia Wal-Mart - JEW\CADD\311005-Figures.dwg Jan 05,2010 - 12:29pm ben.huie



VISALIA WALMART EXPANSION

SITE PLAN

FIGURE 9

Kimley-Horn and Associates, Inc.

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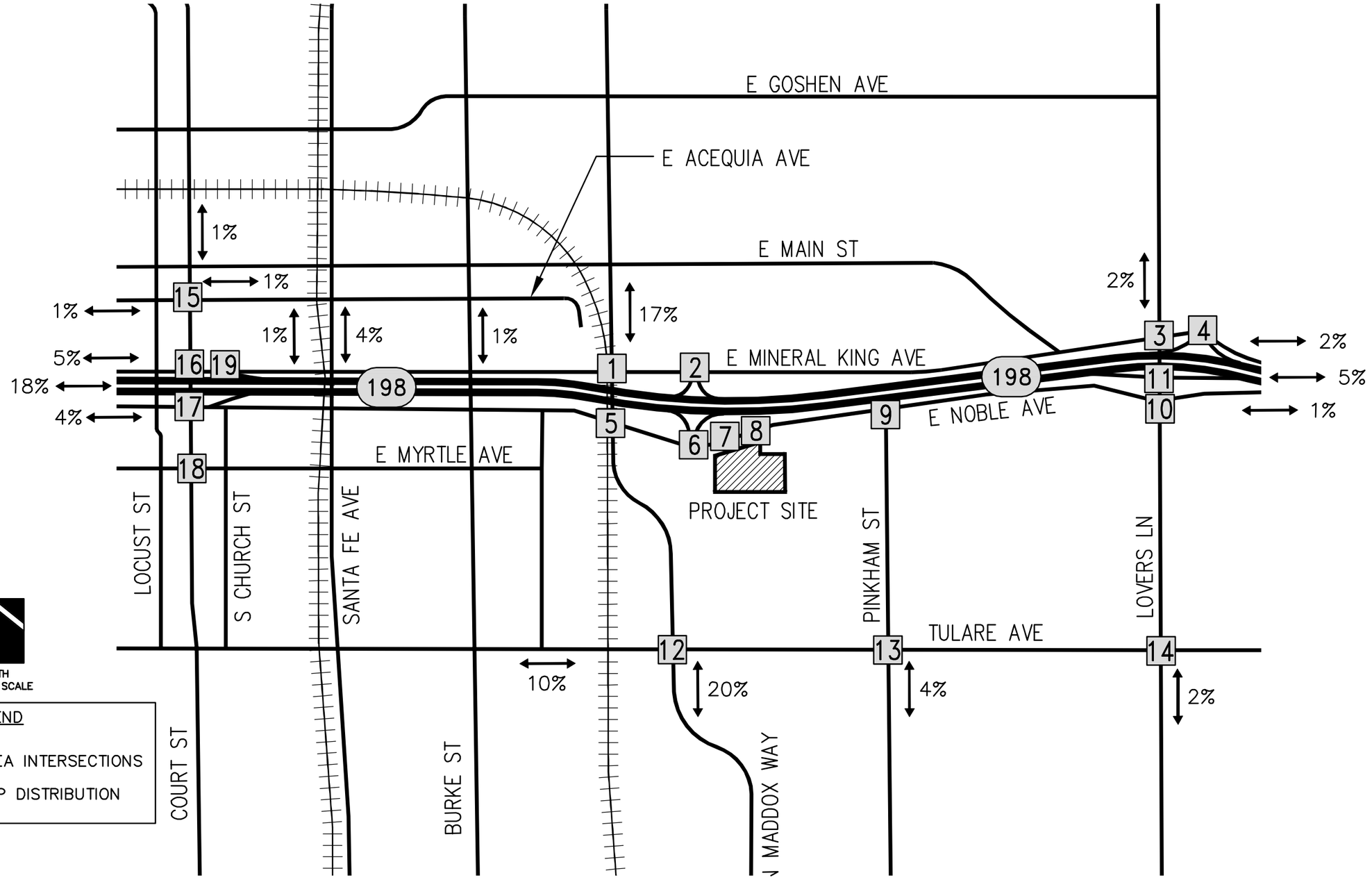

VISALIA WALMART EXPANSION

PROJECT TRIP DISTRIBUTION

FIGURE 10

Kimley-Horn and Associates, Inc.

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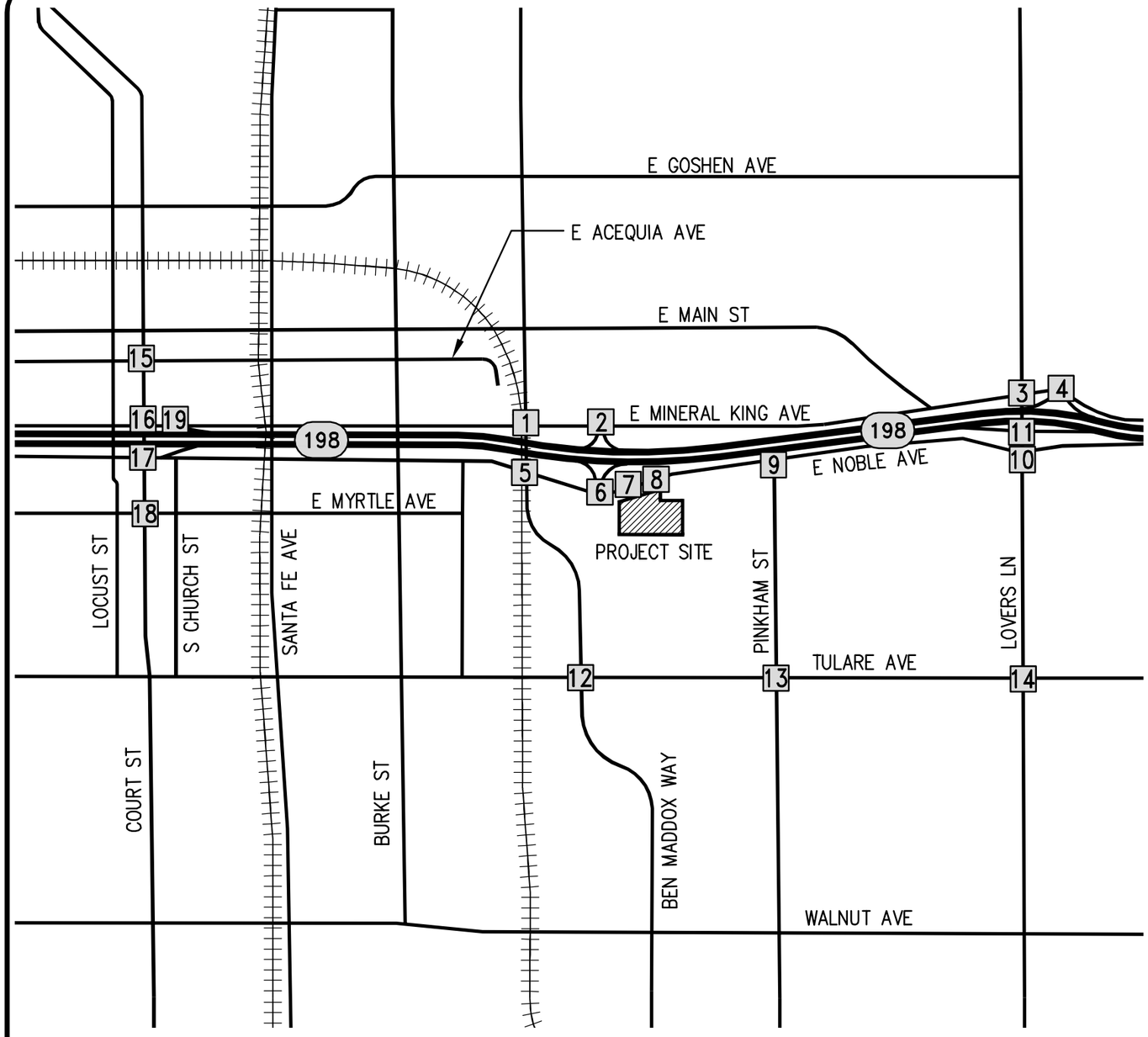
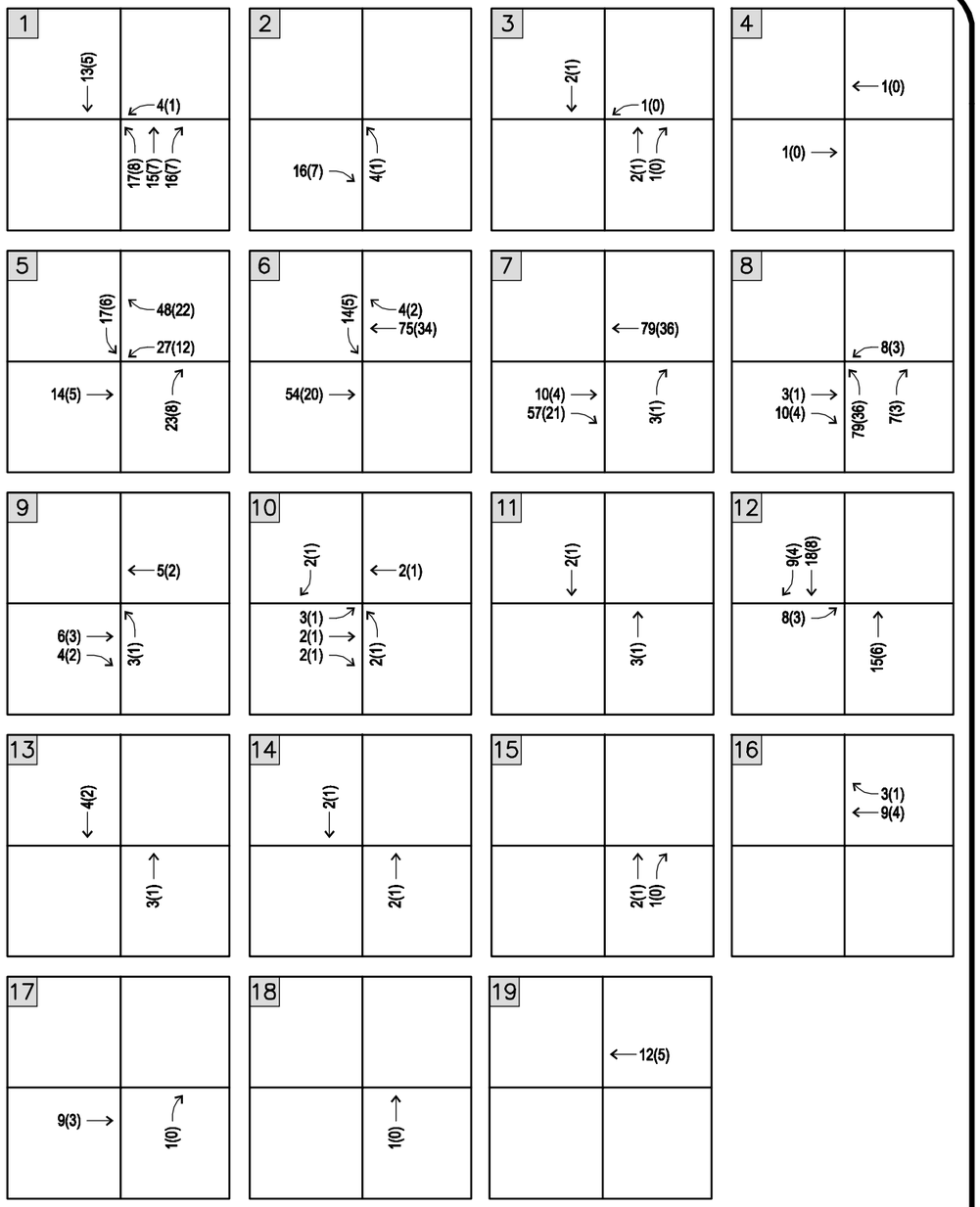




VISALIA WALMART EXPANSION

NEW PROJECT GENERATED TRAFFIC VOLUMES

LEGEND

X — STUDY AREA INTERSECTIONS

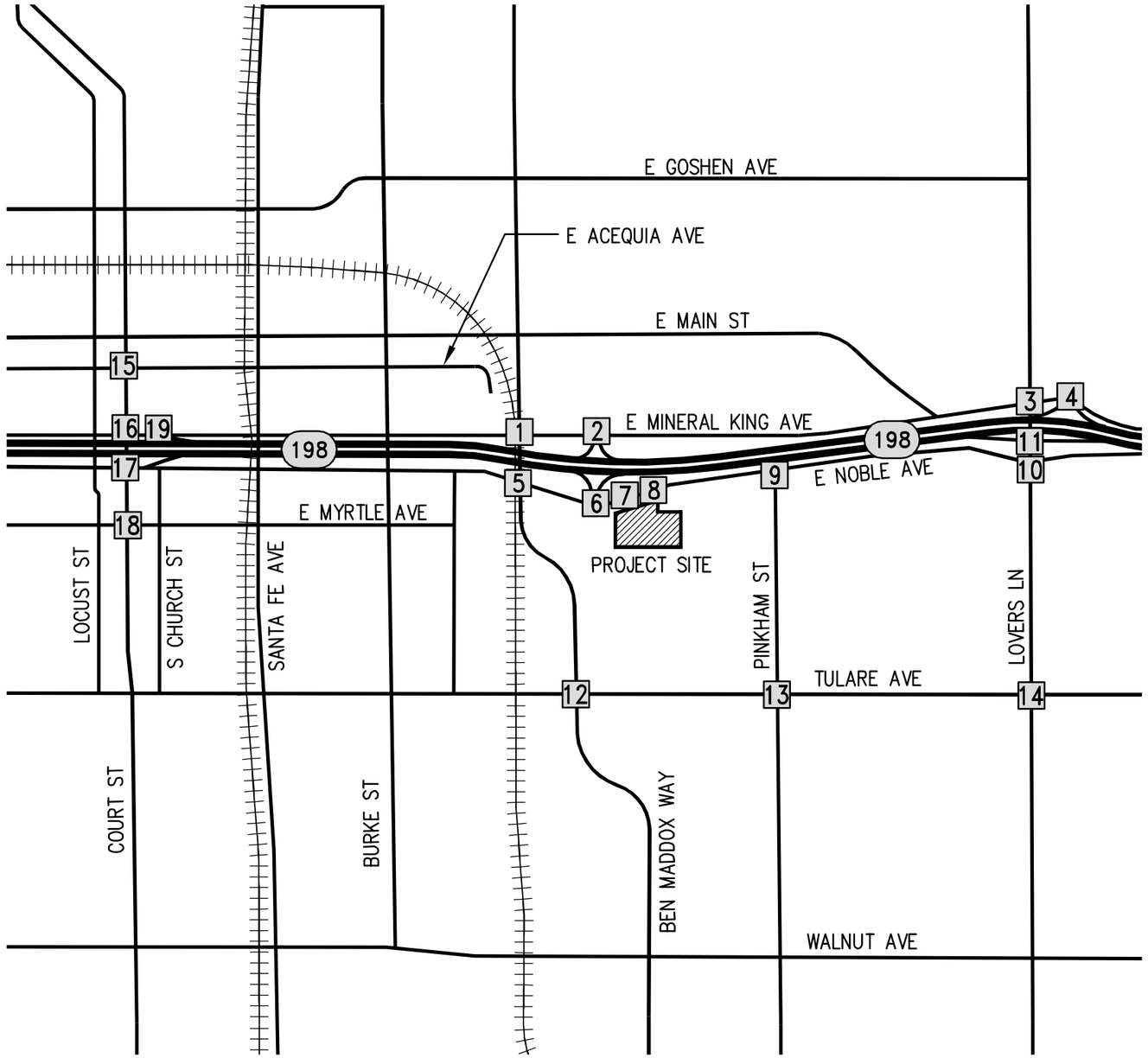
XX (YY) — AM (PM) VOLUMES

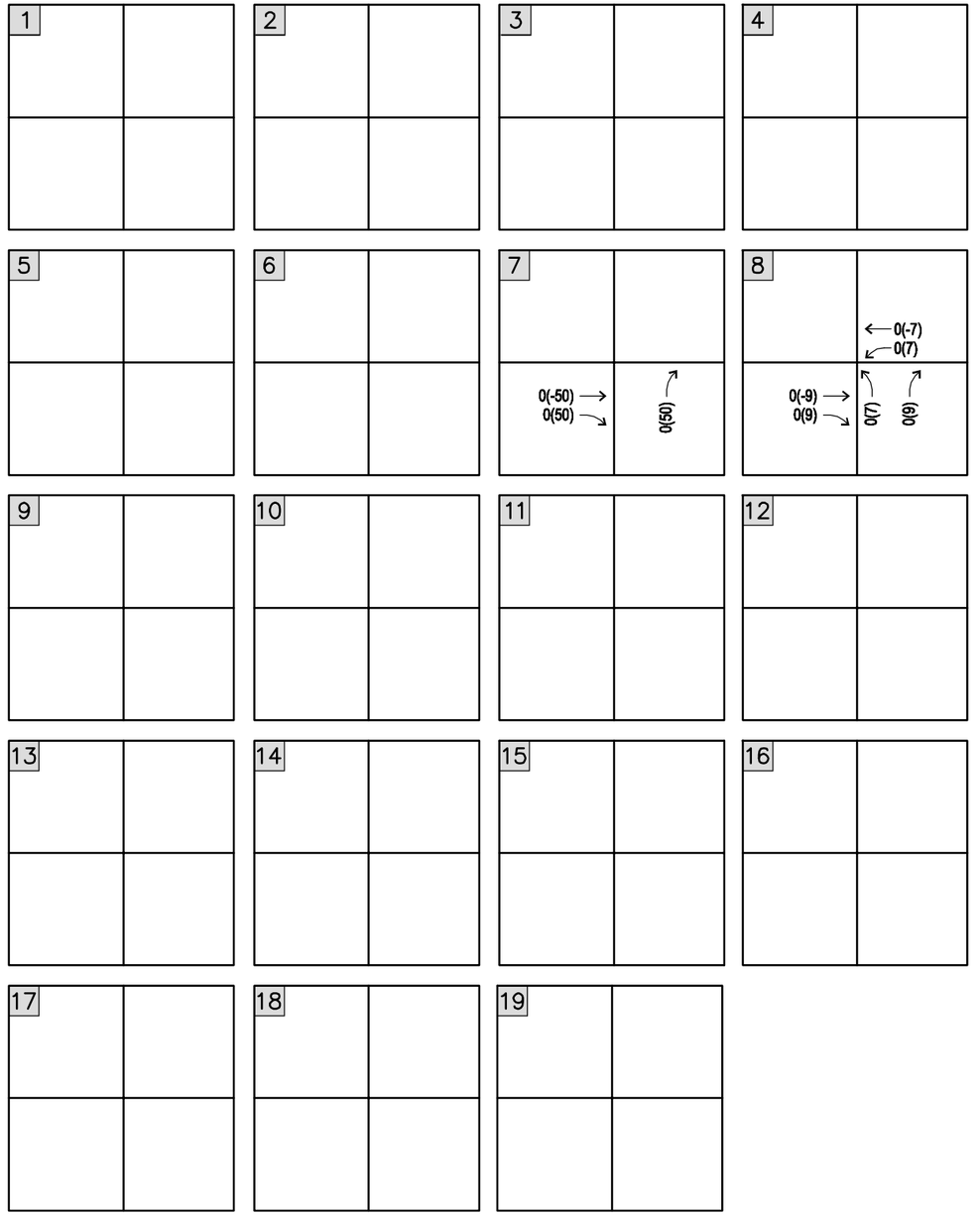
NORTH
NOT TO SCALE

FIGURE 11

Kimley-Horn and Associates, Inc.

K:\BAY_TPTO\097311005 - ECS - Visalia Wal-Mart - JEW\CADD\311005-Figures.dwg Jan 05,2010 - 12:29pm ben.huie





LEGEND

X	STUDY AREA INTERSECTIONS
XX (YY)	AM (PM) VOLUMES

NORTH
NOT TO SCALE

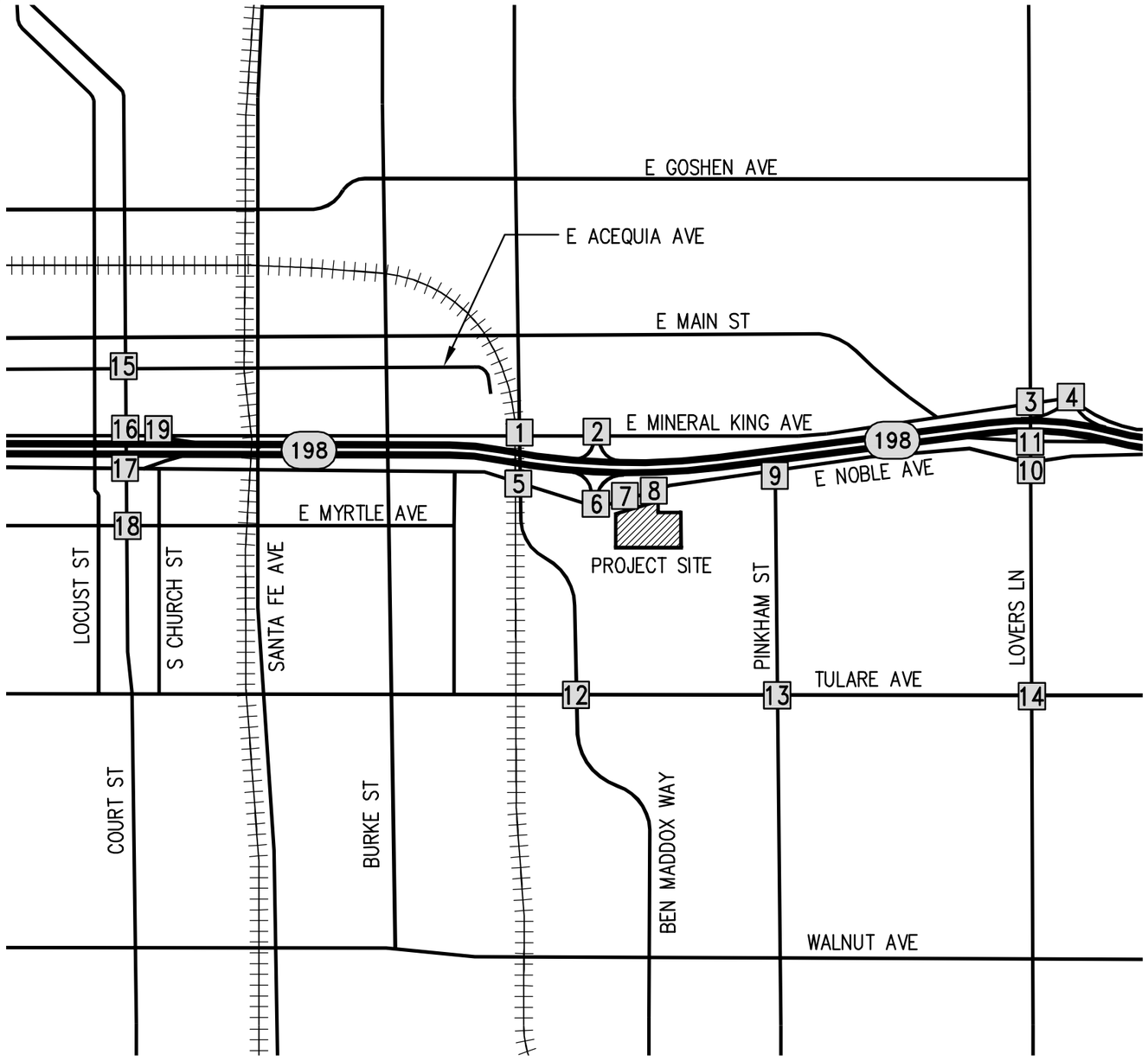
VISALIA WALMART EXPANSION

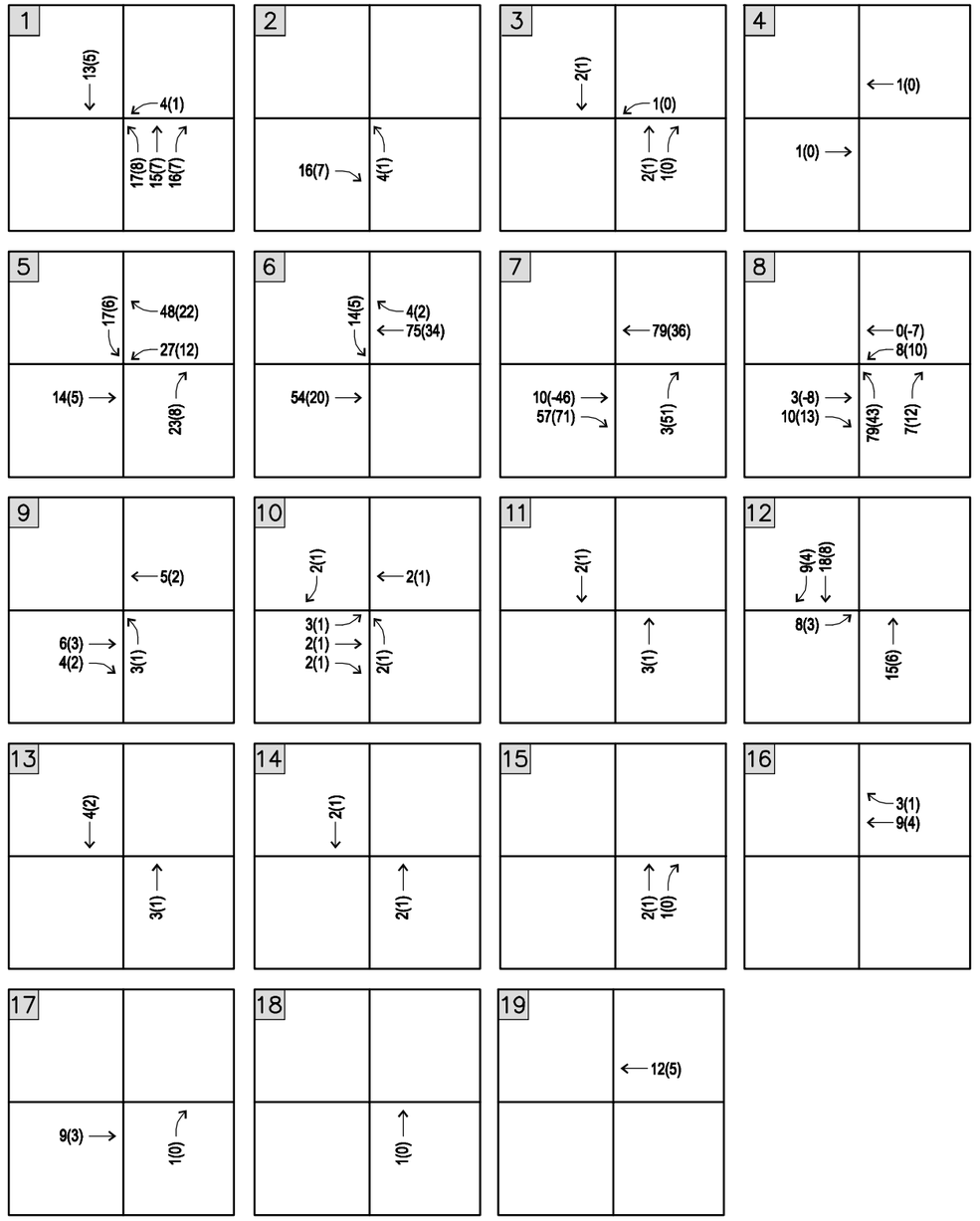
PROJECT PASS-BY TRIPS

FIGURE 12

Kimley-Horn and Associates, Inc.

K:\BAY_TPTO\097311005 - ECS - Visalia Wal-Mart - JEW\CADD\311005-Figures.dwg Jan 05,2010 - 12:29pm ben.huie





VISALIA WALMART EXPANSION

TOTAL PROJECT GENERATED TRAFFIC VOLUMES

LEGEND

X	STUDY AREA INTERSECTIONS
XX (YY)	AM (PM) VOLUMES

NORTH
NOT TO SCALE

FIGURE 13

Kimley-Horn and Associates, Inc.

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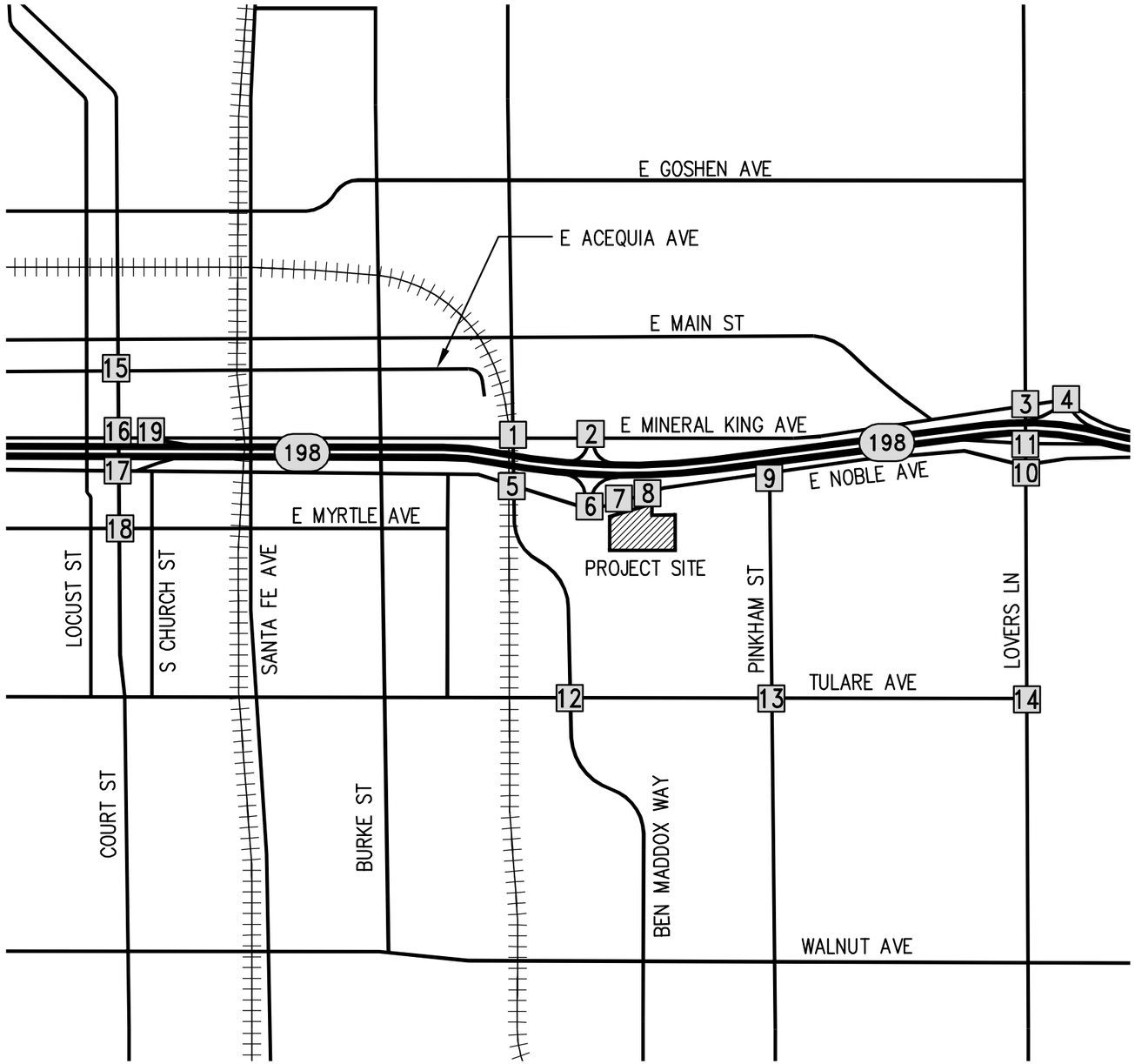
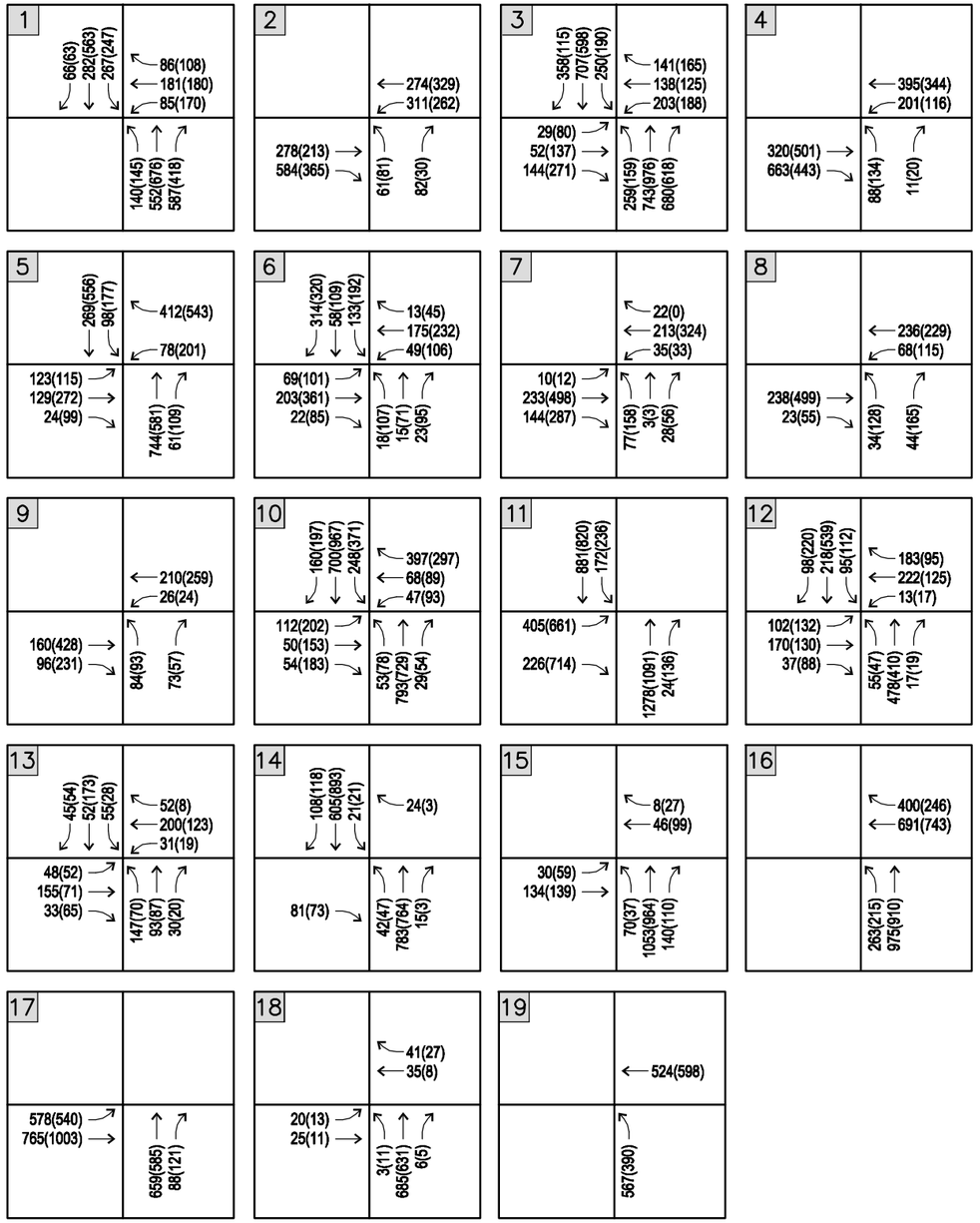




VISALIA WALMART EXPANSION

NEAR-TERM 2010 TRAFFIC VOLUMES

LEGEND

X — STUDY AREA INTERSECTIONS

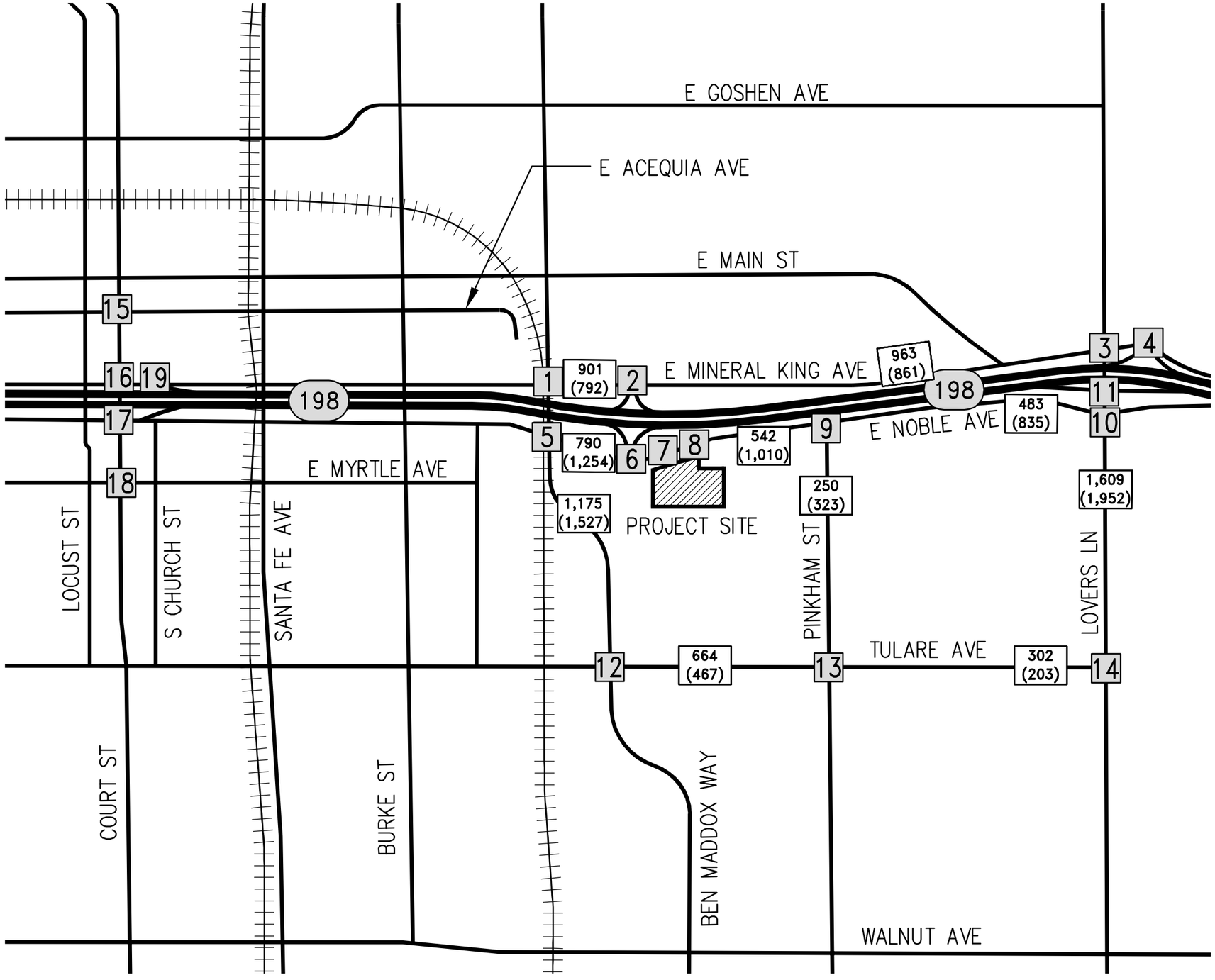
XX (YY) — AM (PM) VOLUMES

NORTH
NOT TO SCALE

FIGURE 14

Kimley-Horn and Associates, Inc.

K:\BAY_TPTO\097311005 - ECS - Visalia Wal-Mart - JEW\CADD\311005-Figures.dwg Apr 07,2010 - 5:08pm ben.huie



NORTH
NOT TO SCALE

LEGEND

- [X] STUDY AREA INTERSECTIONS
- PROJECT SITE
- X / (Y) TWO-WAY AM / PM PEAK HOUR VOLUME

VISALIA WALMART EXPANSION

NEAR-TERM 2010 PEAK HOUR TWO-WAY ROADWAY SEGMENT VOLUMES

FIGURE 15

Kimley-Horn and Associates, Inc.

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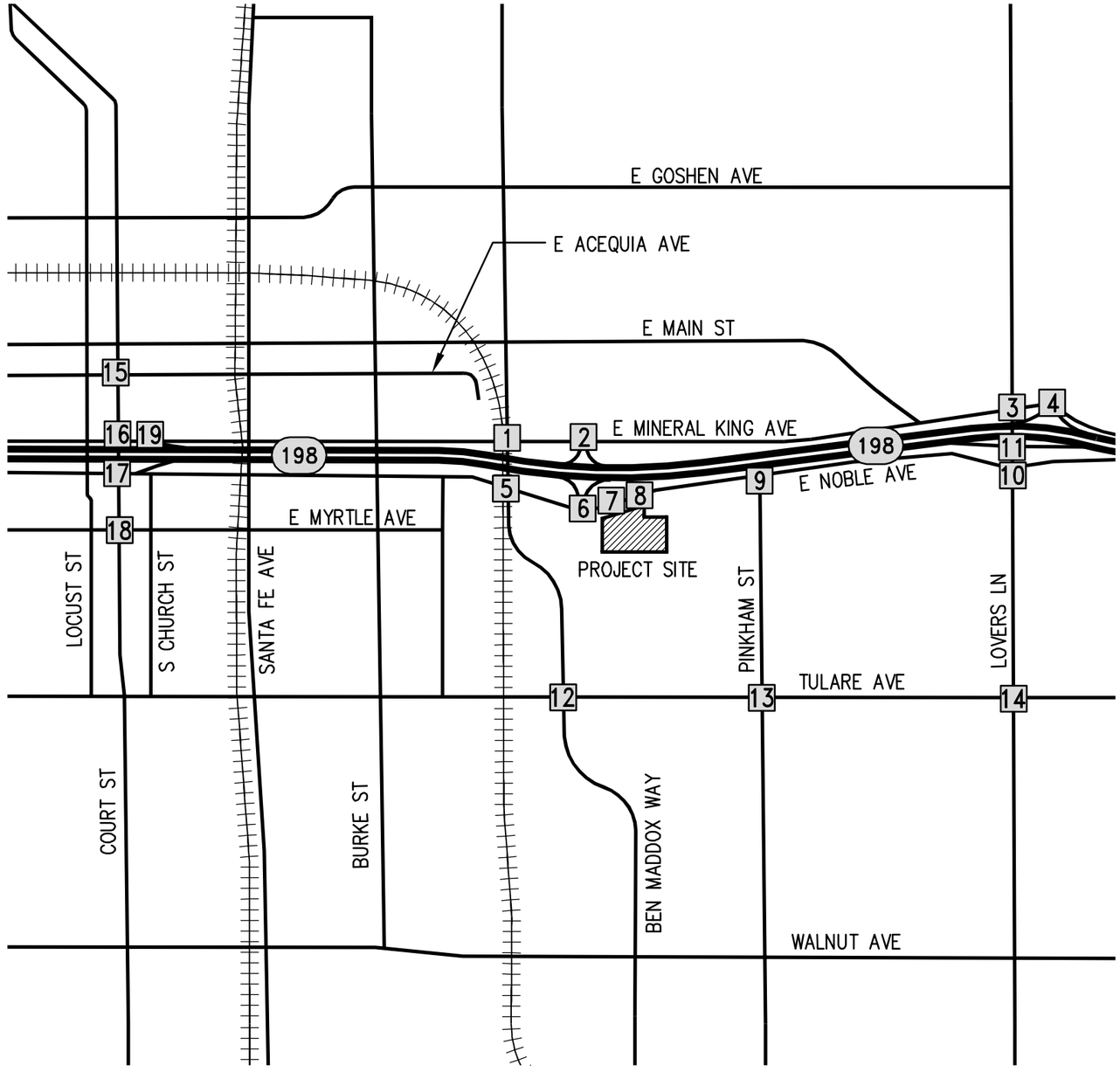
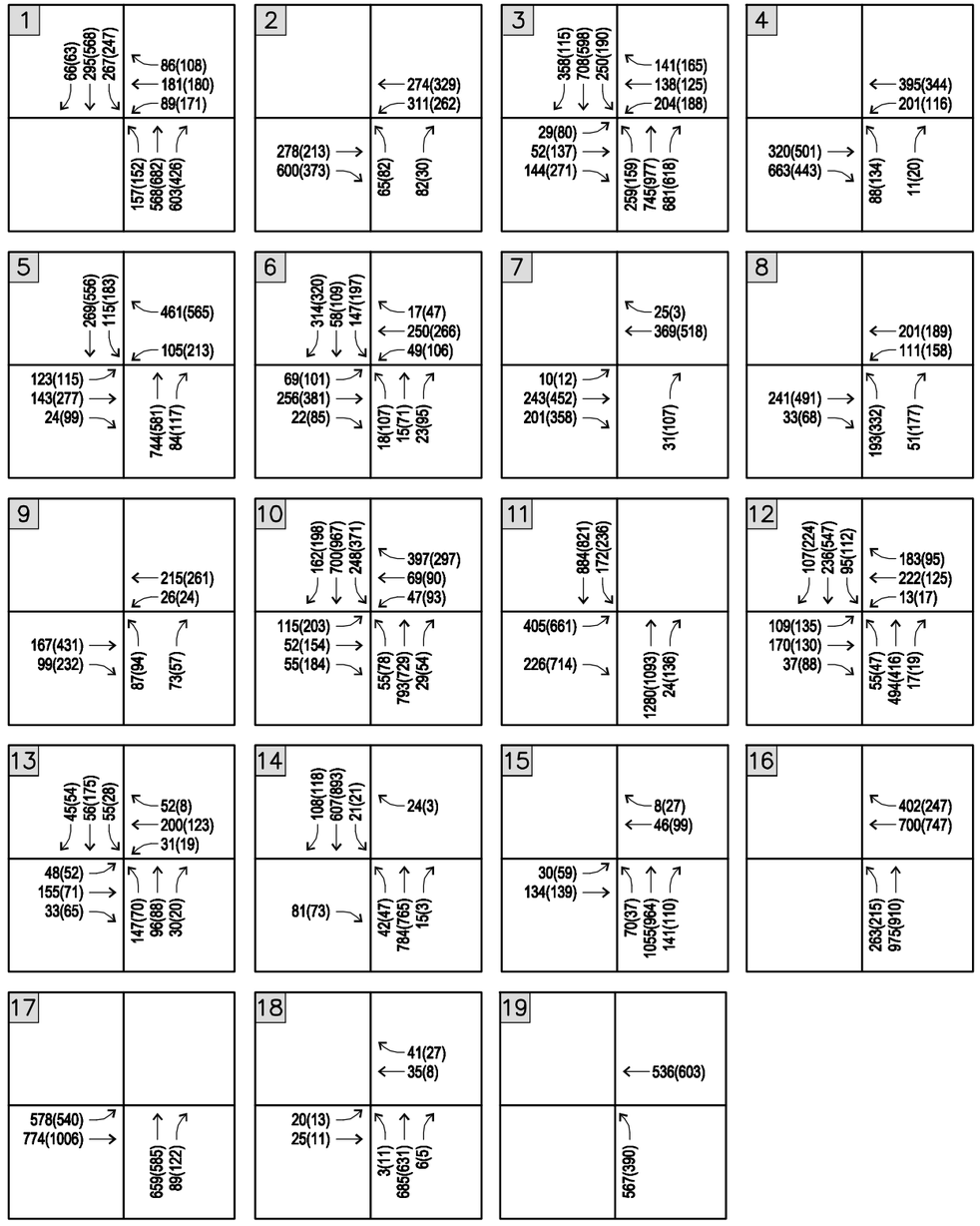




VISALIA WALMART EXPANSION

NEAR-TERM 2010 PLUS PROPOSED PROJECT TRAFFIC VOLUMES

LEGEND

X — STUDY AREA INTERSECTIONS

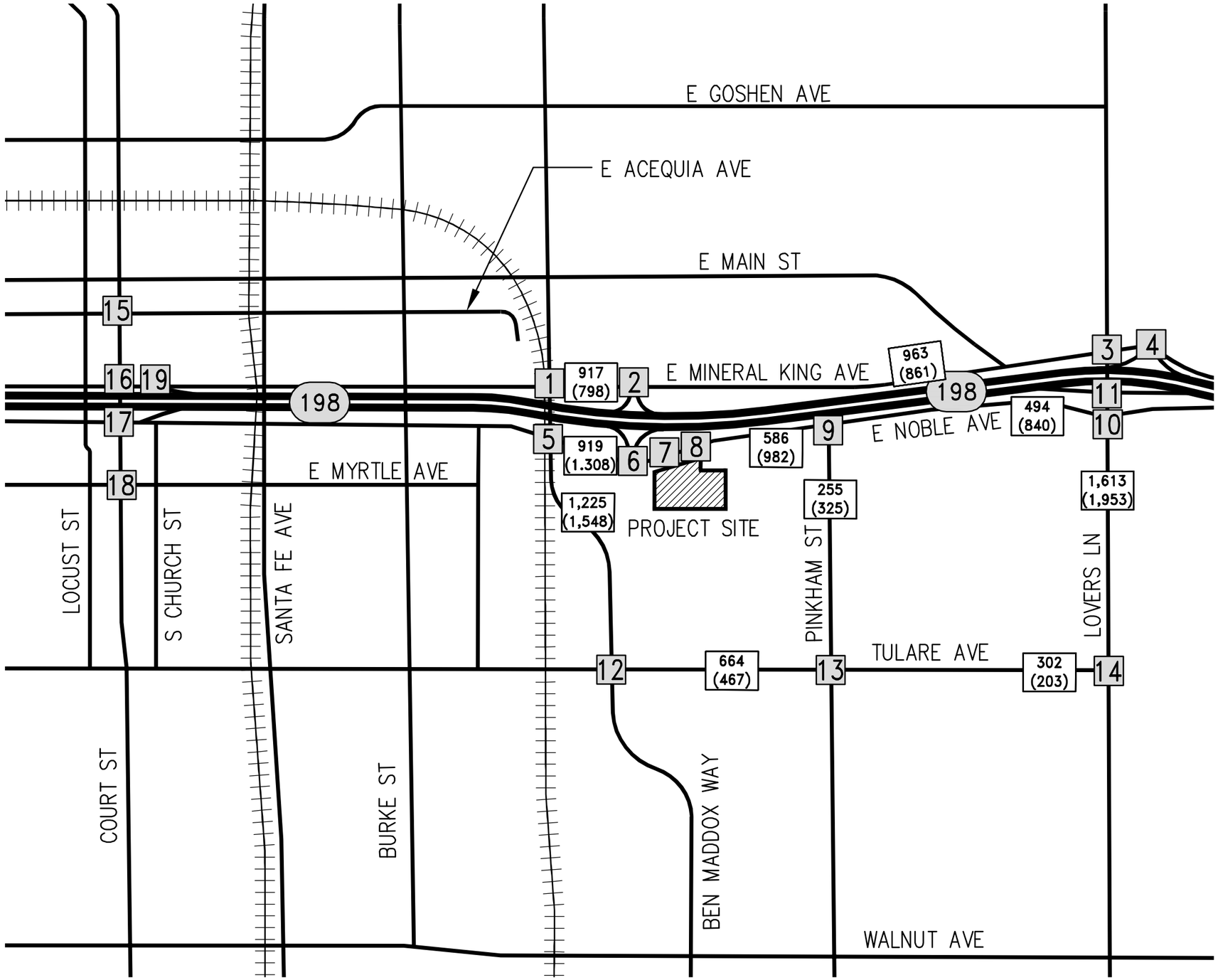
XX (YY) — AM (PM) VOLUMES

NORTH
NOT TO SCALE

FIGURE 16

Kimley-Horn and Associates, Inc.

K:\BAY_TPTO\097311005 - ECS - Visalia Wal-Mart - JEW\CADD\311005-Figures.dwg Apr 07,2010 - 11:17am ben.huie



NORTH
NOT TO SCALE

LEGEND

- X — STUDY AREA INTERSECTIONS
- PROJECT SITE
- X (Y) — TWO-WAY AM PEAK HOUR VOLUME / TWO-WAY PM PEAK HOUR VOLUME

VISALIA WALMART EXPANSION

NEAR-TERM 2010 PLUS PROPOSED PROJECT PEAK HOUR TWO-WAY ROADWAY SEGMENT VOLUMES

FIGURE 17

Kimley-Horn and Associates, Inc.

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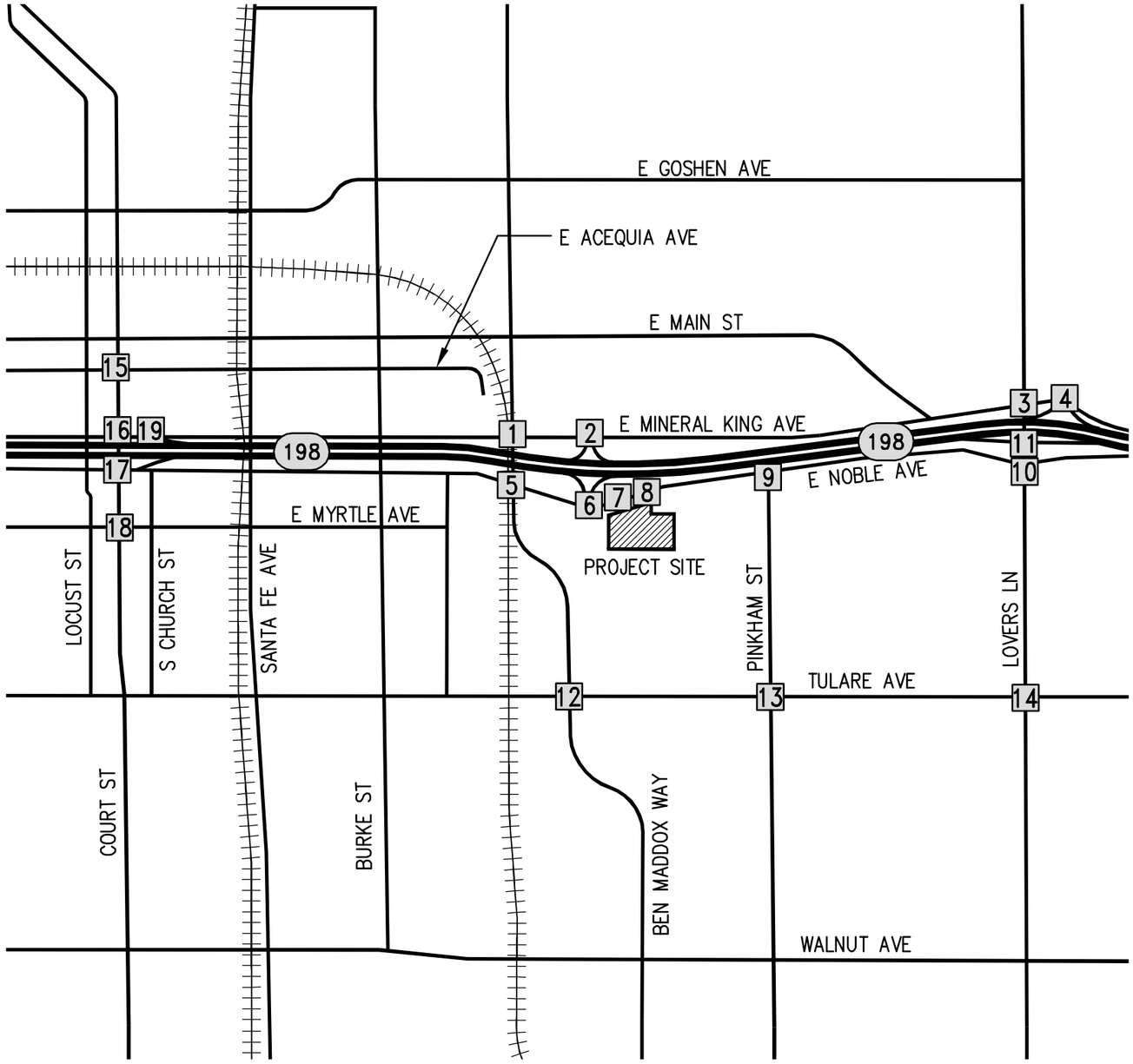

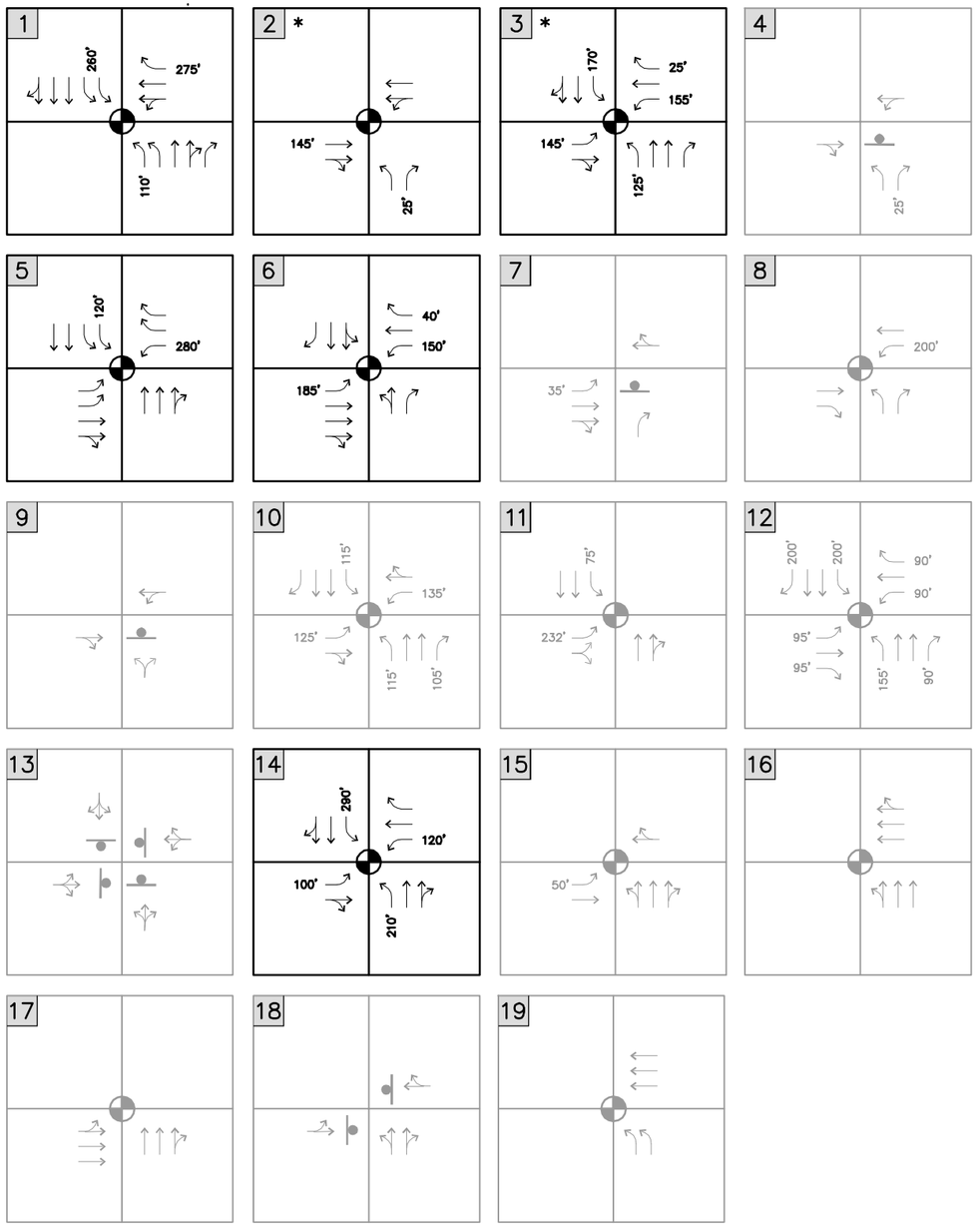

VISALIA WALMART EXPANSION

NEAR-TERM 2015 LANE GEOMETRY AND TRAFFIC CONTROL

LEGEND

- X — STUDY AREA INTERSECTIONS
- TRAFFIC SIGNAL
- STOP SIGN
- XX' — STORAGE LENGTH

NORTH
NOT TO SCALE

NOTE: SHADED INTERSECTIONS REFLECT UNCHANGED CONDITIONS FROM NEAR-TERM (2010) CONDITIONS.

* LANE GEOMETRY CHANGE ONLY IN THE PLUS PROJECT SCENARIO. NO PROJECT SCENARIO IS SAME AS NEAR-TERM 2010 LANE GEOMETRY.

FIGURE 18

Kimley-Horn and Associates, Inc.

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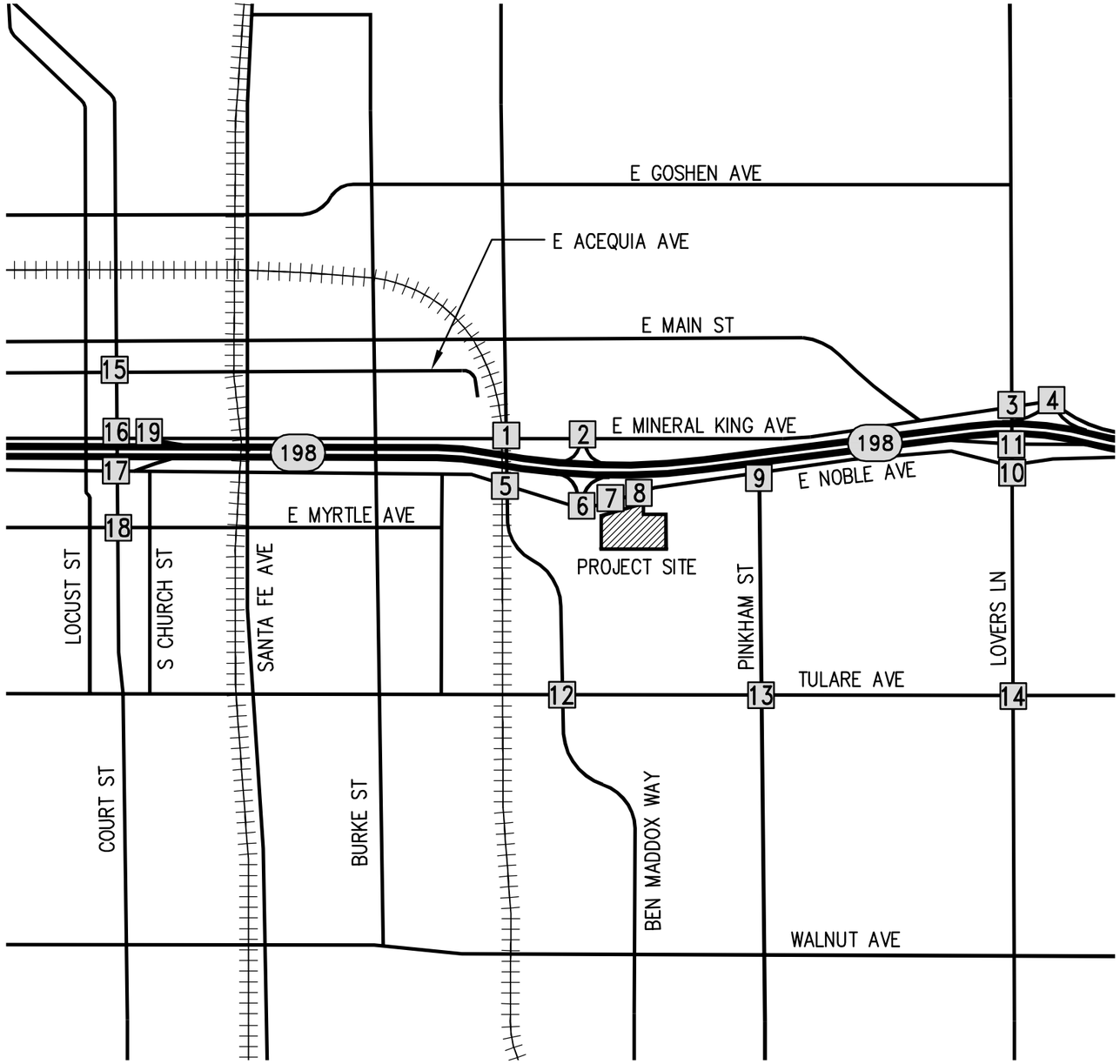
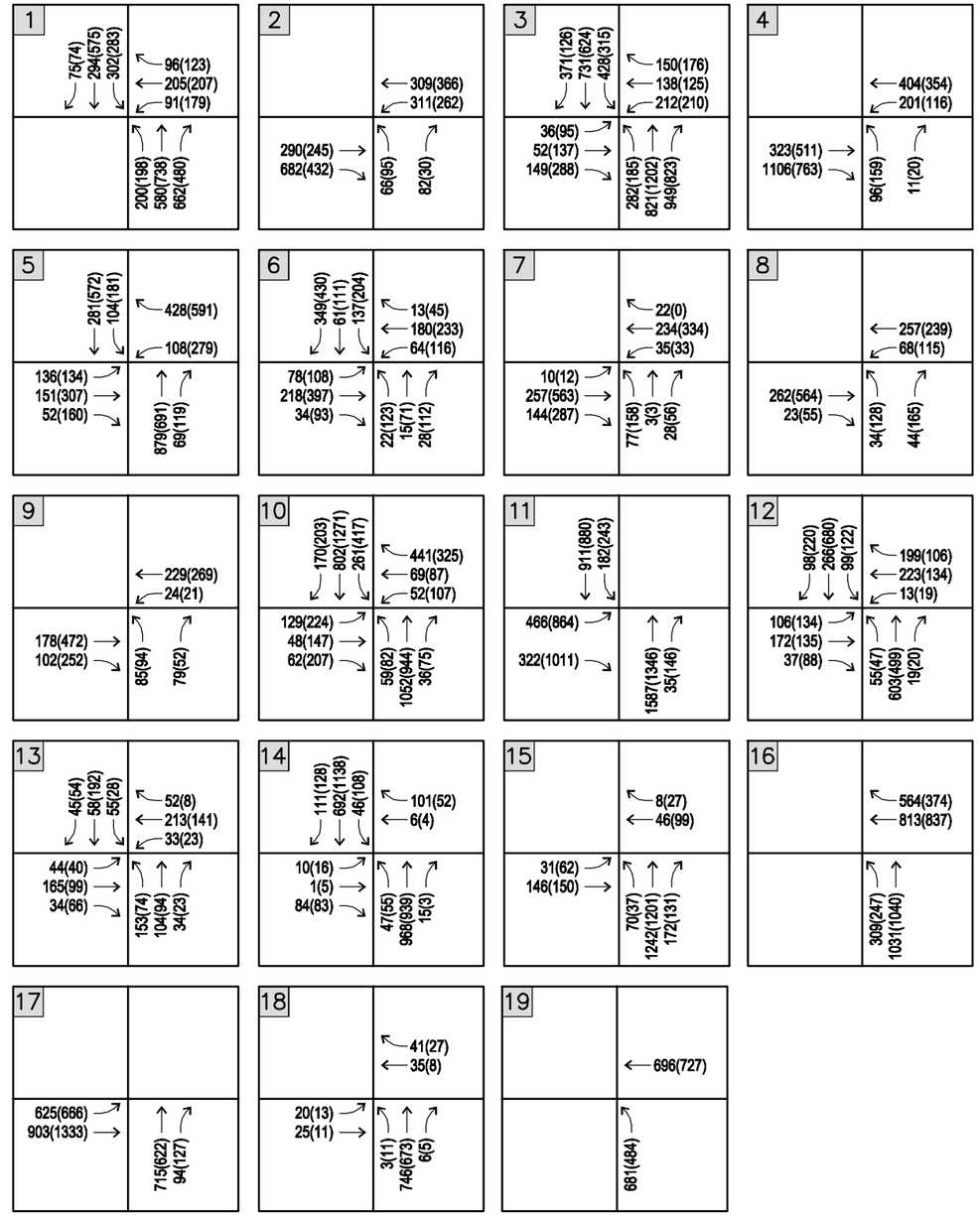




LEGEND

X — STUDY AREA INTERSECTIONS

XX (YY) — AM (PM) VOLUMES

NORTH
NOT TO SCALE

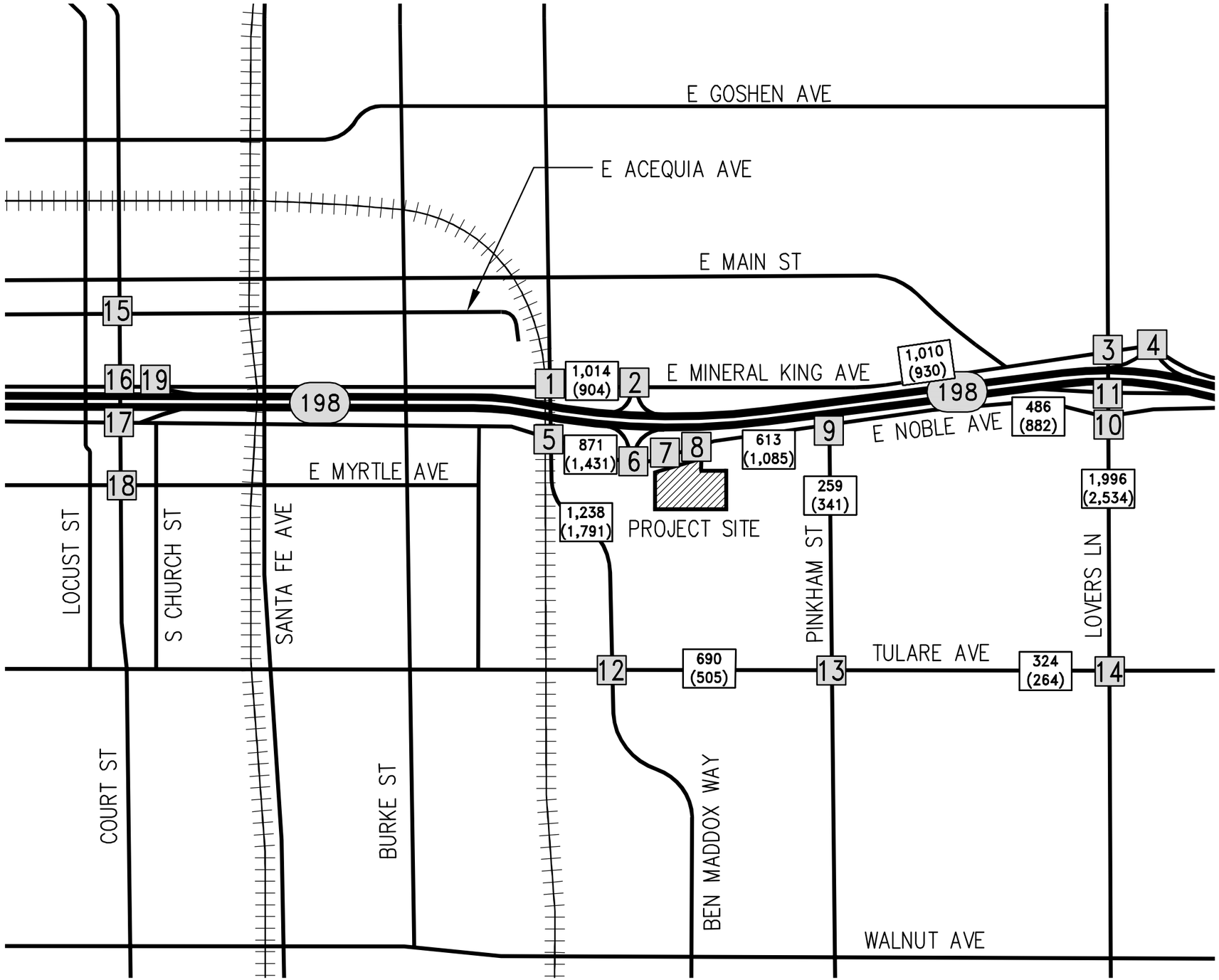
VISALIA WALMART EXPANSION

NEAR-TERM 2015 TRAFFIC VOLUMES

FIGURE 19

Kimley-Horn and Associates, Inc.

K:\BAY_TPTO\097311005 - ECS - Visalia Wal-Mart - JEW\CADD\311005-Figures.dwg Jan 05,2010 - 12:31pm ben.huie



NORTH
NOT TO SCALE

LEGEND

- [X] STUDY AREA INTERSECTIONS
- PROJECT SITE
- X (Y) TWO-WAY AM PEAK HOUR VOLUME / TWO-WAY PM PEAK HOUR VOLUME

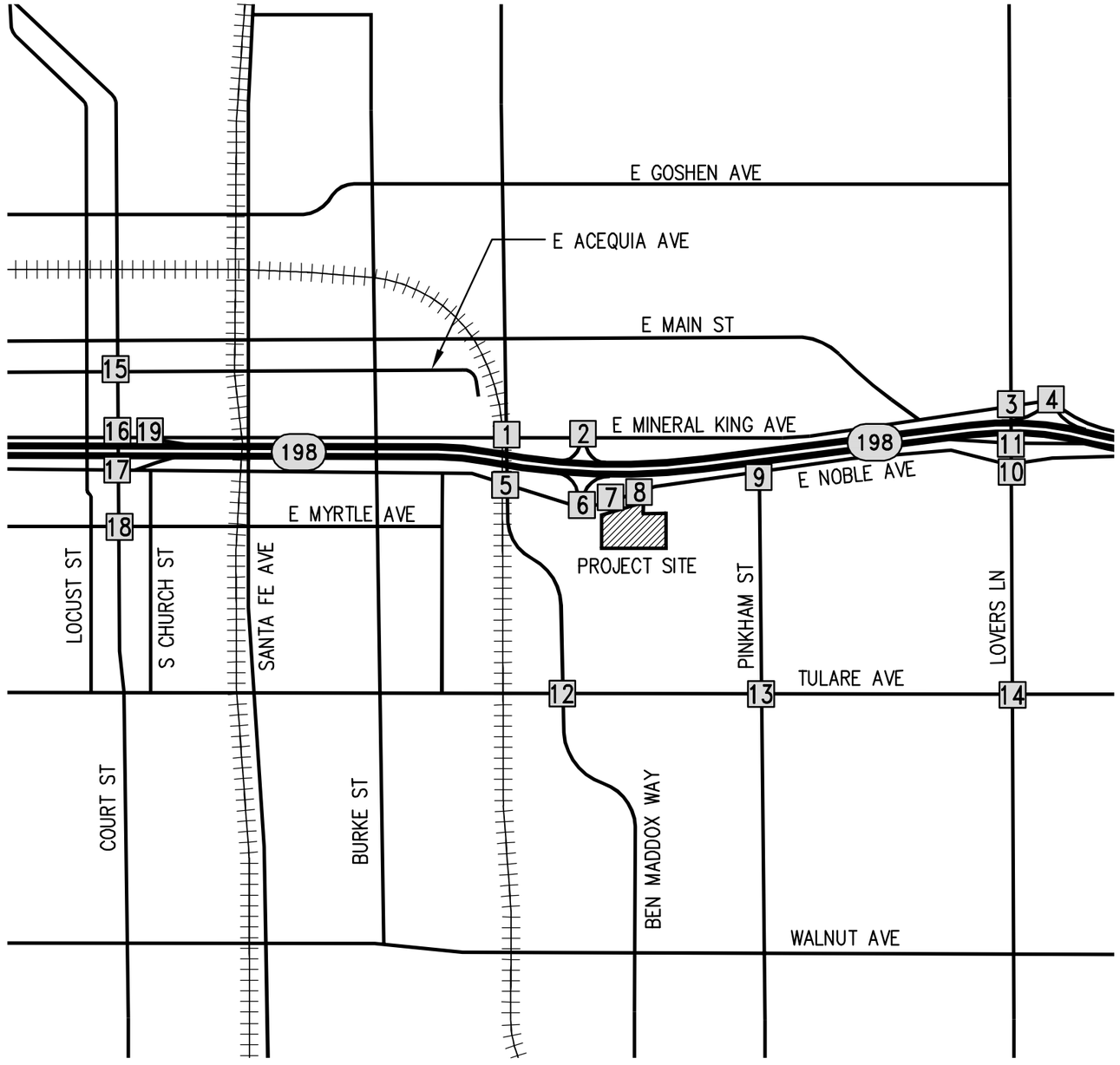
VISALIA WALMART EXPANSION

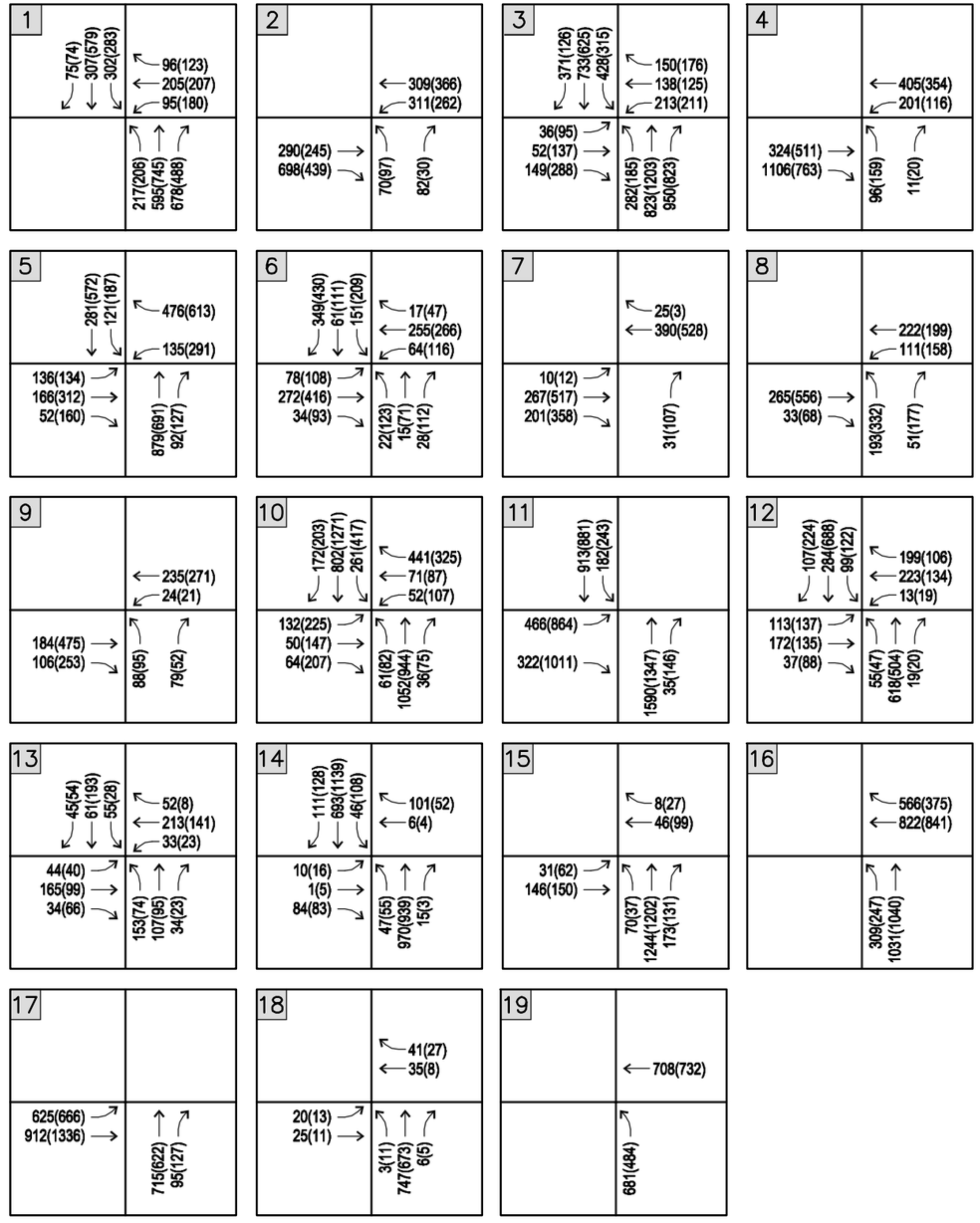
NEAR-TERM 2015 PEAK HOUR TWO-WAY ROADWAY SEGMENT VOLUMES

FIGURE 20

Kimley-Horn and Associates, Inc.

K:\BAY_TPTO\097311005 - ECS - Visalia Wal-Mart - JEW\CADD\311005-Figures.dwg Apr 08,2010 - 11:07am ben.huie





LEGEND

X — STUDY AREA INTERSECTIONS

XX (YY) — AM (PM) VOLUMES

NORTH
NOT TO SCALE

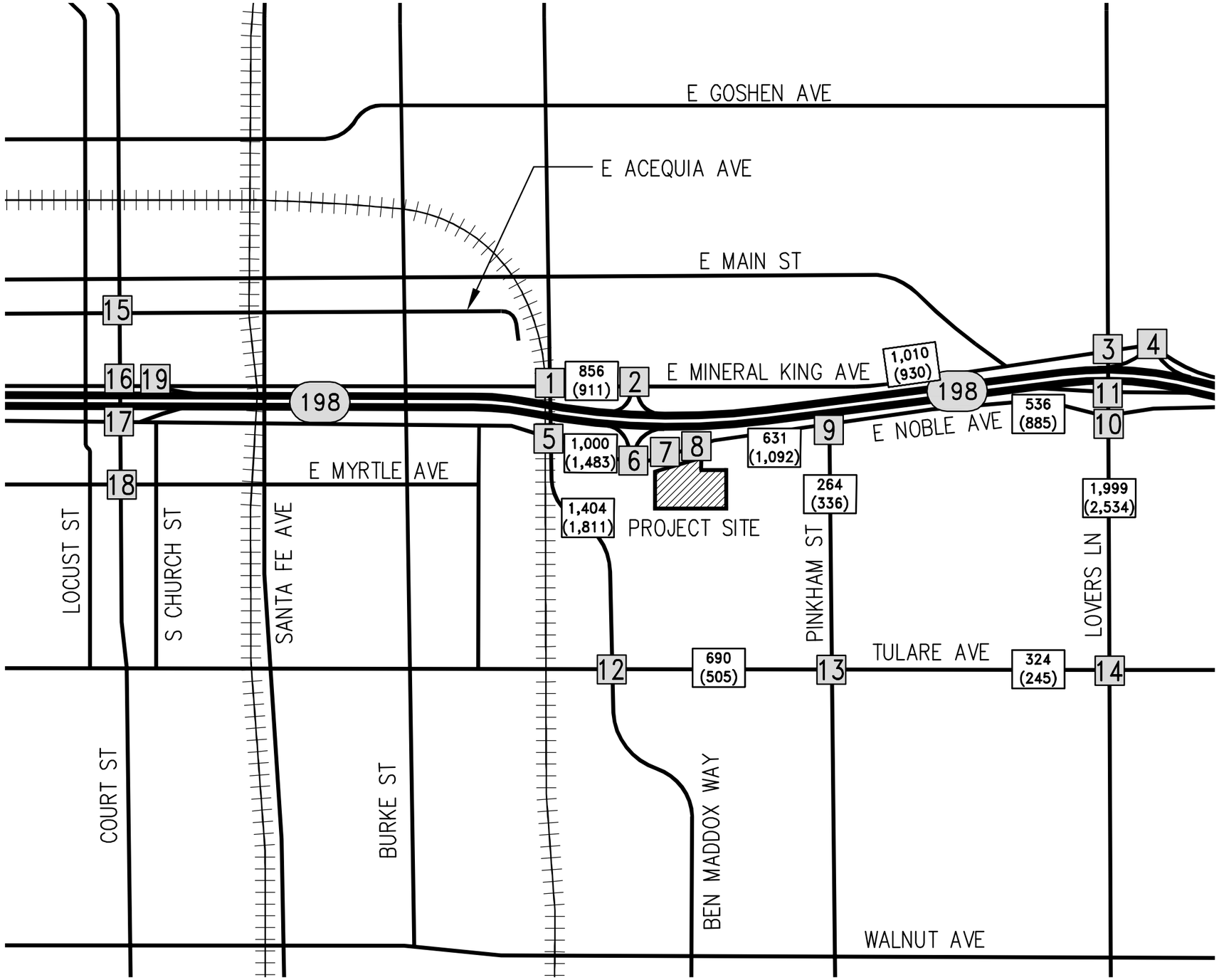
VISALIA WALMART EXPANSION

NEAR-TERM 2015 PLUS PROPOSED PROJECT TRAFFIC VOLUMES

FIGURE 21

Kimley-Horn and Associates, Inc.

K:\BAY_TPTO\097311005 - ECS - Visalia Wal-Mart - JEW\CADD\311005-Figures.dwg Jan 05,2010 - 12:31pm ben.huie



NORTH
NOT TO SCALE

LEGEND

- X — STUDY AREA INTERSECTIONS
- PROJECT SITE
- X (Y) — TWO-WAY AM PEAK HOUR VOLUME / TWO-WAY PM PEAK HOUR VOLUME

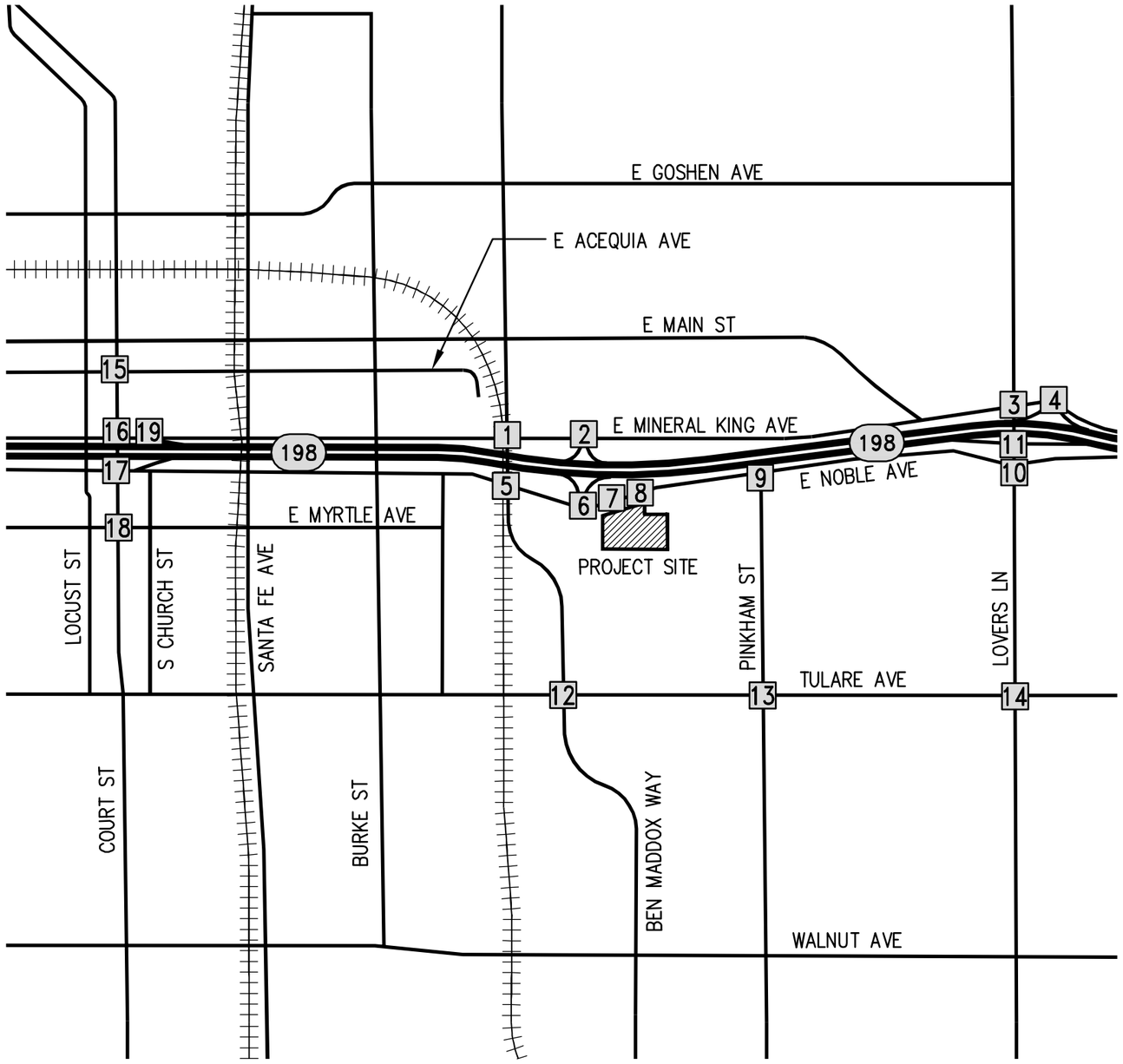
VISALIA WALMART EXPANSION

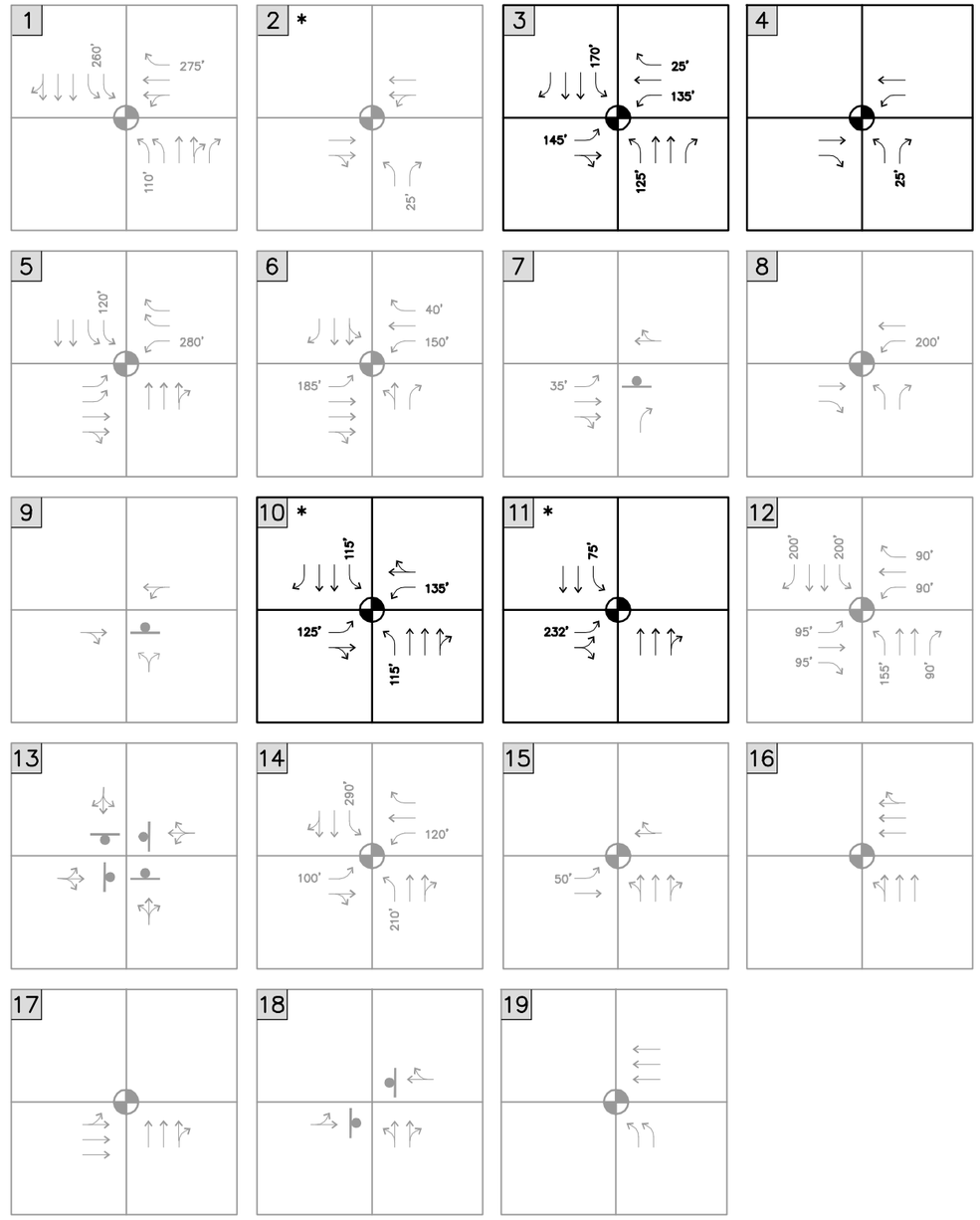
NEAR-TERM 2015 PLUS PROPOSED PROJECT PEAK HOUR TWO-WAY ROADWAY SEGMENT VOLUMES

FIGURE 22

Kimley-Horn and Associates, Inc.

K:\BAY_TPTO\097311005 - ECS - Visalia Wal-Mart - JEW\CADD\311005-Figures.dwg Apr 08,2010 - 11:08am ben.huie





VISALIA WALMART EXPANSION

LONG-TERM 2030 LANE GEOMETRY AND TRAFFIC CONTROL

LEGEND

- X — STUDY AREA INTERSECTIONS
- TRAFFIC SIGNAL
- STOP SIGN
- XX' STORAGE LENGTH

NORTH
NOT TO SCALE

NOTE: SHADED INTERSECTIONS REFLECT UNCHANGED CONDITIONS FROM NEAR-TERM (2015) CONDITIONS.

* LANE GEOMETRY CHANGE ONLY IN THE PLUS PROJECT SCENARIO. NO PROJECT SCENARIO IS SAME AS NEAR-TERM 2015 LANE GEOMETRY.

FIGURE 23

Kimley-Horn and Associates, Inc.

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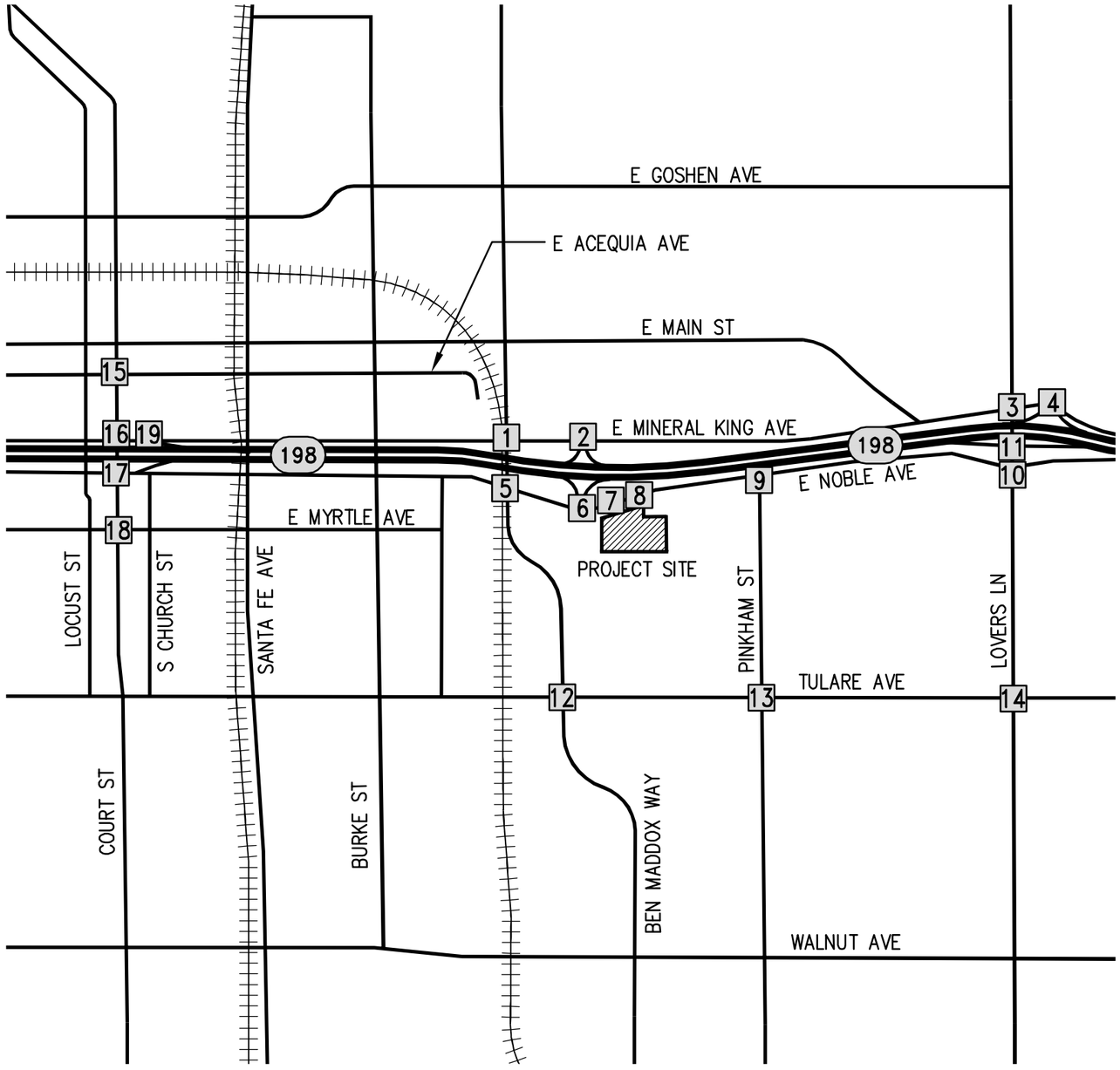
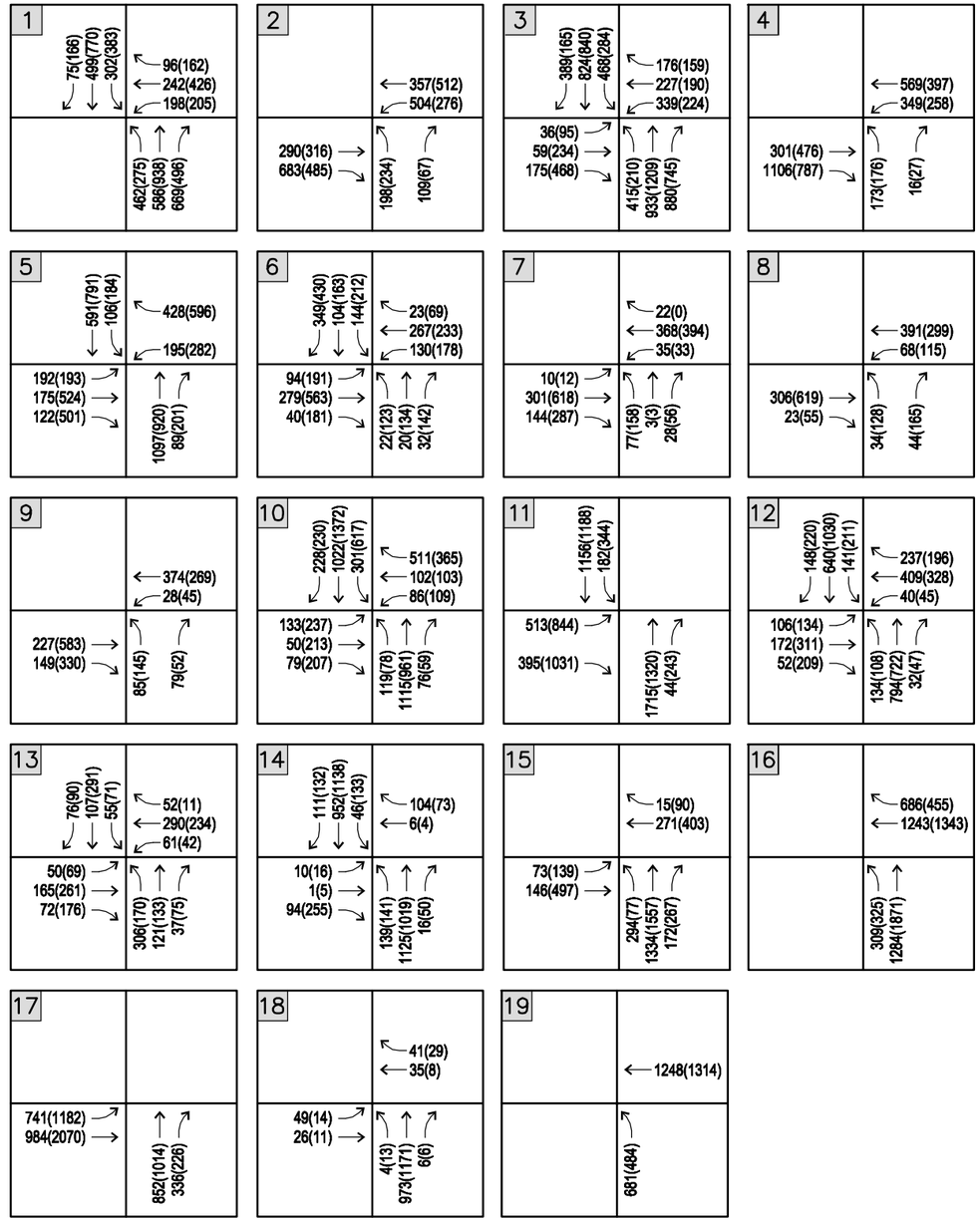




VISALIA WALMART EXPANSION

LONG-TERM 2030 TRAFFIC VOLUMES

LEGEND

X — STUDY AREA INTERSECTIONS

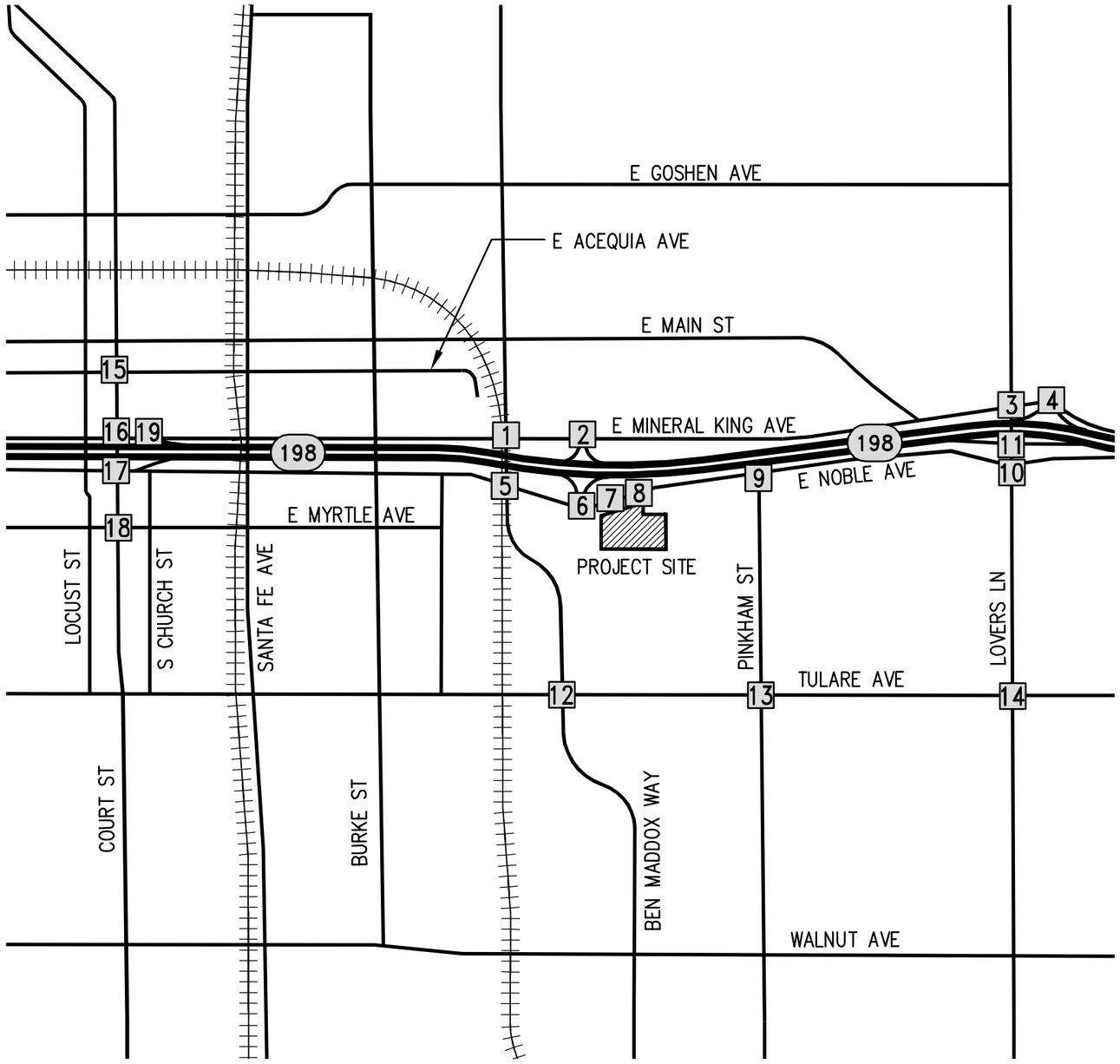
XX (YY) — AM (PM) VOLUMES

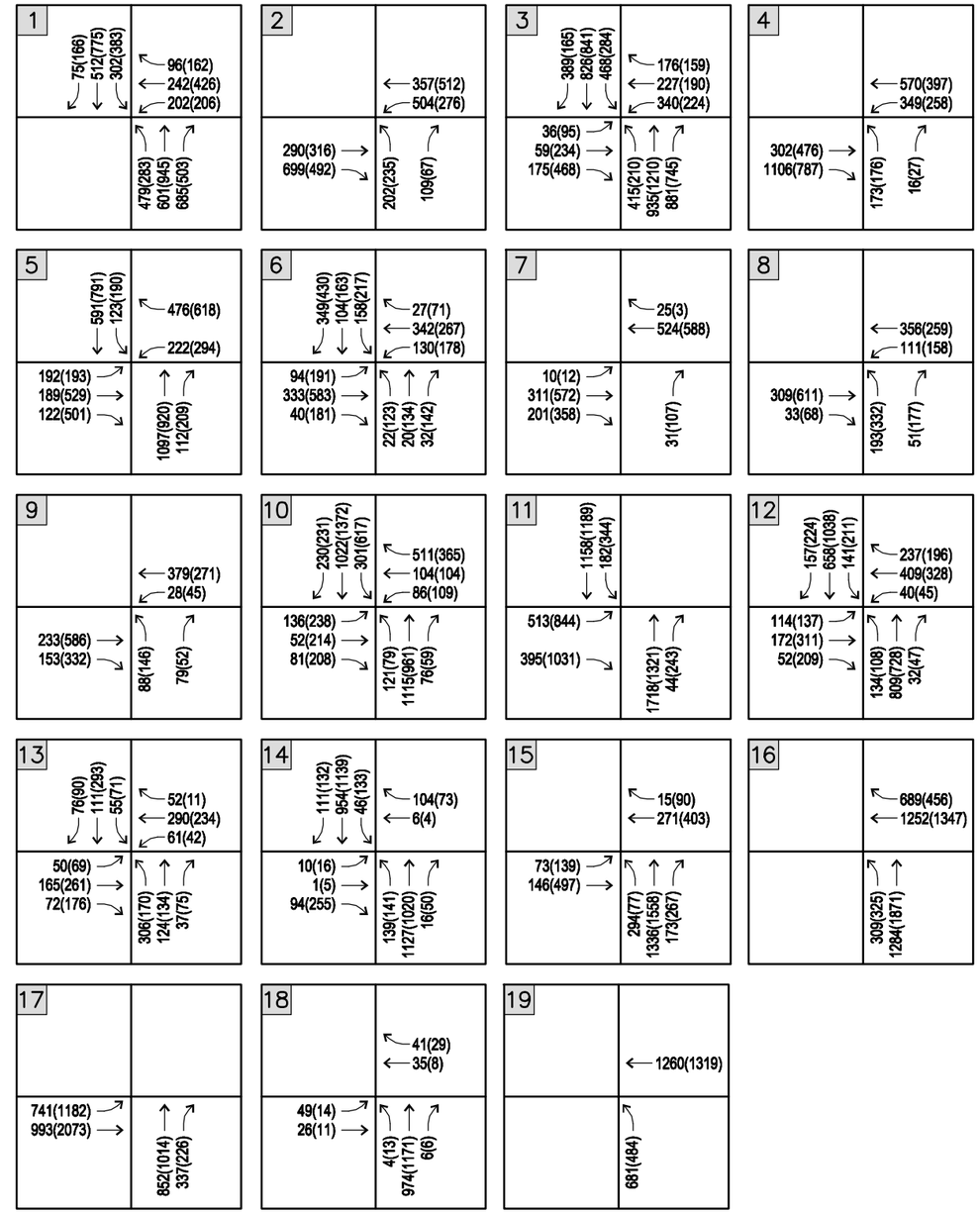
NORTH
NOT TO SCALE

FIGURE 24

Kimley-Horn and Associates, Inc.

K:\BAY_TPTO\097311005 - ECS - Visalia Wal-Mart - JEW\CADD\311005-Figures.dwg Jon 05,2010 - 12:32pm ben.huie





LEGEND

X STUDY AREA INTERSECTIONS

XX (YY) AM (PM) VOLUMES

NORTH
NOT TO SCALE

VISALIA WALMART EXPANSION

LONG-TERM 2030 PLUS PROPOSED PROJECT TRAFFIC VOLUMES

FIGURE 25

Kimley-Horn and Associates, Inc.

K:\BAY_TPTO\097311005 - ECS - Visalia Wal-Mart - JEW\CADD\311005-Figures.dwg Jan 05,2010 - 12:32pm ben.huie

TURNING MOVEMENT VOLUMES

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

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

Turning Movement Report

Prepared For: Robert Paderna
Kimley-Horn and Associates, Inc.
2000 Crow Canyon Place, Suite 410
San Ramon, CA 94583
(925) 242-5342 T

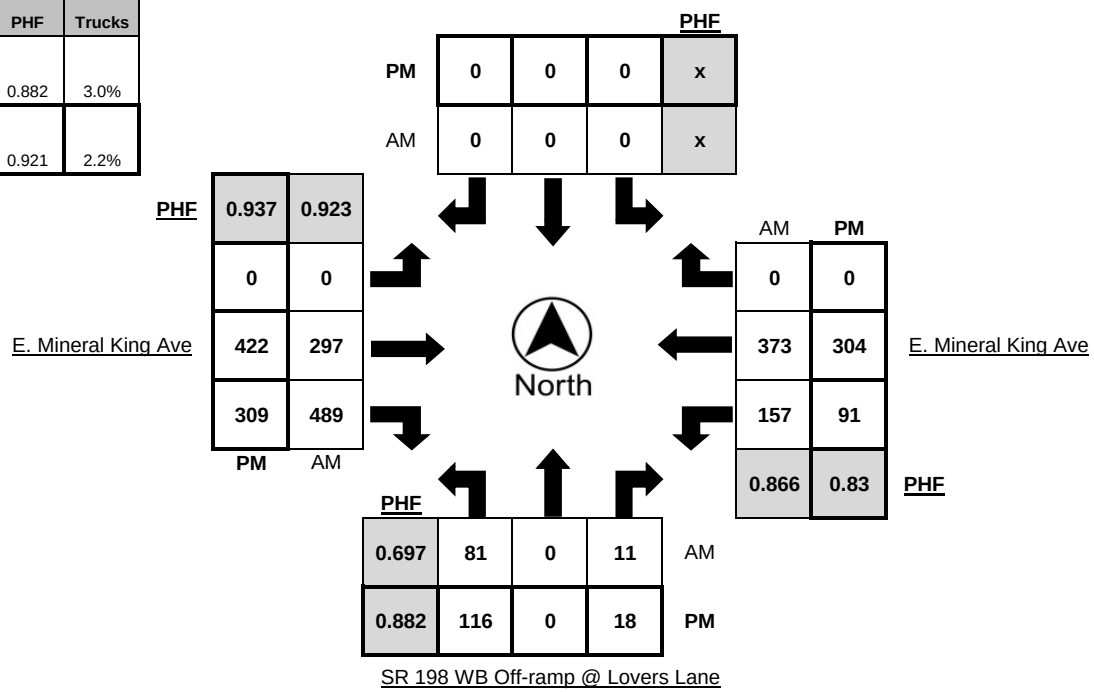
LOCATION E. Mineral King Avenue @ SR 198 WB Ramps
LATITUDE 36°19'41.59"N
COUNTY Tulare
LONGITUDE 119°15'33.21"W
COLLECTION DATE 11/13/2008
WEATHER Sunny and Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	11	0	1	0	0	0	0	0	0	60	89	13	31	41	0	1
7:15 AM - 7:30 AM	26	0	1	0	0	0	0	0	0	67	121	8	33	46	0	5
7:30 AM - 7:45 AM	17	0	1	1	0	0	0	0	0	42	123	4	51	88	0	4
7:45 AM - 8:00 AM	18	0	2	1	0	0	0	0	0	56	149	8	33	99	0	2
8:00 AM - 8:15 AM	25	0	8	1	0	0	0	0	0	96	117	9	40	113	0	2
8:15 AM - 8:30 AM	21	0	0	2	0	0	0	0	0	103	100	7	33	73	0	2
8:30 AM - 8:45 AM	25	0	4	5	0	0	0	0	0	84	83	8	24	74	0	1
8:45 AM - 9:00 AM	34	0	1	4	0	0	0	0	0	94	99	8	32	69	0	6
TOTAL	**177**	**0**	**18**	**14**	**0**	**0**	**0**	**0**	**0**	**602**	**881**	**65**	**277**	**603**	**0**	**23**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	17	0	2	1	0	0	0	0	0	102	80	4	30	79	0	8
4:15 PM - 4:30 PM	33	0	2	3	0	0	0	0	0	90	72	6	20	82	0	3
4:30 PM - 4:45 PM	35	0	3	2	0	0	0	0	0	97	94	2	19	71	0	5
4:45 PM - 5:00 PM	28	0	3	2	0	0	0	0	0	93	66	6	27	69	0	3
5:00 PM - 5:15 PM	24	0	4	0	0	0	0	0	0	121	74	3	18	72	0	1
5:15 PM - 5:30 PM	29	0	8	0	0	0	0	0	0	111	75	1	27	92	0	3
5:30 PM - 5:45 PM	30	0	5	0	0	0	0	0	0	99	76	0	25	69	0	0
5:45 PM - 6:00 PM	31	0	2	0	0	0	0	0	0	75	89	0	20	54	0	1
TOTAL	**227**	**0**	**29**	**8**	**0**	**0**	**0**	**0**	**0**	**788**	**626**	**22**	**186**	**588**	**0**	**24**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:30 AM - 8:30 AM	81	0	11	5	0	0	0	0	0	297	489	28	157	373	0	10
4:30 PM - 5:30 PM	116	0	18	4	0	0	0	0	0	422	309	12	91	304	0	12

	PHF	Trucks
AM	0.882	3.0%
PM	0.921	2.2%



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Turning Movement Report

Prepared For: Robert Paderna
Kimley-Horn and Associates, Inc.
2000 Crow Canyon Place, Suite 410
San Ramon, CA 94583
(925) 242-5342 T

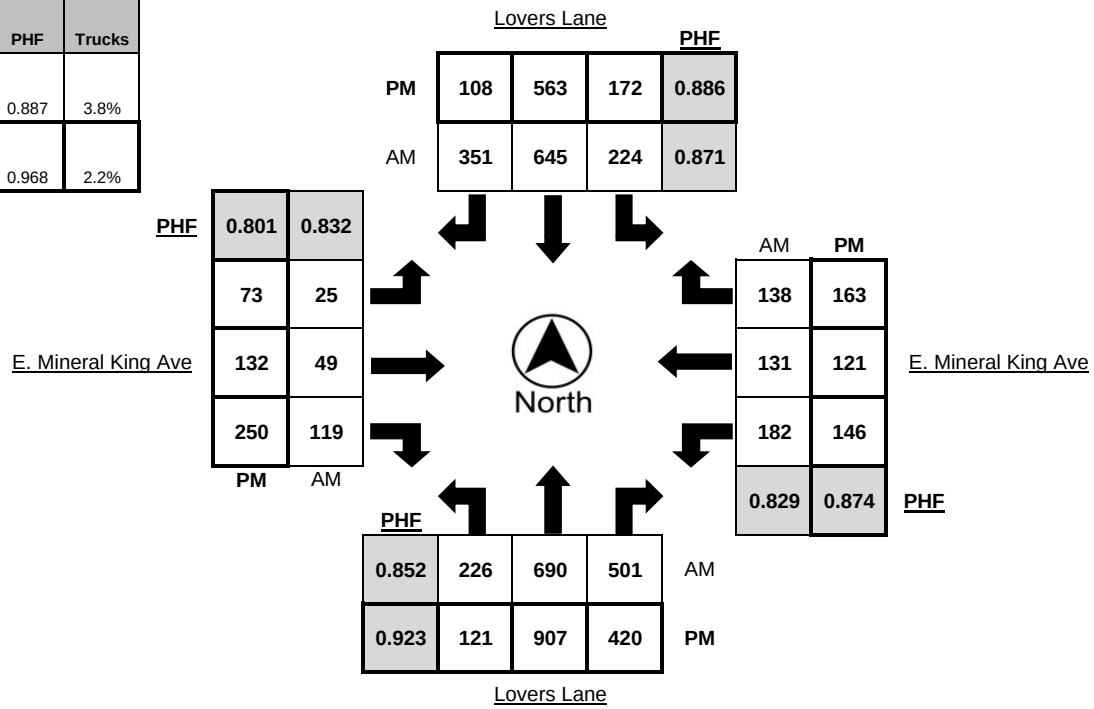
LOCATION E. Mineral King Avenue @ S. Lovers Lane
LATITUDE 36°19'41.18"N
COUNTY Tulare
LONGITUDE 119°15'38.72"W
COLLECTION DATE 11/13/2008
WEATHER Sunny and Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	27	100	93	16	50	110	36	10	3	4	3	1	25	15	26	3
7:15 AM - 7:30 AM	43	121	103	15	77	124	58	8	7	7	14	3	25	16	27	2
7:30 AM - 7:45 AM	50	177	100	17	56	156	67	19	4	8	20	2	41	29	27	4
7:45 AM - 8:00 AM	82	198	136	14	59	181	110	11	5	10	30	5	47	30	37	1
8:00 AM - 8:15 AM	40	212	135	12	55	183	82	8	10	15	33	4	54	41	41	3
8:15 AM - 8:30 AM	54	103	130	9	54	125	92	9	6	16	36	4	40	31	33	2
8:30 AM - 8:45 AM	29	88	96	11	61	61	53	6	3	14	34	2	36	39	16	3
8:45 AM - 9:00 AM	36	89	113	14	60	82	34	8	3	19	37	4	37	33	25	4
TOTAL	**361**	**1088**	**906**	**108**	**472**	**1022**	**532**	**79**	**41**	**93**	**207**	**25**	**305**	**234**	**232**	**22**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	44	161	106	8	37	107	26	2	5	36	73	1	29	35	35	4
4:15 PM - 4:30 PM	34	180	93	10	46	109	25	4	20	23	79	2	42	32	37	4
4:30 PM - 4:45 PM	38	207	118	11	45	127	34	2	20	30	57	5	28	36	41	5
4:45 PM - 5:00 PM	24	227	101	9	42	151	27	8	19	30	58	2	41	25	37	5
5:00 PM - 5:15 PM	24	223	94	4	48	167	23	9	25	44	73	1	35	26	38	3
5:15 PM - 5:30 PM	35	250	107	3	37	118	24	1	9	28	62	0	42	34	47	2
5:30 PM - 5:45 PM	25	225	114	1	48	124	28	5	11	21	47	0	38	16	39	1
5:45 PM - 6:00 PM	21	201	106	2	44	94	22	2	11	12	32	0	39	21	33	0
TOTAL	**245**	**1674**	**839**	**48**	**347**	**997**	**209**	**33**	**120**	**224**	**481**	**11**	**294**	**225**	**307**	**24**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:30 AM - 8:30 AM	226	690	501	52	224	645	351	47	25	49	119	15	182	131	138	10
4:30 PM - 5:30 PM	121	907	420	27	172	563	108	20	73	132	250	8	146	121	163	15

	PHF	Trucks
AM	0.887	3.8%
PM	0.968	2.2%



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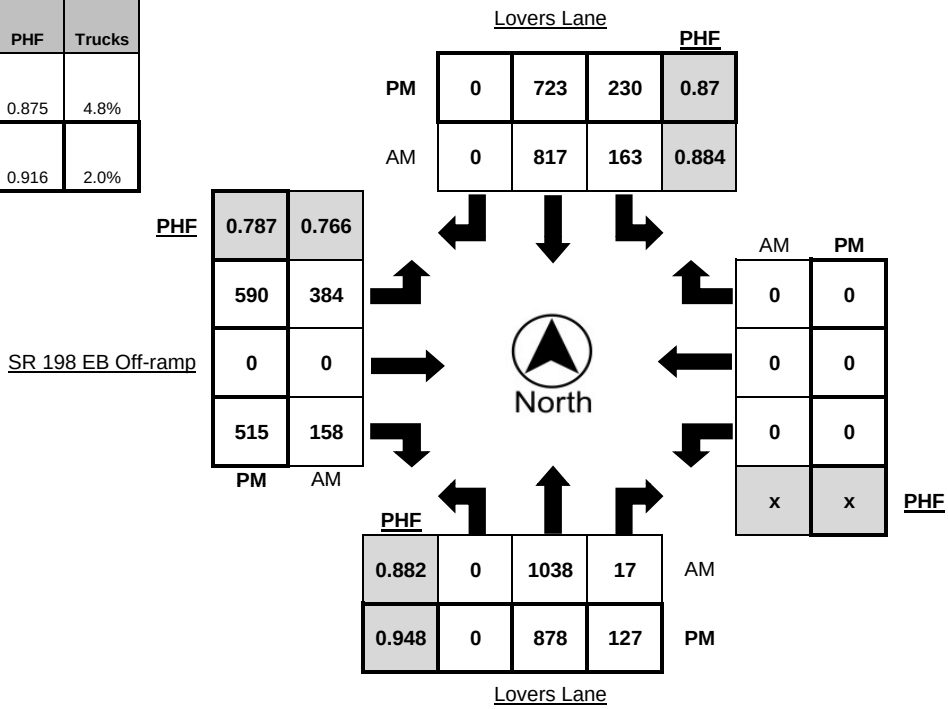
LOCATION SR 198 EB Ramps @ S. Lovers Lane
LATITUDE 36°19'37.71"N
COUNTY Tulare
LONGITUDE 119°15'38.84"W
COLLECTION DATE 11/13/2008
WEATHER Sunny and Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	0	177	17	6	19	132	0	6	49	0	12	13	0	0	0	0
7:15 AM - 7:30 AM	0	184	11	9	32	140	0	5	72	0	36	8	0	0	0	0
7:30 AM - 7:45 AM	0	266	6	11	35	189	0	11	58	0	52	9	0	0	0	0
7:45 AM - 8:00 AM	0	280	2	13	62	215	0	8	141	0	36	2	0	0	0	0
8:00 AM - 8:15 AM	0	296	3	10	41	232	0	11	93	0	34	6	0	0	0	0
8:15 AM - 8:30 AM	0	196	6	18	25	181	0	18	92	0	36	8	0	0	0	0
8:30 AM - 8:45 AM	0	137	9	12	17	114	0	7	69	0	25	5	0	0	0	0
8:45 AM - 9:00 AM	0	157	6	13	26	115	0	10	68	0	40	11	0	0	0	0
TOTAL	**0**	**1693**	**60**	**92**	**257**	**1318**	**0**	**76**	**642**	**0**	**271**	**62**	**0**	**0**	**0**	**0**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	0	208	9	13	53	153	0	10	98	0	59	11	0	0	0	0
4:15 PM - 4:30 PM	0	220	12	9	47	181	0	7	90	0	68	7	0	0	0	0
4:30 PM - 4:45 PM	0	251	25	8	50	156	0	11	116	0	97	6	0	0	0	0
4:45 PM - 5:00 PM	0	215	13	6	57	186	0	5	157	0	111	8	0	0	0	0
5:00 PM - 5:15 PM	0	217	33	5	76	198	0	8	121	0	116	4	0	0	0	0
5:15 PM - 5:30 PM	0	219	43	2	59	164	0	6	177	0	174	2	0	0	0	0
5:30 PM - 5:45 PM	0	227	38	6	38	175	0	5	135	0	114	4	0	0	0	0
5:45 PM - 6:00 PM	0	205	25	8	21	143	0	3	122	0	59	2	0	0	0	0
TOTAL	**0**	**1762**	**198**	**57**	**401**	**1356**	**0**	**55**	**1016**	**0**	**798**	**44**	**0**	**0**	**0**	**0**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:30 AM - 8:30 AM	0	1038	17	52	163	817	0	48	384	0	158	25	0	0	0	0
4:45 PM - 5:45 PM	0	878	127	19	230	723	0	24	590	0	515	18	0	0	0	0

	PHF	Trucks
AM	0.875	4.8%
PM	0.916	2.0%



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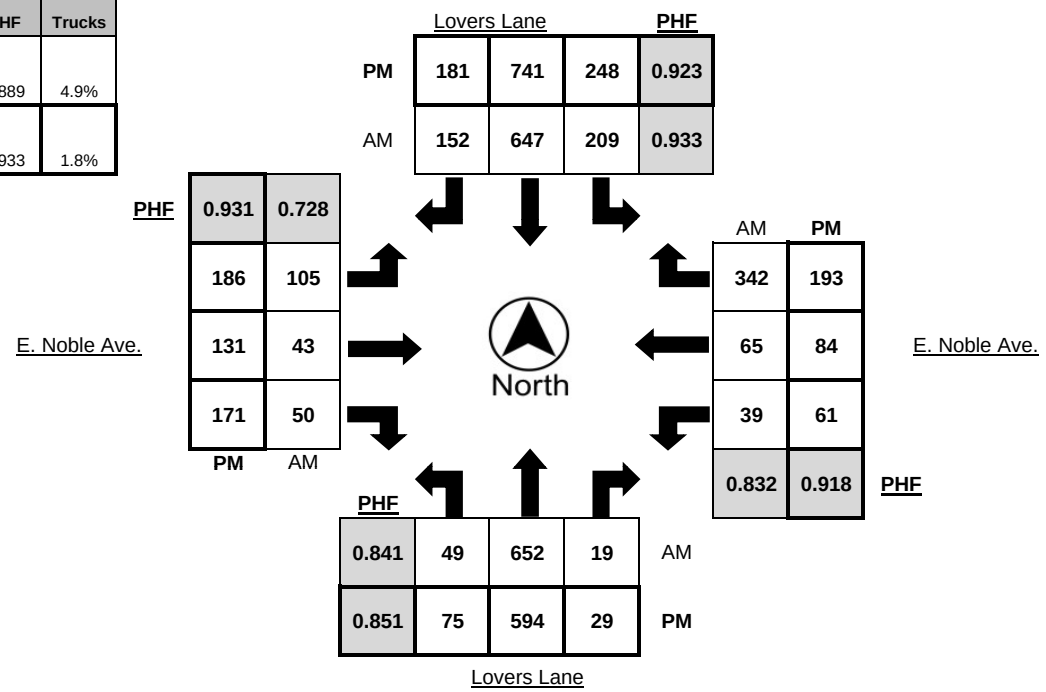
LATITUDE 36°19'35.80"N
COUNTY Tulare
LONGITUDE 119°15'38.83"W
COLLECTION DATE 11/13/2008
WEATHER Sunny and Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	10	116	1	5	24	109	14	13	29	5	10	5	5	12	53	4
7:15 AM - 7:30 AM	7	123	0	7	35	120	17	13	16	11	7	3	10	11	60	4
7:30 AM - 7:45 AM	4	179	3	9	51	178	26	18	18	12	12	4	5	19	90	1
7:45 AM - 8:00 AM	13	196	5	8	59	166	33	15	21	10	7	4	15	18	97	4
8:00 AM - 8:15 AM	14	178	3	12	64	160	46	15	38	13	17	5	10	19	105	3
8:15 AM - 8:30 AM	18	99	8	4	35	143	47	8	28	8	14	3	9	9	50	3
8:30 AM - 8:45 AM	9	96	1	9	22	94	30	8	15	8	19	1	5	8	33	1
8:45 AM - 9:00 AM	14	82	5	7	32	95	34	9	22	11	21	8	11	12	41	0
TOTAL	**89**	**1069**	**26**	**61**	**322**	**1065**	**247**	**99**	**187**	**78**	**107**	**33**	**70**	**108**	**529**	**20**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	21	151	7	9	49	168	48	12	50	29	49	6	9	20	40	2
4:15 PM - 4:30 PM	17	191	6	8	42	166	34	6	47	33	44	0	14	22	54	4
4:30 PM - 4:45 PM	15	144	4	1	62	159	44	5	40	30	49	0	20	20	43	3
4:45 PM - 5:00 PM	26	171	8	6	58	202	57	5	52	34	35	2	16	22	41	0
5:00 PM - 5:15 PM	17	119	7	3	61	189	39	7	48	40	43	2	14	26	52	1
5:15 PM - 5:30 PM	17	160	10	6	67	191	41	5	46	27	44	2	11	16	57	1
5:30 PM - 5:45 PM	24	147	7	0	55	135	43	2	38	28	50	2	14	17	55	1
5:45 PM - 6:00 PM	24	156	5	4	45	174	42	7	40	28	36	2	9	15	50	2
TOTAL	**161**	**1239**	**54**	**37**	**439**	**1384**	**348**	**49**	**361**	**249**	**350**	**16**	**107**	**158**	**392**	**14**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:30 AM - 8:30 AM	49	652	19	33	209	647	152	56	105	43	50	16	39	65	342	11
4:30 PM - 5:30 PM	75	594	29	16	248	741	181	22	186	131	171	6	61	84	193	5

	PHF	Trucks
AM	0.889	4.9%
PM	0.933	1.8%



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

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

Turning Movement Report

Prepared For: Robert Paderna
Kimley-Horn and Associates, Inc.
2000 Crow Canyon Place, Suite 410
San Ramon, CA 94583
(925) 242-5342 T

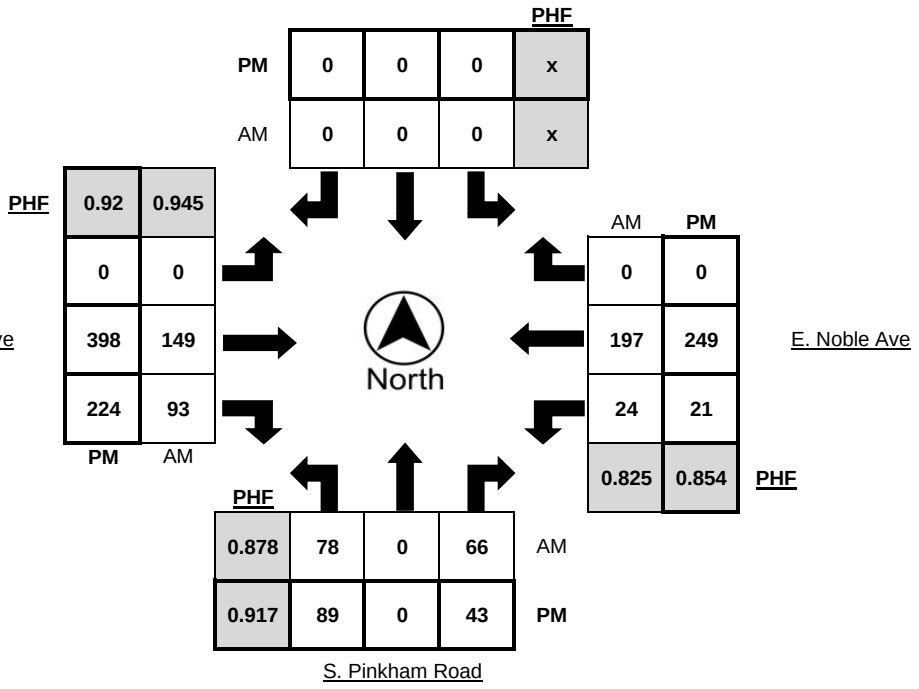
LOCATION E. Noble Avenue @ S. Pinkham Road
LATITUDE 36°19'35.00"N
COUNTY Tulare
LONGITUDE 119°16'10.88"W
COLLECTION DATE 11/13/2008
WEATHER Sunny and Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	8	0	12	1	0	0	0	0	0	14	11	2	2	42	0	0
7:15 AM - 7:30 AM	10	0	8	0	0	0	0	0	0	29	8	6	0	48	0	0
7:30 AM - 7:45 AM	22	0	16	3	0	0	0	0	0	32	28	1	5	43	0	2
7:45 AM - 8:00 AM	25	0	16	0	0	0	0	0	0	43	21	1	7	32	0	0
8:00 AM - 8:15 AM	18	0	18	2	0	0	0	0	0	28	27	5	8	59	0	3
8:15 AM - 8:30 AM	13	0	16	1	0	0	0	0	0	46	17	3	4	63	0	0
8:30 AM - 8:45 AM	14	0	8	0	0	0	0	0	0	29	12	3	4	46	0	0
8:45 AM - 9:00 AM	14	0	15	3	0	0	0	0	0	31	28	3	3	47	0	1
TOTAL	**124**	**0**	**109**	**10**	**0**	**0**	**0**	**0**	**0**	**252**	**152**	**24**	**33**	**380**	**0**	**6**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	8	0	11	0	0	0	0	0	0	88	62	4	5	42	0	1
4:15 PM - 4:30 PM	18	0	13	0	0	0	0	0	0	113	46	4	5	76	0	2
4:30 PM - 4:45 PM	18	0	13	1	0	0	0	0	0	89	43	4	5	55	0	0
4:45 PM - 5:00 PM	17	0	7	1	0	0	0	0	0	96	73	3	3	53	0	1
5:00 PM - 5:15 PM	18	0	18	2	0	0	0	0	0	101	48	3	7	65	0	1
5:15 PM - 5:30 PM	28	0	8	0	0	0	0	0	0	101	51	1	8	71	0	0
5:30 PM - 5:45 PM	26	0	10	1	0	0	0	0	0	100	52	1	3	60	0	0
5:45 PM - 6:00 PM	19	0	17	0	0	0	0	0	0	83	44	1	8	55	0	0
TOTAL	**152**	**0**	**97**	**5**	**0**	**0**	**0**	**0**	**0**	**771**	**419**	**21**	**44**	**477**	**0**	**5**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:30 AM - 8:30 AM	78	0	66	6	0	0	0	0	0	149	93	10	24	197	0	5
4:45 PM - 5:45 PM	89	0	43	4	0	0	0	0	0	398	224	8	21	249	0	2

	PHF	Trucks
AM	0.954	3.4%
PM	0.959	1.4%



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Turning Movement Report

Prepared For: Robert Paderna
Kimley-Horn and Associates, Inc.
2000 Crow Canyon Place, Suite 410
San Ramon, CA 94583
(925) 242-5342 T

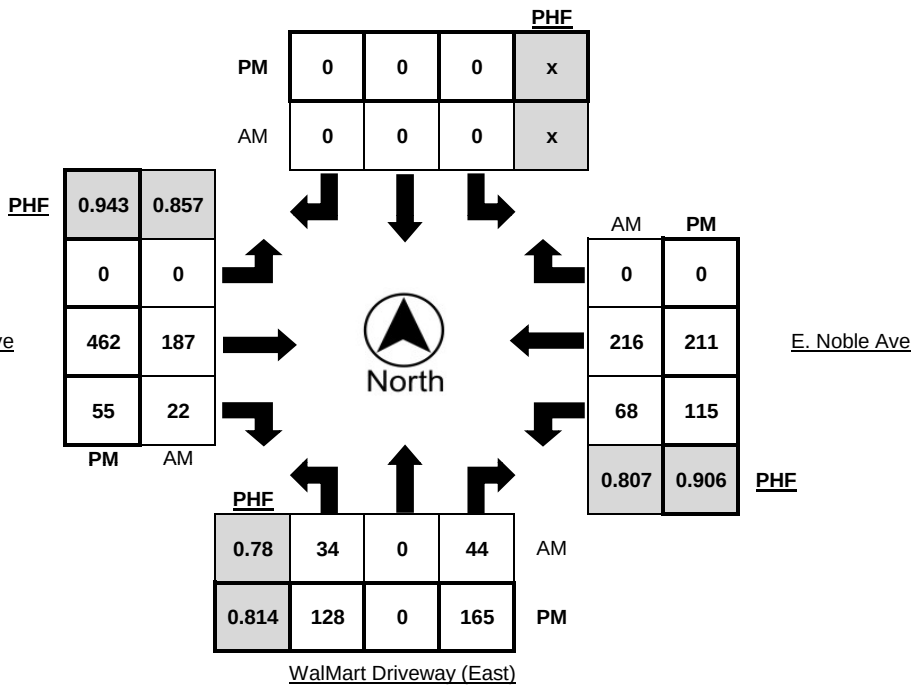
LOCATION E. Noble Avenue @ WalMart Driveway (East)
LATITUDE 36°19'33.99"N
COUNTY Tulare
LONGITUDE 119°16'19.72"W
COLLECTION DATE 11/13/2008
WEATHER Sunny and Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	6	0	8	1	0	0	0	0	0	29	2	2	8	42	0	2
7:15 AM - 7:30 AM	5	0	5	0	0	0	0	0	0	26	8	3	10	49	0	1
7:30 AM - 7:45 AM	3	0	9	0	0	0	0	0	0	36	6	3	11	58	0	0
7:45 AM - 8:00 AM	9	0	10	1	0	0	0	0	0	53	8	6	14	47	0	1
8:00 AM - 8:15 AM	5	0	8	1	0	0	0	0	0	37	5	3	19	59	0	1
8:15 AM - 8:30 AM	10	0	11	1	0	0	0	0	0	52	5	5	21	67	0	3
8:30 AM - 8:45 AM	10	0	15	1	0	0	0	0	0	45	4	5	14	43	0	1
8:45 AM - 9:00 AM	10	0	11	1	0	0	0	0	0	33	9	3	17	48	0	1
TOTAL	**58**	**0**	**77**	**6**	**0**	**0**	**0**	**0**	**0**	**311**	**47**	**30**	**114**	**413**	**0**	**10**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	24	0	46	1	0	0	0	0	0	103	6	2	20	33	0	1
4:15 PM - 4:30 PM	29	0	42	1	0	0	0	0	0	114	8	6	26	64	0	2
4:30 PM - 4:45 PM	41	0	36	0	0	0	0	0	0	103	20	5	24	53	0	0
4:45 PM - 5:00 PM	34	0	56	0	0	0	0	0	0	117	18	3	33	44	0	2
5:00 PM - 5:15 PM	24	0	31	1	0	0	0	0	0	128	9	4	32	50	0	1
5:15 PM - 5:30 PM	26	0	42	1	0	0	0	0	0	90	16	1	36	62	0	0
5:30 PM - 5:45 PM	31	0	48	0	0	0	0	0	0	114	12	2	33	44	0	0
5:45 PM - 6:00 PM	29	0	28	1	0	0	0	0	0	107	14	2	34	55	0	0
TOTAL	**238**	**0**	**329**	**5**	**0**	**0**	**0**	**0**	**0**	**876**	**103**	**25**	**238**	**405**	**0**	**6**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:45 AM - 8:45 AM	34	0	44	4	0	0	0	0	0	187	22	19	68	216	0	6
4:15 PM - 5:15 PM	128	0	165	2	0	0	0	0	0	462	55	18	115	211	0	5

	PHF	Trucks
AM	0.860	4.9%
PM	0.940	2.2%



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Turning Movement Report

Prepared For: Robert Paderna
Kimley-Horn and Associates, Inc.
2000 Crow Canyon Place, Suite 410
San Ramon, CA 94583
(925) 242-5342 T

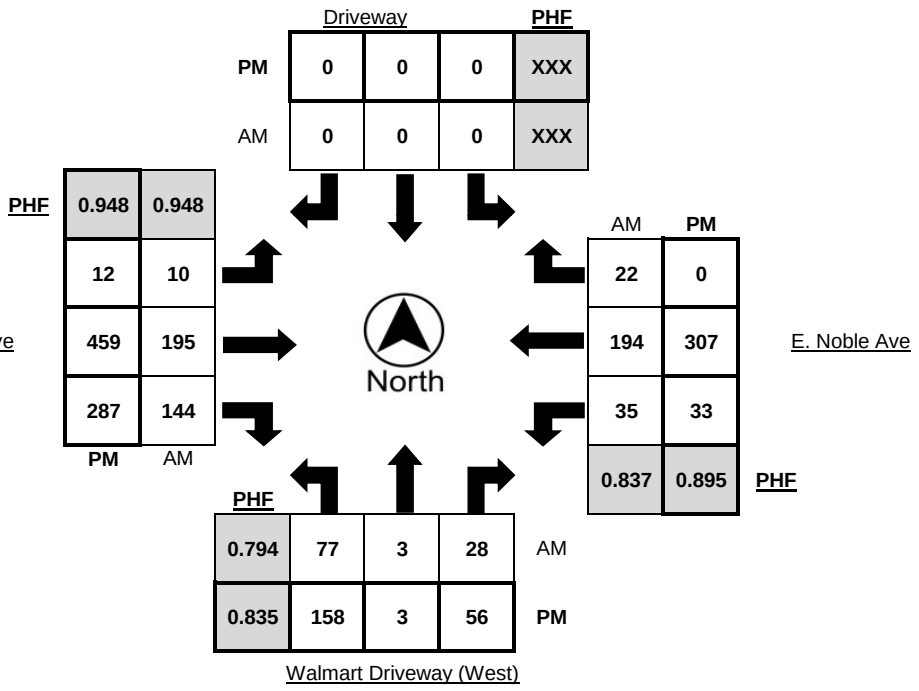
LOCATION E. Noble Avenue @ Walmart Driveway (West)
LATITUDE 36°19'33.38"N
COUNTY Tulare
LONGITUDE 119°16'23.76"W
COLLECTION DATE 11/13/2008
WEATHER Sunny and Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	4	0	1	0	0	0	0	0	3	29	15	4	6	34	6	2
7:15 AM - 7:30 AM	11	0	6	0	0	0	0	0	4	38	22	10	8	45	10	5
7:30 AM - 7:45 AM	15	0	5	1	0	0	0	0	1	53	15	4	7	49	3	1
7:45 AM - 8:00 AM	11	0	0	0	0	0	0	0	2	55	20	6	4	56	7	4
8:00 AM - 8:15 AM	12	0	3	0	0	0	0	0	3	58	31	4	9	54	12	0
8:15 AM - 8:30 AM	23	3	8	2	0	0	0	0	4	42	42	3	11	55	6	2
8:30 AM - 8:45 AM	22	0	5	0	0	0	0	0	0	47	33	3	4	39	4	1
8:45 AM - 9:00 AM	20	0	12	0	0	0	0	0	3	48	38	8	11	46	0	1
TOTAL	**118**	**3**	**40**	**3**	**0**	**0**	**0**	**0**	**20**	**370**	**216**	**42**	**60**	**378**	**48**	**16**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	35	0	17	0	0	0	0	0	1	99	66	3	7	56	0	1
4:15 PM - 4:30 PM	38	0	17	0	0	0	0	0	2	101	83	3	13	82	2	3
4:30 PM - 4:45 PM	37	2	18	2	0	0	0	0	6	102	62	7	9	86	0	0
4:45 PM - 5:00 PM	47	1	17	0	0	0	0	0	1	125	63	2	8	74	0	2
5:00 PM - 5:15 PM	39	0	12	0	0	0	0	0	2	122	75	4	5	63	0	0
5:15 PM - 5:30 PM	35	0	9	0	0	0	0	0	3	110	87	1	11	84	0	1
5:30 PM - 5:45 PM	41	0	16	0	0	0	0	0	0	111	63	2	6	73	2	0
5:45 PM - 6:00 PM	35	0	5	0	0	0	0	0	1	112	60	2	12	67	0	0
TOTAL	**307**	**3**	**111**	**2**	**0**	**0**	**0**	**0**	**16**	**882**	**559**	**24**	**71**	**585**	**4**	**7**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
8:00 AM - 9:00 AM	77	3	28	2	0	0	0	0	10	195	144	18	35	194	22	4
4:30 PM - 5:30 PM	158	3	56	2	0	0	0	0	12	459	287	14	33	307	0	3

	PHF	Trucks
AM	0.912	3.3%
PM	0.970	1.4%



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Turning Movement Report

Prepared For: Robert Paderna
Kimley-Horn and Associates, Inc.
2000 Crow Canyon Place, Suite 410
San Ramon, CA 94583
(925) 242-5342 T

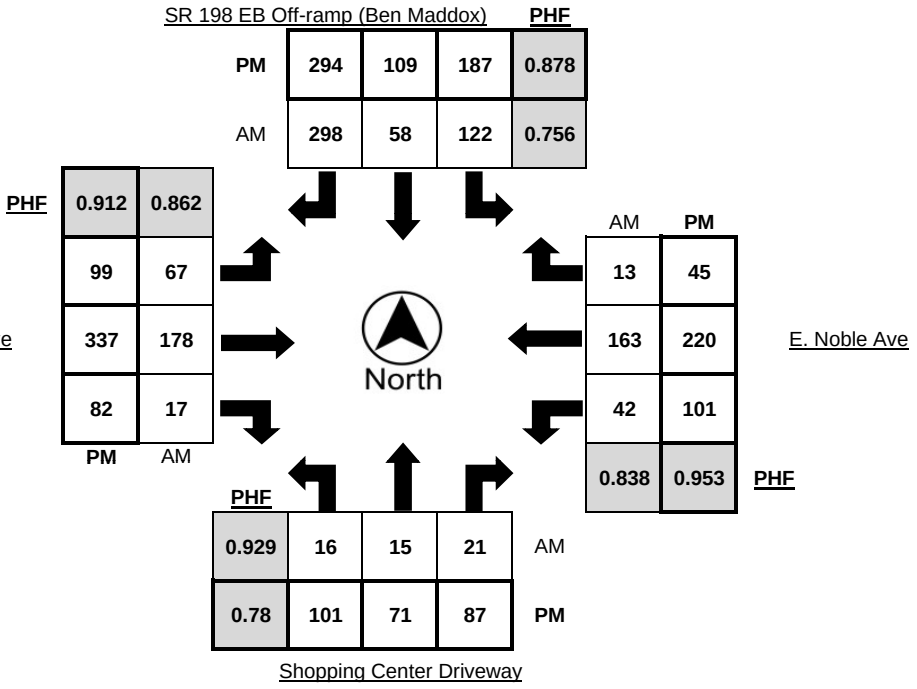
LOCATION E. Noble Avenue @ SR 198 EB Ramps
LATITUDE 36°19'31.42"N
COUNTY Tulare
LONGITUDE 119°16'33.27"W
COLLECTION DATE 11/19/2008
WEATHER Sunny and Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	3	6	6	0	30	1	62	6	29	25	3	1	17	34	3	0
7:15 AM - 7:30 AM	4	1	6	0	32	14	112	6	20	34	4	2	7	39	3	0
7:30 AM - 7:45 AM	4	4	5	0	35	13	69	6	22	51	3	3	12	41	5	1
7:45 AM - 8:00 AM	3	6	5	0	27	18	59	8	16	45	3	3	10	33	3	0
8:00 AM - 8:15 AM	5	4	5	1	28	13	58	6	9	48	7	2	13	50	2	2
8:15 AM - 8:30 AM	9	3	7	0	28	14	67	9	14	45	7	3	15	50	3	1
8:30 AM - 8:45 AM	5	6	8	0	27	16	48	6	17	45	9	0	21	49	1	1
8:45 AM - 9:00 AM	1	0	11	0	20	10	51	5	15	53	6	4	8	47	3	2
TOTAL	**34**	**30**	**53**	**1**	**227**	**99**	**526**	**52**	**142**	**346**	**42**	**18**	**103**	**343**	**23**	**7**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	26	18	20	0	47	42	85	5	24	67	14	1	17	49	6	3
4:15 PM - 4:30 PM	28	24	31	1	37	23	80	8	21	91	18	2	24	58	9	3
4:30 PM - 4:45 PM	22	15	18	0	47	23	71	3	15	83	19	4	22	58	16	1
4:45 PM - 5:00 PM	27	19	19	0	53	24	64	2	25	81	23	0	25	59	9	2
5:00 PM - 5:15 PM	24	13	19	0	50	39	79	1	38	82	22	3	30	45	11	0
5:15 PM - 5:30 PM	27	14	27	0	52	28	49	1	17	85	22	0	33	57	2	1
5:30 PM - 5:45 PM	17	20	26	0	40	26	50	0	18	70	25	3	33	62	10	0
5:45 PM - 6:00 PM	26	18	29	2	49	28	62	1	27	70	12	0	27	47	11	2
TOTAL	**197**	**141**	**189**	**3**	**375**	**233**	**540**	**21**	**185**	**629**	**155**	**13**	**211**	**435**	**74**	**12**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:15 AM - 8:15 AM	16	15	21	1	122	58	298	26	67	178	17	10	42	163	13	3
4:15 PM - 5:15 PM	101	71	87	1	187	109	294	14	99	337	82	9	101	220	45	6

	PHF	Trucks
AM	0.915	3.9%
PM	0.959	1.7%



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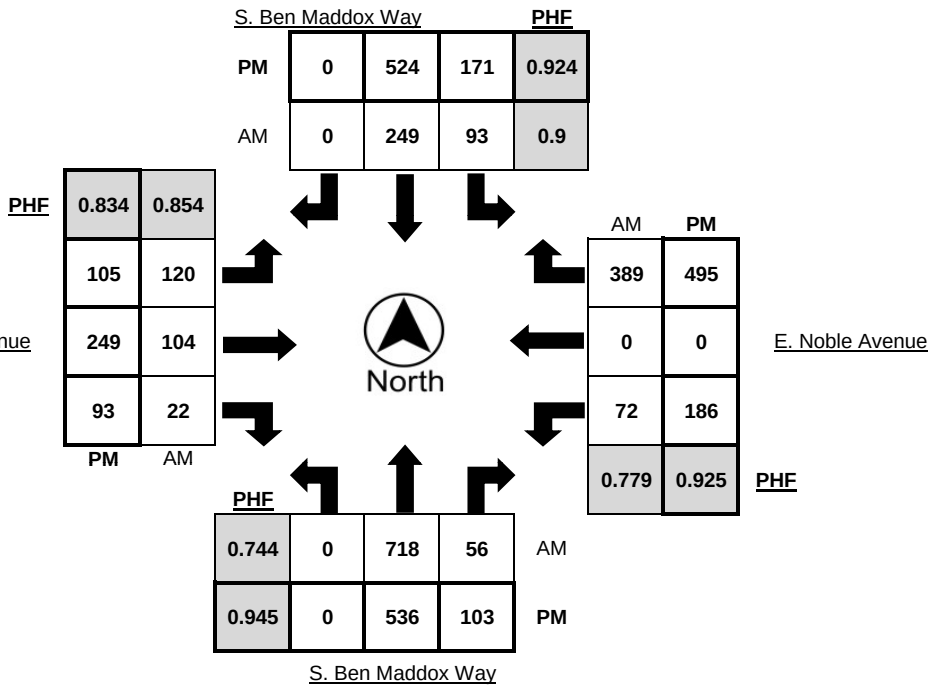
LOCATION E. Noble Avenue @ S. Ben Maddox Way
LATITUDE 36°19'33.92"N
COUNTY Tulare
LONGITUDE 119°16'42.86"W
COLLECTION DATE 11/13/2008
WEATHER Sunny and Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	0	134	9	3	14	43	0	7	21	23	5	3	14	0	85	6
7:15 AM - 7:30 AM	0	157	13	3	23	58	0	5	30	22	2	3	12	0	94	4
7:30 AM - 7:45 AM	0	246	14	5	17	78	0	7	33	24	9	2	25	0	123	5
7:45 AM - 8:00 AM	0	171	15	7	29	58	0	8	26	25	3	4	24	0	90	5
8:00 AM - 8:15 AM	0	144	14	3	24	55	0	3	31	33	8	6	11	0	82	7
8:15 AM - 8:30 AM	0	98	13	6	23	52	0	2	27	16	5	3	17	0	104	7
8:30 AM - 8:45 AM	0	125	11	6	24	73	0	3	28	24	1	3	13	0	89	10
8:45 AM - 9:00 AM	0	113	14	7	37	61	0	8	29	25	2	1	20	0	84	7
TOTAL	**0**	**1188**	**103**	**40**	**191**	**478**	**0**	**43**	**225**	**192**	**35**	**25**	**136**	**0**	**751**	**51**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	0	129	22	5	46	139	0	7	26	65	14	0	45	0	125	5
4:15 PM - 4:30 PM	0	134	25	7	35	122	0	2	27	68	17	2	31	0	113	9
4:30 PM - 4:45 PM	0	132	22	8	37	127	0	4	28	42	20	5	55	0	129	5
4:45 PM - 5:00 PM	0	145	24	2	42	129	0	2	36	71	17	1	36	0	133	4
5:00 PM - 5:15 PM	0	140	29	4	51	137	0	1	27	81	26	1	47	0	114	4
5:15 PM - 5:30 PM	0	119	28	2	41	131	0	4	14	55	30	1	48	0	119	3
5:30 PM - 5:45 PM	0	146	19	8	36	81	0	4	20	53	15	2	42	0	114	1
5:45 PM - 6:00 PM	0	117	29	2	40	83	0	1	16	33	6	0	50	0	94	3
TOTAL	**0**	**1062**	**198**	**38**	**328**	**949**	**0**	**25**	**194**	**468**	**145**	**12**	**354**	**0**	**941**	**34**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:15 AM - 8:15 AM	0	718	56	18	93	249	0	23	120	104	22	15	72	0	389	21
4:30 PM - 5:30 PM	0	536	103	16	171	524	0	11	105	249	93	8	186	0	495	16

	PHF	Trucks
AM	0.801	4.2%
PM	0.944	2.1%



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Turning Movement Report

Prepared For: Robert Paderna
Kimley-Horn and Associates, Inc.
2000 Crow Canyon Place, Suite 410
San Ramon, CA 94583
(925) 242-5342 T

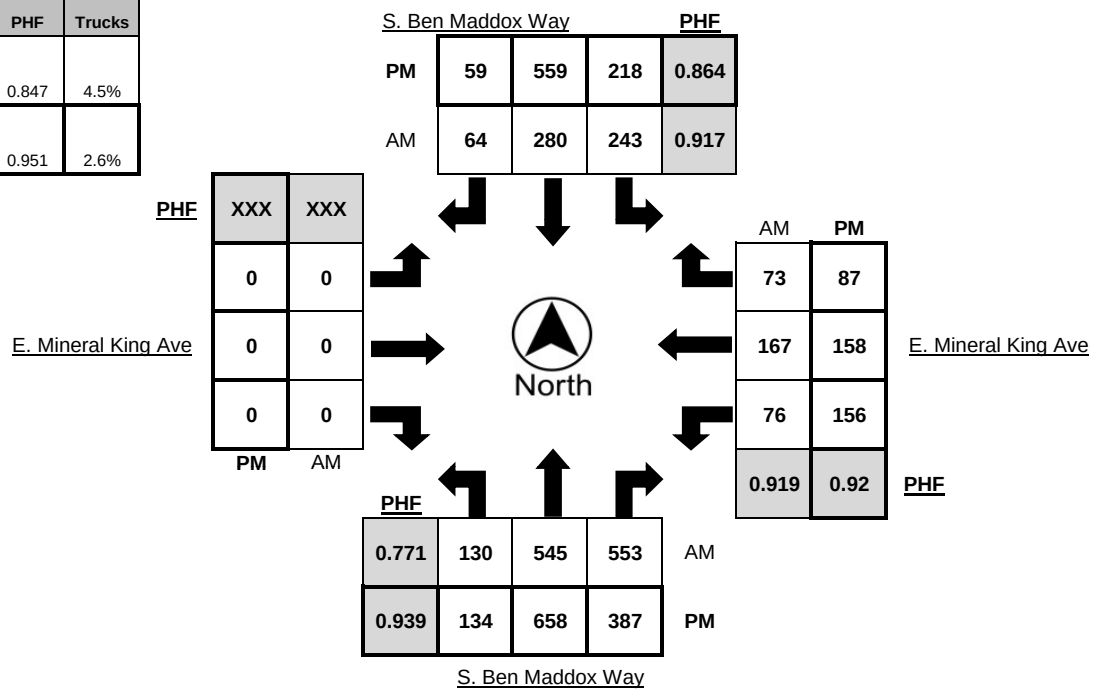
LOCATION E. Mineral King Avenue @ S. Ben Maddox Way
LATITUDE 36°19'38.33"N
COUNTY Tulare
LONGITUDE 119°16'42.86"W
COLLECTION DATE 11/13/2008
WEATHER Sunny and Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	15	106	144	8	42	51	8	10	0	0	0	0	8	24	21	13
7:15 AM - 7:30 AM	24	107	162	9	74	67	19	6	0	0	0	2	18	29	15	4
7:30 AM - 7:45 AM	37	189	172	8	58	74	14	14	0	0	0	0	20	46	19	4
7:45 AM - 8:00 AM	39	133	111	14	59	67	14	9	0	0	0	0	18	49	19	2
8:00 AM - 8:15 AM	30	116	108	12	52	72	17	9	0	0	0	0	20	43	20	4
8:15 AM - 8:30 AM	33	116	74	13	44	65	7	15	0	0	0	0	28	43	26	6
8:30 AM - 8:45 AM	29	123	80	20	48	87	13	10	0	0	0	0	23	31	10	3
8:45 AM - 9:00 AM	24	115	73	16	32	75	17	8	0	0	0	0	19	42	7	7
TOTAL	**231**	**1005**	**924**	**100**	**409**	**558**	**109**	**81**	**0**	**0**	**0**	**2**	**154**	**307**	**137**	**43**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	32	161	101	11	65	138	30	10	0	0	0	0	35	36	22	3
4:15 PM - 4:30 PM	21	141	96	13	38	118	20	1	0	0	0	0	46	38	24	2
4:30 PM - 4:45 PM	41	169	85	12	59	141	20	7	0	0	0	0	32	54	19	3
4:45 PM - 5:00 PM	36	173	103	5	53	135	10	3	0	0	0	0	46	33	30	4
5:00 PM - 5:15 PM	36	175	103	6	68	165	9	5	0	0	0	0	32	33	14	1
5:15 PM - 5:30 PM	28	144	83	6	27	127	20	4	0	0	0	0	41	36	15	2
5:30 PM - 5:45 PM	34	157	86	6	39	106	21	2	0	0	0	0	24	27	15	0
5:45 PM - 6:00 PM	33	138	61	4	38	104	14	1	0	0	0	0	17	28	14	1
TOTAL	**261**	**1258**	**718**	**63**	**387**	**1034**	**144**	**33**	**0**	**0**	**0**	**0**	**273**	**285**	**153**	**16**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:15 AM - 8:15 AM	130	545	553	43	243	280	64	38	0	0	0	2	76	167	73	14
4:15 PM - 5:15 PM	134	658	387	36	218	559	59	16	0	0	0	0	156	158	87	10

	PHF	Trucks
AM	0.847	4.5%
PM	0.951	2.6%



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

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

Turning Movement Report

Prepared For: Robert Paderna
Kimley-Horn and Associates, Inc.
2000 Crow Canyon Place, Suite 410
San Ramon, CA 94583
(925) 242-5342 T

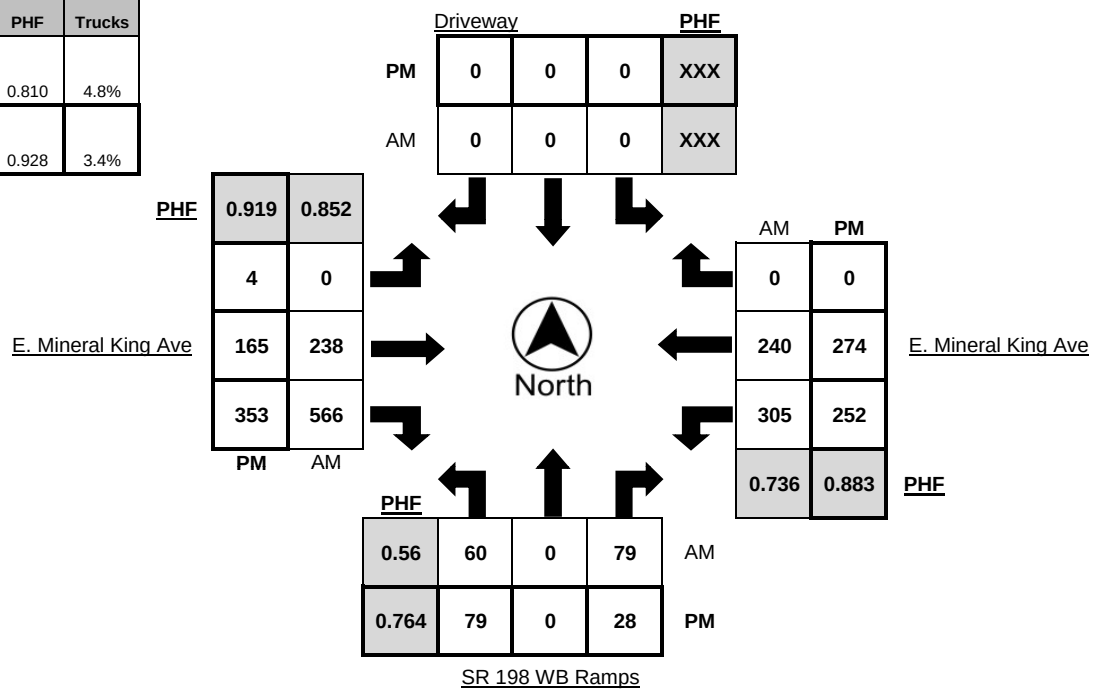
LOCATION E. Mineral King Avenue @ SR 198 WB Ramps
LATITUDE 36°19'38.26"N
COUNTY Tulare
LONGITUDE 119°16'33.03"W
COLLECTION DATE 11/13/2008
WEATHER Sunny and Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	17	0	7	3	0	0	0	0	0	37	75	6	35	26	0	7
7:15 AM - 7:30 AM	15	0	11	0	0	0	0	0	0	51	135	5	63	39	0	18
7:30 AM - 7:45 AM	13	0	11	1	0	0	0	0	0	53	183	4	56	47	0	7
7:45 AM - 8:00 AM	17	0	45	3	0	0	0	0	0	73	139	5	105	80	0	9
8:00 AM - 8:15 AM	15	0	12	2	0	0	0	0	0	61	109	9	81	74	0	9
8:15 AM - 8:30 AM	17	0	14	1	0	0	0	0	0	46	95	9	77	58	0	5
8:30 AM - 8:45 AM	21	0	8	0	0	0	0	0	0	44	80	9	53	69	0	5
8:45 AM - 9:00 AM	9	0	9	0	0	0	0	0	0	49	83	7	50	66	0	9
TOTAL	**124**	**0**	**117**	**10**	**0**	**0**	**0**	**0**	**0**	**414**	**899**	**54**	**520**	**459**	**0**	**69**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	19	0	8	2	0	0	0	0	0	62	92	9	52	69	0	3
4:15 PM - 4:30 PM	25	0	10	2	0	0	0	0	2	40	89	6	67	71	0	8
4:30 PM - 4:45 PM	21	0	6	1	0	0	0	0	1	41	85	5	39	65	0	2
4:45 PM - 5:00 PM	18	0	7	1	0	0	0	0	1	30	91	2	66	69	0	6
5:00 PM - 5:15 PM	15	0	5	1	0	0	0	0	0	54	88	4	80	69	0	2
5:15 PM - 5:30 PM	21	0	2	1	0	0	0	0	0	40	94	1	54	53	0	1
5:30 PM - 5:45 PM	19	0	3	2	0	0	0	0	0	36	88	5	44	56	0	1
5:45 PM - 6:00 PM	13	0	3	0	0	0	0	0	0	28	75	3	51	44	0	0
TOTAL	**151**	**0**	**44**	**10**	**0**	**0**	**0**	**0**	**4**	**331**	**702**	**35**	**453**	**496**	**0**	**23**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:15 AM - 8:15 AM	60	0	79	6	0	0	0	0	0	238	566	23	305	240	0	43
4:15 PM - 5:15 PM	79	0	28	5	0	0	0	0	4	165	353	17	252	274	0	18

	PHF	Trucks
AM	0.810	4.8%
PM	0.928	3.4%



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San Ramon, CA 94583
(925) 242-5342 T

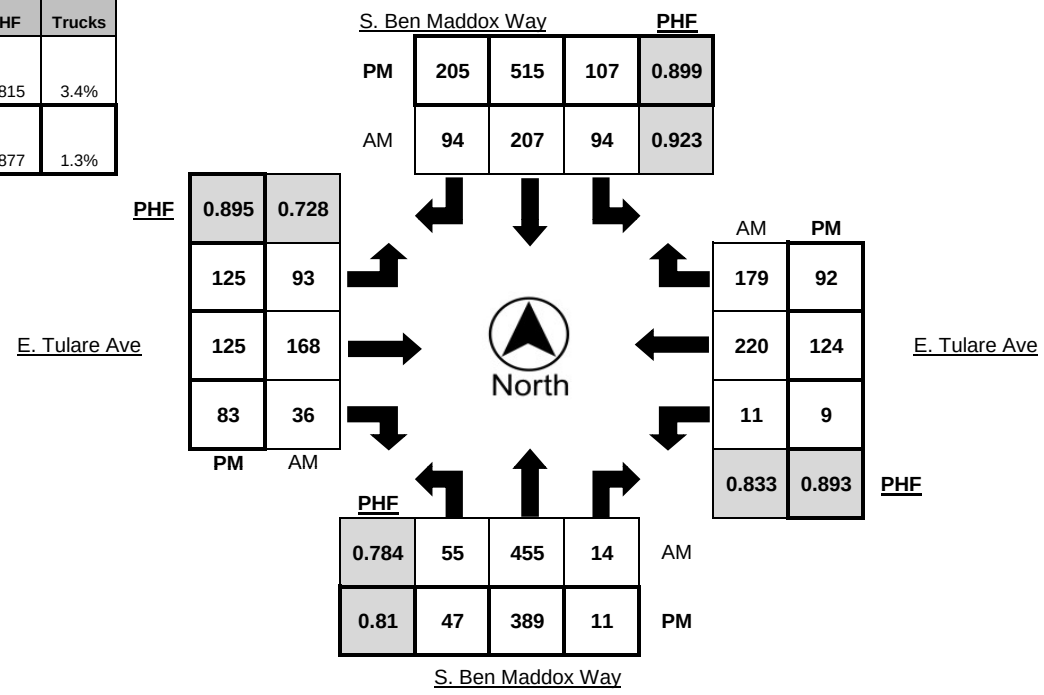
LOCATION E. Tulare Avenue @ S. Ben Maddox Way
LATITUDE 36°19'12.42"N
COUNTY Tulare
LONGITUDE 119°16'35.59"W
COLLECTION DATE 11/19/2008
WEATHER Sunny and Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	12	91	1	7	7	35	16	7	22	9	10	1	3	17	35	1
7:15 AM - 7:30 AM	12	119	1	6	6	53	21	3	19	12	7	1	4	32	43	2
7:30 AM - 7:45 AM	9	127	2	5	24	40	18	4	23	28	7	4	2	45	49	2
7:45 AM - 8:00 AM	28	134	5	5	27	49	31	4	30	61	11	3	2	65	56	3
8:00 AM - 8:15 AM	14	100	7	5	24	61	20	3	20	49	7	1	6	67	45	1
8:15 AM - 8:30 AM	4	94	0	5	19	57	25	4	20	30	11	6	1	43	29	0
8:30 AM - 8:45 AM	5	69	0	8	13	63	21	4	18	12	3	3	2	24	26	1
8:45 AM - 9:00 AM	5	74	1	1	13	60	26	4	16	21	4	1	0	29	16	2
TOTAL	**89**	**808**	**17**	**42**	**133**	**418**	**178**	**33**	**168**	**222**	**60**	**20**	**20**	**322**	**299**	**12**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	6	82	2	5	21	117	55	4	26	23	12	2	1	24	28	1
4:15 PM - 4:30 PM	5	93	1	4	16	142	46	4	30	20	7	3	2	24	18	0
4:30 PM - 4:45 PM	15	80	2	2	31	119	45	3	23	29	23	1	2	35	26	1
4:45 PM - 5:00 PM	9	95	1	0	31	132	60	1	34	33	23	4	4	26	16	0
5:00 PM - 5:15 PM	15	120	3	1	33	141	56	4	37	33	23	0	2	39	20	0
5:15 PM - 5:30 PM	8	94	5	2	12	123	44	1	31	30	14	1	1	24	30	2
5:30 PM - 5:45 PM	13	87	1	1	26	108	40	3	35	27	9	1	1	23	22	0
5:45 PM - 6:00 PM	10	93	2	2	24	126	49	3	31	28	16	2	2	28	23	1
TOTAL	**81**	**744**	**17**	**17**	**194**	**1008**	**395**	**23**	**247**	**223**	**127**	**14**	**15**	**223**	**183**	**5**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:30 AM - 8:30 AM	55	455	14	20	94	207	94	15	93	168	36	14	11	220	179	6
4:30 PM - 5:30 PM	47	389	11	5	107	515	205	9	125	125	83	6	9	124	92	3

	PHF	Trucks
AM	0.815	3.4%
PM	0.877	1.3%



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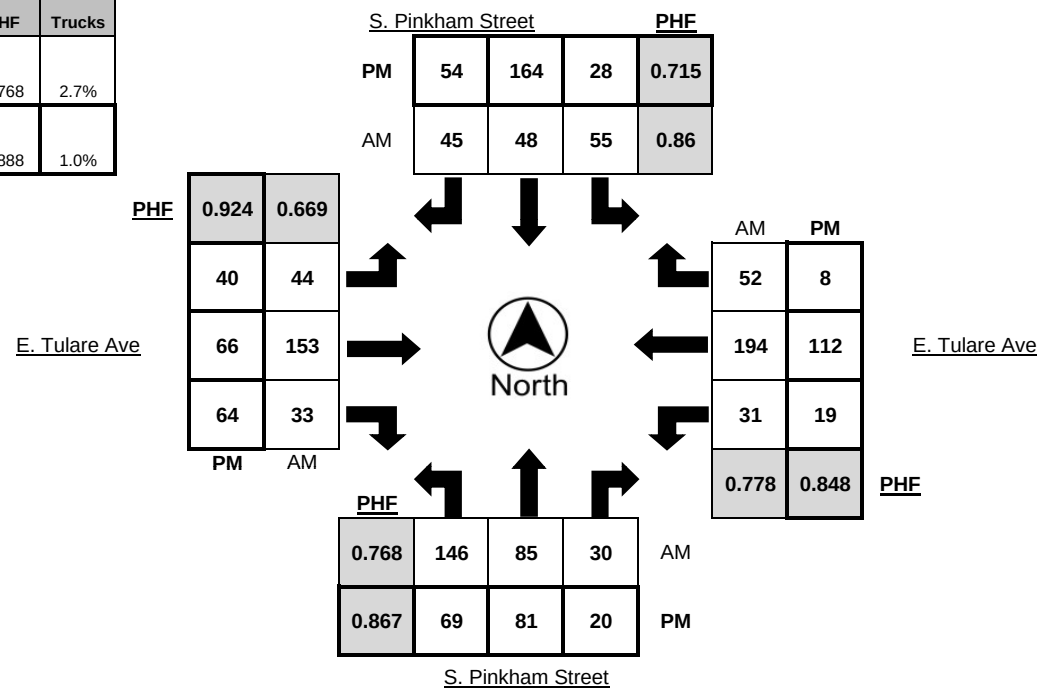
LOCATION E. Tulare Avenue @ S. Pinkham Street
LATITUDE 36°19'12.16"N
COUNTY Tulare
LONGITUDE 119°16'10.57"W
COLLECTION DATE 11/19/2008
WEATHER Sunny and Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	27	16	2	1	2	18	5	0	6	6	6	0	3	13	1	1
7:15 AM - 7:30 AM	32	14	2	1	4	11	8	1	4	4	1	0	1	24	2	1
7:30 AM - 7:45 AM	34	20	1	4	6	9	6	2	12	22	3	1	4	19	9	0
7:45 AM - 8:00 AM	35	19	13	0	13	13	16	0	8	33	7	1	7	55	10	4
8:00 AM - 8:15 AM	47	27	11	1	20	12	11	1	14	64	8	0	14	56	14	1
8:15 AM - 8:30 AM	30	19	5	2	16	14	12	1	10	34	15	4	6	64	19	3
8:30 AM - 8:45 AM	12	10	3	2	3	5	1	0	7	7	6	0	3	20	1	0
8:45 AM - 9:00 AM	22	9	1	0	2	14	4	1	9	7	7	2	3	21	5	1
TOTAL	**239**	**134**	**38**	**11**	**66**	**96**	**63**	**6**	**70**	**177**	**53**	**8**	**41**	**272**	**61**	**11**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	19	13	0	2	4	26	11	1	9	18	8	0	3	26	5	1
4:15 PM - 4:30 PM	11	22	1	0	7	43	18	2	9	14	16	2	1	25	1	0
4:30 PM - 4:45 PM	19	15	4	2	10	26	9	1	10	8	7	0	3	20	3	0
4:45 PM - 5:00 PM	17	23	4	0	8	37	10	2	8	20	14	0	4	34	3	1
5:00 PM - 5:15 PM	14	17	2	1	6	36	10	0	12	16	18	0	6	20	2	0
5:15 PM - 5:30 PM	21	17	6	0	10	55	21	1	13	13	14	0	7	26	1	0
5:30 PM - 5:45 PM	17	24	8	0	4	36	13	2	7	17	18	0	2	32	2	0
5:45 PM - 6:00 PM	14	28	3	1	4	27	9	1	17	14	8	0	4	24	4	0
TOTAL	**132**	**159**	**28**	**6**	**53**	**286**	**101**	**10**	**85**	**120**	**103**	**2**	**30**	**207**	**21**	**2**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:30 AM - 8:30 AM	146	85	30	7	55	48	45	4	44	153	33	6	31	194	52	8
4:45 PM - 5:45 PM	69	81	20	1	28	164	54	5	40	66	64	0	19	112	8	1

	PHF	Trucks
AM	0.768	2.7%
PM	0.888	1.0%



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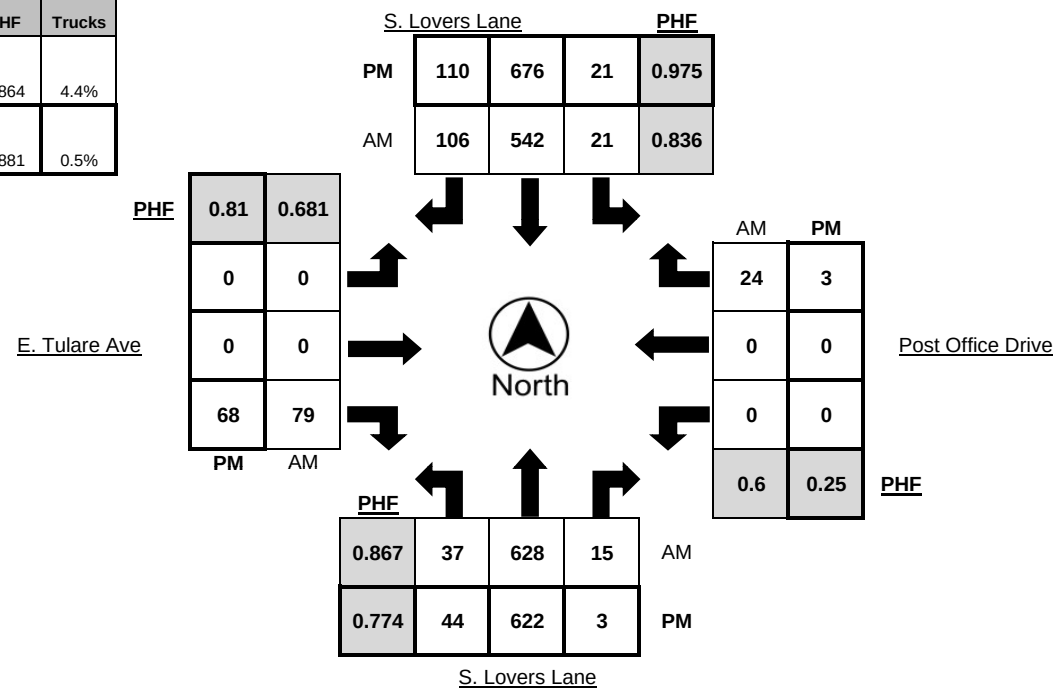
LOCATION E. Tulare Avenue @ S. Lovers Lane
LATITUDE 36°19'11.25"N
COUNTY Tulare
LONGITUDE 119°15'39.27"W
COLLECTION DATE 11/19/2008
WEATHER Sunny and Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	2	105	3	5	6	74	9	6	0	0	10	0	0	0	2	0
7:15 AM - 7:30 AM	5	140	2	5	10	109	18	6	0	0	3	0	0	0	3	0
7:30 AM - 7:45 AM	12	140	6	10	6	136	18	11	0	0	14	0	0	0	6	0
7:45 AM - 8:00 AM	6	185	4	8	3	168	29	11	0	0	20	1	0	0	5	0
8:00 AM - 8:15 AM	10	181	5	5	9	122	36	6	0	0	29	0	0	0	10	0
8:15 AM - 8:30 AM	9	122	0	6	3	116	23	6	0	0	16	0	0	0	3	0
8:30 AM - 8:45 AM	6	99	1	4	4	115	13	4	0	0	9	0	0	0	3	0
8:45 AM - 9:00 AM	13	84	1	4	8	96	19	5	0	0	8	0	0	0	4	0
TOTAL	**63**	**1056**	**22**	**47**	**49**	**936**	**165**	**55**	**0**	**0**	**109**	**1**	**0**	**0**	**36**	**0**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	13	110	4	4	7	128	22	3	0	0	12	0	0	0	10	0
4:15 PM - 4:30 PM	8	116	0	3	2	142	22	2	0	0	9	0	0	0	1	0
4:30 PM - 4:45 PM	7	145	1	1	5	123	26	3	0	0	7	0	0	0	5	0
4:45 PM - 5:00 PM	7	89	1	0	4	118	22	2	0	0	13	0	0	0	1	0
5:00 PM - 5:15 PM	6	139	0	3	6	160	27	2	0	0	18	0	0	0	0	0
5:15 PM - 5:30 PM	12	146	3	0	3	168	36	1	0	0	13	0	0	0	3	0
5:30 PM - 5:45 PM	14	133	0	0	5	167	28	1	0	0	21	0	0	0	0	0
5:45 PM - 6:00 PM	12	204	0	0	7	181	19	1	0	0	16	0	0	0	0	0
TOTAL	**79**	**1082**	**9**	**11**	**39**	**1187**	**202**	**15**	**0**	**0**	**109**	**0**	**0**	**0**	**20**	**0**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:30 AM - 8:30 AM	37	628	15	29	21	542	106	34	0	0	79	1	0	0	24	0
5:00 PM - 6:00 PM	44	622	3	3	21	676	110	5	0	0	68	0	0	0	3	0

	PHF	Trucks
AM	0.864	4.4%
PM	0.881	0.5%



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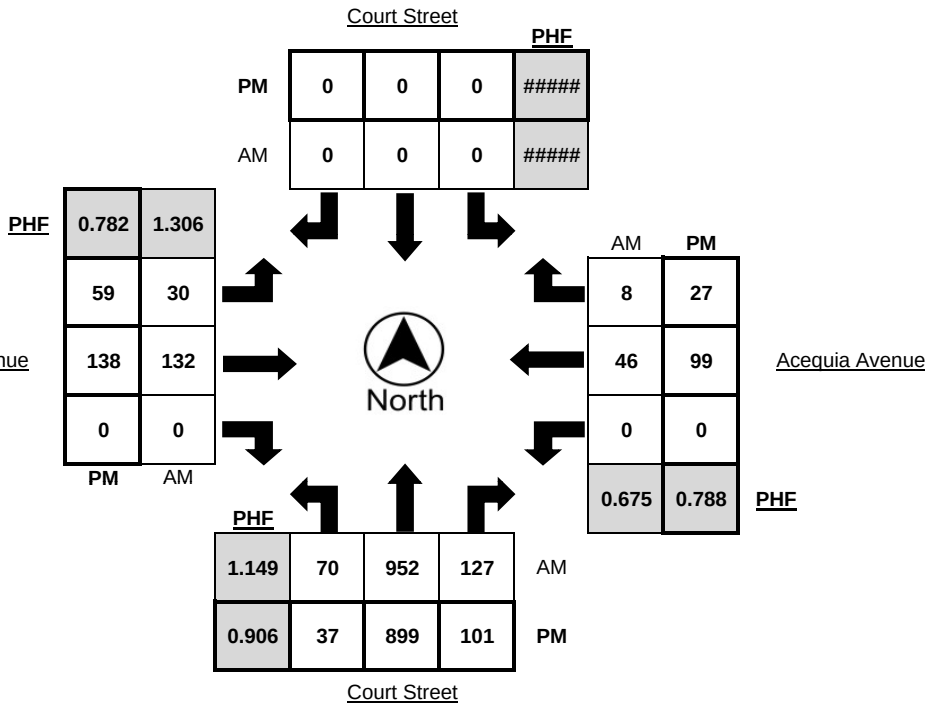
LOCATION Acequia Avenue @ Court Street
LATITUDE 36°19'45.05"N
COUNTY Tulare
LONGITUDE 119°17'32.41"W
COLLECTION DATE 6/2/2009
WEATHER Sunny and Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	9	78	15	2	0	0	0	0	1	4	0	1	0	5	1	0
7:15 AM - 7:30 AM	8	102	19	4	0	0	0	0	4	14	0	2	0	2	0	1
7:30 AM - 7:45 AM	7	117	11	5	0	0	0	0	5	9	0	1	0	6	0	0
7:45 AM - 8:00 AM	6	156	28	5	0	0	0	0	1	13	0	2	0	16	4	0
8:00 AM - 8:15 AM	17	203	30	5	0	0	0	0	3	28	0	1	0	9	2	0
8:15 AM - 8:30 AM	20	275	32	3	0	0	0	0	8	30	0	2	0	11	1	2
8:30 AM - 8:45 AM	16	258	35	7	0	0	0	0	11	38	0	0	0	8	2	0
8:45 AM - 9:00 AM	17	216	30	7	0	0	0	0	8	36	0	4	0	18	3	0
TOTAL	**100**	**1405**	**200**	**38**	**0**	**0**	**0**	**0**	**41**	**172**	**0**	**13**	**0**	**75**	**13**	**3**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	11	241	17	5	0	0	0	0	16	38	0	4	0	24	3	0
4:15 PM - 4:30 PM	10	207	27	4	0	0	0	0	15	34	0	1	0	16	9	1
4:30 PM - 4:45 PM	14	207	25	5	0	0	0	0	22	41	0	2	0	21	3	0
4:45 PM - 5:00 PM	10	242	34	3	0	0	0	0	10	31	0	4	0	20	6	0
5:00 PM - 5:15 PM	7	239	24	5	0	0	0	0	12	33	0	1	0	27	9	0
5:15 PM - 5:30 PM	6	211	18	2	0	0	0	0	15	33	0	3	0	31	9	1
5:30 PM - 5:45 PM	5	211	16	6	0	0	0	0	9	26	0	0	0	17	3	0
5:45 PM - 6:00 PM	6	208	25	3	0	0	0	0	6	13	0	2	0	10	5	0
TOTAL	**69**	**1766**	**186**	**33**	**0**	**0**	**0**	**0**	**105**	**249**	**0**	**17**	**0**	**166**	**47**	**2**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
8:00 AM - 9:00 AM	70	952	127	22	0	0	0	0	30	132	0	7	0	46	8	2
4:30 PM - 5:30 PM	37	899	101	15	0	0	0	0	59	138	0	10	0	99	27	1

	PHF	Trucks
AM	0.905	2.3%
PM	0.963	1.9%



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Turning Movement Report

Prepared For: Robert Paderna
Kimley-Horn and Associates, Inc.
2000 Crow Canyon Place, Suite 410
San Ramon, CA 94583
(925) 242-5342 T

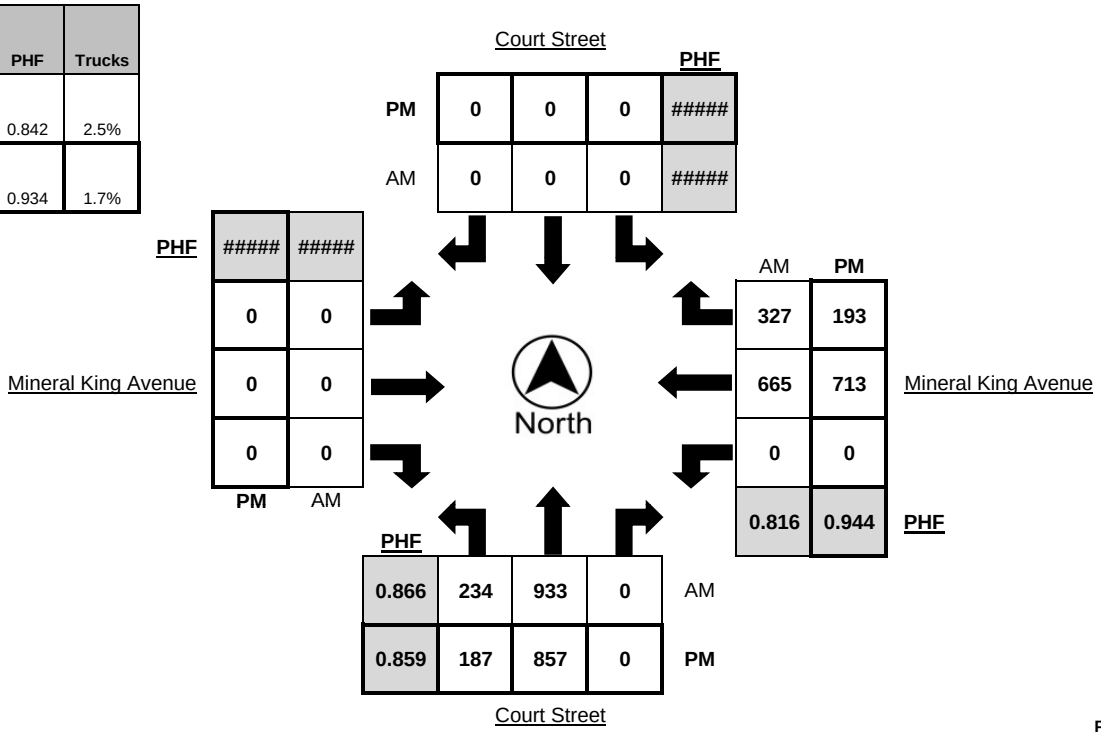
LOCATION Mineral King Avenue @ Court Street
LATITUDE 36°19'38.46"N
COUNTY Tulare
LONGITUDE 119°17'32.32"W
COLLECTION DATE 6/2/2009
WEATHER Sunny and Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	23	96	0	3	0	0	0	0	0	0	0	0	0	92	47	7
7:15 AM - 7:30 AM	45	112	0	4	0	0	0	0	0	0	0	0	0	70	33	12
7:30 AM - 7:45 AM	46	129	0	4	0	0	0	0	0	0	0	0	0	76	59	7
7:45 AM - 8:00 AM	56	149	0	5	0	0	0	0	0	0	0	0	0	144	72	6
8:00 AM - 8:15 AM	76	261	0	5	0	0	0	0	0	0	0	0	0	200	104	8
8:15 AM - 8:30 AM	53	267	0	6	0	0	0	0	0	0	0	0	0	161	84	7
8:30 AM - 8:45 AM	49	256	0	9	0	0	0	0	0	0	0	0	0	160	67	7
8:45 AM - 9:00 AM	49	192	0	10	0	0	0	0	0	0	0	0	0	113	45	8
TOTAL	**397**	**1462**	**0**	**46**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1016**	**511**	**62**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	68	230	0	8	0	0	0	0	0	0	0	0	0	167	54	5
4:15 PM - 4:30 PM	38	204	0	6	0	0	0	0	0	0	0	0	0	155	65	0
4:30 PM - 4:45 PM	43	182	0	3	0	0	0	0	0	0	0	0	0	150	56	8
4:45 PM - 5:00 PM	34	204	0	7	0	0	0	0	0	0	0	0	0	175	59	0
5:00 PM - 5:15 PM	59	245	0	0	0	0	0	0	0	0	0	0	0	168	50	10
5:15 PM - 5:30 PM	46	210	0	2	0	0	0	0	0	0	0	0	0	198	42	6
5:30 PM - 5:45 PM	48	198	0	6	0	0	0	0	0	0	0	0	0	172	42	2
5:45 PM - 6:00 PM	52	199	0	2	0	0	0	0	0	0	0	0	0	133	64	2
TOTAL	**388**	**1672**	**0**	**34**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1318**	**432**	**33**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:45 AM - 8:45 AM	234	933	0	25	0	0	0	0	0	0	0	0	0	665	327	28
4:45 PM - 5:45 PM	187	857	0	15	0	0	0	0	0	0	0	0	0	713	193	18

	PHF	Trucks
AM	0.842	2.5%
PM	0.934	1.7%



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Turning Movement Report

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(925) 242-5342 T

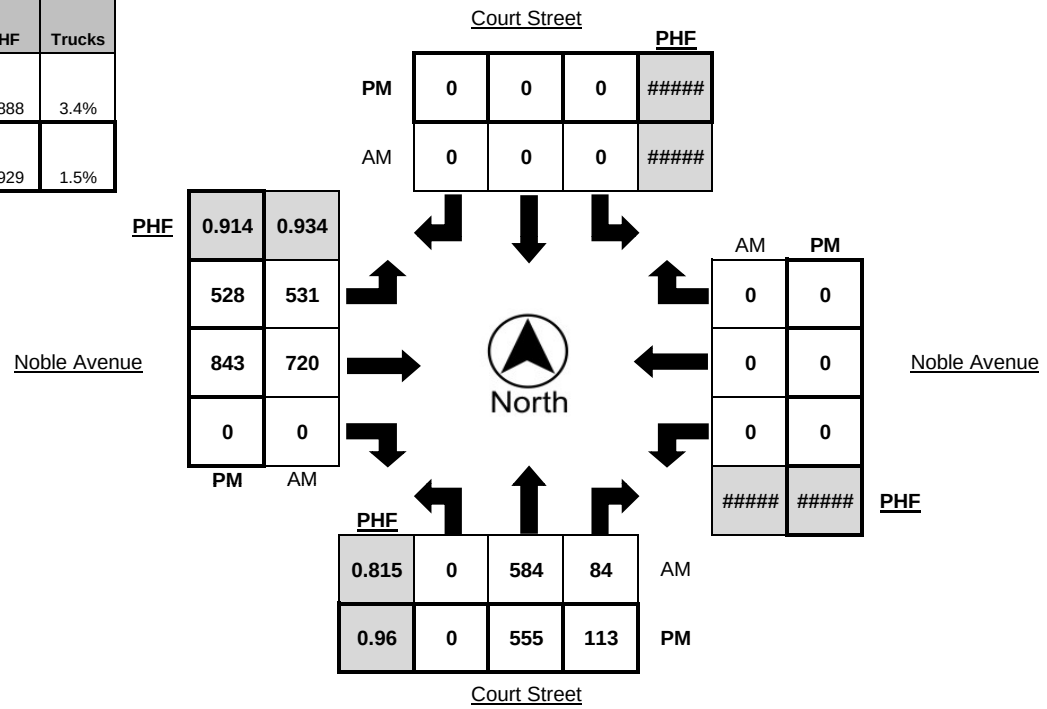
LOCATION Noble Avenue @ Court Street
LATITUDE 36°19'34.83"N
COUNTY Tulare
LONGITUDE 119°17'32.21"W
COLLECTION DATE 6/2/2009
WEATHER Sunny and Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	0	64	8	3	0	0	0	0	57	114	0	15	0	0	0	0
7:15 AM - 7:30 AM	0	102	14	6	0	0	0	0	64	92	0	9	0	0	0	0
7:30 AM - 7:45 AM	0	101	7	3	0	0	0	0	85	105	0	9	0	0	0	0
7:45 AM - 8:00 AM	0	127	16	7	0	0	0	0	94	148	0	10	0	0	0	0
8:00 AM - 8:15 AM	0	177	28	3	0	0	0	0	134	201	0	11	0	0	0	0
8:15 AM - 8:30 AM	0	148	19	4	0	0	0	0	155	172	0	7	0	0	0	0
8:30 AM - 8:45 AM	0	132	21	10	0	0	0	0	148	199	0	14	0	0	0	0
8:45 AM - 9:00 AM	0	119	15	3	0	0	0	0	107	133	0	16	0	0	0	0
TOTAL	**0**	**970**	**128**	**39**	**0**	**0**	**0**	**0**	**844**	**1164**	**0**	**91**	**0**	**0**	**0**	**0**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	0	171	18	2	0	0	0	0	150	198	0	11	0	0	0	0
4:15 PM - 4:30 PM	0	130	15	3	0	0	0	0	121	215	0	7	0	0	0	0
4:30 PM - 4:45 PM	0	138	21	1	0	0	0	0	107	194	0	8	0	0	0	0
4:45 PM - 5:00 PM	0	129	32	5	0	0	0	0	125	203	0	10	0	0	0	0
5:00 PM - 5:15 PM	0	145	29	1	0	0	0	0	151	224	0	7	0	0	0	0
5:15 PM - 5:30 PM	0	139	18	1	0	0	0	0	122	231	0	2	0	0	0	0
5:30 PM - 5:45 PM	0	122	30	5	0	0	0	0	128	202	0	8	0	0	0	0
5:45 PM - 6:00 PM	0	149	36	1	0	0	0	0	127	186	0	6	0	0	0	0
TOTAL	**0**	**1123**	**199**	**19**	**0**	**0**	**0**	**0**	**1031**	**1653**	**0**	**59**	**0**	**0**	**0**	**0**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:45 AM - 8:45 AM	0	584	84	24	0	0	0	0	531	720	0	42	0	0	0	0
5:00 PM - 6:00 PM	0	555	113	8	0	0	0	0	528	843	0	23	0	0	0	0

	PHF	Trucks
AM	0.888	3.4%
PM	0.929	1.5%



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Turning Movement Report

Prepared For: Robert Paderna
Kimley-Horn and Associates, Inc.
2000 Crow Canyon Place, Suite 410
San Ramon, CA 94583
(925) 242-5342 T

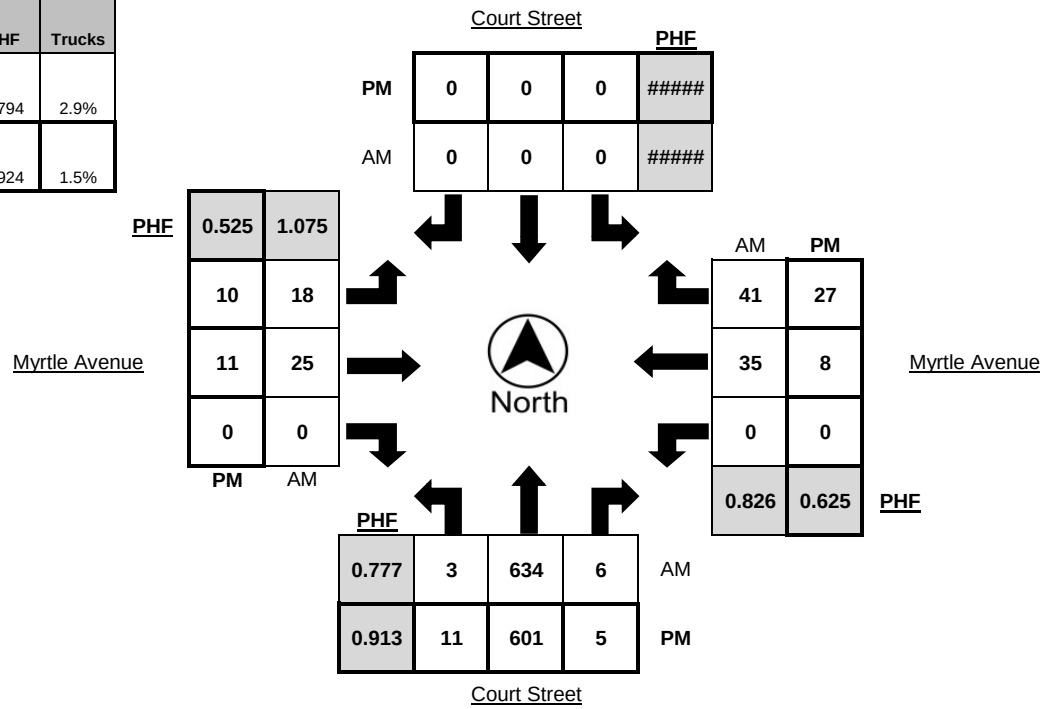
LOCATION Myrtle Avenue @ Court Street
LATITUDE 36°19'29.54"N
COUNTY Tulare
LONGITUDE 119°17'32.27"W
COLLECTION DATE 6/2/2009
WEATHER Sunny and Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	1	60	0	3	0	0	0	0	0	0	0	0	0	1	4	0
7:15 AM - 7:30 AM	0	102	0	4	0	0	0	0	2	2	0	0	0	2	5	0
7:30 AM - 7:45 AM	0	102	0	3	0	0	0	0	0	2	0	1	0	2	3	0
7:45 AM - 8:00 AM	0	119	0	4	0	0	0	0	0	1	0	0	0	4	5	0
8:00 AM - 8:15 AM	0	207	0	3	0	0	0	0	3	7	0	0	0	9	14	0
8:15 AM - 8:30 AM	1	162	3	4	0	0	0	0	8	10	0	0	0	16	10	0
8:30 AM - 8:45 AM	1	147	1	5	0	0	0	0	2	6	0	1	0	6	8	0
8:45 AM - 9:00 AM	1	118	2	6	0	0	0	0	5	2	0	0	0	4	9	3
TOTAL	**4**	**1017**	**6**	**32**	**0**	**0**	**0**	**0**	**20**	**30**	**0**	**2**	**0**	**44**	**58**	**3**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	4	162	0	3	0	0	0	0	3	3	0	0	0	6	10	0
4:15 PM - 4:30 PM	0	138	1	3	0	0	0	0	1	1	0	0	0	8	5	0
4:30 PM - 4:45 PM	1	125	1	1	0	0	0	0	0	5	0	0	0	3	4	0
4:45 PM - 5:00 PM	5	141	0	5	0	0	0	0	2	2	0	0	0	2	7	0
5:00 PM - 5:15 PM	3	164	2	0	0	0	0	0	0	5	0	0	0	1	7	0
5:15 PM - 5:30 PM	2	143	2	1	0	0	0	0	6	4	0	0	0	3	11	0
5:30 PM - 5:45 PM	1	153	1	4	0	0	0	0	2	0	0	0	0	2	2	0
5:45 PM - 6:00 PM	1	145	0	1	0	0	0	0	1	1	0	0	0	5	5	0
TOTAL	**17**	**1171**	**7**	**18**	**0**	**0**	**0**	**0**	**15**	**21**	**0**	**0**	**0**	**30**	**51**	**0**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
8:00 AM - 9:00 AM	3	634	6	18	0	0	0	0	18	25	0	1	0	35	41	3
4:45 PM - 5:45 PM	11	601	5	10	0	0	0	0	10	11	0	0	0	8	27	0

	PHF	Trucks
AM	0.794	2.9%
PM	0.924	1.5%



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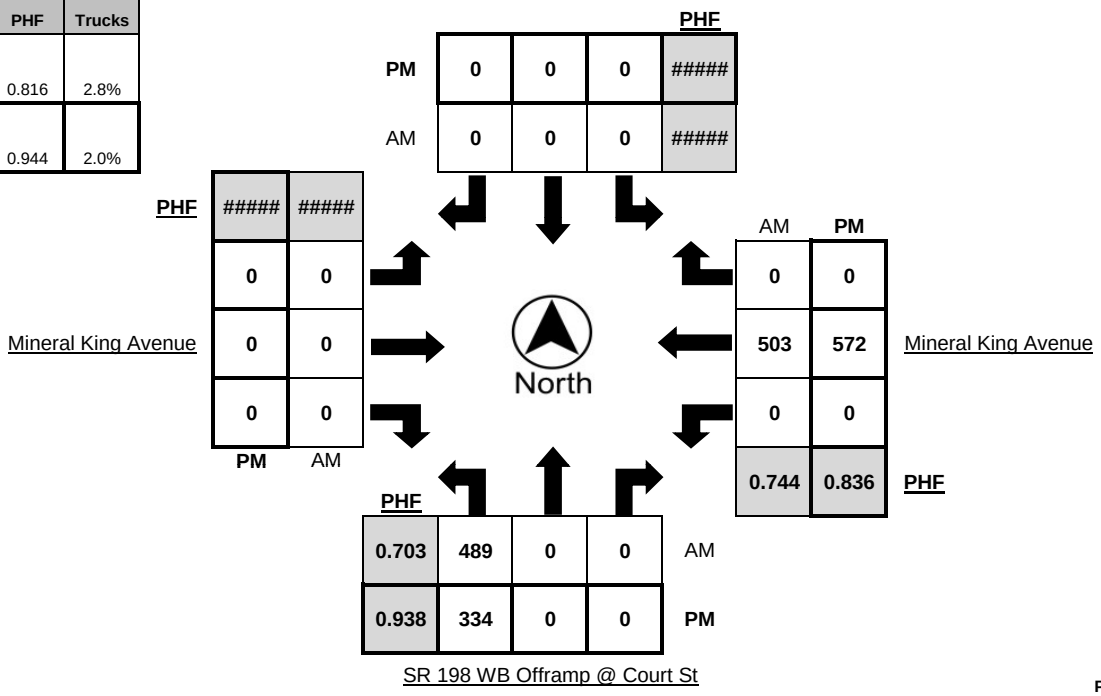
LOCATION Mineral King Ave @ SR 198 WB Off (Court St.)
LATITUDE 36°19'38.26"N
COUNTY Tulare
LONGITUDE 119°17'29.14"W
COLLECTION DATE 6/2/2009
WEATHER Sunny and Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	41	0	0	2	0	0	0	0	0	0	0	0	0	98	0	5
7:15 AM - 7:30 AM	79	0	0	3	0	0	0	0	0	0	0	0	0	24	0	9
7:30 AM - 7:45 AM	130	0	0	1	0	0	0	0	0	0	0	0	0	5	0	6
7:45 AM - 8:00 AM	174	0	0	3	0	0	0	0	0	0	0	0	0	42	0	3
8:00 AM - 8:15 AM	135	0	0	0	0	0	0	0	0	0	0	0	0	169	0	8
8:15 AM - 8:30 AM	110	0	0	1	0	0	0	0	0	0	0	0	0	135	0	6
8:30 AM - 8:45 AM	70	0	0	1	0	0	0	0	0	0	0	0	0	157	0	6
8:45 AM - 9:00 AM	71	0	0	0	0	0	0	0	0	0	0	0	0	87	0	8
TOTAL	**810**	**0**	**0**	**11**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**717**	**0**	**51**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	56	0	0	0	0	0	0	0	0	0	0	0	0	165	0	5
4:15 PM - 4:30 PM	65	0	0	0	0	0	0	0	0	0	0	0	0	155	0	0
4:30 PM - 4:45 PM	78	0	0	1	0	0	0	0	0	0	0	0	0	128	0	7
4:45 PM - 5:00 PM	89	0	0	0	0	0	0	0	0	0	0	0	0	145	0	0
5:00 PM - 5:15 PM	70	0	0	2	0	0	0	0	0	0	0	0	0	148	0	8
5:15 PM - 5:30 PM	69	0	0	1	0	0	0	0	0	0	0	0	0	171	0	5
5:30 PM - 5:45 PM	106	0	0	1	0	0	0	0	0	0	0	0	0	108	0	1
5:45 PM - 6:00 PM	83	0	0	0	0	0	0	0	0	0	0	0	0	114	0	2
TOTAL	**616**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1134**	**0**	**28**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:45 AM - 8:45 AM	489	0	0	5	0	0	0	0	0	0	0	0	0	503	0	23
4:45 PM - 5:45 PM	334	0	0	4	0	0	0	0	0	0	0	0	0	572	0	14

	PHF	Trucks
AM	0.816	2.8%
PM	0.944	2.0%



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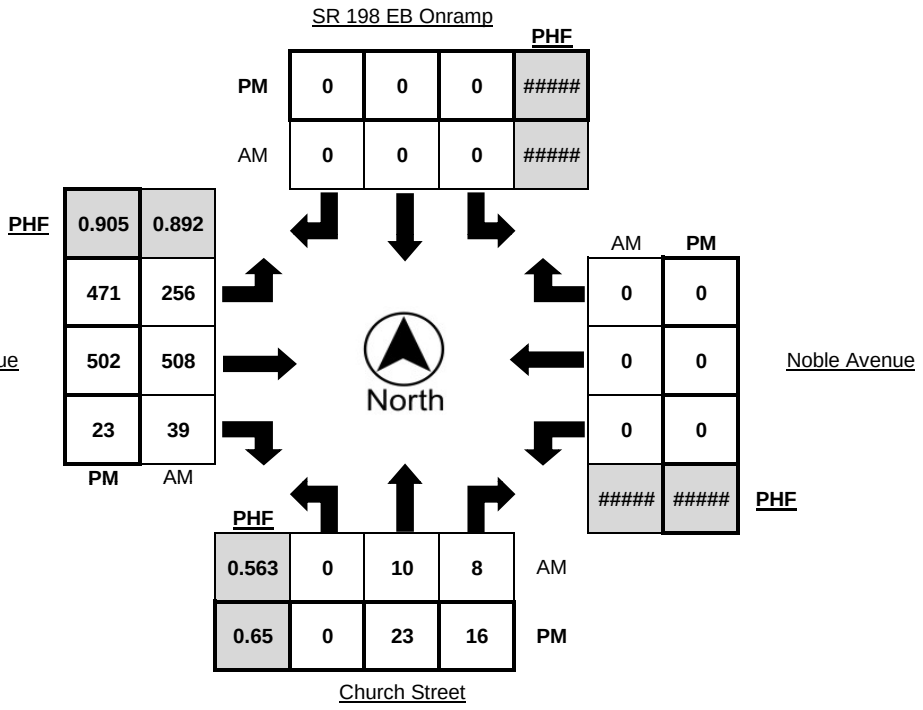
COLLECTION DATE 6/2/2009
WEATHER Sunny and Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	0	7	1	0	0	0	0	0	45	59	5	13	0	0	0	0
7:15 AM - 7:30 AM	0	3	2	0	0	0	0	0	42	52	6	6	0	0	0	0
7:30 AM - 7:45 AM	0	1	0	0	0	0	0	0	71	85	10	8	0	0	0	0
7:45 AM - 8:00 AM	0	6	2	0	0	0	0	0	72	127	10	8	0	0	0	0
8:00 AM - 8:15 AM	0	3	0	0	0	0	0	0	65	146	14	7	0	0	0	0
8:15 AM - 8:30 AM	0	0	3	0	0	0	0	0	55	117	6	9	0	0	0	0
8:30 AM - 8:45 AM	0	1	3	0	0	0	0	0	64	118	9	11	0	0	0	0
8:45 AM - 9:00 AM	0	2	5	0	0	0	0	0	34	101	9	2	0	0	0	0
TOTAL	**0**	**23**	**16**	**0**	**0**	**0**	**0**	**0**	**448**	**805**	**69**	**64**	**0**	**0**	**0**	**0**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	0	3	2	0	0	0	0	0	90	115	13	5	0	0	0	0
4:15 PM - 4:30 PM	0	4	3	0	0	0	0	0	77	126	5	2	0	0	0	0
4:30 PM - 4:45 PM	0	3	6	0	0	0	0	0	107	121	5	5	0	0	0	0
4:45 PM - 5:00 PM	0	5	1	0	0	0	0	0	101	131	5	8	0	0	0	0
5:00 PM - 5:15 PM	0	9	6	1	0	0	0	0	145	122	8	0	0	0	0	0
5:15 PM - 5:30 PM	0	6	3	0	0	0	0	0	118	128	5	4	0	0	0	0
5:30 PM - 5:45 PM	0	2	1	0	0	0	0	0	99	104	7	5	0	0	0	0
5:45 PM - 6:00 PM	0	4	2	0	0	0	0	0	83	107	4	5	0	0	0	0
TOTAL	**0**	**36**	**24**	**1**	**0**	**0**	**0**	**0**	**820**	**954**	**52**	**34**	**0**	**0**	**0**	**0**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:45 AM - 8:45 AM	0	10	8	0	0	0	0	0	256	508	39	35	0	0	0	0
4:30 PM - 5:30 PM	0	23	16	1	0	0	0	0	471	502	23	17	0	0	0	0

	PHF	Trucks
AM	0.900	4.1%
PM	0.892	1.7%



EXISTING CONDITIONS
(INTERSECTION, ROADWAY SEGMENT, AND FREEWAY & RAMP SEGMENTS)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor					0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt					1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)					3418	1553	1736	3471	1553	1736	3374	
Flt Permitted					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)					3418	1553	1736	3471	1553	1736	3374	
Volume (vph)	0	0	0	76	167	73	130	545	553	243	280	64
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.77	0.77	0.77	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	83	182	79	169	708	718	264	304	70
RTOR Reduction (vph)	0	0	0	0	0	61	0	0	178	0	18	0
Lane Group Flow (vph)	0	0	0	0	265	18	169	708	540	264	356	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type				Split		Perm	Prot		Perm	Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)					19.8	19.8	12.4	39.2	39.2	17.0	43.8	
Effective Green, g (s)					20.8	20.8	12.4	40.2	40.2	17.0	44.8	
Actuated g/C Ratio					0.23	0.23	0.14	0.45	0.45	0.19	0.50	
Clearance Time (s)					5.0	5.0	4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)					7.5	7.5	2.0	8.0	8.0	2.0	7.5	
Lane Grp Cap (vph)					790	359	239	1550	694	328	1680	
v/s Ratio Prot					c0.08		0.10	0.20		c0.15	0.11	
v/s Ratio Perm						0.01			c0.35			
v/c Ratio					0.34	0.05	0.71	0.46	0.78	0.80	0.21	
Uniform Delay, d1					28.8	26.9	37.1	17.3	21.1	34.9	12.7	
Progression Factor					1.01	1.25	0.75	1.36	1.85	1.00	1.00	
Incremental Delay, d2					0.8	0.2	4.9	0.6	5.4	12.7	0.3	
Delay (s)					30.0	33.8	32.7	24.1	44.5	47.6	13.0	
Level of Service					C	C	C	C	D	D	B	
Approach Delay (s)		0.0			30.8			34.2			27.3	
Approach LOS		A			C			C			C	

Intersection Summary				
HCM Average Control Delay	32.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	54.4%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	238	566	305	240	60	79
Peak Hour Factor	0.85	0.85	0.74	0.74	0.56	0.56
Hourly flow rate (vph)	280	666	412	324	107	141
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type					None	
Median storage veh)						
Upstream signal (ft)	799					
pX, platoon unblocked						
vC, conflicting volume			946		1599	473
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			946		1599	473
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			42		0	73
cM capacity (veh/h)			709		40	532

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	187	759	520	216	248
Volume Left	0	0	412	0	107
Volume Right	0	666	0	0	141
cSH	1700	1700	709	1700	84
Volume to Capacity	0.11	0.45	0.58	0.13	2.95
Queue Length 95th (ft)	0	0	95	0	608
Control Delay (s)	0.0	0.0	15.6	0.0	986.3
Lane LOS			C		F
Approach Delay (s)	0.0		11.0		986.3
Approach LOS					F

Intersection Summary				
Average Delay	131.0			
Intersection Capacity Utilization	56.2%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.89		1.00	1.00	0.85	1.00	0.94		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1627		1736	1827	1553	1736	3255		1736	3296	
Flt Permitted	0.59	1.00		0.49	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1083	1627		892	1827	1553	1736	3255		1736	3296	
Volume (vph)	25	50	134	183	132	139	236	720	509	227	691	351
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.85	0.85	0.85	0.87	0.87	0.87
Adj. Flow (vph)	30	60	161	220	159	167	278	847	599	261	794	403
RTOR Reduction (vph)	0	115	0	0	0	90	0	133	0	0	64	0
Lane Group Flow (vph)	30	106	0	220	159	77	278	1313	0	261	1133	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	22.4	22.4		23.9	23.9	23.9	17.4	35.5		16.1	34.2	
Effective Green, g (s)	24.4	24.4		24.4	24.4	24.4	17.4	37.5		16.1	36.2	
Actuated g/C Ratio	0.27	0.27		0.27	0.27	0.27	0.19	0.42		0.18	0.40	
Clearance Time (s)	6.0	6.0		4.5	4.5	4.5	4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	294	441		242	495	421	336	1356		311	1326	
v/s Ratio Prot		0.07			0.09		c0.16	c0.40		0.15	0.34	
v/s Ratio Perm	0.03			c0.25		0.05						
v/c Ratio	0.10	0.24		0.91	0.32	0.18	0.83	0.97		0.84	0.85	
Uniform Delay, d1	24.6	25.6		31.7	26.2	25.1	34.9	25.7		35.7	24.5	
Progression Factor	1.04	1.10		1.00	1.00	1.00	0.87	1.14		1.00	1.00	
Incremental Delay, d2	0.1	0.2		34.1	0.4	0.2	9.6	12.7		17.7	7.2	
Delay (s)	25.7	28.5		65.8	26.6	25.4	39.9	41.9		53.4	31.7	
Level of Service	C	C		E	C	C	D	D		D	C	
Approach Delay (s)		28.1			42.0			41.5			35.6	
Approach LOS		C			D			D			D	

Intersection Summary				
HCM Average Control Delay	38.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	83.1%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

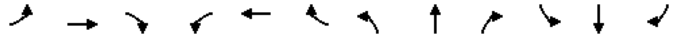
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	297	489	157	373	81	11
Peak Hour Factor	0.92	0.92	0.87	0.87	0.70	0.70
Hourly flow rate (vph)	323	532	180	429	116	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type					None	
Median storage veh)						
Upstream signal (ft)	465					
pX, platoon unblocked						
vC, conflicting volume			854		1378	589
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			854		1378	589
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			77		5	97
cM capacity (veh/h)			777		121	505

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	854	609	131
Volume Left	0	180	116
Volume Right	532	0	16
cSH	1700	777	134
Volume to Capacity	0.50	0.23	0.98
Queue Length 95th (ft)	0	22	171
Control Delay (s)	0.0	5.7	136.1
Lane LOS		A	F
Approach Delay (s)	0.0	5.7	136.1
Approach LOS			F

Intersection Summary			
Average Delay	13.4		
Intersection Capacity Utilization	88.4%	ICU Level of Service	E
Analysis Period (min)	15		

5: Noble Ave & Ben Maddox Way

Timing Plan: AM PEAK



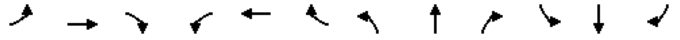
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0		4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	1.00		1.00		1.00		0.95	1.00	1.00	0.95	
Frt	1.00	0.97		1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3367	1779		1736		1553		3471	1553	1736	3471	
Flt Permitted	0.95	1.00		0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3367	1779		1736		1553		3471	1553	1736	3471	
Volume (vph)	120	104	22	72	0	389	0	719	56	97	259	0
Peak-hour factor, PHF	0.85	0.85	0.85	0.78	0.78	0.78	0.74	0.74	0.74	0.90	0.90	0.90
Adj. Flow (vph)	141	122	26	92	0	499	0	972	76	108	288	0
RTOR Reduction (vph)	0	9	0	0	0	184	0	0	42	0	0	0
Lane Group Flow (vph)	141	139	0	92	0	315	0	972	34	108	288	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot		custom			Perm	Prot		
Protected Phases	7	4		3		8		2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	8.0	24.6		6.3		22.9		32.0	32.0	9.1	45.1	
Effective Green, g (s)	8.0	25.6		6.3		23.9		33.0	33.0	9.1	46.1	
Actuated g/C Ratio	0.09	0.28		0.07		0.27		0.37	0.37	0.10	0.51	
Clearance Time (s)	4.0	5.0		4.0		5.0		5.0	5.0	4.0	5.0	
Vehicle Extension (s)	6.5	6.5		2.0		4.5		5.5	5.5	2.0	6.0	
Lane Grp Cap (vph)	299	506		122		412		1273	569	176	1778	
v/s Ratio Prot	0.04	0.08		c0.05		c0.20		c0.28		c0.06	0.08	
v/s Ratio Perm									0.02			
v/c Ratio	0.47	0.27		0.75		0.77		0.76	0.06	0.61	0.16	
Uniform Delay, d1	39.0	25.0		41.1		30.5		25.1	18.4	38.8	11.7	
Progression Factor	1.00	1.00		1.00		1.00		1.00	1.00	0.86	0.91	
Incremental Delay, d2	3.7	0.9		20.6		9.2		4.4	0.2	4.3	0.2	
Delay (s)	42.7	25.9		61.7		39.7		29.5	18.6	37.6	10.8	
Level of Service	D	C		E		D		C	B	D	B	
Approach Delay (s)		34.1			43.1			28.7			18.1	
Approach LOS		C			D			C			B	

Intersection Summary				
HCM Average Control Delay	31.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	59.0%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

6: Noble Ave & SR-198 EB Ramps @ Ben Maddox Way

Timing Plan: AM PEAK



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00		1.00	1.00		0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1644	3425		1644	1827	1471		1781	1471		3357	1471
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (perm)	1644	3425		1644	1827	1471		1781	1471		3357	1471
Volume (vph)	67	178	17	42	163	13	16	15	21	122	58	298
Peak-hour factor, PHF	0.86	0.86	0.86	0.84	0.84	0.84	0.93	0.93	0.93	0.76	0.76	0.76
Adj. Flow (vph)	78	207	20	50	194	15	17	16	23	161	76	392
RTOR Reduction (vph)	0	4	0	0	0	4	0	0	21	0	0	302
Lane Group Flow (vph)	78	223	0	50	194	11	0	33	2	0	237	90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6			3			4
Actuated Green, G (s)	5.2	31.7		4.3	30.8	30.8		5.7	5.7		16.6	16.6
Effective Green, g (s)	4.9	33.0		4.0	32.1	32.1		6.9	6.9		17.8	17.8
Actuated g/C Ratio	0.06	0.42		0.05	0.41	0.41		0.09	0.09		0.23	0.23
Clearance Time (s)	3.7	5.3		3.7	5.3	5.3		5.2	5.2		5.2	5.2
Vehicle Extension (s)	2.0	5.1		2.0	4.8	4.8		6.3	6.3		7.9	7.9
Lane Grp Cap (vph)	104	1455		85	755	608		158	131		769	337
v/s Ratio Prot	c0.05	0.07		0.03	c0.11			c0.02			c0.07	
v/s Ratio Perm						0.01			0.00			0.06
v/c Ratio	0.75	0.15		0.59	0.26	0.02		0.21	0.02		0.31	0.27
Uniform Delay, d1	35.8	13.8		36.0	15.0	13.5		32.9	32.3		24.8	24.6
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	23.2	0.2		6.5	0.4	0.0		2.0	0.1		1.0	1.8
Delay (s)	59.0	14.0		42.6	15.3	13.5		34.9	32.4		25.8	26.4
Level of Service	E	B		D	B	B		C	C		C	C
Approach Delay (s)		25.5			20.5			33.9			26.2	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	25.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.31			
Actuated Cycle Length (s)	77.7	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	44.7%	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		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	195	144	35	194	22	77	3	28	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.84	0.84	0.84	0.79	0.79	0.79	0.92	0.92	0.92
Hourly flow rate (vph)	11	205	152	42	231	26	97	4	35	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		799			328							
pX, platoon unblocked	0.99			0.97			0.98	0.98	0.97	0.98	0.98	0.99
vC, conflicting volume	257			357			629	643	281	667	705	244
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	249			340			606	619	262	644	683	236
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			96			75	99	95	100	100	100
cM capacity (veh/h)	1291			1177			387	379	757	348	350	799

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	367	299	137
Volume Left	11	42	97
Volume Right	152	26	35
cSH	1291	1177	443
Volume to Capacity	0.01	0.04	0.31
Queue Length 95th (ft)	1	3	32
Control Delay (s)	0.3	1.4	16.7
Lane LOS	A	A	C
Approach Delay (s)	0.3	1.4	16.7
Approach LOS			C

Intersection Summary				
Average Delay	3.5			
Intersection Capacity Utilization	41.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1553	1736	1827	1719	1538
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1827	1553	1736	1827	1719	1538
Volume (vph)	200	23	68	217	34	44
Peak-hour factor, PHF	0.86	0.86	0.81	0.81	0.78	0.78
Adj. Flow (vph)	233	27	84	268	44	56
RTOR Reduction (vph)	0	8	0	0	0	51
Lane Group Flow (vph)	233	19	84	268	44	5
Heavy Vehicles (%)	4%	4%	4%	4%	5%	5%
Turn Type		Perm	Prot			Prot
Protected Phases	2		1	6	4	4
Permitted Phases		2				
Actuated Green, G (s)	65.2	65.2	8.2	77.4	8.6	8.6
Effective Green, g (s)	67.2	67.2	8.2	79.4	8.6	8.6
Actuated g/C Ratio	0.70	0.70	0.09	0.83	0.09	0.09
Clearance Time (s)	6.0	6.0	4.0	6.0	4.0	4.0
Vehicle Extension (s)	8.0	8.0	2.0	8.0	2.4	2.4
Lane Grp Cap (vph)	1279	1087	148	1511	154	138
v/s Ratio Prot	0.13		c0.05	c0.15	c0.03	0.00
v/s Ratio Perm		0.01				
v/c Ratio	0.18	0.02	0.57	0.18	0.29	0.04
Uniform Delay, d1	5.0	4.4	42.2	1.7	40.8	39.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.0	3.0	0.3	0.7	0.1
Delay (s)	5.3	4.4	45.2	1.9	41.5	40.0
Level of Service	A	A	D	A	D	D
Approach Delay (s)	5.2			12.3	40.7	
Approach LOS	A			B	D	

Intersection Summary				
HCM Average Control Delay	13.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.22			
Actuated Cycle Length (s)	96.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	35.8%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	149	93	24	197	78	66
Peak Hour Factor	0.95	0.95	0.83	0.83	0.88	0.88
Hourly flow rate (vph)	157	98	29	237	89	75
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	744					
pX, platoon unblocked						
vC, conflicting volume			255		501	206
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			255		501	206
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		83	91
cM capacity (veh/h)			1299		516	832

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	255	266	164
Volume Left	0	29	89
Volume Right	98	0	75
cSH	1700	1299	625
Volume to Capacity	0.15	0.02	0.26
Queue Length 95th (ft)	0	2	26
Control Delay (s)	0.0	1.0	12.8
Lane LOS		A	B
Approach Delay (s)	0.0	1.0	12.8
Approach LOS			B

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	43.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.92		1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	1680		1736	1597		1736	3471	1553	1736	3471	1553
Flt Permitted	0.19	1.00		0.66	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	341	1680		1211	1597		1736	3471	1553	1736	3471	1553
Volume (vph)	105	43	50	39	65	342	49	652	19	209	647	152
Peak-hour factor, PHF	0.73	0.73	0.73	0.83	0.83	0.83	0.84	0.84	0.84	0.93	0.93	0.93
Adj. Flow (vph)	144	59	68	47	78	412	58	776	23	225	696	163
RTOR Reduction (vph)	0	45	0	0	211	0	0	0	11	0	0	85
Lane Group Flow (vph)	144	82	0	47	279	0	58	776	12	225	696	78
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	28.0	28.0		28.0	28.0		4.9	32.1	32.1	13.9	41.1	41.1
Effective Green, g (s)	30.0	30.0		30.0	30.0		4.9	34.1	34.1	13.9	43.1	43.1
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.05	0.38	0.38	0.15	0.48	0.48
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	5.8	5.8		5.8	5.8		1.5	5.8	5.8	1.5	5.8	5.8
Lane Grp Cap (vph)	114	560		404	532		95	1315	588	268	1662	744
v/s Ratio Prot		0.05			0.17		0.03	c0.22		c0.13	0.20	
v/s Ratio Perm	c0.42			0.04					0.01			0.05
v/c Ratio	1.26	0.15		0.12	0.52		0.61	0.59	0.02	0.84	0.42	0.10
Uniform Delay, d1	30.0	21.0		20.8	24.2		41.6	22.4	17.5	37.0	15.3	12.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.11	0.64	0.27
Incremental Delay, d2	170.9	0.3		0.3	2.2		7.9	2.0	0.1	17.4	0.7	0.3
Delay (s)	200.9	21.3		21.2	26.4		49.5	24.3	17.6	58.5	10.5	3.7
Level of Service	F	C		C	C		D	C	B	E	B	A
Approach Delay (s)		116.8			26.0			25.8			19.5	
Approach LOS		F			C			C			B	

Intersection Summary			
HCM Average Control Delay	32.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Visalia Walmart Expansion — Existing
11: SR-198 EB Ramps @ Lovers Lane & Lovers Lane — Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0						4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95						0.95		1.00	0.95	
Frt	1.00	0.91						1.00		1.00	1.00	
Flt Protected	0.95	0.98						1.00		0.95	1.00	
Satd. Flow (prot)	1649	1549						3463		1736	3471	
Flt Permitted	0.95	0.98						1.00		0.95	1.00	
Satd. Flow (perm)	1649	1549						3463		1736	3471	
Volume (vph)	384	0	168	0	0	0	0	1081	18	168	840	0
Peak-hour factor, PHF	0.77	0.77	0.77	0.92	0.92	0.92	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	499	0	218	0	0	0	0	1228	20	191	955	0
RTOR Reduction (vph)	0	60	0	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	352	305	0	0	0	0	0	1247	0	191	955	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	21.4	21.4						42.0		13.5	59.2	
Effective Green, g (s)	22.0	22.0						42.8		13.2	60.0	
Actuated g/C Ratio	0.24	0.24						0.48		0.15	0.67	
Clearance Time (s)	4.6	4.6						4.8		3.7	4.8	
Vehicle Extension (s)	5.0	5.0						7.4		2.0	6.2	
Lane Grp Cap (vph)	403	379						1647		255	2314	
v/s Ratio Prot	c0.21	0.20						c0.36		c0.11	0.28	
v/s Ratio Perm												
v/c Ratio	0.87	0.81						0.76		0.75	0.41	
Uniform Delay, d1	32.7	32.0						19.3		36.8	6.9	
Progression Factor	1.00	1.00						0.65		1.34	0.44	
Incremental Delay, d2	19.8	13.3						2.4		6.0	0.3	
Delay (s)	52.4	45.3						14.9		55.2	3.3	
Level of Service	D	D						B		E	A	
Approach Delay (s)		48.8			0.0			14.9			12.0	
Approach LOS		D			A			B			B	

Intersection Summary				
HCM Average Control Delay	21.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	65.5%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Visalia Walmart Expansion — Existing
12: Tulare Ave & Ben Maddox Way — Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	1845	1568	1752	1845	1568	1736	3471	1553	1736	3471	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1752	1845	1568	1752	1845	1568	1736	3471	1553	1736	3471	1553
Volume (vph)	93	168	36	11	220	179	55	455	14	94	207	94
Peak-hour factor, PHF	0.73	0.73	0.73	0.83	0.83	0.83	0.78	0.78	0.78	0.92	0.92	0.92
Adj. Flow (vph)	127	230	49	13	265	216	71	583	18	102	225	102
RTOR Reduction (vph)	0	0	33	0	0	152	0	0	8	0	0	61
Lane Group Flow (vph)	127	230	16	13	265	64	71	583	10	102	225	41
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	8.4	27.0	27.0	1.2	19.8	19.8	6.0	32.6	32.6	6.6	33.2	33.2
Effective Green, g (s)	8.4	28.0	28.0	1.2	20.8	20.8	6.0	33.6	33.6	6.6	34.2	34.2
Actuated g/C Ratio	0.10	0.33	0.33	0.01	0.24	0.24	0.07	0.39	0.39	0.08	0.40	0.40
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	172	605	514	25	449	382	122	1366	611	134	1390	622
v/s Ratio Prot	c0.07	0.12		0.01	c0.14		0.04	c0.17		c0.06	0.06	
v/s Ratio Perm			0.01			0.04			0.01			0.03
v/c Ratio	0.74	0.38	0.03	0.52	0.59	0.17	0.58	0.43	0.02	0.76	0.16	0.07
Uniform Delay, d1	37.4	22.0	19.5	41.8	28.5	25.5	38.5	18.9	15.8	38.6	16.4	15.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.3	0.1	0.0	8.7	1.4	0.1	4.5	1.0	0.0	20.2	0.2	0.2
Delay (s)	50.7	22.2	19.5	50.5	29.9	25.5	43.0	19.9	15.9	58.8	16.7	16.0
Level of Service	D	C	B	D	C	C	D	B	B	E	B	B
Approach Delay (s)		30.8			28.6			22.2			26.5	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	26.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	85.4	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	47.8%	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)	44	153	33	31	194	52	146	85	30	55	48	45
Peak Hour Factor	0.67	0.67	0.67	0.78	0.78	0.78	0.77	0.77	0.77	0.86	0.86	0.86
Hourly flow rate (vph)	66	228	49	40	249	67	190	110	39	64	56	52

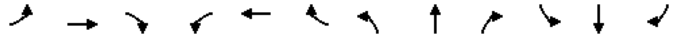
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	343	355	339	172
Volume Left (vph)	66	40	190	64
Volume Right (vph)	49	67	39	52
Hadj (s)	0.00	-0.04	0.09	-0.06
Departure Headway (s)	6.6	6.5	6.8	7.2
Degree Utilization, x	0.63	0.64	0.64	0.34
Capacity (veh/h)	500	512	493	419
Control Delay (s)	20.1	20.6	21.1	13.9
Approach Delay (s)	20.1	20.6	21.1	13.9
Approach LOS	C	C	C	B

Intersection Summary					
Delay			19.7		
HCM Level of Service			C		
Intersection Capacity Utilization			47.9%	ICU Level of Service	A
Analysis Period (min)			15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	79	0	0	24	37	628	15	21	542	106
Peak Hour Factor	0.68	0.68	0.68	0.60	0.60	0.60	0.87	0.87	0.87	0.84	0.84	0.84
Hourly flow rate (vph)	0	0	116	0	0	40	43	722	17	25	645	126
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	1244	1582	386	1304	1637	370	771			739		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1244	1582	386	1304	1637	370	771			739		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
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	81	100	100	94	95			97		
cM capacity (veh/h)	114	98	610	89	91	625	826			850		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	116	40	43	481	258	25	430	341
Volume Left	0	0	43	0	0	25	0	0
Volume Right	116	40	0	0	17	0	0	126
cSH	610	625	826	1700	1700	850	1700	1700
Volume to Capacity	0.19	0.06	0.05	0.28	0.15	0.03	0.25	0.20
Queue Length 95th (ft)	17	5	4	0	0	2	0	0
Control Delay (s)	12.3	11.2	9.6	0.0	0.0	9.4	0.0	0.0
Lane LOS	B	B	A			A		
Approach Delay (s)	12.3	11.2	0.5			0.3		
Approach LOS	B	B						

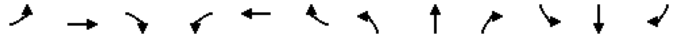
Intersection Summary					
Average Delay			1.5		
Intersection Capacity Utilization			29.9%	ICU Level of Service	A
Analysis Period (min)			15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frt	1.00	1.00			0.98			0.98				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1736	1827			1790			4938				
Flt Permitted	0.95	1.00			1.00			1.00				
Satd. Flow (perm)	1736	1827			1790			4938				
Volume (vph)	30	132	0	0	46	8	70	952	127	0	0	0
Peak-hour factor, PHF	0.83	0.83	0.83	0.68	0.68	0.68	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	36	159	0	0	68	12	80	1082	144	0	0	0
RTOR Reduction (vph)	0	0	0	0	8	0	0	11	0	0	0	0
Lane Group Flow (vph)	36	159	0	0	72	0	0	1296	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	Prot						Perm					
Protected Phases	7	4			8			2				
Permitted Phases							2					
Actuated Green, G (s)	2.9	19.1			12.5			40.1				
Effective Green, g (s)	2.6	19.3			12.7			40.3				
Actuated g/C Ratio	0.04	0.29			0.19			0.60				
Clearance Time (s)	3.7	4.2			4.2			4.2				
Vehicle Extension (s)	2.0	7.9			7.7			6.4				
Lane Grp Cap (vph)	67	522			336			2944				
v/s Ratio Prot	c0.02	c0.09			0.04							
v/s Ratio Perm								0.26				
v/c Ratio	0.54	0.30			0.21			0.44				
Uniform Delay, d1	31.9	18.9			23.2			7.5				
Progression Factor	1.00	1.00			1.00			1.00				
Incremental Delay, d2	4.1	1.4			1.3			0.5				
Delay (s)	36.0	20.3			24.5			8.0				
Level of Service	D	C			C			A				
Approach Delay (s)		23.2			24.5			8.0			0.0	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM Average Control Delay	10.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	67.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	37.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0				
Lane Util. Factor					0.91			0.91				
Frt					0.95			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					4741			4986				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					4741			4986				
Volume (vph)	0	0	0	0	665	327	234	933	0	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.82	0.82	0.82	0.87	0.87	0.87	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	811	399	269	1072	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	34	0	0	36	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1176	0	0	1305	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type							Perm					
Protected Phases					8			2				
Permitted Phases							2					
Actuated Green, G (s)					22.0			30.5				
Effective Green, g (s)					22.6			31.1				
Actuated g/C Ratio					0.37			0.50				
Clearance Time (s)					4.6			4.6				
Vehicle Extension (s)					4.8			3.0				
Lane Grp Cap (vph)					1737			2513				
v/s Ratio Prot					c0.25							
v/s Ratio Perm								0.26				
v/c Ratio					0.68			0.52				
Uniform Delay, d1					16.5			10.3				
Progression Factor					1.00			1.00				
Incremental Delay, d2					1.3			0.8				
Delay (s)					17.8			11.0				
Level of Service					B			B				
Approach Delay (s)		0.0			17.8			11.0			0.0	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM Average Control Delay	14.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	61.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	49.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.91						0.91				
Frt		1.00						0.98				
Flt Protected		0.98						1.00				
Satd. Flow (prot)		4881						4945				
Flt Permitted		0.98						1.00				
Satd. Flow (perm)		4881						4945				
Volume (vph)	556	720	0	0	0	0	0	611	84	0	0	0
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.82	0.82	0.82	0.92	0.92	0.92
Adj. Flow (vph)	598	774	0	0	0	0	0	745	102	0	0	0
RTOR Reduction (vph)	0	45	0	0	0	0	0	35	0	0	0	0
Lane Group Flow (vph)	0	1327	0	0	0	0	0	812	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	Perm											
Protected Phases		2						8				
Permitted Phases	2											
Actuated Green, G (s)		23.2						17.2				
Effective Green, g (s)		24.6						18.3				
Actuated g/C Ratio		0.48						0.36				
Clearance Time (s)		5.4						5.1				
Vehicle Extension (s)		2.0						5.0				
Lane Grp Cap (vph)		2359						1778				
v/s Ratio Prot								c0.16				
v/s Ratio Perm		0.27										
v/c Ratio		0.56						0.46				
Uniform Delay, d1		9.3						12.5				
Progression Factor		1.00						1.00				
Incremental Delay, d2		1.0						0.4				
Delay (s)		10.3						12.9				
Level of Service		B						B				
Approach Delay (s)		10.3			0.0			12.9			0.0	
Approach LOS		B			A			B			A	

Intersection Summary				
HCM Average Control Delay	11.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	50.9	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	51.1%	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)	18	25	0	0	35	41	3	634	6	0	0	0
Peak Hour Factor	0.60	0.60	0.60	0.83	0.83	0.83	0.78	0.78	0.78	0.92	0.92	0.92
Hourly flow rate (vph)	30	42	0	0	42	49	4	813	8	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	72	92	410	414
Volume Left (vph)	30	0	4	0
Volume Right (vph)	0	49	0	8
Hadj (s)	0.12	-0.29	0.06	0.04
Departure Headway (s)	5.7	5.3	5.0	5.0
Degree Utilization, x	0.11	0.13	0.57	0.58
Capacity (veh/h)	590	635	708	711
Control Delay (s)	9.5	9.1	13.3	13.4
Approach Delay (s)	9.5	9.1	13.3	
Approach LOS	A	A	B	

Intersection Summary				
Delay	12.7			
HCM Level of Service	B			
Intersection Capacity Utilization	33.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				4988	3433	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				4988	3433	
Volume (vph)	0	0	0	503	489	0
Peak-hour factor, PHF	0.92	0.92	0.74	0.74	0.70	0.70
Adj. Flow (vph)	0	0	0	680	699	0
RTOR Reduction (vph)	0	0	0	0	189	0
Lane Group Flow (vph)	0	0	0	680	510	0
Heavy Vehicles (%)	4%	4%	4%	4%	2%	2%
Turn Type						
Protected Phases				6	4	
Permitted Phases						
Actuated Green, G (s)				12.3	13.1	
Effective Green, g (s)				12.9	15.1	
Actuated g/C Ratio				0.36	0.42	
Clearance Time (s)				4.6	6.0	
Vehicle Extension (s)				5.0	6.0	
Lane Grp Cap (vph)				1787	1440	
v/s Ratio Prot				c0.14	c0.15	
v/s Ratio Perm						
v/c Ratio				0.38	0.35	
Uniform Delay, d1				8.6	7.1	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.3	0.4	
Delay (s)				8.9	7.6	
Level of Service				A	A	
Approach Delay (s)	0.0			8.9	7.6	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	8.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	36.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	30.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	265	79	169	708	718	264	374
v/c Ratio	0.34	0.19	0.70	0.46	0.82	0.80	0.22
Control Delay	28.9	8.2	37.9	26.4	30.0	54.8	13.7
Queue Delay	0.0	0.0	0.0	0.0	1.6	0.0	0.0
Total Delay	28.9	8.2	37.9	26.4	31.6	54.8	13.7
Queue Length 50th (ft)	63	3	98	203	306	138	56
Queue Length 95th (ft)	m68	m8	m122	211	335	#282	103
Internal Link Dist (ft)	719			378			1660
Turn Bay Length (ft)		275	175		40	185	
Base Capacity (vph)	1064	538	309	1551	872	342	1697
Starvation Cap Reductn	0	0	0	0	54	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.15	0.55	0.46	0.88	0.77	0.22

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	30	221	220	159	167	278	1446	261	1197
v/c Ratio	0.10	0.40	0.85	0.32	0.33	0.83	0.97	0.84	0.86
Control Delay	23.8	10.5	59.0	26.7	9.2	44.0	38.8	61.2	32.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	15.2	0.0	0.0
Total Delay	23.8	10.5	59.0	26.7	9.2	44.0	54.0	61.2	32.7
Queue Length 50th (ft)	11	21	113	69	18	153	~292	143	~336
Queue Length 95th (ft)	m17	m36	#178	106	52	m206	#459	#273	#463
Internal Link Dist (ft)		2033		385			269		731
Turn Bay Length (ft)	145		155		25	125		170	
Base Capacity (vph)	361	632	308	589	584	371	1491	312	1389
Starvation Cap Reductn	0	0	0	0	0	0	91	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.35	0.71	0.27	0.29	0.75	1.03	0.84	0.86

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

5: Noble Ave & Ben Maddox Way

Lane Group	EBL	EBT	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	141	148	92	499	972	76	108	288
v/c Ratio	0.47	0.29	0.63	0.85	0.75	0.12	0.61	0.16
Control Delay	44.6	23.3	59.9	29.2	31.9	8.5	49.5	12.1
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	44.6	23.3	59.9	29.2	31.9	8.5	49.5	12.1
Queue Length 50th (ft)	40	61	51	139	256	3	61	52
Queue Length 95th (ft)	65	90	87	163	285	24	#141	95
Internal Link Dist (ft)		671			2243			378
Turn Bay Length (ft)			280			180	90	
Base Capacity (vph)	299	661	154	728	1300	624	183	1807
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	7	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.22	0.60	0.69	0.75	0.12	0.59	0.16

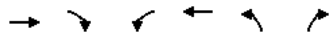
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

6: Noble Ave & SR-198 EB Ramps @ Ben Maddox Way

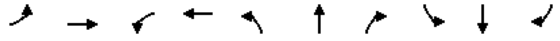
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	78	227	50	194	15	33	23	237	392
v/c Ratio	0.45	0.15	0.33	0.24	0.02	0.13	0.10	0.29	0.60
Control Delay	44.7	17.1	43.2	20.7	16.6	34.6	15.5	26.6	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.7	17.1	43.2	20.7	16.6	34.6	15.5	26.6	7.6
Queue Length 50th (ft)	39	39	25	71	3	15	0	55	0
Queue Length 95th (ft)	84	74	60	139	16	45	23	77	27
Internal Link Dist (ft)		179		406		179		341	
Turn Bay Length (ft)	185		150		40				110
Base Capacity (vph)	387	1536	383	810	656	563	481	1227	786
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.15	0.13	0.24	0.02	0.06	0.05	0.19	0.50

Intersection Summary



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	233	27	84	268	44	56
v/c Ratio	0.18	0.02	0.51	0.18	0.24	0.26
Control Delay	6.4	2.6	47.7	2.2	40.1	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.4	2.6	47.7	2.2	40.1	13.9
Queue Length 50th (ft)	46	0	45	26	22	0
Queue Length 95th (ft)	82	9	80	37	48	26
Internal Link Dist (ft)	248			664	309	
Turn Bay Length (ft)		125	200			
Base Capacity (vph)	1306	1118	342	1564	447	441
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.02	0.25	0.17	0.10	0.13

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	144	127	47	490	58	776	23	225	696	163
v/c Ratio	1.26	0.21	0.12	0.66	0.41	0.59	0.04	0.84	0.40	0.19
Control Delay	201.7	11.8	21.9	13.5	47.6	25.2	10.3	64.3	10.7	1.2
Queue Delay	189.2	0.0	0.0	9.4	0.0	0.1	0.0	41.9	0.6	0.5
Total Delay	390.9	11.8	21.9	22.9	47.6	25.3	10.3	106.2	11.2	1.7
Queue Length 50th (ft)	~104	23	18	75	32	188	2	126	81	0
Queue Length 95th (ft)	#166	44	40	147	63	228	16	m#204	m147	m0
Internal Link Dist (ft)		502		1058		2367			110	
Turn Bay Length (ft)	125		135		115		105	115		
Base Capacity (vph)	114	606	404	744	309	1314	599	309	1722	853
Starvation Cap Reductn	0	0	0	0	0	0	0	94	604	400
Spillback Cap Reductn	29	0	0	220	0	47	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.69	0.21	0.12	0.94	0.19	0.61	0.04	1.05	0.62	0.36

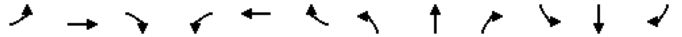
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	352	365	1248	191	955
v/c Ratio	0.87	0.83	0.76	0.75	0.41
Control Delay	56.1	43.0	16.4	59.4	3.4
Queue Delay	1.5	29.5	0.2	0.0	0.5
Total Delay	57.6	72.5	16.7	59.4	3.9
Queue Length 50th (ft)	201	163	136	116	40
Queue Length 95th (ft)	#260	216	m358	m124	m61
Internal Link Dist (ft)		366	110		269
Turn Bay Length (ft)	232			75	
Base Capacity (vph)	414	448	1649	380	2314
Starvation Cap Reductn	0	0	62	0	830
Spillback Cap Reductn	12	94	24	0	197
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.88	1.03	0.79	0.50	0.64

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	127	230	49	13	265	216	71	583	18	102	225	102
v/c Ratio	0.70	0.36	0.09	0.12	0.67	0.44	0.46	0.41	0.03	0.62	0.15	0.14
Control Delay	59.5	23.4	7.1	44.1	39.0	8.2	47.9	19.9	10.7	55.0	17.4	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.5	23.4	7.1	44.1	39.0	8.2	47.9	19.9	10.7	55.0	17.4	5.0
Queue Length 50th (ft)	66	88	0	7	131	6	36	115	1	52	38	0
Queue Length 95th (ft)	#113	135	16	24	189	47	71	156	13	#124	74	33
Internal Link Dist (ft)		1613			1967			1346			2243	
Turn Bay Length (ft)	95		95	90		90	155		90	200		200
Base Capacity (vph)	196	712	635	173	633	670	186	1436	651	187	1459	712
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.32	0.08	0.08	0.42	0.32	0.38	0.41	0.03	0.55	0.15	0.14

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	36	159	80	1306
v/c Ratio	0.23	0.31	0.20	0.42
Control Delay	30.2	15.9	18.1	8.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	30.2	15.9	18.1	8.5
Queue Length 50th (ft)	11	40	17	72
Queue Length 95th (ft)	35	69	40	161
Internal Link Dist (ft)		608	737	568
Turn Bay Length (ft)				
Base Capacity (vph)	436	956	615	3106
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.08	0.17	0.13	0.42

Intersection Summary

Lane Group	WBT	NBT
Lane Group Flow (vph)	1210	1341
v/c Ratio	0.68	0.53
Control Delay	17.9	11.1
Queue Delay	0.1	0.0
Total Delay	17.9	11.1
Queue Length 50th (ft)	129	111
Queue Length 95th (ft)	149	152
Internal Link Dist (ft)	265	310
Turn Bay Length (ft)		
Base Capacity (vph)	1930	2549
Starvation Cap Reductn	82	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.65	0.53

Intersection Summary

Lane Group	EBT	NBT
Lane Group Flow (vph)	1372	847
v/c Ratio	0.57	0.47
Control Delay	10.3	12.4
Queue Delay	0.0	0.0
Total Delay	10.3	12.4
Queue Length 50th (ft)	95	63
Queue Length 95th (ft)	141	80
Internal Link Dist (ft)	4045	445
Turn Bay Length (ft)		
Base Capacity (vph)	2402	1979
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.57	0.43

Intersection Summary

Lane Group	WBT	NBL
Lane Group Flow (vph)	680	699
v/c Ratio	0.38	0.43
Control Delay	9.8	4.8
Queue Delay	0.0	0.0
Total Delay	9.8	4.8
Queue Length 50th (ft)	34	22
Queue Length 95th (ft)	53	33
Internal Link Dist (ft)	3590	122
Turn Bay Length (ft)		
Base Capacity (vph)	2858	2049
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.24	0.34

Intersection Summary

Kimley-Horn and Associates, Inc.

Visalia Walmart Roadway Network Capacity

Existing Conditions
AM Peak

ROADWAY	FROM	TO	Length (Miles)	Area Type (U/T/R)	Functional Class	# of Lanes	Div/Undiv (D/U)	Left-turn Bays (Y/N)	POSTED SPEED	Sig/Mile	Code	Notes	Generalized Service Volumes							
													Code	A	B	C	D	E	Two-Way Vol	LOS
Mineral King Avenue	Ben Maddox Way	SR-198 WB Ramps (B	0.15	U	Arterial	4	U	N	40	3.50	U-NS2-4	adjusted volumes by -25%	U-NS2-4	0	0	2178	2898	3060	831	C
Mineral King Avenue	SR-198 WB Ramps (B	Lovers Lane	0.84	U	Arterial	2	U	Y	40	1.50	U-NS1-2		U-NS1-2	0	837	1350	1440	0	895	C
Noble Avenue	Ben Maddox Way	SR-198 EB Ramps	0.16	U	Arterial	2	U	Y	35	4.00	U-NS2-2		U-NS2-2	0	0	918	1332	1413	729	C
Noble Avenue	East Driveway	Pinkham Street	0.14	U	Arterial	2	U	Y	35	2.50	U-NS2-2		U-NS2-2	0	0	918	1332	1413	523	C
Noble Avenue	Pinkham Street	Lovers Lane	0.50	U	Arterial	2	U	Y	45	2.00	U-NS2-2		U-NS2-2	0	0	918	1332	1413	450	C
Ben Maddox Way	Noble Avenue	Tulare Avenue	0.44	U	Arterial	4	D	Y	40	2.00	U-NS2-4		U-NS2-4	0	0	2178	2898	3060	1,125	C
Pinkham Street	Noble Avenue	Tulare Avenue	0.44	U	Arterial	2	U	N	40	0	U-OS1-2	adjusted volumes by -20%	U-OS1-2	0	605	975	1040	0	236	B
Lovers Lane	Noble Avenue	Tulare Avenue	0.47	U	Arterial	4	D	Y	45	3.00	U-NS2-4		U-NS2-4	0	0	2178	2898	3060	1,389	C
Tulare Avenue	Ben Maddox Way	Pinkham Street	0.39	U	Arterial	2	U	Y	40	0.61	U-OS1-2		U-OS1-2	0	605	975	1040	0	651	C
Tulare Avenue	Pinkham Street	Lovers Lane	0.48	U	Arterial	2	U	N	40	0.82	U-OS1-2	adjusted volumes by -20%	U-OS1-2	0	605	975	1040	0	295	B

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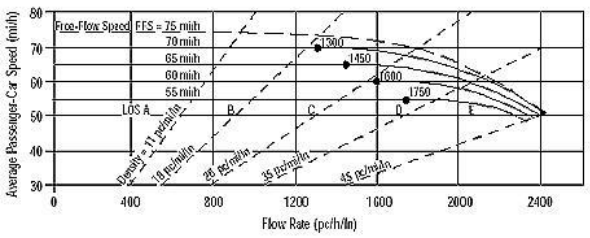

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	B/W Ben Maddox Way & Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Existing
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	1557 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	904	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	14.5	pc/mi/ln	S		mi/h
LOS	B		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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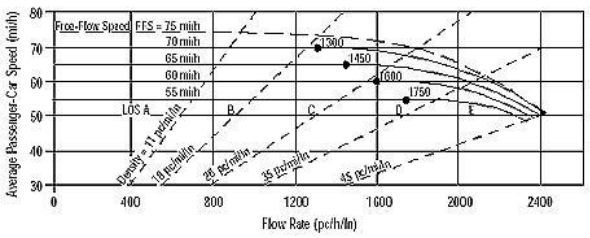

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	E/O Lovers Ln.
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Existing
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	1191 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	0.56	I/mi	f_{ID}	0.3	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	65.2	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	695	pc/h/ln	Design LOS		
S	65.2	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	10.7	pc/mi/ln	S		mi/h
LOS	A		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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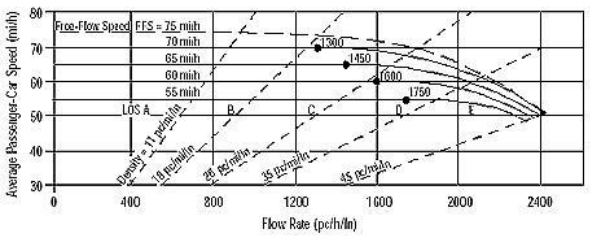

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	W/O S. Ben Maddox Way
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Existing
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	1940 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1126	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	18.0	pc/mi/ln	S		mi/h
LOS	C		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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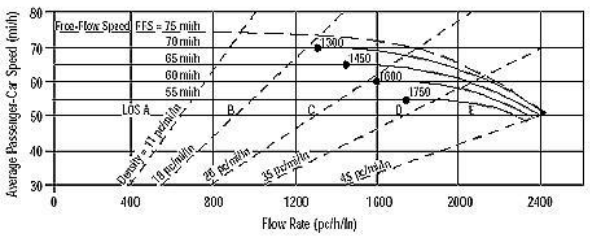

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	B/W Ben Maddox Way & Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Existing
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	1938 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1125	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	18.0	pc/mi/ln	S		mi/h
LOS	B		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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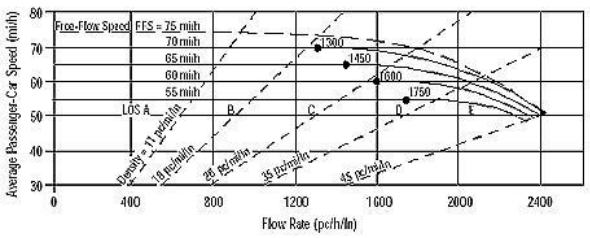

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	E/O Lovers Ln.
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Existing
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	1384 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	0.56	I/mi	f_{ID}	0.3	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	65.2	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	807	pc/h/ln	Design LOS		
S	65.2	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	12.4	pc/mi/ln	S		mi/h
LOS	B		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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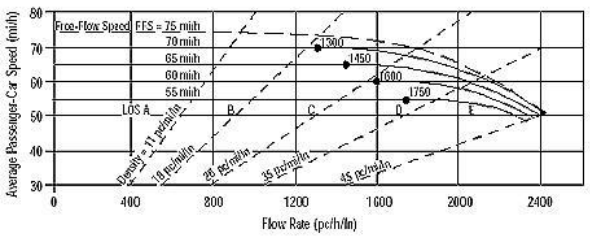

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	W/O S. Ben Maddox Way
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Existing
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2670 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1550	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	24.8	pc/mi/ln	S		mi/h
LOS	C		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Existing

Project Description

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 2500 ft

Vu = 266 veh/h

Terrain Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	1940	0.90	Level	9	0	0.957	1.00	2253
Ramp	478	0.90	Level	4	0	0.980	1.00	542
UpStream	266	0.90	Level	2	0	0.990	1.00	299
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 2253 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

	Actual	Maximum	LOS F?
$V_{FI}=V_F$	2253	4800	No
V_{12}	2253	4400:All	No
$V_{FO} = V_F - V_R$	1711	4800	No
V_R	542	2000	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = 22.1 (pc/ mi /ln)

LOS= C (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

D_s = 0.477 (Exhibit 25-19)

S_R= 56.7 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 56.7 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Existing

Project Description

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 2600 ft

Vu = 95 veh/h

Terrain Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	1557	0.90	Level	9	0	0.957	1.00	1808
Ramp	552	0.90	Level	4	0	0.980	1.00	626
UpStream	95	0.90	Level	2	0	0.990	1.00	107
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 1808 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

	Actual	Maximum	LOS F?
$V_{FI}=V_F$	1808	4800	No
V_{12}	1808	4400:All	No
$V_{FO} = V_F - V_R$	1182	4800	No
V_R	626	2000	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = 17.1 (pc/ mi /ln)

LOS= B (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

D_s = 0.484 (Exhibit 25-19)

S_R= 56.4 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 56.4 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Existing

Project Description

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off
L_{up} = 3400 ft
Vu = 646 veh/h

Terrain: Level
S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off
L_{down} = ft
VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	1938	0.90	Level	9	0	0.957	1.00	2250
Ramp	139	0.90	Level	4	0	0.980	1.00	158
UpStream	646	0.90	Level	2	0	0.990	1.00	725
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 25-2 or 25-3)
P_{FM}= using Equation
V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$
D_R = (pc/ mi /ln)
LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} =1.000 using Equation 0
V_{12} = 2250 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$	2250	4800	No
V_{12}	2250	4400:All	No
$V_{FO} = V_F - V_R$	2092	4800	No
V_R	158	2000	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$
D_R = 21.1 (pc/ mi /ln)
LOS= C (Exhibit 25-4)

Speed Estimation

D_s = 0.442 (Exhibit 25-19)
S_R= 57.6 mph (Exhibit 25-19)
S_0= N/A mph (Exhibit 25-19)
S = 57.6 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Existing

Project Description

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☐ No ☐ Off
L_{up} = ft
Vu = veh/h

Terrain
S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☐ No ☐ Off
L_{down} = ft
VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	1384	0.90	Level	9	0	0.957	1.00	1607
Ramp	92	0.90	Level	4	0	0.980	1.00	104
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 25-2 or 25-3)
P_{FM}= using Equation
V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$
D_R = (pc/ mi /ln)
LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} =1.000 using Equation 0
V_{12} = 1607 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$	1607	4800	No
V_{12}	1607	4400:All	No
$V_{FO} = V_F - V_R$	1503	4800	No
V_R	104	2000	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$
D_R = 16.0 (pc/ mi /ln)
LOS= B (Exhibit 25-4)

Speed Estimation

D_s = 0.437 (Exhibit 25-19)
S_R= 57.8 mph (Exhibit 25-19)
S_0= N/A mph (Exhibit 25-19)
S = 57.8 mph (Exhibit 25-15)

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor					0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt					1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)					3453	1583	1770	3539	1583	1770	3488	
Flt Permitted					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)					3453	1583	1770	3539	1583	1770	3488	
Volume (vph)	0	0	0	156	158	87	134	658	387	218	559	59
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.94	0.86	0.86	0.86
Adj. Flow (vph)	0	0	0	170	172	95	143	700	412	253	650	69
RTOR Reduction (vph)	0	0	0	0	0	69	0	0	107	0	7	0
Lane Group Flow (vph)	0	0	0	0	342	26	143	700	305	253	712	0
Turn Type				Split		Perm	Prot		Perm	Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)					23.5	23.5	11.1	37.3	37.3	15.2	41.4	
Effective Green, g (s)					24.5	24.5	11.1	38.3	38.3	15.2	42.4	
Actuated g/C Ratio					0.27	0.27	0.12	0.43	0.43	0.17	0.47	
Clearance Time (s)					5.0	5.0	4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)					7.5	7.5	2.0	8.0	8.0	2.0	7.5	
Lane Grp Cap (vph)					940	431	218	1506	674	299	1643	
v/s Ratio Prot					c0.10		0.08	c0.20		c0.14	0.20	
v/s Ratio Perm						0.02			0.19			
v/c Ratio					0.36	0.06	0.66	0.46	0.45	0.85	0.43	
Uniform Delay, d1					26.5	24.2	37.6	18.5	18.4	36.3	15.8	
Progression Factor					0.90	0.96	0.84	1.18	1.47	1.00	1.00	
Incremental Delay, d2					0.9	0.2	3.9	0.8	1.6	18.6	0.8	
Delay (s)					24.8	23.5	35.5	22.5	28.6	54.9	16.6	
Level of Service					C	C	D	C	C	D	B	
Approach Delay (s)		0.0			24.5			26.0			26.6	
Approach LOS		A			C			C			C	

Intersection Summary				
HCM Average Control Delay	26.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	49.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	165	353	252	274	79	28
Peak Hour Factor	0.92	0.92	0.88	0.88	0.76	0.76
Hourly flow rate (vph)	179	384	286	311	104	37
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type					None	
Median storage veh)						
Upstream signal (ft)	799					
pX, platoon unblocked						
vC, conflicting volume			563		1100	282
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			563		1100	282
tC, single (s)			4.1		6.9	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			71		29	95
cM capacity (veh/h)			1005		147	713

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	120	443	390	208	141
Volume Left	0	0	286	0	104
Volume Right	0	384	0	0	37
cSH	1700	1700	1005	1700	190
Volume to Capacity	0.07	0.26	0.29	0.12	0.74
Queue Length 95th (ft)	0	0	30	0	121
Control Delay (s)	0.0	0.0	8.2	0.0	64.6
Lane LOS			A		F
Approach Delay (s)	0.0		5.3		64.6
Approach LOS					F

Intersection Summary				
Average Delay	9.4			
Intersection Capacity Utilization	45.5%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.90		1.00	1.00	0.85	1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1680		1770	1863	1583	1770	3371		1770	3454	
Flt Permitted	0.64	1.00		0.19	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1197	1680		347	1863	1583	1770	3371		1770	3454	
Volume (vph)	73	132	250	146	121	163	123	919	426	173	563	108
Peak-hour factor, PHF	0.80	0.80	0.80	0.87	0.87	0.87	0.92	0.92	0.92	0.89	0.89	0.89
Adj. Flow (vph)	91	165	312	168	139	187	134	999	463	194	633	121
RTOR Reduction (vph)	0	76	0	0	0	108	0	59	0	0	15	0
Lane Group Flow (vph)	91	401	0	168	139	79	134	1403	0	194	739	0
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	27.0	27.0		28.5	28.5	28.5	10.1	33.6		13.4	36.9	
Effective Green, g (s)	29.0	29.0		29.0	29.0	29.0	10.1	35.6		13.4	38.9	
Actuated g/C Ratio	0.32	0.32		0.32	0.32	0.32	0.11	0.40		0.15	0.43	
Clearance Time (s)	6.0	6.0		4.5	4.5	4.5	4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	386	541		112	600	510	199	1333		264	1493	
v/s Ratio Prot		0.24			0.07		0.08	c0.42		c0.11	c0.21	
v/s Ratio Perm	0.08			c0.48		0.05						
v/c Ratio	0.24	0.74		1.50	0.23	0.16	0.67	1.05		0.73	0.50	
Uniform Delay, d1	22.4	27.2		30.5	22.3	21.8	38.4	27.2		36.6	18.5	
Progression Factor	0.87	0.82		1.00	1.00	1.00	0.72	1.13		1.00	1.00	
Incremental Delay, d2	0.3	5.4		265.8	0.2	0.1	0.8	26.0		10.1	1.2	
Delay (s)	19.7	27.8		296.3	22.5	21.9	28.4	56.6		46.7	19.6	
Level of Service	B	C		F	C	C	C	E		D	B	
Approach Delay (s)		26.5			115.4			54.2			25.2	
Approach LOS		C			F			D			C	

Intersection Summary				
HCM Average Control Delay	50.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	1.22			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	92.6%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

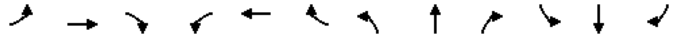
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	422	309	91	311	119	18
Peak Hour Factor	0.94	0.94	0.83	0.83	0.88	0.88
Hourly flow rate (vph)	449	329	110	375	135	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type					None	
Median storage veh)						
Upstream signal (ft)	465					
pX, platoon unblocked						
vC, conflicting volume			778		1207	613
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			778		1207	613
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			87		23	96
cM capacity (veh/h)			839		175	490

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	778	484	156
Volume Left	0	110	135
Volume Right	329	0	20
cSH	1700	839	194
Volume to Capacity	0.46	0.13	0.80
Queue Length 95th (ft)	0	11	140
Control Delay (s)	0.0	3.5	72.4
Lane LOS		A	F
Approach Delay (s)	0.0	3.5	72.4
Approach LOS			F

Intersection Summary			
Average Delay	9.2		
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		

5: Noble Ave & Ben Maddox Way

Timing Plan: PM PEAK

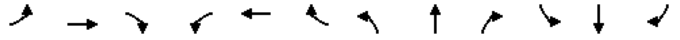


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0		4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	1.00		1.00		1.00		0.95	1.00	1.00	0.95	
Frt	1.00	0.96		1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	1787		1770		1583		3539	1583	1770	3539	
Flt Permitted	0.95	1.00		0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	1787		1770		1583		3539	1583	1770	3539	
Volume (vph)	109	249	93	186	0	514	0	556	103	176	539	0
Peak-hour factor, PHF	0.83	0.83	0.83	0.93	0.93	0.93	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	131	300	112	200	0	553	0	585	108	191	586	0
RTOR Reduction (vph)	0	17	0	0	0	202	0	0	78	0	0	0
Lane Group Flow (vph)	131	395	0	200	0	351	0	585	30	191	586	0
Turn Type	Prot			Prot		custom			Perm	Prot		
Protected Phases	7	4		3		8		2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	8.0	26.2		8.0		26.2		24.0	24.0	13.8	41.8	
Effective Green, g (s)	8.0	27.2		8.0		27.2		25.0	25.0	13.8	42.8	
Actuated g/C Ratio	0.09	0.30		0.09		0.30		0.28	0.28	0.15	0.48	
Clearance Time (s)	4.0	5.0		4.0		5.0		5.0	5.0	4.0	5.0	
Vehicle Extension (s)	6.5	6.5		2.0		4.5		5.5	5.5	2.0	6.0	
Lane Grp Cap (vph)	305	540		157		478		983	440	271	1683	
v/s Ratio Prot	0.04	0.22		c0.11		c0.22		c0.17		c0.11	0.17	
v/s Ratio Perm									0.02			
v/c Ratio	0.43	0.73		1.27		0.74		0.60	0.07	0.70	0.35	
Uniform Delay, d1	38.8	28.1		41.0		28.2		28.1	23.9	36.2	14.8	
Progression Factor	1.00	1.00		1.00		1.00		1.00	1.00	0.79	0.86	
Incremental Delay, d2	3.1	7.3		163.5		6.6		2.7	0.3	6.2	0.5	
Delay (s)	41.9	35.5		204.5		34.7		30.8	24.2	34.8	13.3	
Level of Service	D	D		F		C		C	C	C	B	
Approach Delay (s)		37.0			79.8			29.8			18.6	
Approach LOS		D			E			C			B	

Intersection Summary			
HCM Average Control Delay	41.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

6: Noble Ave & SR-198 EB Ramps @ Ben Maddox Way

Timing Plan: PM PEAK



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00		1.00	1.00		0.95	1.00
Frt	1.00	0.97		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1676	3435		1676	1863	1500		1792	1485		3398	1485
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (perm)	1676	3435		1676	1863	1500		1792	1485		3398	1485
Volume (vph)	99	337	82	101	220	45	101	71	87	187	109	294
Peak-hour factor, PHF	0.91	0.91	0.91	0.95	0.95	0.95	0.78	0.78	0.78	0.88	0.88	0.88
Adj. Flow (vph)	109	370	90	106	232	47	129	91	112	212	124	334
RTOR Reduction (vph)	0	15	0	0	0	13	0	0	88	0	0	264
Lane Group Flow (vph)	109	445	0	106	232	34	0	220	24	0	336	70
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6			3			4
Actuated Green, G (s)	9.2	30.7		9.1	30.6	30.6		20.1	20.1		19.5	19.5
Effective Green, g (s)	8.9	32.0		8.8	31.9	31.9		21.3	21.3		20.7	20.7
Actuated g/C Ratio	0.09	0.32		0.09	0.32	0.32		0.22	0.22		0.21	0.21
Clearance Time (s)	3.7	5.3		3.7	5.3	5.3		5.2	5.2		5.2	5.2
Vehicle Extension (s)	2.0	5.1		2.0	4.8	4.8		6.3	6.3		7.9	7.9
Lane Grp Cap (vph)	151	1113		149	602	484		386	320		712	311
v/s Ratio Prot	c0.07	c0.13		0.06	0.12			c0.12			c0.10	
v/s Ratio Perm						0.02			0.02			0.05
v/c Ratio	0.72	0.40		0.71	0.39	0.07		0.57	0.08		0.47	0.23
Uniform Delay, d1	43.7	25.9		43.8	25.9	23.2		34.7	30.9		34.3	32.4
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	13.4	1.1		12.5	0.8	0.1		4.2	0.3		2.1	1.5
Delay (s)	57.2	27.0		56.3	26.7	23.3		38.9	31.2		36.3	33.9
Level of Service	E	C		E	C	C		D	C		D	C
Approach Delay (s)		32.8			34.4			36.3			35.1	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	34.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	98.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.1%	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		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	12	461	287	33	307	0	158	3	56	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.90	0.90	0.90	0.84	0.84	0.84	0.92	0.92	0.92
Hourly flow rate (vph)	13	485	302	37	341	0	188	4	67	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		799			328							
pX, platoon unblocked	0.98			0.86			0.87	0.87	0.86	0.87	0.87	0.98
vC, conflicting volume	341			787			1076	1076	636	1144	1227	341
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	326			753			1049	1049	577	1128	1222	326
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			95			0	98	85	100	100	100
cM capacity (veh/h)	1206			737			171	186	444	126	147	699

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	800	378	258
Volume Left	13	37	188
Volume Right	302	0	67
cSH	1206	737	203
Volume to Capacity	0.01	0.05	1.27
Queue Length 95th (ft)	1	4	347
Control Delay (s)	0.3	1.6	201.4
Lane LOS	A	A	F
Approach Delay (s)	0.3	1.6	201.4
Approach LOS			F

Intersection Summary				
Average Delay	36.8			
Intersection Capacity Utilization	63.4%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	1863	1770	1583
Volume (vph)	462	55	115	212	128	165
Peak-hour factor, PHF	0.94	0.94	0.91	0.91	0.81	0.81
Adj. Flow (vph)	491	59	126	233	158	204
RTOR Reduction (vph)	0	16	0	0	0	175
Lane Group Flow (vph)	491	43	126	233	158	29
Turn Type		Perm	Prot			Prot
Protected Phases	2		1	6	4	4
Permitted Phases		2				
Actuated Green, G (s)	55.3	55.3	10.9	70.2	13.5	13.5
Effective Green, g (s)	57.3	57.3	10.9	72.2	13.5	13.5
Actuated g/C Ratio	0.61	0.61	0.12	0.77	0.14	0.14
Clearance Time (s)	6.0	6.0	4.0	6.0	4.0	4.0
Vehicle Extension (s)	8.0	8.0	2.0	8.0	2.4	2.4
Lane Grp Cap (vph)	1139	968	206	1436	255	228
v/s Ratio Prot	c0.26		c0.07	0.13	c0.09	0.02
v/s Ratio Perm		0.03				
v/c Ratio	0.43	0.04	0.61	0.16	0.62	0.13
Uniform Delay, d1	9.6	7.3	39.4	2.8	37.7	35.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	0.1	3.7	0.2	3.7	0.2
Delay (s)	10.8	7.4	43.1	3.1	41.4	35.1
Level of Service	B	A	D	A	D	D
Approach Delay (s)	10.4			17.1	37.9	
Approach LOS	B			B	D	

Intersection Summary				
HCM Average Control Delay	20.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	93.7	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	49.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

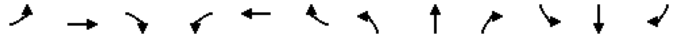
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	398	224	21	249	89	43
Peak Hour Factor	0.92	0.92	0.85	0.85	0.92	0.92
Hourly flow rate (vph)	433	243	25	293	97	47
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	744					
pX, platoon unblocked			0.86		0.86	0.86
vC, conflicting volume			676		897	554
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			623		880	481
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		63	91
cM capacity (veh/h)			822		265	502

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	676	318	143
Volume Left	0	25	97
Volume Right	243	0	47
cSH	1700	822	313
Volume to Capacity	0.40	0.03	0.46
Queue Length 95th (ft)	0	2	57
Control Delay (s)	0.0	1.1	25.9
Lane LOS		A	D
Approach Delay (s)	0.0	1.1	25.9
Approach LOS			D

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.92		1.00	0.89		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1705		1770	1666		1770	3539	1583	1770	3539	1583
Flt Permitted	0.40	1.00		0.37	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	742	1705		696	1666		1770	3539	1583	1770	3539	1583
Volume (vph)	192	131	171	61	84	199	75	614	29	264	786	192
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.85	0.85	0.85	0.92	0.92	0.92
Adj. Flow (vph)	206	141	184	66	91	216	88	722	34	287	854	209
RTOR Reduction (vph)	0	53	0	0	97	0	0	0	18	0	0	111
Lane Group Flow (vph)	206	272	0	66	210	0	88	722	16	287	854	98
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	26.4	26.4		26.4	26.4		7.3	32.1	32.1	15.5	40.3	40.3
Effective Green, g (s)	28.4	28.4		28.4	28.4		7.3	34.1	34.1	15.5	42.3	42.3
Actuated g/C Ratio	0.32	0.32		0.32	0.32		0.08	0.38	0.38	0.17	0.47	0.47
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	5.8	5.8		5.8	5.8		1.5	5.8	5.8	1.5	5.8	5.8
Lane Grp Cap (vph)	234	538		220	526		144	1341	600	305	1663	744
v/s Ratio Prot		0.16			0.13		0.05	0.20		c0.16	c0.24	
v/s Ratio Perm	c0.28			0.09					0.01			0.06
v/c Ratio	0.88	0.50		0.30	0.40		0.61	0.54	0.03	0.94	0.51	0.13
Uniform Delay, d1	29.2	25.1		23.3	24.1		40.0	21.8	17.5	36.8	16.7	13.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.79	1.14	1.75
Incremental Delay, d2	32.2	2.0		2.0	1.3		5.3	1.6	0.1	23.2	0.6	0.2
Delay (s)	61.4	27.1		25.3	25.4		45.3	23.4	17.6	52.3	19.6	23.8
Level of Service	E	C		C	C		D	C	B	D	B	C
Approach Delay (s)		40.4			25.4			25.4			27.2	
Approach LOS		D			C			C			C	

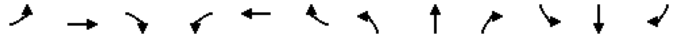
Intersection Summary			
HCM Average Control Delay	28.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0						4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95						0.95		1.00	0.95	
Frt	1.00	0.87						0.98		1.00	1.00	
Flt Protected	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (prot)	1665	1521						3472		1770	3539	
Flt Permitted	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (perm)	1665	1521						3472		1770	3539	
Volume (vph)	590	0	515	0	0	0	0	878	127	232	727	0
Peak-hour factor, PHF	0.79	0.79	0.79	0.92	0.92	0.92	0.95	0.95	0.95	0.87	0.87	0.87
Adj. Flow (vph)	747	0	652	0	0	0	0	924	134	267	836	0
RTOR Reduction (vph)	0	156	0	0	0	0	0	12	0	0	0	0
Lane Group Flow (vph)	617	626	0	0	0	0	0	1046	0	267	836	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	22.0	22.0						38.1		16.8	58.6	
Effective Green, g (s)	22.6	22.6						38.9		16.5	59.4	
Actuated g/C Ratio	0.25	0.25						0.43		0.18	0.66	
Clearance Time (s)	4.6	4.6						4.8		3.7	4.8	
Vehicle Extension (s)	5.0	5.0						7.4		2.0	6.2	
Lane Grp Cap (vph)	418	382						1501		325	2336	
v/s Ratio Prot	0.37	c0.41						c0.30		c0.15	0.24	
v/s Ratio Perm												
v/c Ratio	1.48	1.64						0.70		0.82	0.36	
Uniform Delay, d1	33.7	33.7						20.8		35.3	6.8	
Progression Factor	1.00	1.00						0.67		1.02	0.83	
Incremental Delay, d2	226.8	299.3						2.2		10.3	0.3	
Delay (s)	260.5	333.0						16.2		46.5	6.0	
Level of Service	F	F						B		D	A	
Approach Delay (s)		301.1			0.0			16.2			15.8	
Approach LOS		F			A			B			B	

Intersection Summary				
HCM Average Control Delay	128.0	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.00			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	83.3%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	125	125	83	9	124	92	47	389	11	107	515	205
Peak-hour factor, PHF	0.90	0.90	0.90	0.89	0.89	0.89	0.81	0.81	0.81	0.90	0.90	0.90
Adj. Flow (vph)	139	139	92	10	139	103	58	480	14	119	572	228
RTOR Reduction (vph)	0	0	66	0	0	84	0	0	8	0	0	123
Lane Group Flow (vph)	139	139	26	10	139	19	58	480	6	119	572	105
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	8.8	22.2	22.2	1.2	14.6	14.6	4.7	33.7	33.7	8.3	37.3	37.3
Effective Green, g (s)	8.8	23.2	23.2	1.2	15.6	15.6	4.7	34.7	34.7	8.3	38.3	38.3
Actuated g/C Ratio	0.11	0.28	0.28	0.01	0.19	0.19	0.06	0.42	0.42	0.10	0.46	0.46
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	187	518	440	25	348	296	100	1472	659	176	1625	727
v/s Ratio Prot	c0.08	0.07		0.01	c0.07		0.03	0.14		c0.07	c0.16	
v/s Ratio Perm			0.02			0.01			0.00			0.07
v/c Ratio	0.74	0.27	0.06	0.40	0.40	0.07	0.58	0.33	0.01	0.68	0.35	0.14
Uniform Delay, d1	36.2	23.5	22.1	40.7	29.8	27.9	38.4	16.5	14.3	36.3	14.5	13.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.0	0.1	0.0	3.8	0.3	0.0	5.0	0.6	0.0	7.8	0.6	0.4
Delay (s)	49.2	23.6	22.1	44.5	30.1	27.9	43.4	17.0	14.3	44.1	15.1	13.5
Level of Service	D	C	C	D	C	C	D	B	B	D	B	B
Approach Delay (s)		32.8			29.8			19.7			18.5	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM Average Control Delay	22.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	83.4	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	47.0%	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												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	40	66	64	19	112	8	69	81	20	28	164	54
Peak Hour Factor	0.92	0.92	0.92	0.85	0.85	0.85	0.87	0.87	0.87	0.72	0.72	0.72
Hourly flow rate (vph)	43	72	70	22	132	9	79	93	23	39	228	75

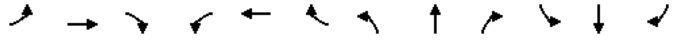
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	185	164	195	342
Volume Left (vph)	43	22	79	39
Volume Right (vph)	70	9	23	75
Hadj (s)	-0.14	0.03	0.04	-0.07
Departure Headway (s)	5.5	5.7	5.5	5.2
Degree Utilization, x	0.28	0.26	0.30	0.49
Capacity (veh/h)	586	562	594	659
Control Delay (s)	10.7	10.7	10.8	13.0
Approach Delay (s)	10.7	10.7	10.8	13.0
Approach LOS	B	B	B	B

Intersection Summary				
Delay			11.6	
HCM Level of Service			B	
Intersection Capacity Utilization			46.3%	ICU Level of Service
Analysis Period (min)			15	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	68	0	0	3	44	622	3	21	676	110
Peak Hour Factor	0.81	0.81	0.81	0.50	0.50	0.50	0.77	0.77	0.77	0.98	0.98	0.98
Hourly flow rate (vph)	0	0	84	0	0	6	57	808	4	21	690	112
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	1313	1715	401	1396	1769	406	802			812		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1313	1715	401	1396	1769	406	802			812		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	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	86	100	100	99	93			97		
cM capacity (veh/h)	107	81	599	80	75	594	817			810		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	84	6	57	539	273	21	460	342
Volume Left	0	0	57	0	0	21	0	0
Volume Right	84	6	0	0	4	0	0	112
cSH	599	594	817	1700	1700	810	1700	1700
Volume to Capacity	0.14	0.01	0.07	0.32	0.16	0.03	0.27	0.20
Queue Length 95th (ft)	12	1	6	0	0	2	0	0
Control Delay (s)	12.0	11.1	9.7	0.0	0.0	9.6	0.0	0.0
Lane LOS	B	B	A			A		
Approach Delay (s)	12.0	11.1	0.6			0.2		
Approach LOS	B	B						

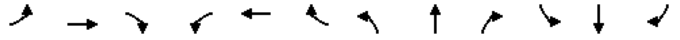
Intersection Summary								
Average Delay			1.0					
Intersection Capacity Utilization			33.1%		ICU Level of Service			A
Analysis Period (min)			15					



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frt	1.00	1.00			0.97			0.99				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1752	1845			1791			5002				
Flt Permitted	0.95	1.00			1.00			1.00				
Satd. Flow (perm)	1752	1845			1791			5002				
Volume (vph)	59	138	0	0	99	27	37	899	101	0	0	0
Peak-hour factor, PHF	0.78	0.78	0.78	0.79	0.79	0.79	0.91	0.91	0.91	0.92	0.92	0.92
Adj. Flow (vph)	76	177	0	0	125	34	41	988	111	0	0	0
RTOR Reduction (vph)	0	0	0	0	12	0	0	10	0	0	0	0
Lane Group Flow (vph)	76	177	0	0	147	0	0	1130	0	0	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Prot						Perm					
Protected Phases	7	4			8			2				
Permitted Phases							2					
Actuated Green, G (s)	4.9	21.4			12.8			36.8				
Effective Green, g (s)	4.6	21.6			13.0			37.0				
Actuated g/C Ratio	0.07	0.32			0.20			0.56				
Clearance Time (s)	3.7	4.2			4.2			4.2				
Vehicle Extension (s)	2.0	7.9			7.7			6.4				
Lane Grp Cap (vph)	121	598			350			2779				
v/s Ratio Prot	c0.04	0.10			c0.08							
v/s Ratio Perm								0.23				
v/c Ratio	0.63	0.30			0.42			0.41				
Uniform Delay, d1	30.2	16.8			23.5			8.5				
Progression Factor	1.00	1.00			1.00			1.00				
Incremental Delay, d2	7.1	1.2			3.3			0.4				
Delay (s)	37.3	18.0			26.8			8.9				
Level of Service	D	B			C			A				
Approach Delay (s)		23.8			26.8			8.9			0.0	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM Average Control Delay	13.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.43			
Actuated Cycle Length (s)	66.6	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	43.7%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0				
Lane Util. Factor					0.91			0.91				
Frt					0.97			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					4923			5040				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					4923			5040				
Volume (vph)	0	0	0	0	713	193	194	889	0	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.86	0.86	0.86	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	759	205	226	1034	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	41	0	0	40	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	923	0	0	1220	0	0	0	0
Turn Type							Perm					
Protected Phases					8			2				
Permitted Phases							2					
Actuated Green, G (s)					17.8			30.5				
Effective Green, g (s)					18.4			31.1				
Actuated g/C Ratio					0.32			0.54				
Clearance Time (s)					4.6			4.6				
Vehicle Extension (s)					4.8			3.0				
Lane Grp Cap (vph)					1575			2726				
v/s Ratio Prot					c0.19							
v/s Ratio Perm								0.24				
v/c Ratio					0.59			0.45				
Uniform Delay, d1					16.4			8.0				
Progression Factor					1.00			1.00				
Incremental Delay, d2					0.8			0.5				
Delay (s)					17.2			8.5				
Level of Service					B			A				
Approach Delay (s)		0.0			17.2			8.5			0.0	
Approach LOS		A			B			A			A	

Intersection Summary				
HCM Average Control Delay	12.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	57.5	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	45.9%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.91						0.91				
Frt		1.00						0.97				
Flt Protected		0.98						1.00				
Satd. Flow (prot)		4992						4951				
Flt Permitted		0.98						1.00				
Satd. Flow (perm)		4992						4951				
Volume (vph)	528	878	0	0	0	0	0	555	118	0	0	0
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92
Adj. Flow (vph)	580	965	0	0	0	0	0	578	123	0	0	0
RTOR Reduction (vph)	0	79	0	0	0	0	0	43	0	0	0	0
Lane Group Flow (vph)	0	1466	0	0	0	0	0	658	0	0	0	0
Turn Type	Perm											
Protected Phases		2						8				
Permitted Phases	2											
Actuated Green, G (s)		23.2						15.3				
Effective Green, g (s)		24.6						16.4				
Actuated g/C Ratio		0.50						0.33				
Clearance Time (s)		5.4						5.1				
Vehicle Extension (s)		2.0						5.0				
Lane Grp Cap (vph)		2506						1657				
v/s Ratio Prot								c0.13				
v/s Ratio Perm		0.29										
v/c Ratio		0.59						0.40				
Uniform Delay, d1		8.6						12.5				
Progression Factor		1.00						1.00				
Incremental Delay, d2		1.0						0.3				
Delay (s)		9.6						12.8				
Level of Service		A						B				
Approach Delay (s)		9.6			0.0			12.8			0.0	
Approach LOS		A			A			B			A	

Intersection Summary				
HCM Average Control Delay	10.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	49.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	49.3%	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)	10	11	0	0	8	27	11	601	5	0	0	0
Peak Hour Factor	0.60	0.60	0.60	0.63	0.63	0.63	0.91	0.91	0.91	0.92	0.92	0.92
Hourly flow rate (vph)	17	18	0	0	13	43	12	660	5	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	35	56	342	336
Volume Left (vph)	17	0	12	0
Volume Right (vph)	0	43	0	5
Hadj (s)	0.13	-0.43	0.05	0.02
Departure Headway (s)	5.4	4.9	4.8	4.8
Degree Utilization, x	0.05	0.07	0.46	0.44
Capacity (veh/h)	616	686	741	745
Control Delay (s)	8.7	8.3	10.5	10.3
Approach Delay (s)	8.7	8.3	10.4	
Approach LOS	A	A	B	

Intersection Summary				
Delay	10.2			
HCM Level of Service	B			
Intersection Capacity Utilization	31.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				5085	3433	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				5085	3433	
Volume (vph)	0	0	0	572	334	0
Peak-hour factor, PHF	0.92	0.92	0.84	0.84	0.94	0.94
Adj. Flow (vph)	0	0	0	681	355	0
RTOR Reduction (vph)	0	0	0	0	210	0
Lane Group Flow (vph)	0	0	0	681	145	0
Turn Type						
Protected Phases				6	4	
Permitted Phases						
Actuated Green, G (s)				12.4	9.4	
Effective Green, g (s)				13.0	11.4	
Actuated g/C Ratio				0.40	0.35	
Clearance Time (s)				4.6	6.0	
Vehicle Extension (s)				5.0	6.0	
Lane Grp Cap (vph)				2040	1208	
v/s Ratio Prot				c0.13	c0.04	
v/s Ratio Perm						
v/c Ratio				0.33	0.12	
Uniform Delay, d1				6.7	7.1	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.2	0.1	
Delay (s)				6.9	7.2	
Level of Service				A	A	
Approach Delay (s)	0.0			6.9	7.2	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	7.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	32.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	27.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	342	95	143	700	412	253	719
v/c Ratio	0.36	0.19	0.66	0.46	0.53	0.85	0.44
Control Delay	24.4	5.9	41.7	24.2	18.7	61.9	18.1
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	24.4	5.9	41.7	24.2	18.8	61.9	18.1
Queue Length 50th (ft)	69	1	80	191	145	137	142
Queue Length 95th (ft)	105	m29	m116	m226	m179	#241	204
Internal Link Dist (ft)	719			378			1660
Turn Bay Length (ft)		275	175		40	185	
Base Capacity (vph)	1075	558	315	1508	781	319	1652
Starvation Cap Reductn	0	0	0	0	22	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.17	0.45	0.46	0.54	0.79	0.44

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	91	477	168	139	187	134	1462	194	754
v/c Ratio	0.24	0.77	1.51	0.23	0.30	0.57	1.05	0.73	0.49
Control Delay	21.4	27.1	299.3	23.7	7.0	26.9	55.0	53.3	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	42.8	0.0	0.0
Total Delay	21.4	27.1	299.3	23.7	7.0	26.9	97.8	53.3	20.0
Queue Length 50th (ft)	31	169	~134	57	11	65	~343	104	156
Queue Length 95th (ft)	m56	239	#249	99	53	m65	m#299	#180	229
Internal Link Dist (ft)		2033		385			269		731
Turn Bay Length (ft)	145		155		25	125		170	
Base Capacity (vph)	386	617	111	600	618	374	1390	295	1540
Starvation Cap Reductn	0	0	0	0	0	0	123	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.77	1.51	0.23	0.30	0.36	1.15	0.66	0.49

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	131	412	200	553	585	108	191	586
v/c Ratio	0.43	0.74	1.27	0.81	0.60	0.21	0.70	0.35
Control Delay	43.6	34.4	199.8	23.3	31.1	6.3	48.5	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.6	34.4	199.8	23.3	31.1	6.3	48.5	14.3
Queue Length 50th (ft)	37	195	~145	140	151	0	108	132
Queue Length 95th (ft)	60	245	#279	256	206	37	#273	190
Internal Link Dist (ft)		671			2243			378
Turn Bay Length (ft)			280			180	90	
Base Capacity (vph)	305	670	157	763	983	518	271	1681
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.61	1.27	0.72	0.60	0.21	0.70	0.35

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	109	460	106	232	47	220	112	336	334
v/c Ratio	0.62	0.41	0.61	0.38	0.09	0.57	0.27	0.47	0.58
Control Delay	60.4	29.2	60.3	32.6	21.4	42.2	8.6	38.2	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.4	29.2	60.3	32.6	21.4	42.2	8.6	38.2	8.6
Queue Length 50th (ft)	67	114	65	115	12	125	0	98	0
Queue Length 95th (ft)	140	211	137	239	49	192	30	164	70
Internal Link Dist (ft)		179		406		179		341	
Turn Bay Length (ft)	185		150		40				110
Base Capacity (vph)	322	1135	321	606	501	522	512	985	668
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.41	0.33	0.38	0.09	0.42	0.22	0.34	0.50

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	491	59	126	233	158	204
v/c Ratio	0.43	0.06	0.61	0.16	0.62	0.51
Control Delay	12.4	4.8	53.0	3.5	49.4	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.4	4.8	53.0	3.5	49.4	10.2
Queue Length 50th (ft)	138	4	71	28	89	0
Queue Length 95th (ft)	282	24	137	63	143	42
Internal Link Dist (ft)	248			664	309	
Turn Bay Length (ft)		125	200			
Base Capacity (vph)	1139	984	359	1475	483	580
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.06	0.35	0.16	0.33	0.35

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	206	325	66	307	88	722	34	287	854	209
v/c Ratio	0.85	0.55	0.29	0.49	0.52	0.54	0.06	0.94	0.50	0.24
Control Delay	59.2	22.6	26.2	15.5	49.6	24.4	8.7	56.5	21.1	5.0
Queue Delay	103.1	0.0	0.0	2.2	0.0	0.0	0.0	163.8	2.3	0.8
Total Delay	162.3	22.6	26.2	17.7	49.6	24.4	8.7	220.3	23.4	5.8
Queue Length 50th (ft)	106	111	27	69	49	172	2	148	224	13
Queue Length 95th (ft)	#229	193	63	144	87	213	20	m#183	m232	m14
Internal Link Dist (ft)		502		1058		2367			110	
Turn Bay Length (ft)	125		135		115		105	115		
Base Capacity (vph)	257	620	243	650	315	1339	617	315	1693	867
Starvation Cap Reductn	0	0	0	0	0	0	0	106	672	407
Spillback Cap Reductn	87	0	0	216	0	6	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.21	0.52	0.27	0.71	0.28	0.54	0.06	1.37	0.84	0.45

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

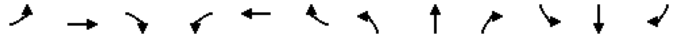
Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	617	782	1058	267	836
v/c Ratio	1.48	1.45	0.70	0.82	0.36
Control Delay	255.4	237.0	16.5	50.8	6.1
Queue Delay	0.0	83.4	0.5	0.0	0.3
Total Delay	255.4	320.3	17.1	50.8	6.3
Queue Length 50th (ft)	~513	~550	122	125	63
Queue Length 95th (ft)	#606	#634	m152	m175	m80
Internal Link Dist (ft)		366	110		269
Turn Bay Length (ft)	232			75	
Base Capacity (vph)	418	538	1513	387	2336
Starvation Cap Reductn	0	0	145	0	802
Spillback Cap Reductn	0	61	0	0	697
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.48	1.64	0.77	0.69	0.54

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	139	139	92	10	139	103	58	480	14	119	572	228
v/c Ratio	0.71	0.25	0.17	0.09	0.47	0.31	0.39	0.32	0.02	0.64	0.33	0.26
Control Delay	55.2	23.9	6.8	39.4	36.2	9.2	42.3	16.4	7.6	50.7	14.5	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.2	23.9	6.8	39.4	36.2	9.2	42.3	16.4	7.6	50.7	14.5	3.2
Queue Length 50th (ft)	66	50	0	5	64	0	27	79	0	56	92	0
Queue Length 95th (ft)	#158	111	36	20	116	39	57	111	10	#128	152	41
Internal Link Dist (ft)		1613			1967			1346			2243	
Turn Bay Length (ft)	95		95	90		90	155		90	200		200
Base Capacity (vph)	202	698	651	178	621	596	190	1490	675	201	1729	890
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.20	0.14	0.06	0.22	0.17	0.31	0.32	0.02	0.59	0.33	0.26

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	76	177	159	1140
v/c Ratio	0.40	0.28	0.38	0.39
Control Delay	34.5	14.3	21.4	10.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.5	14.3	21.4	10.8
Queue Length 50th (ft)	29	45	48	102
Queue Length 95th (ft)	59	68	85	172
Internal Link Dist (ft)		608	737	568
Turn Bay Length (ft)				
Base Capacity (vph)	451	998	615	2955
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.17	0.18	0.26	0.39

Intersection Summary

Lane Group	WBT	NBT
Lane Group Flow (vph)	964	1260
v/c Ratio	0.60	0.46
Control Delay	16.8	8.6
Queue Delay	0.0	0.0
Total Delay	16.8	8.6
Queue Length 50th (ft)	93	79
Queue Length 95th (ft)	127	124
Internal Link Dist (ft)	265	310
Turn Bay Length (ft)		
Base Capacity (vph)	2005	2765
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.48	0.46

Intersection Summary

Lane Group	EBT	NBT
Lane Group Flow (vph)	1545	701
v/c Ratio	0.60	0.41
Control Delay	9.5	11.9
Queue Delay	0.0	0.0
Total Delay	9.5	11.9
Queue Length 50th (ft)	93	49
Queue Length 95th (ft)	156	72
Internal Link Dist (ft)	4045	445
Turn Bay Length (ft)		
Base Capacity (vph)	2583	1989
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.60	0.35

Intersection Summary

Lane Group	WBT	NBL
Lane Group Flow (vph)	681	355
v/c Ratio	0.34	0.25
Control Delay	7.4	2.3
Queue Delay	0.0	0.0
Total Delay	7.4	2.3
Queue Length 50th (ft)	25	1
Queue Length 95th (ft)	45	18
Internal Link Dist (ft)	3590	78
Turn Bay Length (ft)		
Base Capacity (vph)	3125	2046
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.22	0.17

Intersection Summary

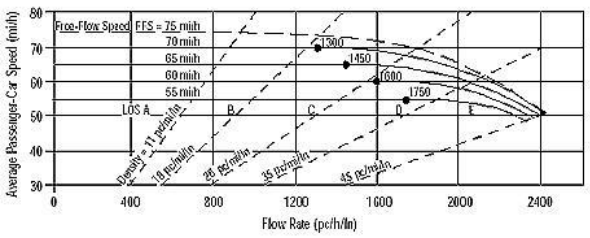
Kimley-Horn and Associates, Inc.

Visalia Walmart Roadway Network Capacity

Existing Conditions
PM Peak

ROADWAY	FROM	TO	Length (Miles)	Area Type (U/T/R)	Functional Class	# of Lanes	Div/Undiv (D/U)	Left-turn Bays (Y/N)	POSTED SPEED	Sig/Mile	Code	Notes	Generalized Service Volumes							
													Code	A	B	C	D	E	Two-Way Vol	LOS
Mineral King Avenue	Ben Maddox Way	SR-198 WB Ramps (B	0.15	U	Arterial	4	U	N	40	3.50	U-NS2-4	adjusted volumes by -25%	U-NS2-4	0	0	2178	2898	3060	704	C
Mineral King Avenue	SR-198 WB Ramps (B	Lovers Lane	0.84	U	Arterial	2	U	Y	40	1.50	U-NS1-2		U-NS1-2	0	837	1350	1440	0	763	B
Noble Avenue	Ben Maddox Way	SR-198 EB Ramps	0.16	U	Arterial	2	U	Y	35	4.00	U-NS2-2		U-NS2-2	0	0	918	1332	1413	1,181	D
Noble Avenue	East Driveway	Pinkham Street	0.14	U	Arterial	2	U	Y	35	2.50	U-NS2-2		U-NS2-2	0	0	918	1332	1413	957	D
Noble Avenue	Pinkham Street	Lovers Lane	0.50	U	Arterial	2	U	Y	45	2.00	U-NS2-2		U-NS2-2	0	0	918	1332	1413	770	C
Ben Maddox Way	Noble Avenue	Tulare Avenue	0.44	U	Arterial	4	D	Y	40	2.00	U-NS2-4		U-NS2-4	0	0	2178	2898	3060	1,455	C
Pinkham Street	Noble Avenue	Tulare Avenue	0.44	U	Arterial	2	U	N	40	0	U-OS1-2	adjusted volumes by -20%	U-OS1-2	0	605	975	1040	0	301	B
Lovers Lane	Noble Avenue	Tulare Avenue	0.47	U	Arterial	4	D	Y	45	3.00	U-NS2-4		U-NS2-4	0	0	2178	2898	3060	1,584	C
Tulare Avenue	Ben Maddox Way	Pinkham Street	0.39	U	Arterial	2	U	Y	40	0.61	U-OS1-2		U-OS1-2	0	605	975	1040	0	437	B
Tulare Avenue	Pinkham Street	Lovers Lane	0.48	U	Arterial	2	U	N	40	0.82	U-OS1-2	adjusted volumes by -20%	U-OS1-2	0	605	975	1040	0	190	B

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	B/W Ben Maddox Way & Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Existing

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2290 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1329	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	21.3	pc/mi/ln	S		mi/h
LOS	C		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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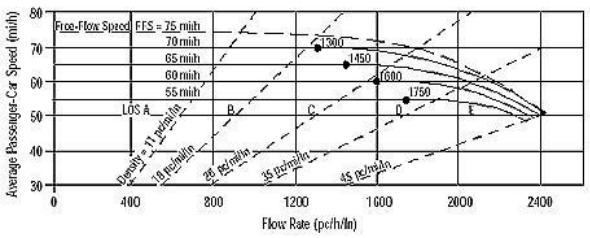
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	E/O Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Existing

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	1544 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	0.56	I/mi	f_{ID}	0.3	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	65.2	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	901	pc/h/ln	Design LOS		
S	65.2	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	13.8	pc/mi/ln	S		mi/h
LOS	B		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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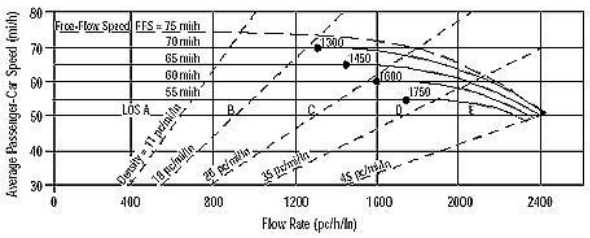
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	W/O S. Ben Maddox Way
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Existing
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2665 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1547	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	24.7	pc/mi/ln	S		mi/h
LOS	C		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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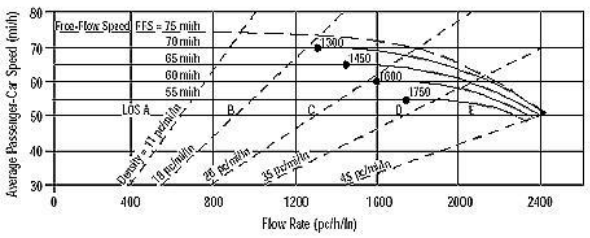
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	B/W Ben Maddox Way & Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Existing
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	1670 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	970	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	15.5	pc/mi/ln	S		mi/h
LOS	B		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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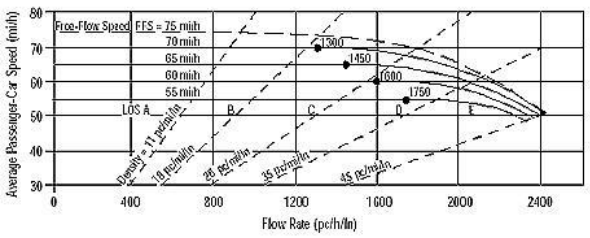
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	
Agency or Company	Kimley-Horn and Associates
Date Performed	7/6/2009
Analysis Time Period	PM Peak
Project Description	

Site Information

Highway/Direction of Travel	SR-198 WB
From/To	E/O Lovers Ln
Jurisdiction	City of Visalia
Analysis Year	Existing

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	1407 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.56	I/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0	mi/h
f_{LC}	0.0	mi/h
f_{ID}	0.3	mi/h
f_N	4.5	mi/h
FFS	65.2	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	821	pc/h/ln
S	65.2	mi/h
D = v_p / S	12.6	pc/mi/ln
LOS	B	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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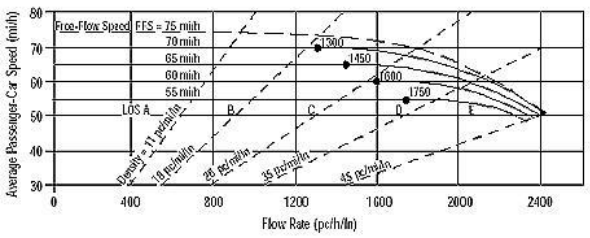
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	
Agency or Company	Kimley-Horn and Associates
Date Performed	7/6/2009
Analysis Time Period	PM Peak
Project Description	

Site Information

Highway/Direction of Travel	SR-198 WB
From/To	W/O S. Ben Maddox Way
Jurisdiction	City of Visalia
Analysis Year	Existing

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	2168 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	1.10	I/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0	mi/h
f_{LC}	0.0	mi/h
f_{ID}	3.0	mi/h
f_N	4.5	mi/h
FFS	62.5	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1259	pc/h/ln
S	62.5	mi/h
D = v_p / S	20.1	pc/mi/ln
LOS	C	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Existing

Project Description

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 2500 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = 494 veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	2665	0.90	Level	9	0	0.957	1.00	3094
Ramp	590	0.90	Level	4	0	0.980	1.00	669
UpStream	494	0.90	Level	2	0	0.990	1.00	554
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 3094 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

	Actual	Maximum	LOS F?
$V_{FI}=V_F$	3094	4800	No
V_{12}	3094	4400:All	No
$V_{FO} = V_F - V_R$	2425	4800	No
V_R	669	2000	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
D_R = (pc/ mi /ln)	D_R = 29.3 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= D (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)	D_s = 0.488 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 56.3 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 56.3 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Existing

Project Description

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 2600 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = 215 veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	2290	0.90	Level	9	0	0.957	1.00	2659
Ramp	1105	0.90	Level	4	0	0.980	1.00	1252
UpStream	215	0.90	Level	2	0	0.990	1.00	241
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 2659 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

	Actual	Maximum	LOS F?
$V_{FI}=V_F$	2659	4800	No
V_{12}	2659	4400:All	No
$V_{FO} = V_F - V_R$	1407	4800	No
V_R	1252	2000	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
D_R = (pc/ mi /ln)	D_R = 24.4 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= C (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)	D_s = 0.541 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 54.9 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 54.9 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Existing

Project Description

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 3400 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = 400 veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	1670	0.90	Level	9	0	0.957	1.00	1939
Ramp	107	0.90	Level	4	0	0.980	1.00	121
UpStream	400	0.90	Level	2	0	0.990	1.00	449
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 1939 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	1939	4800	No
				V_{12}	1939	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	1818	4800	No
				V_R	121	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A	D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D
D_R = (pc/ mi /ln)	D_R = 18.5 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= B (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.439 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 57.7 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 57.7 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET Page 1 of 1

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Existing

Project Description

Inputs

Upstream Adj Ramp	Terrain	Downstream Adj Ramp
☐ Yes ☐ On		☐ Yes ☐ On
☐ No ☐ Off		☐ No ☐ Off
L_{up} = ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	1407	0.90	Level	9	0	0.957	1.00	1634
Ramp	137	0.90	Level	4	0	0.980	1.00	155
UpStream								
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 1634 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	1634	4800	No
				V_{12}	1634	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	1479	4800	No
				V_R	155	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A	D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D
D_R = (pc/ mi /ln)	D_R = 16.3 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= B (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.442 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 57.6 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 57.6 mph (Exhibit 25-15)

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PROJECT TRIP GENERATION

Trip Generation Planner (ITE 8th Edition) - Summary Report

Kimley-Horn and Associates,

Weekday Trip Generation ***Project Name*** **Visalia Walmart Expansion**
Trips Based on Average Rates/Equations ***Project Number*** **097311005.3**

						Rates			Total Trips							Net Trips after Pass-By						
ITE Code	Land Use Type	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Daily Rate	AM Rate	PM Rate	Daily Trips	AM Trips	PM Trips	AM Trips In	AM Trips Out	PM Trips In	PM Trips Out	Daily Trips	AM Trips	PM Trips	AM Trips In	AM Trips Out	PM Trips In	PM Trips Out
813	Select Use	Free Standing Discount Superstore	1,000 Sq Ft	181.64	Avg	53.13	1.67	4.61	9652	303	837	170	133	410	427	9652	303	603	170	133	295	307
815	Select Use	Free Standing Discount Store	1,000 Sq Ft	-126.78	Avg	57.24	1.06	5.00	-7258	-134	-634	-91	-43	-317	-317	-7258	-134	-526	-91	-43	-263	-263
	Select Use																					
	Select Use																					

APPROVED & PENDING DEVELOPMENT INFORMATION

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Bonadventure Unit 2**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	10	Avg	9.57	0.75	1.01	96	8	10	2	6	6	4	96	8	10	2	6	6	4
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**96**	**8**	**10**	**2**	**6**	**6**	**4**	**96**	**8**	**10**	**2**	**6**	**6**	**4**
					14%		**Reduction**	**13**	**1**	**1**	**0**	**1**	**1**	**1**							
							Grand Total	**83**	**7**	**9**	**2**	**5**	**5**	**3**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Eagle Glen Units 2-5**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	89	Avg	9.57	0.75	1.01	852	67	90	17	50	57	33	852	67	90	17	50	57	33
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**852**	**67**	**90**	**17**	**50**	**57**	**33**	**852**	**67**	**90**	**17**	**50**	**57**	**33**
					14%		**Reduction**	**119**	**9**	**13**	**2**	**7**	**8**	**5**							
							Grand Total	**733**	**58**	**77**	**15**	**43**	**49**	**28**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name East Oak Estates
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	9	Avg	9.57	0.75	1.01	88	7	9	2	5	6	3	88	7	9	2	5	6	3
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**88**	**7**	**9**	**2**	**5**	**6**	**3**	**88**	**7**	**9**	**2**	**5**	**6**	**3**
					14%		**Reduction**	**12**	**1**	**1**	**0**	**1**	**1**	**0**							
							Grand Total	**76**	**6**	**8**	**2**	**4**	**5**	**3**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Four Creek Estates II**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	40	Avg	9.57	0.75	1.01	384	30	40	8	22	25	15	384	30	40	8	22	25	15
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**384**	**30**	**40**	**8**	**22**	**25**	**15**	**384**	**30**	**40**	**8**	**22**	**25**	**15**
					14%		**Reduction**	**54**	**4**	**6**	**1**	**3**	**4**	**2**							
							Grand Total	**330**	**26**	**34**	**7**	**19**	**22**	**13**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Hall Estates**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	29	Avg	9.57	0.75	1.01	278	22	29	6	16	18	11	278	22	29	6	16	18	11
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**278**	**22**	**29**	**6**	**16**	**18**	**11**	**278**	**22**	**29**	**6**	**16**	**18**	**11**
					14%		**Reduction**	**39**	**3**	**4**	**1**	**2**	**3**	**2**							
							Grand Total	**239**	**19**	**25**	**5**	**14**	**15**	**9**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Kirkwood Estates Unit No. 3**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	35	Avg	9.57	0.75	1.01	336	26	35	7	19	22	13	336	26	35	7	19	22	13
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**336**	**26**	**35**	**7**	**19**	**22**	**13**	**336**	**26**	**35**	**7**	**19**	**22**	**13**
					14%		**Reduction**	**47**	**4**	**5**	**1**	**3**	**3**	**2**							
							Grand Total	**289**	**22**	**30**	**6**	**16**	**19**	**11**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation — ***Project Name*** — **Maddox at Caldwell V Units 2-3**
Trips Based on Average Rates/Equations — ***Project Number***

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	15	Avg	9.57	0.75	1.01	144	11	15	3	8	9	6	144	11	15	3	8	9	6
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**144**	**11**	**15**	**3**	**8**	**9**	**6**	**144**	**11**	**15**	**3**	**8**	**9**	**6**
					14%		**Reduction**	**20**	**2**	**2**	**0**	**1**	**1**	**1**							
							Grand Total	**124**	**9**	**13**	**3**	**7**	**8**	**5**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation — ***Project Name*** — **Madison Heights**
Trips Based on Average Rates/Equations — ***Project Number***

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	11	Avg	9.57	0.75	1.01	106	8	11	2	6	7	4	106	8	11	2	6	7	4
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**106**	**8**	**11**	**2**	**6**	**7**	**4**	**106**	**8**	**11**	**2**	**6**	**7**	**4**
					14%		**Reduction**	**15**	**1**	**2**	**0**	**1**	**1**	**1**							
							Grand Total	**91**	**7**	**9**	**2**	**5**	**6**	**3**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Park Breeze West Unit No. 3**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	2	Avg	9.57	0.75	1.01	20	2	2	1	1	1	1	20	2	2	1	1	1	1
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**20**	**2**	**2**	**1**	**1**	**1**	**1**	**20**	**2**	**2**	**1**	**1**	**1**	**1**
					14%		**Reduction**	**3**	**0**	**0**	**0**	**0**	**0**	**0**							
							Grand Total	**17**	**2**	**2**	**1**	**1**	**1**	**1**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Park Place Unit No. 4**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)		Avg	9.57	0.75	1.01														
220	Apartment	Dwelling Unit(s)	47	Avg	6.65	0.51	0.62	314	24	29	5	19	19	10	314	24	29	5	19	19	10
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**314**	**24**	**29**	**5**	**19**	**19**	**10**	**314**	**24**	**29**	**5**	**19**	**19**	**10**
					14%		**Reduction**	**44**	**3**	**4**	**1**	**3**	**3**	**1**							
							Grand Total	**270**	**21**	**25**	**4**	**16**	**16**	**9**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Park Place Units 1 & 3**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	5	Avg	9.57	0.75	1.01	48	4	5	1	3	3	2	48	4	5	1	3	3	2
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**48**	**4**	**5**	**1**	**3**	**3**	**2**	**48**	**4**	**5**	**1**	**3**	**3**	**2**
					14%		**Reduction**	**7**	**1**	**1**	**0**	**0**	**0**	**0**							
							Grand Total	**41**	**3**	**4**	**1**	**3**	**3**	**2**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
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Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Park West No. 7**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	8	Avg	9.57	0.75	1.01	78	6	8	2	4	5	3	78	6	8	2	4	5	3
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**78**	**6**	**8**	**2**	**4**	**5**	**3**	**78**	**6**	**8**	**2**	**4**	**5**	**3**
Notes:					14%		**Reduction**	**11**	**1**	**1**	**0**	**1**	**1**	**0**							
(1)	AM and/or PM rates correspond to peak hour of generator						**Grand Total**	**67**	**5**	**7**	**2**	**3**	**4**	**3**							

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Quail River**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	104	Avg	9.57	0.75	1.01	996	78	105	20	58	66	39	996	78	105	20	58	66	39
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**996**	**78**	**105**	**20**	**58**	**66**	**39**	**996**	**78**	**105**	**20**	**58**	**66**	**39**
					14%		**Reduction**	**139**	**11**	**15**	**3**	**8**	**9**	**5**							
							Grand Total	**857**	**67**	**90**	**17**	**50**	**57**	**34**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name Rancho Santa Fe Estates No. 2
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	9	Avg	9.57	0.75	1.01	88	7	9	2	5	6	3	88	7	9	2	5	6	3
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**88**	**7**	**9**	**2**	**5**	**6**	**3**	**88**	**7**	**9**	**2**	**5**	**6**	**3**
Notes:					14%		**Reduction**	**12**	**1**	**1**	**0**	**1**	**1**	**0**							
(1)	AM and/or PM rates correspond to peak hour of generator						**Grand Total**	**76**	**6**	**8**	**2**	**4**	**5**	**3**							

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Riverbend Village Units 6-11**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	25	Avg	9.57	0.75	1.01	240	19	25	5	14	16	9	240	19	25	5	14	16	9
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**240**	**19**	**25**	**5**	**14**	**16**	**9**	**240**	**19**	**25**	**5**	**14**	**16**	**9**
					14%		**Reduction**	**34**	**3**	**4**	**1**	**2**	**2**	**1**							
							Grand Total	**206**	**16**	**22**	**4**	**12**	**14**	**8**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation **Project Name** Riverwood
Trips Based on Average Rates/Equations **Project Number**

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	37	Avg	9.57	0.75	1.01	356	28	37	7	21	23	14	356	28	37	7	21	23	14
220	Apartment	Dwelling Unit(s)	61	Avg	6.65	0.51	0.62	406	31	38	6	25	25	13	406	31	38	6	25	25	13
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**762**	**59**	**75**	**13**	**46**	**48**	**27**	**762**	**59**	**75**	**13**	**46**	**48**	**27**
Notes:					14%		**Reduction**	**107**	**8**	**11**	**2**	**6**	**7**	**4**							
(1)	AM and/or PM rates correspond to peak hour of generator						**Grand Total**	**655**	**51**	**65**	**11**	**40**	**41**	**23**							

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
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Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Salierno Estates**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	1	Avg	9.57	0.75	1.01	10	1	1		1	1		10	1	1		1	1	
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**10**	**1**	**1**		**1**	**1**		**10**	**1**	**1**		**1**	**1**	
					14%		**Reduction**	**1**	**0**	**0**		**0**	**0**								
							Grand Total	**9**	**1**	**1**		**1**	**1**								

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
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Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Sierra Point Villas**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	24	Avg	9.57	0.75	1.01	230	18	24	5	13	15	9	230	18	24	5	13	15	9
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**230**	**18**	**24**	**5**	**13**	**15**	**9**	**230**	**18**	**24**	**5**	**13**	**15**	**9**
					14%		**Reduction**	**32**	**3**	**3**	**1**	**2**	**2**	**1**							
							Grand Total	**198**	**15**	**21**	**4**	**11**	**13**	**8**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **South Cameron Creek Unit No. 3**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	86	Avg	9.57	0.75	1.01	824	65	87	16	49	55	32	824	65	87	16	49	55	32
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**824**	**65**	**87**	**16**	**49**	**55**	**32**	**824**	**65**	**87**	**16**	**49**	**55**	**32**
Notes:					14%		**Reduction**	**115**	**9**	**12**	**2**	**7**	**8**	**4**							
(1)	AM and/or PM rates correspond to peak hour of generator						**Grand Total**	**709**	**56**	**75**	**14**	**42**	**47**	**28**							

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Sunrise Park**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	15	Avg	9.57	0.75	1.01	144	11	15	3	8	9	6	144	11	15	3	8	9	6
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**144**	**11**	**15**	**3**	**8**	**9**	**6**	**144**	**11**	**15**	**3**	**8**	**9**	**6**
					14%		**Reduction**	**20**	**2**	**2**	**0**	**1**	**1**	**1**							
							Grand Total	**124**	**9**	**13**	**3**	**7**	**8**	**5**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Woodside Sousa Property**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	104	Avg	9.57	0.75	1.01	996	78	105	20	58	66	39	996	78	105	20	58	66	39
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**996**	**78**	**105**	**20**	**58**	**66**	**39**	**996**	**78**	**105**	**20**	**58**	**66**	**39**
					14%		**Reduction**	**139**	**11**	**15**	**3**	**8**	**9**	**5**							
							Grand Total	**857**	**67**	**90**	**17**	**50**	**57**	**34**							

Notes:
(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Orchard Walk**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
812	Building Materials and Lumber Store	1,000 Sq Ft		Avg	45.16	2.60	4.49														
813	Free Standing Discount Superstore	1,000 Sq Ft		Avg	53.13	1.67	4.61														
814	Specialty Retail Center	1,000 Sq Ft		Avg	44.32	*	2.71														
815	Free Standing Discount Store	1,000 Sq Ft		Avg	57.24	1.06	5.00														
816	Hardware/Paint Store	1,000 Sq Ft		Avg	51.29	1.08	4.84														
817	Nursery (Garden Center)	1,000 Sq Ft		Avg	36.08	1.31	3.80														
818	Nursery (Wholesale)	1,000 Sq Ft		Avg	39.00	2.40	5.17														
820	Shopping Center	1,000 Sq Ft	40.97	Avg	42.94	1.00	3.73	1760	41	153	25	16	75	78	1760	41	101	25	16	49	52
823	Factory Outlet Center	1,000 Sq Ft		Avg	26.59	0.67	2.29														
841	New Car Sales	1,000 Sq Ft		Avg	33.34	2.03	2.59														
843	Automobile Parts Sales	1,000 Sq Ft		Avg	61.91	2.21	5.98														
848	Tire Store	1,000 Sq Ft		Avg	24.87	2.89	4.15														
849	Tire Superstore	1,000 Sq Ft		Avg	20.36	1.34	2.11														
850	Supermarket	1,000 Sq Ft		Avg	102.24	3.59	10.50														
851	Convenience Market (Open 24 Hours)	1,000 Sq Ft		Avg	737.99	67.03	52.41														
852	Convenience Market (Open 15-16 Hours)	1,000 Sq Ft		Avg	*	31.02	34.57														
853	Convenience Market w/ Gasoline Pumps	Fueling Position(s)		Avg	542.60	16.57	19.07														
854	Discount Supermarket	1,000 Sq Ft		Avg	96.82	2.74	8.90														
857	Discount Club	1,000 Sq Ft		Avg	41.80	0.56	4.24														
860	Wholesale Market	1,000 Sq Ft		Avg	6.73	0.51	0.88														
861	Sporting Goods Superstore	1,000 Sq Ft		Avg	*	*	3.10														
862	Home Improvement Superstore	1,000 Sq Ft		Avg	29.80	1.26	2.37														
863	Electronics Superstore	1,000 Sq Ft		Avg	45.04	0.28	4.50														
864	Toy/Children's Superstore	1,000 Sq Ft		Avg	*	*	4.99														
865	Baby Superstore	1,000 Sq Ft		Avg	*	*	1.82														
866	Pet Supply Superstore	1,000 Sq Ft		Avg	*	*	3.38														
867	Office Supply Superstore	1,000 Sq Ft		Avg	*	*	3.40														
868	Book Superstore	1,000 Sq Ft		Avg	*	*	19.53														
869	Discount Home Furnishing Superstore	1,000 Sq Ft		Avg	20.00	0.57	1.57														
872	Bed and Linen Superstore	1,000 Sq Ft		Avg	*	*	2.22														
875	Department Store	1,000 Sq Ft		Avg	22.88	0.53	1.78														
876	Apparel Store	1,000 Sq Ft		Avg	66.40	1.00	3.83														
879	Arts and Crafts Store *(1)*	1,000 Sq Ft		Avg	56.55	4.65	6.21														
880	Pharmacy/Drugstore w/o Drive-Through Window	1,000 Sq Ft		Avg	90.06	3.20	8.42														
881	Pharmacy/Drugstore w/ Drive-Through Window	1,000 Sq Ft		Avg	88.16	2.66	10.35														
890	Furniture Store	1,000 Sq Ft		Avg	5.06	0.17	0.45														
896	Video Rental Store	1,000 Sq Ft		Avg	*	*	13.60														
							Totals	**1760**	**41**	**153**	**25**	**16**	**75**	**78**	**1760**	**41**	**101**	**25**	**16**	**49**	**52**
					53%		**Reduction**	**933**	**22**	**81**	**13**	**8**	**40**	**41**							
							Grand Total	**827**	**19**	**72**	**12**	**8**	**35**	**37**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

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B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Joe Gong Center**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
812	Building Materials and Lumber Store	1,000 Sq Ft		Avg	45.16	2.60	4.49														
813	Free Standing Discount Superstore	1,000 Sq Ft		Avg	53.13	1.67	4.61														
814	Specialty Retail Center	1,000 Sq Ft		Avg	44.32	*	2.71														
815	Free Standing Discount Store	1,000 Sq Ft		Avg	57.24	1.06	5.00														
816	Hardware/Paint Store	1,000 Sq Ft		Avg	51.29	1.08	4.84														
817	Nursery (Garden Center)	1,000 Sq Ft		Avg	36.08	1.31	3.80														
818	Nursery (Wholesale)	1,000 Sq Ft		Avg	39.00	2.40	5.17														
820	Shopping Center	1,000 Sq Ft	34.27	Avg	42.94	1.00	3.73	1472	34	128	21	13	63	65	1472	34	84	21	13	41	43
823	Factory Outlet Center	1,000 Sq Ft		Avg	26.59	0.67	2.29														
841	New Car Sales	1,000 Sq Ft		Avg	33.34	2.03	2.59														
843	Automobile Parts Sales	1,000 Sq Ft		Avg	61.91	2.21	5.98														
848	Tire Store	1,000 Sq Ft		Avg	24.87	2.89	4.15														
849	Tire Superstore	1,000 Sq Ft		Avg	20.36	1.34	2.11														
850	Supermarket	1,000 Sq Ft		Avg	102.24	3.59	10.50														
851	Convenience Market (Open 24 Hours)	1,000 Sq Ft		Avg	737.99	67.03	52.41														
852	Convenience Market (Open 15-16 Hours)	1,000 Sq Ft		Avg	*	31.02	34.57														
853	Convenience Market w/ Gasoline Pumps	Fueling Position(s)		Avg	542.60	16.57	19.07														
854	Discount Supermarket	1,000 Sq Ft		Avg	96.82	2.74	8.90														
857	Discount Club	1,000 Sq Ft		Avg	41.80	0.56	4.24														
860	Wholesale Market	1,000 Sq Ft		Avg	6.73	0.51	0.88														
861	Sporting Goods Superstore	1,000 Sq Ft		Avg	*	*	3.10														
862	Home Improvement Superstore	1,000 Sq Ft		Avg	29.80	1.26	2.37														
863	Electronics Superstore	1,000 Sq Ft		Avg	45.04	0.28	4.50														
864	Toy/Children's Superstore	1,000 Sq Ft		Avg	*	*	4.99														
865	Baby Superstore	1,000 Sq Ft		Avg	*	*	1.82														
866	Pet Supply Superstore	1,000 Sq Ft		Avg	*	*	3.38														
867	Office Supply Superstore	1,000 Sq Ft		Avg	*	*	3.40														
868	Book Superstore	1,000 Sq Ft		Avg	*	*	19.53														
869	Discount Home Furnishing Superstore	1,000 Sq Ft		Avg	20.00	0.57	1.57														
872	Bed and Linen Superstore	1,000 Sq Ft		Avg	*	*	2.22														
875	Department Store	1,000 Sq Ft		Avg	22.88	0.53	1.78														
876	Apparel Store	1,000 Sq Ft		Avg	66.40	1.00	3.83														
879	Arts and Crafts Store *(1)*	1,000 Sq Ft		Avg	56.55	4.65	6.21														
880	Pharmacy/Drugstore w/o Drive-Through Window	1,000 Sq Ft		Avg	90.06	3.20	8.42														
881	Pharmacy/Drugstore w/ Drive-Through Window	1,000 Sq Ft		Avg	88.16	2.66	10.35														
890	Furniture Store	1,000 Sq Ft		Avg	5.06	0.17	0.45														
896	Video Rental Store	1,000 Sq Ft		Avg	*	*	13.60														
							Totals	**1472**	**34**	**128**	**21**	**13**	**63**	**65**	**1472**	**34**	**84**	**21**	**13**	**41**	**43**
					53%		**Reduction**	**780**	**18**	**68**	**11**	**7**	**33**	**34**							
							Grand Total	**692**	**16**	**60**	**10**	**6**	**30**	**31**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

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B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name El Progresso Market
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
812	Building Materials and Lumber Store	1,000 Sq Ft		Avg	45.16	2.60	4.49														
813	Free Standing Discount Superstore	1,000 Sq Ft		Avg	53.13	1.67	4.61														
814	Specialty Retail Center	1,000 Sq Ft		Avg	44.32	*	2.71														
815	Free Standing Discount Store	1,000 Sq Ft		Avg	57.24	1.06	5.00														
816	Hardware/Paint Store	1,000 Sq Ft		Avg	51.29	1.08	4.84														
817	Nursery (Garden Center)	1,000 Sq Ft		Avg	36.08	1.31	3.80														
818	Nursery (Wholesale)	1,000 Sq Ft		Avg	39.00	2.40	5.17														
820	Shopping Center	1,000 Sq Ft		Avg	42.94	1.00	3.73														
823	Factory Outlet Center	1,000 Sq Ft		Avg	26.59	0.67	2.29														
841	New Car Sales	1,000 Sq Ft		Avg	33.34	2.03	2.59														
843	Automobile Parts Sales	1,000 Sq Ft		Avg	61.91	2.21	5.98														
848	Tire Store	1,000 Sq Ft		Avg	24.87	2.89	4.15														
849	Tire Superstore	1,000 Sq Ft		Avg	20.36	1.34	2.11														
850	Supermarket	1,000 Sq Ft	27.95	Avg	102.24	3.59	10.50	2858	100	293	61	39	149	144	2858	100	188	61	39	96	92
851	Convenience Market (Open 24 Hours)	1,000 Sq Ft		Avg	737.99	67.03	52.41														
852	Convenience Market (Open 15-16 Hours)	1,000 Sq Ft		Avg	*	31.02	34.57														
853	Convenience Market w/ Gasoline Pumps	Fueling Position(s)		Avg	542.60	16.57	19.07														
854	Discount Supermarket	1,000 Sq Ft		Avg	96.82	2.74	8.90														
857	Discount Club	1,000 Sq Ft		Avg	41.80	0.56	4.24														
860	Wholesale Market	1,000 Sq Ft		Avg	6.73	0.51	0.88														
861	Sporting Goods Superstore	1,000 Sq Ft		Avg	*	*	3.10														
862	Home Improvement Superstore	1,000 Sq Ft		Avg	29.80	1.26	2.37														
863	Electronics Superstore	1,000 Sq Ft		Avg	45.04	0.28	4.50														
864	Toy/Children's Superstore	1,000 Sq Ft		Avg	*	*	4.99														
865	Baby Superstore	1,000 Sq Ft		Avg	*	*	1.82														
866	Pet Supply Superstore	1,000 Sq Ft		Avg	*	*	3.38														
867	Office Supply Superstore	1,000 Sq Ft		Avg	*	*	3.40														
868	Book Superstore	1,000 Sq Ft		Avg	*	*	19.53														
869	Discount Home Furnishing Superstore	1,000 Sq Ft		Avg	20.00	0.57	1.57														
872	Bed and Linen Superstore	1,000 Sq Ft		Avg	*	*	2.22														
875	Department Store	1,000 Sq Ft		Avg	22.88	0.53	1.78														
876	Apparel Store	1,000 Sq Ft		Avg	66.40	1.00	3.83														
879	Arts and Crafts Store *(1)*	1,000 Sq Ft		Avg	56.55	4.65	6.21														
880	Pharmacy/Drugstore w/o Drive-Through Window	1,000 Sq Ft		Avg	90.06	3.20	8.42														
881	Pharmacy/Drugstore w/ Drive-Through Window	1,000 Sq Ft		Avg	88.16	2.66	10.35														
890	Furniture Store	1,000 Sq Ft		Avg	5.06	0.17	0.45														
896	Video Rental Store	1,000 Sq Ft		Avg	*	*	13.60														
							Totals	**2858**	**100**	**293**	**61**	**39**	**149**	**144**	**2858**	**100**	**188**	**61**	**39**	**96**	**92**
					55%		**Reduction**	**1572**	**55**	**161**	**34**	**21**	**82**	**79**							
							Grand Total	**1286**	**45**	**132**	**27**	**18**	**67**	**65**							

Notes:
(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Vallarta Shopping Center**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
812	Building Materials and Lumber Store	1,000 Sq Ft		Avg	45.16	2.60	4.49														
813	Free Standing Discount Superstore	1,000 Sq Ft		Avg	53.13	1.67	4.61														
814	Specialty Retail Center	1,000 Sq Ft		Avg	44.32	*	2.71														
815	Free Standing Discount Store	1,000 Sq Ft		Avg	57.24	1.06	5.00														
816	Hardware/Paint Store	1,000 Sq Ft		Avg	51.29	1.08	4.84														
817	Nursery (Garden Center)	1,000 Sq Ft		Avg	36.08	1.31	3.80														
818	Nursery (Wholesale)	1,000 Sq Ft		Avg	39.00	2.40	5.17														
820	Shopping Center	1,000 Sq Ft	45.37	Avg	42.94	1.00	3.73	1950	45	169	27	18	83	86	1950	45	112	27	18	55	57
823	Factory Outlet Center	1,000 Sq Ft		Avg	26.59	0.67	2.29														
841	New Car Sales	1,000 Sq Ft		Avg	33.34	2.03	2.59														
843	Automobile Parts Sales	1,000 Sq Ft		Avg	61.91	2.21	5.98														
848	Tire Store	1,000 Sq Ft		Avg	24.87	2.89	4.15														
849	Tire Superstore	1,000 Sq Ft		Avg	20.36	1.34	2.11														
850	Supermarket	1,000 Sq Ft	42.03	Avg	102.24	3.59	10.50	4298	151	441	92	59	225	216	4298	151	282	92	59	144	138
851	Convenience Market (Open 24 Hours)	1,000 Sq Ft		Avg	737.99	67.03	52.41														
852	Convenience Market (Open 15-16 Hours)	1,000 Sq Ft		Avg	*	31.02	34.57														
853	Convenience Market w/ Gasoline Pumps	Fueling Position(s)		Avg	542.60	16.57	19.07														
854	Discount Supermarket	1,000 Sq Ft		Avg	96.82	2.74	8.90														
857	Discount Club	1,000 Sq Ft		Avg	41.80	0.56	4.24														
860	Wholesale Market	1,000 Sq Ft		Avg	6.73	0.51	0.88														
861	Sporting Goods Superstore	1,000 Sq Ft		Avg	*	*	3.10														
862	Home Improvement Superstore	1,000 Sq Ft		Avg	29.80	1.26	2.37														
863	Electronics Superstore	1,000 Sq Ft		Avg	45.04	0.28	4.50														
864	Toy/Children's Superstore	1,000 Sq Ft		Avg	*	*	4.99														
865	Baby Superstore	1,000 Sq Ft		Avg	*	*	1.82														
866	Pet Supply Superstore	1,000 Sq Ft		Avg	*	*	3.38														
867	Office Supply Superstore	1,000 Sq Ft		Avg	*	*	3.40														
868	Book Superstore	1,000 Sq Ft		Avg	*	*	19.53														
869	Discount Home Furnishing Superstore	1,000 Sq Ft		Avg	20.00	0.57	1.57														
872	Bed and Linen Superstore	1,000 Sq Ft		Avg	*	*	2.22														
875	Department Store	1,000 Sq Ft		Avg	22.88	0.53	1.78														
876	Apparel Store	1,000 Sq Ft		Avg	66.40	1.00	3.83														
879	Arts and Crafts Store *(1)*	1,000 Sq Ft		Avg	56.55	4.65	6.21														
880	Pharmacy/Drugstore w/o Drive-Through Window	1,000 Sq Ft		Avg	90.06	3.20	8.42														
881	Pharmacy/Drugstore w/ Drive-Through Window	1,000 Sq Ft		Avg	88.16	2.66	10.35														
890	Furniture Store	1,000 Sq Ft		Avg	5.06	0.17	0.45														
896	Video Rental Store	1,000 Sq Ft		Avg	*	*	13.60														
							Totals	**1950**	**45**	**169**	**27**	**18**	**83**	**86**	**6248**	**196**	**394**	**119**	**77**	**199**	**195**
					53%		**Reduction 1**	**1034**	**24**	**90**	**14**	**10**	**44**	**46**							
							SubTotal	**917**	**21**	**79**	**13**	**8**	**39**	**40**							
							Totals	**4298**	**151**	**441**	**92**	**59**	**225**	**216**							
					55%		**Reduction 2**	**2364**	**83**	**243**	**51**	**32**	**124**	**119**							
							SubTotal	**1934**	**68**	**198**	**41**	**27**	**101**	**97**							
							Grand Total	**2851**	**89**	**278**	**54**	**35**	**140**	**138**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Shell Building**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
812	Building Materials and Lumber Store	1,000 Sq Ft		Avg	45.16	2.60	4.49														
813	Free Standing Discount Superstore	1,000 Sq Ft		Avg	53.13	1.67	4.61														
814	Specialty Retail Center	1,000 Sq Ft		Avg	44.32	*	2.71														
815	Free Standing Discount Store	1,000 Sq Ft		Avg	57.24	1.06	5.00														
816	Hardware/Paint Store	1,000 Sq Ft		Avg	51.29	1.08	4.84														
817	Nursery (Garden Center)	1,000 Sq Ft		Avg	36.08	1.31	3.80														
818	Nursery (Wholesale)	1,000 Sq Ft		Avg	39.00	2.40	5.17														
820	Shopping Center	1,000 Sq Ft	4.59	Avg	42.94	1.00	3.73	198	5	17	3	2	8	9	198	5	11	3	2	5	6
823	Factory Outlet Center	1,000 Sq Ft		Avg	26.59	0.67	2.29														
841	New Car Sales	1,000 Sq Ft		Avg	33.34	2.03	2.59														
843	Automobile Parts Sales	1,000 Sq Ft		Avg	61.91	2.21	5.98														
848	Tire Store	1,000 Sq Ft		Avg	24.87	2.89	4.15														
849	Tire Superstore	1,000 Sq Ft		Avg	20.36	1.34	2.11														
850	Supermarket	1,000 Sq Ft		Avg	102.24	3.59	10.50														
851	Convenience Market (Open 24 Hours)	1,000 Sq Ft		Avg	737.99	67.03	52.41														
852	Convenience Market (Open 15-16 Hours)	1,000 Sq Ft		Avg	*	31.02	34.57														
853	Convenience Market w/ Gasoline Pumps	Fueling Position(s)		Avg	542.60	16.57	19.07														
854	Discount Supermarket	1,000 Sq Ft		Avg	96.82	2.74	8.90														
857	Discount Club	1,000 Sq Ft		Avg	41.80	0.56	4.24														
860	Wholesale Market	1,000 Sq Ft		Avg	6.73	0.51	0.88														
861	Sporting Goods Superstore	1,000 Sq Ft		Avg	*	*	3.10														
862	Home Improvement Superstore	1,000 Sq Ft		Avg	29.80	1.26	2.37														
863	Electronics Superstore	1,000 Sq Ft		Avg	45.04	0.28	4.50														
864	Toy/Children's Superstore	1,000 Sq Ft		Avg	*	*	4.99														
865	Baby Superstore	1,000 Sq Ft		Avg	*	*	1.82														
866	Pet Supply Superstore	1,000 Sq Ft		Avg	*	*	3.38														
867	Office Supply Superstore	1,000 Sq Ft		Avg	*	*	3.40														
868	Book Superstore	1,000 Sq Ft		Avg	*	*	19.53														
869	Discount Home Furnishing Superstore	1,000 Sq Ft		Avg	20.00	0.57	1.57														
872	Bed and Linen Superstore	1,000 Sq Ft		Avg	*	*	2.22														
875	Department Store	1,000 Sq Ft		Avg	22.88	0.53	1.78														
876	Apparel Store	1,000 Sq Ft		Avg	66.40	1.00	3.83														
879	Arts and Crafts Store *(1)*	1,000 Sq Ft		Avg	56.55	4.65	6.21														
880	Pharmacy/Drugstore w/o Drive-Through Window	1,000 Sq Ft		Avg	90.06	3.20	8.42														
881	Pharmacy/Drugstore w/ Drive-Through Window	1,000 Sq Ft		Avg	88.16	2.66	10.35														
890	Furniture Store	1,000 Sq Ft		Avg	5.06	0.17	0.45														
896	Video Rental Store	1,000 Sq Ft		Avg	*	*	13.60														
							Totals	**198**	**5**	**17**	**3**	**2**	**8**	**9**	**198**	**5**	**11**	**3**	**2**	**5**	**6**
					55%		**Reduction**	**109**	**3**	**9**	**2**	**1**	**4**	**5**							
							Grand Total	**89**	**2**	**8**	**1**	**1**	**4**	**4**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Mini-storage Building**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
010	Waterport/Marine Facility	Acre(s)		Avg	11.93	*	*														
021	Commercial Airport	Comm. Flights/Day		Avg	122.21	6.43	6.88														
022	General Aviation Airport *(1)*	Based Aircraft		Avg	5.00	0.41	0.52														
030	Truck Terminal	1,000 Sq Ft		Avg	9.85	0.90	0.82														
090	Park and Ride w/ Bus Service	Parking Space(s)		Avg	4.50	0.72	0.62														
093	Light Rail Transit Station w/ Parking	Parking Space(s)		Avg	2.51	1.07	1.24														
110	General Light Industrial	1,000 Sq Ft		Avg	6.97	0.92	0.97														
120	General Heavy Industrial *(1)*	1,000 Sq Ft		Avg	1.50	0.51	0.68														
130	Industrial Park	1,000 Sq Ft		Avg	6.96	0.84	0.86														
140	Manufacturing	1,000 Sq Ft		Avg	3.82	0.73	0.73														
14X	Concrete Batch Plant	100 Cu Yd(s)/Day		Avg	*	4.94	2.32														
150	Warehousing	1,000 Sq Ft		Avg	3.56	0.30	0.32														
151	Mini-Warehouse	1,000 Sq Ft	34.25	Avg	2.50	0.15	0.26	86	5	9	3	2	5	4	86	5	9	3	2	5	4
152	High-Cube Warehouse	1,000 Sq Ft		Avg	1.44	0.09	0.10														
170	Utilities	1,000 Sq Ft		Avg	*	0.80	0.76														
							Totals	**86**	**5**	**9**	**3**	**2**	**5**	**4**	**86**	**5**	**9**	**3**	**2**	**5**	**4**
							Reduction														
							Grand Total	**86**	**5**	**9**	**3**	**2**	**5**	**4**							

Notes:
(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Social Security Building**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
710	General Office Building *(1)*	1,000 Sq Ft		Avg	11.01	1.55	1.49														
714	Corporate Headquarters Building*(1)*	1,000 Sq Ft		Avg	7.98	1.49	1.40														
715	Single Tenant Office Building *(1)*	1,000 Sq Ft		Avg	11.57	1.80	1.73														
720	Medical-Dental Office Building	1,000 Sq Ft		Avg	36.13	2.30	3.46														
730	Government Office Building *(1)*	1,000 Sq Ft	12.585	Avg	68.93	5.88	1.21	868	74	15	62	12	5	10	868	74	15	62	12	5	10
731	State Motor Vehicles Department	1,000 Sq Ft		Avg	166.02	9.84	17.09														
732	United States Post Office	1,000 Sq Ft		Avg	108.19	8.21	11.12														
733	Government Office Complex	1,000 Sq Ft		Avg	27.92	2.21	2.85														
750	Office Park *(1)*	1,000 Sq Ft		Avg	11.42	1.71	1.48														
760	Research and Development Center *(1)*	1,000 Sq Ft		Avg	8.11	1.22	1.07														
770	Business Park *(1)*	1,000 Sq Ft		Avg	12.76	1.43	1.29														
							Totals	**868**	**74**	**15**	**62**	**12**	**5**	**10**	**868**	**74**	**15**	**62**	**12**	**5**	**10**
					23%		**Reduction**	**200**	**17**	**3**	**14**	**3**	**1**	**2**							
							Grand Total	**668**	**57**	**12**	**48**	**9**	**4**	**8**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

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C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Sudsational Car Wash**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
911	Walk-In Bank	1,000 Sq Ft		Avg	*	*	12.13														
912	Drive-In Bank	1,000 Sq Ft		Avg	148.15	12.35	25.82														
918	Hair Salon	1,000 Sq Ft		Avg	*	1.21	1.45														
920	Copy, Print and Express Ship Store	1,000 Sq Ft		Avg	*	2.78	7.41														
925	Drinking Place	1,000 Sq Ft		Avg	*	*	11.34														
931	Quality Restaurant	1,000 Sq Ft		Avg	89.95	0.81	7.49														
932	High-Turnover (Sit-Down) Restaurant	1,000 Sq Ft		Avg	127.15	11.52	11.15														
933	Fast-Food Restaurant w/o D.T.	1,000 Sq Ft		Avg	716.00	43.87	26.15														
933-1	Fast-Food Restaurant w/o D.T. - Yogurt	1,000 Sq Ft		Avg	*	*	15.12														
934	Fast-Food Restaurant w/ D.T.	1,000 Sq Ft		Avg	496.12	49.35	33.84														
935	Fast-Food Restaurant w/ D.T. No Indoor Seats	1,000 Sq Ft		Avg	*	*	153.85														
936	Coffee/Donut Shop w/o D.T.	1,000 Sq Ft		Avg	*	117.23	40.57														
936-1	Donut/Ice Cream Shop w/o D.T.	1,000 Sq Ft		Avg	*	*	20.00														
936-2	Donut/Sandwich Shop w/o D.T.	1,000 Sq Ft		Avg	*	59.75	13.00														
937	Coffee/Donut Shop w/ D.T.	1,000 Sq Ft		Avg	818.58	110.75	42.93														
938	Coffee/Donut Shop w/ D.T. No Indoor Seats	1,000 Sq Ft		Avg	1800.00	303.33	75.00														
939	Bread/Donut/Bagel Shop w/o D.T.	1,000 Sq Ft		Avg	*	70.22	28.00														
940	Bread/Donut/Bagel Shop w/ D.T.	1,000 Sq Ft		Avg	*	36.92	19.56														
941	Quick Lubrication Vehicle Shop	Servicing Position(s)		Avg	40.00	3.00	5.19														
942	Automobile Care Center	1,000 Sq Ft		Avg	*	2.94	3.38														
943	Automobile Parts and Service Center	1,000 Sq Ft		Avg	*	*	4.46														
944	Gasoline/Service Station	Fueling Position(s)		Avg	168.56	12.16	13.86														
945	Gasoline Station w/ Convenience Market	Fueling Position(s)		Avg	162.78	10.16	13.38														
946	Gasoline Station w/ Conv. Mkt. & Car Wash	Fueling Position(s)		Avg	152.84	11.93	13.94														
947	Self-Service Car Wash *(1)*	Wash Stall(s)		Avg	108.00	8.00	5.54														
948	Automated Car Wash	1,000 Sq Ft	2.47	Avg	*	*	14.12			35			18	17			35			18	17
							Totals			**35**			**18**	**17**			**35**			**18**	**17**
							Reduction														
							Grand Total			**35**			**18**	**17**							

Notes:

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D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Minor League Baseball Stadium**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
411	City Park	Acre(s)		Avg	1.59	*	*														
412	County Park	Acre(s)		Avg	2.28	0.01	0.06														
413	State Park	Acre(s)		Avg	0.65	*	*														
414	Water Slide Park	Parking Space(s)		Avg	2.27	0.08	0.28														
415	Beach Park *(1)*	Acre(s)		Avg	29.81	0.48	1.30														
416	Campground/RV Park	Occ. Camp Site(s)		Avg	*	0.20	0.37														
417	Regional Park *(1)*	Acre(s)	0.46	Avg	4.57	0.15	0.20	4							4						
418	National Monument *(1)*	Acre(s)		Avg	5.37	0.23	0.42														
420	Marina	Berth(s)		Avg	2.96	0.08	0.19														
430	Golf Course	Acre(s)		Avg	5.04	0.21	0.30														
431	Miniature Golf Course	Hole(s)		Avg	*	*	0.33														
432	Golf Driving Range	Driving Position(s)		Avg	13.65	0.40	1.25														
433	Batting Cages	Cage(s)		Avg	*	*	2.22														
435	Multipurpose Recreational Facility	Acre(s)		Avg	90.38	1.92	3.58														
437	Bowling Alley	Lane(s)		Avg	33.33	3.13	3.54														
440	Adult Cabaret *(1)*	1,000 Sq Ft		Avg	*	*	38.67														
441	Live Theater	Seat(s)		Avg	*	*	0.02														
443	Movie Theater w/o Matinee	Screen(s)		Avg	220.00	*	24.00														
444-1	Movie Theater w/ Matinee	Screen(s)		Avg	*	*	20.22														
444-2	Movie Theater w/ Matinee (Friday)	Screen(s)		Avg	348.33	*	45.91														
445-1	Multiplex Movie Theater	Screen(s)		Avg	*	*	13.64														
445-2	Multiplex Movie Theater (Friday)	Screen(s)		Avg	292.50	*	22.76														
452	Horse Racetrack	Attendee(s)		Avg	1.09	0.01	0.13														
453	Automobile Racetrack	Attendee(s)		Avg	*	*	*														
454	Dog Racetrack	Attendee(s)		Avg	*	*	0.15														
460	Arena	Acre(s)		Avg	33.33	*	*														
465	Ice Skating Rink	1,000 Sq Ft		Avg	*	*	2.36														
473	Casino/Video Lottery Establishment	1,000 Sq Ft		Avg	*	*	13.43														
47X	Native American Gaming Facility	1,000 Sq Ft		Avg	*	*	3.64														
480	Amusement Park	Acre(s)		Avg	75.76	0.21	3.95														
481	Zoo	Acre(s)		Avg	114.88	*	*														
488	Soccer Complex	Field(s)		Avg	71.33	1.40	20.67														
490	Tennis Courts	Court(s)		Avg	31.04	1.67	3.88														
491	Racquet/Tennis Club	Court(s)		Avg	38.70	1.31	3.35														
492	Health/Fitness Club	1,000 Sq Ft		Avg	32.93	1.38	3.53														
493	Athletic Club	1,000 Sq Ft		Avg	43.00	2.97	5.96														
495	Recreational Community Center	1,000 Sq Ft		Avg	22.88	1.62	1.45														
							Totals	**4**							**4**						
							Reduction														
							Grand Total	**4**													

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name AutoJava automotive services
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
911	Walk-In Bank	1,000 Sq Ft		Avg	*	*	12.13														
912	Drive-In Bank	1,000 Sq Ft		Avg	148.15	12.35	25.82														
918	Hair Salon	1,000 Sq Ft		Avg	*	1.21	1.45														
920	Copy, Print and Express Ship Store	1,000 Sq Ft		Avg	*	2.78	7.41														
925	Drinking Place	1,000 Sq Ft		Avg	*	*	11.34														
931	Quality Restaurant	1,000 Sq Ft		Avg	89.95	0.81	7.49														
932	High-Turnover (Sit-Down) Restaurant	1,000 Sq Ft		Avg	127.15	11.52	11.15														
933	Fast-Food Restaurant w/o D.T.	1,000 Sq Ft		Avg	716.00	43.87	26.15														
933-1	Fast-Food Restaurant w/o D.T. - Yogurt	1,000 Sq Ft		Avg	*	*	15.12														
934	Fast-Food Restaurant w/ D.T.	1,000 Sq Ft		Avg	496.12	49.35	33.84														
935	Fast-Food Restaurant w/ D.T. No Indoor Seats	1,000 Sq Ft		Avg	*	*	153.85														
936	Coffee/Donut Shop w/o D.T.	1,000 Sq Ft		Avg	*	117.23	40.57														
936-1	Donut/Ice Cream Shop w/o D.T.	1,000 Sq Ft		Avg	*	*	20.00														
936-2	Donut/Sandwich Shop w/o D.T.	1,000 Sq Ft		Avg	*	59.75	13.00														
937	Coffee/Donut Shop w/ D.T.	1,000 Sq Ft		Avg	818.58	110.75	42.93														
938	Coffee/Donut Shop w/ D.T. No Indoor Seats	1,000 Sq Ft		Avg	1800.00	303.33	75.00														
939	Bread/Donut/Bagel Shop w/o D.T.	1,000 Sq Ft		Avg	*	70.22	28.00														
940	Bread/Donut/Bagel Shop w/ D.T.	1,000 Sq Ft		Avg	*	36.92	19.56														
941	Quick Lubrication Vehicle Shop	Servicing Position(s)		Avg	40.00	3.00	5.19														
942	Automobile Care Center	1,000 Sq Ft	27.82	Avg	*	2.94	3.38		82	94	53	29	47	47		82	94	53	29	47	47
943	Automobile Parts and Service Center	1,000 Sq Ft		Avg	*	*	4.46														
944	Gasoline/Service Station	Fueling Position(s)		Avg	168.56	12.16	13.86														
945	Gasoline Station w/ Convenience Market	Fueling Position(s)		Avg	162.78	10.16	13.38														
946	Gasoline Station w/ Conv. Mkt. & Car Wash	Fueling Position(s)		Avg	152.84	11.93	13.94														
947	Self-Service Car Wash *(1)*	Wash Stall(s)		Avg	108.00	8.00	5.54														
948	Automated Car Wash	1,000 Sq Ft		Avg	*	*	14.12														
							Totals		**82**	**94**	**53**	**29**	**47**	**47**		**82**	**94**	**53**	**29**	**47**	**47**
							Reduction														
							Grand Total		**82**	**94**	**53**	**29**	**47**	**47**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Riverway Sports Park Phase II**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
411	City Park	Acre(s)		Avg	1.59	*	*														
412	County Park	Acre(s)		Avg	2.28	0.01	0.06														
413	State Park	Acre(s)		Avg	0.65	*	*														
414	Water Slide Park	Parking Space(s)		Avg	2.27	0.08	0.28														
415	Beach Park *(1)*	Acre(s)		Avg	29.81	0.48	1.30														
416	Campground/RV Park	Occ. Camp Site(s)		Avg	*	0.20	0.37														
417	Regional Park *(1)*	Acre(s)	14	Avg	4.57	0.15	0.20	64	2	3	1	1	1	2	64	2	3	1	1	1	2
418	National Monument *(1)*	Acre(s)		Avg	5.37	0.23	0.42														
420	Marina	Berth(s)		Avg	2.96	0.08	0.19														
430	Golf Course	Acre(s)		Avg	5.04	0.21	0.30														
431	Miniature Golf Course	Hole(s)		Avg	*	*	0.33														
432	Golf Driving Range	Driving Position(s)		Avg	13.65	0.40	1.25														
433	Batting Cages	Cage(s)		Avg	*	*	2.22														
435	Multipurpose Recreational Facility	Acre(s)		Avg	90.38	1.92	3.58														
437	Bowling Alley	Lane(s)		Avg	33.33	3.13	3.54														
440	Adult Cabaret *(1)*	1,000 Sq Ft		Avg	*	*	38.67														
441	Live Theater	Seat(s)		Avg	*	*	0.02														
443	Movie Theater w/o Matinee	Screen(s)		Avg	220.00	*	24.00														
444-1	Movie Theater w/ Matinee	Screen(s)		Avg	*	*	20.22														
444-2	Movie Theater w/ Matinee (Friday)	Screen(s)		Avg	348.33	*	45.91														
445-1	Multiplex Movie Theater	Screen(s)		Avg	*	*	13.64														
445-2	Multiplex Movie Theater (Friday)	Screen(s)		Avg	292.50	*	22.76														
452	Horse Racetrack	Attendee(s)		Avg	1.09	0.01	0.13														
453	Automobile Racetrack	Attendee(s)		Avg	*	*	*														
454	Dog Racetrack	Attendee(s)		Avg	*	*	0.15														
460	Arena	Acre(s)		Avg	33.33	*	*														
465	Ice Skating Rink	1,000 Sq Ft		Avg	*	*	2.36														
473	Casino/Video Lottery Establishment	1,000 Sq Ft		Avg	*	*	13.43														
47X	Native American Gaming Facility	1,000 Sq Ft		Avg	*	*	3.64														
480	Amusement Park	Acre(s)		Avg	75.76	0.21	3.95														
481	Zoo	Acre(s)		Avg	114.88	*	*														
488	Soccer Complex	Field(s)		Avg	71.33	1.40	20.67														
490	Tennis Courts	Court(s)		Avg	31.04	1.67	3.88														
491	Racquet/Tennis Club	Court(s)		Avg	38.70	1.31	3.35														
492	Health/Fitness Club	1,000 Sq Ft		Avg	32.93	1.38	3.53														
493	Athletic Club	1,000 Sq Ft		Avg	43.00	2.97	5.96														
495	Recreational Community Center	1,000 Sq Ft		Avg	22.88	1.62	1.45														
							Totals	**64**	**2**	**3**	**1**	**1**	**1**	**2**	**64**	**2**	**3**	**1**	**1**	**1**	**2**
							Reduction														
							Grand Total	**64**	**2**	**3**	**1**	**1**	**1**	**2**							

Notes:
(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Packwood Creek Phase II**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
812	Building Materials and Lumber Store	1,000 Sq Ft		Avg	45.16	2.60	4.49														
813	Free Standing Discount Superstore	1,000 Sq Ft		Avg	53.13	1.67	4.61														
814	Specialty Retail Center	1,000 Sq Ft		Avg	44.32	*	2.71														
815	Free Standing Discount Store	1,000 Sq Ft		Avg	57.24	1.06	5.00														
816	Hardware/Paint Store	1,000 Sq Ft		Avg	51.29	1.08	4.84														
817	Nursery (Garden Center)	1,000 Sq Ft		Avg	36.08	1.31	3.80														
818	Nursery (Wholesale)	1,000 Sq Ft		Avg	39.00	2.40	5.17														
820	Shopping Center	1,000 Sq Ft	150	Avg	42.94	1.00	3.73	6442	150	560	92	58	274	286	6442	150	370	92	58	181	189
823	Factory Outlet Center	1,000 Sq Ft		Avg	26.59	0.67	2.29														
841	New Car Sales	1,000 Sq Ft		Avg	33.34	2.03	2.59														
843	Automobile Parts Sales	1,000 Sq Ft		Avg	61.91	2.21	5.98														
848	Tire Store	1,000 Sq Ft		Avg	24.87	2.89	4.15														
849	Tire Superstore	1,000 Sq Ft		Avg	20.36	1.34	2.11														
850	Supermarket	1,000 Sq Ft		Avg	102.24	3.59	10.50														
851	Convenience Market (Open 24 Hours)	1,000 Sq Ft		Avg	737.99	67.03	52.41														
852	Convenience Market (Open 15-16 Hours)	1,000 Sq Ft		Avg	*	31.02	34.57														
853	Convenience Market w/ Gasoline Pumps	Fueling Position(s)		Avg	542.60	16.57	19.07														
854	Discount Supermarket	1,000 Sq Ft		Avg	96.82	2.74	8.90														
857	Discount Club	1,000 Sq Ft		Avg	41.80	0.56	4.24														
860	Wholesale Market	1,000 Sq Ft		Avg	6.73	0.51	0.88														
861	Sporting Goods Superstore	1,000 Sq Ft		Avg	*	*	3.10														
862	Home Improvement Superstore	1,000 Sq Ft		Avg	29.80	1.26	2.37														
863	Electronics Superstore	1,000 Sq Ft		Avg	45.04	0.28	4.50														
864	Toy/Children's Superstore	1,000 Sq Ft		Avg	*	*	4.99														
865	Baby Superstore	1,000 Sq Ft		Avg	*	*	1.82														
866	Pet Supply Superstore	1,000 Sq Ft		Avg	*	*	3.38														
867	Office Supply Superstore	1,000 Sq Ft		Avg	*	*	3.40														
868	Book Superstore	1,000 Sq Ft		Avg	*	*	19.53														
869	Discount Home Furnishing Superstore	1,000 Sq Ft		Avg	20.00	0.57	1.57														
872	Bed and Linen Superstore	1,000 Sq Ft		Avg	*	*	2.22														
875	Department Store	1,000 Sq Ft		Avg	22.88	0.53	1.78														
876	Apparel Store	1,000 Sq Ft		Avg	66.40	1.00	3.83														
879	Arts and Crafts Store *(1)*	1,000 Sq Ft		Avg	56.55	4.65	6.21														
880	Pharmacy/Drugstore w/o Drive-Through Window	1,000 Sq Ft		Avg	90.06	3.20	8.42														
881	Pharmacy/Drugstore w/ Drive-Through Window	1,000 Sq Ft		Avg	88.16	2.66	10.35														
890	Furniture Store	1,000 Sq Ft		Avg	5.06	0.17	0.45														
896	Video Rental Store	1,000 Sq Ft		Avg	*	*	13.60														
							Totals	**6442**	**150**	**560**	**92**	**58**	**274**	**286**	**6442**	**150**	**370**	**92**	**58**	**181**	**189**
Notes:					53%		**Reduction**	**3414**	**80**	**297**	**49**	**31**	**145**	**152**							
(1)	AM and/or PM rates correspond to peak hour of generator						**Grand Total**	**3028**	**71**	**263**	**43**	**27**	**129**	**134**							

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
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Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name Medical Office
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
610	Hospital	1,000 Sq Ft	3.9	Avg	16.50	1.12	1.14	66	4	4	2	2	2	2	66	4	4	2	2	2	2
620	Nursing Home	Bed(s)		Avg	2.37	0.17	0.22														
630	Clinic	1,000 Sq Ft		Avg	31.45	*	5.18														
640	Animal Hospital/Veterinary Clinic	1,000 Sq Ft		Avg	*	4.08	4.72														
710	General Office Building *(1)*	1,000 Sq Ft		Avg	11.01	1.55	1.49														
714	Corporate Headquarters Building*(1)*	1,000 Sq Ft		Avg	7.98	1.49	1.40														
715	Single Tenant Office Building *(1)*	1,000 Sq Ft		Avg	11.57	1.80	1.73														
720	Medical-Dental Office Building	1,000 Sq Ft		Avg	36.13	2.30	3.46														
730	Government Office Building *(1)*	1,000 Sq Ft		Avg	68.93	5.88	1.21														
731	State Motor Vehicles Department	1,000 Sq Ft		Avg	166.02	9.84	17.09														
732	United States Post Office	1,000 Sq Ft		Avg	108.19	8.21	11.12														
733	Government Office Complex	1,000 Sq Ft		Avg	27.92	2.21	2.85														
750	Office Park *(1)*	1,000 Sq Ft		Avg	11.42	1.71	1.48														
760	Research and Development Center *(1)*	1,000 Sq Ft		Avg	8.11	1.22	1.07														
770	Business Park *(1)*	1,000 Sq Ft		Avg	12.76	1.43	1.29														
							Totals	**66**	**4**	**4**	**2**	**2**	**2**	**2**	**66**	**4**	**4**	**2**	**2**	**2**	**2**
					27%		**Reduction**	**18**	**1**	**1**	**1**	**1**	**1**	**1**							
							Grand Total	**48**	**3**	**3**	**1**	**1**	**1**	**1**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

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B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Garden Villas**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)		Avg	9.57	0.75	1.01														
220	Apartment	Dwelling Unit(s)	6	Avg	6.65	0.51	0.62	40	3	4	1	2	3	1	40	3	4	1	2	3	1
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**40**	**3**	**4**	**1**	**2**	**3**	**1**	**40**	**3**	**4**	**1**	**2**	**3**	**1**
					14%		**Reduction**	**6**	**0**	**1**	**0**	**0**	**0**	**0**							
							Grand Total	**34**	**3**	**3**	**1**	**2**	**3**	**1**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name Imagine U Children's Museum
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
411	City Park	Acre(s)		Avg	1.59	*	*														
412	County Park	Acre(s)		Avg	2.28	0.01	0.06														
413	State Park	Acre(s)		Avg	0.65	*	*														
414	Water Slide Park	Parking Space(s)		Avg	2.27	0.08	0.28														
415	Beach Park *(1)*	Acre(s)		Avg	29.81	0.48	1.30														
416	Campground/RV Park	Occ. Camp Site(s)		Avg	*	0.20	0.37														
417	Regional Park *(1)*	Acre(s)		Avg	4.57	0.15	0.20														
418	National Monument *(1)*	Acre(s)		Avg	5.37	0.23	0.42														
420	Marina	Berth(s)		Avg	2.96	0.08	0.19														
430	Golf Course	Acre(s)		Avg	5.04	0.21	0.30														
431	Miniature Golf Course	Hole(s)		Avg	*	*	0.33														
432	Golf Driving Range	Driving Position(s)		Avg	13.65	0.40	1.25														
433	Batting Cages	Cage(s)		Avg	*	*	2.22														
435	Multipurpose Recreational Facility	Acre(s)		Avg	90.38	1.92	3.58														
437	Bowling Alley	Lane(s)		Avg	33.33	3.13	3.54														
440	Adult Cabaret *(1)*	1,000 Sq Ft		Avg	*	*	38.67														
441	Live Theater	Seat(s)		Avg	*	*	0.02														
443	Movie Theater w/o Matinee	Screen(s)		Avg	220.00	*	24.00														
444-1	Movie Theater w/ Matinee	Screen(s)		Avg	*	*	20.22														
444-2	Movie Theater w/ Matinee (Friday)	Screen(s)		Avg	348.33	*	45.91														
445-1	Multiplex Movie Theater	Screen(s)		Avg	*	*	13.64														
445-2	Multiplex Movie Theater (Friday)	Screen(s)		Avg	292.50	*	22.76														
452	Horse Racetrack	Attendee(s)		Avg	1.09	0.01	0.13														
453	Automobile Racetrack	Attendee(s)		Avg	*	*	*														
454	Dog Racetrack	Attendee(s)		Avg	*	*	0.15														
460	Arena	Acre(s)		Avg	33.33	*	*														
465	Ice Skating Rink	1,000 Sq Ft		Avg	*	*	2.36														
473	Casino/Video Lottery Establishment	1,000 Sq Ft		Avg	*	*	13.43														
47X	Native American Gaming Facility	1,000 Sq Ft		Avg	*	*	3.64														
480	Amusement Park	Acre(s)		Avg	75.76	0.21	3.95														
481	Zoo	Acre(s)		Avg	114.88	*	*														
488	Soccer Complex	Field(s)		Avg	71.33	1.40	20.67														
490	Tennis Courts	Court(s)		Avg	31.04	1.67	3.88														
491	Racquet/Tennis Club	Court(s)		Avg	38.70	1.31	3.35														
492	Health/Fitness Club	1,000 Sq Ft		Avg	32.93	1.38	3.53														
493	Athletic Club	1,000 Sq Ft		Avg	43.00	2.97	5.96														
495	Recreational Community Center	1,000 Sq Ft	12.99	Avg	22.88	1.62	1.45	298	21	19	13	8	7	12	298	21	19	13	8	7	12
							Totals	**298**	**21**	**19**	**13**	**8**	**7**	**12**	**298**	**21**	**19**	**13**	**8**	**7**	**12**
							Reduction														
							Grand Total	**298**	**21**	**19**	**13**	**8**	**7**	**12**							

Notes:
(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Kaweah Delta Kids Center**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
411	City Park	Acre(s)		Avg	1.59	*	*														
412	County Park	Acre(s)		Avg	2.28	0.01	0.06														
413	State Park	Acre(s)		Avg	0.65	*	*														
414	Water Slide Park	Parking Space(s)		Avg	2.27	0.08	0.28														
415	Beach Park *(1)*	Acre(s)		Avg	29.81	0.48	1.30														
416	Campground/RV Park	Occ. Camp Site(s)		Avg	*	0.20	0.37														
417	Regional Park *(1)*	Acre(s)		Avg	4.57	0.15	0.20														
418	National Monument *(1)*	Acre(s)		Avg	5.37	0.23	0.42														
420	Marina	Berth(s)		Avg	2.96	0.08	0.19														
430	Golf Course	Acre(s)		Avg	5.04	0.21	0.30														
431	Miniature Golf Course	Hole(s)		Avg	*	*	0.33														
432	Golf Driving Range	Driving Position(s)		Avg	13.65	0.40	1.25														
433	Batting Cages	Cage(s)		Avg	*	*	2.22														
435	Multipurpose Recreational Facility	Acre(s)		Avg	90.38	1.92	3.58														
437	Bowling Alley	Lane(s)		Avg	33.33	3.13	3.54														
440	Adult Cabaret *(1)*	1,000 Sq Ft		Avg	*	*	38.67														
441	Live Theater	Seat(s)		Avg	*	*	0.02														
443	Movie Theater w/o Matinee	Screen(s)		Avg	220.00	*	24.00														
444-1	Movie Theater w/ Matinee	Screen(s)		Avg	*	*	20.22														
444-2	Movie Theater w/ Matinee (Friday)	Screen(s)		Avg	348.33	*	45.91														
445-1	Multiplex Movie Theater	Screen(s)		Avg	*	*	13.64														
445-2	Multiplex Movie Theater (Friday)	Screen(s)		Avg	292.50	*	22.76														
452	Horse Racetrack	Attendee(s)		Avg	1.09	0.01	0.13														
453	Automobile Racetrack	Attendee(s)		Avg	*	*	*														
454	Dog Racetrack	Attendee(s)		Avg	*	*	0.15														
460	Arena	Acre(s)		Avg	33.33	*	*														
465	Ice Skating Rink	1,000 Sq Ft		Avg	*	*	2.36														
473	Casino/Video Lottery Establishment	1,000 Sq Ft		Avg	*	*	13.43														
47X	Native American Gaming Facility	1,000 Sq Ft		Avg	*	*	3.64														
480	Amusement Park	Acre(s)		Avg	75.76	0.21	3.95														
481	Zoo	Acre(s)		Avg	114.88	*	*														
488	Soccer Complex	Field(s)		Avg	71.33	1.40	20.67														
490	Tennis Courts	Court(s)		Avg	31.04	1.67	3.88														
491	Racquet/Tennis Club	Court(s)		Avg	38.70	1.31	3.35														
492	Health/Fitness Club	1,000 Sq Ft		Avg	32.93	1.38	3.53														
493	Athletic Club	1,000 Sq Ft		Avg	43.00	2.97	5.96														
495	Recreational Community Center	1,000 Sq Ft	2.4	Avg	22.88	1.62	1.45	56	4	3	2	2	1	2	56	4	3	2	2	1	2
							Totals	**56**	**4**	**3**	**2**	**2**	**1**	**2**	**56**	**4**	**3**	**2**	**2**	**1**	**2**
					72%		**Reduction**	**40**	**3**	**2**	**1**	**1**	**1**	**1**							
							Grand Total	**16**	**1**	**1**	**1**	**1**	**0**	**1**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Office Addition**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
710	General Office Building *(1)*	1,000 Sq Ft		Avg	11.01	1.55	1.49														
714	Corporate Headquarters Building*(1)*	1,000 Sq Ft		Avg	7.98	1.49	1.40														
715	Single Tenant Office Building *(1)*	1,000 Sq Ft	0.85	Avg	11.57	1.80	1.73	10	2	1	2			1	10	2	1	2			1
720	Medical-Dental Office Building	1,000 Sq Ft		Avg	36.13	2.30	3.46														
730	Government Office Building *(1)*	1,000 Sq Ft		Avg	68.93	5.88	1.21														
731	State Motor Vehicles Department	1,000 Sq Ft		Avg	166.02	9.84	17.09														
732	United States Post Office	1,000 Sq Ft		Avg	108.19	8.21	11.12														
733	Government Office Complex	1,000 Sq Ft		Avg	27.92	2.21	2.85														
750	Office Park *(1)*	1,000 Sq Ft		Avg	11.42	1.71	1.48														
760	Research and Development Center *(1)*	1,000 Sq Ft		Avg	8.11	1.22	1.07														
770	Business Park *(1)*	1,000 Sq Ft		Avg	12.76	1.43	1.29														
							Totals	**10**	**2**	**1**	**2**			**1**	**10**	**2**	**1**	**2**			**1**
							Reduction														
							Grand Total	**10**	**2**	**1**	**2**			**1**							

Notes:
(1) AM and/or PM rates correspond to peak hour of generator

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C Includes weekday rates only
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E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name New Church
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
501	Military Base	Employee(s)		Avg	1.78	0.39	0.39														
520	Elementary School *(1)*	Student(s)		Avg	1.29	0.45	0.15														
522	Middle School/Junior High School *(1)*	Student(s)		Avg	1.62	0.54	0.16														
530	High School *(1)*	Student(s)		Avg	1.71	0.42	0.13														
534	Private School (K-8) *(1)*	Student(s)		Avg	*	0.90	0.60														
536	Private School (K-12)	Student(s)		Avg	2.48	0.81	0.17														
540	Junior/Community College	Student(s)		Avg	1.20	0.12	0.12														
550	University/College	Student(s)		Avg	2.38	0.21	0.21														
560	Church	1,000 Sq Ft	2.04	Avg	9.11	0.56	0.55	20	1	1	1			1	20	1	1	1			1
561	Synagogue	1,000 Sq Ft		Avg	10.64	0.14	1.69														
565	Day Care Center	Student(s)		Avg	4.48	0.80	0.82														
566	Cemetery	Acre(s)		Avg	4.73	0.17	0.84														
571	Prison	Bed(s)		Avg	*	0.10	0.05														
590	Library	1,000 Sq Ft		Avg	56.24	1.04	7.30														
591	Lodge/Fraternal Organization	Member(s)		Avg	0.29	0.01	0.03														
							Totals	**20**	**1**	**1**	**1**			**1**	**20**	**1**	**1**	**1**			**1**
					36%		**Reduction**	**7**	**0**	**0**	**0**			**0**							
							Grand Total	**13**	**1**	**1**	**1**			**1**							

Notes:
(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name George McCann/St. Mary School
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
501	Military Base	Employee(s)		Avg	1.78	0.39	0.39														
520	Elementary School *(1)*	Student(s)		Avg	1.29	0.45	0.15														
522	Middle School/Junior High School *(1)*	Student(s)		Avg	1.62	0.54	0.16														
522-a	Middle School/Junior High School *(1)*	1,000 Sq Ft	0.86	Avg		4.35	1.19		4	1	2	2	1			4	1	2	2	1	
530	High School *(1)*	Student(s)		Avg	1.71	0.42	0.13														
534	Private School (K-8) *(1)*	Student(s)		Avg	*	0.90	0.60														
536	Private School (K-12)	Student(s)		Avg	2.48	0.81	0.17														
540	Junior/Community College	Student(s)		Avg	1.20	0.12	0.12														
550	University/College	Student(s)		Avg	2.38	0.21	0.21														
560	Church	1,000 Sq Ft		Avg	9.11	0.56	0.55														
561	Synagogue	1,000 Sq Ft		Avg	10.64	0.14	1.69														
565	Day Care Center	Student(s)		Avg	4.48	0.80	0.82														
566	Cemetery	Acre(s)		Avg	4.73	0.17	0.84														
571	Prison	Bed(s)		Avg	*	0.10	0.05														
590	Library	1,000 Sq Ft		Avg	56.24	1.04	7.30														
591	Lodge/Fraternal Organization	Member(s)		Avg	0.29	0.01	0.03														
							Totals		**4**	**1**	**2**	**2**	**1**			**4**	**1**	**2**	**2**	**1**	
Notes:					37%		**Reduction**		**1**	**0**	**1**	**1**	**0**								
(1)	AM and/or PM rates correspond to peak hour of generator						**Grand Total**		**3**	**1**	**1**	**1**	**1**								

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Heritage Church**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
501	Military Base	Employee(s)		Avg	1.78	0.39	0.39														
520	Elementary School *(1)*	Student(s)		Avg	1.29	0.45	0.15														
522	Middle School/Junior High School *(1)*	Student(s)		Avg	1.62	0.54	0.16														
530	High School *(1)*	Student(s)		Avg	1.71	0.42	0.13														
534	Private School (K-8) *(1)*	Student(s)		Avg	*	0.90	0.60														
536	Private School (K-12)	Student(s)		Avg	2.48	0.81	0.17														
540	Junior/Community College	Student(s)		Avg	1.20	0.12	0.12														
550	University/College	Student(s)		Avg	2.38	0.21	0.21														
560	Church	1,000 Sq Ft	0.67	Avg	9.11	0.56	0.55	8							8						
561	Synagogue	1,000 Sq Ft		Avg	10.64	0.14	1.69														
565	Day Care Center	Student(s)		Avg	4.48	0.80	0.82														
566	Cemetery	Acre(s)		Avg	4.73	0.17	0.84														
571	Prison	Bed(s)		Avg	*	0.10	0.05														
590	Library	1,000 Sq Ft		Avg	56.24	1.04	7.30														
591	Lodge/Fraternal Organization	Member(s)		Avg	0.29	0.01	0.03														
							Totals	**8**							**8**						
Notes:					36%		**Reduction**	**3**													
(1)	AM and/or PM rates correspond to peak hour of generator						**Grand Total**	**5**													

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Medical Building**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
610	Hospital	1,000 Sq Ft	15	Avg	16.50	1.12	1.14	248	17	17	10	7	7	10	248	17	17	10	7	7	10
620	Nursing Home	Bed(s)		Avg	2.37	0.17	0.22														
630	Clinic	1,000 Sq Ft		Avg	31.45	*	5.18														
640	Animal Hospital/Veterinary Clinic	1,000 Sq Ft		Avg	*	4.08	4.72														
710	General Office Building *(1)*	1,000 Sq Ft		Avg	11.01	1.55	1.49														
714	Corporate Headquarters Building*(1)*	1,000 Sq Ft		Avg	7.98	1.49	1.40														
715	Single Tenant Office Building *(1)*	1,000 Sq Ft		Avg	11.57	1.80	1.73														
720	Medical-Dental Office Building	1,000 Sq Ft		Avg	36.13	2.30	3.46														
730	Government Office Building *(1)*	1,000 Sq Ft		Avg	68.93	5.88	1.21														
731	State Motor Vehicles Department	1,000 Sq Ft		Avg	166.02	9.84	17.09														
732	United States Post Office	1,000 Sq Ft		Avg	108.19	8.21	11.12														
733	Government Office Complex	1,000 Sq Ft		Avg	27.92	2.21	2.85														
750	Office Park *(1)*	1,000 Sq Ft		Avg	11.42	1.71	1.48														
760	Research and Development Center *(1)*	1,000 Sq Ft		Avg	8.11	1.22	1.07														
770	Business Park *(1)*	1,000 Sq Ft		Avg	12.76	1.43	1.29														
							Totals	**248**	**17**	**17**	**10**	**7**	**7**	**10**	**248**	**17**	**17**	**10**	**7**	**7**	**10**
					27%		**Reduction**	**67**	**5**	**5**	**3**	**2**	**2**	**3**							
							Grand Total	**181**	**12**	**12**	**7**	**5**	**5**	**7**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Convenience Store**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
812	Building Materials and Lumber Store	1,000 Sq Ft		Avg	45.16	2.60	4.49														
813	Free Standing Discount Superstore	1,000 Sq Ft		Avg	53.13	1.67	4.61														
814	Specialty Retail Center	1,000 Sq Ft		Avg	44.32	*	2.71														
815	Free Standing Discount Store	1,000 Sq Ft		Avg	57.24	1.06	5.00														
816	Hardware/Paint Store	1,000 Sq Ft		Avg	51.29	1.08	4.84														
817	Nursery (Garden Center)	1,000 Sq Ft		Avg	36.08	1.31	3.80														
818	Nursery (Wholesale)	1,000 Sq Ft		Avg	39.00	2.40	5.17														
820	Shopping Center	1,000 Sq Ft		Avg	42.94	1.00	3.73														
823	Factory Outlet Center	1,000 Sq Ft		Avg	26.59	0.67	2.29														
841	New Car Sales	1,000 Sq Ft		Avg	33.34	2.03	2.59														
843	Automobile Parts Sales	1,000 Sq Ft		Avg	61.91	2.21	5.98														
848	Tire Store	1,000 Sq Ft		Avg	24.87	2.89	4.15														
849	Tire Superstore	1,000 Sq Ft		Avg	20.36	1.34	2.11														
850	Supermarket	1,000 Sq Ft		Avg	102.24	3.59	10.50														
851	Convenience Market (Open 24 Hours)	1,000 Sq Ft		Avg	737.99	67.03	52.41														
852	Convenience Market (Open 15-16 Hours)	1,000 Sq Ft	3.9	Avg	*	31.02	34.57		121	135	61	60	66	69		121	135	61	60	66	69
853	Convenience Market w/ Gasoline Pumps	Fueling Position(s)		Avg	542.60	16.57	19.07														
854	Discount Supermarket	1,000 Sq Ft		Avg	96.82	2.74	8.90														
857	Discount Club	1,000 Sq Ft		Avg	41.80	0.56	4.24														
860	Wholesale Market	1,000 Sq Ft		Avg	6.73	0.51	0.88														
861	Sporting Goods Superstore	1,000 Sq Ft		Avg	*	*	3.10														
862	Home Improvement Superstore	1,000 Sq Ft		Avg	29.80	1.26	2.37														
863	Electronics Superstore	1,000 Sq Ft		Avg	45.04	0.28	4.50														
864	Toy/Children's Superstore	1,000 Sq Ft		Avg	*	*	4.99														
865	Baby Superstore	1,000 Sq Ft		Avg	*	*	1.82														
866	Pet Supply Superstore	1,000 Sq Ft		Avg	*	*	3.38														
867	Office Supply Superstore	1,000 Sq Ft		Avg	*	*	3.40														
868	Book Superstore	1,000 Sq Ft		Avg	*	*	19.53														
869	Discount Home Furnishing Superstore	1,000 Sq Ft		Avg	20.00	0.57	1.57														
872	Bed and Linen Superstore	1,000 Sq Ft		Avg	*	*	2.22														
875	Department Store	1,000 Sq Ft		Avg	22.88	0.53	1.78														
876	Apparel Store	1,000 Sq Ft		Avg	66.40	1.00	3.83														
879	Arts and Crafts Store *(1)*	1,000 Sq Ft		Avg	56.55	4.65	6.21														
880	Pharmacy/Drugstore w/o Drive-Through Window	1,000 Sq Ft		Avg	90.06	3.20	8.42														
881	Pharmacy/Drugstore w/ Drive-Through Window	1,000 Sq Ft		Avg	88.16	2.66	10.35														
890	Furniture Store	1,000 Sq Ft		Avg	5.06	0.17	0.45														
896	Video Rental Store	1,000 Sq Ft		Avg	*	*	13.60														
							Totals		**121**	**135**	**61**	**60**	**66**	**69**		**121**	**135**	**61**	**60**	**66**	**69**
					55%		**Reduction**		**67**	**74**	**34**	**33**	**36**	**38**							
							Grand Total		**54**	**61**	**27**	**27**	**30**	**31**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation ***Project Name*** **3 story structure**
Trips Based on Average Rates/Equations ***Project Number***

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
710	General Office Building *(1)*	1,000 Sq Ft	40	Avg	11.01	1.55	1.49	442	62	60	55	7	10	50	442	62	60	55	7	10	50
714	Corporate Headquarters Building*(1)*	1,000 Sq Ft		Avg	7.98	1.49	1.40														
715	Single Tenant Office Building *(1)*	1,000 Sq Ft		Avg	11.57	1.80	1.73														
720	Medical-Dental Office Building	1,000 Sq Ft		Avg	36.13	2.30	3.46														
730	Government Office Building *(1)*	1,000 Sq Ft		Avg	68.93	5.88	1.21														
731	State Motor Vehicles Department	1,000 Sq Ft		Avg	166.02	9.84	17.09														
732	United States Post Office	1,000 Sq Ft		Avg	108.19	8.21	11.12														
733	Government Office Complex	1,000 Sq Ft		Avg	27.92	2.21	2.85														
750	Office Park *(1)*	1,000 Sq Ft		Avg	11.42	1.71	1.48														
760	Research and Development Center *(1)*	1,000 Sq Ft		Avg	8.11	1.22	1.07														
770	Business Park *(1)*	1,000 Sq Ft		Avg	12.76	1.43	1.29														
							Totals	**442**	**62**	**60**	**55**	**7**	**10**	**50**	**442**	**62**	**60**	**55**	**7**	**10**	**50**
					23%		**Reduction**	**102**	**14**	**14**	**13**	**2**	**2**	**12**							
							Grand Total	**340**	**48**	**46**	**42**	**5**	**8**	**39**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation ***Project Name*** **Sierra Meadows**
Trips Based on Average Rates/Equations ***Project Number***

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	43	Avg	9.57	0.75	1.01	412	32	43	8	24	27	16	412	32	43	8	24	27	16
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**412**	**32**	**43**	**8**	**24**	**27**	**16**	**412**	**32**	**43**	**8**	**24**	**27**	**16**
Notes:					14%		**Reduction**	**58**	**4**	**6**	**1**	**3**	**4**	**2**							
(1)	AM and/or PM rates correspond to peak hour of generator						**Grand Total**	**354**	**28**	**37**	**7**	**21**	**23**	**14**							

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Multi Family Units**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)		Avg	9.57	0.75	1.01														
220	Apartment	Dwelling Unit(s)	9	Avg	6.65	0.51	0.62	60	5	6	1	4	4	2	60	5	6	1	4	4	2
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**60**	**5**	**6**	**1**	**4**	**4**	**2**	**60**	**5**	**6**	**1**	**4**	**4**	**2**
					14%		**Reduction**	**8**	**1**	**1**	**0**	**1**	**1**	**0**							
							Grand Total	**52**	**4**	**5**	**1**	**3**	**3**	**2**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation | ***Project Name*** | **Professional Office**
Trips Based on Average Rates/Equations | ***Project Number***

					Trip Rates			Total Trips							Net Trips after Pass-By Reduction						
ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Daily Rate	AM Rate	PM Rate	Daily Trips	AM Trips	PM Trips	AM Trips In	AM Trips Out	PM Trips In	PM Trips Out	Daily Trips	AM Trips	PM Trips	AM Trips In	AM Trips Out	PM Trips In	PM Trips Out
710	General Office Building *(1)*	1,000 Sq Ft	0.35	Avg	11.01	1.55	1.49	4	1	1	1			1	4	1	1	1			1
714	Corporate Headquarters Building*(1)*	1,000 Sq Ft		Avg	7.98	1.49	1.40														
715	Single Tenant Office Building *(1)*	1,000 Sq Ft		Avg	11.57	1.80	1.73														
720	Medical-Dental Office Building	1,000 Sq Ft		Avg	36.13	2.30	3.46														
730	Government Office Building *(1)*	1,000 Sq Ft		Avg	68.93	5.88	1.21														
731	State Motor Vehicles Department	1,000 Sq Ft		Avg	166.02	9.84	17.09														
732	United States Post Office	1,000 Sq Ft		Avg	108.19	8.21	11.12														
733	Government Office Complex	1,000 Sq Ft		Avg	27.92	2.21	2.85														
750	Office Park *(1)*	1,000 Sq Ft		Avg	11.42	1.71	1.48														
760	Research and Development Center *(1)*	1,000 Sq Ft		Avg	8.11	1.22	1.07														
770	Business Park *(1)*	1,000 Sq Ft		Avg	12.76	1.43	1.29														
							Totals	**4**	**1**	**1**	**1**			**1**	**4**	**1**	**1**	**1**			**1**
					23%		**Reduction**	**1**	**0**	**0**	**0**			**0**							
							Grand Total	**3**	**1**	**1**	**1**			**1**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation | ***Project Name*** | **New Restaurant**
Trips Based on Average Rates/Equations | ***Project Number***

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
911	Walk-In Bank	1,000 Sq Ft		Avg	*	*	12.13														
912	Drive-In Bank	1,000 Sq Ft		Avg	148.15	12.35	25.82														
918	Hair Salon	1,000 Sq Ft		Avg	*	1.21	1.45														
920	Copy, Print and Express Ship Store	1,000 Sq Ft		Avg	*	2.78	7.41														
925	Drinking Place	1,000 Sq Ft		Avg	*	*	11.34														
931	Quality Restaurant	1,000 Sq Ft		Avg	89.95	0.81	7.49														
932	High-Turnover (Sit-Down) Restaurant	1,000 Sq Ft		Avg	127.15	11.52	11.15														
933	Fast-Food Restaurant w/o D.T.	1,000 Sq Ft	1.28	Avg	716.00	43.87	26.15	918	56	33	34	22	17	16	918	56	33	34	22	17	16
933-1	Fast-Food Restaurant w/o D.T. - Yogurt	1,000 Sq Ft		Avg	*	*	15.12														
934	Fast-Food Restaurant w/ D.T.	1,000 Sq Ft		Avg	496.12	49.35	33.84														
935	Fast-Food Restaurant w/ D.T. No Indoor Seats	1,000 Sq Ft		Avg	*	*	153.85														
936	Coffee/Donut Shop w/o D.T.	1,000 Sq Ft		Avg	*	117.23	40.57														
936-1	Donut/Ice Cream Shop w/o D.T.	1,000 Sq Ft		Avg	*	*	20.00														
936-2	Donut/Sandwich Shop w/o D.T.	1,000 Sq Ft		Avg	*	59.75	13.00														
937	Coffee/Donut Shop w/ D.T.	1,000 Sq Ft		Avg	818.58	110.75	42.93														
938	Coffee/Donut Shop w/ D.T. No Indoor Seats	1,000 Sq Ft		Avg	1800.00	303.33	75.00														
939	Bread/Donut/Bagel Shop w/o D.T.	1,000 Sq Ft		Avg	*	70.22	28.00														
940	Bread/Donut/Bagel Shop w/ D.T.	1,000 Sq Ft		Avg	*	36.92	19.56														
941	Quick Lubrication Vehicle Shop	Servicing Position(s)		Avg	40.00	3.00	5.19														
942	Automobile Care Center	1,000 Sq Ft		Avg	*	2.94	3.38														
943	Automobile Parts and Service Center	1,000 Sq Ft		Avg	*	*	4.46														
944	Gasoline/Service Station	Fueling Position(s)		Avg	168.56	12.16	13.86														
945	Gasoline Station w/ Convenience Market	Fueling Position(s)		Avg	162.78	10.16	13.38														
946	Gasoline Station w/ Conv. Mkt. & Car Wash	Fueling Position(s)		Avg	152.84	11.93	13.94														
947	Self-Service Car Wash *(1)*	Wash Stall(s)		Avg	108.00	8.00	5.54														
948	Automated Car Wash	1,000 Sq Ft		Avg	*	*	14.12														
							Totals	**918**	**56**	**33**	**34**	**22**	**17**	**16**	**918**	**56**	**33**	**34**	**22**	**17**	**16**
					49%		**Reduction**	**450**	**27**	**16**	**17**	**11**	**8**	**8**							
							Grand Total	**468**	**29**	**17**	**17**	**11**	**9**	**8**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name New Adult Classrooms
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
501	Military Base	Employee(s)		Avg	1.78	0.39	0.39														
520	Elementary School *(1)*	Student(s)		Avg	1.29	0.45	0.15														
522	Middle School/Junior High School *(1)*	Student(s)		Avg	1.62	0.54	0.16														
530	High School *(1)*	Student(s)		Avg	1.71	0.42	0.13														
534	Private School (K-8) *(1)*	Student(s)		Avg	*	0.90	0.60														
536	Private School (K-12)	Student(s)		Avg	2.48	0.81	0.17														
540	Junior/Community College	Student(s)		Avg	1.20	0.12	0.12														
540-A	Junior/Community College	1,000 Sq Ft	4.6	Avg		2.99	2.54		14	12	10	4	7	5		14	12	10	4	7	5
550	University/College	Student(s)		Avg	2.38	0.21	0.21														
560	Church	1,000 Sq Ft		Avg	9.11	0.56	0.55														
561	Synagogue	1,000 Sq Ft		Avg	10.64	0.14	1.69														
565	Day Care Center	Student(s)		Avg	4.48	0.80	0.82														
566	Cemetery	Acre(s)		Avg	4.73	0.17	0.84														
571	Prison	Bed(s)		Avg	*	0.10	0.05														
590	Library	1,000 Sq Ft		Avg	56.24	1.04	7.30														
591	Lodge/Fraternal Organization	Member(s)		Avg	0.29	0.01	0.03														
							Totals		**14**	**12**	**10**	**4**	**7**	**5**		**14**	**12**	**10**	**4**	**7**	**5**
					8%		**Reduction**		**1**	**1**	**1**	**0**	**1**	**0**							
							Grand Total		**13**	**11**	**9**	**4**	**6**	**5**							

Notes:
(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Metal Storage Building**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
110	General Light Industrial	1,000 Sq Ft		Avg	6.97	0.92	0.97														
120	General Heavy Industrial *(1)*	1,000 Sq Ft		Avg	1.50	0.51	0.68														
130	Industrial Park	1,000 Sq Ft		Avg	6.96	0.84	0.86														
140	Manufacturing	1,000 Sq Ft		Avg	3.82	0.73	0.73														
14X	Concrete Batch Plant	100 Cu Yd(s)/Day		Avg	*	4.94	2.32														
150	Warehousing	1,000 Sq Ft		Avg	3.56	0.30	0.32														
151	Mini-Warehouse	1,000 Sq Ft	4.2	Avg	2.50	0.15	0.26	12	1	1	1		1		12	1	1	1		1	
152	High-Cube Warehouse	1,000 Sq Ft		Avg	1.44	0.09	0.10														
170	Utilities	1,000 Sq Ft		Avg	*	0.80	0.76														
							Totals	**12**	**1**	**1**	**1**		**1**		**12**	**1**	**1**	**1**		**1**	
							Reduction														
							Grand Total	**12**	**1**	**1**	**1**		**1**								

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Commercial Project**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
812	Building Materials and Lumber Store	1,000 Sq Ft		Avg	45.16	2.60	4.49														
813	Free Standing Discount Superstore	1,000 Sq Ft		Avg	53.13	1.67	4.61														
814	Specialty Retail Center	1,000 Sq Ft		Avg	44.32	*	2.71														
815	Free Standing Discount Store	1,000 Sq Ft		Avg	57.24	1.06	5.00														
816	Hardware/Paint Store	1,000 Sq Ft		Avg	51.29	1.08	4.84														
817	Nursery (Garden Center)	1,000 Sq Ft		Avg	36.08	1.31	3.80														
818	Nursery (Wholesale)	1,000 Sq Ft		Avg	39.00	2.40	5.17														
820	Shopping Center	1,000 Sq Ft	6.4	Avg	42.94	1.00	3.73	276	6	24	4	2	12	12	276	6	16	4	2	8	8
823	Factory Outlet Center	1,000 Sq Ft		Avg	26.59	0.67	2.29														
841	New Car Sales	1,000 Sq Ft		Avg	33.34	2.03	2.59														
843	Automobile Parts Sales	1,000 Sq Ft		Avg	61.91	2.21	5.98														
848	Tire Store	1,000 Sq Ft		Avg	24.87	2.89	4.15														
849	Tire Superstore	1,000 Sq Ft		Avg	20.36	1.34	2.11														
850	Supermarket	1,000 Sq Ft		Avg	102.24	3.59	10.50														
851	Convenience Market (Open 24 Hours)	1,000 Sq Ft		Avg	737.99	67.03	52.41														
852	Convenience Market (Open 15-16 Hours)	1,000 Sq Ft		Avg	*	31.02	34.57														
853	Convenience Market w/ Gasoline Pumps	Fueling Position(s)		Avg	542.60	16.57	19.07														
854	Discount Supermarket	1,000 Sq Ft		Avg	96.82	2.74	8.90														
857	Discount Club	1,000 Sq Ft		Avg	41.80	0.56	4.24														
860	Wholesale Market	1,000 Sq Ft		Avg	6.73	0.51	0.88														
861	Sporting Goods Superstore	1,000 Sq Ft		Avg	*	*	3.10														
862	Home Improvement Superstore	1,000 Sq Ft		Avg	29.80	1.26	2.37														
863	Electronics Superstore	1,000 Sq Ft		Avg	45.04	0.28	4.50														
864	Toy/Children's Superstore	1,000 Sq Ft		Avg	*	*	4.99														
865	Baby Superstore	1,000 Sq Ft		Avg	*	*	1.82														
866	Pet Supply Superstore	1,000 Sq Ft		Avg	*	*	3.38														
867	Office Supply Superstore	1,000 Sq Ft		Avg	*	*	3.40														
868	Book Superstore	1,000 Sq Ft		Avg	*	*	19.53														
869	Discount Home Furnishing Superstore	1,000 Sq Ft		Avg	20.00	0.57	1.57														
872	Bed and Linen Superstore	1,000 Sq Ft		Avg	*	*	2.22														
875	Department Store	1,000 Sq Ft		Avg	22.88	0.53	1.78														
876	Apparel Store	1,000 Sq Ft		Avg	66.40	1.00	3.83														
879	Arts and Crafts Store *(1)*	1,000 Sq Ft		Avg	56.55	4.65	6.21														
880	Pharmacy/Drugstore w/o Drive-Through Window	1,000 Sq Ft		Avg	90.06	3.20	8.42														
881	Pharmacy/Drugstore w/ Drive-Through Window	1,000 Sq Ft		Avg	88.16	2.66	10.35														
890	Furniture Store	1,000 Sq Ft		Avg	5.06	0.17	0.45														
896	Video Rental Store	1,000 Sq Ft		Avg	*	*	13.60														
							Totals	**276**	**6**	**24**	**4**	**2**	**12**	**12**	**276**	**6**	**16**	**4**	**2**	**8**	**8**
					53%		**Reduction**	**146**	**3**	**13**	**2**	**1**	**6**	**6**							
							Grand Total	**130**	**3**	**11**	**2**	**1**	**6**	**6**							

Notes:

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Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name New Development
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
812	Building Materials and Lumber Store	1,000 Sq Ft		Avg	45.16	2.60	4.49														
813	Free Standing Discount Superstore	1,000 Sq Ft		Avg	53.13	1.67	4.61														
814	Specialty Retail Center	1,000 Sq Ft		Avg	44.32	*	2.71														
815	Free Standing Discount Store	1,000 Sq Ft		Avg	57.24	1.06	5.00														
816	Hardware/Paint Store	1,000 Sq Ft		Avg	51.29	1.08	4.84														
817	Nursery (Garden Center)	1,000 Sq Ft		Avg	36.08	1.31	3.80														
818	Nursery (Wholesale)	1,000 Sq Ft		Avg	39.00	2.40	5.17														
820	Shopping Center	1,000 Sq Ft	4.98	Avg	42.94	1.00	3.73	214	5	19	3	2	9	10	214	5	13	3	2	6	7
823	Factory Outlet Center	1,000 Sq Ft		Avg	26.59	0.67	2.29														
841	New Car Sales	1,000 Sq Ft		Avg	33.34	2.03	2.59														
843	Automobile Parts Sales	1,000 Sq Ft		Avg	61.91	2.21	5.98														
848	Tire Store	1,000 Sq Ft		Avg	24.87	2.89	4.15														
849	Tire Superstore	1,000 Sq Ft		Avg	20.36	1.34	2.11														
850	Supermarket	1,000 Sq Ft		Avg	102.24	3.59	10.50														
851	Convenience Market (Open 24 Hours)	1,000 Sq Ft		Avg	737.99	67.03	52.41														
852	Convenience Market (Open 15-16 Hours)	1,000 Sq Ft		Avg	*	31.02	34.57														
853	Convenience Market w/ Gasoline Pumps	Fueling Position(s)		Avg	542.60	16.57	19.07														
854	Discount Supermarket	1,000 Sq Ft		Avg	96.82	2.74	8.90														
857	Discount Club	1,000 Sq Ft		Avg	41.80	0.56	4.24														
860	Wholesale Market	1,000 Sq Ft		Avg	6.73	0.51	0.88														
861	Sporting Goods Superstore	1,000 Sq Ft		Avg	*	*	3.10														
862	Home Improvement Superstore	1,000 Sq Ft		Avg	29.80	1.26	2.37														
863	Electronics Superstore	1,000 Sq Ft		Avg	45.04	0.28	4.50														
864	Toy/Children's Superstore	1,000 Sq Ft		Avg	*	*	4.99														
865	Baby Superstore	1,000 Sq Ft		Avg	*	*	1.82														
866	Pet Supply Superstore	1,000 Sq Ft		Avg	*	*	3.38														
867	Office Supply Superstore	1,000 Sq Ft		Avg	*	*	3.40														
868	Book Superstore	1,000 Sq Ft		Avg	*	*	19.53														
869	Discount Home Furnishing Superstore	1,000 Sq Ft		Avg	20.00	0.57	1.57														
872	Bed and Linen Superstore	1,000 Sq Ft		Avg	*	*	2.22														
875	Department Store	1,000 Sq Ft		Avg	22.88	0.53	1.78														
876	Apparel Store	1,000 Sq Ft		Avg	66.40	1.00	3.83														
879	Arts and Crafts Store *(1)*	1,000 Sq Ft		Avg	56.55	4.65	6.21														
880	Pharmacy/Drugstore w/o Drive-Through Window	1,000 Sq Ft		Avg	90.06	3.20	8.42														
881	Pharmacy/Drugstore w/ Drive-Through Window	1,000 Sq Ft		Avg	88.16	2.66	10.35														
890	Furniture Store	1,000 Sq Ft		Avg	5.06	0.17	0.45														
896	Video Rental Store	1,000 Sq Ft		Avg	*	*	13.60														
							Totals	**214**	**5**	**19**	**3**	**2**	**9**	**10**	**214**	**5**	**13**	**3**	**2**	**6**	**7**
					53%		**Reduction**	**113**	**3**	**10**	**2**	**1**	**5**	**5**							
							Grand Total	**101**	**2**	**9**	**1**	**1**	**4**	**5**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

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C Includes weekday rates only
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E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
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G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Residential Development**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)		Avg	9.57	0.75	1.01														
220	Apartment	Dwelling Unit(s)	6	Avg	6.65	0.51	0.62	40	3	4	1	2	3	1	40	3	4	1	2	3	1
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**40**	**3**	**4**	**1**	**2**	**3**	**1**	**40**	**3**	**4**	**1**	**2**	**3**	**1**
					14%		**Reduction**	**6**	**0**	**1**	**0**	**0**	**0**	**0**							
							Grand Total	**34**	**3**	**3**	**1**	**2**	**3**	**1**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Storage Facility**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
110	General Light Industrial	1,000 Sq Ft		Avg	6.97	0.92	0.97														
120	General Heavy Industrial *(1)*	1,000 Sq Ft		Avg	1.50	0.51	0.68														
130	Industrial Park	1,000 Sq Ft		Avg	6.96	0.84	0.86														
140	Manufacturing	1,000 Sq Ft		Avg	3.82	0.73	0.73														
14X	Concrete Batch Plant	100 Cu Yd(s)/Day		Avg	*	4.94	2.32														
150	Warehousing	1,000 Sq Ft		Avg	3.56	0.30	0.32														
151	Mini-Warehouse	1,000 Sq Ft	133.68	Avg	2.50	0.15	0.26	336	20	35	12	8	18	17	336	20	35	12	8	18	17
152	High-Cube Warehouse	1,000 Sq Ft		Avg	1.44	0.09	0.10														
170	Utilities	1,000 Sq Ft		Avg	*	0.80	0.76														
							Totals	**336**	**20**	**35**	**12**	**8**	**18**	**17**	**336**	**20**	**35**	**12**	**8**	**18**	**17**
							Reduction														
							Grand Total	**336**	**20**	**35**	**12**	**8**	**18**	**17**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name New Office Bldg. on Dinuba
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
710	General Office Building *(1)*	1,000 Sq Ft	40.05	Avg	11.01	1.55	1.49	442	62	60	55	7	10	50	442	62	60	55	7	10	50
714	Corporate Headquarters Building*(1)*	1,000 Sq Ft		Avg	7.98	1.49	1.40														
715	Single Tenant Office Building *(1)*	1,000 Sq Ft		Avg	11.57	1.80	1.73														
720	Medical-Dental Office Building	1,000 Sq Ft		Avg	36.13	2.30	3.46														
730	Government Office Building *(1)*	1,000 Sq Ft		Avg	68.93	5.88	1.21														
731	State Motor Vehicles Department	1,000 Sq Ft		Avg	166.02	9.84	17.09														
732	United States Post Office	1,000 Sq Ft		Avg	108.19	8.21	11.12														
733	Government Office Complex	1,000 Sq Ft		Avg	27.92	2.21	2.85														
750	Office Park *(1)*	1,000 Sq Ft		Avg	11.42	1.71	1.48														
760	Research and Development Center *(1)*	1,000 Sq Ft		Avg	8.11	1.22	1.07														
770	Business Park *(1)*	1,000 Sq Ft		Avg	12.76	1.43	1.29														
							Totals	**442**	**62**	**60**	**55**	**7**	**10**	**50**	**442**	**62**	**60**	**55**	**7**	**10**	**50**
					23%		**Reduction**	**102**	**14**	**14**	**13**	**2**	**2**	**12**							
							Grand Total	**340**	**48**	**46**	**42**	**5**	**8**	**39**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Walk up food stand**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
911	Walk-In Bank	1,000 Sq Ft		Avg	*	*	12.13														
912	Drive-In Bank	1,000 Sq Ft		Avg	148.15	12.35	25.82														
918	Hair Salon	1,000 Sq Ft		Avg	*	1.21	1.45														
920	Copy, Print and Express Ship Store	1,000 Sq Ft		Avg	*	2.78	7.41														
925	Drinking Place	1,000 Sq Ft		Avg	*	*	11.34														
931	Quality Restaurant	1,000 Sq Ft		Avg	89.95	0.81	7.49														
932	High-Turnover (Sit-Down) Restaurant	1,000 Sq Ft		Avg	127.15	11.52	11.15														
933	Fast-Food Restaurant w/o D.T.	1,000 Sq Ft	0.34	Avg	716.00	43.87	26.15	244	15	9	9	6	5	4	244	15	9	9	6	5	4
933-1	Fast-Food Restaurant w/o D.T. - Yogurt	1,000 Sq Ft		Avg	*	*	15.12														
934	Fast-Food Restaurant w/ D.T.	1,000 Sq Ft		Avg	496.12	49.35	33.84														
935	Fast-Food Restaurant w/ D.T. No Indoor Seats	1,000 Sq Ft		Avg	*	*	153.85														
936	Coffee/Donut Shop w/o D.T.	1,000 Sq Ft		Avg	*	117.23	40.57														
936-1	Donut/Ice Cream Shop w/o D.T.	1,000 Sq Ft		Avg	*	*	20.00														
936-2	Donut/Sandwich Shop w/o D.T.	1,000 Sq Ft		Avg	*	59.75	13.00														
937	Coffee/Donut Shop w/ D.T.	1,000 Sq Ft		Avg	818.58	110.75	42.93														
938	Coffee/Donut Shop w/ D.T. No Indoor Seats	1,000 Sq Ft		Avg	1800.00	303.33	75.00														
939	Bread/Donut/Bagel Shop w/o D.T.	1,000 Sq Ft		Avg	*	70.22	28.00														
940	Bread/Donut/Bagel Shop w/ D.T.	1,000 Sq Ft		Avg	*	36.92	19.56														
941	Quick Lubrication Vehicle Shop	Servicing Position(s)		Avg	40.00	3.00	5.19														
942	Automobile Care Center	1,000 Sq Ft		Avg	*	2.94	3.38														
943	Automobile Parts and Service Center	1,000 Sq Ft		Avg	*	*	4.46														
944	Gasoline/Service Station	Fueling Position(s)		Avg	168.56	12.16	13.86														
945	Gasoline Station w/ Convenience Market	Fueling Position(s)		Avg	162.78	10.16	13.38														
946	Gasoline Station w/ Conv. Mkt. & Car Wash	Fueling Position(s)		Avg	152.84	11.93	13.94														
947	Self-Service Car Wash *(1)*	Wash Stall(s)		Avg	108.00	8.00	5.54														
948	Automated Car Wash	1,000 Sq Ft		Avg	*	*	14.12														
							Totals	**244**	**15**	**9**	**9**	**6**	**5**	**4**	**244**	**15**	**9**	**9**	**6**	**5**	**4**
Notes:					49%		**Reduction**	**120**	**7**	**4**	**4**	**3**	**2**	**2**							
(1)	AM and/or PM rates correspond to peak hour of generator						**Grand Total**	**124**	**8**	**5**	**5**	**3**	**3**	**2**							

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
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Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation | ***Project Name*** | **New Office Building**
Trips Based on Average Rates/Equations | ***Project Number***

					Trip Rates			Total Trips							Net Trips after Pass-By Reduction						
ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Daily Rate	AM Rate	PM Rate	Daily Trips	AM Trips	PM Trips	AM Trips In	AM Trips Out	PM Trips In	PM Trips Out	Daily Trips	AM Trips	PM Trips	AM Trips In	AM Trips Out	PM Trips In	PM Trips Out
710	General Office Building *(1)*	1,000 Sq Ft	2.94	Avg	11.01	1.55	1.49	34	5	4	4	1	1	3	34	5	4	4	1	1	3
714	Corporate Headquarters Building*(1)*	1,000 Sq Ft		Avg	7.98	1.49	1.40														
715	Single Tenant Office Building *(1)*	1,000 Sq Ft		Avg	11.57	1.80	1.73														
720	Medical-Dental Office Building	1,000 Sq Ft		Avg	36.13	2.30	3.46														
730	Government Office Building *(1)*	1,000 Sq Ft		Avg	68.93	5.88	1.21														
731	State Motor Vehicles Department	1,000 Sq Ft		Avg	166.02	9.84	17.09														
732	United States Post Office	1,000 Sq Ft		Avg	108.19	8.21	11.12														
733	Government Office Complex	1,000 Sq Ft		Avg	27.92	2.21	2.85														
750	Office Park *(1)*	1,000 Sq Ft		Avg	11.42	1.71	1.48														
760	Research and Development Center *(1)*	1,000 Sq Ft		Avg	8.11	1.22	1.07														
770	Business Park *(1)*	1,000 Sq Ft		Avg	12.76	1.43	1.29														
							Totals	**34**	**5**	**4**	**4**	**1**	**1**	**3**	**34**	**5**	**4**	**4**	**1**	**1**	**3**
					23%		**Reduction**	**8**	**1**	**1**	**1**	**0**	**0**	**1**							
							Grand Total	**26**	**4**	**3**	**3**	**1**	**1**	**2**							

Notes:

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C Includes weekday rates only
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E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
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Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name Seventh Day Adventist Church
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
501	Military Base	Employee(s)		Avg	1.78	0.39	0.39														
520	Elementary School *(1)*	Student(s)		Avg	1.29	0.45	0.15														
522	Middle School/Junior High School *(1)*	Student(s)		Avg	1.62	0.54	0.16														
530	High School *(1)*	Student(s)		Avg	1.71	0.42	0.13														
534	Private School (K-8) *(1)*	Student(s)		Avg	*	0.90	0.60														
536	Private School (K-12)	Student(s)		Avg	2.48	0.81	0.17														
540	Junior/Community College	Student(s)		Avg	1.20	0.12	0.12														
550	University/College	Student(s)		Avg	2.38	0.21	0.21														
560	Church	1,000 Sq Ft	15.83	Avg	9.11	0.56	0.55	146	9	9	6	3	4	5	146	9	9	6	3	4	5
561	Synagogue	1,000 Sq Ft		Avg	10.64	0.14	1.69														
565	Day Care Center	Student(s)		Avg	4.48	0.80	0.82														
566	Cemetery	Acre(s)		Avg	4.73	0.17	0.84														
571	Prison	Bed(s)		Avg	*	0.10	0.05														
590	Library	1,000 Sq Ft		Avg	56.24	1.04	7.30														
591	Lodge/Fraternal Organization	Member(s)		Avg	0.29	0.01	0.03														
							Totals	**146**	**9**	**9**	**6**	**3**	**4**	**5**	**146**	**9**	**9**	**6**	**3**	**4**	**5**
					36%		**Reduction**	**53**	**3**	**3**	**2**	**1**	**1**	**2**							
							Grand Total	**93**	**6**	**6**	**4**	**2**	**3**	**3**							

Notes:
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Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name Townhouses
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)		Avg	9.57	0.75	1.01														
220	Apartment	Dwelling Unit(s)	4	Avg	6.65	0.51	0.62	28	2	2		2	1	1	28	2	2		2	1	1
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**28**	**2**	**2**		**2**	**1**	**1**	**28**	**2**	**2**		**2**	**1**	**1**
					14%		**Reduction**	**4**	**0**	**0**		**0**	**0**	**0**							
							Grand Total	**24**	**2**	**2**		**2**	**1**	**1**							

Notes:
(1) AM and/or PM rates correspond to peak hour of generator

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B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
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Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Tortilla Factory**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
110	General Light Industrial	1,000 Sq Ft		Avg	6.97	0.92	0.97														
120	General Heavy Industrial *(1)*	1,000 Sq Ft		Avg	1.50	0.51	0.68														
130	Industrial Park	1,000 Sq Ft		Avg	6.96	0.84	0.86														
140	Manufacturing	1,000 Sq Ft	3.29	Avg	3.82	0.73	0.73	14	2	2	2		1	1	14	2	2	2		1	1
14X	Concrete Batch Plant	100 Cu Yd(s)/Day		Avg	*	4.94	2.32														
150	Warehousing	1,000 Sq Ft		Avg	3.56	0.30	0.32														
151	Mini-Warehouse	1,000 Sq Ft		Avg	2.50	0.15	0.26														
152	High-Cube Warehouse	1,000 Sq Ft		Avg	1.44	0.09	0.10														
170	Utilities	1,000 Sq Ft		Avg	*	0.80	0.76														
							Totals	**14**	**2**	**2**	**2**		**1**	**1**	**14**	**2**	**2**	**2**		**1**	**1**
							Reduction														
							Grand Total	**14**	**2**	**2**	**2**		**1**	**1**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Conceptual 11 unit residential**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	11	Avg	9.57	0.75	1.01	106	8	11	2	6	7	4	106	8	11	2	6	7	4
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**106**	**8**	**11**	**2**	**6**	**7**	**4**	**106**	**8**	**11**	**2**	**6**	**7**	**4**
					14%		**Reduction**	**15**	**1**	**2**	**0**	**1**	**1**	**1**							
							Grand Total	**91**	**7**	**9**	**2**	**5**	**6**	**3**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
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Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Family Life Church**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
501	Military Base	Employee(s)		Avg	1.78	0.39	0.39														
520	Elementary School *(1)*	Student(s)		Avg	1.29	0.45	0.15														
522	Middle School/Junior High School *(1)*	Student(s)		Avg	1.62	0.54	0.16														
530	High School *(1)*	Student(s)		Avg	1.71	0.42	0.13														
534	Private School (K-8) *(1)*	Student(s)		Avg	*	0.90	0.60														
536	Private School (K-12)	Student(s)		Avg	2.48	0.81	0.17														
540	Junior/Community College	Student(s)		Avg	1.20	0.12	0.12														
550	University/College	Student(s)		Avg	2.38	0.21	0.21														
560	Church	1,000 Sq Ft	4.79	Avg	9.11	0.56	0.55	44	3	3	2	1	1	2	44	3	3	2	1	1	2
561	Synagogue	1,000 Sq Ft		Avg	10.64	0.14	1.69														
565	Day Care Center	Student(s)		Avg	4.48	0.80	0.82														
566	Cemetery	Acre(s)		Avg	4.73	0.17	0.84														
571	Prison	Bed(s)		Avg	*	0.10	0.05														
590	Library	1,000 Sq Ft		Avg	56.24	1.04	7.30														
591	Lodge/Fraternal Organization	Member(s)		Avg	0.29	0.01	0.03														
							Totals	**44**	**3**	**3**	**2**	**1**	**1**	**2**	**44**	**3**	**3**	**2**	**1**	**1**	**2**
					36%		**Reduction**	**16**	**1**	**1**	**1**	**0**	**0**	**1**							
							Grand Total	**28**	**2**	**2**	**1**	**1**	**1**	**1**							

Notes:
(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Sol Road Estates**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	17	Avg	9.57	0.75	1.01	164	13	17	3	10	11	6	164	13	17	3	10	11	6
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**164**	**13**	**17**	**3**	**10**	**11**	**6**	**164**	**13**	**17**	**3**	**10**	**11**	**6**
					14%		**Reduction**	**23**	**2**	**2**	**0**	**1**	**2**	**1**							
							Grand Total	**141**	**11**	**15**	**3**	**9**	**9**	**5**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Civic Center Specific Plan**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
710	General Office Building *(1)*	1,000 Sq Ft		Avg	11.01	1.55	1.49														
714	Corporate Headquarters Building*(1)*	1,000 Sq Ft		Avg	7.98	1.49	1.40														
715	Single Tenant Office Building *(1)*	1,000 Sq Ft		Avg	11.57	1.80	1.73														
720	Medical-Dental Office Building	1,000 Sq Ft		Avg	36.13	2.30	3.46														
730	Government Office Building *(1)*	1,000 Sq Ft	44	Avg	68.93	5.88	1.21	3034	259	53	218	41	16	37	3034	259	53	218	41	16	37
731	State Motor Vehicles Department	1,000 Sq Ft		Avg	166.02	9.84	17.09														
732	United States Post Office	1,000 Sq Ft		Avg	108.19	8.21	11.12														
733	Government Office Complex	1,000 Sq Ft		Avg	27.92	2.21	2.85														
750	Office Park *(1)*	1,000 Sq Ft		Avg	11.42	1.71	1.48														
760	Research and Development Center *(1)*	1,000 Sq Ft		Avg	8.11	1.22	1.07														
770	Business Park *(1)*	1,000 Sq Ft		Avg	12.76	1.43	1.29														
							Totals	**3034**	**259**	**53**	**218**	**41**	**16**	**37**	**3034**	**259**	**53**	**218**	**41**	**16**	**37**
					50%		**Reduction**	**1517**	**130**	**27**	**109**	**21**	**8**	**19**							
							Grand Total	**1517**	**130**	**27**	**109**	**21**	**8**	**19**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **DeeLynna Ranch**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	77	Avg	9.57	0.75	1.01	738	58	78	15	43	49	29	738	58	78	15	43	49	29
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**738**	**58**	**78**	**15**	**43**	**49**	**29**	**738**	**58**	**78**	**15**	**43**	**49**	**29**
					14%		**Reduction**	**103**	**8**	**11**	**2**	**6**	**7**	**4**							
							Grand Total	**635**	**50**	**67**	**13**	**37**	**42**	**25**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
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Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Eagle Meadows No. 1**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	65	Avg	9.57	0.75	1.01	624	49	66	12	37	42	24	624	49	66	12	37	42	24
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**624**	**49**	**66**	**12**	**37**	**42**	**24**	**624**	**49**	**66**	**12**	**37**	**42**	**24**
					14%		**Reduction**	**87**	**7**	**9**	**2**	**5**	**6**	**3**							
							Grand Total	**537**	**42**	**57**	**10**	**32**	**36**	**21**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Eagle Meadows No. 2**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	86	Avg	9.57	0.75	1.01	824	65	87	16	49	55	32	824	65	87	16	49	55	32
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**824**	**65**	**87**	**16**	**49**	**55**	**32**	**824**	**65**	**87**	**16**	**49**	**55**	**32**
					14%		**Reduction**	**115**	**9**	**12**	**2**	**7**	**8**	**4**							
							Grand Total	**709**	**56**	**75**	**14**	**42**	**47**	**28**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Emerald Creek**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	40	Avg	9.57	0.75	1.01	384	30	40	8	22	25	15	384	30	40	8	22	25	15
220	Apartment	Dwelling Unit(s)	18	Avg	6.65	0.51	0.62	120	9	11	2	7	7	4	120	9	11	2	7	7	4
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**504**	**39**	**51**	**10**	**29**	**32**	**19**	**504**	**39**	**51**	**10**	**29**	**32**	**19**
					14%		**Reduction**	**71**	**5**	**7**	**1**	**4**	**4**	**3**							
							Grand Total	**433**	**34**	**44**	**9**	**25**	**28**	**16**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Feemster Lane**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	5	Avg	9.57	0.75	1.01	48	4	5	1	3	3	2	48	4	5	1	3	3	2
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**48**	**4**	**5**	**1**	**3**	**3**	**2**	**48**	**4**	**5**	**1**	**3**	**3**	**2**
					14%		**Reduction**	**7**	**1**	**1**	**0**	**0**	**0**	**0**							
							Grand Total	**41**	**3**	**4**	**1**	**3**	**3**	**2**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Four Creek Estates II**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	37	Avg	9.57	0.75	1.01	356	28	37	7	21	23	14	356	28	37	7	21	23	14
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**356**	**28**	**37**	**7**	**21**	**23**	**14**	**356**	**28**	**37**	**7**	**21**	**23**	**14**
					14%		**Reduction**	**50**	**4**	**5**	**1**	**3**	**3**	**2**							
							Grand Total	**306**	**24**	**32**	**6**	**18**	**20**	**12**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Golden Crest Estates**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	17	Avg	9.57	0.75	1.01	164	13	17	3	10	11	6	164	13	17	3	10	11	6
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**164**	**13**	**17**	**3**	**10**	**11**	**6**	**164**	**13**	**17**	**3**	**10**	**11**	**6**
					14%		**Reduction**	**23**	**2**	**2**	**0**	**1**	**2**	**1**							
							Grand Total	**141**	**11**	**15**	**3**	**9**	**9**	**5**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Graystone**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	18	Avg	9.57	0.75	1.01	174	14	18	4	10	11	7	174	14	18	4	10	11	7
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**174**	**14**	**18**	**4**	**10**	**11**	**7**	**174**	**14**	**18**	**4**	**10**	**11**	**7**
					14%		**Reduction**	**24**	**2**	**3**	**1**	**1**	**2**	**1**							
							Grand Total	**150**	**12**	**15**	**3**	**9**	**9**	**6**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Highland Park Estates**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	54	Avg	9.57	0.75	1.01	518	41	55	10	31	35	20	518	41	55	10	31	35	20
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**518**	**41**	**55**	**10**	**31**	**35**	**20**	**518**	**41**	**55**	**10**	**31**	**35**	**20**
					14%		**Reduction**	**73**	**6**	**8**	**1**	**4**	**5**	**3**							
							Grand Total	**445**	**35**	**47**	**9**	**27**	**30**	**17**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Highland Park Estates**
Project Number **at Shannon Ranch**

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	175	Avg	9.57	0.75	1.01	1676	131	177	33	98	112	65	1676	131	177	33	98	112	65
220	Apartment	Dwelling Unit(s)	173	Avg	6.65	0.51	0.62	1152	88	107	18	70	70	37	1152	88	107	18	70	70	37
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**2828**	**219**	**284**	**51**	**168**	**182**	**102**	**2828**	**219**	**284**	**51**	**168**	**182**	**102**
					14%		**Reduction**	**396**	**31**	**40**	**7**	**24**	**25**	**14**							
							Grand Total	**2432**	**188**	**244**	**44**	**144**	**157**	**88**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name La Dolce Villas
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)		Avg	9.57	0.75	1.01														
220	Apartment	Dwelling Unit(s)	11	Avg	6.65	0.51	0.62	74	6	7	1	5	5	2	74	6	7	1	5	5	2
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**74**	**6**	**7**	**1**	**5**	**5**	**2**	**74**	**6**	**7**	**1**	**5**	**5**	**2**
					14%		**Reduction**	**10**	**1**	**1**	**0**	**1**	**1**	**0**							
							Grand Total	**64**	**5**	**6**	**1**	**4**	**4**	**2**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Lance Lane Estates**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	84	Avg	9.57	0.75	1.01	804	63	85	16	47	54	31	804	63	85	16	47	54	31
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**804**	**63**	**85**	**16**	**47**	**54**	**31**	**804**	**63**	**85**	**16**	**47**	**54**	**31**
					14%		**Reduction**	**113**	**9**	**12**	**2**	**7**	**8**	**4**							
							Grand Total	**691**	**54**	**73**	**14**	**40**	**46**	**27**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name Maddox at Caldwell VI
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	148	Avg	9.57	0.75	1.01	1418	111	149	28	83	94	55	1418	111	149	28	83	94	55
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**1418**	**111**	**149**	**28**	**83**	**94**	**55**	**1418**	**111**	**149**	**28**	**83**	**94**	**55**
					14%		**Reduction**	**199**	**16**	**21**	**4**	**12**	**13**	**8**							
							Grand Total	**1219**	**95**	**128**	**24**	**71**	**81**	**47**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name Maddox at Caldwell VII
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	95	Avg	9.57	0.75	1.01	910	71	96	18	53	60	36	910	71	96	18	53	60	36
220	Apartment	Dwelling Unit(s)	40	Avg	6.65	0.51	0.62	266	20	25	4	16	16	9	266	20	25	4	16	16	9
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**1176**	**91**	**121**	**22**	**69**	**76**	**45**	**1176**	**91**	**121**	**22**	**69**	**76**	**45**
					14%		**Reduction**	**165**	**13**	**17**	**3**	**10**	**11**	**6**							
							Grand Total	**1011**	**78**	**104**	**19**	**59**	**65**	**39**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

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C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
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Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Oak Park Estates**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	57	Avg	9.57	0.75	1.01	546	43	58	11	32	37	21	546	43	58	11	32	37	21
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**546**	**43**	**58**	**11**	**32**	**37**	**21**	**546**	**43**	**58**	**11**	**32**	**37**	**21**
					14%		**Reduction**	**76**	**6**	**8**	**2**	**4**	**5**	**3**							
							Grand Total	**470**	**37**	**50**	**9**	**28**	**32**	**18**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
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C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
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Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Olive Place**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	22	Avg	9.57	0.75	1.01	212	17	22	4	13	14	8	212	17	22	4	13	14	8
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**212**	**17**	**22**	**4**	**13**	**14**	**8**	**212**	**17**	**22**	**4**	**13**	**14**	**8**
					14%		**Reduction**	**30**	**2**	**3**	**1**	**2**	**2**	**1**							
							Grand Total	**182**	**15**	**19**	**3**	**11**	**12**	**7**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Pinkham Ranch**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	28	Avg	9.57	0.75	1.01	268	21	28	5	16	18	10	268	21	28	5	16	18	10
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**268**	**21**	**28**	**5**	**16**	**18**	**10**	**268**	**21**	**28**	**5**	**16**	**18**	**10**
					14%		**Reduction**	**38**	**3**	**4**	**1**	**2**	**3**	**1**							
							Grand Total	**230**	**18**	**24**	**4**	**14**	**15**	**9**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Quail River**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	219	Avg	9.57	0.75	1.01	2096	164	221	41	123	139	82	2096	164	221	41	123	139	82
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**2096**	**164**	**221**	**41**	**123**	**139**	**82**	**2096**	**164**	**221**	**41**	**123**	**139**	**82**
					14%		**Reduction**	**293**	**23**	**31**	**6**	**17**	**19**	**11**							
							Grand Total	**1803**	**141**	**190**	**35**	**106**	**120**	**71**							

Notes:
(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name Rancho Santa Fe Estates No. 3
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	70	Avg	9.57	0.75	1.01	670	53	71	13	40	45	26	670	53	71	13	40	45	26
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**670**	**53**	**71**	**13**	**40**	**45**	**26**	**670**	**53**	**71**	**13**	**40**	**45**	**26**
					14%		**Reduction**	**94**	**7**	**10**	**2**	**6**	**6**	**4**							
							Grand Total	**576**	**46**	**61**	**11**	**34**	**39**	**22**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name River Run Ranch 5-7
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	158	Avg	9.57	0.75	1.01	1514	119	160	30	89	101	59	1514	119	160	30	89	101	59
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**1514**	**119**	**160**	**30**	**89**	**101**	**59**	**1514**	**119**	**160**	**30**	**89**	**101**	**59**
					14%		**Reduction**	**212**	**17**	**22**	**4**	**12**	**14**	**8**							
							Grand Total	**1302**	**102**	**138**	**26**	**77**	**87**	**51**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Riverbend Estates**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	111	Avg	9.57	0.75	1.01	1064	83	112	21	62	71	41	1064	83	112	21	62	71	41
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**1064**	**83**	**112**	**21**	**62**	**71**	**41**	**1064**	**83**	**112**	**21**	**62**	**71**	**41**
					14%		**Reduction**	**149**	**12**	**16**	**3**	**9**	**10**	**6**							
							Grand Total	**915**	**71**	**96**	**18**	**53**	**61**	**35**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Riverbend Village Units 6-11**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	93	Avg	9.57	0.75	1.01	892	70	94	18	52	59	35	892	70	94	18	52	59	35
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**892**	**70**	**94**	**18**	**52**	**59**	**35**	**892**	**70**	**94**	**18**	**52**	**59**	**35**
					14%		**Reduction**	**125**	**10**	**13**	**3**	**7**	**8**	**5**							
							Grand Total	**767**	**60**	**81**	**15**	**45**	**51**	**30**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Rivers Edge Unit No. 3**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	20	Avg	9.57	0.75	1.01	192	15	20	4	11	13	7	192	15	20	4	11	13	7
220	Apartment	Dwelling Unit(s)	6	Avg	6.65	0.51	0.62	40	3	4	1	2	3	1	40	3	4	1	2	3	1
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**232**	**18**	**24**	**5**	**13**	**16**	**8**	**232**	**18**	**24**	**5**	**13**	**16**	**8**
					14%		**Reduction**	**32**	**3**	**3**	**1**	**2**	**2**	**1**							
							Grand Total	**200**	**15**	**21**	**4**	**11**	**14**	**7**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Rockwood Estates**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	30	Avg	9.57	0.75	1.01	288	23	30	6	17	19	11	288	23	30	6	17	19	11
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**288**	**23**	**30**	**6**	**17**	**19**	**11**	**288**	**23**	**30**	**6**	**17**	**19**	**11**
					23%		**Reduction**	**66**	**5**	**7**	**1**	**4**	**4**	**3**							
							Grand Total	**222**	**18**	**23**	**5**	**13**	**15**	**8**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name Sequoia Heights No. 2
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	20	Avg	9.57	0.75	1.01	192	15	20	4	11	13	7	192	15	20	4	11	13	7
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**192**	**15**	**20**	**4**	**11**	**13**	**7**	**192**	**15**	**20**	**4**	**11**	**13**	**7**
					14%		**Reduction**	**27**	**2**	**3**	**1**	**2**	**2**	**1**							
							Grand Total	**165**	**13**	**17**	**3**	**9**	**11**	**6**							

Notes:
(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Shannon Ranch 3**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	471	Avg	9.57	0.75	1.01	4508	353	476	88	265	300	176	4508	353	476	88	265	300	176
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**4508**	**353**	**476**	**88**	**265**	**300**	**176**	**4508**	**353**	**476**	**88**	**265**	**300**	**176**
					14%		**Reduction**	**631**	**49**	**67**	**12**	**37**	**42**	**25**							
							Grand Total	**3877**	**304**	**409**	**76**	**228**	**258**	**151**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **South Point Estates**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	33	Avg	9.57	0.75	1.01	316	25	33	6	19	21	12	316	25	33	6	19	21	12
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**316**	**25**	**33**	**6**	**19**	**21**	**12**	**316**	**25**	**33**	**6**	**19**	**21**	**12**
					14%		**Reduction**	**44**	**4**	**5**	**1**	**3**	**3**	**2**							
							Grand Total	**272**	**22**	**28**	**5**	**16**	**18**	**10**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **St. Charles Park**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	17	Avg	9.57	0.75	1.01	164	13	17	3	10	11	6	164	13	17	3	10	11	6
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**164**	**13**	**17**	**3**	**10**	**11**	**6**	**164**	**13**	**17**	**3**	**10**	**11**	**6**
					14%		**Reduction**	**23**	**2**	**2**	**0**	**1**	**2**	**1**							
							Grand Total	**141**	**11**	**15**	**3**	**9**	**9**	**5**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name St. John's Riverwalk
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	32	Avg	9.57	0.75	1.01	308	24	32	6	18	20	12	308	24	32	6	18	20	12
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**308**	**24**	**32**	**6**	**18**	**20**	**12**	**308**	**24**	**32**	**6**	**18**	**20**	**12**
					14%		**Reduction**	**43**	**3**	**4**	**1**	**3**	**3**	**2**							
							Grand Total	**265**	**21**	**28**	**5**	**15**	**17**	**10**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Teakwood Estates**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	23	Avg	9.57	0.75	1.01	222	17	23	4	13	14	9	222	17	23	4	13	14	9
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**222**	**17**	**23**	**4**	**13**	**14**	**9**	**222**	**17**	**23**	**4**	**13**	**14**	**9**
					14%		**Reduction**	**31**	**2**	**3**	**1**	**2**	**2**	**1**							
							Grand Total	**191**	**15**	**20**	**3**	**11**	**12**	**8**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

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C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Willow Springs**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	166	Avg	9.57	0.75	1.01	1590	125	168	31	94	106	62	1590	125	168	31	94	106	62
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**1590**	**125**	**168**	**31**	**94**	**106**	**62**	**1590**	**125**	**168**	**31**	**94**	**106**	**62**
					14%		**Reduction**	**223**	**18**	**24**	**4**	**13**	**15**	**9**							
							Grand Total	**1367**	**108**	**144**	**27**	**81**	**91**	**53**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
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Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Wood Ranch**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	81	Avg	9.57	0.75	1.01	776	61	82	15	46	52	30	776	61	82	15	46	52	30
220	Apartment	Dwelling Unit(s)	38	Avg	6.65	0.51	0.62	254	19	24	4	15	16	8	254	19	24	4	15	16	8
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**1030**	**80**	**106**	**19**	**61**	**68**	**38**	**1030**	**80**	**106**	**19**	**61**	**68**	**38**
					14%		**Reduction**	**144**	**11**	**15**	**3**	**9**	**10**	**5**							
							Grand Total	**886**	**69**	**91**	**16**	**52**	**58**	**33**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
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Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Woodside Sousa Property**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)	141	Avg	9.57	0.75	1.01	1350	106	142	27	79	89	53	1350	106	142	27	79	89	53
220	Apartment	Dwelling Unit(s)		Avg	6.65	0.51	0.62														
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**1350**	**106**	**142**	**27**	**79**	**89**	**53**	**1350**	**106**	**142**	**27**	**79**	**89**	**53**
					14%		**Reduction**	**189**	**15**	**20**	**4**	**11**	**12**	**7**							
							Grand Total	**1161**	**91**	**122**	**23**	**68**	**77**	**46**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
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D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
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Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Orchard Walk**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
812	Building Materials and Lumber Store	1,000 Sq Ft		Avg	45.16	2.60	4.49														
813	Free Standing Discount Superstore	1,000 Sq Ft		Avg	53.13	1.67	4.61														
814	Specialty Retail Center	1,000 Sq Ft		Avg	44.32	*	2.71														
815	Free Standing Discount Store	1,000 Sq Ft		Avg	57.24	1.06	5.00														
816	Hardware/Paint Store	1,000 Sq Ft		Avg	51.29	1.08	4.84														
817	Nursery (Garden Center)	1,000 Sq Ft		Avg	36.08	1.31	3.80														
818	Nursery (Wholesale)	1,000 Sq Ft		Avg	39.00	2.40	5.17														
820	Shopping Center	1,000 Sq Ft	227.35	Avg	42.94	1.00	3.73	9764	227	848	138	89	416	432	9764	227	587	138	89	288	299
823	Factory Outlet Center	1,000 Sq Ft		Avg	26.59	0.67	2.29														
841	New Car Sales	1,000 Sq Ft		Avg	33.34	2.03	2.59														
843	Automobile Parts Sales	1,000 Sq Ft		Avg	61.91	2.21	5.98														
848	Tire Store	1,000 Sq Ft		Avg	24.87	2.89	4.15														
849	Tire Superstore	1,000 Sq Ft		Avg	20.36	1.34	2.11														
850	Supermarket	1,000 Sq Ft		Avg	102.24	3.59	10.50														
851	Convenience Market (Open 24 Hours)	1,000 Sq Ft		Avg	737.99	67.03	52.41														
852	Convenience Market (Open 15-16 Hours)	1,000 Sq Ft		Avg	*	31.02	34.57														
853	Convenience Market w/ Gasoline Pumps	Fueling Position(s)		Avg	542.60	16.57	19.07														
854	Discount Supermarket	1,000 Sq Ft		Avg	96.82	2.74	8.90														
857	Discount Club	1,000 Sq Ft		Avg	41.80	0.56	4.24														
860	Wholesale Market	1,000 Sq Ft		Avg	6.73	0.51	0.88														
861	Sporting Goods Superstore	1,000 Sq Ft		Avg	*	*	3.10														
862	Home Improvement Superstore	1,000 Sq Ft		Avg	29.80	1.26	2.37														
863	Electronics Superstore	1,000 Sq Ft		Avg	45.04	0.28	4.50														
864	Toy/Children's Superstore	1,000 Sq Ft		Avg	*	*	4.99														
865	Baby Superstore	1,000 Sq Ft		Avg	*	*	1.82														
866	Pet Supply Superstore	1,000 Sq Ft		Avg	*	*	3.38														
867	Office Supply Superstore	1,000 Sq Ft		Avg	*	*	3.40														
868	Book Superstore	1,000 Sq Ft		Avg	*	*	19.53														
869	Discount Home Furnishing Superstore	1,000 Sq Ft		Avg	20.00	0.57	1.57														
872	Bed and Linen Superstore	1,000 Sq Ft		Avg	*	*	2.22														
875	Department Store	1,000 Sq Ft		Avg	22.88	0.53	1.78														
876	Apparel Store	1,000 Sq Ft		Avg	66.40	1.00	3.83														
879	Arts and Crafts Store *(1)*	1,000 Sq Ft		Avg	56.55	4.65	6.21														
880	Pharmacy/Drugstore w/o Drive-Through Window	1,000 Sq Ft		Avg	90.06	3.20	8.42														
881	Pharmacy/Drugstore w/ Drive-Through Window	1,000 Sq Ft		Avg	88.16	2.66	10.35														
890	Furniture Store	1,000 Sq Ft		Avg	5.06	0.17	0.45														
896	Video Rental Store	1,000 Sq Ft		Avg	*	*	13.60														
							Totals	**9764**	**227**	**848**	**138**	**89**	**416**	**432**	**9764**	**227**	**587**	**138**	**89**	**288**	**299**
					53%		**Reduction**	**5175**	**120**	**449**	**73**	**47**	**220**	**229**							
							Grand Total	**4589**	**107**	**399**	**65**	**42**	**196**	**203**							

Notes:
(1) AM and/or PM rates correspond to peak hour of generator

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C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Joe Gong Center**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
812	Building Materials and Lumber Store	1,000 Sq Ft		Avg	45.16	2.60	4.49														
813	Free Standing Discount Superstore	1,000 Sq Ft		Avg	53.13	1.67	4.61														
814	Specialty Retail Center	1,000 Sq Ft		Avg	44.32	*	2.71														
815	Free Standing Discount Store	1,000 Sq Ft		Avg	57.24	1.06	5.00														
816	Hardware/Paint Store	1,000 Sq Ft		Avg	51.29	1.08	4.84														
817	Nursery (Garden Center)	1,000 Sq Ft		Avg	36.08	1.31	3.80														
818	Nursery (Wholesale)	1,000 Sq Ft		Avg	39.00	2.40	5.17														
820	Shopping Center	1,000 Sq Ft	33.98	Avg	42.94	1.00	3.73	1460	34	127	21	13	62	65	1460	34	84	21	13	41	43
823	Factory Outlet Center	1,000 Sq Ft		Avg	26.59	0.67	2.29														
841	New Car Sales	1,000 Sq Ft		Avg	33.34	2.03	2.59														
843	Automobile Parts Sales	1,000 Sq Ft		Avg	61.91	2.21	5.98														
848	Tire Store	1,000 Sq Ft		Avg	24.87	2.89	4.15														
849	Tire Superstore	1,000 Sq Ft		Avg	20.36	1.34	2.11														
850	Supermarket	1,000 Sq Ft		Avg	102.24	3.59	10.50														
851	Convenience Market (Open 24 Hours)	1,000 Sq Ft		Avg	737.99	67.03	52.41														
852	Convenience Market (Open 15-16 Hours)	1,000 Sq Ft		Avg	*	31.02	34.57														
853	Convenience Market w/ Gasoline Pumps	Fueling Position(s)		Avg	542.60	16.57	19.07														
854	Discount Supermarket	1,000 Sq Ft		Avg	96.82	2.74	8.90														
857	Discount Club	1,000 Sq Ft		Avg	41.80	0.56	4.24														
860	Wholesale Market	1,000 Sq Ft		Avg	6.73	0.51	0.88														
861	Sporting Goods Superstore	1,000 Sq Ft		Avg	*	*	3.10														
862	Home Improvement Superstore	1,000 Sq Ft		Avg	29.80	1.26	2.37														
863	Electronics Superstore	1,000 Sq Ft		Avg	45.04	0.28	4.50														
864	Toy/Children's Superstore	1,000 Sq Ft		Avg	*	*	4.99														
865	Baby Superstore	1,000 Sq Ft		Avg	*	*	1.82														
866	Pet Supply Superstore	1,000 Sq Ft		Avg	*	*	3.38														
867	Office Supply Superstore	1,000 Sq Ft		Avg	*	*	3.40														
868	Book Superstore	1,000 Sq Ft		Avg	*	*	19.53														
869	Discount Home Furnishing Superstore	1,000 Sq Ft		Avg	20.00	0.57	1.57														
872	Bed and Linen Superstore	1,000 Sq Ft		Avg	*	*	2.22														
875	Department Store	1,000 Sq Ft		Avg	22.88	0.53	1.78														
876	Apparel Store	1,000 Sq Ft		Avg	66.40	1.00	3.83														
879	Arts and Crafts Store *(1)*	1,000 Sq Ft		Avg	56.55	4.65	6.21														
880	Pharmacy/Drugstore w/o Drive-Through Window	1,000 Sq Ft		Avg	90.06	3.20	8.42														
881	Pharmacy/Drugstore w/ Drive-Through Window	1,000 Sq Ft		Avg	88.16	2.66	10.35														
890	Furniture Store	1,000 Sq Ft		Avg	5.06	0.17	0.45														
896	Video Rental Store	1,000 Sq Ft		Avg	*	*	13.60														
911	Walk-In Bank	1,000 Sq Ft		Avg	*	*	12.13														
912	Drive-In Bank	1,000 Sq Ft		Avg	148.15	12.35	25.82														
918	Hair Salon	1,000 Sq Ft		Avg	*	1.21	1.45														
920	Copy, Print and Express Ship Store	1,000 Sq Ft		Avg	*	2.78	7.41														
925	Drinking Place	1,000 Sq Ft		Avg	*	*	11.34														
931	Quality Restaurant	1,000 Sq Ft		Avg	89.95	0.81	7.49														
932	High-Turnover (Sit-Down) Restaurant	1,000 Sq Ft		Avg	127.15	11.52	11.15														
933	Fast-Food Restaurant w/o D.T.	1,000 Sq Ft		Avg	716.00	43.87	26.15														
933-1	Fast-Food Restaurant w/o D.T. - Yogurt	1,000 Sq Ft		Avg	*	*	15.12														
934	Fast-Food Restaurant w/ D.T.	1,000 Sq Ft	7.66	Avg	496.12	49.35	33.84	3802	378	259	193	185	135	124	3802	193	130	98	95	67	63
935	Fast-Food Restaurant w/ D.T. No Indoor Seats	1,000 Sq Ft		Avg	*	*	153.85														
936	Coffee/Donut Shop w/o D.T.	1,000 Sq Ft		Avg	*	117.23	40.57														

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name Joe Gong Center
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
936-1	Donut/Ice Cream Shop w/o D.T.	1,000 Sq Ft		Avg	*	*	20.00														
936-2	Donut/Sandwich Shop w/o D.T.	1,000 Sq Ft		Avg	*	59.75	13.00														
937	Coffee/Donut Shop w/ D.T.	1,000 Sq Ft		Avg	818.58	110.75	42.93														
938	Coffee/Donut Shop w/ D.T. No Indoor Seats	1,000 Sq Ft		Avg	1800.00	303.33	75.00														
939	Bread/Donut/Bagel Shop w/o D.T.	1,000 Sq Ft		Avg	*	70.22	28.00														
940	Bread/Donut/Bagel Shop w/ D.T.	1,000 Sq Ft		Avg	*	36.92	19.56														
941	Quick Lubrication Vehicle Shop	Servicing Position(s)		Avg	40.00	3.00	5.19														
942	Automobile Care Center	1,000 Sq Ft		Avg	*	2.94	3.38														
943	Automobile Parts and Service Center	1,000 Sq Ft		Avg	*	*	4.46														
944	Gasoline/Service Station	Fueling Position(s)		Avg	168.56	12.16	13.86														
945	Gasoline Station w/ Convenience Market	Fueling Position(s)		Avg	162.78	10.16	13.38														
946	Gasoline Station w/ Conv. Mkt. & Car Wash	Fueling Position(s)		Avg	152.84	11.93	13.94														
947	Self-Service Car Wash *(1)*	Wash Stall(s)		Avg	108.00	8.00	5.54														
948	Automated Car Wash	1,000 Sq Ft		Avg	*	*	14.12														
							Totals	**1460**	**34**	**127**	**21**	**13**	**62**	**65**	**5262**	**227**	**213**	**119**	**108**	**108**	**105**
					53%		**Reduction 1**	**774**	**18**	**67**	**11**	**7**	**33**	**34**							
							SubTotal	**686**	**16**	**60**	**10**	**6**	**29**	**31**							
							Totals	**3802**	**378**	**259**	**193**	**185**	**135**	**124**							
					49%		**Reduction 2**	**1863**	**185**	**127**	**95**	**91**	**66**	**61**							
							SubTotal	**1939**	**193**	**132**	**98**	**94**	**69**	**63**							
							Grand Total	**2625**	**209**	**192**	**108**	**100**	**98**	**94**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Packwood Creek Phase II**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
812	Building Materials and Lumber Store	1,000 Sq Ft		Avg	45.16	2.60	4.49														
813	Free Standing Discount Superstore	1,000 Sq Ft		Avg	53.13	1.67	4.61														
814	Specialty Retail Center	1,000 Sq Ft		Avg	44.32	*	2.71														
815	Free Standing Discount Store	1,000 Sq Ft		Avg	57.24	1.06	5.00														
816	Hardware/Paint Store	1,000 Sq Ft		Avg	51.29	1.08	4.84														
817	Nursery (Garden Center)	1,000 Sq Ft		Avg	36.08	1.31	3.80														
818	Nursery (Wholesale)	1,000 Sq Ft		Avg	39.00	2.40	5.17														
820	Shopping Center	1,000 Sq Ft	200	Avg	42.94	1.00	3.73	8588	200	746	122	78	366	380	8588	200	508	122	78	249	259
823	Factory Outlet Center	1,000 Sq Ft		Avg	26.59	0.67	2.29														
841	New Car Sales	1,000 Sq Ft		Avg	33.34	2.03	2.59														
843	Automobile Parts Sales	1,000 Sq Ft		Avg	61.91	2.21	5.98														
848	Tire Store	1,000 Sq Ft		Avg	24.87	2.89	4.15														
849	Tire Superstore	1,000 Sq Ft		Avg	20.36	1.34	2.11														
850	Supermarket	1,000 Sq Ft		Avg	102.24	3.59	10.50														
851	Convenience Market (Open 24 Hours)	1,000 Sq Ft		Avg	737.99	67.03	52.41														
852	Convenience Market (Open 15-16 Hours)	1,000 Sq Ft		Avg	*	31.02	34.57														
853	Convenience Market w/ Gasoline Pumps	Fueling Position(s)		Avg	542.60	16.57	19.07														
854	Discount Supermarket	1,000 Sq Ft		Avg	96.82	2.74	8.90														
857	Discount Club	1,000 Sq Ft		Avg	41.80	0.56	4.24														
860	Wholesale Market	1,000 Sq Ft		Avg	6.73	0.51	0.88														
861	Sporting Goods Superstore	1,000 Sq Ft		Avg	*	*	3.10														
862	Home Improvement Superstore	1,000 Sq Ft		Avg	29.80	1.26	2.37														
863	Electronics Superstore	1,000 Sq Ft		Avg	45.04	0.28	4.50														
864	Toy/Children's Superstore	1,000 Sq Ft		Avg	*	*	4.99														
865	Baby Superstore	1,000 Sq Ft		Avg	*	*	1.82														
866	Pet Supply Superstore	1,000 Sq Ft		Avg	*	*	3.38														
867	Office Supply Superstore	1,000 Sq Ft		Avg	*	*	3.40														
868	Book Superstore	1,000 Sq Ft		Avg	*	*	19.53														
869	Discount Home Furnishing Superstore	1,000 Sq Ft		Avg	20.00	0.57	1.57														
872	Bed and Linen Superstore	1,000 Sq Ft		Avg	*	*	2.22														
875	Department Store	1,000 Sq Ft		Avg	22.88	0.53	1.78														
876	Apparel Store	1,000 Sq Ft		Avg	66.40	1.00	3.83														
879	Arts and Crafts Store *(1)*	1,000 Sq Ft		Avg	56.55	4.65	6.21														
880	Pharmacy/Drugstore w/o Drive-Through Window	1,000 Sq Ft		Avg	90.06	3.20	8.42														
881	Pharmacy/Drugstore w/ Drive-Through Window	1,000 Sq Ft		Avg	88.16	2.66	10.35														
890	Furniture Store	1,000 Sq Ft		Avg	5.06	0.17	0.45														
896	Video Rental Store	1,000 Sq Ft		Avg	*	*	13.60														
							Totals	**8588**	**200**	**746**	**122**	**78**	**366**	**380**	**8588**	**200**	**508**	**122**	**78**	**249**	**259**
					53%		**Reduction**	**4552**	**106**	**395**	**65**	**41**	**194**	**201**							
							Grand Total	**4036**	**94**	**351**	**57**	**37**	**172**	**179**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Neighborhood Commercial Center**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
812	Building Materials and Lumber Store	1,000 Sq Ft		Avg	45.16	2.60	4.49														
813	Free Standing Discount Superstore	1,000 Sq Ft		Avg	53.13	1.67	4.61														
814	Specialty Retail Center	1,000 Sq Ft		Avg	44.32	*	2.71														
815	Free Standing Discount Store	1,000 Sq Ft		Avg	57.24	1.06	5.00														
816	Hardware/Paint Store	1,000 Sq Ft		Avg	51.29	1.08	4.84														
817	Nursery (Garden Center)	1,000 Sq Ft		Avg	36.08	1.31	3.80														
818	Nursery (Wholesale)	1,000 Sq Ft		Avg	39.00	2.40	5.17														
820	Shopping Center	1,000 Sq Ft	54.49	Avg	42.94	1.00	3.73	2340	54	203	33	21	99	104	2340	54	134	33	21	66	68
823	Factory Outlet Center	1,000 Sq Ft		Avg	26.59	0.67	2.29														
841	New Car Sales	1,000 Sq Ft		Avg	33.34	2.03	2.59														
843	Automobile Parts Sales	1,000 Sq Ft		Avg	61.91	2.21	5.98														
848	Tire Store	1,000 Sq Ft		Avg	24.87	2.89	4.15														
849	Tire Superstore	1,000 Sq Ft		Avg	20.36	1.34	2.11														
850	Supermarket	1,000 Sq Ft	13.97	Avg	102.24	3.59	10.50	1430	50	147	31	19	75	72	1430	50	94	31	19	48	46
851	Convenience Market (Open 24 Hours)	1,000 Sq Ft		Avg	737.99	67.03	52.41														
852	Convenience Market (Open 15-16 Hours)	1,000 Sq Ft		Avg	*	31.02	34.57														
853	Convenience Market w/ Gasoline Pumps	Fueling Position(s)		Avg	542.60	16.57	19.07														
854	Discount Supermarket	1,000 Sq Ft		Avg	96.82	2.74	8.90														
857	Discount Club	1,000 Sq Ft		Avg	41.80	0.56	4.24														
860	Wholesale Market	1,000 Sq Ft		Avg	6.73	0.51	0.88														
861	Sporting Goods Superstore	1,000 Sq Ft		Avg	*	*	3.10														
862	Home Improvement Superstore	1,000 Sq Ft		Avg	29.80	1.26	2.37														
863	Electronics Superstore	1,000 Sq Ft		Avg	45.04	0.28	4.50														
864	Toy/Children's Superstore	1,000 Sq Ft		Avg	*	*	4.99														
865	Baby Superstore	1,000 Sq Ft		Avg	*	*	1.82														
866	Pet Supply Superstore	1,000 Sq Ft		Avg	*	*	3.38														
867	Office Supply Superstore	1,000 Sq Ft		Avg	*	*	3.40														
868	Book Superstore	1,000 Sq Ft		Avg	*	*	19.53														
869	Discount Home Furnishing Superstore	1,000 Sq Ft		Avg	20.00	0.57	1.57														
872	Bed and Linen Superstore	1,000 Sq Ft		Avg	*	*	2.22														
875	Department Store	1,000 Sq Ft		Avg	22.88	0.53	1.78														
876	Apparel Store	1,000 Sq Ft		Avg	66.40	1.00	3.83														
879	Arts and Crafts Store *(1)*	1,000 Sq Ft		Avg	56.55	4.65	6.21														
880	Pharmacy/Drugstore w/o Drive-Through Window	1,000 Sq Ft		Avg	90.06	3.20	8.42														
881	Pharmacy/Drugstore w/ Drive-Through Window	1,000 Sq Ft		Avg	88.16	2.66	10.35														
890	Furniture Store	1,000 Sq Ft		Avg	5.06	0.17	0.45														
896	Video Rental Store	1,000 Sq Ft		Avg	*	*	13.60														
911	Walk-In Bank	1,000 Sq Ft		Avg	*	*	12.13														
912	Drive-In Bank	1,000 Sq Ft		Avg	148.15	12.35	25.82														
918	Hair Salon	1,000 Sq Ft		Avg	*	1.21	1.45														
920	Copy, Print and Express Ship Store	1,000 Sq Ft		Avg	*	2.78	7.41														
925	Drinking Place	1,000 Sq Ft		Avg	*	*	11.34														
931	Quality Restaurant	1,000 Sq Ft		Avg	89.95	0.81	7.49														
932	High-Turnover (Sit-Down) Restaurant	1,000 Sq Ft	14.08	Avg	127.15	11.52	11.15	1792	162	157	84	78	93	64	1792	162	89	84	78	53	36
933	Fast-Food Restaurant w/o D.T.	1,000 Sq Ft		Avg	716.00	43.87	26.15														
933-1	Fast-Food Restaurant w/o D.T. - Yogurt	1,000 Sq Ft		Avg	*	*	15.12														
934	Fast-Food Restaurant w/ D.T.	1,000 Sq Ft		Avg	496.12	49.35	33.84														
935	Fast-Food Restaurant w/ D.T. No Indoor Seats	1,000 Sq Ft		Avg	*	*	153.85														
936	Coffee/Donut Shop w/o D.T.	1,000 Sq Ft		Avg	*	117.23	40.57														

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Neighborhood Commercial Center**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
936-1	Donut/Ice Cream Shop w/o D.T.	1,000 Sq Ft		Avg	*	*	20.00														
936-2	Donut/Sandwich Shop w/o D.T.	1,000 Sq Ft		Avg	*	59.75	13.00														
937	Coffee/Donut Shop w/ D.T.	1,000 Sq Ft		Avg	818.58	110.75	42.93														
938	Coffee/Donut Shop w/ D.T. No Indoor Seats	1,000 Sq Ft		Avg	1800.00	303.33	75.00														
939	Bread/Donut/Bagel Shop w/o D.T.	1,000 Sq Ft		Avg	*	70.22	28.00														
940	Bread/Donut/Bagel Shop w/ D.T.	1,000 Sq Ft		Avg	*	36.92	19.56														
941	Quick Lubrication Vehicle Shop	Servicing Position(s)		Avg	40.00	3.00	5.19														
942	Automobile Care Center	1,000 Sq Ft		Avg	*	2.94	3.38														
943	Automobile Parts and Service Center	1,000 Sq Ft		Avg	*	*	4.46														
944	Gasoline/Service Station	Fueling Position(s)		Avg	168.56	12.16	13.86														
945	Gasoline Station w/ Convenience Market	Fueling Position(s)		Avg	162.78	10.16	13.38														
946	Gasoline Station w/ Conv. Mkt. & Car Wash	Fueling Position(s)		Avg	152.84	11.93	13.94														
947	Self-Service Car Wash *(1)*	Wash Stall(s)		Avg	108.00	8.00	5.54														
948	Automated Car Wash	1,000 Sq Ft		Avg	*	*	14.12														
							Totals	**2340**	**54**	**203**	**33**	**21**	**99**	**104**	**5562**	**266**	**318**	**148**	**118**	**167**	**151**
					53%		**Reduction 1**	**1240**	**29**	**108**	**17**	**11**	**52**	**55**							
							SubTotal	**1100**	**25**	**95**	**16**	**10**	**47**	**49**							
							Totals	**1430**	**50**	**147**	**31**	**19**	**75**	**72**							
					55%		**Reduction 2**	**787**	**28**	**81**	**17**	**10**	**41**	**40**							
							SubTotal	**644**	**23**	**66**	**14**	**9**	**34**	**32**							
							Totals	**1792**	**162**	**157**	**84**	**78**	**93**	**64**							
					49%		**Reduction 3**	**878**	**79**	**77**	**41**	**38**	**46**	**31**							
							SubTotal	**914**	**83**	**80**	**43**	**40**	**47**	**33**							
							Grand Total	**2657**	**131**	**242**	**72**	**58**	**128**	**114**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name Neighborhood Commercial Center
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
812	Building Materials and Lumber Store	1,000 Sq Ft		Avg	45.16	2.60	4.49														
813	Free Standing Discount Superstore	1,000 Sq Ft		Avg	53.13	1.67	4.61														
814	Specialty Retail Center	1,000 Sq Ft		Avg	44.32	*	2.71														
815	Free Standing Discount Store	1,000 Sq Ft		Avg	57.24	1.06	5.00														
816	Hardware/Paint Store	1,000 Sq Ft		Avg	51.29	1.08	4.84														
817	Nursery (Garden Center)	1,000 Sq Ft		Avg	36.08	1.31	3.80														
818	Nursery (Wholesale)	1,000 Sq Ft		Avg	39.00	2.40	5.17														
820	Shopping Center	1,000 Sq Ft	56.8	Avg	42.94	1.00	3.73	2440	57	212	35	22	104	108	2440	57	140	35	22	69	71
823	Factory Outlet Center	1,000 Sq Ft		Avg	26.59	0.67	2.29														
841	New Car Sales	1,000 Sq Ft		Avg	33.34	2.03	2.59														
843	Automobile Parts Sales	1,000 Sq Ft		Avg	61.91	2.21	5.98														
848	Tire Store	1,000 Sq Ft		Avg	24.87	2.89	4.15														
849	Tire Superstore	1,000 Sq Ft		Avg	20.36	1.34	2.11														
850	Supermarket	1,000 Sq Ft	71.12	Avg	102.24	3.59	10.50	7272	255	747	156	99	381	366	7272	255	478	156	99	244	234
851	Convenience Market (Open 24 Hours)	1,000 Sq Ft		Avg	737.99	67.03	52.41														
852	Convenience Market (Open 15-16 Hours)	1,000 Sq Ft		Avg	*	31.02	34.57														
853	Convenience Market w/ Gasoline Pumps	Fueling Position(s)		Avg	542.60	16.57	19.07														
854	Discount Supermarket	1,000 Sq Ft		Avg	96.82	2.74	8.90														
857	Discount Club	1,000 Sq Ft		Avg	41.80	0.56	4.24														
860	Wholesale Market	1,000 Sq Ft		Avg	6.73	0.51	0.88														
861	Sporting Goods Superstore	1,000 Sq Ft		Avg	*	*	3.10														
862	Home Improvement Superstore	1,000 Sq Ft		Avg	29.80	1.26	2.37														
863	Electronics Superstore	1,000 Sq Ft		Avg	45.04	0.28	4.50														
864	Toy/Children's Superstore	1,000 Sq Ft		Avg	*	*	4.99														
865	Baby Superstore	1,000 Sq Ft		Avg	*	*	1.82														
866	Pet Supply Superstore	1,000 Sq Ft		Avg	*	*	3.38														
867	Office Supply Superstore	1,000 Sq Ft		Avg	*	*	3.40														
868	Book Superstore	1,000 Sq Ft		Avg	*	*	19.53														
869	Discount Home Furnishing Superstore	1,000 Sq Ft		Avg	20.00	0.57	1.57														
872	Bed and Linen Superstore	1,000 Sq Ft		Avg	*	*	2.22														
875	Department Store	1,000 Sq Ft		Avg	22.88	0.53	1.78														
876	Apparel Store	1,000 Sq Ft		Avg	66.40	1.00	3.83														
879	Arts and Crafts Store *(1)*	1,000 Sq Ft		Avg	56.55	4.65	6.21														
880	Pharmacy/Drugstore w/o Drive-Through Window	1,000 Sq Ft		Avg	90.06	3.20	8.42														
881	Pharmacy/Drugstore w/ Drive-Through Window	1,000 Sq Ft		Avg	88.16	2.66	10.35														
890	Furniture Store	1,000 Sq Ft		Avg	5.06	0.17	0.45														
896	Video Rental Store	1,000 Sq Ft		Avg	*	*	13.60														
							Totals	**2440**	**57**	**212**	**35**	**22**	**104**	**108**	**9712**	**312**	**618**	**191**	**121**	**313**	**305**
					53%		**Reduction 1**	**1293**	**30**	**112**	**19**	**12**	**55**	**57**							
							SubTotal	**1147**	**27**	**100**	**16**	**10**	**49**	**51**							
							Totals	**7272**	**255**	**747**	**156**	**99**	**381**	**366**							
					55%		**Reduction 2**	**4000**	**140**	**411**	**86**	**54**	**210**	**201**							
							SubTotal	**3272**	**115**	**336**	**70**	**45**	**171**	**165**							
							Grand Total	**4419**	**142**	**436**	**87**	**55**	**220**	**215**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Neighborhood Center**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates			Total Trips							Net Trips after Pass-By Reduction						
					Daily Rate	AM Rate	PM Rate	Daily Trips	AM Trips	PM Trips	AM Trips In	AM Trips Out	PM Trips In	PM Trips Out	Daily Trips	AM Trips	PM Trips	AM Trips In	AM Trips Out	PM Trips In	PM Trips Out
710	General Office Building *(1)*	1,000 Sq Ft	36.03	Avg	11.01	1.55	1.49	398	56	54	49	7	9	45	398	56	54	49	7	9	45
714	Corporate Headquarters Building*(1)*	1,000 Sq Ft		Avg	7.98	1.49	1.40														
715	Single Tenant Office Building *(1)*	1,000 Sq Ft		Avg	11.57	1.80	1.73														
720	Medical-Dental Office Building	1,000 Sq Ft		Avg	36.13	2.30	3.46														
730	Government Office Building *(1)*	1,000 Sq Ft		Avg	68.93	5.88	1.21														
731	State Motor Vehicles Department	1,000 Sq Ft		Avg	166.02	9.84	17.09														
732	United States Post Office	1,000 Sq Ft		Avg	108.19	8.21	11.12														
733	Government Office Complex	1,000 Sq Ft		Avg	27.92	2.21	2.85														
750	Office Park *(1)*	1,000 Sq Ft		Avg	11.42	1.71	1.48														
760	Research and Development Center *(1)*	1,000 Sq Ft		Avg	8.11	1.22	1.07														
770	Business Park *(1)*	1,000 Sq Ft		Avg	12.76	1.43	1.29														
812	Building Materials and Lumber Store	1,000 Sq Ft		Avg	45.16	2.60	4.49														
813	Free Standing Discount Superstore	1,000 Sq Ft		Avg	53.13	1.67	4.61														
814	Specialty Retail Center	1,000 Sq Ft		Avg	44.32	*	2.71														
815	Free Standing Discount Store	1,000 Sq Ft		Avg	57.24	1.06	5.00														
816	Hardware/Paint Store	1,000 Sq Ft		Avg	51.29	1.08	4.84														
817	Nursery (Garden Center)	1,000 Sq Ft		Avg	36.08	1.31	3.80														
818	Nursery (Wholesale)	1,000 Sq Ft		Avg	39.00	2.40	5.17														
820	Shopping Center	1,000 Sq Ft	4.39	Avg	42.94	1.00	3.73	190	4	16	2	2	8	8	190	4	11	2	2	5	6
823	Factory Outlet Center	1,000 Sq Ft		Avg	26.59	0.67	2.29														
841	New Car Sales	1,000 Sq Ft		Avg	33.34	2.03	2.59														
843	Automobile Parts Sales	1,000 Sq Ft		Avg	61.91	2.21	5.98														
848	Tire Store	1,000 Sq Ft		Avg	24.87	2.89	4.15														
849	Tire Superstore	1,000 Sq Ft		Avg	20.36	1.34	2.11														
850	Supermarket	1,000 Sq Ft	13.97	Avg	102.24	3.59	10.50	1430	50	147	31	19	75	72	1430	50	94	31	19	48	46
851	Convenience Market (Open 24 Hours)	1,000 Sq Ft		Avg	737.99	67.03	52.41														
852	Convenience Market (Open 15-16 Hours)	1,000 Sq Ft		Avg	*	31.02	34.57														
853	Convenience Market w/ Gasoline Pumps	Fueling Position(s)		Avg	542.60	16.57	19.07														
854	Discount Supermarket	1,000 Sq Ft		Avg	96.82	2.74	8.90														
857	Discount Club	1,000 Sq Ft		Avg	41.80	0.56	4.24														
860	Wholesale Market	1,000 Sq Ft		Avg	6.73	0.51	0.88														
861	Sporting Goods Superstore	1,000 Sq Ft		Avg	*	*	3.10														
862	Home Improvement Superstore	1,000 Sq Ft		Avg	29.80	1.26	2.37														
863	Electronics Superstore	1,000 Sq Ft		Avg	45.04	0.28	4.50														
864	Toy/Children's Superstore	1,000 Sq Ft		Avg	*	*	4.99														
865	Baby Superstore	1,000 Sq Ft		Avg	*	*	1.82														
866	Pet Supply Superstore	1,000 Sq Ft		Avg	*	*	3.38														
867	Office Supply Superstore	1,000 Sq Ft		Avg	*	*	3.40														
868	Book Superstore	1,000 Sq Ft		Avg	*	*	19.53														
869	Discount Home Furnishing Superstore	1,000 Sq Ft		Avg	20.00	0.57	1.57														
872	Bed and Linen Superstore	1,000 Sq Ft		Avg	*	*	2.22														
875	Department Store	1,000 Sq Ft		Avg	22.88	0.53	1.78														
876	Apparel Store	1,000 Sq Ft		Avg	66.40	1.00	3.83														
879	Arts and Crafts Store *(1)*	1,000 Sq Ft		Avg	56.55	4.65	6.21														
880	Pharmacy/Drugstore w/o Drive-Through Window	1,000 Sq Ft		Avg	90.06	3.20	8.42														
881	Pharmacy/Drugstore w/ Drive-Through Window	1,000 Sq Ft		Avg	88.16	2.66	10.35														
890	Furniture Store	1,000 Sq Ft		Avg	5.06	0.17	0.45														
896	Video Rental Store	1,000 Sq Ft		Avg	*	*	13.60														
911	Walk-In Bank	1,000 Sq Ft		Avg	*	*	12.13														

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Neighborhood Center**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
912	Drive-In Bank	1,000 Sq Ft		Avg	148.15	12.35	25.82														
918	Hair Salon	1,000 Sq Ft		Avg	*	1.21	1.45														
920	Copy, Print and Express Ship Store	1,000 Sq Ft		Avg	*	2.78	7.41														
925	Drinking Place	1,000 Sq Ft		Avg	*	*	11.34														
931	Quality Restaurant	1,000 Sq Ft		Avg	89.95	0.81	7.49														
932	High-Turnover (Sit-Down) Restaurant	1,000 Sq Ft	14.08	Avg	127.15	11.52	11.15	1792	162	157	84	78	93	64	1792	162	89	84	78	53	36
933	Fast-Food Restaurant w/o D.T.	1,000 Sq Ft		Avg	716.00	43.87	26.15														
933-1	Fast-Food Restaurant w/o D.T. - Yogurt	1,000 Sq Ft		Avg	*	*	15.12														
934	Fast-Food Restaurant w/ D.T.	1,000 Sq Ft		Avg	496.12	49.35	33.84														
935	Fast-Food Restaurant w/ D.T. No Indoor Seats	1,000 Sq Ft		Avg	*	*	153.85														
936	Coffee/Donut Shop w/o D.T.	1,000 Sq Ft		Avg	*	117.23	40.57														
936-1	Donut/Ice Cream Shop w/o D.T.	1,000 Sq Ft		Avg	*	*	20.00														
936-2	Donut/Sandwich Shop w/o D.T.	1,000 Sq Ft		Avg	*	59.75	13.00														
937	Coffee/Donut Shop w/ D.T.	1,000 Sq Ft		Avg	818.58	110.75	42.93														
938	Coffee/Donut Shop w/ D.T. No Indoor Seats	1,000 Sq Ft		Avg	1800.00	303.33	75.00														
939	Bread/Donut/Bagel Shop w/o D.T.	1,000 Sq Ft		Avg	*	70.22	28.00														
940	Bread/Donut/Bagel Shop w/ D.T.	1,000 Sq Ft		Avg	*	36.92	19.56														
941	Quick Lubrication Vehicle Shop	Servicing Position(s)		Avg	40.00	3.00	5.19														
942	Automobile Care Center	1,000 Sq Ft		Avg	*	2.94	3.38														
943	Automobile Parts and Service Center	1,000 Sq Ft		Avg	*	*	4.46														
944	Gasoline/Service Station	Fueling Position(s)		Avg	168.56	12.16	13.86														
945	Gasoline Station w/ Convenience Market	Fueling Position(s)		Avg	162.78	10.16	13.38														
946	Gasoline Station w/ Conv. Mkt. & Car Wash	Fueling Position(s)		Avg	152.84	11.93	13.94														
947	Self-Service Car Wash *(1)*	Wash Stall(s)		Avg	108.00	8.00	5.54														
948	Automated Car Wash	1,000 Sq Ft		Avg	*	*	14.12														
							Totals	**190**	**4**	**16**	**2**	**2**	**8**	**8**	**3810**	**272**	**248**	**166**	**106**	**115**	**133**
					53%		**Reduction 1**	**101**	**2**	**8**	**1**	**1**	**4**	**4**							
							SubTotal	**89**	**2**	**8**	**1**	**1**	**4**	**4**							
							Totals	**1430**	**50**	**147**	**31**	**19**	**75**	**72**							
					55%		**Reduction 2**	**787**	**28**	**81**	**17**	**10**	**41**	**40**							
							SubTotal	**644**	**23**	**66**	**14**	**9**	**34**	**32**							
							Totals	**1792**	**162**	**157**	**84**	**78**	**93**	**64**							
					49%		**Reduction 3**	**878**	**79**	**77**	**41**	**38**	**46**	**31**							
							SubTotal	**914**	**83**	**80**	**43**	**40**	**47**	**33**							
							Totals	**398**	**56**	**54**	**49**	**7**	**9**	**45**							
					23%		**Reduction 3**	**92**	**13**	**12**	**11**	**2**	**2**	**10**							
							SubTotal	**306**	**43**	**42**	**38**	**5**	**7**	**35**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

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B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name New Apartment Complex
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
210	Single-Family Detached Housing	Dwelling Unit(s)		Avg	9.57	0.75	1.01														
220	Apartment	Dwelling Unit(s)	231	Avg	6.65	0.51	0.62	1538	118	143	24	94	93	50	1538	118	143	24	94	93	50
221	Low-Rise Apartment	Occ. Dwelling Unit(s)		Avg	6.59	0.46	0.58														
222	High-Rise Apartment	Dwelling Unit(s)		Avg	4.20	0.30	0.35														
223	Mid-Rise Apartment	Dwelling Unit(s)		Avg	*	0.30	0.39														
224	Rental Townhouse	Dwelling Unit(s)		Avg	*	0.70	0.72														
230	Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	5.81	0.44	0.52														
231	Low-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	*	0.67	0.78														
232	High-Rise Residential Condominium/Townhouse	Dwelling Unit(s)		Avg	4.18	0.34	0.38														
233	Luxury Condominium/Townhouse	Occ. Dwelling Unit(s)		Avg	*	0.56	0.55														
240	Mobile Home Park	Occ. Dwelling Unit(s)		Avg	4.99	0.44	0.59														
251	Senior Adult Housing-Detached	Dwelling Unit(s)		Avg	3.71	0.22	0.27														
251X-a	Senior Adult Housing (CA Pulte Dell Webb)	Dwelling Unit(s)		Avg	3.96	0.17	0.23														
252	Senior Adult Housing-Attached	Occ. Dwelling Unit(s)		Avg	3.48	0.13	0.16														
253	Congregate Care Facility	Dwelling Unit(s)		Avg	2.02	0.06	0.17														
254	Assisted Living	Bed(s)		Avg	2.66	0.14	0.22														
255	Continuing Care Retirement Community	Occupied Unit(s)		Avg	2.81	0.18	0.29														
260	Recreational Homes	Dwelling Unit(s)		Avg	3.16	0.16	0.26														
265	Timeshare	Dwelling Unit(s)		Avg	10.03	0.48	0.75														
270	Residential Planned Unit Development	Dwelling Unit(s)		Avg	7.50	0.51	0.62														
							Totals	**1538**	**118**	**143**	**24**	**94**	**93**	**50**	**1538**	**118**	**143**	**24**	**94**	**93**	**50**
					14%		**Reduction**	**215**	**17**	**20**	**3**	**13**	**13**	**7**							
							Grand Total	**1323**	**101**	**123**	**21**	**81**	**80**	**43**							

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
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Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Storage/Warehouse space**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
110	General Light Industrial	1,000 Sq Ft		Avg	6.97	0.92	0.97														
120	General Heavy Industrial *(1)*	1,000 Sq Ft		Avg	1.50	0.51	0.68														
130	Industrial Park	1,000 Sq Ft		Avg	6.96	0.84	0.86														
140	Manufacturing	1,000 Sq Ft		Avg	3.82	0.73	0.73														
14X	Concrete Batch Plant	100 Cu Yd(s)/Day		Avg	*	4.94	2.32														
150	Warehousing	1,000 Sq Ft		Avg	3.56	0.30	0.32														
151	Mini-Warehouse	1,000 Sq Ft	0.85	Avg	2.50	0.15	0.26	4							4						
152	High-Cube Warehouse	1,000 Sq Ft		Avg	1.44	0.09	0.10														
170	Utilities	1,000 Sq Ft		Avg	*	0.80	0.76														
							Totals	**4**							**4**						
							Reduction														
							Grand Total	**4**													

Notes:

(1) AM and/or PM rates correspond to peak hour of generator

A Trip generation data from ITE *Trip Generation, 8th Edition*
B AM/PM rates correspond to peak of adjacent street traffic (if data available)
C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Victory Outreach Site**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
501	Military Base	Employee(s)		Avg	1.78	0.39	0.39														
520	Elementary School *(1)*	Student(s)		Avg	1.29	0.45	0.15														
522	Middle School/Junior High School *(1)*	Student(s)		Avg	1.62	0.54	0.16														
530	High School *(1)*	Student(s)		Avg	1.71	0.42	0.13														
534	Private School (K-8) *(1)*	Student(s)		Avg	*	0.90	0.60														
536	Private School (K-12)	Student(s)		Avg	2.48	0.81	0.17														
540	Junior/Community College	Student(s)		Avg	1.20	0.12	0.12														
550	University/College	Student(s)		Avg	2.38	0.21	0.21														
560	Church	1,000 Sq Ft	17.5	Avg	9.11	0.56	0.55	160	10	10	6	4	5	5	160	10	10	6	4	5	5
561	Synagogue	1,000 Sq Ft		Avg	10.64	0.14	1.69														
565	Day Care Center	Student(s)		Avg	4.48	0.80	0.82														
566	Cemetery	Acre(s)		Avg	4.73	0.17	0.84														
571	Prison	Bed(s)		Avg	*	0.10	0.05														
590	Library	1,000 Sq Ft		Avg	56.24	1.04	7.30														
591	Lodge/Fraternal Organization	Member(s)		Avg	0.29	0.01	0.03														
							Totals	**160**	**10**	**10**	**6**	**4**	**5**	**5**	**160**	**10**	**10**	**6**	**4**	**5**	**5**
					36%		**Reduction**	**58**	**4**	**4**	**2**	**1**	**2**	**2**							
							Grand Total	**102**	**6**	**6**	**4**	**3**	**3**	**3**							

Notes:
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C Includes weekday rates only
D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
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Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Lovers Lane Offices**
Project Number

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
710	General Office Building *(1)*	1,000 Sq Ft	20	Avg	11.01	1.55	1.49	222	31	30	27	4	5	25	222	31	30	27	4	5	25
714	Corporate Headquarters Building*(1)*	1,000 Sq Ft		Avg	7.98	1.49	1.40														
715	Single Tenant Office Building *(1)*	1,000 Sq Ft		Avg	11.57	1.80	1.73														
720	Medical-Dental Office Building	1,000 Sq Ft		Avg	36.13	2.30	3.46														
730	Government Office Building *(1)*	1,000 Sq Ft		Avg	68.93	5.88	1.21														
731	State Motor Vehicles Department	1,000 Sq Ft		Avg	166.02	9.84	17.09														
732	United States Post Office	1,000 Sq Ft		Avg	108.19	8.21	11.12														
733	Government Office Complex	1,000 Sq Ft		Avg	27.92	2.21	2.85														
750	Office Park *(1)*	1,000 Sq Ft		Avg	11.42	1.71	1.48														
760	Research and Development Center *(1)*	1,000 Sq Ft		Avg	8.11	1.22	1.07														
770	Business Park *(1)*	1,000 Sq Ft		Avg	12.76	1.43	1.29														
							Totals	**222**	**31**	**30**	**27**	**4**	**5**	**25**	**222**	**31**	**30**	**27**	**4**	**5**	**25**
					23%		**Reduction**	**51**	**7**	**7**	**6**	**1**	**1**	**6**							
							Grand Total	**171**	**24**	**23**	**21**	**3**	**4**	**19**							

Notes:

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D Total trips include pass-by trips w/ no internal capture
E Pass-by rates from ITE *Trip Generation Handbook, 2nd Edition*
F Internal capture rates from ITE *Trip Generation Handbook, 2nd Edition*
G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
H Enter data only in green shaded cells

Trip Generation Planner (ITE 8th Edition)

Kimley-Horn and Associates, Inc.

Weekday Trip Generation | ***Project Name*** | Office Complex
Trips Based on Average Rates/Equations | ***Project Number***

ITE Code	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Trip Rates: Daily Rate	Trip Rates: AM Rate	Trip Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Pass-By Reduction: Daily Trips	Net Trips after Pass-By Reduction: AM Trips	Net Trips after Pass-By Reduction: PM Trips	Net Trips after Pass-By Reduction: AM Trips In	Net Trips after Pass-By Reduction: AM Trips Out	Net Trips after Pass-By Reduction: PM Trips In	Net Trips after Pass-By Reduction: PM Trips Out
710	General Office Building *(1)*	1,000 Sq Ft		Avg	11.01	1.55	1.49														
714	Corporate Headquarters Building*(1)*	1,000 Sq Ft		Avg	7.98	1.49	1.40														
715	Single Tenant Office Building *(1)*	1,000 Sq Ft		Avg	11.57	1.80	1.73														
720	Medical-Dental Office Building	1,000 Sq Ft	9.25	Avg	36.13	2.30	3.46	336	21	32	17	4	9	23	336	21	32	17	4	9	23
730	Government Office Building *(1)*	1,000 Sq Ft		Avg	68.93	5.88	1.21														
731	State Motor Vehicles Department	1,000 Sq Ft		Avg	166.02	9.84	17.09														
732	United States Post Office	1,000 Sq Ft		Avg	108.19	8.21	11.12														
733	Government Office Complex	1,000 Sq Ft		Avg	27.92	2.21	2.85														
750	Office Park *(1)*	1,000 Sq Ft		Avg	11.42	1.71	1.48														
760	Research and Development Center *(1)*	1,000 Sq Ft		Avg	8.11	1.22	1.07														
770	Business Park *(1)*	1,000 Sq Ft		Avg	12.76	1.43	1.29														
							Totals	**336**	**21**	**32**	**17**	**4**	**9**	**23**	**336**	**21**	**32**	**17**	**4**	**9**	**23**
					40%		**Reduction**	**134**	**8**	**13**	**7**	**2**	**4**	**9**							
							Grand Total	**202**	**13**	**19**	**10**	**2**	**5**	**14**							

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G Worksheet is intended as a planning tool. Verify results w/ ITE *Trip Generation, 8th Edition*
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NEAR-TERM 2010 TRAFFIC CONDITIONS (INTERSECTION, ROADWAY SEGMENT, AND FREEWAY & RAMP SEGMENTS)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor					0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt					1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)					3417	1553	1736	3471	1553	1736	3372	
Flt Permitted					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)					3417	1553	1736	3471	1553	1736	3372	
Volume (vph)	0	0	0	85	181	86	140	552	587	267	282	66
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.77	0.77	0.77	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	92	197	93	182	717	762	290	307	72
RTOR Reduction (vph)	0	0	0	0	0	70	0	0	197	0	19	0
Lane Group Flow (vph)	0	0	0	0	289	23	182	717	565	290	360	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type				Split		Perm	Prot		Perm	Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)					21.7	21.7	12.9	36.5	36.5	17.8	41.4	
Effective Green, g (s)					22.7	22.7	12.9	37.5	37.5	17.8	42.4	
Actuated g/C Ratio					0.25	0.25	0.14	0.42	0.42	0.20	0.47	
Clearance Time (s)					5.0	5.0	4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)					7.5	7.5	2.0	8.0	8.0	2.0	7.5	
Lane Grp Cap (vph)					862	392	249	1446	647	343	1589	
v/s Ratio Prot					c0.08		0.10	0.21		c0.17	0.11	
v/s Ratio Perm						0.02			c0.36			
v/c Ratio					0.34	0.06	0.73	0.50	0.87	0.85	0.23	
Uniform Delay, d1					27.5	25.5	36.9	19.3	24.1	34.8	14.1	
Progression Factor					1.01	1.16	0.75	1.32	1.81	1.00	1.00	
Incremental Delay, d2					0.7	0.2	5.4	0.7	9.5	16.5	0.3	
Delay (s)					28.6	29.9	33.1	26.3	53.1	51.3	14.4	
Level of Service					C	C	C	C	D	D	B	
Approach Delay (s)		0.0			28.9			39.3			30.4	
Approach LOS		A			C			D			C	

Intersection Summary				
HCM Average Control Delay	35.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	57.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	278	584	311	274	61	82
Peak Hour Factor	0.85	0.85	0.74	0.74	0.56	0.56
Hourly flow rate (vph)	327	687	420	370	109	146
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type					None	
Median storage veh)						
Upstream signal (ft)	799					
pX, platoon unblocked						
vC, conflicting volume			1014		1696	507
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1014		1696	507
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			37		0	71
cM capacity (veh/h)			668		30	506

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	218	796	544	247	255
Volume Left	0	0	420	0	109
Volume Right	0	687	0	0	146
cSH	1700	1700	668	1700	66
Volume to Capacity	0.13	0.47	0.63	0.15	3.88
Queue Length 95th (ft)	0	0	111	0	Err
Control Delay (s)	0.0	0.0	17.7	0.0	Err
Lane LOS			C		F
Approach Delay (s)	0.0		12.2		Err
Approach LOS					F

Intersection Summary				
Average Delay	1244.1			
Intersection Capacity Utilization	58.3%	ICU Level of Service		B
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.89		1.00	1.00	0.85	1.00	0.93		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1626		1736	1827	1553	1736	3222		1736	3296	
Flt Permitted	0.59	1.00		0.48	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1081	1626		882	1827	1553	1736	3222		1736	3296	
Volume (vph)	29	52	144	203	138	141	259	743	680	250	707	358
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.85	0.85	0.85	0.87	0.87	0.87
Adj. Flow (vph)	35	63	173	245	166	170	305	874	800	287	813	411
RTOR Reduction (vph)	0	114	0	0	0	85	0	181	0	0	67	0
Lane Group Flow (vph)	35	122	0	245	166	85	305	1493	0	287	1157	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	24.5	24.5		26.0	26.0	26.0	18.2	32.9		16.6	31.3	
Effective Green, g (s)	26.5	26.5		26.5	26.5	26.5	18.2	34.9		16.6	33.3	
Actuated g/C Ratio	0.29	0.29		0.29	0.29	0.29	0.20	0.39		0.18	0.37	
Clearance Time (s)	6.0	6.0		4.5	4.5	4.5	4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	318	479		260	538	457	351	1249		320	1220	
v/s Ratio Prot		0.07			0.09		c0.18	c0.46		0.17	0.35	
v/s Ratio Perm	0.03			c0.28		0.05						
v/c Ratio	0.11	0.25		0.94	0.31	0.19	0.87	1.20		0.90	0.95	
Uniform Delay, d1	23.2	24.2		31.0	24.6	23.7	34.7	27.6		35.9	27.5	
Progression Factor	1.04	1.08		1.00	1.00	1.00	0.87	1.23		1.00	1.00	
Incremental Delay, d2	0.1	0.2		40.1	0.3	0.2	8.9	91.1		25.9	16.1	
Delay (s)	24.1	26.3		71.1	25.0	23.9	39.0	125.1		61.7	43.6	
Level of Service	C	C		E	C	C	D	F		E	D	
Approach Delay (s)		26.0			44.1			111.8			47.0	
Approach LOS		C			D			F			D	

Intersection Summary				
HCM Average Control Delay	74.9	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.01			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	92.4%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	320	663	201	395	88	11
Peak Hour Factor	0.92	0.92	0.87	0.87	0.70	0.70
Hourly flow rate (vph)	348	721	231	454	126	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type					None	
Median storage veh)						
Upstream signal (ft)	465					
pX, platoon unblocked						
vC, conflicting volume			1068		1624	708
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1068		1624	708
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			64		0	96
cM capacity (veh/h)			645		72	431

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1068	685	141
Volume Left	0	231	126
Volume Right	721	0	16
cSH	1700	645	79
Volume to Capacity	0.63	0.36	1.79
Queue Length 95th (ft)	0	41	304
Control Delay (s)	0.0	9.0	490.5
Lane LOS		A	F
Approach Delay (s)	0.0	9.0	490.5
Approach LOS			F

Intersection Summary				
Average Delay	39.9			
Intersection Capacity Utilization	104.3%	ICU Level of Service	G	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0		4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	1.00		1.00		1.00		0.95	1.00	1.00	0.95	
Frt	1.00	0.98		1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3367	1784		1736		1553		3471	1553	1736	3471	
Flt Permitted	0.95	1.00		0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3367	1784		1736		1553		3471	1553	1736	3471	
Volume (vph)	123	129	24	78	0	412	0	744	61	98	269	0
Peak-hour factor, PHF	0.85	0.85	0.85	0.78	0.78	0.78	0.74	0.74	0.74	0.90	0.90	0.90
Adj. Flow (vph)	145	152	28	100	0	528	0	1005	82	109	299	0
RTOR Reduction (vph)	0	8	0	0	0	178	0	0	53	0	0	0
Lane Group Flow (vph)	145	172	0	100	0	350	0	1005	29	109	299	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot		custom			Perm	Prot		
Protected Phases	7	4		3		8		2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	8.0	26.0		6.4		24.4		30.8	30.8	8.8	43.6	
Effective Green, g (s)	8.0	27.0		6.4		25.4		31.8	31.8	8.8	44.6	
Actuated g/C Ratio	0.09	0.30		0.07		0.28		0.35	0.35	0.10	0.50	
Clearance Time (s)	4.0	5.0		4.0		5.0		5.0	5.0	4.0	5.0	
Vehicle Extension (s)	6.5	6.5		2.0		4.5		5.5	5.5	2.0	6.0	
Lane Grp Cap (vph)	299	535		123		438		1226	549	170	1720	
v/s Ratio Prot	0.04	0.10		c0.06		c0.23		c0.29		c0.06	0.09	
v/s Ratio Perm									0.02			
v/c Ratio	0.48	0.32		0.81		0.80		0.82	0.05	0.64	0.17	
Uniform Delay, d1	39.0	24.4		41.2		29.9		26.5	19.2	39.1	12.5	
Progression Factor	1.00	1.00		1.00		1.00		1.00	1.00	0.85	0.85	
Incremental Delay, d2	3.9	1.1		30.7		10.9		6.2	0.2	5.9	0.2	
Delay (s)	42.9	25.5		71.9		40.8		32.7	19.4	39.2	10.9	
Level of Service	D	C		E		D		C	B	D	B	
Approach Delay (s)		33.3			45.8			31.7			18.5	
Approach LOS		C			D			C			B	

Intersection Summary				
HCM Average Control Delay	33.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	61.1%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00		1.00	1.00		0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1644	3419		1644	1827	1471		1779	1471		3354	1471
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (perm)	1644	3419		1644	1827	1471		1779	1471		3354	1471
Volume (vph)	69	203	22	49	175	13	18	15	23	133	58	314
Peak-hour factor, PHF	0.86	0.86	0.86	0.84	0.84	0.84	0.93	0.93	0.93	0.76	0.76	0.76
Adj. Flow (vph)	80	236	26	58	208	15	19	16	25	175	76	413
RTOR Reduction (vph)	0	5	0	0	0	4	0	0	23	0	0	316
Lane Group Flow (vph)	80	257	0	58	208	11	0	35	2	0	251	97
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6			3			4
Actuated Green, G (s)	5.3	31.7		4.6	31.0	31.0		5.8	5.8		17.4	17.4
Effective Green, g (s)	5.0	33.0		4.3	32.3	32.3		7.0	7.0		18.6	18.6
Actuated g/C Ratio	0.06	0.42		0.05	0.41	0.41		0.09	0.09		0.24	0.24
Clearance Time (s)	3.7	5.3		3.7	5.3	5.3		5.2	5.2		5.2	5.2
Vehicle Extension (s)	2.0	5.1		2.0	4.8	4.8		6.3	6.3		7.9	7.9
Lane Grp Cap (vph)	104	1430		90	748	602		158	131		791	347
v/s Ratio Prot	c0.05	0.08		0.04	c0.11			c0.02			c0.07	
v/s Ratio Perm						0.01			0.00			0.07
v/c Ratio	0.77	0.18		0.64	0.28	0.02		0.22	0.02		0.32	0.28
Uniform Delay, d1	36.4	14.4		36.6	15.5	13.9		33.4	32.8		24.9	24.7
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	25.9	0.3		11.2	0.4	0.0		2.2	0.2		1.0	1.9
Delay (s)	62.2	14.7		47.8	15.9	13.9		35.6	33.0		25.9	26.5
Level of Service	E	B		D	B	B		D	C		C	C
Approach Delay (s)		25.8			22.4			34.5			26.3	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	25.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.32			
Actuated Cycle Length (s)	78.9	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	46.4%	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		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	233	144	35	213	22	77	3	28	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.84	0.84	0.84	0.79	0.79	0.79	0.92	0.92	0.92
Hourly flow rate (vph)	11	245	152	42	254	26	97	4	35	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		799			328							
pX, platoon unblocked	0.98			0.96			0.96	0.96	0.96	0.96	0.96	0.98
vC, conflicting volume	280			397			692	705	321	729	768	267
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	268			369			656	670	290	695	735	255
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			96			72	99	95	100	100	100
cM capacity (veh/h)	1264			1127			352	348	716	315	322	776

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	407	321	137
Volume Left	11	42	97
Volume Right	152	26	35
cSH	1264	1127	406
Volume to Capacity	0.01	0.04	0.34
Queue Length 95th (ft)	1	3	37
Control Delay (s)	0.3	1.4	18.3
Lane LOS	A	A	C
Approach Delay (s)	0.3	1.4	18.3
Approach LOS			C

Intersection Summary				
Average Delay	3.5			
Intersection Capacity Utilization	43.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1553	1736	1827	1719	1538
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1827	1553	1736	1827	1719	1538
Volume (vph)	238	23	68	236	34	44
Peak-hour factor, PHF	0.86	0.86	0.81	0.81	0.78	0.78
Adj. Flow (vph)	277	27	84	291	44	56
RTOR Reduction (vph)	0	8	0	0	0	51
Lane Group Flow (vph)	277	19	84	291	44	5
Heavy Vehicles (%)	4%	4%	4%	4%	5%	5%
Turn Type		Perm	Prot			Prot
Protected Phases	2		1	6	4	4
Permitted Phases		2				
Actuated Green, G (s)	65.2	65.2	8.2	77.4	8.6	8.6
Effective Green, g (s)	67.2	67.2	8.2	79.4	8.6	8.6
Actuated g/C Ratio	0.70	0.70	0.09	0.83	0.09	0.09
Clearance Time (s)	6.0	6.0	4.0	6.0	4.0	4.0
Vehicle Extension (s)	8.0	8.0	2.0	8.0	2.4	2.4
Lane Grp Cap (vph)	1279	1087	148	1511	154	138
v/s Ratio Prot	c0.15		c0.05	0.16	c0.03	0.00
v/s Ratio Perm		0.01				
v/c Ratio	0.22	0.02	0.57	0.19	0.29	0.04
Uniform Delay, d1	5.1	4.4	42.2	1.7	40.8	39.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.0	3.0	0.3	0.7	0.1
Delay (s)	5.5	4.4	45.2	2.0	41.5	40.0
Level of Service	A	A	D	A	D	D
Approach Delay (s)	5.4			11.7	40.7	
Approach LOS	A			B	D	

Intersection Summary			
HCM Average Control Delay	12.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	96.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	35.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	160	96	26	210	84	73
Peak Hour Factor	0.95	0.95	0.83	0.83	0.88	0.88
Hourly flow rate (vph)	168	101	31	253	95	83
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	744					
pX, platoon unblocked						
vC, conflicting volume			269		535	219
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			269		535	219
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		81	90
cM capacity (veh/h)			1283		492	818

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	269	284	178
Volume Left	0	31	95
Volume Right	101	0	83
cSH	1700	1283	604
Volume to Capacity	0.16	0.02	0.30
Queue Length 95th (ft)	0	2	31
Control Delay (s)	0.0	1.1	13.4
Lane LOS		A	B
Approach Delay (s)	0.0	1.1	13.4
Approach LOS			B

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		

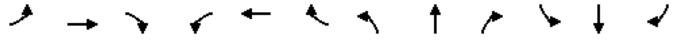
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.92		1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	1684		1736	1593		1736	3471	1553	1736	3471	1553
Flt Permitted	0.13	1.00		0.64	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	244	1684		1171	1593		1736	3471	1553	1736	3471	1553
Volume (vph)	112	50	54	47	68	397	53	793	29	248	700	160
Peak-hour factor, PHF	0.73	0.73	0.73	0.83	0.83	0.83	0.84	0.84	0.84	0.93	0.93	0.93
Adj. Flow (vph)	153	68	74	57	82	478	63	944	35	267	753	172
RTOR Reduction (vph)	0	43	0	0	233	0	0	0	15	0	0	92
Lane Group Flow (vph)	153	99	0	57	327	0	63	944	20	267	753	80
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	28.0	28.0		28.0	28.0		6.3	30.8	30.8	15.2	39.7	39.7
Effective Green, g (s)	30.0	30.0		30.0	30.0		6.3	32.8	32.8	15.2	41.7	41.7
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.07	0.36	0.36	0.17	0.46	0.46
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	5.8	5.8		5.8	5.8		1.5	5.8	5.8	1.5	5.8	5.8
Lane Grp Cap (vph)	81	561		390	531		122	1265	566	293	1608	720
v/s Ratio Prot		0.06			0.21		0.04	c0.27		c0.15	0.22	
v/s Ratio Perm	c0.63			0.05					0.01			0.05
v/c Ratio	1.89	0.18		0.15	0.62		0.52	0.75	0.04	0.91	0.47	0.11
Uniform Delay, d1	30.0	21.2		21.0	25.2		40.4	25.0	18.4	36.7	16.6	13.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.10	0.69	0.34
Incremental Delay, d2	442.7	0.4		0.5	3.5		1.5	4.0	0.1	26.8	0.8	0.3
Delay (s)	472.7	21.6		21.5	28.7		41.9	29.0	18.5	67.4	12.3	4.9
Level of Service	F	C		C	C		D	C	B	E	B	A
Approach Delay (s)		255.6			28.0			29.4			23.6	
Approach LOS		F			C			C			C	

Intersection Summary			
HCM Average Control Delay	48.2	HCM Level of Service	D
HCM Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	85.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Visalia Walmart Expansion
11: SR-198 EB Ramps @ Lovers Lane & Lovers Lane

Near-term 2010
Timing Plan: AM PEAK



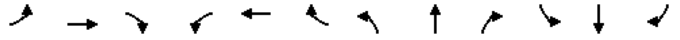
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0						4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95						0.95		1.00	0.95	
Frt	1.00	0.90						1.00		1.00	1.00	
Flt Protected	0.95	0.98						1.00		0.95	1.00	
Satd. Flow (prot)	1649	1533						3462		1736	3471	
Flt Permitted	0.95	0.98						1.00		0.95	1.00	
Satd. Flow (perm)	1649	1533						3462		1736	3471	
Volume (vph)	405	0	226	0	0	0	0	1278	24	172	881	0
Peak-hour factor, PHF	0.77	0.77	0.77	0.92	0.92	0.92	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	526	0	294	0	0	0	0	1452	27	195	1001	0
RTOR Reduction (vph)	0	86	0	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	390	344	0	0	0	0	0	1478	0	195	1001	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	22.0	22.0						41.5		13.4	58.6	
Effective Green, g (s)	22.6	22.6						42.3		13.1	59.4	
Actuated g/C Ratio	0.25	0.25						0.47		0.15	0.66	
Clearance Time (s)	4.6	4.6						4.8		3.7	4.8	
Vehicle Extension (s)	5.0	5.0						7.4		2.0	6.2	
Lane Grp Cap (vph)	414	385						1627		253	2291	
v/s Ratio Prot	c0.24	0.22						c0.43		c0.11	0.29	
v/s Ratio Perm												
v/c Ratio	0.94	0.89						0.91		0.77	0.44	
Uniform Delay, d1	33.1	32.5						22.1		37.0	7.3	
Progression Factor	1.00	1.00						0.58		1.39	0.47	
Incremental Delay, d2	30.6	23.4						4.8		6.2	0.3	
Delay (s)	63.6	55.9						17.7		57.6	3.7	
Level of Service	E	E						B		E	A	
Approach Delay (s)		59.6			0.0			17.7			12.5	
Approach LOS		E			A			B			B	

Intersection Summary				
HCM Average Control Delay	25.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.90			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	73.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Visalia Walmart Expansion
12: Tulare Ave & Ben Maddox Way

Near-term 2010
Timing Plan: AM PEAK



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	1845	1568	1752	1845	1568	1736	3471	1553	1736	3471	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1752	1845	1568	1752	1845	1568	1736	3471	1553	1736	3471	1553
Volume (vph)	102	170	37	13	222	183	55	478	17	95	218	98
Peak-hour factor, PHF	0.73	0.73	0.73	0.83	0.83	0.83	0.78	0.78	0.78	0.92	0.92	0.92
Adj. Flow (vph)	140	233	51	16	267	220	71	613	22	103	237	107
RTOR Reduction (vph)	0	0	34	0	0	155	0	0	10	0	0	64
Lane Group Flow (vph)	140	233	17	16	267	65	71	613	12	103	237	43
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	8.8	27.4	27.4	1.2	19.8	19.8	6.1	32.6	32.6	6.6	33.1	33.1
Effective Green, g (s)	8.8	28.4	28.4	1.2	20.8	20.8	6.1	33.6	33.6	6.6	34.1	34.1
Actuated g/C Ratio	0.10	0.33	0.33	0.01	0.24	0.24	0.07	0.39	0.39	0.08	0.40	0.40
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	180	611	519	25	447	380	123	1359	608	134	1380	617
v/s Ratio Prot	c0.08	0.13		0.01	c0.14		0.04	c0.18		c0.06	0.07	
v/s Ratio Perm			0.01			0.04			0.01			0.03
v/c Ratio	0.78	0.38	0.03	0.64	0.60	0.17	0.58	0.45	0.02	0.77	0.17	0.07
Uniform Delay, d1	37.5	22.0	19.4	42.1	28.8	25.7	38.6	19.3	16.0	38.9	16.7	16.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.3	0.1	0.0	35.0	1.4	0.1	4.0	1.1	0.1	20.8	0.3	0.2
Delay (s)	54.9	22.1	19.4	77.0	30.2	25.8	42.6	20.4	16.1	59.7	17.0	16.2
Level of Service	D	C	B	E	C	C	D	C	B	E	B	B
Approach Delay (s)		32.6			29.8			22.5			26.6	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	27.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	85.8	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	49.1%	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)	48	155	33	31	200	52	147	93	30	55	52	45
Peak Hour Factor	0.67	0.67	0.67	0.78	0.78	0.78	0.77	0.77	0.77	0.86	0.86	0.86
Hourly flow rate (vph)	72	231	49	40	256	67	191	121	39	64	60	52

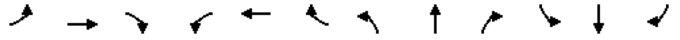
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	352	363	351	177
Volume Left (vph)	72	40	191	64
Volume Right (vph)	49	67	39	52
Hadj (s)	0.01	-0.04	0.09	-0.05
Departure Headway (s)	6.8	6.7	6.9	7.4
Degree Utilization, x	0.66	0.68	0.68	0.36
Capacity (veh/h)	489	500	476	402
Control Delay (s)	22.1	22.5	23.3	14.5
Approach Delay (s)	22.1	22.5	23.3	14.5
Approach LOS	C	C	C	B

Intersection Summary			
Delay	21.5		
HCM Level of Service	C		
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0				4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00				1.00	1.00	0.95		1.00	0.95	
Frt		0.85				0.85	1.00	1.00		1.00	0.98	
Flt Protected		1.00				1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1568				1568	1736	3462		1736	3392	
Flt Permitted		1.00				1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1568				1568	1736	3462		1736	3392	
Volume (vph)	0	0	81	0	0	24	42	783	15	21	605	108
Peak-hour factor, PHF	0.68	0.68	0.68	0.60	0.60	0.60	0.87	0.87	0.87	0.84	0.84	0.84
Adj. Flow (vph)	0	0	119	0	0	40	48	900	17	25	720	129
RTOR Reduction (vph)	0	105	0	0	0	35	0	1	0	0	17	0
Lane Group Flow (vph)	0	14	0	0	0	5	48	916	0	25	832	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		6.4				6.4	2.2	36.2		1.1	35.1	
Effective Green, g (s)		6.4				6.4	2.2	36.2		1.1	35.1	
Actuated g/C Ratio		0.11				0.11	0.04	0.65		0.02	0.63	
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)		180				180	69	2250		34	2138	
v/s Ratio Prot		c0.01					c0.03	c0.26		0.01	0.25	
v/s Ratio Perm						0.00						
v/c Ratio		0.08				0.03	0.70	0.41		0.74	0.39	
Uniform Delay, d1		22.0				21.9	26.4	4.6		27.2	5.0	
Progression Factor		1.00				1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2				0.1	26.2	0.1		57.7	0.1	
Delay (s)		22.2				21.9	52.6	4.8		84.8	5.2	
Level of Service		C				C	D	A		F	A	
Approach Delay (s)		22.2			21.9			7.1			7.4	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM Average Control Delay	8.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	55.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	40.5%	ICU Level of Service	A
Analysis Period (min)	15		

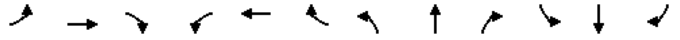
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frt	1.00	1.00			0.98			0.98				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1736	1827			1790			4939				
Flt Permitted	0.95	1.00			1.00			1.00				
Satd. Flow (perm)	1736	1827			1790			4939				
Volume (vph)	30	134	0	0	46	8	70	1053	140	0	0	0
Peak-hour factor, PHF	0.83	0.83	0.83	0.68	0.68	0.68	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	36	161	0	0	68	12	80	1197	159	0	0	0
RTOR Reduction (vph)	0	0	0	0	8	0	0	11	0	0	0	0
Lane Group Flow (vph)	36	161	0	0	72	0	0	1426	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	Prot						Perm					
Protected Phases	7	4			8			2				
Permitted Phases							2					
Actuated Green, G (s)	2.9	19.1			12.5			40.1				
Effective Green, g (s)	2.6	19.3			12.7			40.3				
Actuated g/C Ratio	0.04	0.29			0.19			0.60				
Clearance Time (s)	3.7	4.2			4.2			4.2				
Vehicle Extension (s)	2.0	7.9			7.7			6.4				
Lane Grp Cap (vph)	67	522			336			2944				
v/s Ratio Prot	c0.02	c0.09			0.04							
v/s Ratio Perm								0.29				
v/c Ratio	0.54	0.31			0.21			0.48				
Uniform Delay, d1	31.9	18.9			23.2			7.7				
Progression Factor	1.00	1.00			1.00			1.00				
Incremental Delay, d2	4.1	1.4			1.3			0.6				
Delay (s)	36.0	20.3			24.5			8.3				
Level of Service	D	C			C			A				
Approach Delay (s)		23.2			24.5			8.3			0.0	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM Average Control Delay	10.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	67.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	39.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0				
Lane Util. Factor					0.91			0.91				
Frt					0.95			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					4713			4983				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					4713			4983				
Volume (vph)	0	0	0	0	691	400	263	975	0	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.82	0.82	0.82	0.87	0.87	0.87	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	843	488	302	1121	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	29	0	0	33	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1302	0	0	1390	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type							Perm					
Protected Phases					8			2				
Permitted Phases							2					
Actuated Green, G (s)					23.4			30.5				
Effective Green, g (s)					24.0			31.1				
Actuated g/C Ratio					0.38			0.49				
Clearance Time (s)					4.6			4.6				
Vehicle Extension (s)					4.8			3.0				
Lane Grp Cap (vph)					1793			2456				
v/s Ratio Prot					c0.28							
v/s Ratio Perm								0.28				
v/c Ratio					0.73			0.57				
Uniform Delay, d1					16.7			11.3				
Progression Factor					1.00			1.00				
Incremental Delay, d2					1.8			1.0				
Delay (s)					18.5			12.2				
Level of Service					B			B				
Approach Delay (s)		0.0			18.5			12.2			0.0	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM Average Control Delay	15.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	63.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.91						0.91				
Frt		1.00						0.98				
Flt Protected		0.98						1.00				
Satd. Flow (prot)		4882						4947				
Flt Permitted		0.98						1.00				
Satd. Flow (perm)		4882						4947				
Volume (vph)	578	765	0	0	0	0	0	659	88	0	0	0
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.82	0.82	0.82	0.92	0.92	0.92
Adj. Flow (vph)	622	823	0	0	0	0	0	804	107	0	0	0
RTOR Reduction (vph)	0	38	0	0	0	0	0	33	0	0	0	0
Lane Group Flow (vph)	0	1407	0	0	0	0	0	878	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	Perm											
Protected Phases		2						8				
Permitted Phases	2											
Actuated Green, G (s)		23.2						18.2				
Effective Green, g (s)		24.6						19.3				
Actuated g/C Ratio		0.47						0.37				
Clearance Time (s)		5.4						5.1				
Vehicle Extension (s)		2.0						5.0				
Lane Grp Cap (vph)		2314						1840				
v/s Ratio Prot								c0.18				
v/s Ratio Perm		0.29										
v/c Ratio		0.61						0.48				
Uniform Delay, d1		10.1						12.4				
Progression Factor		1.00						1.00				
Incremental Delay, d2		1.2						0.4				
Delay (s)		11.3						12.9				
Level of Service		B						B				
Approach Delay (s)		11.3			0.0			12.9			0.0	
Approach LOS		B			A			B			A	

Intersection Summary				
HCM Average Control Delay	11.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	51.9	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	53.4%	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)	20	25	0	0	35	41	3	685	6	0	0	0
Peak Hour Factor	0.60	0.60	0.60	0.83	0.83	0.83	0.78	0.78	0.78	0.92	0.92	0.92
Hourly flow rate (vph)	33	42	0	0	42	49	4	878	8	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	75	92	443	447
Volume Left (vph)	33	0	4	0
Volume Right (vph)	0	49	0	8
Hadj (s)	0.12	-0.29	0.06	0.04
Departure Headway (s)	5.8	5.4	5.0	5.0
Degree Utilization, x	0.12	0.14	0.62	0.62
Capacity (veh/h)	584	628	707	709
Control Delay (s)	9.6	9.2	14.7	14.8
Approach Delay (s)	9.6	9.2	14.7	
Approach LOS	A	A	B	

Intersection Summary				
Delay	13.9			
HCM Level of Service	B			
Intersection Capacity Utilization	35.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				4988	3433	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				4988	3433	
Volume (vph)	0	0	0	524	567	0
Peak-hour factor, PHF	0.92	0.92	0.74	0.74	0.70	0.70
Adj. Flow (vph)	0	0	0	708	810	0
RTOR Reduction (vph)	0	0	0	0	169	0
Lane Group Flow (vph)	0	0	0	708	641	0
Heavy Vehicles (%)	4%	4%	4%	4%	2%	2%
Turn Type						
Protected Phases				6	4	
Permitted Phases						
Actuated Green, G (s)				12.8	14.8	
Effective Green, g (s)				13.4	16.8	
Actuated g/C Ratio				0.35	0.44	
Clearance Time (s)				4.6	6.0	
Vehicle Extension (s)				5.0	6.0	
Lane Grp Cap (vph)				1750	1510	
v/s Ratio Prot				c0.14	c0.19	
v/s Ratio Perm						
v/c Ratio				0.40	0.42	
Uniform Delay, d1				9.4	7.4	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.3	0.5	
Delay (s)				9.7	7.9	
Level of Service				A	A	
Approach Delay (s)	0.0			9.7	7.9	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	8.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	38.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	33.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	145	180	100	528	1005	82	109	299
v/c Ratio	0.48	0.33	0.68	0.87	0.80	0.13	0.64	0.17
Control Delay	44.9	23.7	64.1	31.3	34.6	6.6	52.1	12.0
Queue Delay	0.4	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	45.3	23.7	64.1	31.6	34.6	6.6	52.1	12.0
Queue Length 50th (ft)	41	75	56	156	281	0	61	56
Queue Length 95th (ft)	67	108	#98	185	#318	20	#143	96
Internal Link Dist (ft)		671			2243			378
Turn Bay Length (ft)			280				120	
Base Capacity (vph)	299	662	154	727	1256	614	177	1750
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	20	0	0	19	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.27	0.65	0.75	0.80	0.13	0.62	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	80	262	58	208	15	35	25	251	413
v/c Ratio	0.47	0.17	0.37	0.26	0.02	0.14	0.11	0.30	0.61
Control Delay	45.8	17.7	44.6	21.3	16.8	35.3	15.3	26.8	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.8	17.7	44.6	21.3	16.8	35.3	15.3	26.8	7.6
Queue Length 50th (ft)	41	47	30	80	3	17	0	58	0
Queue Length 95th (ft)	87	87	67	152	17	48	24	83	27
Internal Link Dist (ft)		179		406		179		341	
Turn Bay Length (ft)	185		150		40				110
Base Capacity (vph)	383	1511	380	799	647	557	477	1221	798
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.17	0.15	0.26	0.02	0.06	0.05	0.21	0.52

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	277	27	84	291	44	56
v/c Ratio	0.21	0.02	0.51	0.19	0.24	0.26
Control Delay	6.6	2.6	47.7	2.3	40.1	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.6	2.6	47.7	2.3	40.1	13.9
Queue Length 50th (ft)	56	0	45	29	22	0
Queue Length 95th (ft)	97	9	80	40	48	26
Internal Link Dist (ft)	248			664	309	
Turn Bay Length (ft)		125	200			
Base Capacity (vph)	1306	1118	342	1564	447	441
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.02	0.25	0.19	0.10	0.13

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	153	142	57	560	63	944	35	267	753	172
v/c Ratio	1.89	0.23	0.15	0.73	0.43	0.75	0.06	0.91	0.46	0.21
Control Delay	466.4	13.3	22.4	16.1	48.2	29.6	10.9	72.1	12.7	1.4
Queue Delay	261.3	0.0	0.0	86.6	0.0	0.3	0.0	101.2	1.0	0.7
Total Delay	727.8	13.3	22.4	102.6	48.2	29.9	10.9	173.4	13.6	2.1
Queue Length 50th (ft)	~135	30	23	99	35	246	4	151	103	0
Queue Length 95th (ft)	#198	52	47	182	68	291	22	m#254	m174	m2
Internal Link Dist (ft)		502		1058		2367			110	
Turn Bay Length (ft)	125		135		115		105	115		
Base Capacity (vph)	81	605	390	764	309	1266	581	309	1639	824
Starvation Cap Reductn	0	0	0	0	0	0	0	90	578	397
Spillback Cap Reductn	30	0	0	290	0	52	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	3.00	0.23	0.15	1.18	0.20	0.78	0.06	1.22	0.71	0.40

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

11: SR-198 EB Ramps @ Lovers Lane & Lovers Lane

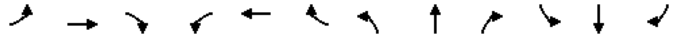
Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	390	430	1479	195	1001
v/c Ratio	0.94	0.91	0.91	0.77	0.44
Control Delay	66.9	50.3	20.5	60.8	3.8
Queue Delay	124.8	118.3	3.1	0.0	0.6
Total Delay	191.7	168.5	23.5	60.8	4.4
Queue Length 50th (ft)	229	189	158	119	49
Queue Length 95th (ft)	#315	#273	m#542	m117	m61
Internal Link Dist (ft)		366	110		269
Turn Bay Length (ft)	232			75	
Base Capacity (vph)	414	471	1629	380	2291
Starvation Cap Reductn	0	0	56	0	828
Spillback Cap Reductn	112	132	86	0	273
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.29	1.27	0.96	0.51	0.68

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

12: Tulare Ave & Ben Maddox Way



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	140	233	51	16	267	220	71	613	22	103	237	107
v/c Ratio	0.74	0.36	0.09	0.15	0.68	0.44	0.46	0.43	0.03	0.63	0.16	0.15
Control Delay	63.0	23.4	7.0	44.6	39.2	8.3	48.1	20.3	10.2	55.7	17.6	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.0	23.4	7.0	44.6	39.2	8.3	48.1	20.3	10.2	55.7	17.6	4.9
Queue Length 50th (ft)	73	89	0	8	132	7	36	123	2	53	41	0
Queue Length 95th (ft)	#131	137	17	27	190	48	71	165	15	#126	77	34
Internal Link Dist (ft)		1613			1967			1346			2243	
Turn Bay Length (ft)	95		95	90		90	155		90	200		200
Base Capacity (vph)	195	712	636	172	631	670	184	1427	648	186	1450	711
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.33	0.08	0.09	0.42	0.33	0.39	0.43	0.03	0.55	0.16	0.15

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	289	93	182	717	762	290	379
v/c Ratio	0.33	0.20	0.73	0.50	0.90	0.84	0.24
Control Delay	27.7	7.0	37.9	28.0	35.5	58.4	15.0
Queue Delay	0.0	0.0	0.0	0.0	4.6	0.0	0.0
Total Delay	27.7	7.0	37.9	28.0	40.2	58.4	15.0
Queue Length 50th (ft)	61	3	104	209	339	155	60
Queue Length 95th (ft)	m70	m8	m125	210	#366	#318	104
Internal Link Dist (ft)	719			378			1660
Turn Bay Length (ft)		275	110		40	260	
Base Capacity (vph)	1063	547	309	1443	843	345	1608
Starvation Cap Reductn	0	0	0	0	47	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.17	0.59	0.50	0.96	0.84	0.24

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	35	236	245	166	170	305	1674	287	1224
v/c Ratio	0.11	0.40	0.91	0.31	0.31	0.87	1.17	0.90	0.95
Control Delay	23.3	10.4	67.2	25.5	9.5	42.8	106.7	69.2	43.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	33.5	0.0	0.0
Total Delay	23.3	10.4	67.2	25.5	9.5	42.8	140.3	69.2	43.4
Queue Length 50th (ft)	12	24	128	70	19	176	~448	165	~379
Queue Length 95th (ft)	m18	m35	#229	110	56	m192	m#573	#309	#481
Internal Link Dist (ft)		2033		385			269		731
Turn Bay Length (ft)	145		155		25	125		170	
Base Capacity (vph)	355	634	295	589	582	368	1432	319	1288
Starvation Cap Reductn	0	0	0	0	0	0	87	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.37	0.83	0.28	0.29	0.83	1.24	0.90	0.95

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	119	40	48	917	25	849
v/c Ratio	0.28	0.10	0.33	0.39	0.18	0.39
Control Delay	1.6	0.5	22.3	5.0	20.1	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.6	0.5	22.3	5.0	20.1	5.8
Queue Length 50th (ft)	0	0	7	34	3	28
Queue Length 95th (ft)	0	0	30	105	19	86
Internal Link Dist (ft)	2570			1470		2367
Turn Bay Length (ft)			210		290	
Base Capacity (vph)	639	616	145	2341	139	2172
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.06	0.33	0.39	0.18	0.39

Intersection Summary

Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	36	161	80	1436
v/c Ratio	0.23	0.31	0.20	0.46
Control Delay	30.2	15.9	18.1	8.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	30.2	15.9	18.1	8.9
Queue Length 50th (ft)	11	40	17	83
Queue Length 95th (ft)	35	70	40	182
Internal Link Dist (ft)		608	737	568
Turn Bay Length (ft)				
Base Capacity (vph)	436	956	615	3105
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.08	0.17	0.13	0.46

Intersection Summary

Lane Group	WBT	NBT
Lane Group Flow (vph)	1331	1423
v/c Ratio	0.73	0.57
Control Delay	18.8	12.2
Queue Delay	0.3	0.0
Total Delay	19.1	12.2
Queue Length 50th (ft)	149	132
Queue Length 95th (ft)	170	165
Internal Link Dist (ft)	265	310
Turn Bay Length (ft)		
Base Capacity (vph)	1913	2487
Starvation Cap Reductn	149	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.75	0.57

Intersection Summary

Lane Group	EBT	NBT
Lane Group Flow (vph)	1445	911
v/c Ratio	0.62	0.49
Control Delay	11.3	12.6
Queue Delay	0.0	0.0
Total Delay	11.3	12.6
Queue Length 50th (ft)	113	70
Queue Length 95th (ft)	153	87
Internal Link Dist (ft)	4045	445
Turn Bay Length (ft)		
Base Capacity (vph)	2348	1978
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.62	0.46

Intersection Summary

Lane Group	WBT	NWL
Lane Group Flow (vph)	708	810
v/c Ratio	0.41	0.48
Control Delay	10.8	5.8
Queue Delay	0.0	0.0
Total Delay	10.8	5.8
Queue Length 50th (ft)	38	31
Queue Length 95th (ft)	61	45
Internal Link Dist (ft)	3590	140
Turn Bay Length (ft)		
Base Capacity (vph)	2775	2023
Starvation Cap Reductn	0	0
Spillback Cap Reductn	21	5
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.26	0.40

Intersection Summary

Kimley-Horn and Associates, Inc.

Visalia Walmart Roadway Network Capacity

Near-term 2010 Conditions
AM Peak

ROADWAY	FROM	TO	Length (Miles)	Area Type (U/T/R)	Functional Class	# of Lanes	Div/Undiv (D/U)	Left-turn Bays (Y/N)	POSTED SPEED	Sig/Mile	Code	Notes	Generalized Service Volumes							
													Code	A	B	C	D	E	Two-Way Vol	LOS
Mineral King Avenue	Ben Maddox Way	SR-198 WB Ramps (B	0.15	U	Arterial	4	U	N	40	3.50	U-NS2-4	adjusted volumes by -25%	U-NS2-4	0	0	2178	2898	3060	901	C
Mineral King Avenue	SR-198 WB Ramps (B	Lovers Lane	0.84	U	Arterial	2	U	Y	40	1.50	U-NS1-2		U-NS1-2	0	837	1350	1440	0	963	C
Noble Avenue	Ben Maddox Way	SR-198 EB Ramps	0.16	U	Arterial	2	U	Y	35	4.00	U-NS2-2		U-NS2-2	0	0	918	1332	1413	790	C
Noble Avenue	East Driveway	Pinkham Street	0.14	U	Arterial	2	U	Y	35	2.50	U-NS2-2		U-NS2-2	0	0	918	1332	1413	542	C
Noble Avenue	Pinkham Street	Lovers Lane	0.50	U	Arterial	2	U	Y	45	2.00	U-NS2-2		U-NS2-2	0	0	918	1332	1413	483	C
Ben Maddox Way	Noble Avenue	Tulare Avenue	0.44	U	Arterial	4	D	Y	40	2.00	U-NS2-4		U-NS2-4	0	0	2178	2898	3060	1,175	C
Pinkham Street	Noble Avenue	Tulare Avenue	0.44	U	Arterial	2	U	N	40	0	U-OS1-2	adjusted volumes by -20%	U-OS1-2	0	605	975	1040	0	250	B
Lovers Lane	Noble Avenue	Tulare Avenue	0.47	U	Arterial	4	D	Y	45	3.00	U-NS2-4		U-NS2-4	0	0	2178	2898	3060	1,609	C
Tulare Avenue	Ben Maddox Way	Pinkham Street	0.39	U	Arterial	2	U	Y	40	0.61	U-OS1-2		U-OS1-2	0	605	975	1040	0	664	C
Tulare Avenue	Pinkham Street	Lovers Lane	0.48	U	Arterial	2	U	N	40	0.82	U-OS1-2	adjusted volumes by -20%	U-OS1-2	0	605	975	1040	0	302	B

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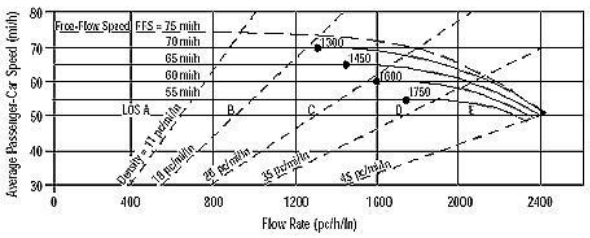

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	B/W Ben Maddox Way & Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2010
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	1644 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	954	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	15.3	pc/mi/ln	S		mi/h
LOS	B		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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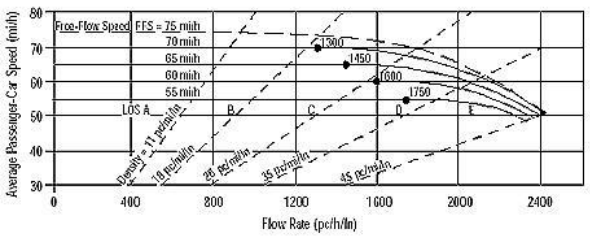

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	E/O Lovers Ln.
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2010
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	1210 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	0.56	I/mi	f_{ID}	0.3	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	65.2	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	706	pc/h/ln	Design LOS		
S	65.2	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	10.8	pc/mi/ln	S		mi/h
LOS	A		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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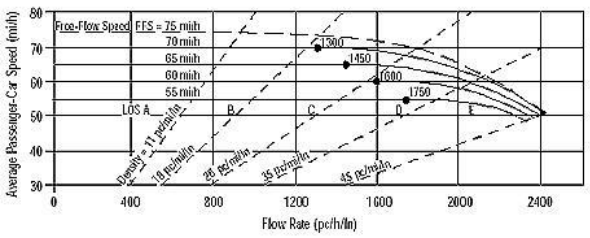

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	W/O S. Ben Maddox Way
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2010
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2052 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1191	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	19.0	pc/mi/ln	S		mi/h
LOS	C		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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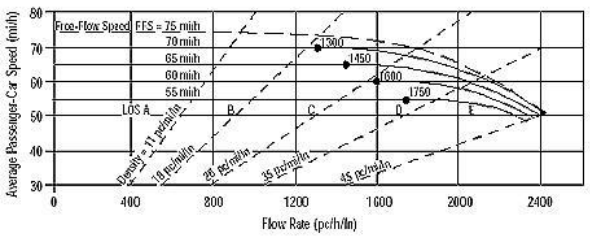
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	B/W Ben Maddox Way & Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2010
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2187 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1270	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	20.3	pc/mi/ln	S		mi/h
LOS	C		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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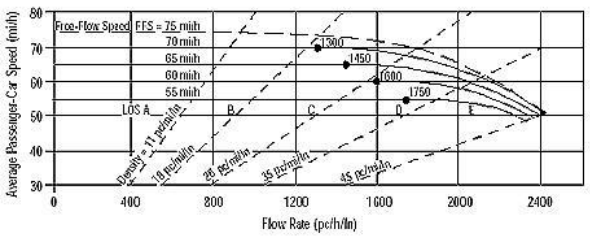
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	E/O Lovers Ln.
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2010
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	1422 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	0.56	I/mi	f_{ID}	0.3	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	65.2	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	830	pc/h/ln	Design LOS		
S	65.2	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	12.7	pc/mi/ln	S		mi/h
LOS	B		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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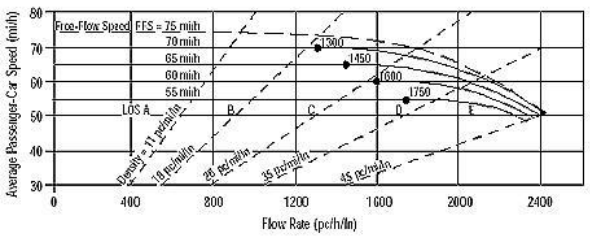
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	W/O S. Ben Maddox Way
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2010
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2939 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1706	pc/h/ln	Design LOS		
S	62.3	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	27.4	pc/mi/ln	S		mi/h
LOS	D		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2010

Project Description

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 2500 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = 296 veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	2052	0.90	Level	9	0	0.957	1.00	2383
Ramp	505	0.90	Level	4	0	0.980	1.00	572
UpStream	296	0.90	Level	2	0	0.990	1.00	332
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 2383 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	2383	4800	No
				V_{12}	2383	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	1811	4800	No
				V_R	572	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A	D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D
D_R = (pc/ mi /ln)	D_R = 23.2 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= C (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.479 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 56.6 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 56.6 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2010

Project Description

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 2600 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = 97 veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	1644	0.90	Level	9	0	0.957	1.00	1909
Ramp	630	0.90	Level	4	0	0.980	1.00	714
UpStream	97	0.90	Level	2	0	0.990	1.00	109
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 1909 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	1909	4800	No
				V_{12}	1909	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	1195	4800	No
				V_R	714	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A	D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D
D_R = (pc/ mi /ln)	D_R = 18.0 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= B (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.492 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 56.2 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 56.2 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2010

Project Description

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off
L_{up} = 3400 ft
Vu = 864 veh/h

Terrain Level
S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off
L_{down} = ft
VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	2187	0.90	Level	9	0	0.957	1.00	2539
Ramp	143	0.90	Level	4	0	0.980	1.00	162
UpStream	864	0.90	Level	2	0	0.990	1.00	970
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 25-2 or 25-3)
P_{FM}= using Equation
V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$
D_R = (pc/ mi /ln)
LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} =1.000 using Equation 0
V_{12} = 2539 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$	2539	4800	No
V_{12}	2539	4400:All	No
$V_{FO} = V_F - V_R$	2377	4800	No
V_R	162	2000	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$
D_R = 23.6 (pc/ mi /ln)
LOS= C (Exhibit 25-4)

Speed Estimation

D_s = 0.443 (Exhibit 25-19)
S_R= 57.6 mph (Exhibit 25-19)
S_0= N/A mph (Exhibit 25-19)
S = 57.6 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET Page 1 of 1

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2010

Project Description

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☐ No ☐ Off
L_{up} = ft
Vu = veh/h

Terrain
S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☐ No ☐ Off
L_{down} = ft
VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	1422	0.90	Level	9	0	0.957	1.00	1651
Ramp	99	0.90	Level	4	0	0.980	1.00	112
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 25-2 or 25-3)
P_{FM}= using Equation
V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$
D_R = (pc/ mi /ln)
LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} =1.000 using Equation 0
V_{12} = 1651 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$	1651	4800	No
V_{12}	1651	4400:All	No
$V_{FO} = V_F - V_R$	1539	4800	No
V_R	112	2000	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$
D_R = 16.4 (pc/ mi /ln)
LOS= B (Exhibit 25-4)

Speed Estimation

D_s = 0.438 (Exhibit 25-19)
S_R= 57.7 mph (Exhibit 25-19)
S_0= N/A mph (Exhibit 25-19)
S = 57.7 mph (Exhibit 25-15)

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor					0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt					1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)					3455	1583	1770	3539	1583	1770	3486	
Flt Permitted					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)					3455	1583	1770	3539	1583	1770	3486	
Volume (vph)	0	0	0	170	180	108	145	676	418	247	563	63
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.94	0.86	0.86	0.86
Adj. Flow (vph)	0	0	0	185	196	117	154	719	445	287	655	73
RTOR Reduction (vph)	0	0	0	0	0	84	0	0	117	0	8	0
Lane Group Flow (vph)	0	0	0	0	381	33	154	719	328	287	720	0
Turn Type				Split		Perm	Prot		Perm	Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)					24.5	24.5	11.5	35.4	35.4	16.1	40.0	
Effective Green, g (s)					25.5	25.5	11.5	36.4	36.4	16.1	41.0	
Actuated g/C Ratio					0.28	0.28	0.13	0.40	0.40	0.18	0.46	
Clearance Time (s)					5.0	5.0	4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)					7.5	7.5	2.0	8.0	8.0	2.0	7.5	
Lane Grp Cap (vph)					979	449	226	1431	640	317	1588	
v/s Ratio Prot					c0.11		0.09	0.20		c0.16	0.21	
v/s Ratio Perm						0.02			c0.21			
v/c Ratio					0.39	0.07	0.68	0.50	0.51	0.91	0.45	
Uniform Delay, d1					26.0	23.6	37.5	20.0	20.1	36.2	16.8	
Progression Factor					0.92	0.95	0.84	1.15	1.43	1.00	1.00	
Incremental Delay, d2					1.0	0.3	4.7	0.9	2.0	27.2	0.9	
Delay (s)					24.8	22.8	36.3	23.9	30.8	63.4	17.7	
Level of Service					C	C	D	C	C	E	B	
Approach Delay (s)		0.0			24.3			27.7			30.7	
Approach LOS		A			C			C			C	

Intersection Summary				
HCM Average Control Delay	28.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	52.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	213	365	262	329	81	30
Peak Hour Factor	0.92	0.92	0.88	0.88	0.76	0.76
Hourly flow rate (vph)	232	397	298	374	107	39
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type					None	
Median storage veh)						
Upstream signal (ft)	799					
pX, platoon unblocked						
vC, conflicting volume			628		1212	314
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			628		1212	314
tC, single (s)			4.1		6.9	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			69		10	94
cM capacity (veh/h)			950		119	679

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	154	474	422	249	146
Volume Left	0	0	298	0	107
Volume Right	0	397	0	0	39
cSH	1700	1700	950	1700	155
Volume to Capacity	0.09	0.28	0.31	0.15	0.94
Queue Length 95th (ft)	0	0	34	0	172
Control Delay (s)	0.0	0.0	8.5	0.0	115.6
Lane LOS			A		F
Approach Delay (s)	0.0		5.3		115.6
Approach LOS					F

Intersection Summary				
Average Delay	14.1			
Intersection Capacity Utilization	49.1%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.90		1.00	1.00	0.85	1.00	0.94		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1677		1770	1863	1583	1770	3333		1770	3454	
Flt Permitted	0.64	1.00		0.15	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1183	1677		271	1863	1583	1770	3333		1770	3454	
Volume (vph)	80	137	271	188	125	165	159	976	618	190	598	115
Peak-hour factor, PHF	0.80	0.80	0.80	0.87	0.87	0.87	0.92	0.92	0.92	0.89	0.89	0.89
Adj. Flow (vph)	100	171	339	216	144	190	173	1061	672	213	672	129
RTOR Reduction (vph)	0	79	0	0	0	106	0	110	0	0	16	0
Lane Group Flow (vph)	100	431	0	216	144	84	173	1623	0	213	785	0
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	27.0	27.0		28.5	28.5	28.5	13.7	33.1		13.9	33.3	
Effective Green, g (s)	29.0	29.0		29.0	29.0	29.0	13.7	35.1		13.9	35.3	
Actuated g/C Ratio	0.32	0.32		0.32	0.32	0.32	0.15	0.39		0.15	0.39	
Clearance Time (s)	6.0	6.0		4.5	4.5	4.5	4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	381	540		87	600	510	269	1300		273	1355	
v/s Ratio Prot		0.26			0.08		0.10	c0.49		c0.12	0.23	
v/s Ratio Perm	0.08			c0.80		0.05						
v/c Ratio	0.26	0.80		2.48	0.24	0.17	0.64	1.25		0.78	0.58	
Uniform Delay, d1	22.6	27.8		30.5	22.4	21.8	35.9	27.4		36.6	21.5	
Progression Factor	0.85	0.80		1.00	1.00	1.00	0.70	1.24		1.00	1.00	
Incremental Delay, d2	0.4	7.9		700.3	0.2	0.2	0.5	112.5		13.4	1.8	
Delay (s)	19.5	30.0		730.8	22.6	22.0	25.6	146.4		50.0	23.3	
Level of Service	B	C		F	C	C	C	F		D	C	
Approach Delay (s)		28.3			300.5			135.5			28.9	
Approach LOS		C			F			F			C	

Intersection Summary			
HCM Average Control Delay	115.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	104.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	501	443	116	344	134	20
Peak Hour Factor	0.94	0.94	0.83	0.83	0.88	0.88
Hourly flow rate (vph)	533	471	140	414	152	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type					None	
Median storage veh)						
Upstream signal (ft)	465					
pX, platoon unblocked						
vC, conflicting volume			1004		1463	769
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1004		1463	769
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			80		0	94
cM capacity (veh/h)			690		112	400

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1004	554	175
Volume Left	0	140	152
Volume Right	471	0	23
cSH	1700	690	124
Volume to Capacity	0.59	0.20	1.41
Queue Length 95th (ft)	0	19	297
Control Delay (s)	0.0	5.2	289.2
Lane LOS		A	F
Approach Delay (s)	0.0	5.2	289.2
Approach LOS			F

Intersection Summary			
Average Delay	30.9		
Intersection Capacity Utilization	95.4%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0		4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	1.00		1.00		1.00		0.95	1.00	1.00	0.95	
Frt	1.00	0.96		1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	1788		1770		1583		3539	1583	1770	3539	
Flt Permitted	0.95	1.00		0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	1788		1770		1583		3539	1583	1770	3539	
Volume (vph)	115	272	99	201	0	543	0	581	109	177	556	0
Peak-hour factor, PHF	0.83	0.83	0.83	0.93	0.93	0.93	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	139	328	119	216	0	584	0	612	115	192	604	0
RTOR Reduction (vph)	0	16	0	0	0	191	0	0	83	0	0	0
Lane Group Flow (vph)	139	431	0	216	0	393	0	612	32	192	604	0
Turn Type	Prot			Prot		custom			Perm	Prot		
Protected Phases	7	4		3		8		2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	8.0	27.5		8.0		27.5		24.0	24.0	12.5	40.5	
Effective Green, g (s)	8.0	28.5		8.0		28.5		25.0	25.0	12.5	41.5	
Actuated g/C Ratio	0.09	0.32		0.09		0.32		0.28	0.28	0.14	0.46	
Clearance Time (s)	4.0	5.0		4.0		5.0		5.0	5.0	4.0	5.0	
Vehicle Extension (s)	6.5	6.5		2.0		4.5		5.5	5.5	2.0	6.0	
Lane Grp Cap (vph)	305	566		157		501		983	440	246	1632	
v/s Ratio Prot	0.04	0.24		c0.12		c0.25		c0.17		c0.11	0.17	
v/s Ratio Perm									0.02			
v/c Ratio	0.46	0.76		1.38		0.78		0.62	0.07	0.78	0.37	
Uniform Delay, d1	38.9	27.7		41.0		27.9		28.4	24.0	37.4	15.8	
Progression Factor	1.00	1.00		1.00		1.00		1.00	1.00	0.80	0.82	
Incremental Delay, d2	3.4	8.0		203.9		8.7		3.0	0.3	12.6	0.6	
Delay (s)	42.3	35.7		244.9		36.7		31.3	24.3	42.5	13.6	
Level of Service	D	D		F		D		C	C	D	B	
Approach Delay (s)		37.3			92.9			30.2			20.5	
Approach LOS		D			F			C			C	

Intersection Summary			
HCM Average Control Delay	46.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00		1.00	1.00		0.95	1.00
Frt	1.00	0.97		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1676	3438		1676	1863	1500		1791	1485		3397	1485
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (perm)	1676	3438		1676	1863	1500		1791	1485		3397	1485
Volume (vph)	101	361	85	106	232	45	107	71	95	192	109	320
Peak-hour factor, PHF	0.91	0.91	0.91	0.95	0.95	0.95	0.78	0.78	0.78	0.88	0.88	0.88
Adj. Flow (vph)	111	397	93	112	244	47	137	91	122	218	124	364
RTOR Reduction (vph)	0	14	0	0	0	12	0	0	95	0	0	288
Lane Group Flow (vph)	111	476	0	112	244	35	0	228	27	0	342	76
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6			3			4
Actuated Green, G (s)	9.4	30.8		9.4	30.8	30.8		20.5	20.5		19.7	19.7
Effective Green, g (s)	9.1	32.1		9.1	32.1	32.1		21.7	21.7		20.9	20.9
Actuated g/C Ratio	0.09	0.32		0.09	0.32	0.32		0.22	0.22		0.21	0.21
Clearance Time (s)	3.7	5.3		3.7	5.3	5.3		5.2	5.2		5.2	5.2
Vehicle Extension (s)	2.0	5.1		2.0	4.8	4.8		6.3	6.3		7.9	7.9
Lane Grp Cap (vph)	153	1106		153	599	482		389	323		711	311
v/s Ratio Prot	0.07	c0.14		c0.07	0.13			c0.13			c0.10	
v/s Ratio Perm						0.02			0.02			0.05
v/c Ratio	0.73	0.43		0.73	0.41	0.07		0.59	0.08		0.48	0.25
Uniform Delay, d1	44.1	26.7		44.2	26.4	23.5		35.0	31.1		34.7	32.9
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	13.5	1.2		14.4	0.9	0.1		4.5	0.3		2.1	1.7
Delay (s)	57.6	27.9		58.5	27.3	23.6		39.5	31.4		36.8	34.6
Level of Service	E	C		E	C	C		D	C		D	C
Approach Delay (s)		33.4			35.6			36.7			35.7	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM Average Control Delay	35.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	99.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	52.8%	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		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	12	498	287	33	324	0	158	3	56	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.90	0.90	0.90	0.84	0.84	0.84	0.92	0.92	0.92
Hourly flow rate (vph)	13	524	302	37	360	0	188	4	67	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		799			328							
pX, platoon unblocked	0.97			0.85			0.86	0.86	0.85	0.86	0.86	0.97
vC, conflicting volume	360			826			1134	1134	675	1202	1285	360
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	342			795			1109	1109	617	1188	1284	342
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			95			0	98	84	100	100	100
cM capacity (veh/h)	1184			701			153	169	415	112	133	681

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	839	397	258
Volume Left	13	37	188
Volume Right	302	0	67
cSH	1184	701	184
Volume to Capacity	0.01	0.05	1.41
Queue Length 95th (ft)	1	4	389
Control Delay (s)	0.3	1.6	260.4
Lane LOS	A	A	F
Approach Delay (s)	0.3	1.6	260.4
Approach LOS			F

Intersection Summary			
Average Delay	45.6		
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	1863	1770	1583
Volume (vph)	499	55	115	229	128	165
Peak-hour factor, PHF	0.94	0.94	0.91	0.91	0.81	0.81
Adj. Flow (vph)	531	59	126	252	158	204
RTOR Reduction (vph)	0	15	0	0	0	175
Lane Group Flow (vph)	531	44	126	252	158	29
Turn Type		Perm	Prot			Prot
Protected Phases	2		1	6	4	4
Permitted Phases		2				
Actuated Green, G (s)	55.3	55.3	10.9	70.2	13.5	13.5
Effective Green, g (s)	57.3	57.3	10.9	72.2	13.5	13.5
Actuated g/C Ratio	0.61	0.61	0.12	0.77	0.14	0.14
Clearance Time (s)	6.0	6.0	4.0	6.0	4.0	4.0
Vehicle Extension (s)	8.0	8.0	2.0	8.0	2.4	2.4
Lane Grp Cap (vph)	1139	968	206	1436	255	228
v/s Ratio Prot	c0.29		c0.07	0.14	c0.09	0.02
v/s Ratio Perm		0.03				
v/c Ratio	0.47	0.05	0.61	0.18	0.62	0.13
Uniform Delay, d1	9.9	7.3	39.4	2.9	37.7	35.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	0.1	3.7	0.3	3.7	0.2
Delay (s)	11.3	7.4	43.1	3.1	41.4	35.1
Level of Service	B	A	D	A	D	D
Approach Delay (s)	10.9			16.5	37.9	
Approach LOS	B			B	D	

Intersection Summary			
HCM Average Control Delay	19.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	93.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	51.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	428	231	24	259	93	57
Peak Hour Factor	0.92	0.92	0.85	0.85	0.92	0.92
Hourly flow rate (vph)	465	251	28	305	101	62
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	744					
pX, platoon unblocked			0.84		0.84	0.84
vC, conflicting volume			716		952	591
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			662		943	512
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		57	87
cM capacity (veh/h)			777		236	471

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	716	333	163
Volume Left	0	28	101
Volume Right	251	0	62
cSH	1700	777	291
Volume to Capacity	0.42	0.04	0.56
Queue Length 95th (ft)	0	3	80
Control Delay (s)	0.0	1.2	32.1
Lane LOS		A	D
Approach Delay (s)	0.0	1.2	32.1
Approach LOS			D

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.92		1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1711		1770	1648		1770	3539	1583	1770	3539	1583
Flt Permitted	0.27	1.00		0.34	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	505	1711		640	1648		1770	3539	1583	1770	3539	1583
Volume (vph)	202	153	183	93	89	297	78	729	54	371	967	197
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.85	0.85	0.85	0.92	0.92	0.92
Adj. Flow (vph)	217	165	197	101	97	323	92	858	64	403	1051	214
RTOR Reduction (vph)	0	48	0	0	133	0	0	0	30	0	0	118
Lane Group Flow (vph)	217	314	0	101	287	0	92	858	34	403	1051	96
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	28.0	28.0		28.0	28.0		7.5	30.0	30.0	16.0	38.5	38.5
Effective Green, g (s)	30.0	30.0		30.0	30.0		7.5	32.0	32.0	16.0	40.5	40.5
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.08	0.36	0.36	0.18	0.45	0.45
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	5.8	5.8		5.8	5.8		1.5	5.8	5.8	1.5	5.8	5.8
Lane Grp Cap (vph)	168	570		213	549		148	1258	563	315	1593	712
v/s Ratio Prot		0.18			0.17		0.05	0.24		c0.23	c0.30	
v/s Ratio Perm	c0.43			0.16					0.02			0.06
v/c Ratio	1.29	0.55		0.47	0.52		0.62	0.68	0.06	1.28	0.66	0.14
Uniform Delay, d1	30.0	24.5		23.8	24.2		39.9	24.7	19.1	37.0	19.4	14.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.84	1.22	2.16
Incremental Delay, d2	168.3	2.4		4.4	2.1		5.7	3.0	0.2	128.0	0.2	0.0
Delay (s)	198.3	26.9		28.2	26.3		45.6	27.7	19.3	158.9	23.8	31.3
Level of Service	F	C		C	C		D	C	B	F	C	C
Approach Delay (s)		91.1			26.7			28.8			57.4	
Approach LOS		F			C			C			E	

Intersection Summary			
HCM Average Control Delay	50.7	HCM Level of Service	D
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	88.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0						4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95						0.95		1.00	0.95	
Frt	1.00	0.86						0.98		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1665	1498						3480		1770	3539	
Flt Permitted	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (perm)	1665	1498						3480		1770	3539	
Volume (vph)	661	0	714	0	0	0	0	1091	136	236	820	0
Peak-hour factor, PHF	0.79	0.79	0.79	0.92	0.92	0.92	0.95	0.95	0.95	0.87	0.87	0.87
Adj. Flow (vph)	837	0	904	0	0	0	0	1148	143	271	943	0
RTOR Reduction (vph)	0	125	0	0	0	0	0	10	0	0	0	0
Lane Group Flow (vph)	794	822	0	0	0	0	0	1281	0	271	943	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	22.0	22.0						38.0		16.9	58.6	
Effective Green, g (s)	22.6	22.6						38.8		16.6	59.4	
Actuated g/C Ratio	0.25	0.25						0.43		0.18	0.66	
Clearance Time (s)	4.6	4.6						4.8		3.7	4.8	
Vehicle Extension (s)	5.0	5.0						7.4		2.0	6.2	
Lane Grp Cap (vph)	418	376						1500		326	2336	
v/s Ratio Prot	0.48	c0.55						c0.37		c0.15	0.27	
v/s Ratio Perm												
v/c Ratio	1.90	2.19						0.85		0.83	0.40	
Uniform Delay, d1	33.7	33.7						23.0		35.4	7.1	
Progression Factor	1.00	1.00						0.64		1.15	0.84	
Incremental Delay, d2	413.7	542.4						4.1		4.7	0.1	
Delay (s)	447.4	576.1						19.0		45.5	6.1	
Level of Service	F	F						B		D	A	
Approach Delay (s)		517.4			0.0			19.0			14.9	
Approach LOS		F			A			B			B	

Intersection Summary				
HCM Average Control Delay	222.2	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.23			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	97.8%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	132	130	88	17	125	95	47	410	19	112	539	220
Peak-hour factor, PHF	0.90	0.90	0.90	0.89	0.89	0.89	0.81	0.81	0.81	0.90	0.90	0.90
Adj. Flow (vph)	147	144	98	19	140	107	58	506	23	124	599	244
RTOR Reduction (vph)	0	0	73	0	0	88	0	0	12	0	0	131
Lane Group Flow (vph)	147	144	25	19	140	19	58	506	11	124	599	113
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	9.0	20.3	20.3	2.5	13.8	13.8	4.7	33.6	33.6	8.5	37.4	37.4
Effective Green, g (s)	9.0	21.3	21.3	2.5	14.8	14.8	4.7	34.6	34.6	8.5	38.4	38.4
Actuated g/C Ratio	0.11	0.26	0.26	0.03	0.18	0.18	0.06	0.42	0.42	0.10	0.46	0.46
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	192	479	407	53	333	283	100	1477	661	181	1639	733
v/s Ratio Prot	c0.08	0.08		0.01	c0.08		0.03	0.14		c0.07	c0.17	
v/s Ratio Perm			0.02			0.01			0.01			0.07
v/c Ratio	0.77	0.30	0.06	0.36	0.42	0.07	0.58	0.34	0.02	0.69	0.37	0.15
Uniform Delay, d1	35.9	24.8	23.3	39.4	30.2	28.3	38.1	16.4	14.2	35.9	14.4	12.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.0	0.1	0.0	1.5	0.3	0.0	5.0	0.6	0.0	8.3	0.6	0.4
Delay (s)	50.9	24.9	23.3	40.9	30.6	28.3	43.1	17.1	14.2	44.2	15.0	13.3
Level of Service	D	C	C	D	C	C	D	B	B	D	B	B
Approach Delay (s)		34.3			30.4			19.5			18.3	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM Average Control Delay	22.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.47			
Actuated Cycle Length (s)	82.9	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	48.0%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

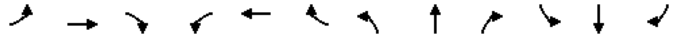
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	52	71	65	19	123	8	70	87	20	28	173	54
Peak Hour Factor	0.92	0.92	0.92	0.85	0.85	0.85	0.87	0.87	0.87	0.72	0.72	0.72
Hourly flow rate (vph)	57	77	71	22	145	9	80	100	23	39	240	75

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	204	176	203	354
Volume Left (vph)	57	22	80	39
Volume Right (vph)	71	9	23	75
Hadj (s)	-0.12	0.03	0.05	-0.07
Departure Headway (s)	5.7	5.9	5.7	5.3
Degree Utilization, x	0.32	0.29	0.32	0.52
Capacity (veh/h)	569	546	574	638
Control Delay (s)	11.4	11.2	11.3	14.0
Approach Delay (s)	11.4	11.2	11.3	14.0
Approach LOS	B	B	B	B

Intersection Summary				
Delay		12.3		
HCM Level of Service		B		
Intersection Capacity Utilization		51.1%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0				4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00				1.00	1.00	0.95		1.00	0.95	
Frt		0.85				0.85	1.00	1.00		1.00	0.98	
Flt Protected		1.00				1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1583				1583	1770	3537		1770	3477	
Flt Permitted		1.00				1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1583				1583	1770	3537		1770	3477	
Volume (vph)	0	0	73	0	0	3	47	764	3	21	893	118
Peak-hour factor, PHF	0.81	0.81	0.81	0.50	0.50	0.50	0.77	0.77	0.77	0.98	0.98	0.98
Adj. Flow (vph)	0	0	90	0	0	6	61	992	4	21	911	120
RTOR Reduction (vph)	0	83	0	0	0	6	0	0	0	0	10	0
Lane Group Flow (vph)	0	7	0	0	0	0	61	996	0	21	1021	0
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		4.7				4.7	2.6	43.0		1.0	41.4	
Effective Green, g (s)		4.7				4.7	2.6	43.0		1.0	41.4	
Actuated g/C Ratio		0.08				0.08	0.04	0.71		0.02	0.68	
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)		123				123	76	2506		29	2371	
v/s Ratio Prot		c0.00					c0.03	0.28		0.01	c0.29	
v/s Ratio Perm						0.00						
v/c Ratio		0.06				0.00	0.80	0.40		0.72	0.43	
Uniform Delay, d1		25.9				25.8	28.8	3.6		29.7	4.3	
Progression Factor		1.00				1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2				0.0	43.8	0.1		61.8	0.1	
Delay (s)		26.1				25.9	72.6	3.7		91.5	4.5	
Level of Service		C				C	E	A		F	A	
Approach Delay (s)		26.1			25.9			7.7			6.2	
Approach LOS		C			C			A			A	

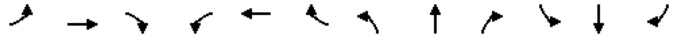
Intersection Summary					
HCM Average Control Delay	7.8	HCM Level of Service		A	
HCM Volume to Capacity ratio	0.41				
Actuated Cycle Length (s)	60.7	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	46.3%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frt	1.00	1.00			0.97			0.99				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1752	1845			1791			5001				
Flt Permitted	0.95	1.00			1.00			1.00				
Satd. Flow (perm)	1752	1845			1791			5001				
Volume (vph)	59	139	0	0	99	27	37	964	110	0	0	0
Peak-hour factor, PHF	0.78	0.78	0.78	0.79	0.79	0.79	0.91	0.91	0.91	0.92	0.92	0.92
Adj. Flow (vph)	76	178	0	0	125	34	41	1059	121	0	0	0
RTOR Reduction (vph)	0	0	0	0	12	0	0	10	0	0	0	0
Lane Group Flow (vph)	76	178	0	0	147	0	0	1211	0	0	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Prot						Perm					
Protected Phases	7	4			8			2				
Permitted Phases							2					
Actuated Green, G (s)	4.9	21.4			12.8			36.7				
Effective Green, g (s)	4.6	21.6			13.0			36.9				
Actuated g/C Ratio	0.07	0.32			0.20			0.55				
Clearance Time (s)	3.7	4.2			4.2			4.2				
Vehicle Extension (s)	2.0	7.9			7.7			6.4				
Lane Grp Cap (vph)	121	599			350			2775				
v/s Ratio Prot	c0.04	0.10			c0.08							
v/s Ratio Perm								0.24				
v/c Ratio	0.63	0.30			0.42			0.44				
Uniform Delay, d1	30.1	16.8			23.4			8.7				
Progression Factor	1.00	1.00			1.00			1.00				
Incremental Delay, d2	7.1	1.2			3.3			0.5				
Delay (s)	37.3	17.9			26.7			9.2				
Level of Service	D	B			C			A				
Approach Delay (s)		23.7			26.7			9.2			0.0	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM Average Control Delay	13.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	66.5	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	45.2%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0				
Lane Util. Factor					0.91			0.91				
Frt					0.96			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					4895			5037				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					4895			5037				
Volume (vph)	0	0	0	0	743	246	215	910	0	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.86	0.86	0.86	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	790	262	250	1058	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	37	0	0	37	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1015	0	0	1271	0	0	0	0
Turn Type							Perm					
Protected Phases					8			2				
Permitted Phases							2					
Actuated Green, G (s)					19.3			30.5				
Effective Green, g (s)					19.9			31.1				
Actuated g/C Ratio					0.34			0.53				
Clearance Time (s)					4.6			4.6				
Vehicle Extension (s)					4.8			3.0				
Lane Grp Cap (vph)					1651			2655				
v/s Ratio Prot					c0.21							
v/s Ratio Perm								0.25				
v/c Ratio					0.61			0.48				
Uniform Delay, d1					16.3			8.8				
Progression Factor					1.00			1.00				
Incremental Delay, d2					0.9			0.6				
Delay (s)					17.3			9.4				
Level of Service					B			A				
Approach Delay (s)		0.0			17.3			9.4			0.0	
Approach LOS		A			B			A			A	

Intersection Summary				
HCM Average Control Delay	12.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	48.5%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.91						0.91				
Frt		1.00						0.97				
Flt Protected		0.98						1.00				
Satd. Flow (prot)		4998						4955				
Flt Permitted		0.98						1.00				
Satd. Flow (perm)		4998						4955				
Volume (vph)	540	1003	0	0	0	0	0	585	121	0	0	0
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92
Adj. Flow (vph)	593	1102	0	0	0	0	0	609	126	0	0	0
RTOR Reduction (vph)	0	72	0	0	0	0	0	28	0	0	0	0
Lane Group Flow (vph)	0	1623	0	0	0	0	0	707	0	0	0	0
Turn Type	Perm											
Protected Phases		2						8				
Permitted Phases	2											
Actuated Green, G (s)		23.2						16.0				
Effective Green, g (s)		24.6						17.1				
Actuated g/C Ratio		0.49						0.34				
Clearance Time (s)		5.4						5.1				
Vehicle Extension (s)		2.0						5.0				
Lane Grp Cap (vph)		2474						1705				
v/s Ratio Prot								c0.14				
v/s Ratio Perm		0.32										
v/c Ratio		0.66						0.41				
Uniform Delay, d1		9.4						12.5				
Progression Factor		1.00						1.00				
Incremental Delay, d2		1.4						0.3				
Delay (s)		10.8						12.8				
Level of Service		B						B				
Approach Delay (s)		10.8			0.0			12.8			0.0	
Approach LOS		B			A			B			A	

Intersection Summary				
HCM Average Control Delay	11.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	49.7	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	51.0%	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												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	13	11	0	0	8	27	11	631	5	0	0	0
Peak Hour Factor	0.60	0.60	0.60	0.63	0.63	0.63	0.91	0.91	0.91	0.92	0.92	0.92
Hourly flow rate (vph)	22	18	0	0	13	43	12	693	5	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	40	56	359	352
Volume Left (vph)	22	0	12	0
Volume Right (vph)	0	43	0	5
Hadj (s)	0.14	-0.43	0.05	0.02
Departure Headway (s)	5.5	4.9	4.8	4.8
Degree Utilization, x	0.06	0.08	0.48	0.47
Capacity (veh/h)	610	678	739	743
Control Delay (s)	8.9	8.3	11.0	10.7
Approach Delay (s)	8.9	8.3	10.8	
Approach LOS	A	A	B	

Intersection Summary				
Delay		10.6		
HCM Level of Service		B		
Intersection Capacity Utilization	32.6%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				5085	3433	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				5085	3433	
Volume (vph)	0	0	0	598	390	0
Peak-hour factor, PHF	0.92	0.92	0.84	0.84	0.94	0.94
Adj. Flow (vph)	0	0	0	712	415	0
RTOR Reduction (vph)	0	0	0	0	191	0
Lane Group Flow (vph)	0	0	0	712	224	0
Turn Type						
Protected Phases				6	4	
Permitted Phases						
Actuated Green, G (s)				12.6	9.8	
Effective Green, g (s)				13.2	11.8	
Actuated g/C Ratio				0.40	0.36	
Clearance Time (s)				4.6	6.0	
Vehicle Extension (s)				5.0	6.0	
Lane Grp Cap (vph)				2034	1228	
v/s Ratio Prot				c0.14	c0.07	
v/s Ratio Perm						
v/c Ratio				0.35	0.18	
Uniform Delay, d1				6.9	7.3	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.2	0.2	
Delay (s)				7.1	7.5	
Level of Service				A	A	
Approach Delay (s)	0.0			7.1	7.5	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	7.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	33.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	29.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	381	117	154	719	445	287	728
v/c Ratio	0.39	0.22	0.68	0.50	0.59	0.91	0.46
Control Delay	24.5	5.5	42.2	25.1	19.9	69.4	19.0
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	24.5	5.5	42.2	25.1	20.0	69.4	19.0
Queue Length 50th (ft)	74	1	83	192	158	162	148
Queue Length 95th (ft)	114	m30	m120	m225	m188	#288	207
Internal Link Dist (ft)	719			378			1660
Turn Bay Length (ft)		275	110		40	260	
Base Capacity (vph)	1075	573	315	1430	757	323	1596
Starvation Cap Reductn	0	0	0	0	25	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.20	0.49	0.50	0.61	0.89	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	100	510	216	144	190	173	1733	213	801
v/c Ratio	0.26	0.82	2.45	0.24	0.31	0.64	1.23	0.78	0.58
Control Delay	21.4	29.9	707.0	23.8	7.4	25.8	132.1	56.8	23.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	51.4	0.0	0.0
Total Delay	21.4	29.9	707.0	23.8	7.4	25.8	183.5	56.8	23.7
Queue Length 50th (ft)	32	184	~206	60	13	83	~529	116	176
Queue Length 95th (ft)	m59	m256	#290	102	56	m70	m#439	#212	260
Internal Link Dist (ft)		2033		385			269		731
Turn Bay Length (ft)	145		155		25	125		170	
Base Capacity (vph)	381	619	88	600	616	374	1411	295	1370
Starvation Cap Reductn	0	0	0	0	0	0	121	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	16
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.82	2.45	0.24	0.31	0.46	1.34	0.72	0.59

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	139	447	216	584	612	115	192	604
v/c Ratio	0.46	0.77	1.38	0.84	0.62	0.22	0.78	0.37
Control Delay	44.1	35.3	238.1	26.4	31.7	6.2	56.8	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.1	35.3	238.1	26.4	31.7	6.2	56.8	14.4
Queue Length 50th (ft)	39	214	~164	165	159	0	111	137
Queue Length 95th (ft)	62	271	#303	296	216	39	#273	192
Internal Link Dist (ft)		671			2243			378
Turn Bay Length (ft)			280				120	
Base Capacity (vph)	305	670	157	758	983	523	246	1633
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.67	1.38	0.77	0.62	0.22	0.78	0.37

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	111	490	112	244	47	228	122	342	364
v/c Ratio	0.62	0.44	0.63	0.41	0.09	0.58	0.29	0.48	0.61
Control Delay	61.3	30.4	61.3	33.3	22.1	43.0	8.4	38.7	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.3	30.4	61.3	33.3	22.1	43.0	8.4	38.7	8.8
Queue Length 50th (ft)	69	127	70	124	13	132	0	102	0
Queue Length 95th (ft)	144	228	144	253	50	200	31	168	74
Internal Link Dist (ft)		179		406		179		341	
Turn Bay Length (ft)	185		150		40				110
Base Capacity (vph)	319	1124	319	602	497	519	517	978	687
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.44	0.35	0.41	0.09	0.44	0.24	0.35	0.53

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	531	59	126	252	158	204
v/c Ratio	0.47	0.06	0.61	0.18	0.62	0.51
Control Delay	12.9	5.1	53.0	3.5	49.4	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.9	5.1	53.0	3.5	49.4	10.2
Queue Length 50th (ft)	154	4	71	30	89	0
Queue Length 95th (ft)	312	25	137	68	143	42
Internal Link Dist (ft)	248			664	309	
Turn Bay Length (ft)		125	200			
Base Capacity (vph)	1139	982	359	1475	483	580
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.06	0.35	0.17	0.33	0.35

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	217	362	101	420	92	858	64	403	1051	214
v/c Ratio	1.29	0.59	0.47	0.61	0.54	0.68	0.11	1.28	0.65	0.25
Control Delay	197.9	24.2	32.7	17.2	50.0	28.0	9.2	157.9	24.8	5.9
Queue Delay	477.2	0.0	0.0	50.3	0.0	0.0	0.0	246.5	26.4	1.1
Total Delay	675.1	24.2	32.7	67.5	50.0	28.0	9.2	404.4	51.2	6.9
Queue Length 50th (ft)	~159	134	45	100	51	215	7	~292	293	12
Queue Length 95th (ft)	#297	225	98	200	90	261	30	m#273	m245	m14
Internal Link Dist (ft)		502		1058		2367			110	
Turn Bay Length (ft)	125		135		115		105	115		
Base Capacity (vph)	168	618	213	683	315	1258	592	315	1626	843
Starvation Cap Reductn	0	0	0	0	0	0	0	95	615	419
Spillback Cap Reductn	76	0	0	296	0	6	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	2.36	0.59	0.47	1.09	0.29	0.69	0.11	1.83	1.04	0.50

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

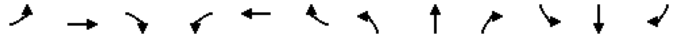
Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	794	947	1291	271	943
v/c Ratio	1.90	1.89	0.85	0.83	0.40
Control Delay	438.0	429.3	20.5	47.2	6.2
Queue Delay	6.2	245.0	2.2	0.0	0.4
Total Delay	444.1	674.3	22.7	47.2	6.6
Queue Length 50th (ft)	~735	~806	155	137	78
Queue Length 95th (ft)	#817	#875	m#261	m179	m88
Internal Link Dist (ft)		366	110		269
Turn Bay Length (ft)	232			75	
Base Capacity (vph)	418	501	1510	387	2336
Starvation Cap Reductn	0	0	115	0	789
Spillback Cap Reductn	3	112	1	0	719
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.91	2.43	0.93	0.70	0.61

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	147	144	98	19	140	107	58	506	23	124	599	244
v/c Ratio	0.73	0.29	0.20	0.16	0.48	0.32	0.39	0.34	0.03	0.65	0.35	0.27
Control Delay	57.3	26.7	7.4	39.1	36.3	9.1	42.3	16.8	7.3	51.8	14.8	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.3	26.7	7.4	39.1	36.3	9.1	42.3	16.8	7.3	51.8	14.8	3.2
Queue Length 50th (ft)	70	52	0	9	64	0	27	84	1	59	97	0
Queue Length 95th (ft)	#169	117	38	30	116	40	57	117	13	#137	160	43
Internal Link Dist (ft)		1613			1967			1346			2243	
Turn Bay Length (ft)	95		95	90		90	155		90	200		200
Base Capacity (vph)	202	681	641	182	619	597	189	1482	675	201	1724	896
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.21	0.15	0.10	0.23	0.18	0.31	0.34	0.03	0.62	0.35	0.27

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	90	6	61	996	21	1031
v/c Ratio	0.25	0.02	0.37	0.37	0.16	0.41
Control Delay	1.6	0.0	23.1	4.0	22.2	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.6	0.0	23.1	4.0	22.2	5.5
Queue Length 50th (ft)	0	0	11	37	4	38
Queue Length 95th (ft)	0	0	34	93	20	130
Internal Link Dist (ft)	2570			1470		2367
Turn Bay Length (ft)			210		290	
Base Capacity (vph)	565	561	166	2719	129	2520
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.01	0.37	0.37	0.16	0.41

Intersection Summary

Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	76	178	159	1221
v/c Ratio	0.40	0.28	0.38	0.41
Control Delay	34.5	14.4	21.4	11.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.5	14.4	21.4	11.1
Queue Length 50th (ft)	29	45	48	112
Queue Length 95th (ft)	59	69	85	187
Internal Link Dist (ft)		608	737	568
Turn Bay Length (ft)				
Base Capacity (vph)	452	998	615	2954
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.17	0.18	0.26	0.41

Intersection Summary

Lane Group	WBT	NBT
Lane Group Flow (vph)	1052	1308
v/c Ratio	0.62	0.49
Control Delay	17.1	9.6
Queue Delay	0.0	0.0
Total Delay	17.1	9.6
Queue Length 50th (ft)	105	90
Queue Length 95th (ft)	141	140
Internal Link Dist (ft)	265	310
Turn Bay Length (ft)		
Base Capacity (vph)	1992	2695
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.53	0.49

Intersection Summary

Lane Group	EBT	NBT
Lane Group Flow (vph)	1695	735
v/c Ratio	0.67	0.42
Control Delay	10.7	12.4
Queue Delay	0.0	0.0
Total Delay	10.7	12.4
Queue Length 50th (ft)	113	54
Queue Length 95th (ft)	182	78
Internal Link Dist (ft)	4045	445
Turn Bay Length (ft)		
Base Capacity (vph)	2544	1976
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.67	0.37

Intersection Summary

Lane Group	WBT	NWL
Lane Group Flow (vph)	712	415
v/c Ratio	0.35	0.29
Control Delay	7.6	3.4
Queue Delay	0.0	0.0
Total Delay	7.6	3.4
Queue Length 50th (ft)	28	6
Queue Length 95th (ft)	48	27
Internal Link Dist (ft)	3590	137
Turn Bay Length (ft)		
Base Capacity (vph)	3102	2024
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.23	0.21

Intersection Summary

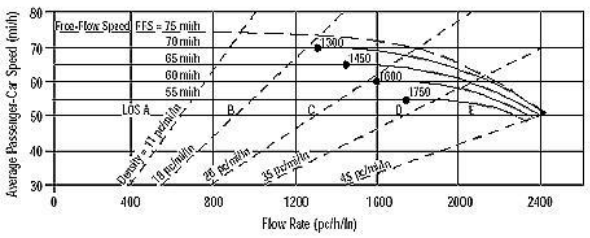
Kimley-Horn and Associates, Inc.

Visalia Walmart Roadway Network Capacity

Near-term 2010 Conditions
PM Peak

ROADWAY	FROM	TO	Length (Miles)	Area Type (U/T/R)	Functional Class	# of Lanes	Div/Undiv (D/U)	Left-turn Bays (Y/N)	POSTED SPEED	Sig/Mile	Code	Notes	Generalized Service Volumes							
													Code	A	B	C	D	E	Two-Way Vol	LOS
Mineral King Avenue	Ben Maddox Way	SR-198 WB Ramps (B	0.15	U	Arterial	4	U	N	40	3.50	U-NS2-4	adjusted volumes by -25%	U-NS2-4	0	0	2178	2898	3060	792	C
Mineral King Avenue	SR-198 WB Ramps (B	Lovers Lane	0.84	U	Arterial	2	U	Y	40	1.50	U-NS1-2		U-NS1-2	0	837	1350	1440	0	861	C
Noble Avenue	Ben Maddox Way	SR-198 EB Ramps	0.16	U	Arterial	2	U	Y	35	4.00	U-NS2-2		U-NS2-2	0	0	918	1332	1413	1,254	D
Noble Avenue	East Driveway	Pinkham Street	0.14	U	Arterial	2	U	Y	35	2.50	U-NS2-2		U-NS2-2	0	0	918	1332	1413	1,010	D
Noble Avenue	Pinkham Street	Lovers Lane	0.50	U	Arterial	2	U	Y	45	2.00	U-NS2-2		U-NS2-2	0	0	918	1332	1413	835	C
Ben Maddox Way	Noble Avenue	Tulare Avenue	0.44	U	Arterial	4	D	Y	40	2.00	U-NS2-4		U-NS2-4	0	0	2178	2898	3060	1,527	C
Pinkham Street	Noble Avenue	Tulare Avenue	0.44	U	Arterial	2	U	N	40	0	U-OS1-2	adjusted volumes by -20%	U-OS1-2	0	605	975	1040	0	323	B
Lovers Lane	Noble Avenue	Tulare Avenue	0.47	U	Arterial	4	D	Y	45	3.00	U-NS2-4		U-NS2-4	0	0	2178	2898	3060	1,952	C
Tulare Avenue	Ben Maddox Way	Pinkham Street	0.39	U	Arterial	2	U	Y	40	0.61	U-OS1-2		U-OS1-2	0	605	975	1040	0	467	B
Tulare Avenue	Pinkham Street	Lovers Lane	0.48	U	Arterial	2	U	N	40	0.82	U-OS1-2	adjusted volumes by -20%	U-OS1-2	0	605	975	1040	0	203	B

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	B/W Ben Maddox Way & Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2010

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2581 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1498	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	24.0	pc/mi/ln	S		mi/h
LOS	C		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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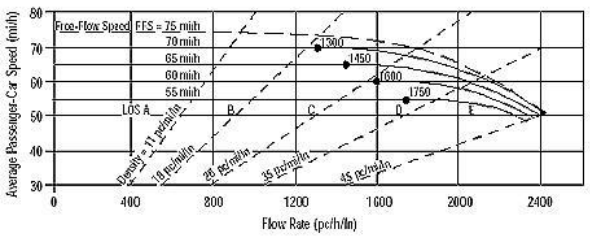
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	E/O Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2010

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	1579 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	0.56	I/mi	f_{ID}	0.3	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	65.2	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	921	pc/h/ln	Design LOS		
S	65.2	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	14.1	pc/mi/ln	S		mi/h
LOS	B		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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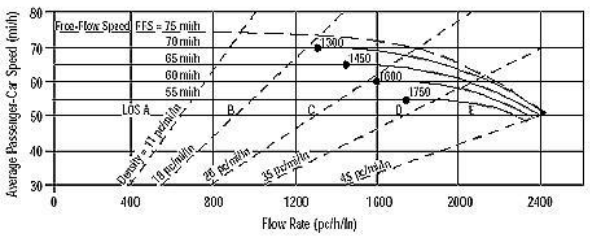
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	W/O S. Ben Maddox Way
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2010
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2985 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1733	pc/h/ln	Design LOS		
S	62.2	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	27.9	pc/mi/ln	S		mi/h
LOS	D		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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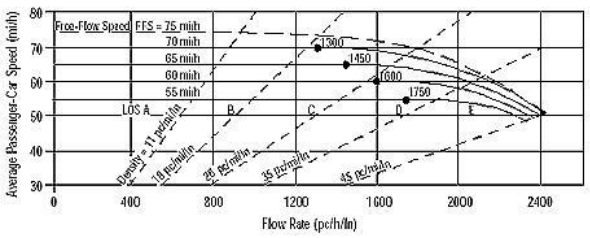

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	B/W Ben Maddox Way & Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2010
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	1826 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1060	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	17.0	pc/mi/ln	S		mi/h
LOS	B		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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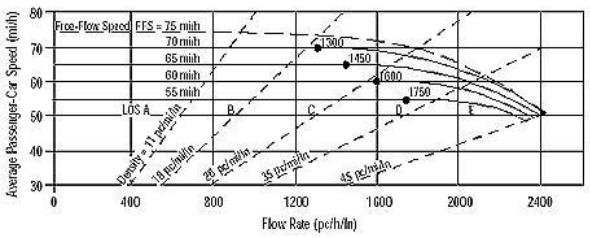

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	E/O Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2010

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	1431 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	0.56	I/mi	f_{ID}	0.3	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	65.2	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	835	pc/h/ln	Design LOS		
S	65.2	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	12.8	pc/mi/ln	S		mi/h
LOS	B		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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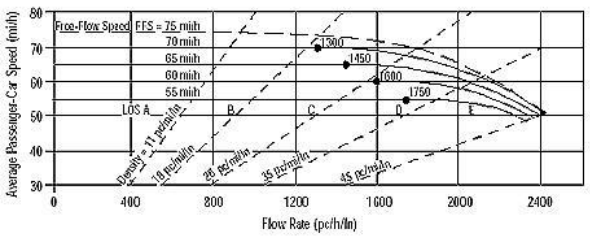

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	W/O S. Ben Maddox Way
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2010

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2342 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1360	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	21.8	pc/mi/ln	S		mi/h
LOS	C		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2010

Project Description

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 2500 ft

Vu = 594 veh/h

Terrain Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	2985	0.90	Level	9	0	0.957	1.00	3466
Ramp	621	0.90	Level	4	0	0.980	1.00	704
UpStream	594	0.90	Level	2	0	0.990	1.00	667
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 3466 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	3466	4800	No
				V_{12}	3466	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	2762	4800	No
				V_R	704	2000	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$	$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$
D_R = (pc/ mi /ln)	D_R = 32.5 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= D (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)	D_s = 0.491 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 56.2 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 56.2 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2010

Project Description

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 2600 ft

Vu = 217 veh/h

Terrain Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	2581	0.90	Level	9	0	0.957	1.00	2997
Ramp	1374	0.90	Level	4	0	0.980	1.00	1557
UpStream	217	0.90	Level	2	0	0.990	1.00	244
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 2997 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	2997	4800	No
				V_{12}	2997	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	1440	4800	No
				V_R	1557	2000	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$	$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$
D_R = (pc/ mi /ln)	D_R = 27.3 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= C (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)	D_s = 0.568 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 54.1 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 54.1 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2010

Project Description

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off
L_{up} = 3400 ft
Vu = 559 veh/h

Terrain Level
S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off
L_{down} = ft
VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	1826	0.90	Level	9	0	0.957	1.00	2120
Ramp	111	0.90	Level	4	0	0.980	1.00	126
UpStream	559	0.90	Level	2	0	0.990	1.00	627
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 25-2 or 25-3)
P_{FM}= using Equation
V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$
D_R = (pc/ mi /ln)
LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} =1.000 using Equation 0
V_{12} = 2120 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$	2120	4800	No
V_{12}	2120	4400:All	No
$V_{FO} = V_F - V_R$	1994	4800	No
V_R	126	2000	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$
D_R = 20.0 (pc/ mi /ln)
LOS= C (Exhibit 25-4)

Speed Estimation

D_s = 0.439 (Exhibit 25-19)
S_R= 57.7 mph (Exhibit 25-19)
S_0= N/A mph (Exhibit 25-19)
S = 57.7 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET Page 1 of 1

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2010

Project Description

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☐ No ☐ Off
L_{up} = ft
Vu = veh/h

Terrain
S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☐ No ☐ Off
L_{down} = ft
VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	1431	0.90	Level	9	0	0.957	1.00	1662
Ramp	164	0.90	Level	4	0	0.980	1.00	186
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 25-2 or 25-3)
P_{FM}= using Equation
V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$
D_R = (pc/ mi /ln)
LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} =1.000 using Equation 0
V_{12} = 1662 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$	1662	4800	No
V_{12}	1662	4400:All	No
$V_{FO} = V_F - V_R$	1476	4800	No
V_R	186	2000	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$
D_R = 16.5 (pc/ mi /ln)
LOS= B (Exhibit 25-4)

Speed Estimation

D_s = 0.445 (Exhibit 25-19)
S_R= 57.5 mph (Exhibit 25-19)
S_0= N/A mph (Exhibit 25-19)
S = 57.5 mph (Exhibit 25-15)

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NEAR-TERM 2010 + PROJECT TRAFFIC CONDITIONS
(INTERSECTION, ROADWAY SEGMENT, AND FREEWAY & RAMP SEGMENTS)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor					0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt					1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)					3415	1553	1736	3471	1553	1736	3376	
Flt Permitted					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)					3415	1553	1736	3471	1553	1736	3376	
Volume (vph)	0	0	0	89	181	86	157	568	603	267	295	66
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.77	0.77	0.77	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	97	197	93	204	738	783	290	321	72
RTOR Reduction (vph)	0	0	0	0	0	69	0	0	197	0	18	0
Lane Group Flow (vph)	0	0	0	0	294	24	204	738	586	290	375	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type				Split		Perm	Prot		Perm	Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)					21.8	21.8	13.8	36.4	36.4	17.8	40.4	
Effective Green, g (s)					22.8	22.8	13.8	37.4	37.4	17.8	41.4	
Actuated g/C Ratio					0.25	0.25	0.15	0.42	0.42	0.20	0.46	
Clearance Time (s)					5.0	5.0	4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)					7.5	7.5	2.0	8.0	8.0	2.0	7.5	
Lane Grp Cap (vph)					865	393	266	1442	645	343	1553	
v/s Ratio Prot					c0.09		0.12	0.21		c0.17	c0.11	
v/s Ratio Perm						0.02			c0.38			
v/c Ratio					0.34	0.06	0.77	0.51	0.91	0.85	0.24	
Uniform Delay, d1					27.5	25.5	36.6	19.5	24.7	34.8	14.8	
Progression Factor					1.01	1.16	0.74	1.27	1.74	1.00	1.00	
Incremental Delay, d2					0.7	0.2	5.6	0.6	10.5	16.5	0.4	
Delay (s)					28.6	29.7	32.8	25.3	53.6	51.3	15.1	
Level of Service					C	C	C	C	D	D	B	
Approach Delay (s)		0.0			28.8			39.0			30.5	
Approach LOS		A			C			D			C	

Intersection Summary				
HCM Average Control Delay	35.5	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	58.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	278	600	311	274	65	82
Peak Hour Factor	0.85	0.85	0.74	0.74	0.56	0.56
Hourly flow rate (vph)	327	706	420	370	116	146
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type					None	
Median storage veh)						
Upstream signal (ft)	799					
pX, platoon unblocked						
vC, conflicting volume			1033		1706	516
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1033		1706	516
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			36		0	71
cM capacity (veh/h)			657		29	498

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	218	815	544	247	262
Volume Left	0	0	420	0	116
Volume Right	0	706	0	0	146
cSH	1700	1700	657	1700	61
Volume to Capacity	0.13	0.48	0.64	0.15	4.29
Queue Length 95th (ft)	0	0	115	0	Err
Control Delay (s)	0.0	0.0	18.3	0.0	Err
Lane LOS			C		F
Approach Delay (s)	0.0		12.6		Err
Approach LOS					F

Intersection Summary				
Average Delay	1263.0			
Intersection Capacity Utilization	59.0%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.89		1.00	1.00	0.85	1.00	0.93		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1626		1736	1827	1553	1736	3222		1736	3296	
Flt Permitted	0.59	1.00		0.48	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1082	1626		884	1827	1553	1736	3222		1736	3296	
Volume (vph)	29	52	144	204	138	141	259	745	681	250	708	358
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.85	0.85	0.85	0.87	0.87	0.87
Adj. Flow (vph)	35	63	173	246	166	170	305	876	801	287	814	411
RTOR Reduction (vph)	0	114	0	0	0	85	0	180	0	0	66	0
Lane Group Flow (vph)	35	122	0	246	166	85	305	1497	0	287	1159	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	24.6	24.6		26.1	26.1	26.1	18.2	32.9		16.5	31.2	
Effective Green, g (s)	26.6	26.6		26.6	26.6	26.6	18.2	34.9		16.5	33.2	
Actuated g/C Ratio	0.30	0.30		0.30	0.30	0.30	0.20	0.39		0.18	0.37	
Clearance Time (s)	6.0	6.0		4.5	4.5	4.5	4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	320	481		261	540	459	351	1249		318	1216	
v/s Ratio Prot		0.07			0.09		c0.18	c0.46		0.17	0.35	
v/s Ratio Perm	0.03			c0.28		0.05						
v/c Ratio	0.11	0.25		0.94	0.31	0.18	0.87	1.20		0.90	0.95	
Uniform Delay, d1	23.1	24.1		31.0	24.6	23.6	34.7	27.6		36.0	27.6	
Progression Factor	1.04	1.10		1.00	1.00	1.00	0.87	1.23		1.00	1.00	
Incremental Delay, d2	0.1	0.2		40.1	0.3	0.2	8.8	92.6		27.2	16.7	
Delay (s)	24.2	26.7		71.0	24.9	23.8	39.0	126.4		63.1	44.4	
Level of Service	C	C		E	C	C	D	F		E	D	
Approach Delay (s)		26.4			44.1			113.0			47.9	
Approach LOS		C			D			F			D	

Intersection Summary				
HCM Average Control Delay	75.7	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.01			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	92.5%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

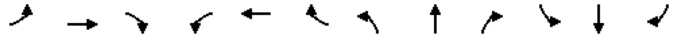
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	320	663	201	395	88	11
Peak Hour Factor	0.92	0.92	0.87	0.87	0.70	0.70
Hourly flow rate (vph)	348	721	231	454	126	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type					None	
Median storage veh)						
Upstream signal (ft)	465					
pX, platoon unblocked						
vC, conflicting volume			1068		1624	708
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1068		1624	708
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			64		0	96
cM capacity (veh/h)			645		72	431

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1068	685	141
Volume Left	0	231	126
Volume Right	721	0	16
cSH	1700	645	79
Volume to Capacity	0.63	0.36	1.79
Queue Length 95th (ft)	0	41	304
Control Delay (s)	0.0	9.0	490.5
Lane LOS		A	F
Approach Delay (s)	0.0	9.0	490.5
Approach LOS			F

Intersection Summary			
Average Delay	39.9		
Intersection Capacity Utilization	104.3%	ICU Level of Service	G
Analysis Period (min)	15		

5: Noble Ave & Ben Maddox Way

Timing Plan: AM PEAK



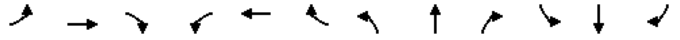
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0		4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	1.00		1.00		1.00		0.95	1.00	1.00	0.95	
Frt	1.00	0.98		1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3367	1788		1736		1553		3471	1553	1736	3471	
Flt Permitted	0.95	1.00		0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3367	1788		1736		1553		3471	1553	1736	3471	
Volume (vph)	123	143	24	105	0	461	0	744	84	115	269	0
Peak-hour factor, PHF	0.85	0.85	0.85	0.78	0.78	0.78	0.74	0.74	0.74	0.90	0.90	0.90
Adj. Flow (vph)	145	168	28	135	0	591	0	1005	114	128	299	0
RTOR Reduction (vph)	0	8	0	0	0	171	0	0	77	0	0	0
Lane Group Flow (vph)	145	188	0	135	0	420	0	1005	37	128	299	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot		custom			Perm	Prot		
Protected Phases	7	4		3		8		2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	8.0	27.0		8.0		27.0		28.2	28.2	8.8	41.0	
Effective Green, g (s)	8.0	28.0		8.0		28.0		29.2	29.2	8.8	42.0	
Actuated g/C Ratio	0.09	0.31		0.09		0.31		0.32	0.32	0.10	0.47	
Clearance Time (s)	4.0	5.0		4.0		5.0		5.0	5.0	4.0	5.0	
Vehicle Extension (s)	6.5	6.5		2.0		4.5		5.5	5.5	2.0	6.0	
Lane Grp Cap (vph)	299	556		154		483		1126	504	170	1620	
v/s Ratio Prot	0.04	0.11		c0.08		c0.27		c0.29		c0.07	0.09	
v/s Ratio Perm									0.02			
v/c Ratio	0.48	0.34		0.88		0.87		0.89	0.07	0.75	0.18	
Uniform Delay, d1	39.0	23.9		40.5		29.3		28.9	21.0	39.5	14.0	
Progression Factor	1.00	1.00		1.00		1.00		1.00	1.00	0.86	0.85	
Incremental Delay, d2	3.9	1.2		37.8		16.2		10.8	0.3	15.0	0.2	
Delay (s)	42.9	25.0		78.3		45.5		39.8	21.3	49.1	12.2	
Level of Service	D	C		E		D		D	C	D	B	
Approach Delay (s)		32.6			51.6			37.9			23.3	
Approach LOS		C			D			D			C	

Intersection Summary				
HCM Average Control Delay	38.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	64.1%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

6: Noble Ave & SR-198 EB Ramps @ Ben Maddox Way

Timing Plan: AM PEAK



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00		1.00	1.00		0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1644	3429		1644	1827	1471		1779	1471		3351	1471
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (perm)	1644	3429		1644	1827	1471		1779	1471		3351	1471
Volume (vph)	69	256	22	49	250	17	18	15	23	147	58	314
Peak-hour factor, PHF	0.86	0.86	0.86	0.84	0.84	0.84	0.93	0.93	0.93	0.76	0.76	0.76
Adj. Flow (vph)	80	298	26	58	298	20	19	16	25	193	76	413
RTOR Reduction (vph)	0	4	0	0	0	4	0	0	23	0	0	315
Lane Group Flow (vph)	80	320	0	58	298	16	0	35	2	0	269	98
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6			3			4
Actuated Green, G (s)	5.3	32.1		4.6	31.4	31.4		5.8	5.8		17.6	17.6
Effective Green, g (s)	5.0	33.4		4.3	32.7	32.7		7.0	7.0		18.8	18.8
Actuated g/C Ratio	0.06	0.42		0.05	0.41	0.41		0.09	0.09		0.24	0.24
Clearance Time (s)	3.7	5.3		3.7	5.3	5.3		5.2	5.2		5.2	5.2
Vehicle Extension (s)	2.0	5.1		2.0	4.8	4.8		6.3	6.3		7.9	7.9
Lane Grp Cap (vph)	103	1441		89	751	605		157	130		792	348
v/s Ratio Prot	c0.05	0.09		0.04	c0.16			c0.02			c0.08	
v/s Ratio Perm						0.01			0.00			0.07
v/c Ratio	0.78	0.22		0.65	0.40	0.03		0.22	0.02		0.34	0.28
Uniform Delay, d1	36.7	14.7		36.9	16.5	13.9		33.7	33.1		25.2	24.8
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	27.6	0.4		12.3	0.7	0.0		2.2	0.2		1.1	1.9
Delay (s)	64.3	15.1		49.1	17.1	14.0		35.9	33.3		26.3	26.7
Level of Service	E	B		D	B	B		D	C		C	C
Approach Delay (s)		24.8			21.9			34.8			26.5	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	25.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.39			
Actuated Cycle Length (s)	79.5	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	50.3%	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		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	243	201	0	369	25	0	0	31	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.84	0.84	0.84	0.79	0.79	0.79	0.92	0.92	0.92
Hourly flow rate (vph)	11	256	212	0	439	30	0	0	39	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		799			328							
pX, platoon unblocked	0.97						0.97	0.97		0.97	0.97	0.97
vC, conflicting volume	469			467			837	852	234	642	943	454
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	450			467			831	846	234	630	941	435
tC, single (s)	4.2			4.2			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	95	100	100	100
cM capacity (veh/h)	1055			1076			251	284	768	337	254	555

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	NB 1
Volume Total	11	171	297	469	39
Volume Left	11	0	0	0	0
Volume Right	0	0	212	30	39
cSH	1055	1700	1700	1700	768
Volume to Capacity	0.01	0.10	0.17	0.28	0.05
Queue Length 95th (ft)	1	0	0	0	4
Control Delay (s)	8.4	0.0	0.0	0.0	9.9
Lane LOS	A				A
Approach Delay (s)	0.2			0.0	9.9
Approach LOS					A

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	24.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1553	1736	1827	1719	1538
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1827	1553	1736	1827	1719	1538
Volume (vph)	241	33	111	201	193	51
Peak-hour factor, PHF	0.86	0.86	0.81	0.81	0.78	0.78
Adj. Flow (vph)	280	38	137	248	247	65
RTOR Reduction (vph)	0	16	0	0	0	53
Lane Group Flow (vph)	280	22	137	248	247	12
Heavy Vehicles (%)	4%	4%	4%	4%	5%	5%
Turn Type		Perm	Prot			Prot
Protected Phases	2		1	6	4	4
Permitted Phases		2				
Actuated Green, G (s)	55.7	55.7	12.1	71.8	18.8	18.8
Effective Green, g (s)	57.7	57.7	12.1	73.8	18.8	18.8
Actuated g/C Ratio	0.57	0.57	0.12	0.73	0.19	0.19
Clearance Time (s)	6.0	6.0	4.0	6.0	4.0	4.0
Vehicle Extension (s)	8.0	8.0	2.0	8.0	2.4	2.4
Lane Grp Cap (vph)	1048	891	209	1340	321	287
v/s Ratio Prot	c0.15		c0.08	0.14	c0.14	0.01
v/s Ratio Perm		0.01				
v/c Ratio	0.27	0.02	0.66	0.19	0.77	0.04
Uniform Delay, d1	10.8	9.3	42.3	4.1	38.8	33.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.1	5.5	0.3	10.0	0.0
Delay (s)	11.4	9.3	47.8	4.4	48.9	33.6
Level of Service	B	A	D	A	D	C
Approach Delay (s)	11.2			19.9	45.7	
Approach LOS	B			B	D	

Intersection Summary			
HCM Average Control Delay	25.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	100.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	167	99	26	215	87	73
Peak Hour Factor	0.95	0.95	0.83	0.83	0.88	0.88
Hourly flow rate (vph)	176	104	31	259	99	83
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	744					
pX, platoon unblocked			0.96		0.96	0.96
vC, conflicting volume			280		550	228
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			251		532	197
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		79	90
cM capacity (veh/h)			1253		475	809

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	280	290	182
Volume Left	0	31	99
Volume Right	104	0	83
cSH	1700	1253	585
Volume to Capacity	0.16	0.03	0.31
Queue Length 95th (ft)	0	2	33
Control Delay (s)	0.0	1.1	13.9
Lane LOS		A	B
Approach Delay (s)	0.0	1.1	13.9
Approach LOS			B

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	46.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.92		1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	1686		1736	1593		1736	3471	1553	1736	3471	1553
Flt Permitted	0.13	1.00		0.64	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	244	1686		1161	1593		1736	3471	1553	1736	3471	1553
Volume (vph)	115	52	55	47	69	397	55	793	29	248	700	162
Peak-hour factor, PHF	0.73	0.73	0.73	0.83	0.83	0.83	0.84	0.84	0.84	0.93	0.93	0.93
Adj. Flow (vph)	158	71	75	57	83	478	65	944	35	267	753	174
RTOR Reduction (vph)	0	42	0	0	231	0	0	0	15	0	0	94
Lane Group Flow (vph)	158	104	0	57	330	0	65	944	20	267	753	80
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	28.0	28.0		28.0	28.0		6.4	30.8	30.8	15.2	39.6	39.6
Effective Green, g (s)	30.0	30.0		30.0	30.0		6.4	32.8	32.8	15.2	41.6	41.6
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.07	0.36	0.36	0.17	0.46	0.46
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	5.8	5.8		5.8	5.8		1.5	5.8	5.8	1.5	5.8	5.8
Lane Grp Cap (vph)	81	562		387	531		123	1265	566	293	1604	718
v/s Ratio Prot		0.06			0.21		0.04	c0.27		c0.15	0.22	
v/s Ratio Perm	c0.65			0.05					0.01			0.05
v/c Ratio	1.95	0.19		0.15	0.62		0.53	0.75	0.04	0.91	0.47	0.11
Uniform Delay, d1	30.0	21.3		21.0	25.2		40.3	25.0	18.4	36.7	16.6	13.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.10	0.70	0.34
Incremental Delay, d2	469.3	0.4		0.5	3.7		1.9	4.0	0.1	26.8	0.8	0.3
Delay (s)	499.3	21.7		21.5	28.9		42.2	29.0	18.5	67.3	12.4	5.0
Level of Service	F	C		C	C		D	C	B	E	B	A
Approach Delay (s)		270.0			28.3			29.5			23.6	
Approach LOS		F			C			C			C	

Intersection Summary			
HCM Average Control Delay	50.2	HCM Level of Service	D
HCM Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	85.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Visalia Walmart Expansion
Near-term 2010 Plus Project
11: SR-198 EB Ramps @ Lovers Lane & Lovers Lane
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0						4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95						0.95		1.00	0.95	
Frt	1.00	0.90						1.00		1.00	1.00	
Flt Protected	0.95	0.98						1.00		0.95	1.00	
Satd. Flow (prot)	1649	1533						3462		1736	3471	
Flt Permitted	0.95	0.98						1.00		0.95	1.00	
Satd. Flow (perm)	1649	1533						3462		1736	3471	
Volume (vph)	405	0	226	0	0	0	0	1280	24	172	884	0
Peak-hour factor, PHF	0.77	0.77	0.77	0.92	0.92	0.92	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	526	0	294	0	0	0	0	1455	27	195	1005	0
RTOR Reduction (vph)	0	86	0	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	390	344	0	0	0	0	0	1481	0	195	1005	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	22.0	22.0						41.5		13.4	58.6	
Effective Green, g (s)	22.6	22.6						42.3		13.1	59.4	
Actuated g/C Ratio	0.25	0.25						0.47		0.15	0.66	
Clearance Time (s)	4.6	4.6						4.8		3.7	4.8	
Vehicle Extension (s)	5.0	5.0						7.4		2.0	6.2	
Lane Grp Cap (vph)	414	385						1627		253	2291	
v/s Ratio Prot	c0.24	0.22						c0.43		c0.11	0.29	
v/s Ratio Perm												
v/c Ratio	0.94	0.89						0.91		0.77	0.44	
Uniform Delay, d1	33.1	32.5						22.1		37.0	7.3	
Progression Factor	1.00	1.00						0.59		1.39	0.47	
Incremental Delay, d2	30.6	23.4						4.8		6.2	0.3	
Delay (s)	63.6	55.9						17.8		57.5	3.8	
Level of Service	E	E						B		E	A	
Approach Delay (s)		59.6			0.0			17.8			12.5	
Approach LOS		E			A			B			B	

Intersection Summary				
HCM Average Control Delay	25.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.90			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	73.8%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Visalia Walmart Expansion
Near-term 2010 Plus Project
12: Tulare Ave & Ben Maddox Way
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	1845	1568	1752	1845	1568	1736	3471	1553	1736	3471	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1752	1845	1568	1752	1845	1568	1736	3471	1553	1736	3471	1553
Volume (vph)	109	170	37	13	222	183	55	494	17	95	236	107
Peak-hour factor, PHF	0.73	0.73	0.73	0.83	0.83	0.83	0.78	0.78	0.78	0.92	0.92	0.92
Adj. Flow (vph)	149	233	51	16	267	220	71	633	22	103	257	116
RTOR Reduction (vph)	0	0	34	0	0	155	0	0	10	0	0	70
Lane Group Flow (vph)	149	233	17	16	267	65	71	633	12	103	257	46
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	9.1	27.7	27.7	1.2	19.8	19.8	6.1	32.5	32.5	6.6	33.0	33.0
Effective Green, g (s)	9.1	28.7	28.7	1.2	20.8	20.8	6.1	33.5	33.5	6.6	34.0	34.0
Actuated g/C Ratio	0.11	0.33	0.33	0.01	0.24	0.24	0.07	0.39	0.39	0.08	0.40	0.40
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	185	616	523	24	446	379	123	1352	605	133	1372	614
v/s Ratio Prot	c0.09	0.13		0.01	c0.14		0.04	c0.18		c0.06	0.07	
v/s Ratio Perm			0.01			0.04			0.01			0.03
v/c Ratio	0.81	0.38	0.03	0.67	0.60	0.17	0.58	0.47	0.02	0.77	0.19	0.07
Uniform Delay, d1	37.6	21.8	19.3	42.2	28.9	25.8	38.7	19.6	16.2	39.0	17.0	16.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.8	0.1	0.0	42.9	1.4	0.1	4.0	1.2	0.1	22.1	0.3	0.2
Delay (s)	58.4	22.0	19.3	85.1	30.3	25.9	42.7	20.8	16.2	61.1	17.3	16.4
Level of Service	E	C	B	F	C	C	D	C	B	E	B	B
Approach Delay (s)		34.2			30.1			22.8			26.6	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	27.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	50.0%	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												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	48	155	33	31	200	52	147	96	30	55	56	45
Peak Hour Factor	0.67	0.67	0.67	0.78	0.78	0.78	0.77	0.77	0.77	0.86	0.86	0.86
Hourly flow rate (vph)	72	231	49	40	256	67	191	125	39	64	65	52

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	352	363	355	181
Volume Left (vph)	72	40	191	64
Volume Right (vph)	49	67	39	52
Hadj (s)	0.01	-0.04	0.09	-0.05
Departure Headway (s)	6.8	6.8	7.0	7.4
Degree Utilization, x	0.67	0.68	0.69	0.37
Capacity (veh/h)	485	495	475	400
Control Delay (s)	22.5	23.0	24.0	14.8
Approach Delay (s)	22.5	23.0	24.0	14.8
Approach LOS	C	C	C	B

Intersection Summary				
Delay	22.0			
HCM Level of Service	C			
Intersection Capacity Utilization	49.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0				4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00				1.00	1.00	0.95		1.00	0.95	
Frt		0.85				0.85	1.00	1.00		1.00	0.98	
Flt Protected		1.00				1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1568				1568	1736	3462		1736	3392	
Flt Permitted		1.00				1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1568				1568	1736	3462		1736	3392	
Volume (vph)	0	0	81	0	0	24	42	784	15	21	607	108
Peak-hour factor, PHF	0.68	0.68	0.68	0.60	0.60	0.60	0.87	0.87	0.87	0.84	0.84	0.84
Adj. Flow (vph)	0	0	119	0	0	40	48	901	17	25	723	129
RTOR Reduction (vph)	0	105	0	0	0	35	0	1	0	0	17	0
Lane Group Flow (vph)	0	14	0	0	0	5	48	917	0	25	835	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		6.4				6.4	2.2	36.3		1.1	35.2	
Effective Green, g (s)		6.4				6.4	2.2	36.3		1.1	35.2	
Actuated g/C Ratio		0.11				0.11	0.04	0.65		0.02	0.63	
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)		180				180	68	2252		34	2140	
v/s Ratio Prot		c0.01					c0.03	c0.26		0.01	0.25	
v/s Ratio Perm						0.00						
v/c Ratio		0.08				0.03	0.71	0.41		0.74	0.39	
Uniform Delay, d1		22.1				21.9	26.5	4.6		27.2	5.0	
Progression Factor		1.00				1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2				0.1	28.3	0.1		57.7	0.1	
Delay (s)		22.2				22.0	54.7	4.8		84.9	5.2	
Level of Service		C				C	D	A		F	A	
Approach Delay (s)		22.2			22.0			7.2			7.4	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM Average Control Delay	8.5	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.35			
Actuated Cycle Length (s)	55.8	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	40.5%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frt	1.00	1.00			0.98			0.98				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1736	1827			1790			4938				
Flt Permitted	0.95	1.00			1.00			1.00				
Satd. Flow (perm)	1736	1827			1790			4938				
Volume (vph)	30	134	0	0	46	8	70	1055	141	0	0	0
Peak-hour factor, PHF	0.83	0.83	0.83	0.68	0.68	0.68	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	36	161	0	0	68	12	80	1199	160	0	0	0
RTOR Reduction (vph)	0	0	0	0	8	0	0	11	0	0	0	0
Lane Group Flow (vph)	36	161	0	0	72	0	0	1428	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	Prot						Perm					
Protected Phases	7	4			8			2				
Permitted Phases							2					
Actuated Green, G (s)	2.9	19.1			12.5			40.1				
Effective Green, g (s)	2.6	19.3			12.7			40.3				
Actuated g/C Ratio	0.04	0.29			0.19			0.60				
Clearance Time (s)	3.7	4.2			4.2			4.2				
Vehicle Extension (s)	2.0	7.9			7.7			6.4				
Lane Grp Cap (vph)	67	522			336			2944				
v/s Ratio Prot	c0.02	c0.09			0.04							
v/s Ratio Perm								0.29				
v/c Ratio	0.54	0.31			0.21			0.49				
Uniform Delay, d1	31.9	18.9			23.2			7.8				
Progression Factor	1.00	1.00			1.00			1.00				
Incremental Delay, d2	4.1	1.4			1.3			0.6				
Delay (s)	36.0	20.3			24.5			8.3				
Level of Service	D	C			C			A				
Approach Delay (s)		23.2			24.5			8.3			0.0	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM Average Control Delay	10.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	67.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	39.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0				
Lane Util. Factor					0.91			0.91				
Frt					0.95			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					4715			4983				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					4715			4983				
Volume (vph)	0	0	0	0	700	402	263	975	0	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.82	0.82	0.82	0.87	0.87	0.87	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	854	490	302	1121	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	28	0	0	32	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1316	0	0	1391	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type							Perm					
Protected Phases					8			2				
Permitted Phases							2					
Actuated Green, G (s)					23.5			30.5				
Effective Green, g (s)					24.1			31.1				
Actuated g/C Ratio					0.38			0.49				
Clearance Time (s)					4.6			4.6				
Vehicle Extension (s)					4.8			3.0				
Lane Grp Cap (vph)					1798			2452				
v/s Ratio Prot					c0.28							
v/s Ratio Perm								0.28				
v/c Ratio					0.73			0.57				
Uniform Delay, d1					16.8			11.3				
Progression Factor					1.00			1.00				
Incremental Delay, d2					1.9			1.0				
Delay (s)					18.6			12.3				
Level of Service					B			B				
Approach Delay (s)		0.0			18.6			12.3			0.0	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	63.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.91						0.91				
Frt		1.00						0.98				
Flt Protected		0.98						1.00				
Satd. Flow (prot)		4883						4946				
Flt Permitted		0.98						1.00				
Satd. Flow (perm)		4883						4946				
Volume (vph)	578	774	0	0	0	0	0	659	89	0	0	0
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.82	0.82	0.82	0.92	0.92	0.92
Adj. Flow (vph)	622	832	0	0	0	0	0	804	109	0	0	0
RTOR Reduction (vph)	0	38	0	0	0	0	0	34	0	0	0	0
Lane Group Flow (vph)	0	1416	0	0	0	0	0	879	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	Perm											
Protected Phases		2						8				
Permitted Phases	2											
Actuated Green, G (s)		23.2						18.2				
Effective Green, g (s)		24.6						19.3				
Actuated g/C Ratio		0.47						0.37				
Clearance Time (s)		5.4						5.1				
Vehicle Extension (s)		2.0						5.0				
Lane Grp Cap (vph)		2314						1839				
v/s Ratio Prot								c0.18				
v/s Ratio Perm		0.29										
v/c Ratio		0.61						0.48				
Uniform Delay, d1		10.1						12.5				
Progression Factor		1.00						1.00				
Incremental Delay, d2		1.2						0.4				
Delay (s)		11.3						12.9				
Level of Service		B						B				
Approach Delay (s)		11.3			0.0			12.9			0.0	
Approach LOS		B			A			B			A	

Intersection Summary				
HCM Average Control Delay	11.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	51.9	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	53.4%	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)	20	25	0	0	35	41	3	685	6	0	0	0
Peak Hour Factor	0.60	0.60	0.60	0.83	0.83	0.83	0.78	0.78	0.78	0.92	0.92	0.92
Hourly flow rate (vph)	33	42	0	0	42	49	4	878	8	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	75	92	443	447
Volume Left (vph)	33	0	4	0
Volume Right (vph)	0	49	0	8
Hadj (s)	0.12	-0.29	0.06	0.04
Departure Headway (s)	5.8	5.4	5.0	5.0
Degree Utilization, x	0.12	0.14	0.62	0.62
Capacity (veh/h)	584	628	707	709
Control Delay (s)	9.6	9.2	14.7	14.8
Approach Delay (s)	9.6	9.2	14.7	
Approach LOS	A	A	B	

Intersection Summary				
Delay	13.9			
HCM Level of Service	B			
Intersection Capacity Utilization	35.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				4988	3433	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				4988	3433	
Volume (vph)	0	0	0	536	567	0
Peak-hour factor, PHF	0.92	0.92	0.74	0.74	0.70	0.70
Adj. Flow (vph)	0	0	0	724	810	0
RTOR Reduction (vph)	0	0	0	0	162	0
Lane Group Flow (vph)	0	0	0	724	648	0
Heavy Vehicles (%)	4%	4%	4%	4%	2%	2%
Turn Type						
Protected Phases				6	4	
Permitted Phases						
Actuated Green, G (s)				12.9	14.7	
Effective Green, g (s)				13.5	16.7	
Actuated g/C Ratio				0.35	0.44	
Clearance Time (s)				4.6	6.0	
Vehicle Extension (s)				5.0	6.0	
Lane Grp Cap (vph)				1763	1501	
v/s Ratio Prot				c0.15	c0.19	
v/s Ratio Perm						
v/c Ratio				0.41	0.43	
Uniform Delay, d1				9.3	7.5	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.3	0.6	
Delay (s)				9.7	8.0	
Level of Service				A	A	
Approach Delay (s)	0.0			9.7	8.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	8.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	38.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	33.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	294	93	204	738	783	290	393
v/c Ratio	0.34	0.20	0.77	0.51	0.93	0.85	0.25
Control Delay	27.7	6.9	37.0	27.0	36.3	58.7	15.7
Queue Delay	0.0	0.0	0.0	0.0	9.5	0.0	0.0
Total Delay	27.7	6.9	37.0	27.0	45.7	58.7	15.7
Queue Length 50th (ft)	62	3	101	207	346	155	65
Queue Length 95th (ft)	m71	m8	m131	212	#388	#318	108
Internal Link Dist (ft)	719			378			1660
Turn Bay Length (ft)		275	110		40	260	
Base Capacity (vph)	1063	547	312	1442	842	345	1573
Starvation Cap Reductn	0	0	0	0	55	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.17	0.65	0.51	0.99	0.84	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	35	236	246	166	170	305	1677	287	1225
v/c Ratio	0.11	0.40	0.91	0.31	0.31	0.87	1.17	0.90	0.95
Control Delay	23.5	10.6	67.5	25.5	9.5	42.8	108.2	69.5	43.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	33.7	0.0	0.0
Total Delay	23.5	10.6	67.5	25.5	9.5	42.8	141.9	69.5	43.9
Queue Length 50th (ft)	12	24	128	70	19	176	~451	165	~380
Queue Length 95th (ft)	m18	m35	#229	110	56	m192	m#576	#309	#481
Internal Link Dist (ft)		2033		385			269		731
Turn Bay Length (ft)	145		155		25	125		170	
Base Capacity (vph)	355	634	295	589	582	368	1430	319	1285
Starvation Cap Reductn	0	0	0	0	0	0	87	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.37	0.83	0.28	0.29	0.83	1.25	0.90	0.95

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	145	196	135	591	1005	114	128	299
v/c Ratio	0.48	0.35	0.88	0.90	0.89	0.20	0.75	0.18
Control Delay	44.9	23.0	88.8	35.0	42.9	6.0	62.6	13.4
Queue Delay	0.3	0.0	0.0	0.7	0.0	0.0	0.0	0.0
Total Delay	45.3	23.0	88.8	35.7	42.9	6.0	62.6	13.4
Queue Length 50th (ft)	41	76	77	188	~328	0	73	61
Queue Length 95th (ft)	67	118	#147	234	#318	23	#175	96
Internal Link Dist (ft)		671			2243			378
Turn Bay Length (ft)			280				120	
Base Capacity (vph)	299	663	154	727	1123	580	172	1618
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	18	0	0	23	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.30	0.88	0.84	0.89	0.20	0.74	0.18

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	80	324	58	298	20	35	25	269	413
v/c Ratio	0.47	0.21	0.37	0.38	0.03	0.14	0.11	0.32	0.61
Control Delay	46.3	18.0	45.1	22.5	18.3	35.8	15.7	27.2	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.3	18.0	45.1	22.5	18.3	35.8	15.7	27.2	7.6
Queue Length 50th (ft)	41	60	30	120	5	17	0	63	0
Queue Length 95th (ft)	89	107	69	218	22	49	24	90	27
Internal Link Dist (ft)		179		406		179		341	
Turn Bay Length (ft)	185		150		40				110
Base Capacity (vph)	381	1519	378	796	645	554	475	1216	797
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.21	0.15	0.37	0.03	0.06	0.05	0.22	0.52

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	280	38	137	248	247	65
v/c Ratio	0.27	0.04	0.66	0.19	0.77	0.19
Control Delay	13.8	4.8	58.4	5.3	55.5	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.8	4.8	58.4	5.3	55.5	10.1
Queue Length 50th (ft)	85	0	85	42	151	0
Queue Length 95th (ft)	175	17	142	82	211	25
Internal Link Dist (ft)	248			664	309	
Turn Bay Length (ft)			200			
Base Capacity (vph)	1046	905	335	1376	463	462
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.04	0.41	0.18	0.53	0.14

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	158	146	57	561	65	944	35	267	753	174
v/c Ratio	1.95	0.24	0.15	0.74	0.45	0.75	0.06	0.91	0.46	0.21
Control Delay	492.6	13.8	22.4	16.4	48.3	29.6	10.9	72.1	12.7	1.4
Queue Delay	234.0	0.0	0.0	96.2	0.0	0.3	0.0	101.2	1.0	0.7
Total Delay	726.5	13.8	22.4	112.6	48.3	29.9	10.9	173.3	13.7	2.1
Queue Length 50th (ft)	~140	33	23	103	36	246	4	151	103	0
Queue Length 95th (ft)	#204	56	47	185	69	291	22	m#253	m176	m2
Internal Link Dist (ft)		502		1058		2367			110	
Turn Bay Length (ft)	125		135		115		105	115		
Base Capacity (vph)	81	604	387	762	309	1266	581	309	1636	824
Starvation Cap Reductn	0	0	0	0	0	0	0	90	575	393
Spillback Cap Reductn	31	0	0	296	0	52	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	3.16	0.24	0.15	1.20	0.21	0.78	0.06	1.22	0.71	0.40

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

11: SR-198 EB Ramps @ Lovers Lane & Lovers Lane

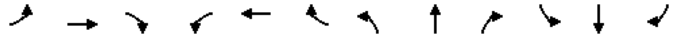
Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	390	430	1482	195	1005
v/c Ratio	0.94	0.91	0.91	0.77	0.44
Control Delay	66.9	50.3	20.6	60.5	3.8
Queue Delay	124.8	118.3	3.2	0.0	0.6
Total Delay	191.7	168.5	23.8	60.5	4.4
Queue Length 50th (ft)	229	189	160	119	50
Queue Length 95th (ft)	#315	#273	m#541	m117	m61
Internal Link Dist (ft)		366	110		269
Turn Bay Length (ft)	232			75	
Base Capacity (vph)	414	471	1628	380	2291
Starvation Cap Reductn	0	0	56	0	827
Spillback Cap Reductn	112	132	86	0	276
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.29	1.27	0.96	0.51	0.69

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

12: Tulare Ave & Ben Maddox Way

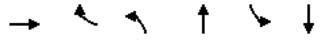


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	149	233	51	16	267	220	71	633	22	103	257	116
v/c Ratio	0.76	0.36	0.09	0.15	0.68	0.44	0.47	0.45	0.03	0.63	0.18	0.16
Control Delay	64.8	23.3	7.0	44.6	39.3	8.3	48.2	20.5	10.7	55.9	17.7	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.8	23.3	7.0	44.6	39.3	8.3	48.2	20.5	10.7	55.9	17.7	4.7
Queue Length 50th (ft)	79	89	0	8	132	7	36	128	2	53	44	0
Queue Length 95th (ft)	#142	137	17	27	190	48	71	171	15	#126	83	34
Internal Link Dist (ft)		1613			1967			1346			2243	
Turn Bay Length (ft)	95		95	90		90	155		90	200		200
Base Capacity (vph)	195	712	636	171	629	669	184	1419	644	185	1442	713
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.33	0.08	0.09	0.42	0.33	0.39	0.45	0.03	0.56	0.18	0.16

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

14: Tulare Ave & Lovers Lane



Lane Group	EBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	119	40	48	918	25	852
v/c Ratio	0.28	0.10	0.33	0.40	0.18	0.40
Control Delay	1.6	0.5	22.3	5.0	20.1	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.6	0.5	22.3	5.0	20.1	5.8
Queue Length 50th (ft)	0	0	7	34	3	28
Queue Length 95th (ft)	0	0	30	105	19	86
Internal Link Dist (ft)	2570			1470		2367
Turn Bay Length (ft)			210		290	
Base Capacity (vph)	638	616	145	2342	139	2172
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.06	0.33	0.39	0.18	0.39

Intersection Summary

15: Acequia Ave & N. Court St

Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	36	161	80	1439
v/c Ratio	0.23	0.31	0.20	0.46
Control Delay	30.2	15.9	18.1	8.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	30.2	15.9	18.1	8.9
Queue Length 50th (ft)	11	40	17	83
Queue Length 95th (ft)	35	70	40	183
Internal Link Dist (ft)		608	737	568
Turn Bay Length (ft)				
Base Capacity (vph)	436	956	615	3105
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.08	0.17	0.13	0.46

Intersection Summary

Lane Group	WBT	NBT
Lane Group Flow (vph)	1344	1423
v/c Ratio	0.74	0.57
Control Delay	18.9	12.2
Queue Delay	0.3	0.0
Total Delay	19.2	12.2
Queue Length 50th (ft)	151	134
Queue Length 95th (ft)	172	166
Internal Link Dist (ft)	265	310
Turn Bay Length (ft)		
Base Capacity (vph)	1913	2483
Starvation Cap Reductn	154	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.76	0.57

Intersection Summary

Lane Group	EBT	NBT
Lane Group Flow (vph)	1454	913
v/c Ratio	0.62	0.49
Control Delay	11.4	12.6
Queue Delay	0.0	0.0
Total Delay	11.4	12.6
Queue Length 50th (ft)	114	70
Queue Length 95th (ft)	155	87
Internal Link Dist (ft)	4045	445
Turn Bay Length (ft)		
Base Capacity (vph)	2348	1979
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.62	0.46

Intersection Summary

Lane Group	WBT	NWL
Lane Group Flow (vph)	724	810
v/c Ratio	0.41	0.49
Control Delay	10.8	6.1
Queue Delay	0.0	0.0
Total Delay	10.8	6.1
Queue Length 50th (ft)	39	32
Queue Length 95th (ft)	63	47
Internal Link Dist (ft)	3590	190
Turn Bay Length (ft)		
Base Capacity (vph)	2778	2011
Starvation Cap Reductn	0	0
Spillback Cap Reductn	22	6
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.26	0.40

Intersection Summary

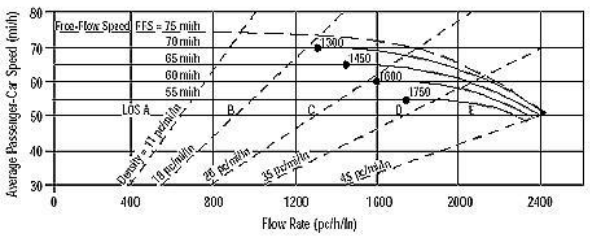
Kimley-Horn and Associates, Inc.

Visalia Walmart Roadway Network Capacity

Near-term 2010 Plus Project Conditions
AM Peak

ROADWAY	FROM	TO	Length (Miles)	Area Type (U/T/R)	Functional Class	# of Lanes	Div/Undiv (D/U)	Left-turn Bays (Y/N)	POSTED SPEED	Sig/Mile	Code	Notes	Generalized Service Volumes							
													Code	A	B	C	D	E	Two-Way Vol	LOS
Mineral King Avenue	Ben Maddox Way	SR-198 WB Ramps (B	0.15	U	Arterial	4	U	N	40	3.50	U-NS2-4	adjusted volumes by -25%	U-NS2-4	0	0	2178	2898	3060	917	C
Mineral King Avenue	SR-198 WB Ramps (B	Lovers Lane	0.84	U	Arterial	2	U	Y	40	1.50	U-NS1-2		U-NS1-2	0	837	1350	1440	0	963	C
Noble Avenue	Ben Maddox Way	SR-198 EB Ramps	0.16	U	Arterial	2	U	Y	35	4.00	U-NS2-2		U-NS2-2	0	0	918	1332	1413	919	D
Noble Avenue	East Driveway	Pinkham Street	0.14	U	Arterial	2	U	Y	35	2.50	U-NS2-2		U-NS2-2	0	0	918	1332	1413	586	C
Noble Avenue	Pinkham Street	Lovers Lane	0.50	U	Arterial	2	U	Y	45	2.00	U-NS2-2		U-NS2-2	0	0	918	1332	1413	494	C
Ben Maddox Way	Noble Avenue	Tulare Avenue	0.44	U	Arterial	4	D	Y	40	2.00	U-NS2-4		U-NS2-4	0	0	2178	2898	3060	1,225	C
Pinkham Street	Noble Avenue	Tulare Avenue	0.44	U	Arterial	2	U	N	40	0	U-OS1-2	adjusted volumes by -20%	U-OS1-2	0	605	975	1040	0	255	B
Lovers Lane	Noble Avenue	Tulare Avenue	0.47	U	Arterial	4	D	Y	45	3.00	U-NS2-4		U-NS2-4	0	0	2178	2898	3060	1,613	C
Tulare Avenue	Ben Maddox Way	Pinkham Street	0.39	U	Arterial	2	U	Y	40	0.61	U-OS1-2		U-OS1-2	0	605	975	1040	0	664	C
Tulare Avenue	Pinkham Street	Lovers Lane	0.48	U	Arterial	2	U	N	40	0.82	U-OS1-2	adjusted volumes by -20%	U-OS1-2	0	605	975	1040	0	302	B

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	
Agency or Company	Kimley-Horn and Associates
Date Performed	7/6/2009
Analysis Time Period	AM Peak

Site Information

Highway/Direction of Travel	SR-198 EB
From/To	B/W Ben Maddox Way & Lovers Ln
Jurisdiction	City of Visalia
Analysis Year	Near-term + Project 2010

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	1648 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	1.10	I/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0	mi/h
f_{LC}	0.0	mi/h
f_{ID}	3.0	mi/h
f_N	4.5	mi/h
FFS	62.5	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	957	pc/h/ln
S	62.5	mi/h
D = v_p / S	15.3	pc/mi/ln
LOS	B	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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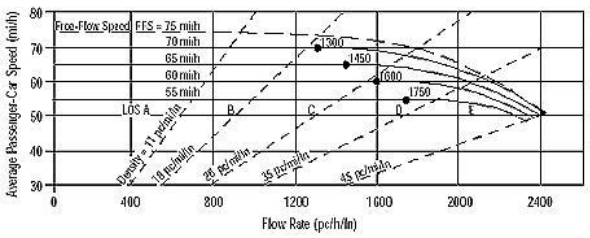
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	
Agency or Company	Kimley-Horn and Associates
Date Performed	7/6/2009
Analysis Time Period	AM Peak

Site Information

Highway/Direction of Travel	SR-198 EB
From/To	E/O Lovers Ln.
Jurisdiction	City of Visalia
Analysis Year	Near-term + Project 2010

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	1214 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.56	I/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0	mi/h
f_{LC}	0.0	mi/h
f_{ID}	0.3	mi/h
f_N	4.5	mi/h
FFS	65.2	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	708	pc/h/ln
S	65.2	mi/h
D = v_p / S	10.9	pc/mi/ln
LOS	A	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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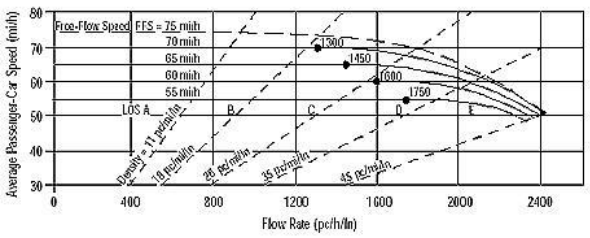

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	W/O S. Ben Maddox Way
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term + Project 2010
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2066 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1199	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	19.2	pc/mi/ln	S		mi/h
LOS	C		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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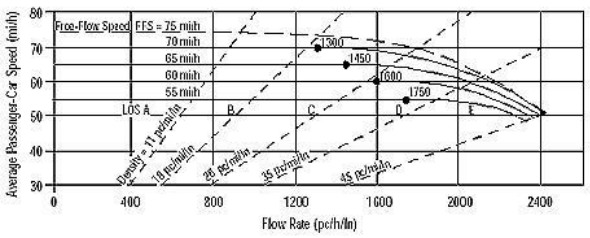

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	B/W Ben Maddox Way & Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term + Project 2010
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2191 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1272	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	20.3	pc/mi/ln	S		mi/h
LOS	C		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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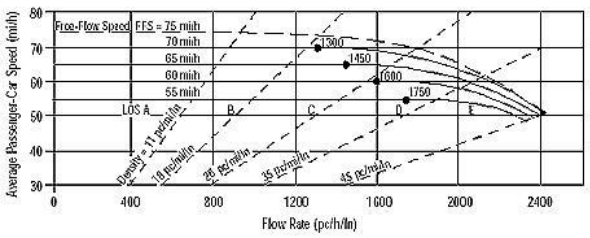
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	E/O Lovers Ln.
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2010 + Project
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	1426 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	0.56	I/mi	f_{ID}	0.3	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	65.2	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	832	pc/h/ln	Design LOS		
S	65.2	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	12.8	pc/mi/ln	S		mi/h
LOS	B		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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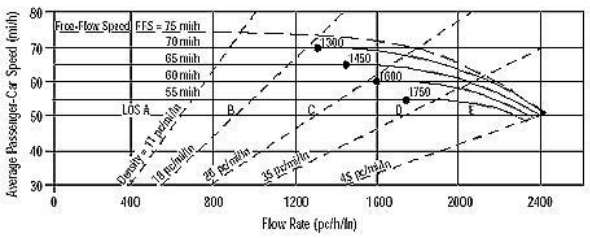
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	W/O S. Ben Maddox Way
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term + Project 2010
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2955 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1716	pc/h/ln	Design LOS		
S	62.3	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	27.6	pc/mi/ln	S		mi/h
LOS	D		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2010 + Project

Project Description

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 2500 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = 296 veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	2066	0.90	Level	9	0	0.957	1.00	2399
Ramp	519	0.90	Level	4	0	0.980	1.00	588
UpStream	296	0.90	Level	2	0	0.990	1.00	332
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 2399 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	2399	4800	No
				V_{12}	2399	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	1811	4800	No
				V_R	588	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A	D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D
D_R = (pc/ mi /ln)	D_R = 23.3 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= C (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.481 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 56.5 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 56.5 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2010 + Project

Project Description

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 2600 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = 101 veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	1648	0.90	Level	9	0	0.957	1.00	1914
Ramp	630	0.90	Level	4	0	0.980	1.00	714
UpStream	101	0.90	Level	2	0	0.990	1.00	113
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 1914 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	1914	4800	No
				V_{12}	1914	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	1200	4800	No
				V_R	714	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A	D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D
D_R = (pc/ mi /ln)	D_R = 18.0 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= B (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.492 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 56.2 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 56.2 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2010 + Project

Project Description

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 3400 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = 864 veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	2191	0.90	Level	9	0	0.957	1.00	2544
Ramp	147	0.90	Level	4	0	0.980	1.00	167
UpStream	864	0.90	Level	2	0	0.990	1.00	970
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 2544 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	2544	4800	No
				V_{12}	2544	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	2377	4800	No
				V_R	167	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
D_R = (pc/ mi /ln)	D_R = 23.7 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= C (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.443 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 57.6 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 57.6 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2010 + Project

Project Description

Inputs

Upstream Adj Ramp	Terrain	Downstream Adj Ramp
☐ Yes ☐ On		☐ Yes ☐ On
☐ No ☐ Off		☐ No ☐ Off
L_{up} = ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	1426	0.90	Level	9	0	0.957	1.00	1656
Ramp	99	0.90	Level	4	0	0.980	1.00	112
UpStream								
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 1656 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	1656	4800	No
				V_{12}	1656	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	1544	4800	No
				V_R	112	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
D_R = (pc/ mi /ln)	D_R = 16.5 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= B (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.438 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 57.7 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 57.7 mph (Exhibit 25-15)

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor					0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt					1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)					3455	1583	1770	3539	1583	1770	3486	
Flt Permitted					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)					3455	1583	1770	3539	1583	1770	3486	
Volume (vph)	0	0	0	171	180	108	152	682	426	247	568	63
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.94	0.86	0.86	0.86
Adj. Flow (vph)	0	0	0	186	196	117	162	726	453	287	660	73
RTOR Reduction (vph)	0	0	0	0	0	84	0	0	118	0	8	0
Lane Group Flow (vph)	0	0	0	0	382	33	162	726	335	287	725	0
Turn Type				Split		Perm	Prot		Perm	Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)					24.7	24.7	11.8	35.2	35.2	16.1	39.5	
Effective Green, g (s)					25.7	25.7	11.8	36.2	36.2	16.1	40.5	
Actuated g/C Ratio					0.29	0.29	0.13	0.40	0.40	0.18	0.45	
Clearance Time (s)					5.0	5.0	4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)					7.5	7.5	2.0	8.0	8.0	2.0	7.5	
Lane Grp Cap (vph)					987	452	232	1423	637	317	1569	
v/s Ratio Prot					c0.11		0.09	0.21		c0.16	0.21	
v/s Ratio Perm						0.02			c0.21			
v/c Ratio					0.39	0.07	0.70	0.51	0.53	0.91	0.46	
Uniform Delay, d1					25.8	23.5	37.4	20.2	20.4	36.2	17.2	
Progression Factor					0.91	0.95	0.86	1.13	1.39	1.00	1.00	
Incremental Delay, d2					1.0	0.3	5.0	0.9	2.1	27.2	1.0	
Delay (s)					24.5	22.6	37.1	23.7	30.4	63.4	18.2	
Level of Service					C	C	D	C	C	E	B	
Approach Delay (s)		0.0			24.1			27.6			30.9	
Approach LOS		A			C			C			C	

Intersection Summary				
HCM Average Control Delay	28.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	52.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	213	373	262	329	82	30
Peak Hour Factor	0.92	0.92	0.88	0.88	0.76	0.76
Hourly flow rate (vph)	232	405	298	374	108	39
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type					None	
Median storage veh)						
Upstream signal (ft)	799					
pX, platoon unblocked						
vC, conflicting volume			637		1217	318
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			637		1217	318
tC, single (s)			4.1		6.9	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			68		8	94
cM capacity (veh/h)			943		118	674

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	154	483	422	249	147
Volume Left	0	0	298	0	108
Volume Right	0	405	0	0	39
cSH	1700	1700	943	1700	153
Volume to Capacity	0.09	0.28	0.32	0.15	0.96
Queue Length 95th (ft)	0	0	34	0	177
Control Delay (s)	0.0	0.0	8.5	0.0	121.7
Lane LOS			A		F
Approach Delay (s)	0.0		5.4		121.7
Approach LOS					F

Intersection Summary				
Average Delay	14.8			
Intersection Capacity Utilization	49.4%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.90		1.00	1.00	0.85	1.00	0.94		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1677		1770	1863	1583	1770	3333		1770	3454	
Flt Permitted	0.64	1.00		0.15	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1183	1677		271	1863	1583	1770	3333		1770	3454	
Volume (vph)	80	137	271	188	125	165	159	977	618	190	598	115
Peak-hour factor, PHF	0.80	0.80	0.80	0.87	0.87	0.87	0.92	0.92	0.92	0.89	0.89	0.89
Adj. Flow (vph)	100	171	339	216	144	190	173	1062	672	213	672	129
RTOR Reduction (vph)	0	79	0	0	0	106	0	109	0	0	16	0
Lane Group Flow (vph)	100	431	0	216	144	84	173	1625	0	213	785	0
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	27.0	27.0		28.5	28.5	28.5	13.7	33.1		13.9	33.3	
Effective Green, g (s)	29.0	29.0		29.0	29.0	29.0	13.7	35.1		13.9	35.3	
Actuated g/C Ratio	0.32	0.32		0.32	0.32	0.32	0.15	0.39		0.15	0.39	
Clearance Time (s)	6.0	6.0		4.5	4.5	4.5	4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	381	540		87	600	510	269	1300		273	1355	
v/s Ratio Prot		0.26			0.08		0.10	c0.49		c0.12	0.23	
v/s Ratio Perm	0.08			c0.80		0.05						
v/c Ratio	0.26	0.80		2.48	0.24	0.17	0.64	1.25		0.78	0.58	
Uniform Delay, d1	22.6	27.8		30.5	22.4	21.8	35.9	27.4		36.6	21.5	
Progression Factor	0.86	0.80		1.00	1.00	1.00	0.70	1.24		1.00	1.00	
Incremental Delay, d2	0.4	7.9		700.3	0.2	0.2	0.5	113.1		13.4	1.8	
Delay (s)	19.7	30.2		730.8	22.6	22.0	25.6	147.0		50.0	23.3	
Level of Service	B	C		F	C	C	C	F		D	C	
Approach Delay (s)		28.5			300.5			136.0			28.9	
Approach LOS		C			F			F			C	

Intersection Summary				
HCM Average Control Delay	115.5	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.62			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	104.9%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	501	443	116	344	134	20
Peak Hour Factor	0.94	0.94	0.83	0.83	0.88	0.88
Hourly flow rate (vph)	533	471	140	414	152	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type					None	
Median storage veh)						
Upstream signal (ft)	465					
pX, platoon unblocked						
vC, conflicting volume			1004		1463	769
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1004		1463	769
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			80		0	94
cM capacity (veh/h)			690		112	400

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1004	554	175
Volume Left	0	140	152
Volume Right	471	0	23
cSH	1700	690	124
Volume to Capacity	0.59	0.20	1.41
Queue Length 95th (ft)	0	19	297
Control Delay (s)	0.0	5.2	289.2
Lane LOS		A	F
Approach Delay (s)	0.0	5.2	289.2
Approach LOS			F

Intersection Summary			
Average Delay	30.9		
Intersection Capacity Utilization	95.4%	ICU Level of Service	F
Analysis Period (min)	15		

5: Noble Ave & Ben Maddox Way

Timing Plan: PM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0		4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	1.00		1.00		1.00		0.95	1.00	1.00	0.95	
Frt	1.00	0.96		1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	1789		1770		1583		3539	1583	1770	3539	
Flt Permitted	0.95	1.00		0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	1789		1770		1583		3539	1583	1770	3539	
Volume (vph)	115	277	99	213	0	565	0	581	117	183	556	0
Peak-hour factor, PHF	0.83	0.83	0.83	0.93	0.93	0.93	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	139	334	119	229	0	608	0	612	123	199	604	0
RTOR Reduction (vph)	0	16	0	0	0	191	0	0	89	0	0	0
Lane Group Flow (vph)	139	437	0	229	0	417	0	612	34	199	604	0
Turn Type	Prot			Prot		custom			Perm	Prot		
Protected Phases	7	4		3		8		2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	8.0	27.6		8.0		27.6		24.0	24.0	12.4	40.4	
Effective Green, g (s)	8.0	28.6		8.0		28.6		25.0	25.0	12.4	41.4	
Actuated g/C Ratio	0.09	0.32		0.09		0.32		0.28	0.28	0.14	0.46	
Clearance Time (s)	4.0	5.0		4.0		5.0		5.0	5.0	4.0	5.0	
Vehicle Extension (s)	6.5	6.5		2.0		4.5		5.5	5.5	2.0	6.0	
Lane Grp Cap (vph)	305	569		157		503		983	440	244	1628	
v/s Ratio Prot	0.04	0.24		c0.13		c0.26		c0.17		c0.11	0.17	
v/s Ratio Perm									0.02			
v/c Ratio	0.46	0.77		1.46		0.83		0.62	0.08	0.82	0.37	
Uniform Delay, d1	38.9	27.7		41.0		28.4		28.4	24.0	37.7	15.8	
Progression Factor	1.00	1.00		1.00		1.00		1.00	1.00	0.79	0.81	
Incremental Delay, d2	3.4	8.3		238.0		11.8		3.0	0.3	16.3	0.6	
Delay (s)	42.3	36.0		279.0		40.2		31.3	24.3	46.3	13.4	
Level of Service	D	D		F		D		C	C	D	B	
Approach Delay (s)		37.5			105.6			30.2			21.6	
Approach LOS		D			F			C			C	

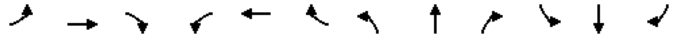
Intersection Summary			
HCM Average Control Delay	50.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

6: Noble Ave & SR-198 EB Ramps @ Ben Maddox Way

Timing Plan: PM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00		1.00	1.00		0.95	1.00
Frt	1.00	0.97		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1676	3443		1676	1863	1500		1791	1485		3396	1485
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (perm)	1676	3443		1676	1863	1500		1791	1485		3396	1485
Volume (vph)	101	381	85	106	266	47	107	71	95	197	109	320
Peak-hour factor, PHF	0.91	0.91	0.91	0.95	0.95	0.95	0.78	0.78	0.78	0.88	0.88	0.88
Adj. Flow (vph)	111	419	93	112	280	49	137	91	122	224	124	364
RTOR Reduction (vph)	0	13	0	0	0	12	0	0	96	0	0	287
Lane Group Flow (vph)	111	499	0	112	280	37	0	228	26	0	348	77
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6			3			4
Actuated Green, G (s)	9.4	30.8		9.4	30.8	30.8		20.5	20.5		19.9	19.9
Effective Green, g (s)	9.1	32.1		9.1	32.1	32.1		21.7	21.7		21.1	21.1
Actuated g/C Ratio	0.09	0.32		0.09	0.32	0.32		0.22	0.22		0.21	0.21
Clearance Time (s)	3.7	5.3		3.7	5.3	5.3		5.2	5.2		5.2	5.2
Vehicle Extension (s)	2.0	5.1		2.0	4.8	4.8		6.3	6.3		7.9	7.9
Lane Grp Cap (vph)	153	1105		153	598	482		389	322		717	313
v/s Ratio Prot	0.07	0.14		c0.07	c0.15			c0.13			c0.10	
v/s Ratio Perm						0.02			0.02			0.05
v/c Ratio	0.73	0.45		0.73	0.47	0.08		0.59	0.08		0.49	0.25
Uniform Delay, d1	44.2	27.0		44.3	27.1	23.6		35.1	31.2		34.7	32.8
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	13.5	1.3		14.4	1.1	0.1		4.5	0.3		2.2	1.7
Delay (s)	57.7	28.3		58.6	28.3	23.8		39.6	31.5		36.8	34.5
Level of Service	E	C		E	C	C		D	C		D	C
Approach Delay (s)		33.5			35.5			36.8			35.7	
Approach LOS		C			D			D			D	

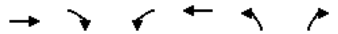
Intersection Summary			
HCM Average Control Delay	35.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	54.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	12	452	358	0	518	3	0	0	107	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.90	0.90	0.90	0.84	0.84	0.84	0.92	0.92	0.92
Hourly flow rate (vph)	13	476	377	0	576	3	0	0	127	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		799			328							
pX, platoon unblocked	0.97			0.93			0.94	0.94	0.93	0.94	0.94	0.97
vC, conflicting volume	579			853			1267	1268	426	968	1455	577
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	564			760			1149	1151	299	832	1349	562
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	80	100	100	100
cM capacity (veh/h)	969			784			143	183	645	196	139	454

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	NB 1
Volume Total	13	317	535	579	127
Volume Left	13	0	0	0	0
Volume Right	0	0	377	3	127
cSH	969	1700	1700	1700	645
Volume to Capacity	0.01	0.19	0.31	0.34	0.20
Queue Length 95th (ft)	1	0	0	0	18
Control Delay (s)	8.8	0.0	0.0	0.0	11.9
Lane LOS	A				B
Approach Delay (s)	0.1			0.0	11.9
Approach LOS					B

Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	37.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	1863	1770	1583
Volume (vph)	491	68	158	189	332	177
Peak-hour factor, PHF	0.94	0.94	0.91	0.91	0.81	0.81
Adj. Flow (vph)	522	72	174	208	410	219
RTOR Reduction (vph)	0	35	0	0	0	164
Lane Group Flow (vph)	522	37	174	208	410	55
Turn Type		Perm	Prot			Prot
Protected Phases	2		1	6	4	4
Permitted Phases		2				
Actuated Green, G (s)	55.3	55.3	15.0	74.3	28.4	28.4
Effective Green, g (s)	57.3	57.3	15.0	76.3	28.4	28.4
Actuated g/C Ratio	0.51	0.51	0.13	0.68	0.25	0.25
Clearance Time (s)	6.0	6.0	4.0	6.0	4.0	4.0
Vehicle Extension (s)	8.0	8.0	2.0	8.0	2.4	2.4
Lane Grp Cap (vph)	947	805	236	1261	446	399
v/s Ratio Prot	c0.28		c0.10	0.11	c0.23	0.03
v/s Ratio Perm		0.02				
v/c Ratio	0.55	0.05	0.74	0.16	0.92	0.14
Uniform Delay, d1	18.9	13.9	47.0	6.6	41.0	32.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	0.1	9.9	0.3	23.7	0.1
Delay (s)	21.2	14.0	56.8	6.9	64.7	32.8
Level of Service	C	B	E	A	E	C
Approach Delay (s)	20.4			29.6	53.6	
Approach LOS	C			C	D	

Intersection Summary				
HCM Average Control Delay	35.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	112.7	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	63.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	431	232	24	261	94	57
Peak Hour Factor	0.92	0.92	0.85	0.85	0.92	0.92
Hourly flow rate (vph)	468	252	28	307	102	62
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	744					
pX, platoon unblocked			0.80		0.80	0.80
vC, conflicting volume			721		958	595
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			652		948	495
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		54	87
cM capacity (veh/h)			750		224	461

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	721	335	164
Volume Left	0	28	102
Volume Right	252	0	62
cSH	1700	750	278
Volume to Capacity	0.42	0.04	0.59
Queue Length 95th (ft)	0	3	87
Control Delay (s)	0.0	1.3	35.1
Lane LOS		A	E
Approach Delay (s)	0.0	1.3	35.1
Approach LOS			E

Intersection Summary			
Average Delay		5.1	
Intersection Capacity Utilization		52.2%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.92		1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1711		1770	1648		1770	3539	1583	1770	3539	1583
Flt Permitted	0.27	1.00		0.34	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	503	1711		635	1648		1770	3539	1583	1770	3539	1583
Volume (vph)	203	154	184	93	90	297	78	729	54	371	967	198
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.85	0.85	0.85	0.92	0.92	0.92
Adj. Flow (vph)	218	166	198	101	98	323	92	858	64	403	1051	215
RTOR Reduction (vph)	0	48	0	0	132	0	0	0	30	0	0	118
Lane Group Flow (vph)	218	316	0	101	289	0	92	858	34	403	1051	97
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	28.0	28.0		28.0	28.0		7.5	30.0	30.0	16.0	38.5	38.5
Effective Green, g (s)	30.0	30.0		30.0	30.0		7.5	32.0	32.0	16.0	40.5	40.5
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.08	0.36	0.36	0.18	0.45	0.45
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	5.8	5.8		5.8	5.8		1.5	5.8	5.8	1.5	5.8	5.8
Lane Grp Cap (vph)	168	570		212	549		148	1258	563	315	1593	712
v/s Ratio Prot		0.18			0.18		0.05	0.24		c0.23	c0.30	
v/s Ratio Perm	c0.43			0.16					0.02			0.06
v/c Ratio	1.30	0.55		0.48	0.53		0.62	0.68	0.06	1.28	0.66	0.14
Uniform Delay, d1	30.0	24.5		23.8	24.3		39.9	24.7	19.1	37.0	19.4	14.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.84	1.22	2.16
Incremental Delay, d2	170.6	2.4		4.5	2.2		5.7	3.0	0.2	128.0	0.2	0.0
Delay (s)	200.6	26.9		28.2	26.4		45.6	27.7	19.3	158.9	23.8	31.4
Level of Service	F	C		C	C		D	C	B	F	C	C
Approach Delay (s)		92.0			26.8			28.8			57.4	
Approach LOS		F			C			C			E	

Intersection Summary			
HCM Average Control Delay	50.8	HCM Level of Service	D
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	88.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

11: SR-198 EB Ramps @ Lovers Lane & Lovers Lane

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0						4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95						0.95		1.00	0.95	
Frt	1.00	0.86						0.98		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1665	1498						3481		1770	3539	
Flt Permitted	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (perm)	1665	1498						3481		1770	3539	
Volume (vph)	661	0	714	0	0	0	0	1093	136	236	821	0
Peak-hour factor, PHF	0.79	0.79	0.79	0.92	0.92	0.92	0.95	0.95	0.95	0.87	0.87	0.87
Adj. Flow (vph)	837	0	904	0	0	0	0	1151	143	271	944	0
RTOR Reduction (vph)	0	125	0	0	0	0	0	10	0	0	0	0
Lane Group Flow (vph)	794	822	0	0	0	0	0	1284	0	271	944	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	22.0	22.0						38.0		16.9	58.6	
Effective Green, g (s)	22.6	22.6						38.8		16.6	59.4	
Actuated g/C Ratio	0.25	0.25						0.43		0.18	0.66	
Clearance Time (s)	4.6	4.6						4.8		3.7	4.8	
Vehicle Extension (s)	5.0	5.0						7.4		2.0	6.2	
Lane Grp Cap (vph)	418	376						1501		326	2336	
v/s Ratio Prot	0.48	c0.55						c0.37		c0.15	0.27	
v/s Ratio Perm												
v/c Ratio	1.90	2.19						0.86		0.83	0.40	
Uniform Delay, d1	33.7	33.7						23.1		35.4	7.1	
Progression Factor	1.00	1.00						0.65		1.15	0.85	
Incremental Delay, d2	413.7	542.4						4.2		4.7	0.1	
Delay (s)	447.4	576.1						19.1		45.4	6.1	
Level of Service	F	F						B		D	A	
Approach Delay (s)		517.4			0.0			19.1			14.9	
Approach LOS		F			A			B			B	

Intersection Summary				
HCM Average Control Delay	222.0	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.24			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	97.8%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

12: Tulare Ave & Ben Maddox Way

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	135	130	88	17	125	95	47	416	19	112	547	224
Peak-hour factor, PHF	0.90	0.90	0.90	0.89	0.89	0.89	0.81	0.81	0.81	0.90	0.90	0.90
Adj. Flow (vph)	150	144	98	19	140	107	58	514	23	124	608	249
RTOR Reduction (vph)	0	0	73	0	0	88	0	0	12	0	0	134
Lane Group Flow (vph)	150	144	25	19	140	19	58	514	11	124	608	115
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	9.0	20.4	20.4	2.5	13.9	13.9	4.7	33.6	33.6	8.5	37.4	37.4
Effective Green, g (s)	9.0	21.4	21.4	2.5	14.9	14.9	4.7	34.6	34.6	8.5	38.4	38.4
Actuated g/C Ratio	0.11	0.26	0.26	0.03	0.18	0.18	0.06	0.42	0.42	0.10	0.46	0.46
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	192	480	408	53	334	284	100	1475	660	181	1637	732
v/s Ratio Prot	c0.08	0.08		0.01	c0.08		0.03	0.15		c0.07	c0.17	
v/s Ratio Perm			0.02			0.01			0.01			0.07
v/c Ratio	0.78	0.30	0.06	0.36	0.42	0.07	0.58	0.35	0.02	0.69	0.37	0.16
Uniform Delay, d1	36.0	24.8	23.2	39.5	30.2	28.3	38.2	16.5	14.2	36.0	14.5	12.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.1	0.1	0.0	1.5	0.3	0.0	5.0	0.7	0.0	8.3	0.6	0.5
Delay (s)	53.2	24.9	23.3	41.0	30.5	28.3	43.2	17.2	14.3	44.2	15.1	13.4
Level of Service	D	C	C	D	C	C	D	B	B	D	B	B
Approach Delay (s)		35.3			30.4			19.6			18.4	
Approach LOS		D			C			B			B	

Intersection Summary				
HCM Average Control Delay	23.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.47			
Actuated Cycle Length (s)	83.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	48.4%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

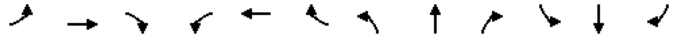
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	52	71	65	19	123	8	70	88	20	28	175	54
Peak Hour Factor	0.92	0.92	0.92	0.85	0.85	0.85	0.87	0.87	0.87	0.72	0.72	0.72
Hourly flow rate (vph)	57	77	71	22	145	9	80	101	23	39	243	75

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	204	176	205	357
Volume Left (vph)	57	22	80	39
Volume Right (vph)	71	9	23	75
Hadj (s)	-0.12	0.03	0.05	-0.07
Departure Headway (s)	5.7	5.9	5.7	5.3
Degree Utilization, x	0.32	0.29	0.32	0.53
Capacity (veh/h)	567	544	573	638
Control Delay (s)	11.4	11.3	11.4	14.1
Approach Delay (s)	11.4	11.3	11.4	14.1
Approach LOS	B	B	B	B

Intersection Summary			
Delay	12.4		
HCM Level of Service	B		
Intersection Capacity Utilization	51.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0				4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00				1.00	1.00	0.95		1.00	0.95	
Frt		0.85				0.85	1.00	1.00		1.00	0.98	
Flt Protected		1.00				1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1583				1583	1770	3537		1770	3477	
Flt Permitted		1.00				1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1583				1583	1770	3537		1770	3477	
Volume (vph)	0	0	73	0	0	3	47	765	3	21	893	118
Peak-hour factor, PHF	0.81	0.81	0.81	0.50	0.50	0.50	0.77	0.77	0.77	0.98	0.98	0.98
Adj. Flow (vph)	0	0	90	0	0	6	61	994	4	21	911	120
RTOR Reduction (vph)	0	83	0	0	0	6	0	0	0	0	10	0
Lane Group Flow (vph)	0	7	0	0	0	0	61	998	0	21	1021	0
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		4.7				4.7	2.6	43.0		1.0	41.4	
Effective Green, g (s)		4.7				4.7	2.6	43.0		1.0	41.4	
Actuated g/C Ratio		0.08				0.08	0.04	0.71		0.02	0.68	
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)		123				123	76	2506		29	2371	
v/s Ratio Prot		c0.00					c0.03	0.28		0.01	c0.29	
v/s Ratio Perm						0.00						
v/c Ratio		0.06				0.00	0.80	0.40		0.72	0.43	
Uniform Delay, d1		25.9				25.8	28.8	3.6		29.7	4.3	
Progression Factor		1.00				1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2				0.0	43.8	0.1		61.8	0.1	
Delay (s)		26.1				25.9	72.6	3.7		91.5	4.5	
Level of Service		C				C	E	A		F	A	
Approach Delay (s)		26.1			25.9			7.7			6.2	
Approach LOS		C			C			A			A	

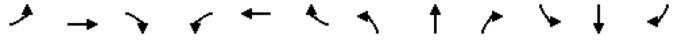
Intersection Summary					
HCM Average Control Delay	7.8	HCM Level of Service		A	
HCM Volume to Capacity ratio	0.41				
Actuated Cycle Length (s)	60.7	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	46.3%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frt	1.00	1.00			0.97			0.99				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1752	1845			1791			5001				
Flt Permitted	0.95	1.00			1.00			1.00				
Satd. Flow (perm)	1752	1845			1791			5001				
Volume (vph)	59	139	0	0	99	27	37	964	110	0	0	0
Peak-hour factor, PHF	0.78	0.78	0.78	0.79	0.79	0.79	0.91	0.91	0.91	0.92	0.92	0.92
Adj. Flow (vph)	76	178	0	0	125	34	41	1059	121	0	0	0
RTOR Reduction (vph)	0	0	0	0	12	0	0	10	0	0	0	0
Lane Group Flow (vph)	76	178	0	0	147	0	0	1211	0	0	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Prot						Perm					
Protected Phases	7	4			8			2				
Permitted Phases							2					
Actuated Green, G (s)	4.9	21.4			12.8			36.7				
Effective Green, g (s)	4.6	21.6			13.0			36.9				
Actuated g/C Ratio	0.07	0.32			0.20			0.55				
Clearance Time (s)	3.7	4.2			4.2			4.2				
Vehicle Extension (s)	2.0	7.9			7.7			6.4				
Lane Grp Cap (vph)	121	599			350			2775				
v/s Ratio Prot	c0.04	0.10			c0.08							
v/s Ratio Perm								0.24				
v/c Ratio	0.63	0.30			0.42			0.44				
Uniform Delay, d1	30.1	16.8			23.4			8.7				
Progression Factor	1.00	1.00			1.00			1.00				
Incremental Delay, d2	7.1	1.2			3.3			0.5				
Delay (s)	37.3	17.9			26.7			9.2				
Level of Service	D	B			C			A				
Approach Delay (s)		23.7			26.7			9.2			0.0	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM Average Control Delay	13.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	66.5	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	45.2%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0				
Lane Util. Factor					0.91			0.91				
Frt					0.96			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					4896			5037				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					4896			5037				
Volume (vph)	0	0	0	0	747	247	215	910	0	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.86	0.86	0.86	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	795	263	250	1058	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	37	0	0	36	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1021	0	0	1272	0	0	0	0
Turn Type							Perm					
Protected Phases					8			2				
Permitted Phases							2					
Actuated Green, G (s)					19.3			30.5				
Effective Green, g (s)					19.9			31.1				
Actuated g/C Ratio					0.34			0.53				
Clearance Time (s)					4.6			4.6				
Vehicle Extension (s)					4.8			3.0				
Lane Grp Cap (vph)					1651			2655				
v/s Ratio Prot					c0.21							
v/s Ratio Perm								0.25				
v/c Ratio					0.62			0.48				
Uniform Delay, d1					16.4			8.8				
Progression Factor					1.00			1.00				
Incremental Delay, d2					1.0			0.6				
Delay (s)					17.3			9.4				
Level of Service					B			A				
Approach Delay (s)		0.0			17.3			9.4			0.0	
Approach LOS		A			B			A			A	

Intersection Summary				
HCM Average Control Delay	13.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	59.0	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.91						0.91				
Frt		1.00						0.97				
Flt Protected		0.98						1.00				
Satd. Flow (prot)		4998						4954				
Flt Permitted		0.98						1.00				
Satd. Flow (perm)		4998						4954				
Volume (vph)	540	1006	0	0	0	0	0	585	122	0	0	0
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92
Adj. Flow (vph)	593	1105	0	0	0	0	0	609	127	0	0	0
RTOR Reduction (vph)	0	72	0	0	0	0	0	28	0	0	0	0
Lane Group Flow (vph)	0	1626	0	0	0	0	0	708	0	0	0	0
Turn Type	Perm											
Protected Phases		2						8				
Permitted Phases	2											
Actuated Green, G (s)		23.2						16.0				
Effective Green, g (s)		24.6						17.1				
Actuated g/C Ratio		0.49						0.34				
Clearance Time (s)		5.4						5.1				
Vehicle Extension (s)		2.0						5.0				
Lane Grp Cap (vph)		2474						1704				
v/s Ratio Prot								c0.14				
v/s Ratio Perm		0.33										
v/c Ratio		0.66						0.42				
Uniform Delay, d1		9.4						12.5				
Progression Factor		1.00						1.00				
Incremental Delay, d2		1.4						0.3				
Delay (s)		10.8						12.8				
Level of Service		B						B				
Approach Delay (s)		10.8			0.0			12.8			0.0	
Approach LOS		B			A			B			A	

Intersection Summary				
HCM Average Control Delay	11.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	49.7	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	51.1%	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)	13	11	0	0	8	27	11	631	5	0	0	0
Peak Hour Factor	0.60	0.60	0.60	0.63	0.63	0.63	0.91	0.91	0.91	0.92	0.92	0.92
Hourly flow rate (vph)	22	18	0	0	13	43	12	693	5	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	40	56	359	352
Volume Left (vph)	22	0	12	0
Volume Right (vph)	0	43	0	5
Hadj (s)	0.14	-0.43	0.05	0.02
Departure Headway (s)	5.5	4.9	4.8	4.8
Degree Utilization, x	0.06	0.08	0.48	0.47
Capacity (veh/h)	610	678	739	743
Control Delay (s)	8.9	8.3	11.0	10.7
Approach Delay (s)	8.9	8.3	10.8	
Approach LOS	A	A	B	

Intersection Summary				
Delay		10.6		
HCM Level of Service		B		
Intersection Capacity Utilization	32.6%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				5085	3433	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				5085	3433	
Volume (vph)	0	0	0	603	390	0
Peak-hour factor, PHF	0.92	0.92	0.84	0.84	0.94	0.94
Adj. Flow (vph)	0	0	0	718	415	0
RTOR Reduction (vph)	0	0	0	0	187	0
Lane Group Flow (vph)	0	0	0	718	228	0
Turn Type						
Protected Phases				6	4	
Permitted Phases						
Actuated Green, G (s)				12.7	9.9	
Effective Green, g (s)				13.3	11.9	
Actuated g/C Ratio				0.40	0.36	
Clearance Time (s)				4.6	6.0	
Vehicle Extension (s)				5.0	6.0	
Lane Grp Cap (vph)				2037	1231	
v/s Ratio Prot				c0.14	c0.07	
v/s Ratio Perm						
v/c Ratio				0.35	0.18	
Uniform Delay, d1				6.9	7.3	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.2	0.2	
Delay (s)				7.2	7.5	
Level of Service				A	A	
Approach Delay (s)	0.0			7.2	7.5	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	7.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	33.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	29.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	382	117	162	726	453	287	733
v/c Ratio	0.39	0.22	0.70	0.51	0.60	0.91	0.47
Control Delay	24.3	5.5	42.9	24.8	19.8	69.4	19.4
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	24.3	5.5	42.9	24.8	19.9	69.4	19.4
Queue Length 50th (ft)	75	1	87	190	158	162	151
Queue Length 95th (ft)	114	m30	m125	m221	m184	#288	208
Internal Link Dist (ft)	719			378			1660
Turn Bay Length (ft)		275	110		40	260	
Base Capacity (vph)	1075	573	315	1421	754	323	1576
Starvation Cap Reductn	0	0	0	0	26	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.20	0.51	0.51	0.62	0.89	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	100	510	216	144	190	173	1734	213	801
v/c Ratio	0.26	0.82	2.45	0.24	0.31	0.64	1.23	0.78	0.58
Control Delay	21.5	30.1	707.0	23.8	7.4	25.8	132.7	56.8	23.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	51.6	0.0	0.0
Total Delay	21.5	30.1	707.0	23.8	7.4	25.8	184.3	56.8	23.7
Queue Length 50th (ft)	33	185	~206	60	13	83	~531	116	176
Queue Length 95th (ft)	m59	m257	#290	102	56	m70	m#440	#212	260
Internal Link Dist (ft)		2033		385			269		731
Turn Bay Length (ft)	145		155		25	125		170	
Base Capacity (vph)	381	619	88	600	616	374	1410	295	1370
Starvation Cap Reductn	0	0	0	0	0	0	121	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	16
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.82	2.45	0.24	0.31	0.46	1.35	0.72	0.59

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	139	453	229	608	612	123	199	604
v/c Ratio	0.46	0.77	1.46	0.88	0.62	0.23	0.82	0.37
Control Delay	44.1	35.6	270.7	29.9	31.7	6.1	60.8	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.1	35.6	270.7	29.9	31.7	6.1	60.8	14.3
Queue Length 50th (ft)	39	217	~180	183	159	0	116	138
Queue Length 95th (ft)	62	275	#321	#368	216	40	#284	192
Internal Link Dist (ft)		671			2243			378
Turn Bay Length (ft)			280				120	
Base Capacity (vph)	305	671	157	758	983	529	243	1627
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.68	1.46	0.80	0.62	0.23	0.82	0.37

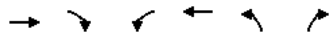
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	111	512	112	280	49	228	122	348	364
v/c Ratio	0.62	0.46	0.63	0.47	0.10	0.58	0.29	0.48	0.60
Control Delay	61.5	30.9	61.6	34.6	22.9	43.1	8.4	38.7	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.5	30.9	61.6	34.6	22.9	43.1	8.4	38.7	8.7
Queue Length 50th (ft)	70	134	70	146	15	132	0	104	0
Queue Length 95th (ft)	144	241	144	292	53	201	31	170	74
Internal Link Dist (ft)		179		406		179		341	
Turn Bay Length (ft)	185		150		40				110
Base Capacity (vph)	319	1122	319	601	495	518	516	978	687
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.46	0.35	0.47	0.10	0.44	0.24	0.36	0.53

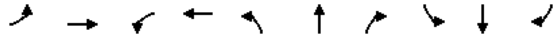
Intersection Summary



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	522	72	174	208	410	219
v/c Ratio	0.55	0.09	0.74	0.16	0.92	0.39
Control Delay	22.9	4.2	65.8	7.2	68.7	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.9	4.2	65.8	7.2	68.7	6.9
Queue Length 50th (ft)	259	0	125	52	291	0
Queue Length 95th (ft)	400	25	201	81	#417	40
Internal Link Dist (ft)	248			664	309	
Turn Bay Length (ft)			200			
Base Capacity (vph)	946	840	314	1291	466	578
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.09	0.55	0.16	0.88	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	218	364	101	421	92	858	64	403	1051	215
v/c Ratio	1.30	0.59	0.48	0.62	0.54	0.68	0.11	1.28	0.65	0.26
Control Delay	200.2	24.3	32.9	17.4	50.0	28.0	9.2	157.9	24.8	5.9
Queue Delay	491.3	0.0	0.0	53.4	0.0	0.0	0.0	246.5	26.1	1.1
Total Delay	691.5	24.3	32.9	70.8	50.0	28.0	9.2	404.4	50.9	6.9
Queue Length 50th (ft)	~160	136	45	101	51	215	7	~292	293	12
Queue Length 95th (ft)	#300	227	98	202	90	261	30	m#273	m246	m14
Internal Link Dist (ft)		502		1058		2367			110	
Turn Bay Length (ft)	125		135		115		105	115		
Base Capacity (vph)	168	618	212	682	315	1258	592	315	1626	843
Starvation Cap Reductn	0	0	0	0	0	0	0	95	614	419
Spillback Cap Reductn	77	0	0	297	0	6	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	2.40	0.59	0.48	1.09	0.29	0.69	0.11	1.83	1.04	0.51

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

11: SR-198 EB Ramps @ Lovers Lane & Lovers Lane

Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	794	947	1294	271	944
v/c Ratio	1.90	1.89	0.86	0.83	0.40
Control Delay	438.0	429.3	20.6	47.1	6.2
Queue Delay	6.2	245.0	2.2	0.0	0.4
Total Delay	444.1	674.3	22.8	47.1	6.6
Queue Length 50th (ft)	~735	~806	155	136	78
Queue Length 95th (ft)	#817	#875	m#271	m179	m88
Internal Link Dist (ft)		366	110		269
Turn Bay Length (ft)	232			75	
Base Capacity (vph)	418	501	1509	387	2336
Starvation Cap Reductn	0	0	111	0	789
Spillback Cap Reductn	3	112	1	0	719
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.91	2.43	0.93	0.70	0.61

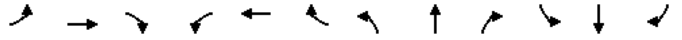
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

12: Tulare Ave & Ben Maddox Way



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	150	144	98	19	140	107	58	514	23	124	608	249
v/c Ratio	0.74	0.29	0.20	0.16	0.48	0.32	0.39	0.35	0.03	0.65	0.35	0.28
Control Delay	58.3	26.7	7.4	39.1	36.3	9.1	42.3	16.8	7.3	51.7	14.8	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.3	26.7	7.4	39.1	36.3	9.1	42.3	16.8	7.3	51.7	14.8	3.2
Queue Length 50th (ft)	72	52	0	9	64	0	27	86	1	59	99	0
Queue Length 95th (ft)	#174	117	38	30	116	40	57	119	13	#137	162	43
Internal Link Dist (ft)		1613			1967			1346			2243	
Turn Bay Length (ft)	95		95	90		90	155		90	200		200
Base Capacity (vph)	202	681	640	182	618	597	188	1481	675	201	1723	899
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.21	0.15	0.10	0.23	0.18	0.31	0.35	0.03	0.62	0.35	0.28

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	90	6	61	998	21	1031
v/c Ratio	0.25	0.02	0.37	0.37	0.16	0.41
Control Delay	1.6	0.0	23.1	4.0	22.2	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.6	0.0	23.1	4.0	22.2	5.5
Queue Length 50th (ft)	0	0	11	38	4	38
Queue Length 95th (ft)	0	0	34	93	20	130
Internal Link Dist (ft)	2570			1470		2367
Turn Bay Length (ft)			210		290	
Base Capacity (vph)	565	561	166	2719	129	2520
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.01	0.37	0.37	0.16	0.41

Intersection Summary

Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	76	178	159	1221
v/c Ratio	0.40	0.28	0.38	0.41
Control Delay	34.5	14.4	21.4	11.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.5	14.4	21.4	11.1
Queue Length 50th (ft)	29	45	48	112
Queue Length 95th (ft)	59	69	85	187
Internal Link Dist (ft)		608	737	568
Turn Bay Length (ft)				
Base Capacity (vph)	452	998	615	2954
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.17	0.18	0.26	0.41

Intersection Summary

Lane Group	WBT	NBT
Lane Group Flow (vph)	1058	1308
v/c Ratio	0.63	0.49
Control Delay	17.1	9.6
Queue Delay	0.0	0.0
Total Delay	17.1	9.6
Queue Length 50th (ft)	106	90
Queue Length 95th (ft)	142	141
Internal Link Dist (ft)	265	310
Turn Bay Length (ft)		
Base Capacity (vph)	1992	2691
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.53	0.49

Intersection Summary

Lane Group	EBT	NBT
Lane Group Flow (vph)	1698	736
v/c Ratio	0.67	0.42
Control Delay	10.7	12.4
Queue Delay	0.0	0.0
Total Delay	10.7	12.4
Queue Length 50th (ft)	114	54
Queue Length 95th (ft)	183	79
Internal Link Dist (ft)	4045	445
Turn Bay Length (ft)		
Base Capacity (vph)	2544	1975
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.67	0.37

Intersection Summary

Lane Group	WBT	NWL
Lane Group Flow (vph)	718	415
v/c Ratio	0.35	0.29
Control Delay	7.6	3.4
Queue Delay	0.0	0.0
Total Delay	7.6	3.4
Queue Length 50th (ft)	28	6
Queue Length 95th (ft)	49	27
Internal Link Dist (ft)	3590	180
Turn Bay Length (ft)		
Base Capacity (vph)	3098	2020
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.23	0.21

Intersection Summary

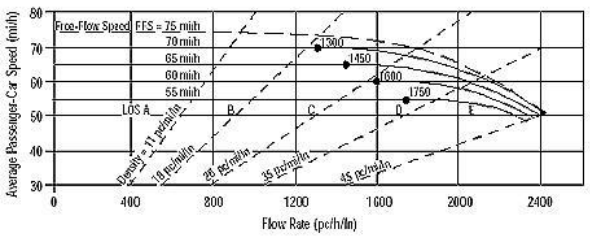
Kimley-Horn and Associates, Inc.

Visalia Walmart Roadway Network Capacity

Near-term 2010 Plus Project Conditions
PM Peak

ROADWAY	FROM	TO	Length (Miles)	Area Type (U/T/R)	Functional Class	# of Lanes	Div/Undiv (D/U)	Left-turn Bays (Y/N)	POSTED SPEED	Sig/Mile	Code	Notes	Generalized Service Volumes							
													Code	A	B	C	D	E	Two-Way Vol	LOS
Mineral King Avenue	Ben Maddox Way	SR-198 WB Ramps (B	0.15	U	Arterial	4	U	N	40	3.50	U-NS2-4	adjusted volumes by -25%	U-NS2-4	0	0	2178	2898	3060	798	C
Mineral King Avenue	SR-198 WB Ramps (B	Lovers Lane	0.84	U	Arterial	2	U	Y	40	1.50	U-NS1-2		U-NS1-2	0	837	1350	1440	0	861	C
Noble Avenue	Ben Maddox Way	SR-198 EB Ramps	0.16	U	Arterial	2	U	Y	35	4.00	U-NS2-2		U-NS2-2	0	0	918	1332	1413	1,308	D
Noble Avenue	East Driveway	Pinkham Street	0.14	U	Arterial	2	U	Y	35	2.50	U-NS2-2		U-NS2-2	0	0	918	1332	1413	982	D
Noble Avenue	Pinkham Street	Lovers Lane	0.50	U	Arterial	2	U	Y	45	2.00	U-NS2-2		U-NS2-2	0	0	918	1332	1413	840	C
Ben Maddox Way	Noble Avenue	Tulare Avenue	0.44	U	Arterial	4	D	Y	40	2.00	U-NS2-4		U-NS2-4	0	0	2178	2898	3060	1,548	C
Pinkham Street	Noble Avenue	Tulare Avenue	0.44	U	Arterial	2	U	N	40	0	U-OS1-2	adjusted volumes by -20%	U-OS1-2	0	605	975	1040	0	325	B
Lovers Lane	Noble Avenue	Tulare Avenue	0.47	U	Arterial	4	D	Y	45	3.00	U-NS2-4		U-NS2-4	0	0	2178	2898	3060	1,953	C
Tulare Avenue	Ben Maddox Way	Pinkham Street	0.39	U	Arterial	2	U	Y	40	0.61	U-OS1-2		U-OS1-2	0	605	975	1040	0	467	B
Tulare Avenue	Pinkham Street	Lovers Lane	0.48	U	Arterial	2	U	N	40	0.82	U-OS1-2	adjusted volumes by -20%	U-OS1-2	0	605	975	1040	0	203	B

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	B/W Ben Maddox Way & Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2010 + Project

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	2583 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	1.10	I/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0	mi/h
f_{LC}	0.0	mi/h
f_{ID}	3.0	mi/h
f_N	4.5	mi/h
FFS	62.5	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1500	pc/h/ln
S	62.5	mi/h
D = v_p / S	24.0	pc/mi/ln
LOS	C	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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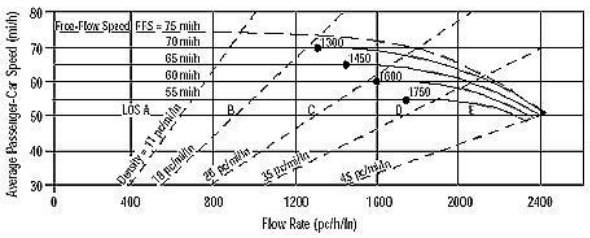
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	E/O Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2010 + Project

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	1581 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.56	I/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0	mi/h
f_{LC}	0.0	mi/h
f_{ID}	0.3	mi/h
f_N	4.5	mi/h
FFS	65.2	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	922	pc/h/ln
S	65.2	mi/h
D = v_p / S	14.1	pc/mi/ln
LOS	B	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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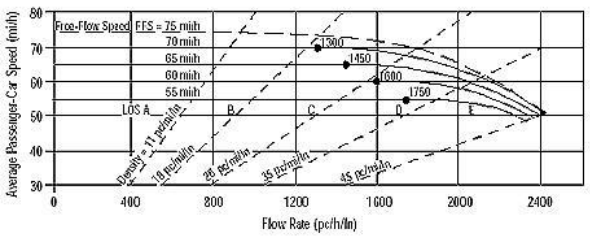
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	W/O S. Ben Maddox Way
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term + Project 2010
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2990 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1736	pc/h/ln	Design LOS		
S	62.2	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	27.9	pc/mi/ln	S		mi/h
LOS	D		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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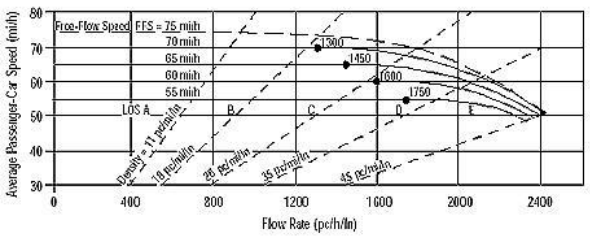
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	B/W Ben Maddox Way & Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term + Project 2010
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	1827 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1061	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	17.0	pc/mi/ln	S		mi/h
LOS	B		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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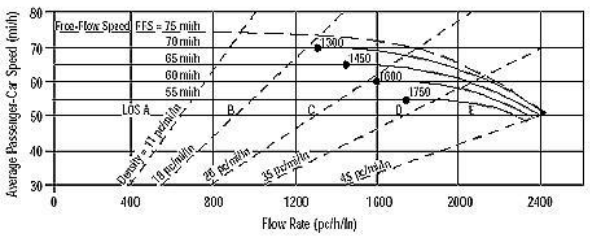
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	
Agency or Company	Kimley-Horn and Associates
Date Performed	7/6/2009
Analysis Time Period	PM Peak

Site Information

Highway/Direction of Travel	SR-198 WB
From/To	E/O Lovers Ln
Jurisdiction	City of Visalia
Analysis Year	Near-term + Project 2010

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	1432 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.56	I/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0	mi/h
f_{LC}	0.0	mi/h
f_{ID}	0.3	mi/h
f_N	4.5	mi/h
FFS	65.2	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	835	pc/h/ln
S	65.2	mi/h
D = v_p / S	12.8	pc/mi/ln
LOS	B	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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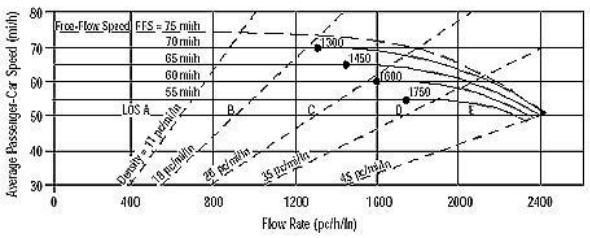
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	
Agency or Company	Kimley-Horn and Associates
Date Performed	7/6/2009
Analysis Time Period	PM Peak

Site Information

Highway/Direction of Travel	SR-198 WB
From/To	W/O S. Ben Maddox Way
Jurisdiction	City of Visalia
Analysis Year	Near-term + Project 2010

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	2350 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	1.10	I/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0	mi/h
f_{LC}	0.0	mi/h
f_{ID}	3.0	mi/h
f_N	4.5	mi/h
FFS	62.5	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1364	pc/h/ln
S	62.5	mi/h
D = v_p / S	21.8	pc/mi/ln
LOS	C	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2010 + Project

Project Description

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 2500 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = 594 veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	2990	0.90	Level	9	0	0.957	1.00	3472
Ramp	626	0.90	Level	4	0	0.980	1.00	709
UpStream	594	0.90	Level	2	0	0.990	1.00	667
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 3472 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	3472	4800	No
				V_{12}	3472	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	2763	4800	No
				V_R	709	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A	D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D
D_R = (pc/ mi /ln)	D_R = 32.6 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= D (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.492 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 56.2 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 56.2 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2010 + Project

Project Description

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 2600 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = 219 veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	2583	0.90	Level	9	0	0.957	1.00	2999
Ramp	1374	0.90	Level	4	0	0.980	1.00	1557
UpStream	219	0.90	Level	2	0	0.990	1.00	246
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 2999 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	2999	4800	No
				V_{12}	2999	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	1442	4800	No
				V_R	1557	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A	D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D
D_R = (pc/ mi /ln)	D_R = 27.4 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= C (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.568 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 54.1 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 54.1 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2010 + Project

Project Description

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 3400 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = 559 veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	1827	0.90	Level	9	0	0.957	1.00	2121
Ramp	112	0.90	Level	4	0	0.980	1.00	127
UpStream	559	0.90	Level	2	0	0.990	1.00	627
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 2121 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	2121	4800	No
				V_{12}	2121	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	1994	4800	No
				V_R	127	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A	D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D
D_R = (pc/ mi /ln)	D_R = 20.0 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= C (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.439 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 57.7 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 57.7 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2010 + Project

Project Description

Inputs

Upstream Adj Ramp	Terrain	Downstream Adj Ramp
☐ Yes ☐ On		☐ Yes ☐ On
☐ No ☐ Off		☐ No ☐ Off
L_{up} = ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	1432	0.90	Level	9	0	0.957	1.00	1663
Ramp	164	0.90	Level	4	0	0.980	1.00	186
UpStream								
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 1663 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	1663	4800	No
				V_{12}	1663	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	1477	4800	No
				V_R	186	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A	D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D
D_R = (pc/ mi /ln)	D_R = 16.5 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= B (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.445 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 57.5 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 57.5 mph (Exhibit 25-15)

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NEAR-TERM 2010 + PROJECT (MITIGATED) TRAFFIC CONDITIONS (INTERSECTIONS)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor					0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt					1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)					3415	1553	1736	3471	1553	1736	3376	
Flt Permitted					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)					3415	1553	1736	3471	1553	1736	3376	
Volume (vph)	0	0	0	89	181	86	157	568	603	267	295	66
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.77	0.77	0.77	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	97	197	93	204	738	783	290	321	72
RTOR Reduction (vph)	0	0	0	0	0	72	0	0	194	0	17	0
Lane Group Flow (vph)	0	0	0	0	294	21	204	738	589	290	376	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type				Split		Perm	Prot		Perm	Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)					18.9	18.9	14.2	37.3	37.3	19.8	42.9	
Effective Green, g (s)					19.9	19.9	14.2	38.3	38.3	19.8	43.9	
Actuated g/C Ratio					0.22	0.22	0.16	0.43	0.43	0.22	0.49	
Clearance Time (s)					5.0	5.0	4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)					7.5	7.5	2.0	8.0	8.0	2.0	7.5	
Lane Grp Cap (vph)					755	343	274	1477	661	382	1647	
v/s Ratio Prot					c0.09		0.12	0.21		c0.17	0.11	
v/s Ratio Perm						0.01			c0.38			
v/c Ratio					0.39	0.06	0.74	0.50	0.89	0.76	0.23	
Uniform Delay, d1					29.9	27.7	36.2	18.9	23.9	32.9	13.3	
Progression Factor					1.00	1.00	0.73	1.29	1.76	1.00	1.00	
Incremental Delay, d2					1.3	0.3	5.1	0.6	10.0	7.5	0.3	
Delay (s)					31.2	28.0	31.6	25.1	52.2	40.4	13.6	
Level of Service					C	C	C	C	D	D	B	
Approach Delay (s)		0.0			30.4			38.2			25.0	
Approach LOS		A			C			D			C	

Intersection Summary			
HCM Average Control Delay	33.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	278	600	311	274	65	82
Peak Hour Factor	0.85	0.85	0.74	0.74	0.56	0.56
Hourly flow rate (vph)	327	706	420	370	116	146
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total (vph)	218	815	544	247	116	146
Volume Left (vph)	0	0	420	0	116	0
Volume Right (vph)	0	706	0	0	0	146
Hadj (s)	0.07	-0.54	0.45	0.07	0.57	-0.63
Departure Headway (s)	6.7	6.1	7.0	6.6	8.4	7.3
Degree Utilization, x	0.40	1.37	1.06	0.45	0.27	0.30
Capacity (veh/h)	526	606	521	534	417	484
Control Delay (s)	12.9	196.1	81.7	13.8	13.4	12.1
Approach Delay (s)	157.4		60.5		12.6	
Approach LOS	F		F		B	

Intersection Summary			
Delay	102.5		
HCM Level of Service	F		
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1736	1626		1736	1827	1553	1736	3471	1553	1736	3296	
Flt Permitted	0.59	1.00		0.48	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1082	1626		884	1827	1553	1736	3471	1553	1736	3296	
Volume (vph)	29	52	144	204	138	141	259	745	681	250	708	358
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.85	0.85	0.85	0.87	0.87	0.87
Adj. Flow (vph)	35	63	173	246	166	170	305	876	801	287	814	411
RTOR Reduction (vph)	0	114	0	0	0	85	0	0	359	0	66	0
Lane Group Flow (vph)	35	122	0	246	166	85	305	876	442	287	1159	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm			Perm		Perm	Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8			2			
Actuated Green, G (s)	24.6	24.6		26.1	26.1	26.1	18.2	32.9	32.9	16.5	31.2	
Effective Green, g (s)	26.6	26.6		26.6	26.6	26.6	18.2	34.9	34.9	16.5	33.2	
Actuated g/C Ratio	0.30	0.30		0.30	0.30	0.30	0.20	0.39	0.39	0.18	0.37	
Clearance Time (s)	6.0	6.0		4.5	4.5	4.5	4.0	6.0	6.0	4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	320	481		261	540	459	351	1346	602	318	1216	
v/s Ratio Prot		0.07			0.09		c0.18	0.25		0.17	c0.35	
v/s Ratio Perm	0.03			c0.28		0.05			0.28			
v/c Ratio	0.11	0.25		0.94	0.31	0.18	0.87	0.65	0.73	0.90	0.95	
Uniform Delay, d1	23.1	24.1		31.0	24.6	23.6	34.7	22.6	23.6	36.0	27.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.87	1.28	2.12	1.00	1.00	
Incremental Delay, d2	0.2	0.3		40.1	0.3	0.2	8.9	1.0	3.1	27.2	16.7	
Delay (s)	23.2	24.4		71.0	24.9	23.8	39.0	29.9	53.2	63.1	44.4	
Level of Service	C	C		E	C	C	D	C	D	E	D	
Approach Delay (s)		24.3			44.1			40.7			47.9	
Approach LOS		C			D			D			D	

Intersection Summary				
HCM Average Control Delay	42.7	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	81.6%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	320	663	201	395	88	11
Peak Hour Factor	0.92	0.92	0.87	0.87	0.70	0.70
Hourly flow rate (vph)	348	721	231	454	126	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type					None	
Median storage veh)						
Upstream signal (ft)	465					
pX, platoon unblocked						
vC, conflicting volume			1068		1624	708
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1068		1624	708
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			64		0	96
cM capacity (veh/h)			645		72	431

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1068	685	141
Volume Left	0	231	126
Volume Right	721	0	16
cSH	1700	645	79
Volume to Capacity	0.63	0.36	1.79
Queue Length 95th (ft)	0	41	304
Control Delay (s)	0.0	9.0	490.5
Lane LOS		A	F
Approach Delay (s)	0.0	9.0	490.5
Approach LOS			F

Intersection Summary				
Average Delay	39.9			
Intersection Capacity Utilization	104.3%	ICU Level of Service	G	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0		4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	1.00		1.00		1.00		0.95	1.00	1.00	0.95	
Frt	1.00	0.98		1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3367	1788		1736		1553		3471	1553	1736	3471	
Flt Permitted	0.95	1.00		0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3367	1788		1736		1553		3471	1553	1736	3471	
Volume (vph)	123	143	24	105	0	461	0	744	84	115	269	0
Peak-hour factor, PHF	0.85	0.85	0.85	0.78	0.78	0.78	0.74	0.74	0.74	0.90	0.90	0.90
Adj. Flow (vph)	145	168	28	135	0	591	0	1005	114	128	299	0
RTOR Reduction (vph)	0	7	0	0	0	226	0	0	74	0	0	0
Lane Group Flow (vph)	145	189	0	135	0	365	0	1005	40	128	299	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot		custom			Perm	Prot		
Protected Phases	7	4		3		8		2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	8.0	24.0		8.0		24.0		30.3	30.3	9.7	44.0	
Effective Green, g (s)	8.0	25.0		8.0		25.0		31.3	31.3	9.7	45.0	
Actuated g/C Ratio	0.09	0.28		0.09		0.28		0.35	0.35	0.11	0.50	
Clearance Time (s)	4.0	5.0		4.0		5.0		5.0	5.0	4.0	5.0	
Vehicle Extension (s)	6.5	6.5		2.0		4.5		5.5	5.5	2.0	6.0	
Lane Grp Cap (vph)	299	497		154		431		1207	540	187	1736	
v/s Ratio Prot	0.04	0.11		c0.08		c0.24		c0.29		c0.07	0.09	
v/s Ratio Perm									0.03			
v/c Ratio	0.48	0.38		0.88		0.85		0.83	0.07	0.68	0.17	
Uniform Delay, d1	39.0	26.2		40.5		30.7		26.9	19.6	38.7	12.3	
Progression Factor	1.00	1.00		1.00		1.00		1.00	1.00	0.88	0.87	
Incremental Delay, d2	3.9	1.5		37.8		15.3		6.8	0.3	7.8	0.2	
Delay (s)	42.9	27.8		78.3		46.0		33.8	19.9	41.7	10.9	
Level of Service	D	C		E		D		C	B	D	B	
Approach Delay (s)		34.2			52.0			32.3			20.1	
Approach LOS		C			D			C			C	

Intersection Summary				
HCM Average Control Delay	36.0	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	64.1%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00		1.00	1.00		0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1644	3429		1644	1827	1471		1779	1471		3351	1471
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (perm)	1644	3429		1644	1827	1471		1779	1471		3351	1471
Volume (vph)	69	256	22	49	250	17	18	15	23	147	58	314
Peak-hour factor, PHF	0.86	0.86	0.86	0.84	0.84	0.84	0.93	0.93	0.93	0.76	0.76	0.76
Adj. Flow (vph)	80	298	26	58	298	20	19	16	25	193	76	413
RTOR Reduction (vph)	0	4	0	0	0	4	0	0	23	0	0	315
Lane Group Flow (vph)	80	320	0	58	298	16	0	35	2	0	269	98
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6			3			4
Actuated Green, G (s)	5.3	32.1		4.6	31.4	31.4		5.8	5.8		17.6	17.6
Effective Green, g (s)	5.0	33.4		4.3	32.7	32.7		7.0	7.0		18.8	18.8
Actuated g/C Ratio	0.06	0.42		0.05	0.41	0.41		0.09	0.09		0.24	0.24
Clearance Time (s)	3.7	5.3		3.7	5.3	5.3		5.2	5.2		5.2	5.2
Vehicle Extension (s)	2.0	5.1		2.0	4.8	4.8		6.3	6.3		7.9	7.9
Lane Grp Cap (vph)	103	1441		89	751	605		157	130		792	348
v/s Ratio Prot	c0.05	0.09		0.04	c0.16			c0.02			c0.08	
v/s Ratio Perm						0.01			0.00			0.07
v/c Ratio	0.78	0.22		0.65	0.40	0.03		0.22	0.02		0.34	0.28
Uniform Delay, d1	36.7	14.7		36.9	16.5	13.9		33.7	33.1		25.2	24.8
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	27.6	0.4		12.3	0.7	0.0		2.2	0.2		1.1	1.9
Delay (s)	64.3	15.1		49.1	17.1	14.0		35.9	33.3		26.3	26.7
Level of Service	E	B		D	B	B		D	C		C	C
Approach Delay (s)		24.8			21.9			34.8			26.5	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	25.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.39			
Actuated Cycle Length (s)	79.5	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	50.3%	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		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	243	201	0	369	25	0	0	31	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.84	0.84	0.84	0.79	0.79	0.79	0.92	0.92	0.92
Hourly flow rate (vph)	11	256	212	0	439	30	0	0	39	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		799			328							
pX, platoon unblocked	0.97						0.97	0.97		0.97	0.97	0.97
vC, conflicting volume	469			467			837	852	234	642	943	454
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	451			467			831	847	234	630	941	435
tC, single (s)	4.2			4.2			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	95	100	100	100
cM capacity (veh/h)	1056			1076			251	285	768	337	254	555

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	NB 1
Volume Total	11	171	297	469	39
Volume Left	11	0	0	0	0
Volume Right	0	0	212	30	39
cSH	1056	1700	1700	1700	768
Volume to Capacity	0.01	0.10	0.17	0.28	0.05
Queue Length 95th (ft)	1	0	0	0	4
Control Delay (s)	8.4	0.0	0.0	0.0	9.9
Lane LOS	A				A
Approach Delay (s)	0.2			0.0	9.9
Approach LOS					A

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	24.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1553	1736	1827	1719	1538
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1827	1553	1736	1827	1719	1538
Volume (vph)	241	33	111	201	193	51
Peak-hour factor, PHF	0.86	0.86	0.81	0.81	0.78	0.78
Adj. Flow (vph)	280	38	137	248	247	65
RTOR Reduction (vph)	0	16	0	0	0	53
Lane Group Flow (vph)	280	22	137	248	247	12
Heavy Vehicles (%)	4%	4%	4%	4%	5%	5%
Turn Type		Perm	Prot			Prot
Protected Phases	2		1	6	4	4
Permitted Phases		2				
Actuated Green, G (s)	63.3	63.3	12.9	80.2	20.3	20.3
Effective Green, g (s)	65.3	65.3	12.9	82.2	20.3	20.3
Actuated g/C Ratio	0.59	0.59	0.12	0.74	0.18	0.18
Clearance Time (s)	6.0	6.0	4.0	6.0	4.0	4.0
Vehicle Extension (s)	8.0	8.0	2.0	8.0	2.4	2.4
Lane Grp Cap (vph)	1080	918	203	1359	316	283
v/s Ratio Prot	c0.15		c0.08	0.14	c0.14	0.01
v/s Ratio Perm		0.01				
v/c Ratio	0.26	0.02	0.67	0.18	0.78	0.04
Uniform Delay, d1	10.9	9.4	46.8	4.2	43.0	37.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.0	6.8	0.3	11.4	0.0
Delay (s)	11.5	9.4	53.6	4.5	54.4	37.1
Level of Service	B	A	D	A	D	D
Approach Delay (s)	11.3			22.0	50.8	
Approach LOS	B			C	D	

Intersection Summary			
HCM Average Control Delay	27.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	110.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	167	99	26	215	87	73
Peak Hour Factor	0.95	0.95	0.83	0.83	0.88	0.88
Hourly flow rate (vph)	176	104	31	259	99	83
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	744					
pX, platoon unblocked			0.96		0.96	0.96
vC, conflicting volume			280		550	228
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			250		531	196
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		79	90
cM capacity (veh/h)			1252		475	809

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	280	290	182
Volume Left	0	31	99
Volume Right	104	0	83
cSH	1700	1252	585
Volume to Capacity	0.16	0.03	0.31
Queue Length 95th (ft)	0	2	33
Control Delay (s)	0.0	1.1	13.9
Lane LOS		A	B
Approach Delay (s)	0.0	1.1	13.9
Approach LOS			B

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	46.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.92		1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	1686		1736	1593		1736	3471	1553	1736	3471	1553
Flt Permitted	0.13	1.00		0.64	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	244	1686		1161	1593		1736	3471	1553	1736	3471	1553
Volume (vph)	115	52	55	47	69	397	55	793	29	248	700	162
Peak-hour factor, PHF	0.73	0.73	0.73	0.83	0.83	0.83	0.84	0.84	0.84	0.93	0.93	0.93
Adj. Flow (vph)	158	71	75	57	83	478	65	944	35	267	753	174
RTOR Reduction (vph)	0	42	0	0	231	0	0	0	15	0	0	94
Lane Group Flow (vph)	158	104	0	57	330	0	65	944	20	267	753	80
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	28.0	28.0		28.0	28.0		6.4	30.8	30.8	15.2	39.6	39.6
Effective Green, g (s)	30.0	30.0		30.0	30.0		6.4	32.8	32.8	15.2	41.6	41.6
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.07	0.36	0.36	0.17	0.46	0.46
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	5.8	5.8		5.8	5.8		1.5	5.8	5.8	1.5	5.8	5.8
Lane Grp Cap (vph)	81	562		387	531		123	1265	566	293	1604	718
v/s Ratio Prot		0.06			0.21		0.04	c0.27		c0.15	0.22	
v/s Ratio Perm	c0.65			0.05					0.01			0.05
v/c Ratio	1.95	0.19		0.15	0.62		0.53	0.75	0.04	0.91	0.47	0.11
Uniform Delay, d1	30.0	21.3		21.0	25.2		40.3	25.0	18.4	36.7	16.6	13.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.11	0.70	0.34
Incremental Delay, d2	469.3	0.4		0.5	3.7		1.9	4.0	0.1	26.8	0.8	0.3
Delay (s)	499.3	21.7		21.5	28.9		42.2	29.0	18.5	67.4	12.4	4.9
Level of Service	F	C		C	C		D	C	B	E	B	A
Approach Delay (s)		270.0			28.3			29.5			23.6	
Approach LOS		F			C			C			C	

Intersection Summary			
HCM Average Control Delay	50.2	HCM Level of Service	D
HCM Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	85.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0						4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95						0.95		1.00	0.95	
Frt	1.00	0.90						1.00		1.00	1.00	
Flt Protected	0.95	0.98						1.00		0.95	1.00	
Satd. Flow (prot)	1649	1533						3462		1736	3471	
Flt Permitted	0.95	0.98						1.00		0.95	1.00	
Satd. Flow (perm)	1649	1533						3462		1736	3471	
Volume (vph)	405	0	226	0	0	0	0	1280	24	172	884	0
Peak-hour factor, PHF	0.77	0.77	0.77	0.92	0.92	0.92	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	526	0	294	0	0	0	0	1455	27	195	1005	0
RTOR Reduction (vph)	0	86	0	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	390	344	0	0	0	0	0	1481	0	195	1005	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	22.0	22.0						41.5		13.4	58.6	
Effective Green, g (s)	22.6	22.6						42.3		13.1	59.4	
Actuated g/C Ratio	0.25	0.25						0.47		0.15	0.66	
Clearance Time (s)	4.6	4.6						4.8		3.7	4.8	
Vehicle Extension (s)	5.0	5.0						7.4		2.0	6.2	
Lane Grp Cap (vph)	414	385						1627		253	2291	
v/s Ratio Prot	c0.24	0.22						c0.43		c0.11	0.29	
v/s Ratio Perm												
v/c Ratio	0.94	0.89						0.91		0.77	0.44	
Uniform Delay, d1	33.1	32.5						22.1		37.0	7.3	
Progression Factor	1.00	1.00						0.59		1.39	0.46	
Incremental Delay, d2	30.6	23.4						4.8		6.2	0.3	
Delay (s)	63.6	55.9						17.8		57.6	3.7	
Level of Service	E	E						B		E	A	
Approach Delay (s)		59.6			0.0			17.8			12.4	
Approach LOS		E			A			B			B	

Intersection Summary				
HCM Average Control Delay	25.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.90			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	73.8%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	1845	1568	1752	1845	1568	1736	3471	1553	1736	3471	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1752	1845	1568	1752	1845	1568	1736	3471	1553	1736	3471	1553
Volume (vph)	109	170	37	13	222	183	55	494	17	95	236	107
Peak-hour factor, PHF	0.73	0.73	0.73	0.83	0.83	0.83	0.78	0.78	0.78	0.92	0.92	0.92
Adj. Flow (vph)	149	233	51	16	267	220	71	633	22	103	257	116
RTOR Reduction (vph)	0	0	34	0	0	155	0	0	10	0	0	70
Lane Group Flow (vph)	149	233	17	16	267	65	71	633	12	103	257	46
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	9.1	27.7	27.7	1.2	19.8	19.8	6.1	32.5	32.5	6.6	33.0	33.0
Effective Green, g (s)	9.1	28.7	28.7	1.2	20.8	20.8	6.1	33.5	33.5	6.6	34.0	34.0
Actuated g/C Ratio	0.11	0.33	0.33	0.01	0.24	0.24	0.07	0.39	0.39	0.08	0.40	0.40
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	185	616	523	24	446	379	123	1352	605	133	1372	614
v/s Ratio Prot	c0.09	0.13		0.01	c0.14		0.04	c0.18		c0.06	0.07	
v/s Ratio Perm			0.01			0.04			0.01			0.03
v/c Ratio	0.81	0.38	0.03	0.67	0.60	0.17	0.58	0.47	0.02	0.77	0.19	0.07
Uniform Delay, d1	37.6	21.8	19.3	42.2	28.9	25.8	38.7	19.6	16.2	39.0	17.0	16.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.8	0.1	0.0	42.9	1.4	0.1	4.0	1.2	0.1	22.1	0.3	0.2
Delay (s)	58.4	22.0	19.3	85.1	30.3	25.9	42.7	20.8	16.2	61.1	17.3	16.4
Level of Service	E	C	B	F	C	C	D	C	B	E	B	B
Approach Delay (s)		34.2			30.1			22.8			26.6	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	27.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	50.0%	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												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	48	155	33	31	200	52	147	96	30	55	56	45
Peak Hour Factor	0.67	0.67	0.67	0.78	0.78	0.78	0.77	0.77	0.77	0.86	0.86	0.86
Hourly flow rate (vph)	72	231	49	40	256	67	191	125	39	64	65	52

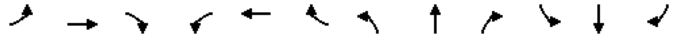
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	352	363	355	181
Volume Left (vph)	72	40	191	64
Volume Right (vph)	49	67	39	52
Hadj (s)	0.01	-0.04	0.09	-0.05
Departure Headway (s)	6.8	6.8	7.0	7.4
Degree Utilization, x	0.67	0.68	0.69	0.37
Capacity (veh/h)	485	495	475	400
Control Delay (s)	22.5	23.0	24.0	14.8
Approach Delay (s)	22.5	23.0	24.0	14.8
Approach LOS	C	C	C	B

Intersection Summary				
Delay		22.0		
HCM Level of Service		C		
Intersection Capacity Utilization		49.9%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0				4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00				1.00	1.00	0.95		1.00	0.95	
Frt		0.85				0.85	1.00	1.00		1.00	0.98	
Flt Protected		1.00				1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1568				1568	1736	3462		1736	3392	
Flt Permitted		1.00				1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1568				1568	1736	3462		1736	3392	
Volume (vph)	0	0	81	0	0	24	42	784	15	21	607	108
Peak-hour factor, PHF	0.68	0.68	0.68	0.60	0.60	0.60	0.87	0.87	0.87	0.84	0.84	0.84
Adj. Flow (vph)	0	0	119	0	0	40	48	901	17	25	723	129
RTOR Reduction (vph)	0	105	0	0	0	35	0	1	0	0	17	0
Lane Group Flow (vph)	0	14	0	0	0	5	48	917	0	25	835	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		6.4				6.4	2.2	36.3		1.1	35.2	
Effective Green, g (s)		6.4				6.4	2.2	36.3		1.1	35.2	
Actuated g/C Ratio		0.11				0.11	0.04	0.65		0.02	0.63	
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)		180				180	68	2252		34	2140	
v/s Ratio Prot		c0.01					c0.03	c0.26		0.01	0.25	
v/s Ratio Perm						0.00						
v/c Ratio		0.08				0.03	0.71	0.41		0.74	0.39	
Uniform Delay, d1		22.1				21.9	26.5	4.6		27.2	5.0	
Progression Factor		1.00				1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2				0.1	28.3	0.1		57.7	0.1	
Delay (s)		22.2				22.0	54.7	4.8		84.9	5.2	
Level of Service		C				C	D	A		F	A	
Approach Delay (s)		22.2			22.0			7.2			7.4	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM Average Control Delay	8.5	HCM Level of Service	A	
HCM Volume to Capacity ratio	0.35			
Actuated Cycle Length (s)	55.8	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	40.5%	ICU Level of Service	A	
Analysis Period (min)	15			

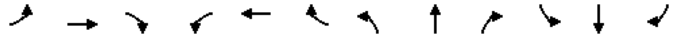
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frt	1.00	1.00			0.98			0.98				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1736	1827			1790			4938				
Flt Permitted	0.95	1.00			1.00			1.00				
Satd. Flow (perm)	1736	1827			1790			4938				
Volume (vph)	30	134	0	0	46	8	70	1055	141	0	0	0
Peak-hour factor, PHF	0.83	0.83	0.83	0.68	0.68	0.68	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	36	161	0	0	68	12	80	1199	160	0	0	0
RTOR Reduction (vph)	0	0	0	0	8	0	0	11	0	0	0	0
Lane Group Flow (vph)	36	161	0	0	72	0	0	1428	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	Prot						Perm					
Protected Phases	7	4			8			2				
Permitted Phases							2					
Actuated Green, G (s)	2.9	19.1			12.5			40.1				
Effective Green, g (s)	2.6	19.3			12.7			40.3				
Actuated g/C Ratio	0.04	0.29			0.19			0.60				
Clearance Time (s)	3.7	4.2			4.2			4.2				
Vehicle Extension (s)	2.0	7.9			7.7			6.4				
Lane Grp Cap (vph)	67	522			336			2944				
v/s Ratio Prot	c0.02	c0.09			0.04							
v/s Ratio Perm								0.29				
v/c Ratio	0.54	0.31			0.21			0.49				
Uniform Delay, d1	31.9	18.9			23.2			7.8				
Progression Factor	1.00	1.00			1.00			1.00				
Incremental Delay, d2	4.1	1.4			1.3			0.6				
Delay (s)	36.0	20.3			24.5			8.3				
Level of Service	D	C			C			A				
Approach Delay (s)		23.2			24.5			8.3			0.0	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM Average Control Delay	10.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	67.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	39.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0				
Lane Util. Factor					0.91			0.91				
Frt					0.95			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					4715			4983				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					4715			4983				
Volume (vph)	0	0	0	0	700	402	263	975	0	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.82	0.82	0.82	0.87	0.87	0.87	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	854	490	302	1121	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	28	0	0	32	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1316	0	0	1391	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type							Perm					
Protected Phases					8			2				
Permitted Phases							2					
Actuated Green, G (s)					23.5			30.5				
Effective Green, g (s)					24.1			31.1				
Actuated g/C Ratio					0.38			0.49				
Clearance Time (s)					4.6			4.6				
Vehicle Extension (s)					4.8			3.0				
Lane Grp Cap (vph)					1798			2452				
v/s Ratio Prot					c0.28							
v/s Ratio Perm								0.28				
v/c Ratio					0.73			0.57				
Uniform Delay, d1					16.8			11.3				
Progression Factor					1.00			1.00				
Incremental Delay, d2					1.9			1.0				
Delay (s)					18.6			12.3				
Level of Service					B			B				
Approach Delay (s)		0.0			18.6			12.3			0.0	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	63.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.91						0.91				
Frt		1.00						0.98				
Flt Protected		0.98						1.00				
Satd. Flow (prot)		4883						4946				
Flt Permitted		0.98						1.00				
Satd. Flow (perm)		4883						4946				
Volume (vph)	578	774	0	0	0	0	0	659	89	0	0	0
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.82	0.82	0.82	0.92	0.92	0.92
Adj. Flow (vph)	622	832	0	0	0	0	0	804	109	0	0	0
RTOR Reduction (vph)	0	38	0	0	0	0	0	34	0	0	0	0
Lane Group Flow (vph)	0	1416	0	0	0	0	0	879	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	Perm											
Protected Phases		2						8				
Permitted Phases	2											
Actuated Green, G (s)		23.2						18.2				
Effective Green, g (s)		24.6						19.3				
Actuated g/C Ratio		0.47						0.37				
Clearance Time (s)		5.4						5.1				
Vehicle Extension (s)		2.0						5.0				
Lane Grp Cap (vph)		2314						1839				
v/s Ratio Prot								c0.18				
v/s Ratio Perm		0.29										
v/c Ratio		0.61						0.48				
Uniform Delay, d1		10.1						12.5				
Progression Factor		1.00						1.00				
Incremental Delay, d2		1.2						0.4				
Delay (s)		11.3						12.9				
Level of Service		B						B				
Approach Delay (s)		11.3			0.0			12.9			0.0	
Approach LOS		B			A			B			A	

Intersection Summary				
HCM Average Control Delay	11.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	51.9	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	53.4%	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)	20	25	0	0	35	41	3	685	6	0	0	0
Peak Hour Factor	0.60	0.60	0.60	0.83	0.83	0.83	0.78	0.78	0.78	0.92	0.92	0.92
Hourly flow rate (vph)	33	42	0	0	42	49	4	878	8	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	75	92	443	447
Volume Left (vph)	33	0	4	0
Volume Right (vph)	0	49	0	8
Hadj (s)	0.12	-0.29	0.06	0.04
Departure Headway (s)	5.8	5.4	5.0	5.0
Degree Utilization, x	0.12	0.14	0.62	0.62
Capacity (veh/h)	584	628	707	709
Control Delay (s)	9.6	9.2	14.7	14.8
Approach Delay (s)	9.6	9.2	14.7	
Approach LOS	A	A	B	

Intersection Summary				
Delay	13.9			
HCM Level of Service	B			
Intersection Capacity Utilization	35.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				4988	3433	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				4988	3433	
Volume (vph)	0	0	0	536	567	0
Peak-hour factor, PHF	0.92	0.92	0.74	0.74	0.70	0.70
Adj. Flow (vph)	0	0	0	724	810	0
RTOR Reduction (vph)	0	0	0	0	162	0
Lane Group Flow (vph)	0	0	0	724	648	0
Heavy Vehicles (%)	4%	4%	4%	4%	2%	2%
Turn Type						
Protected Phases				6	4	
Permitted Phases						
Actuated Green, G (s)				12.9	14.7	
Effective Green, g (s)				13.5	16.7	
Actuated g/C Ratio				0.35	0.44	
Clearance Time (s)				4.6	6.0	
Vehicle Extension (s)				5.0	6.0	
Lane Grp Cap (vph)				1763	1501	
v/s Ratio Prot				c0.15	c0.19	
v/s Ratio Perm						
v/c Ratio				0.41	0.43	
Uniform Delay, d1				9.3	7.5	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.3	0.6	
Delay (s)				9.7	8.0	
Level of Service				A	A	
Approach Delay (s)	0.0			9.7	8.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	8.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	38.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	33.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	294	93	204	738	783	290	393
v/c Ratio	0.39	0.22	0.74	0.50	0.92	0.76	0.24
Control Delay	30.6	7.0	35.5	26.7	35.3	47.7	14.2
Queue Delay	0.0	0.0	0.0	0.0	6.5	0.0	0.0
Total Delay	30.6	7.0	35.5	26.7	41.9	47.7	14.2
Queue Length 50th (ft)	75	0	101	209	353	148	59
Queue Length 95th (ft)	102	34	m136	217	#399	#300	108
Internal Link Dist (ft)	719			378			1660
Turn Bay Length (ft)		275	110		40	260	
Base Capacity (vph)	1063	547	321	1478	855	382	1663
Starvation Cap Reductn	0	0	0	0	52	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.17	0.64	0.50	0.98	0.76	0.24

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	35	236	246	166	170	305	876	801	287	1225
v/c Ratio	0.11	0.40	0.91	0.31	0.31	0.87	0.65	0.83	0.90	0.95
Control Delay	22.7	10.2	67.5	25.5	9.5	42.8	30.7	18.0	69.5	43.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	2.0	1.9	0.0	0.0
Total Delay	22.7	10.2	67.5	25.5	9.5	42.8	32.7	20.0	69.5	43.9
Queue Length 50th (ft)	14	30	128	70	19	176	203	141	165	~380
Queue Length 95th (ft)	33	72	#229	110	56	m192	m255	m315	#309	#481
Internal Link Dist (ft)		2033		385			269			731
Turn Bay Length (ft)	145		155		25	125			170	
Base Capacity (vph)	355	634	295	589	582	368	1347	962	319	1285
Starvation Cap Reductn	0	0	0	0	0	0	310	66	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.37	0.83	0.28	0.29	0.83	0.84	0.89	0.90	0.95

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	145	196	135	591	1005	114	128	299
v/c Ratio	0.48	0.39	0.88	0.90	0.83	0.19	0.68	0.17
Control Delay	44.9	25.8	88.8	31.9	37.3	6.1	52.2	12.1
Queue Delay	0.5	0.0	0.0	0.8	0.0	0.0	0.0	0.0
Total Delay	45.4	25.8	88.8	32.7	37.3	6.1	52.2	12.1
Queue Length 50th (ft)	41	82	77	157	290	0	72	56
Queue Length 95th (ft)	67	123	#147	198	#330	23	#139	92
Internal Link Dist (ft)		671			2243			378
Turn Bay Length (ft)			280				120	
Base Capacity (vph)	299	623	154	740	1209	615	212	1737
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	23	0	0	30	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.31	0.88	0.83	0.83	0.19	0.60	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	80	324	58	298	20	35	25	269	413
v/c Ratio	0.47	0.21	0.37	0.38	0.03	0.14	0.11	0.32	0.61
Control Delay	46.3	18.0	45.1	22.5	18.3	35.8	15.7	27.2	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.3	18.0	45.1	22.5	18.3	35.8	15.7	27.2	7.6
Queue Length 50th (ft)	41	60	30	120	5	17	0	63	0
Queue Length 95th (ft)	89	107	69	218	22	49	24	90	27
Internal Link Dist (ft)		179		406		179		341	
Turn Bay Length (ft)	185		150		40				110
Base Capacity (vph)	381	1519	378	796	645	554	475	1216	797
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.21	0.15	0.37	0.03	0.06	0.05	0.22	0.52

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	280	38	137	248	247	65
v/c Ratio	0.26	0.04	0.68	0.18	0.78	0.19
Control Delay	13.7	4.6	63.8	5.3	60.2	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.7	4.6	63.8	5.3	60.2	10.3
Queue Length 50th (ft)	91	0	94	45	168	0
Queue Length 95th (ft)	175	17	145	83	215	26
Internal Link Dist (ft)	248			664	309	
Turn Bay Length (ft)			200			
Base Capacity (vph)	1080	933	308	1359	430	433
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.04	0.44	0.18	0.57	0.15

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	158	146	57	561	65	944	35	267	753	174
v/c Ratio	1.95	0.24	0.15	0.74	0.45	0.75	0.06	0.91	0.46	0.21
Control Delay	492.6	13.8	22.4	16.4	48.3	29.6	10.9	72.2	12.7	1.4
Queue Delay	234.0	0.0	0.0	96.2	0.0	0.3	0.0	101.2	1.0	0.7
Total Delay	726.5	13.8	22.4	112.6	48.3	29.9	10.9	173.4	13.7	2.1
Queue Length 50th (ft)	~140	33	23	103	36	246	4	151	104	0
Queue Length 95th (ft)	#204	56	47	185	69	291	22	m#253	m175	m2
Internal Link Dist (ft)		502		1058		2367			110	
Turn Bay Length (ft)	125		135		115		105	115		
Base Capacity (vph)	81	604	387	762	309	1266	581	309	1636	824
Starvation Cap Reductn	0	0	0	0	0	0	0	90	575	393
Spillback Cap Reductn	31	0	0	296	0	52	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	3.16	0.24	0.15	1.20	0.21	0.78	0.06	1.22	0.71	0.40

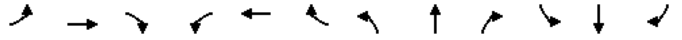
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	390	430	1482	195	1005
v/c Ratio	0.94	0.91	0.91	0.77	0.44
Control Delay	66.9	50.3	20.5	60.8	3.7
Queue Delay	22.6	118.3	1.6	0.0	0.6
Total Delay	89.5	168.5	22.2	60.8	4.3
Queue Length 50th (ft)	229	189	160	119	50
Queue Length 95th (ft)	#315	#273	m#541	m117	m59
Internal Link Dist (ft)		366	110		269
Turn Bay Length (ft)	232			75	
Base Capacity (vph)	414	471	1629	380	2291
Starvation Cap Reductn	0	0	56	0	827
Spillback Cap Reductn	39	132	6	0	279
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.04	1.27	0.94	0.51	0.69

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	149	233	51	16	267	220	71	633	22	103	257	116
v/c Ratio	0.76	0.36	0.09	0.15	0.68	0.44	0.47	0.45	0.03	0.63	0.18	0.16
Control Delay	64.8	23.3	7.0	44.6	39.3	8.3	48.2	20.5	10.7	55.9	17.7	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.8	23.3	7.0	44.6	39.3	8.3	48.2	20.5	10.7	55.9	17.7	4.7
Queue Length 50th (ft)	79	89	0	8	132	7	36	128	2	53	44	0
Queue Length 95th (ft)	#142	137	17	27	190	48	71	171	15	#126	83	34
Internal Link Dist (ft)		1613			1967			1346			2243	
Turn Bay Length (ft)	95		95	90		90	155		90	200		200
Base Capacity (vph)	195	712	636	171	629	669	184	1419	644	185	1442	713
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.33	0.08	0.09	0.42	0.33	0.39	0.45	0.03	0.56	0.18	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	119	40	48	918	25	852
v/c Ratio	0.28	0.10	0.33	0.40	0.18	0.40
Control Delay	1.6	0.5	22.3	5.0	20.1	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.6	0.5	22.3	5.0	20.1	5.8
Queue Length 50th (ft)	0	0	7	34	3	28
Queue Length 95th (ft)	0	0	30	105	19	86
Internal Link Dist (ft)	2570			1470		2367
Turn Bay Length (ft)			210		290	
Base Capacity (vph)	638	616	145	2342	139	2172
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.06	0.33	0.39	0.18	0.39

Intersection Summary

Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	36	161	80	1439
v/c Ratio	0.23	0.31	0.20	0.46
Control Delay	30.2	15.9	18.1	8.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	30.2	15.9	18.1	8.9
Queue Length 50th (ft)	11	40	17	83
Queue Length 95th (ft)	35	70	40	183
Internal Link Dist (ft)		608	737	568
Turn Bay Length (ft)				
Base Capacity (vph)	436	956	615	3105
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.08	0.17	0.13	0.46

Intersection Summary

Lane Group	WBT	NBT
Lane Group Flow (vph)	1344	1423
v/c Ratio	0.74	0.57
Control Delay	18.9	12.2
Queue Delay	0.3	0.0
Total Delay	19.2	12.2
Queue Length 50th (ft)	151	134
Queue Length 95th (ft)	172	166
Internal Link Dist (ft)	265	310
Turn Bay Length (ft)		
Base Capacity (vph)	1913	2483
Starvation Cap Reductn	154	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.76	0.57

Intersection Summary

Lane Group	EBT	NBT
Lane Group Flow (vph)	1454	913
v/c Ratio	0.62	0.49
Control Delay	11.4	12.6
Queue Delay	0.0	0.0
Total Delay	11.4	12.6
Queue Length 50th (ft)	114	70
Queue Length 95th (ft)	155	87
Internal Link Dist (ft)	4045	445
Turn Bay Length (ft)		
Base Capacity (vph)	2348	1979
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.62	0.46

Intersection Summary

Lane Group	WBT	NWL
Lane Group Flow (vph)	724	810
v/c Ratio	0.41	0.49
Control Delay	10.8	6.1
Queue Delay	0.0	0.0
Total Delay	10.8	6.1
Queue Length 50th (ft)	39	32
Queue Length 95th (ft)	63	47
Internal Link Dist (ft)	3590	171
Turn Bay Length (ft)		
Base Capacity (vph)	2778	2011
Starvation Cap Reductn	0	0
Spillback Cap Reductn	22	6
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.26	0.40

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor					0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt					1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)					3455	1583	1770	3539	1583	1770	3486	
Flt Permitted					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)					3455	1583	1770	3539	1583	1770	3486	
Volume (vph)	0	0	0	171	180	108	152	682	426	247	568	63
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.94	0.86	0.86	0.86
Adj. Flow (vph)	0	0	0	186	196	117	162	726	453	287	660	73
RTOR Reduction (vph)	0	0	0	0	0	87	0	0	115	0	8	0
Lane Group Flow (vph)	0	0	0	0	382	30	162	726	338	287	725	0
Turn Type				Split		Perm	Prot		Perm	Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)					21.8	21.8	11.9	36.7	36.7	17.5	42.3	
Effective Green, g (s)					22.8	22.8	11.9	37.7	37.7	17.5	43.3	
Actuated g/C Ratio					0.25	0.25	0.13	0.42	0.42	0.19	0.48	
Clearance Time (s)					5.0	5.0	4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)					7.5	7.5	2.0	8.0	8.0	2.0	7.5	
Lane Grp Cap (vph)					875	401	234	1482	663	344	1677	
v/s Ratio Prot					c0.11		0.09	0.21		c0.16	0.21	
v/s Ratio Perm						0.02			c0.21			
v/c Ratio					0.44	0.07	0.69	0.49	0.51	0.83	0.43	
Uniform Delay, d1					28.2	25.6	37.3	19.1	19.3	34.9	15.3	
Progression Factor					1.00	1.00	0.86	1.12	1.38	1.00	1.00	
Incremental Delay, d2					1.4	0.3	4.8	0.8	1.9	15.2	0.8	
Delay (s)					29.6	25.9	37.1	22.3	28.5	50.0	16.1	
Level of Service					C	C	D	C	C	D	B	
Approach Delay (s)		0.0			28.7			26.2			25.7	
Approach LOS		A			C			C			C	

Intersection Summary			
HCM Average Control Delay	26.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	213	373	262	329	82	30
Peak Hour Factor	0.92	0.92	0.88	0.88	0.76	0.76
Hourly flow rate (vph)	232	405	298	374	108	39

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total (vph)	154	483	422	249	108	39
Volume Left (vph)	0	0	298	0	108	0
Volume Right (vph)	0	405	0	0	0	39
Hadj (s)	0.03	-0.55	0.39	0.03	0.55	-0.65
Departure Headway (s)	6.0	5.4	6.2	5.8	7.9	6.7
Degree Utilization, x	0.26	0.72	0.73	0.40	0.24	0.07
Capacity (veh/h)	577	650	565	600	414	489
Control Delay (s)	9.8	19.8	22.7	11.5	12.1	9.0
Approach Delay (s)	17.4		18.6		11.3	
Approach LOS	C		C		B	

Intersection Summary			
Delay	17.3		
HCM Level of Service	C		
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1677		1770	1863	1583	1770	3539	1583	1770	3454	
Flt Permitted	0.64	1.00		0.15	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1183	1677		271	1863	1583	1770	3539	1583	1770	3454	
Volume (vph)	80	137	271	188	125	165	159	977	618	190	598	115
Peak-hour factor, PHF	0.80	0.80	0.80	0.87	0.87	0.87	0.92	0.92	0.92	0.89	0.89	0.89
Adj. Flow (vph)	100	171	339	216	144	190	173	1062	672	213	672	129
RTOR Reduction (vph)	0	79	0	0	0	106	0	0	261	0	16	0
Lane Group Flow (vph)	100	431	0	216	144	84	173	1062	411	213	785	0
Turn Type	Perm			Perm		Perm	Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8			2			
Actuated Green, G (s)	27.0	27.0		28.5	28.5	28.5	13.7	33.1	33.1	13.9	33.3	
Effective Green, g (s)	29.0	29.0		29.0	29.0	29.0	13.7	35.1	35.1	13.9	35.3	
Actuated g/C Ratio	0.32	0.32		0.32	0.32	0.32	0.15	0.39	0.39	0.15	0.39	
Clearance Time (s)	6.0	6.0		4.5	4.5	4.5	4.0	6.0	6.0	4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	381	540		87	600	510	269	1380	617	273	1355	
v/s Ratio Prot		0.26			0.08		0.10	c0.30		c0.12	0.23	
v/s Ratio Perm	0.08			c0.80		0.05			0.26			
v/c Ratio	0.26	0.80		2.48	0.24	0.17	0.64	0.77	0.67	0.78	0.58	
Uniform Delay, d1	22.6	27.8		30.5	22.4	21.8	35.9	23.9	22.6	36.6	21.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.70	1.25	1.73	1.00	1.00	
Incremental Delay, d2	0.4	8.0		700.3	0.2	0.2	0.5	0.4	0.5	13.4	1.8	
Delay (s)	23.0	35.9		730.8	22.6	22.0	25.6	30.3	39.7	50.0	23.3	
Level of Service	C	D		F	C	C	C	C	D	D	C	
Approach Delay (s)		33.7			300.5			33.2			28.9	
Approach LOS		C			F			C			C	

Intersection Summary				
HCM Average Control Delay	68.2	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.40			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	85.1%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	501	443	116	344	134	20
Peak Hour Factor	0.94	0.94	0.83	0.83	0.88	0.88
Hourly flow rate (vph)	533	471	140	414	152	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type					None	
Median storage veh)						
Upstream signal (ft)	465					
pX, platoon unblocked						
vC, conflicting volume			1004		1463	769
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1004		1463	769
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			80		0	94
cM capacity (veh/h)			690		112	400

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1004	554	175
Volume Left	0	140	152
Volume Right	471	0	23
cSH	1700	690	124
Volume to Capacity	0.59	0.20	1.41
Queue Length 95th (ft)	0	19	297
Control Delay (s)	0.0	5.2	289.2
Lane LOS		A	F
Approach Delay (s)	0.0	5.2	289.2
Approach LOS			F

Intersection Summary			
Average Delay	30.9		
Intersection Capacity Utilization	95.4%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0		4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	1.00		1.00		1.00		0.95	1.00	1.00	0.95	
Frt	1.00	0.96		1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	1789		1770		1583		3539	1583	1770	3539	
Flt Permitted	0.95	1.00		0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	1789		1770		1583		3539	1583	1770	3539	
Volume (vph)	115	277	99	213	0	565	0	581	117	183	556	0
Peak-hour factor, PHF	0.83	0.83	0.83	0.93	0.93	0.93	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	139	334	119	229	0	608	0	612	123	199	604	0
RTOR Reduction (vph)	0	16	0	0	0	191	0	0	89	0	0	0
Lane Group Flow (vph)	139	437	0	229	0	417	0	612	34	199	604	0
Turn Type	Prot			Prot		custom			Perm	Prot		
Protected Phases	7	4		3		8		2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	8.0	27.6		8.0		27.6		24.0	24.0	12.4	40.4	
Effective Green, g (s)	8.0	28.6		8.0		28.6		25.0	25.0	12.4	41.4	
Actuated g/C Ratio	0.09	0.32		0.09		0.32		0.28	0.28	0.14	0.46	
Clearance Time (s)	4.0	5.0		4.0		5.0		5.0	5.0	4.0	5.0	
Vehicle Extension (s)	6.5	6.5		2.0		4.5		5.5	5.5	2.0	6.0	
Lane Grp Cap (vph)	305	569		157		503		983	440	244	1628	
v/s Ratio Prot	0.04	0.24		c0.13		c0.26		c0.17		c0.11	0.17	
v/s Ratio Perm									0.02			
v/c Ratio	0.46	0.77		1.46		0.83		0.62	0.08	0.82	0.37	
Uniform Delay, d1	38.9	27.7		41.0		28.4		28.4	24.0	37.7	15.8	
Progression Factor	1.00	1.00		1.00		1.00		1.00	1.00	0.83	0.87	
Incremental Delay, d2	3.4	8.3		238.0		11.8		3.0	0.3	16.4	0.6	
Delay (s)	42.3	36.0		279.0		40.2		31.3	24.3	47.8	14.4	
Level of Service	D	D		F		D		C	C	D	B	
Approach Delay (s)		37.5			105.6			30.2			22.7	
Approach LOS		D			F			C			C	

Intersection Summary			
HCM Average Control Delay	50.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00		1.00	1.00		0.95	1.00
Frt	1.00	0.97		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1676	3443		1676	1863	1500		1791	1485		3396	1485
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (perm)	1676	3443		1676	1863	1500		1791	1485		3396	1485
Volume (vph)	101	381	85	106	266	47	107	71	95	197	109	320
Peak-hour factor, PHF	0.91	0.91	0.91	0.95	0.95	0.95	0.78	0.78	0.78	0.88	0.88	0.88
Adj. Flow (vph)	111	419	93	112	280	49	137	91	122	224	124	364
RTOR Reduction (vph)	0	13	0	0	0	12	0	0	96	0	0	287
Lane Group Flow (vph)	111	499	0	112	280	37	0	228	26	0	348	77
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6			3			4
Actuated Green, G (s)	9.4	30.8		9.4	30.8	30.8		20.5	20.5		19.9	19.9
Effective Green, g (s)	9.1	32.1		9.1	32.1	32.1		21.7	21.7		21.1	21.1
Actuated g/C Ratio	0.09	0.32		0.09	0.32	0.32		0.22	0.22		0.21	0.21
Clearance Time (s)	3.7	5.3		3.7	5.3	5.3		5.2	5.2		5.2	5.2
Vehicle Extension (s)	2.0	5.1		2.0	4.8	4.8		6.3	6.3		7.9	7.9
Lane Grp Cap (vph)	153	1105		153	598	482		389	322		717	313
v/s Ratio Prot	0.07	0.14		c0.07	c0.15			c0.13			c0.10	
v/s Ratio Perm						0.02			0.02			0.05
v/c Ratio	0.73	0.45		0.73	0.47	0.08		0.59	0.08		0.49	0.25
Uniform Delay, d1	44.2	27.0		44.3	27.1	23.6		35.1	31.2		34.7	32.8
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	13.5	1.3		14.4	1.1	0.1		4.5	0.3		2.2	1.7
Delay (s)	57.7	28.3		58.6	28.3	23.8		39.6	31.5		36.8	34.5
Level of Service	E	C		E	C	C		D	C		D	C
Approach Delay (s)		33.5			35.5			36.8			35.7	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM Average Control Delay	35.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	54.6%	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		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	12	452	358	0	518	3	0	0	107	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.90	0.90	0.90	0.84	0.84	0.84	0.92	0.92	0.92
Hourly flow rate (vph)	13	476	377	0	576	3	0	0	127	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		799			328							
pX, platoon unblocked	0.97			0.93			0.94	0.94	0.93	0.94	0.94	0.97
vC, conflicting volume	579			853			1267	1268	426	968	1455	577
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	566			760			1155	1157	299	837	1355	564
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	80	100	100	100
cM capacity (veh/h)	972			784			141	181	645	194	137	455

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	NB 1
Volume Total	13	317	535	579	127
Volume Left	13	0	0	0	0
Volume Right	0	0	377	3	127
cSH	972	1700	1700	1700	645
Volume to Capacity	0.01	0.19	0.31	0.34	0.20
Queue Length 95th (ft)	1	0	0	0	18
Control Delay (s)	8.8	0.0	0.0	0.0	11.9
Lane LOS	A				B
Approach Delay (s)	0.1			0.0	11.9
Approach LOS					B

Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	37.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	1863	1770	1583
Volume (vph)	491	68	158	189	332	177
Peak-hour factor, PHF	0.94	0.94	0.91	0.91	0.81	0.81
Adj. Flow (vph)	522	72	174	208	410	219
RTOR Reduction (vph)	0	43	0	0	0	162
Lane Group Flow (vph)	522	29	174	208	410	57
Turn Type		Perm	Prot			Prot
Protected Phases	2		1	6	4	4
Permitted Phases		2				
Actuated Green, G (s)	22.3	22.3	7.7	34.0	15.4	15.4
Effective Green, g (s)	24.3	24.3	7.7	36.0	15.4	15.4
Actuated g/C Ratio	0.41	0.41	0.13	0.61	0.26	0.26
Clearance Time (s)	6.0	6.0	4.0	6.0	4.0	4.0
Vehicle Extension (s)	8.0	8.0	2.0	8.0	2.4	2.4
Lane Grp Cap (vph)	762	648	229	1129	459	410
v/s Ratio Prot	c0.28		c0.10	0.11	c0.23	0.04
v/s Ratio Perm		0.02				
v/c Ratio	0.69	0.05	0.76	0.18	0.89	0.14
Uniform Delay, d1	14.4	10.6	25.0	5.2	21.2	16.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.0	0.1	12.1	0.4	19.2	0.1
Delay (s)	19.4	10.7	37.0	5.5	40.4	17.0
Level of Service	B	B	D	A	D	B
Approach Delay (s)	18.3			19.9	32.2	
Approach LOS	B			B	C	

Intersection Summary				
HCM Average Control Delay	24.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	59.4	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	63.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	431	232	24	261	94	57
Peak Hour Factor	0.92	0.92	0.85	0.85	0.92	0.92
Hourly flow rate (vph)	468	252	28	307	102	62
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	744					
pX, platoon unblocked			0.76		0.76	0.76
vC, conflicting volume			721		958	595
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			634		945	468
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		52	86
cM capacity (veh/h)			724		213	454

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	721	335	164
Volume Left	0	28	102
Volume Right	252	0	62
cSH	1700	724	266
Volume to Capacity	0.42	0.04	0.62
Queue Length 95th (ft)	0	3	93
Control Delay (s)	0.0	1.3	38.0
Lane LOS		A	E
Approach Delay (s)	0.0	1.3	38.0
Approach LOS			E

Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.92		1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1711		1770	1648		1770	3539	1583	1770	3539	1583
Flt Permitted	0.27	1.00		0.34	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	503	1711		635	1648		1770	3539	1583	1770	3539	1583
Volume (vph)	203	154	184	93	90	297	78	729	54	371	967	198
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.85	0.85	0.85	0.92	0.92	0.92
Adj. Flow (vph)	218	166	198	101	98	323	92	858	64	403	1051	215
RTOR Reduction (vph)	0	48	0	0	132	0	0	0	30	0	0	118
Lane Group Flow (vph)	218	316	0	101	289	0	92	858	34	403	1051	97
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	28.0	28.0		28.0	28.0		7.5	30.0	30.0	16.0	38.5	38.5
Effective Green, g (s)	30.0	30.0		30.0	30.0		7.5	32.0	32.0	16.0	40.5	40.5
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.08	0.36	0.36	0.18	0.45	0.45
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	5.8	5.8		5.8	5.8		1.5	5.8	5.8	1.5	5.8	5.8
Lane Grp Cap (vph)	168	570		212	549		148	1258	563	315	1593	712
v/s Ratio Prot		0.18			0.18		0.05	0.24		c0.23	c0.30	
v/s Ratio Perm	c0.43			0.16					0.02			0.06
v/c Ratio	1.30	0.55		0.48	0.53		0.62	0.68	0.06	1.28	0.66	0.14
Uniform Delay, d1	30.0	24.5		23.8	24.3		39.9	24.7	19.1	37.0	19.4	14.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.83	1.22	2.16
Incremental Delay, d2	170.6	2.4		4.5	2.2		5.7	3.0	0.2	128.0	0.2	0.0
Delay (s)	200.6	26.9		28.2	26.4		45.6	27.7	19.3	158.9	23.8	31.4
Level of Service	F	C		C	C		D	C	B	F	C	C
Approach Delay (s)		92.0			26.8			28.8			57.4	
Approach LOS		F			C			C			E	

Intersection Summary			
HCM Average Control Delay	50.8	HCM Level of Service	D
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	88.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0						4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95						0.95		1.00	0.95	
Frt	1.00	0.86						0.98		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1665	1498						3481		1770	3539	
Flt Permitted	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (perm)	1665	1498						3481		1770	3539	
Volume (vph)	661	0	714	0	0	0	0	1093	136	236	821	0
Peak-hour factor, PHF	0.79	0.79	0.79	0.92	0.92	0.92	0.95	0.95	0.95	0.87	0.87	0.87
Adj. Flow (vph)	837	0	904	0	0	0	0	1151	143	271	944	0
RTOR Reduction (vph)	0	125	0	0	0	0	0	10	0	0	0	0
Lane Group Flow (vph)	794	822	0	0	0	0	0	1284	0	271	944	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	22.0	22.0						38.0		16.9	58.6	
Effective Green, g (s)	22.6	22.6						38.8		16.6	59.4	
Actuated g/C Ratio	0.25	0.25						0.43		0.18	0.66	
Clearance Time (s)	4.6	4.6						4.8		3.7	4.8	
Vehicle Extension (s)	5.0	5.0						7.4		2.0	6.2	
Lane Grp Cap (vph)	418	376						1501		326	2336	
v/s Ratio Prot	0.48	c0.55						c0.37		c0.15	0.27	
v/s Ratio Perm												
v/c Ratio	1.90	2.19						0.86		0.83	0.40	
Uniform Delay, d1	33.7	33.7						23.1		35.4	7.1	
Progression Factor	1.00	1.00						0.65		1.15	0.85	
Incremental Delay, d2	413.7	542.4						4.2		4.7	0.1	
Delay (s)	447.4	576.1						19.1		45.4	6.2	
Level of Service	F	F						B		D	A	
Approach Delay (s)		517.4			0.0			19.1			14.9	
Approach LOS		F			A			B			B	

Intersection Summary				
HCM Average Control Delay	222.0	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.24			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	97.8%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	135	130	88	17	125	95	47	416	19	112	547	224
Peak-hour factor, PHF	0.90	0.90	0.90	0.89	0.89	0.89	0.81	0.81	0.81	0.90	0.90	0.90
Adj. Flow (vph)	150	144	98	19	140	107	58	514	23	124	608	249
RTOR Reduction (vph)	0	0	73	0	0	88	0	0	12	0	0	134
Lane Group Flow (vph)	150	144	25	19	140	19	58	514	11	124	608	115
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	9.0	20.4	20.4	2.5	13.9	13.9	4.7	33.6	33.6	8.5	37.4	37.4
Effective Green, g (s)	9.0	21.4	21.4	2.5	14.9	14.9	4.7	34.6	34.6	8.5	38.4	38.4
Actuated g/C Ratio	0.11	0.26	0.26	0.03	0.18	0.18	0.06	0.42	0.42	0.10	0.46	0.46
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	192	480	408	53	334	284	100	1475	660	181	1637	732
v/s Ratio Prot	c0.08	0.08		0.01	c0.08		0.03	0.15		c0.07	c0.17	
v/s Ratio Perm			0.02			0.01			0.01			0.07
v/c Ratio	0.78	0.30	0.06	0.36	0.42	0.07	0.58	0.35	0.02	0.69	0.37	0.16
Uniform Delay, d1	36.0	24.8	23.2	39.5	30.2	28.3	38.2	16.5	14.2	36.0	14.5	12.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.1	0.1	0.0	1.5	0.3	0.0	5.0	0.7	0.0	8.3	0.6	0.5
Delay (s)	53.2	24.9	23.3	41.0	30.5	28.3	43.2	17.2	14.3	44.2	15.1	13.4
Level of Service	D	C	C	D	C	C	D	B	B	D	B	B
Approach Delay (s)		35.3			30.4			19.6			18.4	
Approach LOS		D			C			B			B	

Intersection Summary				
HCM Average Control Delay	23.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.47			
Actuated Cycle Length (s)	83.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	48.4%	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)	52	71	65	19	123	8	70	88	20	28	175	54
Peak Hour Factor	0.92	0.92	0.92	0.85	0.85	0.85	0.87	0.87	0.87	0.72	0.72	0.72
Hourly flow rate (vph)	57	77	71	22	145	9	80	101	23	39	243	75

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	204	176	205	357
Volume Left (vph)	57	22	80	39
Volume Right (vph)	71	9	23	75
Hadj (s)	-0.12	0.03	0.05	-0.07
Departure Headway (s)	5.7	5.9	5.7	5.3
Degree Utilization, x	0.32	0.29	0.32	0.53
Capacity (veh/h)	567	544	573	638
Control Delay (s)	11.4	11.3	11.4	14.1
Approach Delay (s)	11.4	11.3	11.4	14.1
Approach LOS	B	B	B	B

Intersection Summary			
Delay	12.4		
HCM Level of Service	B		
Intersection Capacity Utilization	51.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0				4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00				1.00	1.00	0.95		1.00	0.95	
Frt		0.85				0.85	1.00	1.00		1.00	0.98	
Flt Protected		1.00				1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1583				1583	1770	3537		1770	3477	
Flt Permitted		1.00				1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1583				1583	1770	3537		1770	3477	
Volume (vph)	0	0	73	0	0	3	47	765	3	21	893	118
Peak-hour factor, PHF	0.81	0.81	0.81	0.50	0.50	0.50	0.77	0.77	0.77	0.98	0.98	0.98
Adj. Flow (vph)	0	0	90	0	0	6	61	994	4	21	911	120
RTOR Reduction (vph)	0	83	0	0	0	6	0	0	0	0	10	0
Lane Group Flow (vph)	0	7	0	0	0	0	61	998	0	21	1021	0
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		4.7				4.7	2.6	43.0		1.0	41.4	
Effective Green, g (s)		4.7				4.7	2.6	43.0		1.0	41.4	
Actuated g/C Ratio		0.08				0.08	0.04	0.71		0.02	0.68	
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)		123				123	76	2506		29	2371	
v/s Ratio Prot		c0.00					c0.03	0.28		0.01	c0.29	
v/s Ratio Perm						0.00						
v/c Ratio		0.06				0.00	0.80	0.40		0.72	0.43	
Uniform Delay, d1		25.9				25.8	28.8	3.6		29.7	4.3	
Progression Factor		1.00				1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2				0.0	43.8	0.1		61.8	0.1	
Delay (s)		26.1				25.9	72.6	3.7		91.5	4.5	
Level of Service		C				C	E	A		F	A	
Approach Delay (s)		26.1			25.9			7.7			6.2	
Approach LOS		C			C			A			A	

Intersection Summary					
HCM Average Control Delay	7.8	HCM Level of Service		A	
HCM Volume to Capacity ratio	0.41				
Actuated Cycle Length (s)	60.7	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	46.3%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frt	1.00	1.00			0.97			0.99				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1752	1845			1791			5001				
Flt Permitted	0.95	1.00			1.00			1.00				
Satd. Flow (perm)	1752	1845			1791			5001				
Volume (vph)	59	139	0	0	99	27	37	964	110	0	0	0
Peak-hour factor, PHF	0.78	0.78	0.78	0.79	0.79	0.79	0.91	0.91	0.91	0.92	0.92	0.92
Adj. Flow (vph)	76	178	0	0	125	34	41	1059	121	0	0	0
RTOR Reduction (vph)	0	0	0	0	12	0	0	10	0	0	0	0
Lane Group Flow (vph)	76	178	0	0	147	0	0	1211	0	0	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Prot						Perm					
Protected Phases	7	4			8			2				
Permitted Phases							2					
Actuated Green, G (s)	4.9	21.4			12.8			36.7				
Effective Green, g (s)	4.6	21.6			13.0			36.9				
Actuated g/C Ratio	0.07	0.32			0.20			0.55				
Clearance Time (s)	3.7	4.2			4.2			4.2				
Vehicle Extension (s)	2.0	7.9			7.7			6.4				
Lane Grp Cap (vph)	121	599			350			2775				
v/s Ratio Prot	c0.04	0.10			c0.08							
v/s Ratio Perm								0.24				
v/c Ratio	0.63	0.30			0.42			0.44				
Uniform Delay, d1	30.1	16.8			23.4			8.7				
Progression Factor	1.00	1.00			1.00			1.00				
Incremental Delay, d2	7.1	1.2			3.3			0.5				
Delay (s)	37.3	17.9			26.7			9.2				
Level of Service	D	B			C			A				
Approach Delay (s)		23.7			26.7			9.2			0.0	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM Average Control Delay	13.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	66.5	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	45.2%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0				
Lane Util. Factor					0.91			0.91				
Frt					0.96			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					4896			5037				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					4896			5037				
Volume (vph)	0	0	0	0	747	247	215	910	0	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.86	0.86	0.86	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	795	263	250	1058	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	37	0	0	36	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1021	0	0	1272	0	0	0	0
Turn Type							Perm					
Protected Phases					8			2				
Permitted Phases							2					
Actuated Green, G (s)					19.3			30.5				
Effective Green, g (s)					19.9			31.1				
Actuated g/C Ratio					0.34			0.53				
Clearance Time (s)					4.6			4.6				
Vehicle Extension (s)					4.8			3.0				
Lane Grp Cap (vph)					1651			2655				
v/s Ratio Prot					c0.21							
v/s Ratio Perm								0.25				
v/c Ratio					0.62			0.48				
Uniform Delay, d1					16.4			8.8				
Progression Factor					1.00			1.00				
Incremental Delay, d2					1.0			0.6				
Delay (s)					17.3			9.4				
Level of Service					B			A				
Approach Delay (s)		0.0			17.3			9.4			0.0	
Approach LOS		A			B			A			A	

Intersection Summary				
HCM Average Control Delay	13.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	59.0	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.91						0.91				
Frt		1.00						0.97				
Flt Protected		0.98						1.00				
Satd. Flow (prot)		4998						4954				
Flt Permitted		0.98						1.00				
Satd. Flow (perm)		4998						4954				
Volume (vph)	540	1006	0	0	0	0	0	585	122	0	0	0
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92
Adj. Flow (vph)	593	1105	0	0	0	0	0	609	127	0	0	0
RTOR Reduction (vph)	0	72	0	0	0	0	0	28	0	0	0	0
Lane Group Flow (vph)	0	1626	0	0	0	0	0	708	0	0	0	0
Turn Type	Perm											
Protected Phases		2						8				
Permitted Phases	2											
Actuated Green, G (s)		23.2						16.0				
Effective Green, g (s)		24.6						17.1				
Actuated g/C Ratio		0.49						0.34				
Clearance Time (s)		5.4						5.1				
Vehicle Extension (s)		2.0						5.0				
Lane Grp Cap (vph)		2474						1704				
v/s Ratio Prot								c0.14				
v/s Ratio Perm		0.33										
v/c Ratio		0.66						0.42				
Uniform Delay, d1		9.4						12.5				
Progression Factor		1.00						1.00				
Incremental Delay, d2		1.4						0.3				
Delay (s)		10.8						12.8				
Level of Service		B						B				
Approach Delay (s)		10.8			0.0			12.8			0.0	
Approach LOS		B			A			B			A	

Intersection Summary				
HCM Average Control Delay	11.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	49.7	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	51.1%	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)	13	11	0	0	8	27	11	631	5	0	0	0
Peak Hour Factor	0.60	0.60	0.60	0.63	0.63	0.63	0.91	0.91	0.91	0.92	0.92	0.92
Hourly flow rate (vph)	22	18	0	0	13	43	12	693	5	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	40	56	359	352
Volume Left (vph)	22	0	12	0
Volume Right (vph)	0	43	0	5
Hadj (s)	0.14	-0.43	0.05	0.02
Departure Headway (s)	5.5	4.9	4.8	4.8
Degree Utilization, x	0.06	0.08	0.48	0.47
Capacity (veh/h)	610	678	739	743
Control Delay (s)	8.9	8.3	11.0	10.7
Approach Delay (s)	8.9	8.3	10.8	
Approach LOS	A	A	B	

Intersection Summary					
Delay	10.6				
HCM Level of Service	B				
Intersection Capacity Utilization	32.6%	ICU Level of Service		A	
Analysis Period (min)	15				

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				5085	3433	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				5085	3433	
Volume (vph)	0	0	0	603	390	0
Peak-hour factor, PHF	0.92	0.92	0.84	0.84	0.94	0.94
Adj. Flow (vph)	0	0	0	718	415	0
RTOR Reduction (vph)	0	0	0	0	187	0
Lane Group Flow (vph)	0	0	0	718	228	0
Turn Type						
Protected Phases				6	4	
Permitted Phases						
Actuated Green, G (s)				12.7	9.9	
Effective Green, g (s)				13.3	11.9	
Actuated g/C Ratio				0.40	0.36	
Clearance Time (s)				4.6	6.0	
Vehicle Extension (s)				5.0	6.0	
Lane Grp Cap (vph)				2037	1231	
v/s Ratio Prot				c0.14	c0.07	
v/s Ratio Perm						
v/c Ratio				0.35	0.18	
Uniform Delay, d1				6.9	7.3	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.2	0.2	
Delay (s)				7.2	7.5	
Level of Service				A	A	
Approach Delay (s)	0.0			7.2	7.5	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	7.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	33.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	29.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	382	117	162	726	453	287	733
v/c Ratio	0.44	0.24	0.69	0.49	0.58	0.83	0.44
Control Delay	29.0	6.0	42.6	23.7	18.9	57.0	17.6
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	29.0	6.0	42.6	23.7	19.1	57.0	17.6
Queue Length 50th (ft)	95	0	95	190	158	151	138
Queue Length 95th (ft)	127	37	m125	m221	m184	#288	208
Internal Link Dist (ft)	719			378			1660
Turn Bay Length (ft)		275	110		40	260	
Base Capacity (vph)	1075	573	315	1482	778	350	1684
Starvation Cap Reductn	0	0	0	0	26	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.20	0.51	0.49	0.60	0.82	0.44

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	100	510	216	144	190	173	1062	672	213	801
v/c Ratio	0.26	0.82	2.45	0.24	0.31	0.64	0.77	0.77	0.78	0.58
Control Delay	24.9	34.5	707.0	23.8	7.4	25.8	31.2	16.0	56.8	23.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	10.8	2.4	0.0	0.0
Total Delay	24.9	34.5	707.0	23.8	7.4	25.8	42.0	18.3	56.8	23.7
Queue Length 50th (ft)	42	209	~206	60	13	83	262	162	116	176
Queue Length 95th (ft)	72	276	#290	102	56	m70	m258	m158	#212	260
Internal Link Dist (ft)		2033		385			269			731
Turn Bay Length (ft)	145		155		25	125			170	
Base Capacity (vph)	381	619	88	600	616	374	1381	878	295	1370
Starvation Cap Reductn	0	0	0	0	0	0	304	105	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	16
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.82	2.45	0.24	0.31	0.46	0.99	0.87	0.72	0.59

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	139	453	229	608	612	123	199	604
v/c Ratio	0.46	0.77	1.46	0.88	0.62	0.23	0.82	0.37
Control Delay	44.1	35.6	270.7	29.9	31.7	6.1	62.1	15.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.1	35.6	270.7	29.9	31.7	6.1	62.1	15.4
Queue Length 50th (ft)	39	217	~180	183	159	0	115	135
Queue Length 95th (ft)	62	275	#321	#368	216	40	#284	194
Internal Link Dist (ft)		671			2243			378
Turn Bay Length (ft)			280				120	
Base Capacity (vph)	305	671	157	758	983	529	243	1627
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.68	1.46	0.80	0.62	0.23	0.82	0.37

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	111	512	112	280	49	228	122	348	364
v/c Ratio	0.62	0.46	0.63	0.47	0.10	0.58	0.29	0.48	0.60
Control Delay	61.5	30.9	61.6	34.6	22.9	43.1	8.4	38.7	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.5	30.9	61.6	34.6	22.9	43.1	8.4	38.7	8.7
Queue Length 50th (ft)	70	134	70	146	15	132	0	104	0
Queue Length 95th (ft)	144	241	144	292	53	201	31	170	74
Internal Link Dist (ft)		179		406		179		341	
Turn Bay Length (ft)	185		150		40				110
Base Capacity (vph)	319	1122	319	601	495	518	516	978	687
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.46	0.35	0.47	0.10	0.44	0.24	0.36	0.53

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	522	72	174	208	410	219
v/c Ratio	0.68	0.10	0.76	0.18	0.90	0.38
Control Delay	20.4	3.9	49.1	5.9	46.8	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.4	3.9	49.1	5.9	46.8	5.3
Queue Length 50th (ft)	151	0	62	29	141	0
Queue Length 95th (ft)	251	20	#148	55	#238	32
Internal Link Dist (ft)	248			664	309	
Turn Bay Length (ft)			200			
Base Capacity (vph)	764	691	237	1130	472	583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.10	0.73	0.18	0.87	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	218	364	101	421	92	858	64	403	1051	215
v/c Ratio	1.30	0.59	0.48	0.62	0.54	0.68	0.11	1.28	0.65	0.26
Control Delay	200.2	24.3	32.9	17.4	50.0	28.0	9.2	157.8	24.8	5.9
Queue Delay	491.3	0.0	0.0	53.4	0.0	0.0	0.0	246.5	26.1	1.1
Total Delay	691.5	24.3	32.9	70.8	50.0	28.0	9.2	404.4	50.8	6.9
Queue Length 50th (ft)	~160	136	45	101	51	215	7	~292	293	12
Queue Length 95th (ft)	#300	227	98	202	90	261	30	m#273	m246	m14
Internal Link Dist (ft)		502		1058		2367			110	
Turn Bay Length (ft)	125		135		115		105	115		
Base Capacity (vph)	168	618	212	682	315	1258	592	315	1626	843
Starvation Cap Reductn	0	0	0	0	0	0	0	95	614	419
Spillback Cap Reductn	77	0	0	297	0	6	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	2.40	0.59	0.48	1.09	0.29	0.69	0.11	1.83	1.04	0.51

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

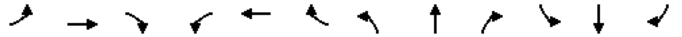
Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	794	947	1294	271	944
v/c Ratio	1.90	1.89	0.86	0.83	0.40
Control Delay	438.0	429.3	20.6	47.1	6.3
Queue Delay	113.5	245.0	2.2	0.0	0.4
Total Delay	551.5	674.3	22.8	47.1	6.7
Queue Length 50th (ft)	~735	~806	155	136	78
Queue Length 95th (ft)	#817	#875	m#271	m179	m88
Internal Link Dist (ft)		366	110		269
Turn Bay Length (ft)	232			75	
Base Capacity (vph)	418	501	1509	387	2336
Starvation Cap Reductn	0	0	111	0	789
Spillback Cap Reductn	49	112	10	0	719
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	2.15	2.43	0.93	0.70	0.61

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	150	144	98	19	140	107	58	514	23	124	608	249
v/c Ratio	0.74	0.29	0.20	0.16	0.48	0.32	0.39	0.35	0.03	0.65	0.35	0.28
Control Delay	58.3	26.7	7.4	39.1	36.3	9.1	42.3	16.8	7.3	51.7	14.8	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.3	26.7	7.4	39.1	36.3	9.1	42.3	16.8	7.3	51.7	14.8	3.2
Queue Length 50th (ft)	72	52	0	9	64	0	27	86	1	59	99	0
Queue Length 95th (ft)	#174	117	38	30	116	40	57	119	13	#137	162	43
Internal Link Dist (ft)		1613			1967			1346			2243	
Turn Bay Length (ft)	95		95	90		90	155		90	200		200
Base Capacity (vph)	202	681	640	182	618	597	188	1481	675	201	1723	899
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.21	0.15	0.10	0.23	0.18	0.31	0.35	0.03	0.62	0.35	0.28

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	90	6	61	998	21	1031
v/c Ratio	0.25	0.02	0.37	0.37	0.16	0.41
Control Delay	1.6	0.0	23.1	4.0	22.2	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.6	0.0	23.1	4.0	22.2	5.5
Queue Length 50th (ft)	0	0	11	38	4	38
Queue Length 95th (ft)	0	0	34	93	20	130
Internal Link Dist (ft)	2570			1470		2367
Turn Bay Length (ft)			210		290	
Base Capacity (vph)	565	561	166	2719	129	2520
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.01	0.37	0.37	0.16	0.41

Intersection Summary

Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	76	178	159	1221
v/c Ratio	0.40	0.28	0.38	0.41
Control Delay	34.5	14.4	21.4	11.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.5	14.4	21.4	11.1
Queue Length 50th (ft)	29	45	48	112
Queue Length 95th (ft)	59	69	85	187
Internal Link Dist (ft)		608	737	568
Turn Bay Length (ft)				
Base Capacity (vph)	452	998	615	2954
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.17	0.18	0.26	0.41

Intersection Summary

Lane Group	WBT	NBT
Lane Group Flow (vph)	1058	1308
v/c Ratio	0.63	0.49
Control Delay	17.1	9.6
Queue Delay	0.0	0.0
Total Delay	17.1	9.6
Queue Length 50th (ft)	106	90
Queue Length 95th (ft)	142	141
Internal Link Dist (ft)	265	310
Turn Bay Length (ft)		
Base Capacity (vph)	1992	2691
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.53	0.49

Intersection Summary

Lane Group	EBT	NBT
Lane Group Flow (vph)	1698	736
v/c Ratio	0.67	0.42
Control Delay	10.7	12.4
Queue Delay	0.0	0.0
Total Delay	10.7	12.4
Queue Length 50th (ft)	114	54
Queue Length 95th (ft)	183	79
Internal Link Dist (ft)	4045	445
Turn Bay Length (ft)		
Base Capacity (vph)	2544	1975
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.67	0.37

Intersection Summary

Lane Group	WBT	NWL
Lane Group Flow (vph)	718	415
v/c Ratio	0.35	0.29
Control Delay	7.6	3.4
Queue Delay	0.0	0.0
Total Delay	7.6	3.4
Queue Length 50th (ft)	28	6
Queue Length 95th (ft)	49	27
Internal Link Dist (ft)	3590	208
Turn Bay Length (ft)		
Base Capacity (vph)	3098	2020
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.23	0.21

Intersection Summary

NEAR-TERM 2015 TRAFFIC CONDITIONS (INTERSECTION, ROADWAY SEGMENT, AND FREEWAY & RAMP SEGMENTS)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor					0.95	1.00	0.97	0.91	0.91	0.97	0.91	
Frt					1.00	0.85	1.00	0.97	0.85	1.00	0.97	
Flt Protected					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)					3419	1553	3367	3216	1413	3367	4835	
Flt Permitted					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)					3419	1553	3367	3216	1413	3367	4835	
Volume (vph)	0	0	0	91	205	96	200	580	662	302	294	75
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.77	0.77	0.77	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	99	223	104	260	753	860	328	320	82
RTOR Reduction (vph)	0	0	0	0	0	81	0	20	308	0	37	0
Lane Group Flow (vph)	0	0	0	0	322	23	260	944	341	328	365	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type				Split		Perm	Prot		Perm	Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)					21.0	21.0	11.6	51.6	51.6	13.4	53.4	
Effective Green, g (s)					22.0	22.0	11.6	52.6	52.6	13.4	54.4	
Actuated g/C Ratio					0.22	0.22	0.12	0.53	0.53	0.13	0.54	
Clearance Time (s)					5.0	5.0	4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)					7.5	7.5	2.0	8.0	8.0	2.0	7.5	
Lane Grp Cap (vph)					752	342	391	1692	743	451	2630	
v/s Ratio Prot					c0.09		0.08	c0.29		c0.10	0.08	
v/s Ratio Perm						0.01			0.24			
v/c Ratio					0.43	0.07	0.66	0.56	0.46	0.73	0.14	
Uniform Delay, d1					33.6	30.9	42.3	15.9	14.8	41.5	11.2	
Progression Factor					1.00	1.00	0.92	1.36	5.54	1.00	1.00	
Incremental Delay, d2					1.5	0.3	2.7	1.1	1.7	4.9	0.1	
Delay (s)					35.1	31.2	41.6	22.7	83.8	46.5	11.4	
Level of Service					D	C	D	C	F	D	B	
Approach Delay (s)		0.0			34.2			46.5			27.1	
Approach LOS		A			C			D			C	

Intersection Summary				
HCM Average Control Delay	40.1	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	50.0%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	290	682	311	309	66	82
Peak Hour Factor	0.85	0.85	0.74	0.74	0.56	0.56
Hourly flow rate (vph)	341	802	420	418	118	146
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type					None	
Median storage veh)						
Upstream signal (ft)	799					
pX, platoon unblocked						
vC, conflicting volume			1144		1792	572
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1144		1792	572
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			29		0	68
cM capacity (veh/h)			595		21	458

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	227	916	559	278	264
Volume Left	0	0	420	0	118
Volume Right	0	802	0	0	146
cSH	1700	1700	595	1700	44
Volume to Capacity	0.13	0.54	0.71	0.16	6.00
Queue Length 95th (ft)	0	0	143	0	Err
Control Delay (s)	0.0	0.0	22.8	0.0	Err
Lane LOS			C		F
Approach Delay (s)	0.0		15.3		Err
Approach LOS					F

Intersection Summary				
Average Delay	1182.5			
Intersection Capacity Utilization	62.1%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.89		1.00	1.00	0.85	1.00	0.92		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1624		1736	1827	1553	1736	3192		1736	3296	
Flt Permitted	0.60	1.00		0.48	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1089	1624		878	1827	1553	1736	3192		1736	3296	
Volume (vph)	36	52	149	212	138	150	282	821	949	428	731	371
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.85	0.85	0.85	0.87	0.87	0.87
Adj. Flow (vph)	43	63	180	255	166	181	332	966	1116	492	840	426
RTOR Reduction (vph)	0	117	0	0	0	90	0	231	0	0	68	0
Lane Group Flow (vph)	43	126	0	255	166	91	332	1851	0	492	1198	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	25.5	25.5		27.0	27.0	27.0	18.6	32.0		16.5	29.9	
Effective Green, g (s)	27.5	27.5		27.5	27.5	27.5	18.6	34.0		16.5	31.9	
Actuated g/C Ratio	0.31	0.31		0.31	0.31	0.31	0.21	0.38		0.18	0.35	
Clearance Time (s)	6.0	6.0		4.5	4.5	4.5	4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	333	496		268	558	475	359	1206		318	1168	
v/s Ratio Prot		0.08			0.09		0.19	c0.58		c0.28	0.36	
v/s Ratio Perm	0.04			c0.29		0.06						
v/c Ratio	0.13	0.25		0.95	0.30	0.19	0.92	1.53		1.55	1.03	
Uniform Delay, d1	22.6	23.5		30.6	23.9	23.1	35.0	28.0		36.8	29.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.86	1.32		1.00	1.00	
Incremental Delay, d2	0.2	0.3		41.7	0.3	0.2	4.3	240.9		261.3	33.0	
Delay (s)	22.8	23.8		72.3	24.2	23.3	34.4	277.9		298.1	62.0	
Level of Service	C	C		E	C	C	C	F		F	E	
Approach Delay (s)		23.6			44.3			244.4			128.1	
Approach LOS		C			D			F			F	

Intersection Summary				
HCM Average Control Delay	167.7	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.27			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	113.9%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	323	1106	201	404	96	11
Peak Hour Factor	0.92	0.92	0.87	0.87	0.70	0.70
Hourly flow rate (vph)	351	1202	231	464	137	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type					None	
Median storage veh)						
Upstream signal (ft)	465					
pX, platoon unblocked						
vC, conflicting volume			1553		1879	952
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1553		1879	952
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			45		0	95
cM capacity (veh/h)			421		35	312

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1553	695	153
Volume Left	0	231	137
Volume Right	1202	0	16
cSH	1700	421	38
Volume to Capacity	0.91	0.55	3.98
Queue Length 95th (ft)	0	80	Err
Control Delay (s)	0.0	19.7	Err
Lane LOS		C	F
Approach Delay (s)	0.0	19.7	Err
Approach LOS			F

Intersection Summary			
Average Delay	642.1		
Intersection Capacity Utilization	132.8%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0		4.0		4.0		4.0	4.0	
Lane Util. Factor	0.97	0.95		1.00		0.88		0.91		0.97	0.95	
Frt	1.00	0.96		1.00		0.85		0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)	3367	3338		1736		2733		4933		3367	3471	
Flt Permitted	0.95	1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)	3367	3338		1736		2733		4933		3367	3471	
Volume (vph)	136	151	52	108	0	428	0	879	69	104	281	0
Peak-hour factor, PHF	0.85	0.85	0.85	0.78	0.78	0.78	0.74	0.74	0.74	0.90	0.90	0.90
Adj. Flow (vph)	160	178	61	138	0	549	0	1188	93	116	312	0
RTOR Reduction (vph)	0	46	0	0	0	252	0	7	0	0	0	0
Lane Group Flow (vph)	160	193	0	138	0	297	0	1275	0	116	312	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot		custom				Prot		
Protected Phases	7	4		3		8		2		1	6	
Permitted Phases												
Actuated Green, G (s)	9.0	14.7		10.3		16.0		49.0		8.0	61.0	
Effective Green, g (s)	9.0	15.7		10.3		17.0		50.0		8.0	62.0	
Actuated g/C Ratio	0.09	0.16		0.10		0.17		0.50		0.08	0.62	
Clearance Time (s)	4.0	5.0		4.0		5.0		5.0		4.0	5.0	
Vehicle Extension (s)	6.5	6.5		2.0		4.5		5.5		2.0	6.0	
Lane Grp Cap (vph)	303	524		179		465		2467		269	2152	
v/s Ratio Prot	0.05	0.06		c0.08		c0.11		c0.26		c0.03	0.09	
v/s Ratio Perm												
v/c Ratio	0.53	0.37		0.77		0.64		0.52		0.43	0.14	
Uniform Delay, d1	43.5	37.7		43.7		38.6		16.9		43.8	7.9	
Progression Factor	1.00	1.00		1.00		1.00		1.00		0.88	0.84	
Incremental Delay, d2	4.6	1.4		16.9		3.6		0.8		0.4	0.1	
Delay (s)	48.1	39.1		60.6		42.2		17.6		39.0	6.8	
Level of Service	D	D		E		D		B		D	A	
Approach Delay (s)		42.7			45.9			17.6			15.6	
Approach LOS		D			D			B			B	

Intersection Summary				
HCM Average Control Delay	27.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	49.5%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	1.00	1.00		1.00	1.00		0.95	1.00
Frt	1.00	0.98		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1644	4885		1644	1827	1471		1774	1471		3355	1471
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (perm)	1644	4885		1644	1827	1471		1774	1471		3355	1471
Volume (vph)	78	218	34	64	180	13	22	15	28	137	61	349
Peak-hour factor, PHF	0.86	0.86	0.86	0.84	0.84	0.84	0.93	0.93	0.93	0.76	0.76	0.76
Adj. Flow (vph)	91	253	40	76	214	15	24	16	30	180	80	459
RTOR Reduction (vph)	0	12	0	0	0	4	0	0	27	0	0	355
Lane Group Flow (vph)	91	281	0	76	214	11	0	40	3	0	260	104
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6			3			4
Actuated Green, G (s)	7.6	34.9		6.9	34.2	34.2		6.2	6.2		18.2	18.2
Effective Green, g (s)	7.3	36.2		6.6	35.5	35.5		7.4	7.4		19.4	19.4
Actuated g/C Ratio	0.09	0.42		0.08	0.41	0.41		0.09	0.09		0.23	0.23
Clearance Time (s)	3.7	5.3		3.7	5.3	5.3		5.2	5.2		5.2	5.2
Vehicle Extension (s)	2.0	5.1		2.0	4.8	4.8		6.3	6.3		7.9	7.9
Lane Grp Cap (vph)	140	2066		127	758	610		153	127		760	333
v/s Ratio Prot	c0.06	0.06		0.05	c0.12			c0.02			c0.08	
v/s Ratio Perm						0.01			0.00			0.07
v/c Ratio	0.65	0.14		0.60	0.28	0.02		0.26	0.02		0.34	0.31
Uniform Delay, d1	37.9	15.1		38.2	16.6	14.8		36.5	35.8		27.7	27.5
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	8.0	0.1		5.0	0.4	0.0		2.8	0.2		1.1	2.3
Delay (s)	45.9	15.3		43.2	17.0	14.8		39.3	36.0		28.9	29.8
Level of Service	D	B		D	B	B		D	D		C	C
Approach Delay (s)		22.5			23.4			37.9			29.5	
Approach LOS		C			C			D			C	

Intersection Summary				
HCM Average Control Delay	26.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.34			
Actuated Cycle Length (s)	85.6	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	49.0%	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												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	257	144	35	234	22	77	3	28	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.84	0.84	0.84	0.79	0.79	0.79	0.92	0.92	0.92
Hourly flow rate (vph)	11	271	152	42	279	26	97	4	35	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		799			328							
pX, platoon unblocked	0.97						0.97	0.97		0.97	0.97	0.97
vC, conflicting volume	305			422			742	755	211	569	818	292
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	285			422			735	748	211	556	813	271
tC, single (s)	4.2			4.2			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			96			66	99	96	100	100	100
cM capacity (veh/h)	1225			1119			289	315	794	371	292	712

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	NB 1
Volume Total	11	180	242	346	137
Volume Left	11	0	0	42	97
Volume Right	0	0	152	26	35
cSH	1225	1700	1700	1119	347
Volume to Capacity	0.01	0.11	0.14	0.04	0.39
Queue Length 95th (ft)	1	0	0	3	46
Control Delay (s)	8.0	0.0	0.0	1.3	22.0
Lane LOS	A			A	C
Approach Delay (s)	0.2			1.3	22.0
Approach LOS					C

Intersection Summary				
Average Delay	3.9			
Intersection Capacity Utilization	43.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1553	1736	1827	1719	1538
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1827	1553	1736	1827	1719	1538
Volume (vph)	262	23	68	257	34	44
Peak-hour factor, PHF	0.86	0.86	0.81	0.81	0.78	0.78
Adj. Flow (vph)	305	27	84	317	44	56
RTOR Reduction (vph)	0	8	0	0	0	51
Lane Group Flow (vph)	305	19	84	317	44	5
Heavy Vehicles (%)	4%	4%	4%	4%	5%	5%
Turn Type		Perm	Prot			Prot
Protected Phases	2		1	6	4	4
Permitted Phases		2				
Actuated Green, G (s)	65.2	65.2	8.2	77.4	8.6	8.6
Effective Green, g (s)	67.2	67.2	8.2	79.4	8.6	8.6
Actuated g/C Ratio	0.70	0.70	0.09	0.83	0.09	0.09
Clearance Time (s)	6.0	6.0	4.0	6.0	4.0	4.0
Vehicle Extension (s)	8.0	8.0	2.0	8.0	2.4	2.4
Lane Grp Cap (vph)	1279	1087	148	1511	154	138
v/s Ratio Prot	c0.17		c0.05	0.17	c0.03	0.00
v/s Ratio Perm		0.01				
v/c Ratio	0.24	0.02	0.57	0.21	0.29	0.04
Uniform Delay, d1	5.2	4.4	42.2	1.7	40.8	39.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.0	3.0	0.3	0.7	0.1
Delay (s)	5.6	4.4	45.2	2.1	41.5	40.0
Level of Service	A	A	D	A	D	D
Approach Delay (s)	5.5			11.1	40.7	
Approach LOS	A			B	D	

Intersection Summary			
HCM Average Control Delay	12.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	96.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	37.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	178	102	24	229	85	79
Peak Hour Factor	0.95	0.95	0.83	0.83	0.88	0.88
Hourly flow rate (vph)	187	107	29	276	97	90
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	744					
pX, platoon unblocked			0.99		0.99	0.99
vC, conflicting volume			295		575	241
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			286		569	231
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		79	89
cM capacity (veh/h)			1249		465	795

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	295	305	186
Volume Left	0	29	97
Volume Right	107	0	90
cSH	1700	1249	581
Volume to Capacity	0.17	0.02	0.32
Queue Length 95th (ft)	0	2	34
Control Delay (s)	0.0	1.0	14.1
Lane LOS		A	B
Approach Delay (s)	0.0	1.0	14.1
Approach LOS			B

Intersection Summary			
Average Delay		3.7	
Intersection Capacity Utilization		48.3%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.92		1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	1673		1736	1590		1736	3471	1553	1736	3471	1553
Flt Permitted	0.13	1.00		0.63	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	244	1673		1147	1590		1736	3471	1553	1736	3471	1553
Volume (vph)	129	48	62	52	69	441	59	1052	36	261	802	170
Peak-hour factor, PHF	0.73	0.73	0.73	0.83	0.83	0.83	0.84	0.84	0.84	0.93	0.93	0.93
Adj. Flow (vph)	177	66	85	63	83	531	70	1252	43	281	862	183
RTOR Reduction (vph)	0	51	0	0	256	0	0	0	13	0	0	99
Lane Group Flow (vph)	177	100	0	63	358	0	70	1252	30	281	862	84
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	28.0	28.0		28.0	28.0		6.6	30.5	30.5	15.5	39.4	39.4
Effective Green, g (s)	30.0	30.0		30.0	30.0		6.6	32.5	32.5	15.5	41.4	41.4
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.07	0.36	0.36	0.17	0.46	0.46
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	5.8	5.8		5.8	5.8		1.5	5.8	5.8	1.5	5.8	5.8
Lane Grp Cap (vph)	81	558		382	530		127	1253	561	299	1597	714
v/s Ratio Prot		0.06			0.23		0.04	c0.36		c0.16	0.25	
v/s Ratio Perm	c0.73			0.05					0.02			0.05
v/c Ratio	2.19	0.18		0.16	0.68		0.55	1.00	0.05	0.94	0.54	0.12
Uniform Delay, d1	30.0	21.3		21.2	25.8		40.3	28.7	18.7	36.8	17.5	13.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.10	0.78	0.50
Incremental Delay, d2	571.6	0.4		0.5	5.1		2.9	25.2	0.2	29.7	1.0	0.3
Delay (s)	601.6	21.7		21.7	30.9		43.2	54.0	18.9	70.1	14.5	7.2
Level of Service	F	C		C	C		D	D	B	E	B	A
Approach Delay (s)		334.6			30.0			52.3			25.3	
Approach LOS		F			C			D			C	

Intersection Summary				
HCM Average Control Delay	63.6	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.44			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	96.0%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Visalia Walmart Expansion
11: SR-198 EB Ramps @ Lovers Lane & Lovers Lane

Near-term 2015
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0						4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95						0.95		1.00	0.95	
Frt	1.00	0.89						1.00		1.00	1.00	
Flt Protected	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (prot)	1649	1518						3460		1736	3471	
Flt Permitted	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (perm)	1649	1518						3460		1736	3471	
Volume (vph)	466	0	322	0	0	0	0	1587	35	182	911	0
Peak-hour factor, PHF	0.77	0.77	0.77	0.92	0.92	0.92	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	605	0	418	0	0	0	0	1803	40	207	1035	0
RTOR Reduction (vph)	0	103	0	0	0	0	0	2	0	0	0	0
Lane Group Flow (vph)	477	443	0	0	0	0	0	1841	0	207	1035	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	22.0	22.0						41.0		13.9	58.6	
Effective Green, g (s)	22.6	22.6						41.8		13.6	59.4	
Actuated g/C Ratio	0.25	0.25						0.46		0.15	0.66	
Clearance Time (s)	4.6	4.6						4.8		3.7	4.8	
Vehicle Extension (s)	5.0	5.0						7.4		2.0	6.2	
Lane Grp Cap (vph)	414	381						1607		262	2291	
v/s Ratio Prot	0.29	c0.29						c0.53		c0.12	0.30	
v/s Ratio Perm												
v/c Ratio	1.15	1.16						1.15		0.79	0.45	
Uniform Delay, d1	33.7	33.7						24.1		36.8	7.4	
Progression Factor	1.00	1.00						0.47		1.40	0.46	
Incremental Delay, d2	92.8	98.0						66.4		5.8	0.3	
Delay (s)	126.5	131.7						77.8		57.3	3.7	
Level of Service	F	F						E		E	A	
Approach Delay (s)		129.3			0.0			77.8			12.6	
Approach LOS		F			A			E			B	

Intersection Summary				
HCM Average Control Delay	70.9	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.09			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	87.8%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Visalia Walmart Expansion
12: Tulare Ave & Ben Maddox Way

Near-term 2015
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	1845	1568	1752	1845	1568	1736	3471	1553	1736	3471	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1752	1845	1568	1752	1845	1568	1736	3471	1553	1736	3471	1553
Volume (vph)	106	172	37	13	223	199	55	603	19	99	266	98
Peak-hour factor, PHF	0.73	0.73	0.73	0.83	0.83	0.83	0.78	0.78	0.78	0.92	0.92	0.92
Adj. Flow (vph)	145	236	51	16	269	240	71	773	24	108	289	107
RTOR Reduction (vph)	0	0	34	0	0	167	0	0	9	0	0	65
Lane Group Flow (vph)	145	236	17	16	269	73	71	773	15	108	289	42
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	8.9	27.6	27.6	1.2	19.9	19.9	6.1	32.5	32.5	6.7	33.1	33.1
Effective Green, g (s)	8.9	28.6	28.6	1.2	20.9	20.9	6.1	33.5	33.5	6.7	34.1	34.1
Actuated g/C Ratio	0.10	0.33	0.33	0.01	0.24	0.24	0.07	0.39	0.39	0.08	0.40	0.40
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	181	614	521	24	448	381	123	1352	605	135	1376	616
v/s Ratio Prot	c0.08	0.13		0.01	c0.15		0.04	c0.22		c0.06	0.08	
v/s Ratio Perm			0.01			0.05			0.01			0.03
v/c Ratio	0.80	0.38	0.03	0.67	0.60	0.19	0.58	0.57	0.02	0.80	0.21	0.07
Uniform Delay, d1	37.7	22.0	19.4	42.2	28.8	25.8	38.7	20.6	16.2	39.0	17.1	16.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.8	0.1	0.0	42.9	1.6	0.1	4.0	1.8	0.1	26.4	0.3	0.2
Delay (s)	58.5	22.1	19.4	85.1	30.4	25.9	42.7	22.4	16.3	65.4	17.4	16.3
Level of Service	E	C	B	F	C	C	D	C	B	E	B	B
Approach Delay (s)		34.0			30.0			23.9			27.5	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	27.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	53.1%	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)	44	165	34	33	213	52	153	104	34	55	58	45
Peak Hour Factor	0.67	0.67	0.67	0.78	0.78	0.78	0.77	0.77	0.77	0.86	0.86	0.86
Hourly flow rate (vph)	66	246	51	42	273	67	199	135	44	64	67	52

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	363	382	378	184
Volume Left (vph)	66	42	199	64
Volume Right (vph)	51	67	44	52
Hadj (s)	0.00	-0.03	0.09	-0.05
Departure Headway (s)	7.1	7.1	7.2	7.8
Degree Utilization, x	0.72	0.75	0.76	0.40
Capacity (veh/h)	470	480	467	373
Control Delay (s)	26.4	28.2	29.7	15.9
Approach Delay (s)	26.4	28.2	29.7	15.9
Approach LOS	D	D	D	C

Intersection Summary				
Delay		26.4		
HCM Level of Service		D		
Intersection Capacity Utilization		50.2%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.85			1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1570			1845	1568	1736	3463		1736	3399	
Flt Permitted	0.75	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1385	1570			1845	1568	1736	3463		1736	3399	
Volume (vph)	10	1	84	0	6	101	47	968	15	46	692	111
Peak-hour factor, PHF	0.68	0.68	0.68	0.60	0.60	0.60	0.87	0.87	0.87	0.84	0.84	0.84
Adj. Flow (vph)	15	1	124	0	10	168	54	1113	17	55	824	132
RTOR Reduction (vph)	0	106	0	0	0	143	0	1	0	0	17	0
Lane Group Flow (vph)	15	19	0	0	10	25	54	1129	0	55	939	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	7.5	7.5			7.5	7.5	1.9	29.9		1.9	29.9	
Effective Green, g (s)	7.5	7.5			7.5	7.5	1.9	29.9		1.9	29.9	
Actuated g/C Ratio	0.15	0.15			0.15	0.15	0.04	0.58		0.04	0.58	
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	202	230			270	229	64	2018		64	1981	
v/s Ratio Prot		0.01			0.01		0.03	c0.33		c0.03	0.28	
v/s Ratio Perm	0.01					c0.02						
v/c Ratio	0.07	0.08			0.04	0.11	0.84	0.56		0.86	0.47	
Uniform Delay, d1	18.9	18.9			18.8	19.0	24.6	6.6		24.6	6.2	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2			0.1	0.2	60.7	0.3		64.6	0.2	
Delay (s)	19.1	19.1			18.9	19.2	85.2	7.0		89.2	6.3	
Level of Service	B	B			B	B	F	A		F	A	
Approach Delay (s)		19.1			19.2			10.5			10.9	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM Average Control Delay	11.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	51.3	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	47.8%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frt	1.00	1.00			0.98			0.98				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1736	1827			1790			4937				
Flt Permitted	0.95	1.00			1.00			1.00				
Satd. Flow (perm)	1736	1827			1790			4937				
Volume (vph)	31	146	0	0	46	8	70	1242	172	0	0	0
Peak-hour factor, PHF	0.83	0.83	0.83	0.68	0.68	0.68	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	37	176	0	0	68	12	80	1411	195	0	0	0
RTOR Reduction (vph)	0	0	0	0	8	0	0	12	0	0	0	0
Lane Group Flow (vph)	37	176	0	0	72	0	0	1674	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	Prot						Perm					
Protected Phases	7	4			8			2				
Permitted Phases							2					
Actuated Green, G (s)	2.9	20.8			14.2			36.5				
Effective Green, g (s)	2.6	21.0			14.4			36.7				
Actuated g/C Ratio	0.04	0.32			0.22			0.56				
Clearance Time (s)	3.7	4.2			4.2			4.2				
Vehicle Extension (s)	2.0	7.9			7.7			6.4				
Lane Grp Cap (vph)	69	584			392			2758				
v/s Ratio Prot	c0.02	c0.10			0.04							
v/s Ratio Perm								0.34				
v/c Ratio	0.54	0.30			0.18			0.61				
Uniform Delay, d1	31.0	16.8			20.9			9.7				
Progression Factor	1.00	1.00			1.00			1.00				
Incremental Delay, d2	4.0	1.2			0.9			1.0				
Delay (s)	34.9	18.1			21.8			10.7				
Level of Service	C	B			C			B				
Approach Delay (s)		21.0			21.8			10.7			0.0	
Approach LOS		C			C			B			A	

Intersection Summary				
HCM Average Control Delay	12.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	65.7	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	44.3%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0				
Lane Util. Factor					0.91			0.91				
Frt					0.94			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					4681			4979				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					4681			4979				
Volume (vph)	0	0	0	0	813	564	309	1031	0	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.82	0.82	0.82	0.87	0.87	0.87	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	991	688	355	1185	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	23	0	0	20	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1656	0	0	1520	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type							Perm					
Protected Phases					8			2				
Permitted Phases							2					
Actuated Green, G (s)					25.4			30.4				
Effective Green, g (s)					26.0			31.0				
Actuated g/C Ratio					0.40			0.48				
Clearance Time (s)					4.6			4.6				
Vehicle Extension (s)					4.8			3.0				
Lane Grp Cap (vph)					1872			2375				
v/s Ratio Prot					c0.35							
v/s Ratio Perm								0.31				
v/c Ratio					1.05dr			0.64				
Uniform Delay, d1					18.1			12.8				
Progression Factor					1.00			1.00				
Incremental Delay, d2					5.8			1.3				
Delay (s)					23.9			14.1				
Level of Service					C			B				
Approach Delay (s)		0.0			23.9			14.1			0.0	
Approach LOS		A			C			B			A	

Intersection Summary				
HCM Average Control Delay	19.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	61.2%	ICU Level of Service	B	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.91						0.91				
Frt		1.00						0.98				
Flt Protected		0.98						1.00				
Satd. Flow (prot)		4888						4948				
Flt Permitted		0.98						1.00				
Satd. Flow (perm)		4888						4948				
Volume (vph)	625	903	0	0	0	0	0	715	94	0	0	0
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.82	0.82	0.82	0.92	0.92	0.92
Adj. Flow (vph)	672	971	0	0	0	0	0	872	115	0	0	0
RTOR Reduction (vph)	0	30	0	0	0	0	0	32	0	0	0	0
Lane Group Flow (vph)	0	1613	0	0	0	0	0	955	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	Perm											
Protected Phases		2						8				
Permitted Phases	2											
Actuated Green, G (s)		23.1						18.5				
Effective Green, g (s)		24.5						19.6				
Actuated g/C Ratio		0.47						0.38				
Clearance Time (s)		5.4						5.1				
Vehicle Extension (s)		2.0						5.0				
Lane Grp Cap (vph)		2299						1861				
v/s Ratio Prot								c0.19				
v/s Ratio Perm		0.33										
v/c Ratio		0.70						0.51				
Uniform Delay, d1		10.9						12.6				
Progression Factor		1.00						1.00				
Incremental Delay, d2		1.8						0.5				
Delay (s)		12.7						13.0				
Level of Service		B						B				
Approach Delay (s)		12.7			0.0			13.0			0.0	
Approach LOS		B			A			B			A	

Intersection Summary				
HCM Average Control Delay	12.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	52.1	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	57.2%	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)	20	25	0	0	35	41	3	746	6	0	0	0
Peak Hour Factor	0.60	0.60	0.60	0.83	0.83	0.83	0.78	0.78	0.78	0.92	0.92	0.92
Hourly flow rate (vph)	33	42	0	0	42	49	4	956	8	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	75	92	482	486
Volume Left (vph)	33	0	4	0
Volume Right (vph)	0	49	0	8
Hadj (s)	0.12	-0.29	0.05	0.04
Departure Headway (s)	5.9	5.5	5.0	5.0
Degree Utilization, x	0.12	0.14	0.68	0.68
Capacity (veh/h)	580	622	708	710
Control Delay (s)	9.7	9.3	16.7	16.8
Approach Delay (s)	9.7	9.3	16.7	
Approach LOS	A	A	C	

Intersection Summary				
Delay	15.7			
HCM Level of Service	C			
Intersection Capacity Utilization	36.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				4988	3433	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				4988	3433	
Volume (vph)	0	0	0	696	681	0
Peak-hour factor, PHF	0.92	0.92	0.74	0.74	0.70	0.70
Adj. Flow (vph)	0	0	0	941	973	0
RTOR Reduction (vph)	0	0	0	0	83	0
Lane Group Flow (vph)	0	0	0	941	890	0
Heavy Vehicles (%)	4%	4%	4%	4%	2%	2%
Turn Type						
Protected Phases				6	4	
Permitted Phases						
Actuated Green, G (s)				15.9	18.8	
Effective Green, g (s)				16.5	20.8	
Actuated g/C Ratio				0.36	0.46	
Clearance Time (s)				4.6	6.0	
Vehicle Extension (s)				5.0	6.0	
Lane Grp Cap (vph)				1817	1576	
v/s Ratio Prot				c0.19	c0.26	
v/s Ratio Perm						
v/c Ratio				0.52	0.56	
Uniform Delay, d1				11.3	8.9	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.5	1.0	
Delay (s)				11.8	9.9	
Level of Service				B	A	
Approach Delay (s)	0.0			11.8	9.9	
Approach LOS	A			B	A	

Intersection Summary			
HCM Average Control Delay	10.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	45.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	322	104	260	964	649	328	402
v/c Ratio	0.43	0.25	0.67	0.56	0.62	0.73	0.15
Control Delay	34.5	7.1	45.8	24.1	11.6	51.1	10.2
Queue Delay	0.0	0.0	0.0	0.4	0.3	0.0	0.0
Total Delay	34.5	7.1	45.8	24.5	11.9	51.1	10.2
Queue Length 50th (ft)	93	0	86	197	74	104	34
Queue Length 95th (ft)	122	38	104	344	215	147	63
Internal Link Dist (ft)	719			378			1660
Turn Bay Length (ft)		275	110			260	
Base Capacity (vph)	1026	539	447	1710	1051	514	2666
Starvation Cap Reductn	0	0	0	297	72	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.19	0.58	0.68	0.66	0.64	0.15

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	43	243	255	166	181	332	2082	492	1266
v/c Ratio	0.13	0.40	0.93	0.30	0.32	0.92	1.45	1.55	1.02
Control Delay	22.9	9.9	70.5	24.9	9.4	37.2	227.8	290.9	60.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	41.4	0.0	0.0
Total Delay	22.9	9.9	70.5	24.9	9.4	37.2	269.2	290.9	60.4
Queue Length 50th (ft)	17	30	136	70	21	193	~810	~415	~406
Queue Length 95th (ft)	38	72	#244	110	57	m163	m#575	#579	#507
Internal Link Dist (ft)		2033		385			269		731
Turn Bay Length (ft)	145		155		25	125		170	
Base Capacity (vph)	355	638	290	589	588	366	1438	318	1237
Starvation Cap Reductn	0	0	0	0	0	0	86	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.38	0.88	0.28	0.31	0.91	1.54	1.55	1.02

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	160	239	138	549	1281	116	312
v/c Ratio	0.53	0.42	0.78	0.77	0.52	0.43	0.14
Control Delay	50.3	30.8	71.9	24.4	18.6	43.1	7.5
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	50.3	30.8	71.9	24.5	18.6	43.1	7.5
Queue Length 50th (ft)	51	56	86	84	189	38	47
Queue Length 95th (ft)	79	80	#137	99	213	65	83
Internal Link Dist (ft)		671			2243		378
Turn Bay Length (ft)			280			120	
Base Capacity (vph)	303	1269	191	1251	2475	271	2155
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	85	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.19	0.72	0.47	0.52	0.43	0.14

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	91	293	76	214	15	40	30	260	459
v/c Ratio	0.52	0.14	0.47	0.27	0.02	0.17	0.13	0.33	0.66
Control Delay	50.1	17.4	49.5	22.2	18.0	38.9	15.4	29.8	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.1	17.4	49.5	22.2	18.0	38.9	15.4	29.8	8.3
Queue Length 50th (ft)	50	36	42	85	3	21	0	66	0
Queue Length 95th (ft)	102	66	87	164	18	56	27	91	24
Internal Link Dist (ft)		179		406		179		341	
Turn Bay Length (ft)	185		150		40				110
Base Capacity (vph)	364	2152	362	794	643	517	450	1181	815
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.14	0.21	0.27	0.02	0.08	0.07	0.22	0.56

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	305	27	84	317	44	56
v/c Ratio	0.23	0.02	0.51	0.21	0.24	0.26
Control Delay	6.8	2.6	47.7	2.3	40.1	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.8	2.6	47.7	2.3	40.1	13.9
Queue Length 50th (ft)	63	0	45	32	22	0
Queue Length 95th (ft)	108	9	80	44	48	26
Internal Link Dist (ft)	248			664	309	
Turn Bay Length (ft)			200			
Base Capacity (vph)	1306	1118	342	1564	447	441
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.02	0.25	0.20	0.10	0.13

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	177	151	63	614	70	1252	43	281	862	183
v/c Ratio	2.19	0.25	0.16	0.78	0.47	1.00	0.07	0.94	0.53	0.22
Control Delay	592.9	12.4	22.7	18.0	48.8	55.7	12.4	73.6	15.0	1.9
Queue Delay	129.6	0.0	0.0	439.5	0.0	5.6	0.0	129.6	1.4	0.7
Total Delay	722.5	12.4	22.7	457.5	48.8	61.3	12.4	203.3	16.4	2.6
Queue Length 50th (ft)	~163	29	25	115	39	~381	8	160	146	0
Queue Length 95th (ft)	#227	52	51	205	73	#467	27	m#248	m210	m6
Internal Link Dist (ft)		502		1058		2367			110	
Turn Bay Length (ft)	125		135		115		105	115		
Base Capacity (vph)	81	609	382	786	309	1252	574	309	1628	826
Starvation Cap Reductn	0	0	0	0	0	0	0	92	534	395
Spillback Cap Reductn	57	0	0	475	0	25	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	7.38	0.25	0.16	1.97	0.23	1.02	0.07	1.29	0.79	0.42

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

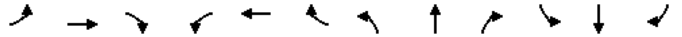
Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	477	546	1843	207	1035
v/c Ratio	1.15	1.13	1.15	0.79	0.45
Control Delay	125.9	106.0	82.9	59.3	3.7
Queue Delay	597.8	609.8	94.7	0.0	0.7
Total Delay	723.6	715.7	177.6	59.3	4.4
Queue Length 50th (ft)	~340	~315	~631	125	54
Queue Length 95th (ft)	#421	#395	m#680	m117	m58
Internal Link Dist (ft)		366	110		269
Turn Bay Length (ft)	232			75	
Base Capacity (vph)	414	485	1609	380	2291
Starvation Cap Reductn	0	0	37	0	827
Spillback Cap Reductn	339	328	252	0	519
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	6.36	3.48	1.36	0.54	0.71

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	145	236	51	16	269	240	71	773	24	108	289	107
v/c Ratio	0.76	0.37	0.09	0.15	0.68	0.47	0.46	0.54	0.04	0.65	0.20	0.15
Control Delay	64.7	23.4	7.0	44.7	39.3	8.5	48.2	22.1	11.5	57.2	17.8	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.7	23.4	7.0	44.7	39.3	8.5	48.2	22.1	11.5	57.2	17.8	4.9
Queue Length 50th (ft)	76	90	0	8	134	8	36	165	3	56	51	0
Queue Length 95th (ft)	#138	139	17	27	191	50	71	214	17	#135	93	34
Internal Link Dist (ft)		1613			1967			1346			2243	
Turn Bay Length (ft)	95		95	90		90	155		90	200		200
Base Capacity (vph)	195	711	636	172	630	681	184	1420	644	185	1446	709
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.33	0.08	0.09	0.43	0.35	0.39	0.54	0.04	0.58	0.20	0.15

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	15	125	10	168	54	1130	55	956
v/c Ratio	0.07	0.35	0.03	0.43	0.37	0.54	0.38	0.46
Control Delay	14.1	6.8	13.5	7.0	25.3	9.0	25.5	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.1	6.8	13.5	7.0	25.3	9.0	25.5	7.3
Queue Length 50th (ft)	2	0	1	0	8	47	9	35
Queue Length 95th (ft)	10	15	7	10	36	174	36	127
Internal Link Dist (ft)		2570	207			1470		2367
Turn Bay Length (ft)	100				210		290	
Base Capacity (vph)	420	562	559	592	146	2089	146	2064
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.22	0.02	0.28	0.37	0.54	0.38	0.46

Intersection Summary

Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	37	176	80	1686
v/c Ratio	0.23	0.33	0.19	0.59
Control Delay	30.2	16.1	18.2	10.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	30.2	16.1	18.2	10.6
Queue Length 50th (ft)	11	45	17	108
Queue Length 95th (ft)	35	76	40	228
Internal Link Dist (ft)		608	737	568
Turn Bay Length (ft)				
Base Capacity (vph)	440	981	634	2860
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.08	0.18	0.13	0.59

Intersection Summary

Lane Group	WBT	NBT
Lane Group Flow (vph)	1679	1540
v/c Ratio	1.05dr	0.64
Control Delay	25.1	14.0
Queue Delay	2.6	0.2
Total Delay	27.8	14.2
Queue Length 50th (ft)	214	154
Queue Length 95th (ft)	236	188
Internal Link Dist (ft)	265	310
Turn Bay Length (ft)		
Base Capacity (vph)	1896	2396
Starvation Cap Reductn	128	255
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.95	0.72

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lane Group	EBT	NBT
Lane Group Flow (vph)	1643	987
v/c Ratio	0.71	0.52
Control Delay	12.9	13.0
Queue Delay	0.0	0.0
Total Delay	12.9	13.0
Queue Length 50th (ft)	139	77
Queue Length 95th (ft)	187	96
Internal Link Dist (ft)	4045	445
Turn Bay Length (ft)		
Base Capacity (vph)	2329	1980
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.71	0.50

Intersection Summary

Lane Group	WBT	NWL
Lane Group Flow (vph)	941	973
v/c Ratio	0.52	0.59
Control Delay	13.0	9.6
Queue Delay	0.0	0.1
Total Delay	13.0	9.7
Queue Length 50th (ft)	68	72
Queue Length 95th (ft)	88	94
Internal Link Dist (ft)	3590	131
Turn Bay Length (ft)		
Base Capacity (vph)	2593	1847
Starvation Cap Reductn	0	0
Spillback Cap Reductn	195	91
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.39	0.55

Intersection Summary

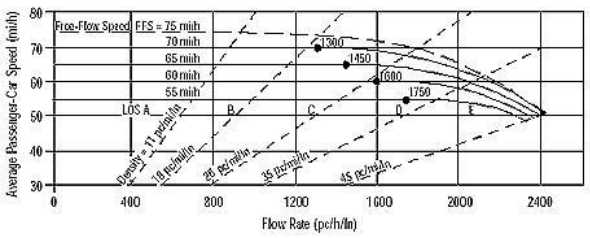
Kimley-Horn and Associates, Inc.

Visalia Walmart Roadway Network Capacity

Near-term 2015 Conditions
AM Peak

ROADWAY	FROM	TO	Length (Miles)	Area Type (U/T/R)	Functional Class	# of Lanes	Div/Undiv (D/U)	Left-turn Bays (Y/N)	POSTED SPEED	Sig/Mile	Code	Notes	Generalized Service Volumes							
													Code	A	B	C	D	E	Two-Way Vol	LOS
Mineral King Avenue	Ben Maddox Way	SR-198 WB Ramps (B	0.15	U	Arterial	4	U	N	40	3.50	U-NS2-4	adjusted volumes by -25%	U-NS2-4	0	0	2178	2898	3060	1,014	C
Mineral King Avenue	SR-198 WB Ramps (B	Lovers Lane	0.84	U	Arterial	2	U	Y	40	1.50	U-NS1-2		U-NS1-2	0	837	1350	1440	0	1,010	C
Noble Avenue	Ben Maddox Way	SR-198 EB Ramps	0.16	U	Arterial	3	U	Y	35	4.00	U-NS2-4	adjusted generalized service	U-NS2-4	0	0	1307	1739	1836	871	C
Noble Avenue	East Driveway	Pinkham Street	0.14	U	Arterial	2	U	Y	35	2.50	U-NS2-2		U-NS2-2	0	0	918	1332	1413	613	C
Noble Avenue	Pinkham Street	Lovers Lane	0.50	U	Arterial	2	U	Y	45	2.00	U-NS2-2		U-NS2-2	0	0	918	1332	1413	486	C
Ben Maddox Way	Noble Avenue	Tulare Avenue	0.44	U	Arterial	4	D	Y	40	2.00	U-NS2-4		U-NS2-4	0	0	2178	2898	3060	1,238	C
Pinkham Street	Noble Avenue	Tulare Avenue	0.44	U	Arterial	2	U	N	40	0	U-OS1-2	adjusted volumes by -20%	U-OS1-2	0	605	975	1040	0	259	B
Lovers Lane	Noble Avenue	Tulare Avenue	0.47	U	Arterial	4	D	Y	45	3.00	U-NS2-4		U-NS2-4	0	0	2178	2898	3060	1,996	C
Tulare Avenue	Ben Maddox Way	Pinkham Street	0.39	U	Arterial	2	U	Y	40	0.61	U-OS1-2		U-OS1-2	0	605	975	1040	0	690	C
Tulare Avenue	Pinkham Street	Lovers Lane	0.48	U	Arterial	2	U	N	40	0.82	U-OS1-2	adjusted volumes by -20%	U-OS1-2	0	605	975	1040	0	324	B

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	B/W Ben Maddox Way & Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2015

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	1798 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	1.10	I/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0	mi/h
f_{LC}	0.0	mi/h
f_{ID}	3.0	mi/h
f_N	4.5	mi/h
FFS	62.5	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1044	pc/h/ln
S	62.5	mi/h
D = v_p / S	16.7	pc/mi/ln
LOS	B	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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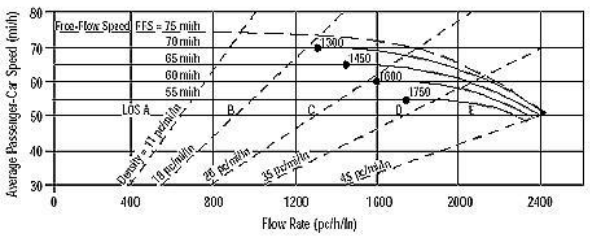
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	E/O Lovers Ln.
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2015

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	1227 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.56	I/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0	mi/h
f_{LC}	0.0	mi/h
f_{ID}	0.3	mi/h
f_N	4.5	mi/h
FFS	65.2	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	716	pc/h/ln
S	65.2	mi/h
D = v_p / S	11.0	pc/mi/ln
LOS	A	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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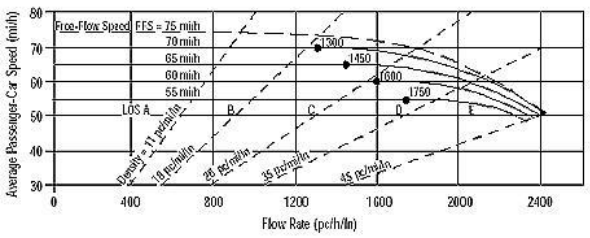

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	W/O S. Ben Maddox Way
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2015
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2239 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1300	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	20.8	pc/mi/ln	S		mi/h
LOS	C		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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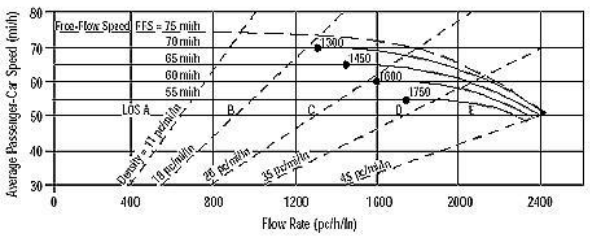

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	B/W Ben Maddox Way & Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2015
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2717 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1577	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	25.2	pc/mi/ln	S		mi/h
LOS	C		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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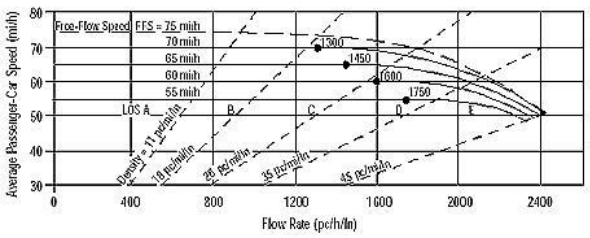

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	
Agency or Company	Kimley-Horn and Associates
Date Performed	7/6/2009
Analysis Time Period	AM Peak

Site Information

Highway/Direction of Travel	SR-198 WB
From/To	E/O Lovers Ln.
Jurisdiction	City of Visalia
Analysis Year	Near-term 2015

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	1517 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.56	I/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0	mi/h
f_{LC}	0.0	mi/h
f_{ID}	0.3	mi/h
f_N	4.5	mi/h
FFS	65.2	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	885	pc/h/ln
S	65.2	mi/h
D = v_p / S	13.6	pc/mi/ln
LOS	B	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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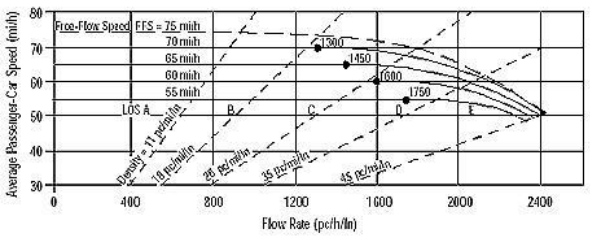

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	
Agency or Company	Kimley-Horn and Associates
Date Performed	7/6/2009
Analysis Time Period	AM Peak

Site Information

Highway/Direction of Travel	SR-198 WB
From/To	W/O S. Ben Maddox Way
Jurisdiction	City of Visalia
Analysis Year	Near-term 2015

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	3562 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	1.10	I/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0	mi/h
f_{LC}	0.0	mi/h
f_{ID}	3.0	mi/h
f_N	4.5	mi/h
FFS	62.5	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	2068	pc/h/ln
S	58.6	mi/h
D = v_p / S	35.3	pc/mi/ln
LOS	E	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2015

Project Description

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 2500 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = 352 veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	2239	0.90	Level	9	0	0.957	1.00	2600
Ramp	547	0.90	Level	4	0	0.980	1.00	620
UpStream	352	0.90	Level	2	0	0.990	1.00	395
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 2600 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	2600	4800	No
				V_{12}	2600	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	1980	4800	No
				V_R	620	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A	D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D
D_R = (pc/ mi /ln)	D_R = 25.1 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= C (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.484 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 56.5 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 56.5 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2015

Project Description

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 2600 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = 106 veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	1798	0.90	Level	9	0	0.957	1.00	2088
Ramp	788	0.90	Level	4	0	0.980	1.00	893
UpStream	106	0.90	Level	2	0	0.990	1.00	119
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 2088 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	2088	4800	No
				V_{12}	2088	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	1195	4800	No
				V_R	893	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A	D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D
D_R = (pc/ mi /ln)	D_R = 19.5 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= B (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.508 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 55.8 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 55.8 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2015

Project Description

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off
L_{up} = 3400 ft
Vu = 1307 veh/h

Terrain Level
S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off
L_{down} = ft
VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	2717	0.90	Level	9	0	0.957	1.00	3155
Ramp	148	0.90	Level	4	0	0.980	1.00	168
UpStream	1307	0.90	Level	2	0	0.990	1.00	1467
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 25-2 or 25-3)
P_{FM}= using Equation
V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$
D_R = (pc/ mi /ln)
LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} =1.000 using Equation 0
V_{12} = 3155 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$	3155	4800	No
V_{12}	3155	4400:All	No
$V_{FO} = V_F - V_R$	2987	4800	No
V_R	168	2000	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$
D_R = 28.9 (pc/ mi /ln)
LOS= D (Exhibit 25-4)

Speed Estimation

D_s = 0.443 (Exhibit 25-19)
S_R= 57.6 mph (Exhibit 25-19)
S_0= N/A mph (Exhibit 25-19)
S = 57.6 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET Page 1 of 1

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information | **Site Information**

Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2015

Project Description

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☐ No ☐ Off
L_{up} = ft
Vu = veh/h

Terrain
S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☐ No ☐ Off
L_{down} = ft
VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	1517	0.90	Level	9	0	0.957	1.00	1761
Ramp	107	0.90	Level	4	0	0.980	1.00	121
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 25-2 or 25-3)
P_{FM}= using Equation
V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$
D_R = (pc/ mi /ln)
LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} =1.000 using Equation 0
V_{12} = 1761 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$	1761	4800	No
V_{12}	1761	4400:All	No
$V_{FO} = V_F - V_R$	1640	4800	No
V_R	121	2000	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$
D_R = 17.4 (pc/ mi /ln)
LOS= B (Exhibit 25-4)

Speed Estimation

D_s = 0.439 (Exhibit 25-19)
S_R= 57.7 mph (Exhibit 25-19)
S_0= N/A mph (Exhibit 25-19)
S = 57.7 mph (Exhibit 25-15)

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor					0.95	1.00	0.97	0.91	0.91	0.97	0.91	
Frt					1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)					3459	1583	3433	3380	1441	3433	4998	
Flt Permitted					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)					3459	1583	3433	3380	1441	3433	4998	
Volume (vph)	0	0	0	179	207	123	198	738	480	283	575	74
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.94	0.86	0.86	0.86
Adj. Flow (vph)	0	0	0	195	225	134	211	785	511	329	669	86
RTOR Reduction (vph)	0	0	0	0	0	100	0	1	250	0	14	0
Lane Group Flow (vph)	0	0	0	0	420	34	211	800	245	329	741	0
Turn Type				Split		Perm	Prot		Perm	Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)					24.5	24.5	10.2	48.4	48.4	13.1	51.3	
Effective Green, g (s)					25.5	25.5	10.2	49.4	49.4	13.1	52.3	
Actuated g/C Ratio					0.26	0.26	0.10	0.49	0.49	0.13	0.52	
Clearance Time (s)					5.0	5.0	4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)					7.5	7.5	2.0	8.0	8.0	2.0	7.5	
Lane Grp Cap (vph)					882	404	350	1670	712	450	2614	
v/s Ratio Prot					c0.12		0.06	c0.24		c0.10	c0.15	
v/s Ratio Perm						0.02			0.17			
v/c Ratio					0.48	0.08	0.60	0.48	0.34	0.73	0.28	
Uniform Delay, d1					31.6	28.4	43.0	16.8	15.4	41.8	13.4	
Progression Factor					1.00	1.00	0.94	1.46	5.48	1.00	1.00	
Incremental Delay, d2					1.6	0.4	1.7	0.8	1.1	5.2	0.3	
Delay (s)					33.2	28.7	42.3	25.3	85.6	47.0	13.6	
Level of Service					C	C	D	C	F	D	B	
Approach Delay (s)		0.0			32.1			47.5			23.7	
Approach LOS		A			C			D			C	

Intersection Summary				
HCM Average Control Delay	36.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	54.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	245	432	262	366	95	30
Peak Hour Factor	0.92	0.92	0.88	0.88	0.76	0.76
Hourly flow rate (vph)	266	470	298	416	125	39
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type					None	
Median storage veh)						
Upstream signal (ft)	799					
pX, platoon unblocked						
vC, conflicting volume			736		1304	368
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			736		1304	368
tC, single (s)			4.1		6.9	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			66		0	94
cM capacity (veh/h)			865		99	626

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	178	558	436	277	164
Volume Left	0	0	298	0	125
Volume Right	0	470	0	0	39
cSH	1700	1700	865	1700	124
Volume to Capacity	0.10	0.33	0.34	0.16	1.32
Queue Length 95th (ft)	0	0	38	0	269
Control Delay (s)	0.0	0.0	9.1	0.0	256.6
Lane LOS			A		F
Approach Delay (s)	0.0		5.5		256.6
Approach LOS					F

Intersection Summary				
Average Delay	28.6			
Intersection Capacity Utilization	54.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.90		1.00	1.00	0.85	1.00	0.94		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1673		1770	1863	1583	1770	3323		1770	3450	
Flt Permitted	0.64	1.00		0.14	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1183	1673		257	1863	1583	1770	3323		1770	3450	
Volume (vph)	95	137	288	210	125	176	185	1202	823	315	624	126
Peak-hour factor, PHF	0.80	0.80	0.80	0.87	0.87	0.87	0.92	0.92	0.92	0.89	0.89	0.89
Adj. Flow (vph)	119	171	360	241	144	202	201	1307	895	354	701	142
RTOR Reduction (vph)	0	84	0	0	0	113	0	136	0	0	17	0
Lane Group Flow (vph)	119	447	0	241	144	89	201	2066	0	354	826	0
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	27.0	27.0		28.5	28.5	28.5	14.6	32.0		15.0	32.4	
Effective Green, g (s)	29.0	29.0		29.0	29.0	29.0	14.6	34.0		15.0	34.4	
Actuated g/C Ratio	0.32	0.32		0.32	0.32	0.32	0.16	0.38		0.17	0.38	
Clearance Time (s)	6.0	6.0		4.5	4.5	4.5	4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	381	539		83	600	510	287	1255		295	1319	
v/s Ratio Prot		0.27			0.08		0.11	c0.62		c0.20	0.24	
v/s Ratio Perm	0.10			c0.94		0.06						
v/c Ratio	0.31	0.83		2.90	0.24	0.18	0.70	1.65		1.20	0.63	
Uniform Delay, d1	23.0	28.2		30.5	22.4	21.9	35.6	28.0		37.5	22.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.67	1.29		1.00	1.00	
Incremental Delay, d2	0.5	10.2		888.5	0.2	0.2	0.7	291.3		117.9	2.3	
Delay (s)	23.5	38.4		919.0	22.6	22.1	24.5	327.4		155.4	24.8	
Level of Service	C	D		F	C	C	C	F		F	C	
Approach Delay (s)		35.7			390.5			302.0			63.5	
Approach LOS		D			F			F			E	

Intersection Summary				
HCM Average Control Delay	217.9	HCM Level of Service	F	
HCM Volume to Capacity ratio	2.03			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	126.9%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	511	763	116	354	159	20
Peak Hour Factor	0.94	0.94	0.83	0.83	0.88	0.88
Hourly flow rate (vph)	544	812	140	427	181	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type					None	
Median storage veh)						
Upstream signal (ft)	465					
pX, platoon unblocked						
vC, conflicting volume			1355		1655	949
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1355		1655	949
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			72		0	93
cM capacity (veh/h)			508		78	314

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1355	566	203
Volume Left	0	140	181
Volume Right	812	0	23
cSH	1700	508	85
Volume to Capacity	0.80	0.28	2.40
Queue Length 95th (ft)	0	28	471
Control Delay (s)	0.0	7.7	741.2
Lane LOS		A	F
Approach Delay (s)	0.0	7.7	741.2
Approach LOS			F

Intersection Summary				
Average Delay	73.0			
Intersection Capacity Utilization	117.5%	ICU Level of Service	H	
Analysis Period (min)	15			

5: Noble Ave & Ben Maddox Way

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0		4.0		4.0		4.0	4.0	
Lane Util. Factor	0.97	0.95		1.00		0.88		0.91		0.97	0.95	
Frt	1.00	0.95		1.00		0.85		0.98		1.00	1.00	
Flt Protected	0.95	1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)	3433	3357		1770		2787		4973		3433	3539	
Flt Permitted	0.95	1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)	3433	3357		1770		2787		4973		3433	3539	
Volume (vph)	134	307	160	279	0	591	0	691	119	181	572	0
Peak-hour factor, PHF	0.83	0.83	0.83	0.93	0.93	0.93	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	161	370	193	300	0	635	0	727	125	197	622	0
RTOR Reduction (vph)	0	83	0	0	0	262	0	21	0	0	0	0
Lane Group Flow (vph)	161	480	0	300	0	373	0	831	0	197	622	0
Turn Type	Prot			Prot		custom				Prot		
Protected Phases	7	4		3		8		2		1	6	
Permitted Phases												
Actuated Green, G (s)	9.0	21.5		11.0		23.5		37.9		11.6	53.5	
Effective Green, g (s)	9.0	22.5		11.0		24.5		38.9		11.6	54.5	
Actuated g/C Ratio	0.09	0.22		0.11		0.24		0.39		0.12	0.54	
Clearance Time (s)	4.0	5.0		4.0		5.0		5.0		4.0	5.0	
Vehicle Extension (s)	6.5	6.5		2.0		4.5		5.5		2.0	6.0	
Lane Grp Cap (vph)	309	755		195		683		1934		398	1929	
v/s Ratio Prot	0.05	c0.14		c0.17		0.13		c0.17		c0.06	0.18	
v/s Ratio Perm												
v/c Ratio	0.52	0.64		1.54		0.55		0.43		0.49	0.32	
Uniform Delay, d1	43.4	35.0		44.5		32.9		22.4		41.5	12.6	
Progression Factor	1.00	1.00		1.00		1.00		1.00		0.84	0.91	
Incremental Delay, d2	4.4	3.2		266.3		1.3		0.7		0.3	0.4	
Delay (s)	47.8	38.2		310.8		34.3		23.1		35.3	11.8	
Level of Service	D	D		F		C		C		D	B	
Approach Delay (s)		40.4			123.0			23.1			17.5	
Approach LOS		D			F			C			B	

Intersection Summary			
HCM Average Control Delay	53.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

6: Noble Ave & SR-198 EB Ramps @ Ben Maddox Way

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	1.00	1.00		1.00	1.00		0.95	1.00
Frt	1.00	0.97		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1676	4941		1676	1863	1500		1788	1485		3395	1485
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (perm)	1676	4941		1676	1863	1500		1788	1485		3395	1485
Volume (vph)	108	397	93	116	233	45	123	71	112	204	111	430
Peak-hour factor, PHF	0.91	0.91	0.91	0.95	0.95	0.95	0.78	0.78	0.78	0.88	0.88	0.88
Adj. Flow (vph)	119	436	102	122	245	47	158	91	144	232	126	489
RTOR Reduction (vph)	0	26	0	0	0	12	0	0	113	0	0	386
Lane Group Flow (vph)	119	512	0	122	245	35	0	249	31	0	358	103
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6			3			4
Actuated Green, G (s)	12.0	33.6		12.2	33.8	33.8		22.5	22.5		21.8	21.8
Effective Green, g (s)	11.7	34.9		11.9	35.1	35.1		23.7	23.7		23.0	23.0
Actuated g/C Ratio	0.11	0.32		0.11	0.32	0.32		0.22	0.22		0.21	0.21
Clearance Time (s)	3.7	5.3		3.7	5.3	5.3		5.2	5.2		5.2	5.2
Vehicle Extension (s)	2.0	5.1		2.0	4.8	4.8		6.3	6.3		7.9	7.9
Lane Grp Cap (vph)	179	1575		182	597	481		387	321		713	312
v/s Ratio Prot	0.07	0.10		c0.07	c0.13			c0.14			c0.11	
v/s Ratio Perm						0.02			0.02			0.07
v/c Ratio	0.66	0.33		0.67	0.41	0.07		0.64	0.10		0.50	0.33
Uniform Delay, d1	47.0	28.3		46.9	29.1	25.9		39.1	34.3		38.2	36.7
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	7.0	0.5		7.4	0.9	0.1		6.2	0.4		2.3	2.6
Delay (s)	54.0	28.9		54.3	30.0	26.0		45.2	34.7		40.5	39.3
Level of Service	D	C		D	C	C		D	C		D	D
Approach Delay (s)		33.5			36.7			41.4			39.8	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM Average Control Delay	37.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	109.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	12	563	287	33	334	0	158	3	56	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.90	0.90	0.90	0.84	0.84	0.84	0.92	0.92	0.92
Hourly flow rate (vph)	13	593	302	37	371	0	188	4	67	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		799			328							
pX, platoon unblocked	0.97			0.92			0.93	0.93	0.92	0.93	0.93	0.97
vC, conflicting volume	371			895			1213	1213	447	834	1364	371
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	351			798			1093	1093	311	688	1255	351
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			95			0	98	89	100	100	100
cM capacity (veh/h)	1167			754			150	187	629	262	150	625

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	NB 1
Volume Total	13	395	500	408	258
Volume Left	13	0	0	37	188
Volume Right	0	0	302	0	67
cSH	1167	1700	1700	754	188
Volume to Capacity	0.01	0.23	0.29	0.05	1.37
Queue Length 95th (ft)	1	0	0	4	380
Control Delay (s)	8.1	0.0	0.0	1.5	246.2
Lane LOS	A			A	F
Approach Delay (s)	0.1			1.5	246.2
Approach LOS					F

Intersection Summary				
Average Delay	40.9			
Intersection Capacity Utilization	64.0%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	1863	1770	1583
Volume (vph)	564	55	115	239	128	165
Peak-hour factor, PHF	0.94	0.94	0.91	0.91	0.81	0.81
Adj. Flow (vph)	600	59	126	263	158	204
RTOR Reduction (vph)	0	23	0	0	0	175
Lane Group Flow (vph)	600	36	126	263	158	29
Turn Type		Perm	Prot			Prot
Protected Phases	2		1	6	4	4
Permitted Phases		2				
Actuated Green, G (s)	55.3	55.3	10.9	70.2	13.5	13.5
Effective Green, g (s)	57.3	57.3	10.9	72.2	13.5	13.5
Actuated g/C Ratio	0.61	0.61	0.12	0.77	0.14	0.14
Clearance Time (s)	6.0	6.0	4.0	6.0	4.0	4.0
Vehicle Extension (s)	8.0	8.0	2.0	8.0	2.4	2.4
Lane Grp Cap (vph)	1139	968	206	1436	255	228
v/s Ratio Prot	c0.32		c0.07	0.14	c0.09	0.02
v/s Ratio Perm		0.02				
v/c Ratio	0.53	0.04	0.61	0.18	0.62	0.13
Uniform Delay, d1	10.4	7.2	39.4	2.9	37.7	35.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.7	0.1	3.7	0.3	3.7	0.2
Delay (s)	12.2	7.3	43.1	3.2	41.4	35.1
Level of Service	B	A	D	A	D	D
Approach Delay (s)	11.7			16.1	37.9	
Approach LOS	B			B	D	

Intersection Summary				
HCM Average Control Delay	19.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	93.7	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	54.4%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	472	252	21	269	94	52
Peak Hour Factor	0.92	0.92	0.85	0.85	0.92	0.92
Hourly flow rate (vph)	513	274	25	316	102	57
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	744					
pX, platoon unblocked			0.80		0.80	0.80
vC, conflicting volume			787		1016	650
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			735		1020	564
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		50	87
cM capacity (veh/h)			699		203	421

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	787	341	159
Volume Left	0	25	102
Volume Right	274	0	57
cSH	1700	699	249
Volume to Capacity	0.46	0.04	0.64
Queue Length 95th (ft)	0	3	98
Control Delay (s)	0.0	1.2	41.8
Lane LOS		A	E
Approach Delay (s)	0.0	1.2	41.8
Approach LOS			E

Intersection Summary			
Average Delay		5.5	
Intersection Capacity Utilization		55.3%	ICU Level of Service B
Analysis Period (min)		15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1699		1770	1643		1770	3539	1583	1770	3539	1583
Flt Permitted	0.24	1.00		0.32	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	442	1699		595	1643		1770	3539	1583	1770	3539	1583
Volume (vph)	224	147	207	107	87	325	82	944	75	417	1271	203
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.85	0.85	0.85	0.92	0.92	0.92
Adj. Flow (vph)	241	158	223	116	95	353	96	1111	88	453	1382	221
RTOR Reduction (vph)	0	57	0	0	149	0	0	0	32	0	0	115
Lane Group Flow (vph)	241	324	0	116	299	0	96	1111	56	453	1382	106
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	28.0	28.0		28.0	28.0		7.6	30.0	30.0	16.0	38.4	38.4
Effective Green, g (s)	30.0	30.0		30.0	30.0		7.6	32.0	32.0	16.0	40.4	40.4
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.08	0.36	0.36	0.18	0.45	0.45
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	5.8	5.8		5.8	5.8		1.5	5.8	5.8	1.5	5.8	5.8
Lane Grp Cap (vph)	147	566		198	548		149	1258	563	315	1589	711
v/s Ratio Prot		0.19			0.18		0.05	0.31		c0.26	c0.39	
v/s Ratio Perm	c0.55			0.19					0.04			0.07
v/c Ratio	1.64	0.57		0.59	0.55		0.64	0.88	0.10	1.44	0.87	0.15
Uniform Delay, d1	30.0	24.7		24.9	24.5		39.9	27.2	19.4	37.0	22.4	14.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.85	1.31	2.52
Incremental Delay, d2	316.3	2.7		7.9	2.4		7.0	9.2	0.4	198.8	0.7	0.0
Delay (s)	346.3	27.4		32.8	26.9		46.9	36.4	19.7	230.2	30.0	36.9
Level of Service	F	C		C	C		D	D	B	F	C	D
Approach Delay (s)		151.0			28.1			36.1			74.8	
Approach LOS		F			C			D			E	

Intersection Summary				
HCM Average Control Delay	68.4	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.25			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	99.5%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Visalia Walmart Expansion
11: SR-198 EB Ramps @ Lovers Lane & Lovers Lane

Near-term 2015
Timing Plan: PM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0						4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95						0.95		1.00	0.95	
Frt	1.00	0.85						0.99		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1665	1490						3487		1770	3539	
Flt Permitted	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (perm)	1665	1490						3487		1770	3539	
Volume (vph)	864	0	1011	0	0	0	0	1346	146	243	880	0
Peak-hour factor, PHF	0.79	0.79	0.79	0.92	0.92	0.92	0.95	0.95	0.95	0.87	0.87	0.87
Adj. Flow (vph)	1094	0	1280	0	0	0	0	1417	154	279	1011	0
RTOR Reduction (vph)	0	109	0	0	0	0	0	9	0	0	0	0
Lane Group Flow (vph)	1094	1171	0	0	0	0	0	1562	0	279	1011	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	22.0	22.0						37.6		17.3	58.6	
Effective Green, g (s)	22.6	22.6						38.4		17.0	59.4	
Actuated g/C Ratio	0.25	0.25						0.43		0.19	0.66	
Clearance Time (s)	4.6	4.6						4.8		3.7	4.8	
Vehicle Extension (s)	5.0	5.0						7.4		2.0	6.2	
Lane Grp Cap (vph)	418	374						1488		334	2336	
v/s Ratio Prot	0.66	c0.79						c0.45		c0.16	0.29	
v/s Ratio Perm												
v/c Ratio	2.62	3.13						1.05		0.84	0.43	
Uniform Delay, d1	33.7	33.7						25.8		35.2	7.3	
Progression Factor	1.00	1.00						0.60		1.20	0.86	
Incremental Delay, d2	734.7	966.5						29.2		1.7	0.1	
Delay (s)	768.4	1000.2						44.7		43.8	6.3	
Level of Service	F	F						D		D	A	
Approach Delay (s)		893.3			0.0			44.7			14.4	
Approach LOS		F			A			D			B	

Intersection Summary				
HCM Average Control Delay	422.1	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.61			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	120.3%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

Visalia Walmart Expansion
12: Tulare Ave & Ben Maddox Way

Near-term 2015
Timing Plan: PM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	134	135	88	19	134	106	47	499	20	122	680	220
Peak-hour factor, PHF	0.90	0.90	0.90	0.89	0.89	0.89	0.81	0.81	0.81	0.90	0.90	0.90
Adj. Flow (vph)	149	150	98	21	151	119	58	616	25	136	756	244
RTOR Reduction (vph)	0	0	73	0	0	97	0	0	11	0	0	131
Lane Group Flow (vph)	149	150	25	21	151	22	58	616	14	136	756	113
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	9.0	20.6	20.6	2.6	14.2	14.2	4.7	33.7	33.7	8.7	37.7	37.7
Effective Green, g (s)	9.0	21.6	21.6	2.6	15.2	15.2	4.7	34.7	34.7	8.7	38.7	38.7
Actuated g/C Ratio	0.11	0.26	0.26	0.03	0.18	0.18	0.06	0.42	0.42	0.10	0.46	0.46
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	191	481	409	55	339	288	100	1469	657	184	1638	733
v/s Ratio Prot	c0.08	0.08		0.01	c0.08		0.03	0.17		c0.08	c0.21	
v/s Ratio Perm			0.02			0.01			0.01			0.07
v/c Ratio	0.78	0.31	0.06	0.38	0.45	0.08	0.58	0.42	0.02	0.74	0.46	0.15
Uniform Delay, d1	36.3	25.0	23.4	39.7	30.4	28.4	38.5	17.3	14.4	36.3	15.3	13.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.1	0.1	0.0	1.6	0.3	0.0	5.0	0.9	0.1	12.5	0.9	0.4
Delay (s)	53.4	25.1	23.4	41.3	30.8	28.4	43.5	18.2	14.5	48.9	16.3	13.4
Level of Service	D	C	C	D	C	C	D	B	B	D	B	B
Approach Delay (s)		35.3			30.6			20.2			19.6	
Approach LOS		D			C			C			B	

Intersection Summary				
HCM Average Control Delay	23.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	83.6	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	52.1%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

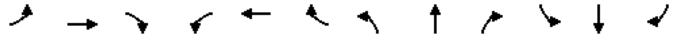
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	40	99	66	23	141	8	74	94	23	28	192	54
Peak Hour Factor	0.92	0.92	0.92	0.85	0.85	0.85	0.87	0.87	0.87	0.72	0.72	0.72
Hourly flow rate (vph)	43	108	72	27	166	9	85	108	26	39	267	75

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	223	202	220	381
Volume Left (vph)	43	27	85	39
Volume Right (vph)	72	9	26	75
Hadj (s)	-0.12	0.03	0.04	-0.06
Departure Headway (s)	6.0	6.1	6.0	5.6
Degree Utilization, x	0.37	0.35	0.36	0.59
Capacity (veh/h)	530	520	542	610
Control Delay (s)	12.4	12.3	12.3	16.2
Approach Delay (s)	12.4	12.3	12.3	16.2
Approach LOS	B	B	B	C

Intersection Summary				
Delay		13.8		
HCM Level of Service		B		
Intersection Capacity Utilization		51.4%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.86			1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1599			1863	1583	1770	3537		1770	3485	
Flt Permitted	0.75	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1402	1599			1863	1583	1770	3537		1770	3485	
Volume (vph)	16	5	83	0	4	52	55	939	3	108	1138	128
Peak-hour factor, PHF	0.81	0.81	0.81	0.50	0.50	0.50	0.77	0.77	0.77	0.98	0.98	0.98
Adj. Flow (vph)	20	6	102	0	8	104	71	1219	4	110	1161	131
RTOR Reduction (vph)	0	92	0	0	0	94	0	0	0	0	9	0
Lane Group Flow (vph)	20	16	0	0	8	10	71	1223	0	110	1283	0
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	5.5	5.5			5.5	5.5	3.7	36.0		5.0	37.3	
Effective Green, g (s)	5.5	5.5			5.5	5.5	3.7	36.0		5.0	37.3	
Actuated g/C Ratio	0.09	0.09			0.09	0.09	0.06	0.62		0.09	0.64	
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	132	150			175	149	112	2177		151	2222	
v/s Ratio Prot		0.01			0.00		0.04	0.35		c0.06	c0.37	
v/s Ratio Perm	c0.01					0.01						
v/c Ratio	0.15	0.10			0.05	0.07	0.63	0.56		0.73	0.58	
Uniform Delay, d1	24.4	24.2			24.1	24.2	26.7	6.6		26.1	6.1	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.3			0.1	0.2	11.2	0.3		16.1	0.4	
Delay (s)	24.9	24.6			24.2	24.3	37.9	6.9		42.1	6.4	
Level of Service	C	C			C	C	D	A		D	A	
Approach Delay (s)		24.6			24.3			8.6			9.2	
Approach LOS		C			C			A			A	

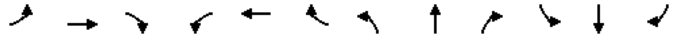
Intersection Summary				
HCM Average Control Delay	10.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	58.5	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	56.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frt	1.00	1.00			0.97			0.99				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1752	1845			1791			5005				
Flt Permitted	0.95	1.00			1.00			1.00				
Satd. Flow (perm)	1752	1845			1791			5005				
Volume (vph)	62	150	0	0	99	27	37	1201	131	0	0	0
Peak-hour factor, PHF	0.78	0.78	0.78	0.79	0.79	0.79	0.91	0.91	0.91	0.92	0.92	0.92
Adj. Flow (vph)	79	192	0	0	125	34	41	1320	144	0	0	0
RTOR Reduction (vph)	0	0	0	0	12	0	0	10	0	0	0	0
Lane Group Flow (vph)	79	192	0	0	147	0	0	1495	0	0	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Prot						Perm					
Protected Phases	7	4			8			2				
Permitted Phases							2					
Actuated Green, G (s)	4.9	21.3			12.7			36.4				
Effective Green, g (s)	4.6	21.5			12.9			36.6				
Actuated g/C Ratio	0.07	0.33			0.20			0.55				
Clearance Time (s)	3.7	4.2			4.2			4.2				
Vehicle Extension (s)	2.0	7.9			7.7			6.4				
Lane Grp Cap (vph)	122	600			350			2771				
v/s Ratio Prot	c0.05	0.10			c0.08							
v/s Ratio Perm								0.30				
v/c Ratio	0.65	0.32			0.42			0.54				
Uniform Delay, d1	30.0	16.8			23.3			9.4				
Progression Factor	1.00	1.00			1.00			1.00				
Incremental Delay, d2	8.5	1.3			3.3			0.8				
Delay (s)	38.5	18.1			26.6			10.1				
Level of Service	D	B			C			B				
Approach Delay (s)		24.0			26.6			10.1			0.0	
Approach LOS		C			C			B			A	

Intersection Summary				
HCM Average Control Delay	13.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	66.1	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	50.2%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0				
Lane Util. Factor					0.91			0.91				
Frt					0.95			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					4850			5037				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					4850			5037				
Volume (vph)	0	0	0	0	837	374	247	1040	0	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.86	0.86	0.86	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	890	398	287	1209	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	23	0	0	28	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1265	0	0	1468	0	0	0	0
Turn Type							Perm					
Protected Phases					8			2				
Permitted Phases							2					
Actuated Green, G (s)					22.6			30.5				
Effective Green, g (s)					23.2			31.1				
Actuated g/C Ratio					0.37			0.50				
Clearance Time (s)					4.6			4.6				
Vehicle Extension (s)					4.8			3.0				
Lane Grp Cap (vph)					1806			2514				
v/s Ratio Prot					c0.26							
v/s Ratio Perm								0.29				
v/c Ratio					0.70			0.58				
Uniform Delay, d1					16.6			11.0				
Progression Factor					1.00			1.00				
Incremental Delay, d2					1.5			1.0				
Delay (s)					18.1			12.0				
Level of Service					B			B				
Approach Delay (s)		0.0			18.1			12.0			0.0	
Approach LOS		A			B			B			A	

Intersection Summary				
HCM Average Control Delay	14.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	62.3	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	56.3%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.91						0.91				
Frt		1.00						0.97				
Flt Protected		0.98						1.00				
Satd. Flow (prot)		5002						4956				
Flt Permitted		0.98						1.00				
Satd. Flow (perm)		5002						4956				
Volume (vph)	666	1333	0	0	0	0	0	622	127	0	0	0
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92
Adj. Flow (vph)	732	1465	0	0	0	0	0	648	132	0	0	0
RTOR Reduction (vph)	0	64	0	0	0	0	0	9	0	0	0	0
Lane Group Flow (vph)	0	2133	0	0	0	0	0	771	0	0	0	0
Turn Type	Perm											
Protected Phases		2						8				
Permitted Phases	2											
Actuated Green, G (s)		23.2						16.9				
Effective Green, g (s)		24.6						18.0				
Actuated g/C Ratio		0.49						0.36				
Clearance Time (s)		5.4						5.1				
Vehicle Extension (s)		2.0						5.0				
Lane Grp Cap (vph)		2432						1763				
v/s Ratio Prot								c0.16				
v/s Ratio Perm		0.43										
v/c Ratio		0.88						0.44				
Uniform Delay, d1		11.6						12.4				
Progression Factor		1.00						1.00				
Incremental Delay, d2		4.9						0.4				
Delay (s)		16.5						12.8				
Level of Service		B						B				
Approach Delay (s)		16.5			0.0			12.8			0.0	
Approach LOS		B			A			B			A	

Intersection Summary			
HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	50.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	13	11	0	0	8	27	11	673	5	0	0	0
Peak Hour Factor	0.60	0.60	0.60	0.63	0.63	0.63	0.91	0.91	0.91	0.92	0.92	0.92
Hourly flow rate (vph)	22	18	0	0	13	43	12	740	5	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	40	56	382	375
Volume Left (vph)	22	0	12	0
Volume Right (vph)	0	43	0	5
Hadj (s)	0.14	-0.43	0.05	0.02
Departure Headway (s)	5.6	5.0	4.8	4.8
Degree Utilization, x	0.06	0.08	0.51	0.50
Capacity (veh/h)	604	671	739	743
Control Delay (s)	8.9	8.4	11.5	11.3
Approach Delay (s)	8.9	8.4	11.4	
Approach LOS	A	A	B	

Intersection Summary			
Delay	11.1		
HCM Level of Service	B		
Intersection Capacity Utilization	33.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				5085	3433	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				5085	3433	
Volume (vph)	0	0	0	727	484	0
Peak-hour factor, PHF	0.92	0.92	0.84	0.84	0.94	0.94
Adj. Flow (vph)	0	0	0	865	515	0
RTOR Reduction (vph)	0	0	0	0	119	0
Lane Group Flow (vph)	0	0	0	865	396	0
Turn Type						
Protected Phases				6	4	
Permitted Phases						
Actuated Green, G (s)				14.6	11.9	
Effective Green, g (s)				15.2	13.9	
Actuated g/C Ratio				0.41	0.37	
Clearance Time (s)				4.6	6.0	
Vehicle Extension (s)				5.0	6.0	
Lane Grp Cap (vph)				2083	1286	
v/s Ratio Prot				c0.17	c0.12	
v/s Ratio Perm						
v/c Ratio				0.42	0.31	
Uniform Delay, d1				7.8	8.2	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.3	0.4	
Delay (s)				8.1	8.6	
Level of Service				A	A	
Approach Delay (s)	0.0			8.1	8.6	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	8.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	37.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	34.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	420	134	211	801	495	329	755
v/c Ratio	0.48	0.27	0.60	0.48	0.51	0.73	0.29
Control Delay	32.8	6.1	46.6	27.3	11.9	51.7	14.1
Queue Delay	0.0	0.0	0.0	0.6	0.4	0.0	0.0
Total Delay	32.8	6.1	46.6	27.9	12.3	51.7	14.1
Queue Length 50th (ft)	118	0	70	271	100	104	91
Queue Length 95th (ft)	156	42	m99	346	225	141	128
Internal Link Dist (ft)	719			378			1660
Turn Bay Length (ft)		275	110			260	
Base Capacity (vph)	1037	569	446	1672	963	516	2629
Starvation Cap Reductn	0	0	0	461	150	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.24	0.47	0.66	0.61	0.64	0.29

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	119	531	241	144	202	201	2202	354	843
v/c Ratio	0.31	0.85	2.90	0.24	0.32	0.70	1.58	1.20	0.63
Control Delay	25.8	36.7	905.7	23.8	7.4	24.7	288.8	153.1	25.2
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	65.4	0.0	0.0
Total Delay	25.8	36.8	905.7	23.8	7.4	24.7	354.2	153.1	25.2
Queue Length 50th (ft)	51	221	~239	60	14	94	~928	~247	194
Queue Length 95th (ft)	84	290	#333	102	58	m61	m#457	#409	276
Internal Link Dist (ft)		2033		385			269		731
Turn Bay Length (ft)	145		155		25	125		170	
Base Capacity (vph)	381	623	83	600	623	374	1391	295	1335
Starvation Cap Reductn	0	0	0	0	0	0	117	0	0
Spillback Cap Reductn	0	1	0	0	0	0	0	0	23
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.85	2.90	0.24	0.32	0.54	1.73	1.20	0.64

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	161	563	300	635	852	197	622
v/c Ratio	0.52	0.67	1.54	0.67	0.44	0.50	0.32
Control Delay	50.0	32.0	298.9	18.1	23.4	39.1	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.0	32.0	298.9	18.1	23.4	39.1	12.6
Queue Length 50th (ft)	51	141	~270	92	136	63	130
Queue Length 95th (ft)	77	162	#436	146	200	98	191
Internal Link Dist (ft)		671			2243		378
Turn Bay Length (ft)			280			120	
Base Capacity (vph)	309	1310	195	1299	1955	397	1927
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.43	1.54	0.49	0.44	0.50	0.32

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	119	538	122	245	47	249	144	358	489
v/c Ratio	0.67	0.34	0.67	0.41	0.10	0.65	0.33	0.50	0.70
Control Delay	67.6	29.4	67.5	35.2	23.0	48.9	8.5	42.1	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.6	29.4	67.5	35.2	23.0	48.9	8.5	42.1	9.6
Queue Length 50th (ft)	81	97	83	134	14	158	0	117	0
Queue Length 95th (ft)	160	167	163	264	51	236	33	183	86
Internal Link Dist (ft)		179		406		179		341	
Turn Bay Length (ft)	185		150		40				110
Base Capacity (vph)	299	1598	299	596	492	477	502	948	767
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.34	0.41	0.41	0.10	0.52	0.29	0.38	0.64

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	600	59	126	263	158	204
v/c Ratio	0.53	0.06	0.61	0.18	0.62	0.51
Control Delay	14.0	3.1	53.0	3.5	49.4	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.0	3.1	53.0	3.5	49.4	10.2
Queue Length 50th (ft)	184	0	71	32	89	0
Queue Length 95th (ft)	370	19	137	71	143	42
Internal Link Dist (ft)	248			664	309	
Turn Bay Length (ft)			200			
Base Capacity (vph)	1139	991	359	1475	483	580
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.06	0.35	0.18	0.33	0.35

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	241	381	116	448	96	1111	88	453	1382	221
v/c Ratio	1.64	0.61	0.59	0.64	0.55	0.88	0.15	1.44	0.85	0.26
Control Delay	342.1	24.2	39.1	17.2	50.4	37.2	11.0	226.9	31.1	8.3
Queue Delay	378.1	0.0	0.0	219.3	0.0	0.6	0.0	287.2	126.7	1.4
Total Delay	720.2	24.2	39.1	236.5	50.4	37.9	11.0	514.1	157.8	9.6
Queue Length 50th (ft)	~200	139	54	103	53	307	14	~355	412	22
Queue Length 95th (ft)	#346	235	#127	209	92	362	42	m#248	m281	m16
Internal Link Dist (ft)		502		1058		2367			110	
Turn Bay Length (ft)	125		135		115		105	115		
Base Capacity (vph)	147	623	198	696	315	1258	594	315	1620	837
Starvation Cap Reductn	0	0	0	0	0	0	0	97	541	434
Spillback Cap Reductn	90	0	0	393	0	26	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	4.23	0.61	0.59	1.48	0.30	0.90	0.15	2.08	1.28	0.55

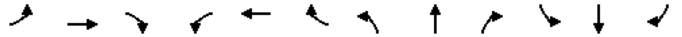
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	1094	1280	1571	279	1011
v/c Ratio	2.62	2.65	1.05	0.84	0.43
Control Delay	753.7	765.9	47.7	44.5	6.5
Queue Delay	0.0	0.0	25.9	0.0	0.5
Total Delay	753.7	765.9	73.5	44.5	6.9
Queue Length 50th (ft)	~1113	~1257	~500	145	87
Queue Length 95th (ft)	#1166	#1290	m#587	m180	m94
Internal Link Dist (ft)		366	110		269
Turn Bay Length (ft)	232			75	
Base Capacity (vph)	418	483	1498	387	2336
Starvation Cap Reductn	0	0	85	0	786
Spillback Cap Reductn	165	171	82	0	724
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	4.32	4.10	1.11	0.72	0.65

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	149	150	98	21	151	119	58	616	25	136	756	244
v/c Ratio	0.74	0.30	0.20	0.17	0.51	0.34	0.39	0.42	0.04	0.70	0.44	0.27
Control Delay	58.7	26.8	7.3	39.6	36.9	8.9	42.7	17.9	8.4	55.6	16.0	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.7	26.8	7.3	39.6	36.9	8.9	42.7	17.9	8.4	55.6	16.0	3.2
Queue Length 50th (ft)	72	54	0	10	70	0	27	108	2	65	132	0
Queue Length 95th (ft)	#175	121	38	31	124	41	58	146	14	#156	211	43
Internal Link Dist (ft)		1613			1967			1346			2243	
Turn Bay Length (ft)	95		95	90		90	155		90	200		200
Base Capacity (vph)	201	678	639	181	617	603	187	1471	669	200	1721	895
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.22	0.15	0.12	0.24	0.20	0.31	0.42	0.04	0.68	0.44	0.27

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	20	108	8	104	71	1223	110	1292
v/c Ratio	0.11	0.36	0.03	0.35	0.40	0.58	0.71	0.54
Control Delay	18.0	8.7	16.8	8.0	26.3	8.7	49.8	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.0	8.7	16.8	8.0	26.3	8.7	49.8	8.9
Queue Length 50th (ft)	5	1	2	0	18	110	29	125
Queue Length 95th (ft)	16	26	6	5	41	147	#98	#224
Internal Link Dist (ft)		2570	207			1470		2367
Turn Bay Length (ft)	100				210		290	
Base Capacity (vph)	370	497	491	494	176	2156	154	2395
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.22	0.02	0.21	0.40	0.57	0.71	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	79	192	159	1505
v/c Ratio	0.41	0.30	0.37	0.51
Control Delay	34.7	14.6	21.4	12.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.7	14.6	21.4	12.3
Queue Length 50th (ft)	30	49	48	150
Queue Length 95th (ft)	61	74	85	247
Internal Link Dist (ft)		608	737	568
Turn Bay Length (ft)				
Base Capacity (vph)	454	1001	617	2954
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.17	0.19	0.26	0.51

Intersection Summary

Lane Group	WBT	NBT
Lane Group Flow (vph)	1288	1496
v/c Ratio	0.70	0.59
Control Delay	18.4	12.2
Queue Delay	0.2	0.2
Total Delay	18.6	12.4
Queue Length 50th (ft)	142	137
Queue Length 95th (ft)	186	174
Internal Link Dist (ft)	265	310
Turn Bay Length (ft)		
Base Capacity (vph)	1962	2539
Starvation Cap Reductn	147	282
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.71	0.66

Intersection Summary

Lane Group	EBT	NBT
Lane Group Flow (vph)	2197	780
v/c Ratio	0.88	0.44
Control Delay	17.9	12.9
Queue Delay	0.0	0.0
Total Delay	17.9	12.9
Queue Length 50th (ft)	196	61
Queue Length 95th (ft)	#338	87
Internal Link Dist (ft)	4045	445
Turn Bay Length (ft)		
Base Capacity (vph)	2496	1960
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.88	0.40

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	NWL
Lane Group Flow (vph)	865	515
v/c Ratio	0.42	0.37
Control Delay	8.8	6.3
Queue Delay	0.0	0.0
Total Delay	8.8	6.3
Queue Length 50th (ft)	41	22
Queue Length 95th (ft)	72	54
Internal Link Dist (ft)	3590	124
Turn Bay Length (ft)		
Base Capacity (vph)	2979	1908
Starvation Cap Reductn	0	0
Spillback Cap Reductn	31	1
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.29	0.27

Intersection Summary

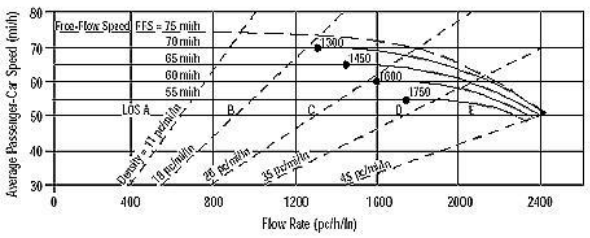
Kimley-Horn and Associates, Inc.

Visalia Walmart Roadway Network Capacity

Near-term 2015 Conditions
PM Peak

ROADWAY	FROM	TO	Length (Miles)	Area Type (U/T/R)	Functional Class	# of Lanes	Div/Undiv (D/U)	Left-turn Bays (Y/N)	POSTED SPEED	Sig/Mile	Code	Notes	Generalized Service Volumes							
													Code	A	B	C	D	E	Two-Way Vol	LOS
Mineral King Avenue	Ben Maddox Way	SR-198 WB Ramps (B	0.15	U	Arterial	4	U	N	40	3.50	U-NS2-4	adjusted volumes by -25%	U-NS2-4	0	0	2178	2898	3060	904	C
Mineral King Avenue	SR-198 WB Ramps (B	Lovers Lane	0.84	U	Arterial	2	U	Y	40	1.50	U-NS1-2		U-NS1-2	0	837	1350	1440	0	930	C
Noble Avenue	Ben Maddox Way	SR-198 EB Ramps	0.16	U	Arterial	3	U	Y	35	4.00	U-NS2-4	adjusted generalized service	U-NS2-4	0	0	1307	1739	1836	1,431	D
Noble Avenue	East Driveway	Pinkham Street	0.14	U	Arterial	2	U	Y	35	2.50	U-NS2-2		U-NS2-2	0	0	918	1332	1413	1,085	D
Noble Avenue	Pinkham Street	Lovers Lane	0.50	U	Arterial	2	U	Y	45	2.00	U-NS2-2		U-NS2-2	0	0	918	1332	1413	882	C
Ben Maddox Way	Noble Avenue	Tulare Avenue	0.44	U	Arterial	4	D	Y	40	2.00	U-NS2-4		U-NS2-4	0	0	2178	2898	3060	1,791	C
Pinkham Street	Noble Avenue	Tulare Avenue	0.44	U	Arterial	2	U	N	40	0	U-OS1-2	adjusted volumes by -20%	U-OS1-2	0	605	975	1040	0	341	B
Lovers Lane	Noble Avenue	Tulare Avenue	0.47	U	Arterial	4	D	Y	45	3.00	U-NS2-4		U-NS2-4	0	0	2178	2898	3060	2,534	D
Tulare Avenue	Ben Maddox Way	Pinkham Street	0.39	U	Arterial	2	U	Y	40	0.61	U-OS1-2		U-OS1-2	0	605	975	1040	0	505	B
Tulare Avenue	Pinkham Street	Lovers Lane	0.48	U	Arterial	2	U	N	40	0.82	U-OS1-2	adjusted volumes by -20%	U-OS1-2	0	605	975	1040	0	264	B

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	B/W Ben Maddox Way & Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2015
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	3151 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1829	pc/h/ln	Design LOS		
S	61.6	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	29.7	pc/mi/ln	S		mi/h
LOS	D		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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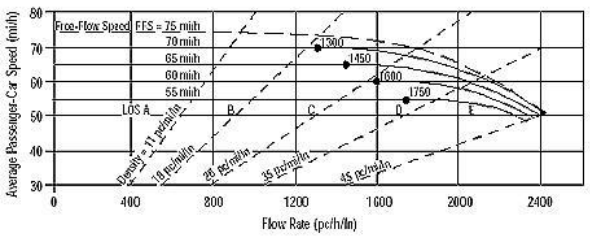
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	E/O Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2015
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	1665 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	0.56	I/mi	f_{ID}	0.3	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	65.2	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	971	pc/h/ln	Design LOS		
S	65.2	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	14.9	pc/mi/ln	S		mi/h
LOS	B		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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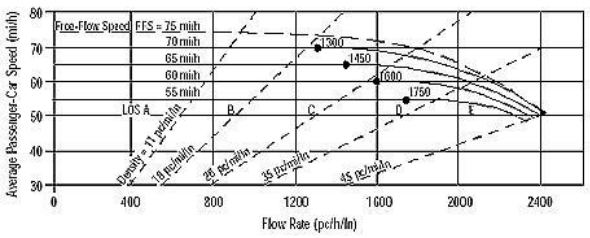
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	W/O S. Ben Maddox Way
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2015
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	3672 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	2132	pc/h/ln	Design LOS		
S	57.2	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	37.3	pc/mi/ln	S		mi/h
LOS	E		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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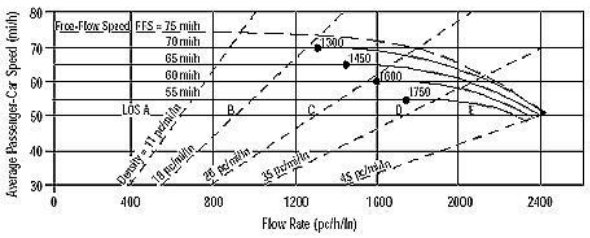
BASIC FREEWAY WORKSHEET Page 1 of 1

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	B/W Ben Maddox Way & Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2015
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2190 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1271	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	20.3	pc/mi/ln	S		mi/h
LOS	C		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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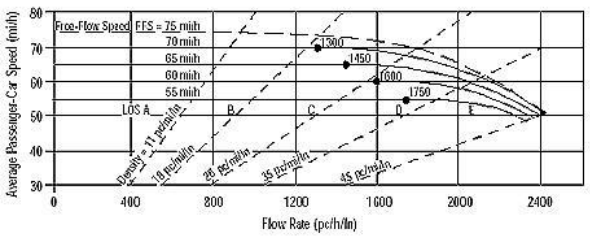
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	E/O Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2015

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	1490 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	0.56	I/mi	f_{ID}	0.3	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	65.2	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	869	pc/h/ln	Design LOS		
S	65.2	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	13.3	pc/mi/ln	S		mi/h
LOS	B		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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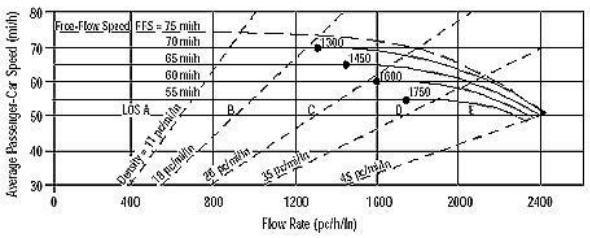
BASIC FREEWAY WORKSHEET Page 1 of 1

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	W/O S. Ben Maddox Way
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2015

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2759 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1602	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	25.6	pc/mi/ln	S		mi/h
LOS	C		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2015
Project Description			

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 2500 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = 731 veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	3592	0.90	Level	9	0	0.957	1.00	4171
Ramp	745	0.90	Level	4	0	0.980	1.00	844
UpStream	731	0.90	Level	2	0	0.990	1.00	820
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

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

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =1.000 using Equation 0

V_{12} = 4171 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$	4171	4800	No
V_{12}	4171	4400:All	No
$V_{FO} = V_F - V_R$	3327	4800	No
V_R	844	2000	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 38.6 (pc/ mi /ln)

LOS= E (Exhibit 25-4)

Speed Estimation

D_s = 0.504 (Exhibit 25-19)

S_R= 55.9 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 55.9 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2015
Project Description			

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 2600 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = 224 veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	3151	0.90	Level	9	0	0.957	1.00	3659
Ramp	1875	0.90	Level	4	0	0.980	1.00	2125
UpStream	224	0.90	Level	2	0	0.990	1.00	251
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

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

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =1.000 using Equation 0

V_{12} = 3659 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$	3659	4800	No
V_{12}	3659	4400:All	No
$V_{FO} = V_F - V_R$	1534	4800	No
V_R	2125	2000	Yes

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 33.0 (pc/ mi /ln)

LOS= F (Exhibit 25-4)

Speed Estimation

D_s = 0.619 (Exhibit 25-19)

S_R= 52.7 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 52.7 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / **Site Information**

Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2015

Project Description

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off
L_{up} = 3400 ft
Vu = 879 veh/h

Terrain Level
S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off
L_{down} = ft
VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	2190	0.90	Level	9	0	0.957	1.00	2543
Ramp	125	0.90	Level	4	0	0.980	1.00	142
UpStream	879	0.90	Level	2	0	0.990	1.00	986
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 25-2 or 25-3)
P_{FM}= using Equation
V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$
D_R = (pc/ mi /ln)
LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} =1.000 using Equation 0
V_{12} = 2543 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$	2543	4800	No
V_{12}	2543	4400:All	No
$V_{FO} = V_F - V_R$	2401	4800	No
V_R	142	2000	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$
D_R = 23.7 (pc/ mi /ln)
LOS= C (Exhibit 25-4)

Speed Estimation

D_s = 0.441 (Exhibit 25-19)
S_R= 57.7 mph (Exhibit 25-19)
S_0= N/A mph (Exhibit 25-19)
S = 57.7 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / **Site Information**

Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2015

Project Description

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☐ No ☐ Off
L_{up} = ft
Vu = veh/h

Terrain
S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☐ No ☐ Off
L_{down} = ft
VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	1490	0.90	Level	9	0	0.957	1.00	1730
Ramp	179	0.90	Level	4	0	0.980	1.00	203
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 25-2 or 25-3)
P_{FM}= using Equation
V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$
D_R = (pc/ mi /ln)
LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} =1.000 using Equation 0
V_{12} = 1730 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$	1730	4800	No
V_{12}	1730	4400:All	No
$V_{FO} = V_F - V_R$	1527	4800	No
V_R	203	2000	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$
D_R = 17.1 (pc/ mi /ln)
LOS= B (Exhibit 25-4)

Speed Estimation

D_s = 0.446 (Exhibit 25-19)
S_R= 57.5 mph (Exhibit 25-19)
S_0= N/A mph (Exhibit 25-19)
S = 57.5 mph (Exhibit 25-15)

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NEAR-TERM 2015 + PROJECT TRAFFIC CONDITIONS
(INTERSECTION, ROADWAY SEGMENT, AND FREEWAY & RAMP SEGMENTS)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor					0.95	1.00	0.97	0.91	0.91	0.97	0.91	
Frt					1.00	0.85	1.00	0.97	0.85	1.00	0.97	
Flt Protected					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)					3417	1553	3367	3218	1413	3367	4840	
Flt Permitted					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)					3417	1553	3367	3218	1413	3367	4840	
Volume (vph)	0	0	0	95	205	96	217	595	678	302	307	75
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.77	0.77	0.77	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	103	223	104	282	773	881	328	334	82
RTOR Reduction (vph)	0	0	0	0	0	81	0	19	319	0	36	0
Lane Group Flow (vph)	0	0	0	0	326	23	282	964	352	328	380	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type				Split		Perm	Prot		Perm	Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)					21.1	21.1	12.1	51.5	51.5	13.4	52.8	
Effective Green, g (s)					22.1	22.1	12.1	52.5	52.5	13.4	53.8	
Actuated g/C Ratio					0.22	0.22	0.12	0.52	0.52	0.13	0.54	
Clearance Time (s)					5.0	5.0	4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)					7.5	7.5	2.0	8.0	8.0	2.0	7.5	
Lane Grp Cap (vph)					755	343	407	1689	742	451	2604	
v/s Ratio Prot					c0.10		0.08	c0.30		c0.10	0.08	
v/s Ratio Perm						0.01			0.25			
v/c Ratio					0.43	0.07	0.69	0.57	0.47	0.73	0.15	
Uniform Delay, d1					33.5	30.8	42.2	16.1	15.0	41.5	11.6	
Progression Factor					1.00	1.00	0.91	1.44	5.98	1.00	1.00	
Incremental Delay, d2					1.5	0.3	3.2	1.1	1.7	4.9	0.1	
Delay (s)					35.1	31.1	41.4	24.3	91.6	46.5	11.7	
Level of Service					D	C	D	C	F	D	B	
Approach Delay (s)		0.0			34.1			50.1			27.0	
Approach LOS		A			C			D			C	

Intersection Summary			
HCM Average Control Delay	42.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	290	698	311	309	70	82
Peak Hour Factor	0.85	0.85	0.74	0.74	0.56	0.56
Hourly flow rate (vph)	341	821	420	418	125	146
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total (vph)	227	935	559	278	125	146
Volume Left (vph)	0	0	420	0	125	0
Volume Right (vph)	0	821	0	0	0	146
Hadj (s)	0.07	-0.55	0.44	0.07	0.57	-0.63
Departure Headway (s)	6.8	6.2	7.1	6.7	8.5	7.3
Degree Utilization, x	0.43	1.60	1.10	0.52	0.30	0.30
Capacity (veh/h)	519	590	522	530	414	480
Control Delay (s)	13.5	292.6	94.2	15.5	13.8	12.2
Approach Delay (s)	238.0		68.1		12.9	
Approach LOS	F		F		B	

Intersection Summary					
Delay	148.4				
HCM Level of Service	F				
Intersection Capacity Utilization	62.8%	ICU Level of Service		B	
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1736	1624		1736	1827	1553	1736	3471	1553	1736	3296	
Flt Permitted	0.60	1.00		0.48	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1090	1624		880	1827	1553	1736	3471	1553	1736	3296	
Volume (vph)	36	52	149	213	138	150	282	823	950	428	733	371
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.85	0.85	0.85	0.87	0.87	0.87
Adj. Flow (vph)	43	63	180	257	166	181	332	968	1118	492	843	426
RTOR Reduction (vph)	0	117	0	0	0	89	0	0	345	0	69	0
Lane Group Flow (vph)	43	126	0	257	166	92	332	968	773	492	1200	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm			Perm		Perm	Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8			2			
Actuated Green, G (s)	25.6	25.6		27.1	27.1	27.1	18.6	32.0	32.0	16.4	29.8	
Effective Green, g (s)	27.6	27.6		27.6	27.6	27.6	18.6	34.0	34.0	16.4	31.8	
Actuated g/C Ratio	0.31	0.31		0.31	0.31	0.31	0.21	0.38	0.38	0.18	0.35	
Clearance Time (s)	6.0	6.0		4.5	4.5	4.5	4.0	6.0	6.0	4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	334	498		270	560	476	359	1311	587	316	1165	
v/s Ratio Prot		0.08			0.09		0.19	0.28		c0.28	0.36	
v/s Ratio Perm	0.04			c0.29		0.06			c0.50			
v/c Ratio	0.13	0.25		0.95	0.30	0.19	0.92	0.74	1.32	1.56	1.03	
Uniform Delay, d1	22.5	23.4		30.5	23.8	23.0	35.0	24.2	28.0	36.8	29.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.86	1.31	1.68	1.00	1.00	
Incremental Delay, d2	0.2	0.3		41.6	0.3	0.2	4.3	0.3	143.9	265.7	34.5	
Delay (s)	22.7	23.7		72.1	24.1	23.2	34.5	32.1	190.9	302.5	63.6	
Level of Service	C	C		E	C	C	C	C	F	F	E	
Approach Delay (s)		23.6			44.2			105.8			130.3	
Approach LOS		C			D			F			F	

Intersection Summary			
HCM Average Control Delay	102.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	104.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	324	1106	201	405	96	11
Peak Hour Factor	0.92	0.92	0.87	0.87	0.70	0.70
Hourly flow rate (vph)	352	1202	231	466	137	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type					None	
Median storage veh)						
Upstream signal (ft)	465					
pX, platoon unblocked						
vC, conflicting volume			1554		1881	953
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1554		1881	953
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			45		0	95
cM capacity (veh/h)			420		35	311

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1554	697	153
Volume Left	0	231	137
Volume Right	1202	0	16
cSH	1700	420	38
Volume to Capacity	0.91	0.55	4.00
Queue Length 95th (ft)	0	81	Err
Control Delay (s)	0.0	19.7	Err
Lane LOS		C	F
Approach Delay (s)	0.0	19.7	Err
Approach LOS			F

Intersection Summary			
Average Delay	641.6		
Intersection Capacity Utilization	132.9%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0		4.0		4.0		4.0	4.0	
Lane Util. Factor	0.97	0.95		1.00		0.88		0.91		0.97	0.95	
Frt	1.00	0.96		1.00		0.85		0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)	3367	3347		1736		2733		4917		3367	3471	
Flt Permitted	0.95	1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)	3367	3347		1736		2733		4917		3367	3471	
Volume (vph)	136	166	52	135	0	476	0	879	92	121	281	0
Peak-hour factor, PHF	0.85	0.85	0.85	0.78	0.78	0.78	0.74	0.74	0.74	0.90	0.90	0.90
Adj. Flow (vph)	160	195	61	173	0	610	0	1188	124	134	312	0
RTOR Reduction (vph)	0	39	0	0	0	245	0	10	0	0	0	0
Lane Group Flow (vph)	160	217	0	173	0	365	0	1302	0	134	312	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot		custom				Prot		
Protected Phases	7	4		3		8		2		1	6	
Permitted Phases												
Actuated Green, G (s)	9.0	16.4		11.0		18.4		46.0		8.6	58.6	
Effective Green, g (s)	9.0	17.4		11.0		19.4		47.0		8.6	59.6	
Actuated g/C Ratio	0.09	0.17		0.11		0.19		0.47		0.09	0.60	
Clearance Time (s)	4.0	5.0		4.0		5.0		5.0		4.0	5.0	
Vehicle Extension (s)	6.5	6.5		2.0		4.5		5.5		2.0	6.0	
Lane Grp Cap (vph)	303	582		191		530		2311		290	2069	
v/s Ratio Prot	0.05	0.06		c0.10		c0.13		c0.26		c0.04	0.09	
v/s Ratio Perm												
v/c Ratio	0.53	0.37		0.91		0.69		0.56		0.46	0.15	
Uniform Delay, d1	43.5	36.5		44.0		37.5		19.1		43.5	9.0	
Progression Factor	1.00	1.00		1.00		1.00		1.00		0.89	0.86	
Incremental Delay, d2	4.6	1.3		38.8		4.3		1.0		0.4	0.2	
Delay (s)	48.1	37.8		82.8		41.8		20.1		39.2	7.9	
Level of Service	D	D		F		D		C		D	A	
Approach Delay (s)		41.7			50.9			20.1			17.3	
Approach LOS		D			D			C			B	

Intersection Summary				
HCM Average Control Delay	30.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	51.5%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	1.00	1.00		1.00	1.00		0.95	1.00
Frt	1.00	0.98		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1644	4903		1644	1827	1471		1774	1471		3352	1471
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (perm)	1644	4903		1644	1827	1471		1774	1471		3352	1471
Volume (vph)	78	272	34	64	255	17	22	15	28	151	61	349
Peak-hour factor, PHF	0.86	0.86	0.86	0.84	0.84	0.84	0.93	0.93	0.93	0.76	0.76	0.76
Adj. Flow (vph)	91	316	40	76	304	20	24	16	30	199	80	459
RTOR Reduction (vph)	0	9	0	0	0	4	0	0	27	0	0	355
Lane Group Flow (vph)	91	347	0	76	304	16	0	40	3	0	279	104
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6			3			4
Actuated Green, G (s)	7.6	34.8		7.0	34.2	34.2		6.2	6.2		18.3	18.3
Effective Green, g (s)	7.3	36.1		6.7	35.5	35.5		7.4	7.4		19.5	19.5
Actuated g/C Ratio	0.09	0.42		0.08	0.41	0.41		0.09	0.09		0.23	0.23
Clearance Time (s)	3.7	5.3		3.7	5.3	5.3		5.2	5.2		5.2	5.2
Vehicle Extension (s)	2.0	5.1		2.0	4.8	4.8		6.3	6.3		7.9	7.9
Lane Grp Cap (vph)	140	2065		129	757	609		153	127		763	335
v/s Ratio Prot	c0.06	0.07		0.05	c0.17			c0.02			c0.08	
v/s Ratio Perm						0.01			0.00			0.07
v/c Ratio	0.65	0.17		0.59	0.40	0.03		0.26	0.02		0.37	0.31
Uniform Delay, d1	38.0	15.4		38.2	17.6	14.9		36.6	35.8		27.9	27.5
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	8.0	0.2		4.4	0.7	0.0		2.8	0.2		1.3	2.2
Delay (s)	45.9	15.6		42.5	18.3	14.9		39.4	36.0		29.1	29.8
Level of Service	D	B		D	B	B		D	D		C	C
Approach Delay (s)		21.8			22.8			37.9			29.5	
Approach LOS		C			C			D			C	

Intersection Summary				
HCM Average Control Delay	26.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.40			
Actuated Cycle Length (s)	85.7	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	52.9%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	267	201	0	390	25	0	0	31	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.84	0.84	0.84	0.79	0.79	0.79	0.92	0.92	0.92
Hourly flow rate (vph)	11	281	212	0	464	30	0	0	39	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		799			328							
pX, platoon unblocked	0.96						0.96	0.96		0.96	0.96	0.96
vC, conflicting volume	494			493			887	902	246	680	993	479
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	475			493			883	898	246	668	993	459
tC, single (s)	4.2			4.2			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	95	100	100	100
cM capacity (veh/h)	1030			1053			230	264	754	315	236	534

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	NB 1
Volume Total	11	187	305	494	39
Volume Left	11	0	0	0	0
Volume Right	0	0	212	30	39
cSH	1030	1700	1700	1700	754
Volume to Capacity	0.01	0.11	0.18	0.29	0.05
Queue Length 95th (ft)	1	0	0	0	4
Control Delay (s)	8.5	0.0	0.0	0.0	10.0
Lane LOS	A				B
Approach Delay (s)	0.2			0.0	10.0
Approach LOS					B

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	25.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1553	1736	1827	1719	1538
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1827	1553	1736	1827	1719	1538
Volume (vph)	265	33	111	222	193	51
Peak-hour factor, PHF	0.86	0.86	0.81	0.81	0.78	0.78
Adj. Flow (vph)	308	38	137	274	247	65
RTOR Reduction (vph)	0	16	0	0	0	53
Lane Group Flow (vph)	308	22	137	274	247	12
Heavy Vehicles (%)	4%	4%	4%	4%	5%	5%
Turn Type		Perm	Prot			Prot
Protected Phases	2		1	6	4	4
Permitted Phases		2				
Actuated Green, G (s)	55.7	55.7	12.1	71.8	18.8	18.8
Effective Green, g (s)	57.7	57.7	12.1	73.8	18.8	18.8
Actuated g/C Ratio	0.57	0.57	0.12	0.73	0.19	0.19
Clearance Time (s)	6.0	6.0	4.0	6.0	4.0	4.0
Vehicle Extension (s)	8.0	8.0	2.0	8.0	2.4	2.4
Lane Grp Cap (vph)	1048	891	209	1340	321	287
v/s Ratio Prot	c0.17		c0.08	0.15	c0.14	0.01
v/s Ratio Perm		0.01				
v/c Ratio	0.29	0.02	0.66	0.20	0.77	0.04
Uniform Delay, d1	11.0	9.3	42.3	4.2	38.8	33.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.1	5.5	0.3	10.0	0.0
Delay (s)	11.7	9.3	47.8	4.5	48.9	33.6
Level of Service	B	A	D	A	D	C
Approach Delay (s)	11.5			19.0	45.7	
Approach LOS	B			B	D	

Intersection Summary			
HCM Average Control Delay	24.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	100.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	40.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	184	106	24	235	88	79
Peak Hour Factor	0.95	0.95	0.83	0.83	0.88	0.88
Hourly flow rate (vph)	194	112	29	283	100	90
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	744					
pX, platoon unblocked			0.96		0.96	0.96
vC, conflicting volume			305		590	249
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			279		575	221
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		78	89
cM capacity (veh/h)			1226		450	786

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	305	312	190
Volume Left	0	29	100
Volume Right	112	0	90
cSH	1700	1226	564
Volume to Capacity	0.18	0.02	0.34
Queue Length 95th (ft)	0	2	37
Control Delay (s)	0.0	0.9	14.6
Lane LOS		A	B
Approach Delay (s)	0.0	0.9	14.6
Approach LOS			B

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.92		1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	1672		1736	1591		1736	3471	1553	1736	3471	1553
Flt Permitted	0.13	1.00		0.62	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	244	1672		1134	1591		1736	3471	1553	1736	3471	1553
Volume (vph)	132	50	64	52	71	441	61	1052	36	261	802	172
Peak-hour factor, PHF	0.73	0.73	0.73	0.83	0.83	0.83	0.84	0.84	0.84	0.93	0.93	0.93
Adj. Flow (vph)	181	68	88	63	86	531	73	1252	43	281	862	185
RTOR Reduction (vph)	0	52	0	0	247	0	0	0	13	0	0	100
Lane Group Flow (vph)	181	104	0	63	370	0	73	1252	30	281	862	85
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	28.0	28.0		28.0	28.0		6.7	30.5	30.5	15.5	39.3	39.3
Effective Green, g (s)	30.0	30.0		30.0	30.0		6.7	32.5	32.5	15.5	41.3	41.3
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.07	0.36	0.36	0.17	0.46	0.46
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	5.8	5.8		5.8	5.8		1.5	5.8	5.8	1.5	5.8	5.8
Lane Grp Cap (vph)	81	557		378	530		129	1253	561	299	1593	713
v/s Ratio Prot		0.06			0.23		0.04	c0.36		c0.16	0.25	
v/s Ratio Perm	c0.74			0.06					0.02			0.05
v/c Ratio	2.23	0.19		0.17	0.70		0.57	1.00	0.05	0.94	0.54	0.12
Uniform Delay, d1	30.0	21.3		21.2	26.1		40.2	28.7	18.7	36.8	17.5	13.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.10	0.78	0.50
Incremental Delay, d2	593.2	0.4		0.6	5.8		3.4	25.2	0.2	29.7	1.0	0.3
Delay (s)	623.2	21.8		21.7	31.8		43.6	54.0	18.9	70.2	14.6	7.3
Level of Service	F	C		C	C		D	D	B	E	B	A
Approach Delay (s)		344.8			30.9			52.3			25.3	
Approach LOS		F			C			D			C	

Intersection Summary			
HCM Average Control Delay	65.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.46		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	96.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Visalia Walmart Expansion
11: SR-198 EB Ramps @ Lovers Lane & Lovers Lane

Near-term 2015 Plus Project
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0						4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95						0.95		1.00	0.95	
Frt	1.00	0.89						1.00		1.00	1.00	
Flt Protected	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (prot)	1649	1518						3460		1736	3471	
Flt Permitted	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (perm)	1649	1518						3460		1736	3471	
Volume (vph)	466	0	322	0	0	0	0	1590	35	182	913	0
Peak-hour factor, PHF	0.77	0.77	0.77	0.92	0.92	0.92	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	605	0	418	0	0	0	0	1807	40	207	1038	0
RTOR Reduction (vph)	0	103	0	0	0	0	0	2	0	0	0	0
Lane Group Flow (vph)	477	443	0	0	0	0	0	1845	0	207	1038	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	22.0	22.0						41.0		13.9	58.6	
Effective Green, g (s)	22.6	22.6						41.8		13.6	59.4	
Actuated g/C Ratio	0.25	0.25						0.46		0.15	0.66	
Clearance Time (s)	4.6	4.6						4.8		3.7	4.8	
Vehicle Extension (s)	5.0	5.0						7.4		2.0	6.2	
Lane Grp Cap (vph)	414	381						1607		262	2291	
v/s Ratio Prot	0.29	c0.29						c0.53		c0.12	0.30	
v/s Ratio Perm												
v/c Ratio	1.15	1.16						1.15		0.79	0.45	
Uniform Delay, d1	33.7	33.7						24.1		36.8	7.4	
Progression Factor	1.00	1.00						0.48		1.40	0.46	
Incremental Delay, d2	92.8	98.8						67.5		5.7	0.2	
Delay (s)	126.5	132.5						79.2		57.2	3.7	
Level of Service	F	F						E		E	A	
Approach Delay (s)		129.7			0.0			79.2			12.6	
Approach LOS		F			A			E			B	

Intersection Summary				
HCM Average Control Delay	71.6	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.09			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	87.9%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Visalia Walmart Expansion
12: Tulare Ave & Ben Maddox Way

Near-term 2015 Plus Project
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	1845	1568	1752	1845	1568	1736	3471	1553	1736	3471	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1752	1845	1568	1752	1845	1568	1736	3471	1553	1736	3471	1553
Volume (vph)	113	172	37	13	223	199	55	618	19	99	284	107
Peak-hour factor, PHF	0.73	0.73	0.73	0.83	0.83	0.83	0.78	0.78	0.78	0.92	0.92	0.92
Adj. Flow (vph)	155	236	51	16	269	240	71	792	24	108	309	116
RTOR Reduction (vph)	0	0	34	0	0	167	0	0	9	0	0	70
Lane Group Flow (vph)	155	236	17	16	269	73	71	792	15	108	309	46
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	9.1	27.9	27.9	1.2	20.0	20.0	6.1	32.5	32.5	6.7	33.1	33.1
Effective Green, g (s)	9.1	28.9	28.9	1.2	21.0	21.0	6.1	33.5	33.5	6.7	34.1	34.1
Actuated g/C Ratio	0.11	0.33	0.33	0.01	0.24	0.24	0.07	0.39	0.39	0.08	0.40	0.40
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	185	618	525	24	449	382	123	1347	603	135	1372	614
v/s Ratio Prot	c0.09	0.13		0.01	c0.15		0.04	c0.23		c0.06	0.09	
v/s Ratio Perm			0.01			0.05			0.01			0.03
v/c Ratio	0.84	0.38	0.03	0.67	0.60	0.19	0.58	0.59	0.03	0.80	0.23	0.07
Uniform Delay, d1	37.9	21.9	19.3	42.4	28.9	25.9	38.9	20.9	16.3	39.1	17.3	16.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	25.8	0.1	0.0	42.9	1.4	0.1	4.0	1.9	0.1	26.4	0.4	0.2
Delay (s)	63.7	22.0	19.3	85.3	30.4	26.0	42.9	22.8	16.4	65.5	17.7	16.5
Level of Service	E	C	B	F	C	C	D	C	B	E	B	B
Approach Delay (s)		36.3			30.0			24.2			27.1	
Approach LOS		D			C			C			C	

Intersection Summary				
HCM Average Control Delay	28.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	86.3	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	53.9%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	44	165	34	33	213	52	153	107	34	55	61	45
Peak Hour Factor	0.67	0.67	0.67	0.78	0.78	0.78	0.77	0.77	0.77	0.86	0.86	0.86
Hourly flow rate (vph)	66	246	51	42	273	67	199	139	44	64	71	52

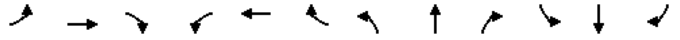
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	363	382	382	187
Volume Left (vph)	66	42	199	64
Volume Right (vph)	51	67	44	52
Hadj (s)	0.00	-0.03	0.09	-0.05
Departure Headway (s)	7.2	7.1	7.3	7.9
Degree Utilization, x	0.73	0.76	0.77	0.41
Capacity (veh/h)	464	476	466	370
Control Delay (s)	27.0	28.9	30.9	16.2
Approach Delay (s)	27.0	28.9	30.9	16.2
Approach LOS	D	D	D	C

Intersection Summary				
Delay		27.1		
HCM Level of Service		D		
Intersection Capacity Utilization		50.4%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.85			1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1570			1845	1568	1736	3463		1736	3399	
Flt Permitted	0.75	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1385	1570			1845	1568	1736	3463		1736	3399	
Volume (vph)	10	1	84	0	6	101	47	970	15	46	693	111
Peak-hour factor, PHF	0.68	0.68	0.68	0.60	0.60	0.60	0.87	0.87	0.87	0.84	0.84	0.84
Adj. Flow (vph)	15	1	124	0	10	168	54	1115	17	55	825	132
RTOR Reduction (vph)	0	106	0	0	0	143	0	1	0	0	17	0
Lane Group Flow (vph)	15	19	0	0	10	25	54	1131	0	55	940	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	7.5	7.5			7.5	7.5	1.9	29.9		1.9	29.9	
Effective Green, g (s)	7.5	7.5			7.5	7.5	1.9	29.9		1.9	29.9	
Actuated g/C Ratio	0.15	0.15			0.15	0.15	0.04	0.58		0.04	0.58	
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	202	230			270	229	64	2018		64	1981	
v/s Ratio Prot		0.01			0.01		0.03	c0.33		c0.03	0.28	
v/s Ratio Perm	0.01					c0.02						
v/c Ratio	0.07	0.08			0.04	0.11	0.84	0.56		0.86	0.47	
Uniform Delay, d1	18.9	18.9			18.8	19.0	24.6	6.6		24.6	6.2	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2			0.1	0.2	60.7	0.4		64.6	0.2	
Delay (s)	19.1	19.1			18.9	19.2	85.2	7.0		89.2	6.4	
Level of Service	B	B			B	B	F	A		F	A	
Approach Delay (s)		19.1			19.2			10.5			10.9	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM Average Control Delay	11.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	51.3	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	47.8%	ICU Level of Service	A	
Analysis Period (min)	15			

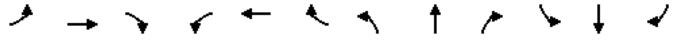
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frt	1.00	1.00			0.98			0.98				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1736	1827			1790			4936				
Flt Permitted	0.95	1.00			1.00			1.00				
Satd. Flow (perm)	1736	1827			1790			4936				
Volume (vph)	31	146	0	0	46	8	70	1244	173	0	0	0
Peak-hour factor, PHF	0.83	0.83	0.83	0.68	0.68	0.68	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	37	176	0	0	68	12	80	1414	197	0	0	0
RTOR Reduction (vph)	0	0	0	0	8	0	0	12	0	0	0	0
Lane Group Flow (vph)	37	176	0	0	72	0	0	1679	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	Prot						Perm					
Protected Phases	7	4			8			2				
Permitted Phases							2					
Actuated Green, G (s)	2.9	20.8			14.2			36.5				
Effective Green, g (s)	2.6	21.0			14.4			36.7				
Actuated g/C Ratio	0.04	0.32			0.22			0.56				
Clearance Time (s)	3.7	4.2			4.2			4.2				
Vehicle Extension (s)	2.0	7.9			7.7			6.4				
Lane Grp Cap (vph)	69	584			392			2757				
v/s Ratio Prot	c0.02	c0.10			0.04							
v/s Ratio Perm								0.34				
v/c Ratio	0.54	0.30			0.18			0.61				
Uniform Delay, d1	31.0	16.8			20.9			9.7				
Progression Factor	1.00	1.00			1.00			1.00				
Incremental Delay, d2	4.0	1.2			0.9			1.0				
Delay (s)	34.9	18.1			21.8			10.7				
Level of Service	C	B			C			B				
Approach Delay (s)		21.0			21.8			10.7			0.0	
Approach LOS		C			C			B			A	

Intersection Summary				
HCM Average Control Delay	12.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	65.7	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	44.4%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0				
Lane Util. Factor					0.91			0.91				
Frt					0.94			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					4682			4979				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					4682			4979				
Volume (vph)	0	0	0	0	822	566	309	1031	0	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.82	0.82	0.82	0.87	0.87	0.87	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	1002	690	355	1185	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	23	0	0	19	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1669	0	0	1521	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type							Perm					
Protected Phases					8			2				
Permitted Phases							2					
Actuated Green, G (s)					25.4			30.4				
Effective Green, g (s)					26.0			31.0				
Actuated g/C Ratio					0.40			0.48				
Clearance Time (s)					4.6			4.6				
Vehicle Extension (s)					4.8			3.0				
Lane Grp Cap (vph)					1873			2375				
v/s Ratio Prot					c0.36							
v/s Ratio Perm								0.31				
v/c Ratio					1.05dr			0.64				
Uniform Delay, d1					18.2			12.8				
Progression Factor					1.00			1.00				
Incremental Delay, d2					6.2			1.3				
Delay (s)					24.3			14.1				
Level of Service					C			B				
Approach Delay (s)		0.0			24.3			14.1			0.0	
Approach LOS		A			C			B			A	

Intersection Summary				
HCM Average Control Delay	19.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	61.4%	ICU Level of Service	B	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.91						0.91				
Frt		1.00						0.98				
Flt Protected		0.98						1.00				
Satd. Flow (prot)		4888						4947				
Flt Permitted		0.98						1.00				
Satd. Flow (perm)		4888						4947				
Volume (vph)	625	912	0	0	0	0	0	715	95	0	0	0
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.82	0.82	0.82	0.92	0.92	0.92
Adj. Flow (vph)	672	981	0	0	0	0	0	872	116	0	0	0
RTOR Reduction (vph)	0	30	0	0	0	0	0	32	0	0	0	0
Lane Group Flow (vph)	0	1623	0	0	0	0	0	956	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	Perm											
Protected Phases		2						8				
Permitted Phases	2											
Actuated Green, G (s)		23.1						18.5				
Effective Green, g (s)		24.5						19.6				
Actuated g/C Ratio		0.47						0.38				
Clearance Time (s)		5.4						5.1				
Vehicle Extension (s)		2.0						5.0				
Lane Grp Cap (vph)		2299						1861				
v/s Ratio Prot								c0.19				
v/s Ratio Perm		0.33										
v/c Ratio		0.71						0.51				
Uniform Delay, d1		10.9						12.6				
Progression Factor		1.00						1.00				
Incremental Delay, d2		1.9						0.5				
Delay (s)		12.8						13.0				
Level of Service		B						B				
Approach Delay (s)		12.8			0.0			13.0			0.0	
Approach LOS		B			A			B			A	

Intersection Summary				
HCM Average Control Delay	12.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	52.1	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	57.2%	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)	20	25	0	0	35	41	3	747	6	0	0	0
Peak Hour Factor	0.60	0.60	0.60	0.83	0.83	0.83	0.78	0.78	0.78	0.92	0.92	0.92
Hourly flow rate (vph)	33	42	0	0	42	49	4	958	8	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	75	92	483	487
Volume Left (vph)	33	0	4	0
Volume Right (vph)	0	49	0	8
Hadj (s)	0.12	-0.29	0.05	0.04
Departure Headway (s)	5.9	5.5	5.0	5.0
Degree Utilization, x	0.12	0.14	0.68	0.68
Capacity (veh/h)	580	622	708	710
Control Delay (s)	9.7	9.3	16.7	16.8
Approach Delay (s)	9.7	9.3	16.8	
Approach LOS	A	A	C	

Intersection Summary				
Delay	15.7			
HCM Level of Service	C			
Intersection Capacity Utilization	36.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				4988	3433	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				4988	3433	
Volume (vph)	0	0	0	708	681	0
Peak-hour factor, PHF	0.92	0.92	0.74	0.74	0.70	0.70
Adj. Flow (vph)	0	0	0	957	973	0
RTOR Reduction (vph)	0	0	0	0	79	0
Lane Group Flow (vph)	0	0	0	957	894	0
Heavy Vehicles (%)	4%	4%	4%	4%	2%	2%
Turn Type						
Protected Phases				6	4	
Permitted Phases						
Actuated Green, G (s)				16.0	18.9	
Effective Green, g (s)				16.6	20.9	
Actuated g/C Ratio				0.36	0.46	
Clearance Time (s)				4.6	6.0	
Vehicle Extension (s)				5.0	6.0	
Lane Grp Cap (vph)				1820	1577	
v/s Ratio Prot				c0.19	c0.26	
v/s Ratio Perm						
v/c Ratio				0.53	0.57	
Uniform Delay, d1				11.4	9.0	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.5	1.0	
Delay (s)				11.9	10.0	
Level of Service				B	A	
Approach Delay (s)	0.0			11.9	10.0	
Approach LOS	A			B	A	

Intersection Summary			
HCM Average Control Delay	10.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	45.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	39.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

1: Mineral King Ave & Ben Maddox Way

Lane Group	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	326	104	282	983	671	328	416
v/c Ratio	0.43	0.25	0.69	0.58	0.63	0.73	0.16
Control Delay	34.5	7.1	45.4	25.8	12.3	51.2	10.6
Queue Delay	0.0	0.0	0.0	0.6	0.5	0.0	0.0
Total Delay	34.5	7.1	45.4	26.4	12.8	51.2	10.6
Queue Length 50th (ft)	94	0	94	242	109	104	37
Queue Length 95th (ft)	123	38	111	359	221	148	65
Internal Link Dist (ft)	719			378			1660
Turn Bay Length (ft)		275	110			260	
Base Capacity (vph)	1025	539	451	1709	1060	513	2640
Starvation Cap Reductn	0	0	0	354	107	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.19	0.63	0.73	0.70	0.64	0.16

Intersection Summary

3: Mineral King Ave & Lovers Lane

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	43	243	257	166	181	332	968	1118	492	1269
v/c Ratio	0.13	0.40	0.93	0.30	0.32	0.92	0.74	1.20	1.56	1.03
Control Delay	22.8	9.9	71.3	24.9	9.4	37.2	32.6	112.9	295.0	62.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	12.0	29.5	0.0	0.0
Total Delay	22.8	9.9	71.3	24.9	9.4	37.2	44.6	142.4	295.0	62.1
Queue Length 50th (ft)	17	30	138	70	21	193	233	~526	~415	~408
Queue Length 95th (ft)	38	72	#248	110	57	m163	m226	m#417	#579	#510
Internal Link Dist (ft)		2033		385			269			731
Turn Bay Length (ft)	145		155		25	125			170	
Base Capacity (vph)	355	638	290	589	588	366	1311	931	316	1232
Starvation Cap Reductn	0	0	0	0	0	0	331	49	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.38	0.89	0.28	0.31	0.91	0.99	1.27	1.56	1.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	160	256	173	610	1312	134	312
v/c Ratio	0.53	0.41	0.91	0.79	0.57	0.46	0.15
Control Delay	50.3	30.8	90.1	26.2	21.2	43.5	8.6
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	50.3	30.8	90.1	26.3	21.2	43.5	8.6
Queue Length 50th (ft)	51	63	111	107	208	43	50
Queue Length 95th (ft)	79	85	#187	118	234	73	87
Internal Link Dist (ft)		671			2243		378
Turn Bay Length (ft)			280			120	
Base Capacity (vph)	303	1268	191	1251	2320	290	2069
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	90	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.20	0.91	0.53	0.57	0.46	0.15

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	91	356	76	304	20	40	30	279	459
v/c Ratio	0.52	0.17	0.47	0.39	0.03	0.17	0.13	0.35	0.66
Control Delay	50.1	17.9	49.6	23.7	18.5	39.1	15.5	30.0	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.1	17.9	49.6	23.7	18.5	39.1	15.5	30.0	8.2
Queue Length 50th (ft)	50	45	42	127	5	20	0	71	0
Queue Length 95th (ft)	102	81	87	233	22	56	27	97	24
Internal Link Dist (ft)		179		406		179		341	
Turn Bay Length (ft)	185		150		40				110
Base Capacity (vph)	364	2151	361	793	642	516	449	1180	815
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.17	0.21	0.38	0.03	0.08	0.07	0.24	0.56

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	308	38	137	274	247	65
v/c Ratio	0.29	0.04	0.66	0.20	0.77	0.19
Control Delay	14.1	4.8	58.4	5.4	55.5	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.1	4.8	58.4	5.4	55.5	10.1
Queue Length 50th (ft)	96	0	85	47	151	0
Queue Length 95th (ft)	193	17	142	91	211	25
Internal Link Dist (ft)	248			664	309	
Turn Bay Length (ft)			200			
Base Capacity (vph)	1046	905	335	1376	463	462
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.04	0.41	0.20	0.53	0.14

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	181	156	63	617	73	1252	43	281	862	185
v/c Ratio	2.23	0.26	0.17	0.79	0.48	1.00	0.07	0.94	0.53	0.22
Control Delay	614.1	12.5	22.8	19.4	49.0	55.7	12.4	73.7	15.1	1.9
Queue Delay	107.6	0.0	0.0	449.4	0.0	5.6	0.0	129.6	1.4	0.7
Total Delay	721.8	12.5	22.8	468.8	49.0	61.3	12.4	203.3	16.5	2.6
Queue Length 50th (ft)	~168	31	25	126	41	~381	8	160	147	0
Queue Length 95th (ft)	#231	53	51	217	75	#467	27	m#246	m213	m5
Internal Link Dist (ft)		502		1058		2367			110	
Turn Bay Length (ft)	125		135		115		105	115		
Base Capacity (vph)	81	609	378	777	309	1252	574	309	1624	825
Starvation Cap Reductn	0	0	0	0	0	0	0	92	530	391
Spillback Cap Reductn	56	0	0	468	0	25	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	7.24	0.26	0.17	2.00	0.24	1.02	0.07	1.29	0.79	0.43

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

11: SR-198 EB Ramps @ Lovers Lane & Lovers Lane

Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	477	546	1847	207	1038
v/c Ratio	1.15	1.13	1.15	0.79	0.45
Control Delay	125.9	106.9	84.4	59.1	3.7
Queue Delay	200.2	180.2	19.3	0.0	0.7
Total Delay	326.1	287.1	103.7	59.1	4.4
Queue Length 50th (ft)	~340	~316	~633	125	55
Queue Length 95th (ft)	#421	#396	m#681	m116	m58
Internal Link Dist (ft)		366	110		269
Turn Bay Length (ft)	232			75	
Base Capacity (vph)	414	484	1608	380	2291
Starvation Cap Reductn	0	0	39	0	827
Spillback Cap Reductn	117	129	59	0	522
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.61	1.54	1.19	0.54	0.71

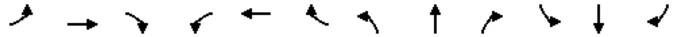
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

12: Tulare Ave & Ben Maddox Way



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	155	236	51	16	269	240	71	792	24	108	309	116
v/c Ratio	0.79	0.36	0.09	0.15	0.68	0.47	0.47	0.56	0.04	0.65	0.21	0.16
Control Delay	68.3	23.4	7.0	44.8	39.4	8.5	48.3	22.4	11.9	57.3	18.0	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.3	23.4	7.0	44.8	39.4	8.5	48.3	22.4	11.9	57.3	18.0	4.8
Queue Length 50th (ft)	82	90	0	8	134	8	36	170	3	56	54	0
Queue Length 95th (ft)	#150	139	17	27	191	50	71	219	17	#135	99	35
Internal Link Dist (ft)		1613			1967			1346			2243	
Turn Bay Length (ft)	95		95	90		90	155		90	200		200
Base Capacity (vph)	195	711	636	171	628	680	183	1415	641	185	1441	713
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.33	0.08	0.09	0.43	0.35	0.39	0.56	0.04	0.58	0.21	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

14: Tulare Ave & Lovers Lane

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	15	125	10	168	54	1132	55	957
v/c Ratio	0.07	0.35	0.03	0.43	0.37	0.54	0.38	0.46
Control Delay	14.1	6.8	13.5	7.0	25.3	9.0	25.5	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.1	6.8	13.5	7.0	25.3	9.0	25.5	7.3
Queue Length 50th (ft)	2	0	1	0	8	47	9	35
Queue Length 95th (ft)	10	15	7	10	36	175	36	127
Internal Link Dist (ft)		2570	207			1470		2367
Turn Bay Length (ft)	100				210		290	
Base Capacity (vph)	419	562	559	592	146	2090	146	2065
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.22	0.02	0.28	0.37	0.54	0.38	0.46

Intersection Summary

15: Acequia Ave & N. Court St

Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	37	176	80	1691
v/c Ratio	0.23	0.33	0.19	0.59
Control Delay	30.2	16.1	18.2	10.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	30.2	16.1	18.2	10.6
Queue Length 50th (ft)	11	45	17	108
Queue Length 95th (ft)	35	76	40	230
Internal Link Dist (ft)		608	737	568
Turn Bay Length (ft)				
Base Capacity (vph)	440	981	634	2860
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.08	0.18	0.13	0.59

Intersection Summary

Lane Group	WBT	NBT
Lane Group Flow (vph)	1692	1540
v/c Ratio	1.05dr	0.64
Control Delay	25.6	14.0
Queue Delay	3.1	0.2
Total Delay	28.7	14.3
Queue Length 50th (ft)	216	154
Queue Length 95th (ft)	239	188
Internal Link Dist (ft)	265	310
Turn Bay Length (ft)		
Base Capacity (vph)	1896	2395
Starvation Cap Reductn	128	255
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.96	0.72

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lane Group	EBT	NBT
Lane Group Flow (vph)	1653	988
v/c Ratio	0.71	0.52
Control Delay	13.0	13.0
Queue Delay	0.0	0.0
Total Delay	13.0	13.0
Queue Length 50th (ft)	140	77
Queue Length 95th (ft)	189	96
Internal Link Dist (ft)	4045	445
Turn Bay Length (ft)		
Base Capacity (vph)	2329	1978
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.71	0.50

Intersection Summary

Lane Group	WBT	NBL
Lane Group Flow (vph)	957	973
v/c Ratio	0.53	0.59
Control Delay	13.1	9.8
Queue Delay	0.0	0.1
Total Delay	13.1	9.9
Queue Length 50th (ft)	70	73
Queue Length 95th (ft)	90	97
Internal Link Dist (ft)	3590	28
Turn Bay Length (ft)		
Base Capacity (vph)	2588	1838
Starvation Cap Reductn	0	0
Spillback Cap Reductn	211	94
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.40	0.56

Intersection Summary

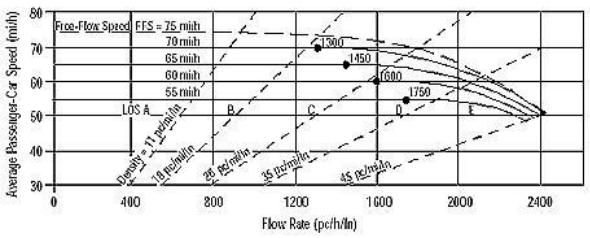
Kimley-Horn and Associates, Inc.

Visalia Walmart Roadway Network Capacity

Near-term 2015 Plus Project Conditions
AM Peak

ROADWAY	FROM	TO	Length (Miles)	Area Type (U/T/R)	Functional Class	# of Lanes	Div/Undiv (D/U)	Left-turn Bays (Y/N)	POSTED SPEED	Sig/Mile	Code	Notes	Generalized Service Volumes							
													Code	A	B	C	D	E	Two-Way Vol	LOS
Mineral King Avenue	Ben Maddox Way	SR-198 WB Ramps (B	0.15	U	Arterial	4	U	N	40	4.00	U-NS2-4	adjusted volumes by -25%	U-NS2-4	0	0	2178	2898	3060	856	C
Mineral King Avenue	SR-198 WB Ramps (B	Lovers Lane	0.84	U	Arterial	2	U	Y	40	1.50	U-NS1-2		U-NS1-2	0	837	1350	1440	0	1,010	C
Noble Avenue	Ben Maddox Way	SR-198 EB Ramps	0.16	U	Arterial	3	U	Y	35	4.00	U-NS2-4	adjusted generalized service	U-NS2-4	0	0	1307	1739	1836	1,000	C
Noble Avenue	East Driveway	Pinkham Street	0.14	U	Arterial	2	U	Y	35	2.50	U-NS2-2		U-NS2-2	0	0	918	1332	1413	631	C
Noble Avenue	Pinkham Street	Lovers Lane	0.50	U	Arterial	2	U	Y	45	2.00	U-NS2-2		U-NS2-2	0	0	918	1332	1413	536	C
Ben Maddox Way	Noble Avenue	Tulare Avenue	0.44	U	Arterial	4	D	Y	40	2.00	U-NS2-4		U-NS2-4	0	0	2178	2898	3060	1,404	C
Pinkham Street	Noble Avenue	Tulare Avenue	0.44	U	Arterial	2	U	N	40	0	U-OS1-2	adjusted volumes by -20%	U-OS1-2	0	605	975	1040	0	264	B
Lovers Lane	Noble Avenue	Tulare Avenue	0.47	U	Arterial	4	D	Y	45	3.00	U-NS2-4		U-NS2-4	0	0	2178	2898	3060	1,999	C
Tulare Avenue	Ben Maddox Way	Pinkham Street	0.39	U	Arterial	2	U	Y	40	0.61	U-OS1-2		U-OS1-2	0	605	975	1040	0	690	C
Tulare Avenue	Pinkham Street	Lovers Lane	0.48	U	Arterial	2	U	N	40	0.82	U-OS1-2	adjusted volumes by -20%	U-OS1-2	0	605	975	1040	0	324	B

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	B/W Ben Maddox Way & Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2015 + Project

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	1802 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	1.10	I/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0	mi/h
f_{LC}	0.0	mi/h
f_{ID}	3.0	mi/h
f_N	4.5	mi/h
FFS	62.5	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1046	pc/h/ln
S	62.5	mi/h
D = v_p / S	16.7	pc/mi/ln
LOS	B	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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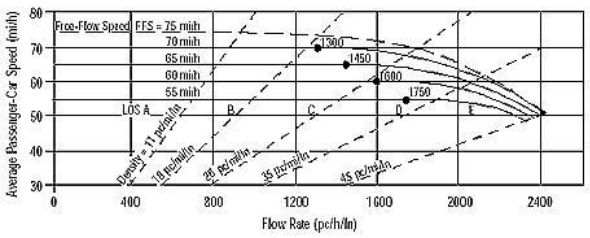
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	E/O Lovers Ln.
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2015 + Project

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	1231 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.56	I/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0	mi/h
f_{LC}	0.0	mi/h
f_{ID}	0.3	mi/h
f_N	4.5	mi/h
FFS	65.2	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	718	pc/h/ln
S	65.2	mi/h
D = v_p / S	11.0	pc/mi/ln
LOS	B	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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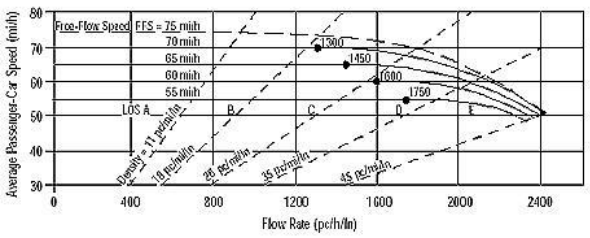
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	W/O S. Ben Maddox Way
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2015 + Project
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2253 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1308	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	20.9	pc/mi/ln	S		mi/h
LOS	C		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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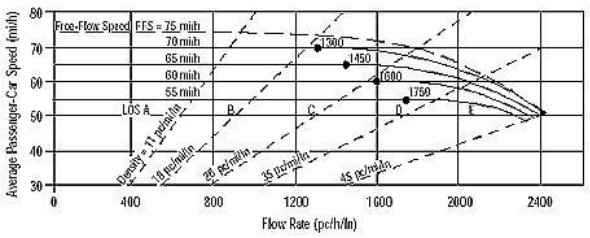
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	B/W Ben Maddox Way & Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2015 + Project
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2721 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1580	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	25.3	pc/mi/ln	S		mi/h
LOS	C		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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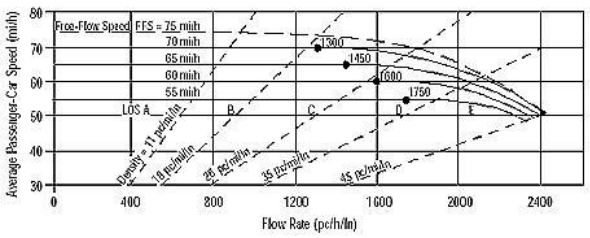
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	
Agency or Company	Kimley-Horn and Associates
Date Performed	7/6/2009
Analysis Time Period	AM Peak
Project Description	

Site Information

Highway/Direction of Travel	SR-198 WB
From/To	E/O Lovers Ln.
Jurisdiction	City of Visalia
Analysis Year	Near-term 2015 + Project

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	1521 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.56	I/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0	mi/h
f_{LC}	0.0	mi/h
f_{ID}	0.3	mi/h
f_N	4.5	mi/h
FFS	65.2	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	887	pc/h/ln
S	65.2	mi/h
D = v_p / S	13.6	pc/mi/ln
LOS	B	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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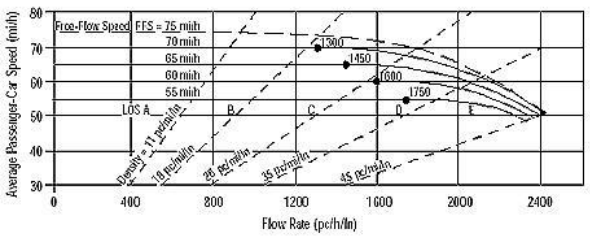

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	
Agency or Company	Kimley-Horn and Associates
Date Performed	7/6/2009
Analysis Time Period	AM Peak
Project Description	

Site Information

Highway/Direction of Travel	SR-198 WB
From/To	W/O S. Ben Maddox Way
Jurisdiction	City of Visalia
Analysis Year	Near-term 2015 + Project

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	3578 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	1.10	I/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0	mi/h
f_{LC}	0.0	mi/h
f_{ID}	3.0	mi/h
f_N	4.5	mi/h
FFS	62.5	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	2077	pc/h/ln
S	58.4	mi/h
D = v_p / S	35.6	pc/mi/ln
LOS	E	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	mi/h
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2015 + Project

Project Description

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 2500 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = 352 veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	2253	0.90	Level	9	0	0.957	1.00	2616
Ramp	561	0.90	Level	4	0	0.980	1.00	636
UpStream	352	0.90	Level	2	0	0.990	1.00	395
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 2616 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	2616	4800	No
				V_{12}	2616	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	1980	4800	No
				V_R	636	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A	D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D
D_R = (pc/ mi /ln)	D_R = 25.2 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= C (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.485 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 56.4 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 56.4 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2015 + Project

Project Description

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 2600 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = 110 veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	1802	0.90	Level	9	0	0.957	1.00	2092
Ramp	788	0.90	Level	4	0	0.980	1.00	893
UpStream	110	0.90	Level	2	0	0.990	1.00	123
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 2092 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	2092	4800	No
				V_{12}	2092	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	1199	4800	No
				V_R	893	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A	D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D
D_R = (pc/ mi /ln)	D_R = 19.6 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= B (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.508 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 55.8 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 55.8 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2015 + Project

Project Description

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 3400 ft		L_{down} = ft
Vu = 1307 veh/h	S_{FF} = 70.0 mph S_{FR} = 35.0 mph Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	2721	0.90	Level	9	0	0.957	1.00	3159
Ramp	152	0.90	Level	4	0	0.980	1.00	172
UpStream	1307	0.90	Level	2	0	0.990	1.00	1467
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 3159 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	3159	4800	No
				V_{12}	3159	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	2987	4800	No
				V_R	172	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
D_R = (pc/ mi /ln)	D_R = 29.0 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= D (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.443 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 57.6 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 57.6 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Near-term 2015 + Project

Project Description

Inputs

Upstream Adj Ramp	Terrain	Downstream Adj Ramp
☐ Yes ☐ On		☐ Yes ☐ On
☐ No ☐ Off		☐ No ☐ Off
L_{up} = ft		L_{down} = ft
Vu = veh/h	S_{FF} = 70.0 mph S_{FR} = 35.0 mph Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	1521	0.90	Level	9	0	0.957	1.00	1766
Ramp	107	0.90	Level	4	0	0.980	1.00	121
UpStream								
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 1766 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	1766	4800	No
				V_{12}	1766	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	1645	4800	No
				V_R	121	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
D_R = (pc/ mi /ln)	D_R = 17.4 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= B (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.439 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 57.7 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 57.7 mph (Exhibit 25-15)

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor					0.95	1.00	0.97	0.91	0.91	0.97	0.91	
Frt					1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)					3459	1583	3433	3380	1441	3433	4999	
Flt Permitted					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)					3459	1583	3433	3380	1441	3433	4999	
Volume (vph)	0	0	0	180	207	123	206	745	488	283	579	74
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.94	0.86	0.86	0.86
Adj. Flow (vph)	0	0	0	196	225	134	219	793	519	329	673	86
RTOR Reduction (vph)	0	0	0	0	0	100	0	1	255	0	14	0
Lane Group Flow (vph)	0	0	0	0	421	34	219	808	248	329	745	0
Turn Type				Split		Perm	Prot		Perm	Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)					24.5	24.5	10.4	48.4	48.4	13.1	51.1	
Effective Green, g (s)					25.5	25.5	10.4	49.4	49.4	13.1	52.1	
Actuated g/C Ratio					0.26	0.26	0.10	0.49	0.49	0.13	0.52	
Clearance Time (s)					5.0	5.0	4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)					7.5	7.5	2.0	8.0	8.0	2.0	7.5	
Lane Grp Cap (vph)					882	404	357	1670	712	450	2604	
v/s Ratio Prot					c0.12		0.06	c0.24		c0.10	c0.15	
v/s Ratio Perm						0.02			0.17			
v/c Ratio					0.48	0.08	0.61	0.48	0.35	0.73	0.29	
Uniform Delay, d1					31.6	28.4	42.9	16.8	15.5	41.8	13.5	
Progression Factor					1.00	1.00	0.95	1.45	5.36	1.00	1.00	
Incremental Delay, d2					1.6	0.4	1.8	0.8	1.1	5.2	0.3	
Delay (s)					33.2	28.7	42.4	25.2	84.0	47.0	13.8	
Level of Service					C	C	D	C	F	D	B	
Approach Delay (s)		0.0			32.1			47.0			23.8	
Approach LOS		A			C			D			C	

Intersection Summary				
HCM Average Control Delay	36.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	54.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	245	439	262	366	97	30
Peak Hour Factor	0.92	0.92	0.88	0.88	0.76	0.76
Hourly flow rate (vph)	266	477	298	416	128	39
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total (vph)	178	566	436	277	128	39
Volume Left (vph)	0	0	298	0	128	0
Volume Right (vph)	0	477	0	0	0	39
Hadj (s)	0.03	-0.56	0.38	0.03	0.55	-0.65
Departure Headway (s)	6.2	5.6	6.5	6.1	8.2	7.0
Degree Utilization, x	0.31	0.88	0.78	0.47	0.29	0.08
Capacity (veh/h)	556	633	545	573	422	487
Control Delay (s)	10.7	34.6	27.8	13.3	13.3	9.3
Approach Delay (s)	28.9		22.2		12.3	
Approach LOS	D		C		B	

Intersection Summary				
Delay	24.3			
HCM Level of Service	C			
Intersection Capacity Utilization	54.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1673		1770	1863	1583	1770	3539	1583	1770	3450	
Flt Permitted	0.64	1.00		0.14	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1183	1673		257	1863	1583	1770	3539	1583	1770	3450	
Volume (vph)	95	137	288	211	125	176	185	1203	823	315	625	126
Peak-hour factor, PHF	0.80	0.80	0.80	0.87	0.87	0.87	0.92	0.92	0.92	0.89	0.89	0.89
Adj. Flow (vph)	119	171	360	243	144	202	201	1308	895	354	702	142
RTOR Reduction (vph)	0	84	0	0	0	113	0	0	235	0	17	0
Lane Group Flow (vph)	119	447	0	243	144	89	201	1308	660	354	827	0
Turn Type	Perm			Perm		Perm	Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8			2			
Actuated Green, G (s)	27.0	27.0		28.5	28.5	28.5	14.6	32.0	32.0	15.0	32.4	
Effective Green, g (s)	29.0	29.0		29.0	29.0	29.0	14.6	34.0	34.0	15.0	34.4	
Actuated g/C Ratio	0.32	0.32		0.32	0.32	0.32	0.16	0.38	0.38	0.17	0.38	
Clearance Time (s)	6.0	6.0		4.5	4.5	4.5	4.0	6.0	6.0	4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	381	539		83	600	510	287	1337	598	295	1319	
v/s Ratio Prot		0.27			0.08		0.11	0.37		c0.20	0.24	
v/s Ratio Perm	0.10			c0.95		0.06			c0.42			
v/c Ratio	0.31	0.83		2.93	0.24	0.18	0.70	0.98	1.10	1.20	0.63	
Uniform Delay, d1	23.0	28.2		30.5	22.4	21.9	35.6	27.6	28.0	37.5	22.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.67	1.26	1.49	1.00	1.00	
Incremental Delay, d2	0.5	10.2		899.2	0.2	0.2	0.7	3.9	49.2	117.9	2.3	
Delay (s)	23.5	38.4		929.7	22.6	22.1	24.5	38.6	91.0	155.4	24.8	
Level of Service	C	D		F	C	C	C	D	F	F	C	
Approach Delay (s)		35.7			396.7			56.9			63.4	
Approach LOS		D			F			E			E	

Intersection Summary				
HCM Average Control Delay	97.0	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.80			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	103.3%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	511	763	116	354	159	20
Peak Hour Factor	0.94	0.94	0.83	0.83	0.88	0.88
Hourly flow rate (vph)	544	812	140	427	181	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type					None	
Median storage veh)						
Upstream signal (ft)	465					
pX, platoon unblocked						
vC, conflicting volume			1355		1655	949
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1355		1655	949
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			72		0	93
cM capacity (veh/h)			508		78	314

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1355	566	203
Volume Left	0	140	181
Volume Right	812	0	23
cSH	1700	508	85
Volume to Capacity	0.80	0.28	2.40
Queue Length 95th (ft)	0	28	471
Control Delay (s)	0.0	7.7	741.2
Lane LOS		A	F
Approach Delay (s)	0.0	7.7	741.2
Approach LOS			F

Intersection Summary			
Average Delay	73.0		
Intersection Capacity Utilization	117.5%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0		4.0		4.0		4.0	4.0	
Lane Util. Factor	0.97	0.95		1.00		0.88		0.91		0.97	0.95	
Frt	1.00	0.95		1.00		0.85		0.98		1.00	1.00	
Flt Protected	0.95	1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)	3433	3359		1770		2787		4967		3433	3539	
Flt Permitted	0.95	1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)	3433	3359		1770		2787		4967		3433	3539	
Volume (vph)	134	312	160	291	0	613	0	691	127	187	572	0
Peak-hour factor, PHF	0.83	0.83	0.83	0.93	0.93	0.93	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	161	376	193	313	0	659	0	727	134	203	622	0
RTOR Reduction (vph)	0	80	0	0	0	261	0	23	0	0	0	0
Lane Group Flow (vph)	161	489	0	313	0	398	0	838	0	203	622	0
Turn Type	Prot			Prot		custom				Prot		
Protected Phases	7	4		3		8		2		1	6	
Permitted Phases												
Actuated Green, G (s)	9.0	21.8		11.0		23.8		37.2		12.0	53.2	
Effective Green, g (s)	9.0	22.8		11.0		24.8		38.2		12.0	54.2	
Actuated g/C Ratio	0.09	0.23		0.11		0.25		0.38		0.12	0.54	
Clearance Time (s)	4.0	5.0		4.0		5.0		5.0		4.0	5.0	
Vehicle Extension (s)	6.5	6.5		2.0		4.5		5.5		2.0	6.0	
Lane Grp Cap (vph)	309	766		195		691		1897		412	1918	
v/s Ratio Prot	0.05	c0.15		c0.18		0.14		c0.17		c0.06	0.18	
v/s Ratio Perm												
v/c Ratio	0.52	0.64		1.61		0.58		0.44		0.49	0.32	
Uniform Delay, d1	43.4	34.9		44.5		33.0		23.0		41.2	12.7	
Progression Factor	1.00	1.00		1.00		1.00		1.00		0.84	0.91	
Incremental Delay, d2	4.4	3.2		294.9		1.6		0.7		0.3	0.4	
Delay (s)	47.8	38.0		339.4		34.6		23.7		35.1	12.0	
Level of Service	D	D		F		C		C		D	B	
Approach Delay (s)		40.2			132.8			23.7			17.6	
Approach LOS		D			F			C			B	

Intersection Summary			
HCM Average Control Delay	57.1	HCM Level of Service	E
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	1.00	1.00		1.00	1.00		0.95	1.00
Frt	1.00	0.97		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1676	4946		1676	1863	1500		1788	1485		3394	1485
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (perm)	1676	4946		1676	1863	1500		1788	1485		3394	1485
Volume (vph)	108	416	93	116	266	47	123	71	112	209	111	430
Peak-hour factor, PHF	0.91	0.91	0.91	0.95	0.95	0.95	0.78	0.78	0.78	0.88	0.88	0.88
Adj. Flow (vph)	119	457	102	122	280	49	158	91	144	238	126	489
RTOR Reduction (vph)	0	24	0	0	0	11	0	0	113	0	0	382
Lane Group Flow (vph)	119	535	0	122	280	38	0	249	31	0	364	107
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6			3			4
Actuated Green, G (s)	12.0	33.6		12.2	33.8	33.8		22.4	22.4		21.9	21.9
Effective Green, g (s)	11.7	34.9		11.9	35.1	35.1		23.6	23.6		23.1	23.1
Actuated g/C Ratio	0.11	0.32		0.11	0.32	0.32		0.22	0.22		0.21	0.21
Clearance Time (s)	3.7	5.3		3.7	5.3	5.3		5.2	5.2		5.2	5.2
Vehicle Extension (s)	2.0	5.1		2.0	4.8	4.8		6.3	6.3		7.9	7.9
Lane Grp Cap (vph)	179	1576		182	597	481		385	320		716	313
v/s Ratio Prot	0.07	0.11		c0.07	c0.15			c0.14			c0.11	
v/s Ratio Perm						0.03			0.02			0.07
v/c Ratio	0.66	0.34		0.67	0.47	0.08		0.65	0.10		0.51	0.34
Uniform Delay, d1	47.0	28.5		46.9	29.7	25.9		39.2	34.4		38.2	36.7
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	7.0	0.6		7.4	1.1	0.1		6.3	0.4		2.4	2.7
Delay (s)	54.0	29.1		54.3	30.9	26.1		45.4	34.8		40.6	39.5
Level of Service	D	C		D	C	C		D	C		D	D
Approach Delay (s)		33.5			36.7			41.5			39.9	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM Average Control Delay	37.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	109.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	12	517	358	0	528	3	0	0	107	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.90	0.90	0.90	0.84	0.84	0.84	0.92	0.92	0.92
Hourly flow rate (vph)	13	544	377	0	587	3	0	0	127	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		799			328							
pX, platoon unblocked	0.97			0.91			0.93	0.93	0.91	0.93	0.93	0.97
vC, conflicting volume	590			921			1346	1348	461	1013	1535	588
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	575			819			1223	1225	316	865	1425	573
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	80	100	100	100
cM capacity (veh/h)	959			736			125	163	622	181	123	446

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	NB 1
Volume Total	13	363	558	590	127
Volume Left	13	0	0	0	0
Volume Right	0	0	377	3	127
cSH	959	1700	1700	1700	622
Volume to Capacity	0.01	0.21	0.33	0.35	0.20
Queue Length 95th (ft)	1	0	0	0	19
Control Delay (s)	8.8	0.0	0.0	0.0	12.3
Lane LOS	A				B
Approach Delay (s)	0.1			0.0	12.3
Approach LOS					B

Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	39.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	1863	1770	1583
Volume (vph)	556	68	158	199	332	177
Peak-hour factor, PHF	0.94	0.94	0.91	0.91	0.81	0.81
Adj. Flow (vph)	591	72	174	219	410	219
RTOR Reduction (vph)	0	43	0	0	0	162
Lane Group Flow (vph)	591	29	174	219	410	57
Turn Type		Perm	Prot			Prot
Protected Phases	2		1	6	4	4
Permitted Phases		2				
Actuated Green, G (s)	22.3	22.3	7.7	34.0	15.4	15.4
Effective Green, g (s)	24.3	24.3	7.7	36.0	15.4	15.4
Actuated g/C Ratio	0.41	0.41	0.13	0.61	0.26	0.26
Clearance Time (s)	6.0	6.0	4.0	6.0	4.0	4.0
Vehicle Extension (s)	8.0	8.0	2.0	8.0	2.4	2.4
Lane Grp Cap (vph)	762	648	229	1129	459	410
v/s Ratio Prot	c0.32		c0.10	0.12	c0.23	0.04
v/s Ratio Perm		0.02				
v/c Ratio	0.78	0.05	0.76	0.19	0.89	0.14
Uniform Delay, d1	15.2	10.6	25.0	5.2	21.2	16.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.6	0.1	12.1	0.4	19.2	0.1
Delay (s)	22.8	10.7	37.0	5.6	40.4	17.0
Level of Service	C	B	D	A	D	B
Approach Delay (s)	21.5			19.5	32.2	
Approach LOS	C			B	C	

Intersection Summary				
HCM Average Control Delay	25.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	59.4	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	66.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	475	253	21	271	95	52
Peak Hour Factor	0.92	0.92	0.85	0.85	0.92	0.92
Hourly flow rate (vph)	516	275	25	319	103	57
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	744					
pX, platoon unblocked			0.71		0.71	0.71
vC, conflicting volume			791		1022	654
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			705		1031	511
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		41	86
cM capacity (veh/h)			632		175	398

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	791	344	160
Volume Left	0	25	103
Volume Right	275	0	57
cSH	1700	632	219
Volume to Capacity	0.47	0.04	0.73
Queue Length 95th (ft)	0	3	122
Control Delay (s)	0.0	1.3	56.1
Lane LOS		A	F
Approach Delay (s)	0.0	1.3	56.1
Approach LOS			F

Intersection Summary			
Average Delay	7.3		
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1699		1770	1643		1770	3539	1583	1770	3539	1583
Flt Permitted	0.24	1.00		0.32	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	442	1699		595	1643		1770	3539	1583	1770	3539	1583
Volume (vph)	225	147	207	107	87	325	82	944	75	417	1271	203
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.85	0.85	0.85	0.92	0.92	0.92
Adj. Flow (vph)	242	158	223	116	95	353	96	1111	88	453	1382	221
RTOR Reduction (vph)	0	57	0	0	149	0	0	0	32	0	0	115
Lane Group Flow (vph)	242	324	0	116	299	0	96	1111	56	453	1382	106
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	28.0	28.0		28.0	28.0		7.6	30.0	30.0	16.0	38.4	38.4
Effective Green, g (s)	30.0	30.0		30.0	30.0		7.6	32.0	32.0	16.0	40.4	40.4
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.08	0.36	0.36	0.18	0.45	0.45
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	5.8	5.8		5.8	5.8		1.5	5.8	5.8	1.5	5.8	5.8
Lane Grp Cap (vph)	147	566		198	548		149	1258	563	315	1589	711
v/s Ratio Prot		0.19			0.18		0.05	0.31		c0.26	c0.39	
v/s Ratio Perm	c0.55			0.19					0.04			0.07
v/c Ratio	1.65	0.57		0.59	0.55		0.64	0.88	0.10	1.44	0.87	0.15
Uniform Delay, d1	30.0	24.7		24.9	24.5		39.9	27.2	19.4	37.0	22.4	14.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.85	1.31	2.51
Incremental Delay, d2	319.2	2.7		7.9	2.4		7.0	9.2	0.4	198.8	0.7	0.0
Delay (s)	349.2	27.4		32.8	26.9		46.9	36.4	19.7	230.2	30.0	36.9
Level of Service	F	C		C	C		D	D	B	F	C	D
Approach Delay (s)		152.4			28.1			36.1			74.8	
Approach LOS		F			C			D			E	

Intersection Summary			
HCM Average Control Delay	68.6	HCM Level of Service	E
HCM Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	99.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0						4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95						0.95		1.00	0.95	
Frt	1.00	0.85						0.99		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1665	1490						3487		1770	3539	
Flt Permitted	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (perm)	1665	1490						3487		1770	3539	
Volume (vph)	864	0	1011	0	0	0	0	1347	146	243	881	0
Peak-hour factor, PHF	0.79	0.79	0.79	0.92	0.92	0.92	0.95	0.95	0.95	0.87	0.87	0.87
Adj. Flow (vph)	1094	0	1280	0	0	0	0	1418	154	279	1013	0
RTOR Reduction (vph)	0	109	0	0	0	0	0	9	0	0	0	0
Lane Group Flow (vph)	1094	1171	0	0	0	0	0	1563	0	279	1013	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	22.0	22.0						37.6		17.3	58.6	
Effective Green, g (s)	22.6	22.6						38.4		17.0	59.4	
Actuated g/C Ratio	0.25	0.25						0.43		0.19	0.66	
Clearance Time (s)	4.6	4.6						4.8		3.7	4.8	
Vehicle Extension (s)	5.0	5.0						7.4		2.0	6.2	
Lane Grp Cap (vph)	418	374						1488		334	2336	
v/s Ratio Prot	0.66	c0.79						c0.45		c0.16	0.29	
v/s Ratio Perm												
v/c Ratio	2.62	3.13						1.05		0.84	0.43	
Uniform Delay, d1	33.7	33.7						25.8		35.2	7.3	
Progression Factor	1.00	1.00						0.60		1.20	0.87	
Incremental Delay, d2	734.7	966.5						29.4		1.7	0.1	
Delay (s)	768.4	1000.2						44.9		43.8	6.4	
Level of Service	F	F						D		D	A	
Approach Delay (s)		893.3			0.0			44.9			14.4	
Approach LOS		F			A			D			B	

Intersection Summary				
HCM Average Control Delay	421.9	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.61			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	120.3%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	137	135	88	19	134	106	47	504	20	122	688	224
Peak-hour factor, PHF	0.90	0.90	0.90	0.89	0.89	0.89	0.81	0.81	0.81	0.90	0.90	0.90
Adj. Flow (vph)	152	150	98	21	151	119	58	622	25	136	764	249
RTOR Reduction (vph)	0	0	73	0	0	97	0	0	11	0	0	134
Lane Group Flow (vph)	152	150	25	21	151	22	58	622	14	136	764	115
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	9.0	20.6	20.6	2.6	14.2	14.2	4.7	33.7	33.7	8.7	37.7	37.7
Effective Green, g (s)	9.0	21.6	21.6	2.6	15.2	15.2	4.7	34.7	34.7	8.7	38.7	38.7
Actuated g/C Ratio	0.11	0.26	0.26	0.03	0.18	0.18	0.06	0.42	0.42	0.10	0.46	0.46
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	191	481	409	55	339	288	100	1469	657	184	1638	733
v/s Ratio Prot	c0.09	0.08		0.01	c0.08		0.03	0.18		c0.08	c0.22	
v/s Ratio Perm			0.02			0.01			0.01			0.07
v/c Ratio	0.80	0.31	0.06	0.38	0.45	0.08	0.58	0.42	0.02	0.74	0.47	0.16
Uniform Delay, d1	36.4	25.0	23.4	39.7	30.4	28.4	38.5	17.4	14.4	36.3	15.4	13.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.9	0.1	0.0	1.6	0.3	0.0	5.0	0.9	0.1	12.5	1.0	0.5
Delay (s)	55.3	25.1	23.4	41.3	30.8	28.4	43.5	18.2	14.5	48.9	16.3	13.5
Level of Service	E	C	C	D	C	C	D	B	B	D	B	B
Approach Delay (s)		36.2			30.6			20.2			19.6	
Approach LOS		D			C			C			B	

Intersection Summary				
HCM Average Control Delay	23.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	83.6	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	52.4%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

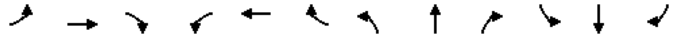
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	40	99	66	23	141	8	74	95	23	28	193	54
Peak Hour Factor	0.92	0.92	0.92	0.85	0.85	0.85	0.87	0.87	0.87	0.72	0.72	0.72
Hourly flow rate (vph)	43	108	72	27	166	9	85	109	26	39	268	75

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	223	202	221	382
Volume Left (vph)	43	27	85	39
Volume Right (vph)	72	9	26	75
Hadj (s)	-0.12	0.03	0.04	-0.06
Departure Headway (s)	6.0	6.2	6.0	5.6
Degree Utilization, x	0.37	0.35	0.37	0.59
Capacity (veh/h)	529	519	541	610
Control Delay (s)	12.4	12.4	12.4	16.3
Approach Delay (s)	12.4	12.4	12.4	16.3
Approach LOS	B	B	B	C

Intersection Summary				
Delay		13.8		
HCM Level of Service		B		
Intersection Capacity Utilization		51.5%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.86			1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1599			1863	1583	1770	3537		1770	3485	
Flt Permitted	0.75	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1402	1599			1863	1583	1770	3537		1770	3485	
Volume (vph)	16	5	83	0	4	52	55	939	3	108	1139	128
Peak-hour factor, PHF	0.81	0.81	0.81	0.50	0.50	0.50	0.77	0.77	0.77	0.98	0.98	0.98
Adj. Flow (vph)	20	6	102	0	8	104	71	1219	4	110	1162	131
RTOR Reduction (vph)	0	92	0	0	0	94	0	0	0	0	9	0
Lane Group Flow (vph)	20	16	0	0	8	10	71	1223	0	110	1284	0
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	5.5	5.5			5.5	5.5	3.7	36.0		5.0	37.3	
Effective Green, g (s)	5.5	5.5			5.5	5.5	3.7	36.0		5.0	37.3	
Actuated g/C Ratio	0.09	0.09			0.09	0.09	0.06	0.62		0.09	0.64	
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	132	150			175	149	112	2177		151	2222	
v/s Ratio Prot		0.01			0.00		0.04	0.35		c0.06	c0.37	
v/s Ratio Perm	c0.01					0.01						
v/c Ratio	0.15	0.10			0.05	0.07	0.63	0.56		0.73	0.58	
Uniform Delay, d1	24.4	24.2			24.1	24.2	26.7	6.6		26.1	6.1	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.3			0.1	0.2	11.2	0.3		16.1	0.4	
Delay (s)	24.9	24.6			24.2	24.3	37.9	6.9		42.1	6.4	
Level of Service	C	C			C	C	D	A		D	A	
Approach Delay (s)		24.6			24.3			8.6			9.2	
Approach LOS		C			C			A			A	

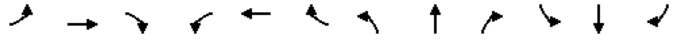
Intersection Summary				
HCM Average Control Delay	10.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	58.5	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	56.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frt	1.00	1.00			0.97			0.99				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1752	1845			1791			5006				
Flt Permitted	0.95	1.00			1.00			1.00				
Satd. Flow (perm)	1752	1845			1791			5006				
Volume (vph)	62	150	0	0	99	27	37	1202	131	0	0	0
Peak-hour factor, PHF	0.78	0.78	0.78	0.79	0.79	0.79	0.91	0.91	0.91	0.92	0.92	0.92
Adj. Flow (vph)	79	192	0	0	125	34	41	1321	144	0	0	0
RTOR Reduction (vph)	0	0	0	0	12	0	0	10	0	0	0	0
Lane Group Flow (vph)	79	192	0	0	147	0	0	1496	0	0	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Prot						Perm					
Protected Phases	7	4			8			2				
Permitted Phases							2					
Actuated Green, G (s)	4.9	21.3			12.7			36.4				
Effective Green, g (s)	4.6	21.5			12.9			36.6				
Actuated g/C Ratio	0.07	0.33			0.20			0.55				
Clearance Time (s)	3.7	4.2			4.2			4.2				
Vehicle Extension (s)	2.0	7.9			7.7			6.4				
Lane Grp Cap (vph)	122	600			350			2772				
v/s Ratio Prot	c0.05	0.10			c0.08							
v/s Ratio Perm								0.30				
v/c Ratio	0.65	0.32			0.42			0.54				
Uniform Delay, d1	30.0	16.8			23.3			9.4				
Progression Factor	1.00	1.00			1.00			1.00				
Incremental Delay, d2	8.5	1.3			3.3			0.8				
Delay (s)	38.5	18.1			26.6			10.1				
Level of Service	D	B			C			B				
Approach Delay (s)		24.0			26.6			10.1			0.0	
Approach LOS		C			C			B			A	

Intersection Summary				
HCM Average Control Delay	13.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	66.1	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	50.2%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0				
Lane Util. Factor					0.91			0.91				
Frt					0.95			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					4850			5037				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					4850			5037				
Volume (vph)	0	0	0	0	841	375	247	1040	0	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.86	0.86	0.86	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	895	399	287	1209	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	23	0	0	27	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1271	0	0	1469	0	0	0	0
Turn Type							Perm					
Protected Phases					8			2				
Permitted Phases							2					
Actuated Green, G (s)					22.6			30.5				
Effective Green, g (s)					23.2			31.1				
Actuated g/C Ratio					0.37			0.50				
Clearance Time (s)					4.6			4.6				
Vehicle Extension (s)					4.8			3.0				
Lane Grp Cap (vph)					1806			2514				
v/s Ratio Prot					c0.26							
v/s Ratio Perm								0.29				
v/c Ratio					0.70			0.58				
Uniform Delay, d1					16.6			11.0				
Progression Factor					1.00			1.00				
Incremental Delay, d2					1.5			1.0				
Delay (s)					18.2			12.0				
Level of Service					B			B				
Approach Delay (s)		0.0			18.2			12.0			0.0	
Approach LOS		A			B			B			A	

Intersection Summary				
HCM Average Control Delay	14.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	62.3	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	56.4%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.91						0.91				
Frt		1.00						0.97				
Flt Protected		0.98						1.00				
Satd. Flow (prot)		5002						4956				
Flt Permitted		0.98						1.00				
Satd. Flow (perm)		5002						4956				
Volume (vph)	666	1336	0	0	0	0	0	622	127	0	0	0
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92
Adj. Flow (vph)	732	1468	0	0	0	0	0	648	132	0	0	0
RTOR Reduction (vph)	0	64	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	2136	0	0	0	0	0	772	0	0	0	0
Turn Type	Perm											
Protected Phases		2						8				
Permitted Phases	2											
Actuated Green, G (s)		23.2						16.9				
Effective Green, g (s)		24.6						18.0				
Actuated g/C Ratio		0.49						0.36				
Clearance Time (s)		5.4						5.1				
Vehicle Extension (s)		2.0						5.0				
Lane Grp Cap (vph)		2432						1763				
v/s Ratio Prot								c0.16				
v/s Ratio Perm		0.43										
v/c Ratio		0.88						0.44				
Uniform Delay, d1		11.7						12.4				
Progression Factor		1.00						1.00				
Incremental Delay, d2		4.9						0.4				
Delay (s)		16.6						12.8				
Level of Service		B						B				
Approach Delay (s)		16.6			0.0			12.8			0.0	
Approach LOS		B			A			B			A	

Intersection Summary				
HCM Average Control Delay	15.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	50.6	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	60.9%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	13	11	0	0	8	27	11	673	5	0	0	0
Peak Hour Factor	0.60	0.60	0.60	0.63	0.63	0.63	0.91	0.91	0.91	0.92	0.92	0.92
Hourly flow rate (vph)	22	18	0	0	13	43	12	740	5	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	40	56	382	375
Volume Left (vph)	22	0	12	0
Volume Right (vph)	0	43	0	5
Hadj (s)	0.14	-0.43	0.05	0.02
Departure Headway (s)	5.6	5.0	4.8	4.8
Degree Utilization, x	0.06	0.08	0.51	0.50
Capacity (veh/h)	604	671	739	743
Control Delay (s)	8.9	8.4	11.5	11.3
Approach Delay (s)	8.9	8.4	11.4	
Approach LOS	A	A	B	

Intersection Summary				
Delay		11.1		
HCM Level of Service		B		
Intersection Capacity Utilization	33.7%	ICU Level of Service		A
Analysis Period (min)		15		

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				5085	3433	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				5085	3433	
Volume (vph)	0	0	0	732	484	0
Peak-hour factor, PHF	0.92	0.92	0.84	0.84	0.94	0.94
Adj. Flow (vph)	0	0	0	871	515	0
RTOR Reduction (vph)	0	0	0	0	117	0
Lane Group Flow (vph)	0	0	0	871	398	0
Turn Type						
Protected Phases				6	4	
Permitted Phases						
Actuated Green, G (s)				14.6	12.0	
Effective Green, g (s)				15.2	14.0	
Actuated g/C Ratio				0.41	0.38	
Clearance Time (s)				4.6	6.0	
Vehicle Extension (s)				5.0	6.0	
Lane Grp Cap (vph)				2078	1292	
v/s Ratio Prot				c0.17	c0.12	
v/s Ratio Perm						
v/c Ratio				0.42	0.31	
Uniform Delay, d1				7.8	8.2	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.3	0.4	
Delay (s)				8.1	8.6	
Level of Service				A	A	
Approach Delay (s)	0.0			8.1	8.6	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	8.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	37.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	34.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	421	134	219	809	503	329	759
v/c Ratio	0.48	0.27	0.61	0.48	0.52	0.73	0.29
Control Delay	32.8	6.1	46.8	27.2	11.7	51.7	14.3
Queue Delay	0.0	0.0	0.0	0.6	0.5	0.0	0.0
Total Delay	32.8	6.1	46.8	27.8	12.1	51.7	14.3
Queue Length 50th (ft)	118	0	72	269	100	104	93
Queue Length 95th (ft)	156	42	m102	349	223	141	129
Internal Link Dist (ft)	719			378			1660
Turn Bay Length (ft)		275	110			260	
Base Capacity (vph)	1037	569	446	1672	967	515	2619
Starvation Cap Reductn	0	0	0	460	153	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.24	0.49	0.67	0.62	0.64	0.29

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	119	531	243	144	202	201	1308	895	354	844
v/c Ratio	0.31	0.85	2.93	0.24	0.32	0.70	0.98	1.07	1.20	0.63
Control Delay	25.8	36.7	916.3	23.8	7.4	24.7	39.2	59.9	153.1	25.2
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	117.3	57.2	0.0	0.0
Total Delay	25.8	36.8	916.3	23.8	7.4	24.7	156.5	117.1	153.1	25.2
Queue Length 50th (ft)	51	221	~241	60	14	94	347	~422	~247	195
Queue Length 95th (ft)	84	290	#334	102	58	m61	m252	m192	#409	276
Internal Link Dist (ft)		2033		385			269			731
Turn Bay Length (ft)	145		155		25	125			170	
Base Capacity (vph)	381	623	83	600	623	374	1337	833	295	1335
Starvation Cap Reductn	0	0	0	0	0	0	312	93	0	0
Spillback Cap Reductn	0	1	0	0	0	0	0	0	0	23
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.85	2.93	0.24	0.32	0.54	1.28	1.21	1.20	0.64

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	161	569	313	659	861	203	622
v/c Ratio	0.52	0.67	1.61	0.69	0.45	0.49	0.32
Control Delay	50.0	32.2	326.4	19.2	23.9	38.6	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.0	32.2	326.4	19.2	23.9	38.6	12.7
Queue Length 50th (ft)	51	143	~288	101	139	65	131
Queue Length 95th (ft)	77	164	#456	156	203	101	192
Internal Link Dist (ft)		671			2243		378
Turn Bay Length (ft)			280			120	
Base Capacity (vph)	309	1308	195	1299	1921	413	1919
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.44	1.61	0.51	0.45	0.49	0.32

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	119	559	122	280	49	249	144	364	489
v/c Ratio	0.67	0.35	0.67	0.47	0.10	0.65	0.33	0.51	0.70
Control Delay	67.6	29.9	67.5	36.4	24.4	49.0	8.5	42.2	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.6	29.9	67.5	36.4	24.4	49.0	8.5	42.2	10.0
Queue Length 50th (ft)	81	102	83	157	16	158	0	120	3
Queue Length 95th (ft)	161	176	164	306	55	238	34	186	92
Internal Link Dist (ft)		179		406		179		341	
Turn Bay Length (ft)	185		150		40				110
Base Capacity (vph)	299	1598	299	596	491	477	502	947	763
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.35	0.41	0.47	0.10	0.52	0.29	0.38	0.64

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	591	72	174	219	410	219
v/c Ratio	0.77	0.10	0.76	0.19	0.90	0.38
Control Delay	24.7	3.9	49.1	5.9	46.8	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.7	3.9	49.1	5.9	46.8	5.3
Queue Length 50th (ft)	180	0	62	31	141	0
Queue Length 95th (ft)	#341	20	#148	57	#238	32
Internal Link Dist (ft)	248			664	309	
Turn Bay Length (ft)			200			
Base Capacity (vph)	764	691	237	1130	472	583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.10	0.73	0.19	0.87	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	242	381	116	448	96	1111	88	453	1382	221
v/c Ratio	1.65	0.61	0.59	0.64	0.55	0.88	0.15	1.44	0.85	0.26
Control Delay	344.9	24.2	39.1	17.2	50.4	37.2	11.0	226.9	31.0	8.3
Queue Delay	375.1	0.0	0.0	219.3	0.0	0.6	0.0	287.2	126.2	1.4
Total Delay	720.0	24.2	39.1	236.5	50.4	37.9	11.0	514.1	157.2	9.6
Queue Length 50th (ft)	~201	139	54	103	53	307	14	~355	412	22
Queue Length 95th (ft)	#347	235	#127	209	92	362	42	m#247	m282	m16
Internal Link Dist (ft)		502		1058		2367			110	
Turn Bay Length (ft)	125		135		115		105	115		
Base Capacity (vph)	147	623	198	696	315	1258	594	315	1620	837
Starvation Cap Reductn	0	0	0	0	0	0	0	97	540	434
Spillback Cap Reductn	90	0	0	393	0	26	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	4.25	0.61	0.59	1.48	0.30	0.90	0.15	2.08	1.28	0.55

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

11: SR-198 EB Ramps @ Lovers Lane & Lovers Lane

Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	1094	1280	1572	279	1013
v/c Ratio	2.62	2.65	1.05	0.84	0.43
Control Delay	753.7	765.9	47.9	44.5	6.5
Queue Delay	0.0	0.0	25.9	0.0	0.5
Total Delay	753.7	765.9	73.8	44.5	6.9
Queue Length 50th (ft)	~1113	~1257	~501	145	88
Queue Length 95th (ft)	#1166	#1290	m#587	m180	m94
Internal Link Dist (ft)		366	110		269
Turn Bay Length (ft)	232			75	
Base Capacity (vph)	418	483	1498	387	2336
Starvation Cap Reductn	0	0	85	0	786
Spillback Cap Reductn	152	171	4	0	724
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	4.11	4.10	1.11	0.72	0.65

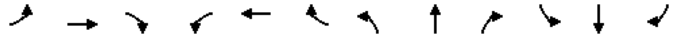
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

12: Tulare Ave & Ben Maddox Way



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	152	150	98	21	151	119	58	622	25	136	764	249
v/c Ratio	0.76	0.30	0.20	0.17	0.51	0.34	0.39	0.42	0.04	0.70	0.44	0.28
Control Delay	60.2	26.8	7.3	39.6	36.9	8.9	42.7	17.9	8.4	55.6	16.0	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.2	26.8	7.3	39.6	36.9	8.9	42.7	17.9	8.4	55.6	16.0	3.2
Queue Length 50th (ft)	74	54	0	10	70	0	27	109	2	65	134	0
Queue Length 95th (ft)	#179	121	38	31	124	41	58	147	14	#156	213	43
Internal Link Dist (ft)		1613			1967			1346			2243	
Turn Bay Length (ft)	95		95	90		90	155		90	200		200
Base Capacity (vph)	201	678	639	181	617	603	187	1471	669	200	1721	898
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.22	0.15	0.12	0.24	0.20	0.31	0.42	0.04	0.68	0.44	0.28

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	20	108	8	104	71	1223	110	1293
v/c Ratio	0.11	0.36	0.03	0.35	0.40	0.58	0.71	0.54
Control Delay	18.0	8.7	16.8	8.0	26.3	8.7	49.8	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.0	8.7	16.8	8.0	26.3	8.7	49.8	8.9
Queue Length 50th (ft)	5	1	2	0	18	110	29	125
Queue Length 95th (ft)	16	26	6	5	41	147	#98	#224
Internal Link Dist (ft)		2570	207			1470		2367
Turn Bay Length (ft)	100				210		290	
Base Capacity (vph)	370	497	491	494	176	2156	154	2395
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.22	0.02	0.21	0.40	0.57	0.71	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	79	192	159	1506
v/c Ratio	0.41	0.30	0.37	0.51
Control Delay	34.7	14.6	21.4	12.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.7	14.6	21.4	12.3
Queue Length 50th (ft)	30	49	48	150
Queue Length 95th (ft)	61	74	85	247
Internal Link Dist (ft)		608	737	568
Turn Bay Length (ft)				
Base Capacity (vph)	454	1001	617	2954
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.17	0.19	0.26	0.51

Intersection Summary

Lane Group	WBT	NBT
Lane Group Flow (vph)	1294	1496
v/c Ratio	0.71	0.59
Control Delay	18.5	12.2
Queue Delay	0.2	0.2
Total Delay	18.7	12.4
Queue Length 50th (ft)	143	138
Queue Length 95th (ft)	187	174
Internal Link Dist (ft)	265	310
Turn Bay Length (ft)		
Base Capacity (vph)	1962	2537
Starvation Cap Reductn	150	283
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.71	0.66

Intersection Summary

Lane Group	EBT	NBT
Lane Group Flow (vph)	2200	780
v/c Ratio	0.88	0.44
Control Delay	17.9	12.9
Queue Delay	0.0	0.0
Total Delay	17.9	12.9
Queue Length 50th (ft)	196	61
Queue Length 95th (ft)	#339	87
Internal Link Dist (ft)	4045	445
Turn Bay Length (ft)		
Base Capacity (vph)	2496	1960
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.88	0.40

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	NWL
Lane Group Flow (vph)	871	515
v/c Ratio	0.42	0.37
Control Delay	8.9	6.4
Queue Delay	0.0	0.0
Total Delay	8.9	6.4
Queue Length 50th (ft)	41	22
Queue Length 95th (ft)	72	54
Internal Link Dist (ft)	3590	221
Turn Bay Length (ft)		
Base Capacity (vph)	2976	1904
Starvation Cap Reductn	0	0
Spillback Cap Reductn	32	1
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.30	0.27

Intersection Summary

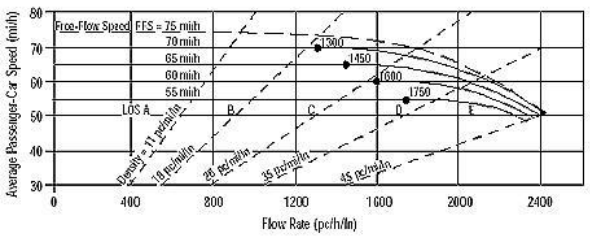
Kimley-Horn and Associates, Inc.

Visalia Walmart Roadway Network Capacity

Near-term 2015 Plus Project Conditions
PM Peak

ROADWAY	FROM	TO	Length (Miles)	Area Type (U/T/R)	Functional Class	# of Lanes	Div/Undiv (D/U)	Left-turn Bays (Y/N)	POSTED SPEED	Sig/Mile	Code	Notes	Generalized Service Volumes							
													Code	A	B	C	D	E	Two-Way Vol	LOS
Mineral King Avenue	Ben Maddox Way	SR-198 WB Ramps (B	0.15	U	Arterial	4	U	N	40	4.00	U-NS2-4	adjusted volumes by -25%	U-NS2-4	0	0	2178	2898	3060	911	C
Mineral King Avenue	SR-198 WB Ramps (B	Lovers Lane	0.84	U	Arterial	2	U	Y	40	1.50	U-NS1-2		U-NS1-2	0	837	1350	1440	0	930	C
Noble Avenue	Ben Maddox Way	SR-198 EB Ramps	0.16	U	Arterial	3	U	Y	35	4.00	U-NS2-4	adjusted generalized service	U-NS2-4	0	0	1307	1739	1836	1,483	D
Noble Avenue	East Driveway	Pinkham Street	0.14	U	Arterial	2	U	Y	35	2.50	U-NS2-2		U-NS2-2	0	0	918	1332	1413	1,092	D
Noble Avenue	Pinkham Street	Lovers Lane	0.50	U	Arterial	2	U	Y	45	2.00	U-NS2-2		U-NS2-2	0	0	918	1332	1413	885	C
Ben Maddox Way	Noble Avenue	Tulare Avenue	0.44	U	Arterial	4	D	Y	40	2.00	U-NS2-4		U-NS2-4	0	0	2178	2898	3060	1,811	C
Pinkham Street	Noble Avenue	Tulare Avenue	0.44	U	Arterial	2	U	N	40	0	U-OS1-2	adjusted volumes by -20%	U-OS1-2	0	605	975	1040	0	336	B
Lovers Lane	Noble Avenue	Tulare Avenue	0.47	U	Arterial	4	D	Y	45	3.00	U-NS2-4		U-NS2-4	0	0	2178	2898	3060	2,534	D
Tulare Avenue	Ben Maddox Way	Pinkham Street	0.39	U	Arterial	2	U	Y	40	0.61	U-OS1-2		U-OS1-2	0	605	975	1040	0	505	B
Tulare Avenue	Pinkham Street	Lovers Lane	0.48	U	Arterial	2	U	N	40	0.82	U-OS1-2	adjusted volumes by -20%	U-OS1-2	0	605	975	1040	0	245	B

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	B/W Ben Maddox Way & Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2015 + Project

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	3153 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	1.10	I/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0	mi/h
f_{LC}	0.0	mi/h
f_{ID}	3.0	mi/h
f_N	4.5	mi/h
FFS	62.5	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1830	pc/h/ln
S	61.6	mi/h
D = v_p / S	29.7	pc/mi/ln
LOS	D	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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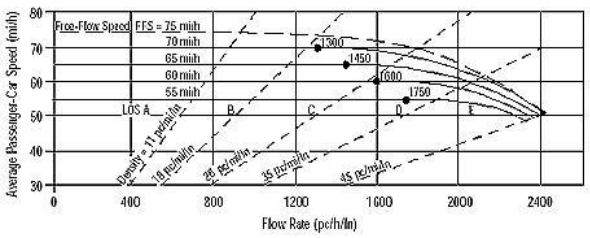
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	E/O Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2015 + Project

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	1667 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.56	I/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0	mi/h
f_{LC}	0.0	mi/h
f_{ID}	0.3	mi/h
f_N	4.5	mi/h
FFS	65.2	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	972	pc/h/ln
S	65.2	mi/h
D = v_p / S	14.9	pc/mi/ln
LOS	B	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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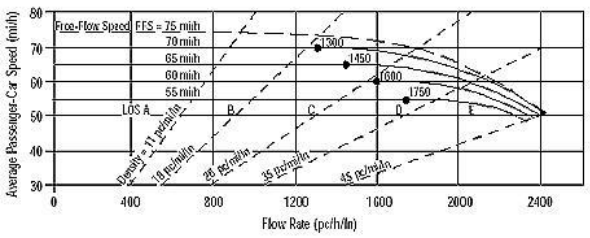

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	W/O S. Ben Maddox Way
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2015 + Project
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	3677 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	2135	pc/h/ln	Design LOS		
S	57.2	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	37.4	pc/mi/ln	S		mi/h
LOS	E		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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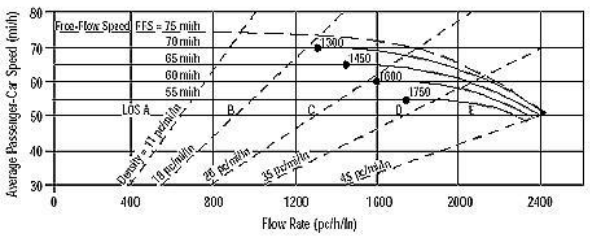
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	B/W Ben Maddox Way & Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2015 + Project
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2191 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1272	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	20.3	pc/mi/ln	S		mi/h
LOS	C		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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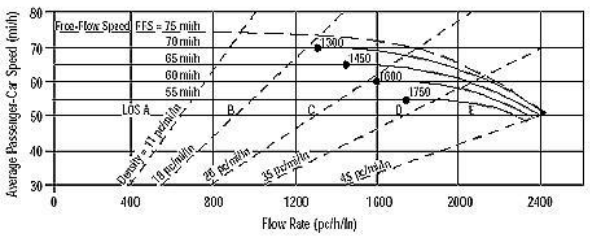
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	E/O Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2015 + Project

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	1491 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	0.56	I/mi	f_{ID}	0.3	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	65.2	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	870	pc/h/ln	Design LOS		
S	65.2	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	13.3	pc/mi/ln	S		mi/h
LOS	B		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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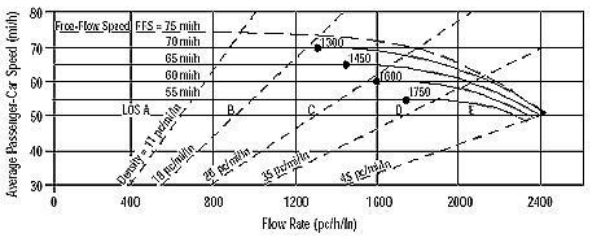
BASIC FREEWAY WORKSHEET Page 1 of 1

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	W/O S. Ben Maddox Way
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2015 + Project

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2765 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1605	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	25.7	pc/mi/ln	S		mi/h
LOS	C		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2015 + Project

Project Description

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 2500 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = 731 veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	3677	0.90	Level	9	0	0.957	1.00	4269
Ramp	750	0.90	Level	4	0	0.980	1.00	850
UpStream	731	0.90	Level	2	0	0.990	1.00	820
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 4269 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	4269	4800	No
				V_{12}	4269	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	3419	4800	No
				V_R	850	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A	D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D
D_R = (pc/ mi /ln)	D_R = 39.4 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= E (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.505 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 55.9 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 55.9 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2015 + Project

Project Description

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 2600 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = 226 veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	3153	0.90	Level	9	0	0.957	1.00	3661
Ramp	1875	0.90	Level	4	0	0.980	1.00	2125
UpStream	226	0.90	Level	2	0	0.990	1.00	254
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 3661 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	3661	4800	No
				V_{12}	3661	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	1536	4800	No
				V_R	2125	2000	Yes

Level of Service Determination (if not F)	Level of Service Determination (if not F)
D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A	D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D
D_R = (pc/ mi /ln)	D_R = 33.0 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= F (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.619 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 52.7 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 52.7 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2015 + Project

Project Description

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 3400 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = 879 veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	2191	0.90	Level	9	0	0.957	1.00	2544
Ramp	127	0.90	Level	4	0	0.980	1.00	144
UpStream	879	0.90	Level	2	0	0.990	1.00	986
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 2544 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	2544	4800	No
				V_{12}	2544	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	2400	4800	No
				V_R	144	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
D_R = (pc/ mi /ln)	D_R = 23.7 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= C (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.441 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 57.7 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 57.7 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Near-term 2015 + Project

Project Description

Inputs

Upstream Adj Ramp	Terrain	Downstream Adj Ramp
☐ Yes ☐ On		☐ Yes ☐ On
☐ No ☐ Off		☐ No ☐ Off
L_{up} = ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	1491	0.90	Level	9	0	0.957	1.00	1731
Ramp	179	0.90	Level	4	0	0.980	1.00	203
UpStream								
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 1731 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	1731	4800	No
				V_{12}	1731	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	1528	4800	No
				V_R	203	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
D_R = (pc/ mi /ln)	D_R = 17.1 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= B (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.446 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 57.5 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 57.5 mph (Exhibit 25-15)

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NEAR-TERM 2015 + PROJECT (MITIGATED) TRAFFIC CONDITIONS (INTERSECTIONS)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor					0.95	1.00	0.97	0.91	0.91	0.97	0.91	
Frt					1.00	0.85	1.00	0.96	0.85	1.00	0.97	
Flt Protected					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)					3417	1553	3367	3186	1413	3367	4840	
Flt Permitted					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)					3417	1553	3367	3186	1413	3367	4840	
Volume (vph)	0	0	0	95	205	96	217	595	678	302	307	75
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.77	0.77	0.77	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	103	223	104	282	773	881	328	334	82
RTOR Reduction (vph)	0	0	0	0	0	81	0	31	157	0	36	0
Lane Group Flow (vph)	0	0	0	0	326	23	282	1041	425	328	380	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type				Split		Perm	Prot		Perm	Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)					21.1	21.1	12.1	51.5	51.5	13.4	52.8	
Effective Green, g (s)					22.1	22.1	12.1	52.5	52.5	13.4	53.8	
Actuated g/C Ratio					0.22	0.22	0.12	0.52	0.52	0.13	0.54	
Clearance Time (s)					5.0	5.0	4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)					7.5	7.5	2.0	8.0	8.0	2.0	7.5	
Lane Grp Cap (vph)					755	343	407	1673	742	451	2604	
v/s Ratio Prot					c0.10		0.08	c0.33		c0.10	0.08	
v/s Ratio Perm						0.01			0.30			
v/c Ratio					0.43	0.07	0.69	0.62	0.57	0.73	0.15	
Uniform Delay, d1					33.5	30.8	42.2	16.8	16.1	41.5	11.6	
Progression Factor					1.00	1.00	0.91	1.44	1.98	1.00	1.00	
Incremental Delay, d2					1.5	0.3	3.2	1.4	2.5	4.9	0.1	
Delay (s)					35.1	31.1	41.4	25.4	34.4	46.5	11.7	
Level of Service					D	C	D	C	C	D	B	
Approach Delay (s)		0.0			34.1			30.4			27.0	
Approach LOS		A			C			C			C	

Intersection Summary			
HCM Average Control Delay	30.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	290	698	311	309	70	82
Peak Hour Factor	0.85	0.85	0.74	0.74	0.56	0.56
Hourly flow rate (vph)	341	821	420	418	125	146
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total (vph)	227	935	559	278	125	146
Volume Left (vph)	0	0	420	0	125	0
Volume Right (vph)	0	821	0	0	0	146
Hadj (s)	0.07	-0.55	0.44	0.07	0.57	-0.63
Departure Headway (s)	6.8	6.2	7.1	6.7	8.5	7.3
Degree Utilization, x	0.43	1.60	1.10	0.52	0.30	0.30
Capacity (veh/h)	519	590	522	530	414	480
Control Delay (s)	13.5	292.6	94.2	15.5	13.8	12.2
Approach Delay (s)	238.0		68.1		12.9	
Approach LOS	F		F		B	

Intersection Summary					
Delay	148.4				
HCM Level of Service	F				
Intersection Capacity Utilization	62.8%	ICU Level of Service		B	
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1736	1624		1736	1827	1553	1736	3471	1553	1736	3296	
Flt Permitted	0.60	1.00		0.48	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1090	1624		880	1827	1553	1736	3471	1553	1736	3296	
Volume (vph)	36	52	149	213	138	150	282	823	950	428	733	371
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.85	0.85	0.85	0.87	0.87	0.87
Adj. Flow (vph)	43	63	180	257	166	181	332	968	1118	492	843	426
RTOR Reduction (vph)	0	117	0	0	0	89	0	0	345	0	69	0
Lane Group Flow (vph)	43	126	0	257	166	92	332	968	773	492	1200	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm			Perm		Perm	Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8			2			
Actuated Green, G (s)	25.6	25.6		27.1	27.1	27.1	18.6	32.0	32.0	16.4	29.8	
Effective Green, g (s)	27.6	27.6		27.6	27.6	27.6	18.6	34.0	34.0	16.4	31.8	
Actuated g/C Ratio	0.31	0.31		0.31	0.31	0.31	0.21	0.38	0.38	0.18	0.35	
Clearance Time (s)	6.0	6.0		4.5	4.5	4.5	4.0	6.0	6.0	4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	334	498		270	560	476	359	1311	587	316	1165	
v/s Ratio Prot		0.08			0.09		0.19	0.28		c0.28	0.36	
v/s Ratio Perm	0.04			c0.29		0.06			c0.50			
v/c Ratio	0.13	0.25		0.95	0.30	0.19	0.92	0.74	1.32	1.56	1.03	
Uniform Delay, d1	22.5	23.4		30.5	23.8	23.0	35.0	24.2	28.0	36.8	29.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.91	1.26	1.78	1.00	1.00	
Incremental Delay, d2	0.2	0.3		41.6	0.3	0.2	16.1	1.7	148.2	265.7	34.5	
Delay (s)	22.7	23.7		72.1	24.1	23.2	48.0	32.1	198.0	302.5	63.6	
Level of Service	C	C		E	C	C	D	C	F	F	E	
Approach Delay (s)		23.6			44.2			111.0			130.3	
Approach LOS		C			D			F			F	

Intersection Summary			
HCM Average Control Delay	104.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	104.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	324	1106	201	405	96	11
Peak Hour Factor	0.92	0.92	0.87	0.87	0.70	0.70
Hourly flow rate (vph)	352	1202	231	466	137	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type					None	
Median storage veh)						
Upstream signal (ft)	465					
pX, platoon unblocked						
vC, conflicting volume			1554		1881	953
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1554		1881	953
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			45		0	95
cM capacity (veh/h)			420		35	311

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1554	697	153
Volume Left	0	231	137
Volume Right	1202	0	16
cSH	1700	420	38
Volume to Capacity	0.91	0.55	4.00
Queue Length 95th (ft)	0	81	Err
Control Delay (s)	0.0	19.7	Err
Lane LOS		C	F
Approach Delay (s)	0.0	19.7	Err
Approach LOS			F

Intersection Summary			
Average Delay	641.6		
Intersection Capacity Utilization	132.9%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0		4.0		4.0		4.0	4.0	
Lane Util. Factor	0.97	0.95		1.00		0.88		0.91		0.97	0.95	
Frt	1.00	0.96		1.00		0.85		0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)	3367	3347		1736		2733		4917		3367	3471	
Flt Permitted	0.95	1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)	3367	3347		1736		2733		4917		3367	3471	
Volume (vph)	136	166	52	135	0	476	0	879	92	121	281	0
Peak-hour factor, PHF	0.85	0.85	0.85	0.78	0.78	0.78	0.74	0.74	0.74	0.90	0.90	0.90
Adj. Flow (vph)	160	195	61	173	0	610	0	1188	124	134	312	0
RTOR Reduction (vph)	0	39	0	0	0	245	0	10	0	0	0	0
Lane Group Flow (vph)	160	217	0	173	0	365	0	1302	0	134	312	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot		custom				Prot		
Protected Phases	7	4		3		8		2		1	6	
Permitted Phases												
Actuated Green, G (s)	9.0	16.4		11.0		18.4		46.0		8.6	58.6	
Effective Green, g (s)	9.0	17.4		11.0		19.4		47.0		8.6	59.6	
Actuated g/C Ratio	0.09	0.17		0.11		0.19		0.47		0.09	0.60	
Clearance Time (s)	4.0	5.0		4.0		5.0		5.0		4.0	5.0	
Vehicle Extension (s)	6.5	6.5		2.0		4.5		5.5		2.0	6.0	
Lane Grp Cap (vph)	303	582		191		530		2311		290	2069	
v/s Ratio Prot	0.05	0.06		c0.10		c0.13		c0.26		c0.04	0.09	
v/s Ratio Perm												
v/c Ratio	0.53	0.37		0.91		0.69		0.56		0.46	0.15	
Uniform Delay, d1	43.5	36.5		44.0		37.5		19.1		43.5	9.0	
Progression Factor	1.00	1.00		1.00		1.00		1.00		0.89	0.86	
Incremental Delay, d2	4.6	1.3		38.8		4.3		1.0		0.4	0.2	
Delay (s)	48.1	37.8		82.8		41.8		20.1		39.2	7.9	
Level of Service	D	D		F		D		C		D	A	
Approach Delay (s)		41.7			50.9			20.1			17.3	
Approach LOS		D			D			C			B	

Intersection Summary				
HCM Average Control Delay	30.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	51.5%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	1.00	1.00		1.00	1.00		0.95	1.00
Frt	1.00	0.98		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1644	4903		1644	1827	1471		1774	1471		3352	1471
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (perm)	1644	4903		1644	1827	1471		1774	1471		3352	1471
Volume (vph)	78	272	34	64	255	17	22	15	28	151	61	349
Peak-hour factor, PHF	0.86	0.86	0.86	0.84	0.84	0.84	0.93	0.93	0.93	0.76	0.76	0.76
Adj. Flow (vph)	91	316	40	76	304	20	24	16	30	199	80	459
RTOR Reduction (vph)	0	9	0	0	0	4	0	0	27	0	0	355
Lane Group Flow (vph)	91	347	0	76	304	16	0	40	3	0	279	104
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6			3			4
Actuated Green, G (s)	7.6	34.8		7.0	34.2	34.2		6.2	6.2		18.3	18.3
Effective Green, g (s)	7.3	36.1		6.7	35.5	35.5		7.4	7.4		19.5	19.5
Actuated g/C Ratio	0.09	0.42		0.08	0.41	0.41		0.09	0.09		0.23	0.23
Clearance Time (s)	3.7	5.3		3.7	5.3	5.3		5.2	5.2		5.2	5.2
Vehicle Extension (s)	2.0	5.1		2.0	4.8	4.8		6.3	6.3		7.9	7.9
Lane Grp Cap (vph)	140	2065		129	757	609		153	127		763	335
v/s Ratio Prot	c0.06	0.07		0.05	c0.17			c0.02			c0.08	
v/s Ratio Perm						0.01			0.00			0.07
v/c Ratio	0.65	0.17		0.59	0.40	0.03		0.26	0.02		0.37	0.31
Uniform Delay, d1	38.0	15.4		38.2	17.6	14.9		36.6	35.8		27.9	27.5
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	8.0	0.2		4.4	0.7	0.0		2.8	0.2		1.3	2.2
Delay (s)	45.9	15.6		42.5	18.3	14.9		39.4	36.0		29.1	29.8
Level of Service	D	B		D	B	B		D	D		C	C
Approach Delay (s)		21.8			22.8			37.9			29.5	
Approach LOS		C			C			D			C	

Intersection Summary				
HCM Average Control Delay	26.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.40			
Actuated Cycle Length (s)	85.7	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	52.9%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	267	201	0	390	25	0	0	31	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.84	0.84	0.84	0.79	0.79	0.79	0.92	0.92	0.92
Hourly flow rate (vph)	11	281	212	0	464	30	0	0	39	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		799			328							
pX, platoon unblocked	0.96						0.96	0.96		0.96	0.96	0.96
vC, conflicting volume	494			493			887	902	246	680	993	479
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	475			493			883	898	246	668	993	459
tC, single (s)	4.2			4.2			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	95	100	100	100
cM capacity (veh/h)	1030			1053			230	265	754	315	236	534

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	NB 1
Volume Total	11	187	305	494	39
Volume Left	11	0	0	0	0
Volume Right	0	0	212	30	39
cSH	1030	1700	1700	1700	754
Volume to Capacity	0.01	0.11	0.18	0.29	0.05
Queue Length 95th (ft)	1	0	0	0	4
Control Delay (s)	8.5	0.0	0.0	0.0	10.0
Lane LOS	A				B
Approach Delay (s)	0.2			0.0	10.0
Approach LOS					B

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	25.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1553	1736	1827	1719	1538
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1827	1553	1736	1827	1719	1538
Volume (vph)	265	33	111	222	193	51
Peak-hour factor, PHF	0.86	0.86	0.81	0.81	0.78	0.78
Adj. Flow (vph)	308	38	137	274	247	65
RTOR Reduction (vph)	0	16	0	0	0	53
Lane Group Flow (vph)	308	22	137	274	247	12
Heavy Vehicles (%)	4%	4%	4%	4%	5%	5%
Turn Type		Perm	Prot			Prot
Protected Phases	2		1	6	4	4
Permitted Phases		2				
Actuated Green, G (s)	63.3	63.3	12.9	80.2	20.3	20.3
Effective Green, g (s)	65.3	65.3	12.9	82.2	20.3	20.3
Actuated g/C Ratio	0.59	0.59	0.12	0.74	0.18	0.18
Clearance Time (s)	6.0	6.0	4.0	6.0	4.0	4.0
Vehicle Extension (s)	8.0	8.0	2.0	8.0	2.4	2.4
Lane Grp Cap (vph)	1080	918	203	1359	316	283
v/s Ratio Prot	c0.17		c0.08	0.15	c0.14	0.01
v/s Ratio Perm		0.01				
v/c Ratio	0.29	0.02	0.67	0.20	0.78	0.04
Uniform Delay, d1	11.1	9.4	46.8	4.3	43.0	37.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.0	6.8	0.3	11.4	0.0
Delay (s)	11.8	9.4	53.6	4.6	54.4	37.1
Level of Service	B	A	D	A	D	D
Approach Delay (s)	11.5			20.9	50.8	
Approach LOS	B			C	D	

Intersection Summary			
HCM Average Control Delay	26.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	110.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	40.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	184	106	24	235	88	79
Peak Hour Factor	0.95	0.95	0.83	0.83	0.88	0.88
Hourly flow rate (vph)	194	112	29	283	100	90
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	744					
pX, platoon unblocked			0.96		0.96	0.96
vC, conflicting volume			305		590	249
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			277		574	219
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		78	89
cM capacity (veh/h)			1225		449	786

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	305	312	190
Volume Left	0	29	100
Volume Right	112	0	90
cSH	1700	1225	563
Volume to Capacity	0.18	0.02	0.34
Queue Length 95th (ft)	0	2	37
Control Delay (s)	0.0	0.9	14.6
Lane LOS		A	B
Approach Delay (s)	0.0	0.9	14.6
Approach LOS			B

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.95	1.00
Frt	1.00	0.92		1.00	0.87		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1672		1736	1591		1736	4963		1736	3471	1553
Flt Permitted	0.13	1.00		0.62	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	244	1672		1134	1591		1736	4963		1736	3471	1553
Volume (vph)	132	50	64	52	71	441	61	1052	36	261	802	172
Peak-hour factor, PHF	0.73	0.73	0.73	0.83	0.83	0.83	0.84	0.84	0.84	0.93	0.93	0.93
Adj. Flow (vph)	181	68	88	63	86	531	73	1252	43	281	862	185
RTOR Reduction (vph)	0	52	0	0	247	0	0	4	0	0	0	100
Lane Group Flow (vph)	181	104	0	63	370	0	73	1291	0	281	862	85
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm			Perm			Prot			Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								6
Actuated Green, G (s)	28.0	28.0		28.0	28.0		6.7	30.5		15.5	39.3	39.3
Effective Green, g (s)	30.0	30.0		30.0	30.0		6.7	32.5		15.5	41.3	41.3
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.07	0.36		0.17	0.46	0.46
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	5.8	5.8		5.8	5.8		1.5	5.8		1.5	5.8	5.8
Lane Grp Cap (vph)	81	557		378	530		129	1792		299	1593	713
v/s Ratio Prot		0.06			0.23		0.04	c0.26		c0.16	0.25	
v/s Ratio Perm	c0.74			0.06								0.05
v/c Ratio	2.23	0.19		0.17	0.70		0.57	0.72		0.94	0.54	0.12
Uniform Delay, d1	30.0	21.3		21.2	26.1		40.2	24.8		36.8	17.5	13.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.10	0.78	0.50
Incremental Delay, d2	593.2	0.4		0.6	5.8		3.4	2.5		29.7	1.0	0.3
Delay (s)	623.2	21.8		21.7	31.8		43.6	27.4		70.2	14.6	7.3
Level of Service	F	C		C	C		D	C		E	B	A
Approach Delay (s)		344.8			30.9			28.2			25.3	
Approach LOS		F			C			C			C	

Intersection Summary					
HCM Average Control Delay	56.4	HCM Level of Service		E	
HCM Volume to Capacity ratio	1.34				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	88.2%	ICU Level of Service		E	
Analysis Period (min)	15				

c Critical Lane Group

Visalia Walmart Expansion
2015 + Project (Mitigated)
11: SR-198 EB Ramps @ Lovers Lane & Lovers Lane
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0						4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95						0.91		1.00	0.95	
Frt	1.00	0.89						1.00		1.00	1.00	
Flt Protected	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (prot)	1649	1518						4971		1736	3471	
Flt Permitted	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (perm)	1649	1518						4971		1736	3471	
Volume (vph)	466	0	322	0	0	0	0	1590	35	182	913	0
Peak-hour factor, PHF	0.77	0.77	0.77	0.92	0.92	0.92	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	605	0	418	0	0	0	0	1807	40	207	1038	0
RTOR Reduction (vph)	0	103	0	0	0	0	0	2	0	0	0	0
Lane Group Flow (vph)	477	443	0	0	0	0	0	1845	0	207	1038	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	22.0	22.0						41.0		13.9	58.6	
Effective Green, g (s)	22.6	22.6						41.8		13.6	59.4	
Actuated g/C Ratio	0.25	0.25						0.46		0.15	0.66	
Clearance Time (s)	4.6	4.6						4.8		3.7	4.8	
Vehicle Extension (s)	5.0	5.0						7.4		2.0	6.2	
Lane Grp Cap (vph)	414	381						2309		262	2291	
v/s Ratio Prot	0.29	c0.29						c0.37		c0.12	0.30	
v/s Ratio Perm												
v/c Ratio	1.15	1.16						0.80		0.79	0.45	
Uniform Delay, d1	33.7	33.7						20.5		36.8	7.4	
Progression Factor	1.00	1.00						0.53		1.40	0.46	
Incremental Delay, d2	92.8	98.8						1.4		5.7	0.2	
Delay (s)	126.5	132.5						12.2		57.2	3.7	
Level of Service	F	F						B		E	A	
Approach Delay (s)		129.7			0.0			12.2			12.6	
Approach LOS		F			A			B			B	

Intersection Summary				
HCM Average Control Delay	41.5	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.90			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	74.3%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Visalia Walmart Expansion
2015 + Project (Mitigated)
12: Tulare Ave & Ben Maddox Way
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	1845	1568	1752	1845	1568	1736	3471	1553	1736	3471	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1752	1845	1568	1752	1845	1568	1736	3471	1553	1736	3471	1553
Volume (vph)	113	172	37	13	223	199	55	618	19	99	284	107
Peak-hour factor, PHF	0.73	0.73	0.73	0.83	0.83	0.83	0.78	0.78	0.78	0.92	0.92	0.92
Adj. Flow (vph)	155	236	51	16	269	240	71	792	24	108	309	116
RTOR Reduction (vph)	0	0	34	0	0	167	0	0	9	0	0	70
Lane Group Flow (vph)	155	236	17	16	269	73	71	792	15	108	309	46
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	9.1	27.9	27.9	1.2	20.0	20.0	6.1	32.5	32.5	6.7	33.1	33.1
Effective Green, g (s)	9.1	28.9	28.9	1.2	21.0	21.0	6.1	33.5	33.5	6.7	34.1	34.1
Actuated g/C Ratio	0.11	0.33	0.33	0.01	0.24	0.24	0.07	0.39	0.39	0.08	0.40	0.40
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	185	618	525	24	449	382	123	1347	603	135	1372	614
v/s Ratio Prot	c0.09	0.13		0.01	c0.15		0.04	c0.23		c0.06	0.09	
v/s Ratio Perm			0.01			0.05			0.01			0.03
v/c Ratio	0.84	0.38	0.03	0.67	0.60	0.19	0.58	0.59	0.03	0.80	0.23	0.07
Uniform Delay, d1	37.9	21.9	19.3	42.4	28.9	25.9	38.9	20.9	16.3	39.1	17.3	16.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	25.8	0.1	0.0	42.9	1.4	0.1	4.0	1.9	0.1	26.4	0.4	0.2
Delay (s)	63.7	22.0	19.3	85.3	30.4	26.0	42.9	22.8	16.4	65.5	17.7	16.5
Level of Service	E	C	B	F	C	C	D	C	B	E	B	B
Approach Delay (s)		36.3			30.0			24.2			27.1	
Approach LOS		D			C			C			C	

Intersection Summary				
HCM Average Control Delay	28.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	86.3	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	53.9%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	44	165	34	33	213	52	153	107	34	55	61	45
Peak Hour Factor	0.67	0.67	0.67	0.78	0.78	0.78	0.77	0.77	0.77	0.86	0.86	0.86
Hourly flow rate (vph)	66	246	51	42	273	67	199	139	44	64	71	52

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	363	382	382	187
Volume Left (vph)	66	42	199	64
Volume Right (vph)	51	67	44	52
Hadj (s)	0.00	-0.03	0.09	-0.05
Departure Headway (s)	7.2	7.1	7.3	7.9
Degree Utilization, x	0.73	0.76	0.77	0.41
Capacity (veh/h)	464	476	466	370
Control Delay (s)	27.0	28.9	30.9	16.2
Approach Delay (s)	27.0	28.9	30.9	16.2
Approach LOS	D	D	D	C

Intersection Summary				
Delay		27.1		
HCM Level of Service		D		
Intersection Capacity Utilization		50.4%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.85			1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1570			1845	1568	1736	3463		1736	3399	
Flt Permitted	0.75	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1385	1570			1845	1568	1736	3463		1736	3399	
Volume (vph)	10	1	84	0	6	101	47	970	15	46	693	111
Peak-hour factor, PHF	0.68	0.68	0.68	0.60	0.60	0.60	0.87	0.87	0.87	0.84	0.84	0.84
Adj. Flow (vph)	15	1	124	0	10	168	54	1115	17	55	825	132
RTOR Reduction (vph)	0	106	0	0	0	143	0	1	0	0	17	0
Lane Group Flow (vph)	15	19	0	0	10	25	54	1131	0	55	940	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	7.5	7.5			7.5	7.5	1.9	29.9		1.9	29.9	
Effective Green, g (s)	7.5	7.5			7.5	7.5	1.9	29.9		1.9	29.9	
Actuated g/C Ratio	0.15	0.15			0.15	0.15	0.04	0.58		0.04	0.58	
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	202	230			270	229	64	2018		64	1981	
v/s Ratio Prot		0.01			0.01		0.03	c0.33		c0.03	0.28	
v/s Ratio Perm	0.01					c0.02						
v/c Ratio	0.07	0.08			0.04	0.11	0.84	0.56		0.86	0.47	
Uniform Delay, d1	18.9	18.9			18.8	19.0	24.6	6.6		24.6	6.2	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2			0.1	0.2	60.7	0.4		64.6	0.2	
Delay (s)	19.1	19.1			18.9	19.2	85.2	7.0		89.2	6.4	
Level of Service	B	B			B	B	F	A		F	A	
Approach Delay (s)		19.1			19.2			10.5			10.9	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM Average Control Delay	11.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	51.3	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	47.8%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frt	1.00	1.00			0.98			0.98				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1736	1827			1790			4936				
Flt Permitted	0.95	1.00			1.00			1.00				
Satd. Flow (perm)	1736	1827			1790			4936				
Volume (vph)	31	146	0	0	46	8	70	1244	173	0	0	0
Peak-hour factor, PHF	0.83	0.83	0.83	0.68	0.68	0.68	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	37	176	0	0	68	12	80	1414	197	0	0	0
RTOR Reduction (vph)	0	0	0	0	8	0	0	12	0	0	0	0
Lane Group Flow (vph)	37	176	0	0	72	0	0	1679	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	Prot						Perm					
Protected Phases	7	4			8			2				
Permitted Phases							2					
Actuated Green, G (s)	2.9	20.8			14.2			36.5				
Effective Green, g (s)	2.6	21.0			14.4			36.7				
Actuated g/C Ratio	0.04	0.32			0.22			0.56				
Clearance Time (s)	3.7	4.2			4.2			4.2				
Vehicle Extension (s)	2.0	7.9			7.7			6.4				
Lane Grp Cap (vph)	69	584			392			2757				
v/s Ratio Prot	c0.02	c0.10			0.04							
v/s Ratio Perm								0.34				
v/c Ratio	0.54	0.30			0.18			0.61				
Uniform Delay, d1	31.0	16.8			20.9			9.7				
Progression Factor	1.00	1.00			1.00			1.00				
Incremental Delay, d2	4.0	1.2			0.9			1.0				
Delay (s)	34.9	18.1			21.8			10.7				
Level of Service	C	B			C			B				
Approach Delay (s)		21.0			21.8			10.7			0.0	
Approach LOS		C			C			B			A	

Intersection Summary				
HCM Average Control Delay	12.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	65.7	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	44.4%	ICU Level of Service	A	
Analysis Period (min)	15			

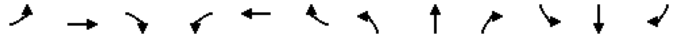
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0				
Lane Util. Factor					0.91			0.91				
Frt					0.94			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					4682			4979				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					4682			4979				
Volume (vph)	0	0	0	0	822	566	309	1031	0	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.82	0.82	0.82	0.87	0.87	0.87	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	1002	690	355	1185	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	23	0	0	19	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1669	0	0	1521	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type							Perm					
Protected Phases					8			2				
Permitted Phases							2					
Actuated Green, G (s)					25.4			30.4				
Effective Green, g (s)					26.0			31.0				
Actuated g/C Ratio					0.40			0.48				
Clearance Time (s)					4.6			4.6				
Vehicle Extension (s)					4.8			3.0				
Lane Grp Cap (vph)					1873			2375				
v/s Ratio Prot					c0.36							
v/s Ratio Perm								0.31				
v/c Ratio					1.05dr			0.64				
Uniform Delay, d1					18.2			12.8				
Progression Factor					1.00			1.00				
Incremental Delay, d2					6.2			1.3				
Delay (s)					24.3			14.1				
Level of Service					C			B				
Approach Delay (s)		0.0			24.3			14.1			0.0	
Approach LOS		A			C			B			A	

Intersection Summary				
HCM Average Control Delay	19.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	61.4%	ICU Level of Service	B	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

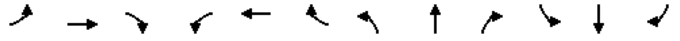
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.91						0.91				
Frt		1.00						0.98				
Flt Protected		0.98						1.00				
Satd. Flow (prot)		4888						4947				
Flt Permitted		0.98						1.00				
Satd. Flow (perm)		4888						4947				
Volume (vph)	625	912	0	0	0	0	0	715	95	0	0	0
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.82	0.82	0.82	0.92	0.92	0.92
Adj. Flow (vph)	672	981	0	0	0	0	0	872	116	0	0	0
RTOR Reduction (vph)	0	30	0	0	0	0	0	32	0	0	0	0
Lane Group Flow (vph)	0	1623	0	0	0	0	0	956	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	Perm											
Protected Phases		2						8				
Permitted Phases	2											
Actuated Green, G (s)		23.1						18.5				
Effective Green, g (s)		24.5						19.6				
Actuated g/C Ratio		0.47						0.38				
Clearance Time (s)		5.4						5.1				
Vehicle Extension (s)		2.0						5.0				
Lane Grp Cap (vph)		2299						1861				
v/s Ratio Prot								c0.19				
v/s Ratio Perm		0.33										
v/c Ratio		0.71						0.51				
Uniform Delay, d1		10.9						12.6				
Progression Factor		1.00						1.00				
Incremental Delay, d2		1.9						0.5				
Delay (s)		12.8						13.0				
Level of Service		B						B				
Approach Delay (s)		12.8			0.0			13.0			0.0	
Approach LOS		B			A			B			A	

Intersection Summary				
HCM Average Control Delay	12.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	52.1	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	57.2%	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)	20	25	0	0	35	41	3	747	6	0	0	0
Peak Hour Factor	0.60	0.60	0.60	0.83	0.83	0.83	0.78	0.78	0.78	0.92	0.92	0.92
Hourly flow rate (vph)	33	42	0	0	42	49	4	958	8	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	75	92	483	487
Volume Left (vph)	33	0	4	0
Volume Right (vph)	0	49	0	8
Hadj (s)	0.12	-0.29	0.05	0.04
Departure Headway (s)	5.9	5.5	5.0	5.0
Degree Utilization, x	0.12	0.14	0.68	0.68
Capacity (veh/h)	580	622	708	710
Control Delay (s)	9.7	9.3	16.7	16.8
Approach Delay (s)	9.7	9.3	16.8	
Approach LOS	A	A	C	

Intersection Summary				
Delay	15.7			
HCM Level of Service	C			
Intersection Capacity Utilization	36.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				4988	3433	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				4988	3433	
Volume (vph)	0	0	0	708	681	0
Peak-hour factor, PHF	0.92	0.92	0.74	0.74	0.70	0.70
Adj. Flow (vph)	0	0	0	957	973	0
RTOR Reduction (vph)	0	0	0	0	79	0
Lane Group Flow (vph)	0	0	0	957	894	0
Heavy Vehicles (%)	4%	4%	4%	4%	2%	2%
Turn Type						
Protected Phases				6	4	
Permitted Phases						
Actuated Green, G (s)				16.0	18.9	
Effective Green, g (s)				16.6	20.9	
Actuated g/C Ratio				0.36	0.46	
Clearance Time (s)				4.6	6.0	
Vehicle Extension (s)				5.0	6.0	
Lane Grp Cap (vph)				1820	1577	
v/s Ratio Prot				c0.19	c0.26	
v/s Ratio Perm						
v/c Ratio				0.53	0.57	
Uniform Delay, d1				11.4	9.0	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.5	1.0	
Delay (s)				11.9	10.0	
Level of Service				B	A	
Approach Delay (s)	0.0			11.9	10.0	
Approach LOS	A			B	A	

Intersection Summary			
HCM Average Control Delay	10.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	45.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	39.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	326	104	282	1072	582	328	416
v/c Ratio	0.43	0.25	0.69	0.63	0.65	0.73	0.16
Control Delay	34.5	7.1	45.4	26.4	19.5	51.2	10.6
Queue Delay	0.0	0.0	0.0	0.8	0.6	0.0	0.0
Total Delay	34.5	7.1	45.4	27.3	20.1	51.2	10.6
Queue Length 50th (ft)	94	0	94	278	157	104	37
Queue Length 95th (ft)	123	38	111	386	286	148	65
Internal Link Dist (ft)	719			378			1660
Turn Bay Length (ft)		275	110		40	260	
Base Capacity (vph)	1025	539	451	1703	899	513	2640
Starvation Cap Reductn	0	0	0	329	88	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.19	0.63	0.78	0.72	0.64	0.16

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	43	243	257	166	181	332	968	1118	492	1269
v/c Ratio	0.13	0.40	0.93	0.30	0.32	0.92	0.74	1.20	1.56	1.03
Control Delay	22.8	9.9	71.3	24.9	9.4	51.6	32.6	117.4	295.0	62.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	3.7	29.5	0.0	0.0
Total Delay	22.8	9.9	71.3	24.9	9.4	51.6	36.3	146.9	295.0	62.1
Queue Length 50th (ft)	17	30	138	70	21	193	212	~480	~415	~408
Queue Length 95th (ft)	38	72	#248	110	57	m#248	m277	m#724	#579	#510
Internal Link Dist (ft)		2033		385			269			731
Turn Bay Length (ft)	145		155		25	125			170	
Base Capacity (vph)	355	638	290	589	588	366	1311	931	316	1232
Starvation Cap Reductn	0	0	0	0	0	0	253	49	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.38	0.89	0.28	0.31	0.91	0.91	1.27	1.56	1.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	160	256	173	610	1312	134	312
v/c Ratio	0.53	0.41	0.91	0.79	0.57	0.46	0.15
Control Delay	50.3	30.8	90.1	26.2	21.2	43.5	8.6
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Total Delay	50.3	30.8	90.1	26.4	21.2	43.5	8.6
Queue Length 50th (ft)	51	63	111	107	208	43	50
Queue Length 95th (ft)	79	85	#187	118	234	73	87
Internal Link Dist (ft)		671			2243		378
Turn Bay Length (ft)			280			120	
Base Capacity (vph)	303	1268	191	1251	2320	290	2069
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	155	1	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.20	0.91	0.56	0.57	0.46	0.15

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	91	356	76	304	20	40	30	279	459
v/c Ratio	0.52	0.17	0.47	0.39	0.03	0.17	0.13	0.35	0.66
Control Delay	50.1	17.9	49.6	23.7	18.5	39.1	15.5	30.0	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.1	17.9	49.6	23.7	18.5	39.1	15.5	30.0	8.2
Queue Length 50th (ft)	50	45	42	127	5	20	0	71	0
Queue Length 95th (ft)	102	81	87	233	22	56	27	97	24
Internal Link Dist (ft)		179		406		179		341	
Turn Bay Length (ft)	185		150		40				110
Base Capacity (vph)	364	2151	361	793	642	516	449	1180	815
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.17	0.21	0.38	0.03	0.08	0.07	0.24	0.56

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	308	38	137	274	247	65
v/c Ratio	0.29	0.04	0.68	0.20	0.78	0.19
Control Delay	14.0	4.6	63.8	5.4	60.2	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.0	4.6	63.8	5.4	60.2	10.3
Queue Length 50th (ft)	102	0	94	50	168	0
Queue Length 95th (ft)	194	17	145	91	215	26
Internal Link Dist (ft)	248			664	309	
Turn Bay Length (ft)			200			
Base Capacity (vph)	1080	933	308	1359	430	433
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.04	0.44	0.20	0.57	0.15

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	181	156	63	617	73	1295	281	862	185
v/c Ratio	2.23	0.26	0.17	0.79	0.48	0.72	0.94	0.53	0.22
Control Delay	614.1	12.5	22.8	19.4	49.0	27.7	73.7	15.1	1.9
Queue Delay	95.4	0.0	0.0	13.0	0.0	0.2	129.6	1.4	0.7
Total Delay	709.6	12.5	22.8	32.5	49.0	27.9	203.3	16.5	2.6
Queue Length 50th (ft)	~168	31	25	126	41	230	160	147	0
Queue Length 95th (ft)	#231	53	51	217	75	257	m#246	m213	m5
Internal Link Dist (ft)		502		1058		2367		110	
Turn Bay Length (ft)	125		135		115		115		
Base Capacity (vph)	81	609	378	777	309	1793	309	1624	825
Starvation Cap Reductn	0	0	0	0	0	0	92	530	391
Spillback Cap Reductn	7	0	0	148	0	92	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	2.45	0.26	0.17	0.98	0.24	0.76	1.29	0.79	0.43

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

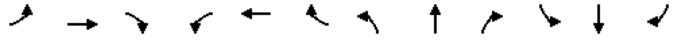
Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	477	546	1847	207	1038
v/c Ratio	1.15	1.13	0.80	0.79	0.45
Control Delay	125.9	106.9	13.7	59.1	3.7
Queue Delay	200.2	180.2	0.3	0.0	0.7
Total Delay	326.1	287.1	14.0	59.1	4.4
Queue Length 50th (ft)	~340	~316	124	125	55
Queue Length 95th (ft)	#421	#396	m209	m116	m58
Internal Link Dist (ft)		366	110		269
Turn Bay Length (ft)	232			75	
Base Capacity (vph)	414	484	2311	380	2291
Starvation Cap Reductn	0	0	109	0	827
Spillback Cap Reductn	117	129	101	0	522
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.61	1.54	0.84	0.54	0.71

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	155	236	51	16	269	240	71	792	24	108	309	116
v/c Ratio	0.79	0.36	0.09	0.15	0.68	0.47	0.47	0.56	0.04	0.65	0.21	0.16
Control Delay	68.3	23.4	7.0	44.8	39.4	8.5	48.3	22.4	11.9	57.3	18.0	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.3	23.4	7.0	44.8	39.4	8.5	48.3	22.4	11.9	57.3	18.0	4.8
Queue Length 50th (ft)	82	90	0	8	134	8	36	170	3	56	54	0
Queue Length 95th (ft)	#150	139	17	27	191	50	71	219	17	#135	99	35
Internal Link Dist (ft)		1613			1967			1346			2243	
Turn Bay Length (ft)	95		95	90		90	155		90	200		200
Base Capacity (vph)	195	711	636	171	628	680	183	1415	641	185	1441	713
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.33	0.08	0.09	0.43	0.35	0.39	0.56	0.04	0.58	0.21	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	15	125	10	168	54	1132	55	957
v/c Ratio	0.07	0.35	0.03	0.43	0.37	0.54	0.38	0.46
Control Delay	14.1	6.8	13.5	7.0	25.3	9.0	25.5	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.1	6.8	13.5	7.0	25.3	9.0	25.5	7.3
Queue Length 50th (ft)	2	0	1	0	8	47	9	35
Queue Length 95th (ft)	10	15	7	10	36	175	36	127
Internal Link Dist (ft)		2570	207			1470		2367
Turn Bay Length (ft)	100				210		290	
Base Capacity (vph)	419	562	559	592	146	2090	146	2065
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.22	0.02	0.28	0.37	0.54	0.38	0.46

Intersection Summary

Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	37	176	80	1691
v/c Ratio	0.23	0.33	0.19	0.59
Control Delay	30.2	16.1	18.2	10.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	30.2	16.1	18.2	10.6
Queue Length 50th (ft)	11	45	17	108
Queue Length 95th (ft)	35	76	40	230
Internal Link Dist (ft)		608	737	568
Turn Bay Length (ft)				
Base Capacity (vph)	440	981	634	2860
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.08	0.18	0.13	0.59

Intersection Summary

Lane Group	WBT	NBT
Lane Group Flow (vph)	1692	1540
v/c Ratio	1.05dr	0.64
Control Delay	25.6	14.0
Queue Delay	3.1	0.2
Total Delay	28.7	14.3
Queue Length 50th (ft)	216	154
Queue Length 95th (ft)	239	188
Internal Link Dist (ft)	265	310
Turn Bay Length (ft)		
Base Capacity (vph)	1896	2395
Starvation Cap Reductn	128	255
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.96	0.72

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lane Group	EBT	NBT
Lane Group Flow (vph)	1653	988
v/c Ratio	0.71	0.52
Control Delay	13.0	13.0
Queue Delay	0.0	0.0
Total Delay	13.0	13.0
Queue Length 50th (ft)	140	77
Queue Length 95th (ft)	189	96
Internal Link Dist (ft)	4045	445
Turn Bay Length (ft)		
Base Capacity (vph)	2329	1978
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.71	0.50

Intersection Summary

Lane Group	WBT	NWL
Lane Group Flow (vph)	957	973
v/c Ratio	0.53	0.59
Control Delay	13.1	9.8
Queue Delay	0.0	0.1
Total Delay	13.1	9.9
Queue Length 50th (ft)	70	73
Queue Length 95th (ft)	90	97
Internal Link Dist (ft)	3590	189
Turn Bay Length (ft)		
Base Capacity (vph)	2588	1838
Starvation Cap Reductn	0	0
Spillback Cap Reductn	211	94
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.40	0.56

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor					0.95	1.00	0.97	0.91	0.91	0.97	0.91	
Frt					1.00	0.85	1.00	0.99	0.85	1.00	0.98	
Flt Protected					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)					3459	1583	3433	3340	1441	3433	4999	
Flt Permitted					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)					3459	1583	3433	3340	1441	3433	4999	
Volume (vph)	0	0	0	180	207	123	206	745	488	283	579	74
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.94	0.86	0.86	0.86
Adj. Flow (vph)	0	0	0	196	225	134	219	793	519	329	673	86
RTOR Reduction (vph)	0	0	0	0	0	100	0	7	91	0	14	0
Lane Group Flow (vph)	0	0	0	0	421	34	219	872	342	329	745	0
Turn Type				Split		Perm	Prot		Perm	Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)					24.5	24.5	10.4	48.4	48.4	13.1	51.1	
Effective Green, g (s)					25.5	25.5	10.4	49.4	49.4	13.1	52.1	
Actuated g/C Ratio					0.26	0.26	0.10	0.49	0.49	0.13	0.52	
Clearance Time (s)					5.0	5.0	4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)					7.5	7.5	2.0	8.0	8.0	2.0	7.5	
Lane Grp Cap (vph)					882	404	357	1650	712	450	2604	
v/s Ratio Prot					c0.12		0.06	c0.26		c0.10	c0.15	
v/s Ratio Perm						0.02			0.24			
v/c Ratio					0.48	0.08	0.61	0.53	0.48	0.73	0.29	
Uniform Delay, d1					31.6	28.4	42.9	17.3	16.8	41.8	13.5	
Progression Factor					1.00	1.00	0.81	1.46	1.75	1.00	1.00	
Incremental Delay, d2					1.6	0.4	1.9	1.0	2.0	5.2	0.3	
Delay (s)					33.2	28.7	36.8	26.3	31.3	47.0	13.8	
Level of Service					C	C	D	C	C	D	B	
Approach Delay (s)		0.0			32.1			29.2			23.8	
Approach LOS		A			C			C			C	

Intersection Summary			
HCM Average Control Delay	27.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	54.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	245	439	262	366	97	30
Peak Hour Factor	0.92	0.92	0.88	0.88	0.76	0.76
Hourly flow rate (vph)	266	477	298	416	128	39

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total (vph)	178	566	436	277	128	39
Volume Left (vph)	0	0	298	0	128	0
Volume Right (vph)	0	477	0	0	0	39
Hadj (s)	0.03	-0.56	0.38	0.03	0.55	-0.65
Departure Headway (s)	6.2	5.6	6.5	6.1	8.2	7.0
Degree Utilization, x	0.31	0.88	0.78	0.47	0.29	0.08
Capacity (veh/h)	556	633	545	573	422	487
Control Delay (s)	10.7	34.6	27.8	13.3	13.3	9.3
Approach Delay (s)	28.9		22.2		12.3	
Approach LOS	D		C		B	

Intersection Summary			
Delay	24.3		
HCM Level of Service	C		
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1673		1770	1863	1583	1770	3539	1583	1770	3450	
Flt Permitted	0.64	1.00		0.14	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1183	1673		257	1863	1583	1770	3539	1583	1770	3450	
Volume (vph)	95	137	288	211	125	176	185	1203	823	315	625	126
Peak-hour factor, PHF	0.80	0.80	0.80	0.87	0.87	0.87	0.92	0.92	0.92	0.89	0.89	0.89
Adj. Flow (vph)	119	171	360	243	144	202	201	1308	895	354	702	142
RTOR Reduction (vph)	0	84	0	0	0	113	0	0	235	0	17	0
Lane Group Flow (vph)	119	447	0	243	144	89	201	1308	660	354	827	0
Turn Type	Perm			Perm		Perm	Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8			2			
Actuated Green, G (s)	27.0	27.0		28.5	28.5	28.5	14.6	32.0	32.0	15.0	32.4	
Effective Green, g (s)	29.0	29.0		29.0	29.0	29.0	14.6	34.0	34.0	15.0	34.4	
Actuated g/C Ratio	0.32	0.32		0.32	0.32	0.32	0.16	0.38	0.38	0.17	0.38	
Clearance Time (s)	6.0	6.0		4.5	4.5	4.5	4.0	6.0	6.0	4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	381	539		83	600	510	287	1337	598	295	1319	
v/s Ratio Prot		0.27			0.08		0.11	0.37		c0.20	0.24	
v/s Ratio Perm	0.10			c0.95		0.06			c0.42			
v/c Ratio	0.31	0.83		2.93	0.24	0.18	0.70	0.98	1.10	1.20	0.63	
Uniform Delay, d1	23.0	28.2		30.5	22.4	21.9	35.6	27.6	28.0	37.5	22.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.70	1.21	1.40	1.00	1.00	
Incremental Delay, d2	0.5	10.2		899.2	0.2	0.2	0.7	3.9	49.2	117.9	2.3	
Delay (s)	23.5	38.4		929.7	22.6	22.1	25.7	37.4	88.5	155.4	24.8	
Level of Service	C	D		F	C	C	C	D	F	F	C	
Approach Delay (s)		35.7			396.7			55.4			63.4	
Approach LOS		D			F			E			E	

Intersection Summary				
HCM Average Control Delay	96.3	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.80			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	103.3%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	511	763	116	354	159	20
Peak Hour Factor	0.94	0.94	0.83	0.83	0.88	0.88
Hourly flow rate (vph)	544	812	140	427	181	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type					None	
Median storage veh)						
Upstream signal (ft)	465					
pX, platoon unblocked						
vC, conflicting volume			1355		1655	949
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1355		1655	949
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			72		0	93
cM capacity (veh/h)			508		78	314

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1355	566	203
Volume Left	0	140	181
Volume Right	812	0	23
cSH	1700	508	85
Volume to Capacity	0.80	0.28	2.40
Queue Length 95th (ft)	0	28	471
Control Delay (s)	0.0	7.7	741.2
Lane LOS		A	F
Approach Delay (s)	0.0	7.7	741.2
Approach LOS			F

Intersection Summary			
Average Delay	73.0		
Intersection Capacity Utilization	117.5%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0		4.0		4.0		4.0	4.0	
Lane Util. Factor	0.97	0.95		1.00		0.88		0.91		0.97	0.95	
Frt	1.00	0.95		1.00		0.85		0.98		1.00	1.00	
Flt Protected	0.95	1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)	3433	3359		1770		2787		4967		3433	3539	
Flt Permitted	0.95	1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)	3433	3359		1770		2787		4967		3433	3539	
Volume (vph)	134	312	160	291	0	613	0	691	127	187	572	0
Peak-hour factor, PHF	0.83	0.83	0.83	0.93	0.93	0.93	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	161	376	193	313	0	659	0	727	134	203	622	0
RTOR Reduction (vph)	0	73	0	0	0	294	0	25	0	0	0	0
Lane Group Flow (vph)	161	496	0	313	0	365	0	836	0	203	622	0
Turn Type	Prot			Prot		custom				Prot		
Protected Phases	7	4		3		8		2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.0	22.4		20.2		34.6		28.5		9.9	42.4	
Effective Green, g (s)	9.0	23.4		21.2		35.6		29.5		9.9	43.4	
Actuated g/C Ratio	0.09	0.23		0.21		0.36		0.29		0.10	0.43	
Clearance Time (s)	5.0	5.0		5.0		5.0		5.0		4.0	5.0	
Vehicle Extension (s)	6.5	6.5		4.5		4.5		5.5		2.0	6.0	
Lane Grp Cap (vph)	309	786		375		992		1465		340	1536	
v/s Ratio Prot	0.05	c0.15		c0.18		0.13		c0.17		c0.06	0.18	
v/s Ratio Perm												
v/c Ratio	0.52	0.63		0.83		0.37		0.57		0.60	0.40	
Uniform Delay, d1	43.4	34.4		37.7		23.9		29.9		43.1	19.4	
Progression Factor	1.00	1.00		1.00		1.00		1.00		0.90	0.97	
Incremental Delay, d2	4.4	3.0		15.9		0.4		1.6		1.8	0.8	
Delay (s)	47.8	37.4		53.6		24.3		31.5		40.6	19.6	
Level of Service	D	D		D		C		C		D	B	
Approach Delay (s)		39.7			33.7			31.5			24.8	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM Average Control Delay	32.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	1.00	1.00		1.00	1.00		0.95	1.00
Frt	1.00	0.97		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1676	4946		1676	1863	1500		1788	1485		3394	1485
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (perm)	1676	4946		1676	1863	1500		1788	1485		3394	1485
Volume (vph)	108	416	93	116	266	47	123	71	112	209	111	430
Peak-hour factor, PHF	0.91	0.91	0.91	0.95	0.95	0.95	0.78	0.78	0.78	0.88	0.88	0.88
Adj. Flow (vph)	119	457	102	122	280	49	158	91	144	238	126	489
RTOR Reduction (vph)	0	24	0	0	0	11	0	0	113	0	0	382
Lane Group Flow (vph)	119	535	0	122	280	38	0	249	31	0	364	107
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6			3			4
Actuated Green, G (s)	12.0	33.6		12.2	33.8	33.8		22.4	22.4		21.9	21.9
Effective Green, g (s)	11.7	34.9		11.9	35.1	35.1		23.6	23.6		23.1	23.1
Actuated g/C Ratio	0.11	0.32		0.11	0.32	0.32		0.22	0.22		0.21	0.21
Clearance Time (s)	3.7	5.3		3.7	5.3	5.3		5.2	5.2		5.2	5.2
Vehicle Extension (s)	2.0	5.1		2.0	4.8	4.8		6.3	6.3		7.9	7.9
Lane Grp Cap (vph)	179	1576		182	597	481		385	320		716	313
v/s Ratio Prot	0.07	0.11		c0.07	c0.15			c0.14			c0.11	
v/s Ratio Perm						0.03			0.02			0.07
v/c Ratio	0.66	0.34		0.67	0.47	0.08		0.65	0.10		0.51	0.34
Uniform Delay, d1	47.0	28.5		46.9	29.7	25.9		39.2	34.4		38.2	36.7
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	7.0	0.6		7.4	1.1	0.1		6.3	0.4		2.4	2.7
Delay (s)	54.0	29.1		54.3	30.9	26.1		45.4	34.8		40.6	39.5
Level of Service	D	C		D	C	C		D	C		D	D
Approach Delay (s)		33.5			36.7			41.5			39.9	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM Average Control Delay	37.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	109.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	12	517	358	0	528	3	0	0	107	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.90	0.90	0.90	0.84	0.84	0.84	0.92	0.92	0.92
Hourly flow rate (vph)	13	544	377	0	587	3	0	0	127	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		799			328							
pX, platoon unblocked	0.97			0.91			0.93	0.93	0.91	0.93	0.93	0.97
vC, conflicting volume	590			921			1346	1348	461	1013	1535	588
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	575			819			1223	1225	316	865	1425	573
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	80	100	100	100
cM capacity (veh/h)	959			736			125	163	622	181	123	446

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	NB 1
Volume Total	13	363	558	590	127
Volume Left	13	0	0	0	0
Volume Right	0	0	377	3	127
cSH	959	1700	1700	1700	622
Volume to Capacity	0.01	0.21	0.33	0.35	0.20
Queue Length 95th (ft)	1	0	0	0	19
Control Delay (s)	8.8	0.0	0.0	0.0	12.3
Lane LOS	A				B
Approach Delay (s)	0.1			0.0	12.3
Approach LOS					B

Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	39.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	1863	1770	1583
Volume (vph)	556	68	158	199	332	177
Peak-hour factor, PHF	0.94	0.94	0.91	0.91	0.81	0.81
Adj. Flow (vph)	591	72	174	219	410	219
RTOR Reduction (vph)	0	43	0	0	0	162
Lane Group Flow (vph)	591	29	174	219	410	57
Turn Type		Perm	Prot			Prot
Protected Phases	2		1	6	4	4
Permitted Phases		2				
Actuated Green, G (s)	22.3	22.3	7.7	34.0	15.4	15.4
Effective Green, g (s)	24.3	24.3	7.7	36.0	15.4	15.4
Actuated g/C Ratio	0.41	0.41	0.13	0.61	0.26	0.26
Clearance Time (s)	6.0	6.0	4.0	6.0	4.0	4.0
Vehicle Extension (s)	8.0	8.0	2.0	8.0	2.4	2.4
Lane Grp Cap (vph)	762	648	229	1129	459	410
v/s Ratio Prot	c0.32		c0.10	0.12	c0.23	0.04
v/s Ratio Perm		0.02				
v/c Ratio	0.78	0.05	0.76	0.19	0.89	0.14
Uniform Delay, d1	15.2	10.6	25.0	5.2	21.2	16.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.6	0.1	12.1	0.4	19.2	0.1
Delay (s)	22.8	10.7	37.0	5.6	40.4	17.0
Level of Service	C	B	D	A	D	B
Approach Delay (s)	21.5			19.5	32.2	
Approach LOS	C			B	C	

Intersection Summary				
HCM Average Control Delay	25.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	59.4	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	66.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	475	253	21	271	95	52
Peak Hour Factor	0.92	0.92	0.85	0.85	0.92	0.92
Hourly flow rate (vph)	516	275	25	319	103	57
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	744					
pX, platoon unblocked			0.71		0.71	0.71
vC, conflicting volume			791		1022	654
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			705		1031	511
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		41	86
cM capacity (veh/h)			632		175	398

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	791	344	160
Volume Left	0	25	103
Volume Right	275	0	57
cSH	1700	632	219
Volume to Capacity	0.47	0.04	0.73
Queue Length 95th (ft)	0	3	122
Control Delay (s)	0.0	1.3	56.1
Lane LOS		A	F
Approach Delay (s)	0.0	1.3	56.1
Approach LOS			F

Intersection Summary			
Average Delay	7.3		
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.88		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1699		1770	1643		1770	5029		1770	3539	1583
Flt Permitted	0.24	1.00		0.32	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	442	1699		595	1643		1770	5029		1770	3539	1583
Volume (vph)	225	147	207	107	87	325	82	944	75	417	1271	203
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.85	0.85	0.85	0.92	0.92	0.92
Adj. Flow (vph)	242	158	223	116	95	353	96	1111	88	453	1382	221
RTOR Reduction (vph)	0	57	0	0	149	0	0	10	0	0	0	115
Lane Group Flow (vph)	242	324	0	116	299	0	96	1189	0	453	1382	106
Turn Type	Perm			Perm			Prot			Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								6
Actuated Green, G (s)	28.0	28.0		28.0	28.0		7.6	30.0		16.0	38.4	38.4
Effective Green, g (s)	30.0	30.0		30.0	30.0		7.6	32.0		16.0	40.4	40.4
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.08	0.36		0.18	0.45	0.45
Clearance Time (s)	6.0	6.0		6.0	6.0		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	5.8	5.8		5.8	5.8		1.5	5.8		1.5	5.8	5.8
Lane Grp Cap (vph)	147	566		198	548		149	1788		315	1589	711
v/s Ratio Prot		0.19			0.18		0.05	0.24		c0.26	c0.39	
v/s Ratio Perm	c0.55			0.19								0.07
v/c Ratio	1.65	0.57		0.59	0.55		0.64	0.66		1.44	0.87	0.15
Uniform Delay, d1	30.0	24.7		24.9	24.5		39.9	24.5		37.0	22.4	14.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.85	1.31	2.51
Incremental Delay, d2	319.2	2.7		7.9	2.4		7.0	2.0		198.8	0.7	0.0
Delay (s)	349.2	27.4		32.8	26.9		46.9	26.4		230.2	30.0	36.9
Level of Service	F	C		C	C		D	C		F	C	D
Approach Delay (s)		152.4			28.1			28.0			74.8	
Approach LOS		F			C			C			E	

Intersection Summary					
HCM Average Control Delay	66.3	HCM Level of Service		E	
HCM Volume to Capacity ratio	1.25				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	93.4%	ICU Level of Service		F	
Analysis Period (min)	15				
c Critical Lane Group					

Visalia Walmart Expansion
2015 + Project (Mitigated)
11: SR-198 EB Ramps @ Lovers Lane & Lovers Lane
Timing Plan: PM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0						4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95						0.91		1.00	0.95	
Frt	1.00	0.85						0.99		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1665	1490						5011		1770	3539	
Flt Permitted	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (perm)	1665	1490						5011		1770	3539	
Volume (vph)	864	0	1011	0	0	0	0	1347	146	243	881	0
Peak-hour factor, PHF	0.79	0.79	0.79	0.92	0.92	0.92	0.95	0.95	0.95	0.87	0.87	0.87
Adj. Flow (vph)	1094	0	1280	0	0	0	0	1418	154	279	1013	0
RTOR Reduction (vph)	0	109	0	0	0	0	0	14	0	0	0	0
Lane Group Flow (vph)	1094	1171	0	0	0	0	0	1558	0	279	1013	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	22.0	22.0						37.6		17.3	58.6	
Effective Green, g (s)	22.6	22.6						38.4		17.0	59.4	
Actuated g/C Ratio	0.25	0.25						0.43		0.19	0.66	
Clearance Time (s)	4.6	4.6						4.8		3.7	4.8	
Vehicle Extension (s)	5.0	5.0						7.4		2.0	6.2	
Lane Grp Cap (vph)	418	374						2138		334	2336	
v/s Ratio Prot	0.66	c0.79						c0.31		c0.16	0.29	
v/s Ratio Perm												
v/c Ratio	2.62	3.13						0.73		0.84	0.43	
Uniform Delay, d1	33.7	33.7						21.5		35.2	7.3	
Progression Factor	1.00	1.00						0.58		1.20	0.87	
Incremental Delay, d2	734.7	966.5						1.3		1.7	0.1	
Delay (s)	768.4	1000.2						13.8		43.8	6.4	
Level of Service	F	F						B		D	A	
Approach Delay (s)		893.3			0.0			13.8			14.4	
Approach LOS		F			A			B			B	

Intersection Summary				
HCM Average Control Delay	412.6	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.45			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	107.7%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

Visalia Walmart Expansion
2015 + Project (Mitigated)
12: Tulare Ave & Ben Maddox Way
Timing Plan: PM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	137	135	88	19	134	106	47	504	20	122	688	224
Peak-hour factor, PHF	0.90	0.90	0.90	0.89	0.89	0.89	0.81	0.81	0.81	0.90	0.90	0.90
Adj. Flow (vph)	152	150	98	21	151	119	58	622	25	136	764	249
RTOR Reduction (vph)	0	0	73	0	0	97	0	0	11	0	0	134
Lane Group Flow (vph)	152	150	25	21	151	22	58	622	14	136	764	115
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	9.0	20.6	20.6	2.6	14.2	14.2	4.7	33.7	33.7	8.7	37.7	37.7
Effective Green, g (s)	9.0	21.6	21.6	2.6	15.2	15.2	4.7	34.7	34.7	8.7	38.7	38.7
Actuated g/C Ratio	0.11	0.26	0.26	0.03	0.18	0.18	0.06	0.42	0.42	0.10	0.46	0.46
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	191	481	409	55	339	288	100	1469	657	184	1638	733
v/s Ratio Prot	c0.09	0.08		0.01	c0.08		0.03	0.18		c0.08	c0.22	
v/s Ratio Perm			0.02			0.01			0.01			0.07
v/c Ratio	0.80	0.31	0.06	0.38	0.45	0.08	0.58	0.42	0.02	0.74	0.47	0.16
Uniform Delay, d1	36.4	25.0	23.4	39.7	30.4	28.4	38.5	17.4	14.4	36.3	15.4	13.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.9	0.1	0.0	1.6	0.3	0.0	5.0	0.9	0.1	12.5	1.0	0.5
Delay (s)	55.3	25.1	23.4	41.3	30.8	28.4	43.5	18.2	14.5	48.9	16.3	13.5
Level of Service	E	C	C	D	C	C	D	B	B	D	B	B
Approach Delay (s)		36.2			30.6			20.2			19.6	
Approach LOS		D			C			C			B	

Intersection Summary				
HCM Average Control Delay	23.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	83.6	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	52.4%	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)	40	99	66	23	141	8	74	95	23	28	193	54
Peak Hour Factor	0.92	0.92	0.92	0.85	0.85	0.85	0.87	0.87	0.87	0.72	0.72	0.72
Hourly flow rate (vph)	43	108	72	27	166	9	85	109	26	39	268	75

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	223	202	221	382
Volume Left (vph)	43	27	85	39
Volume Right (vph)	72	9	26	75
Hadj (s)	-0.12	0.03	0.04	-0.06
Departure Headway (s)	6.0	6.2	6.0	5.6
Degree Utilization, x	0.37	0.35	0.37	0.59
Capacity (veh/h)	529	519	541	610
Control Delay (s)	12.4	12.4	12.4	16.3
Approach Delay (s)	12.4	12.4	12.4	16.3
Approach LOS	B	B	B	C

Intersection Summary				
Delay		13.8		
HCM Level of Service		B		
Intersection Capacity Utilization		51.5%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.86			1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1599			1863	1583	1770	3537		1770	3485	
Flt Permitted	0.75	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1402	1599			1863	1583	1770	3537		1770	3485	
Volume (vph)	16	5	83	0	4	52	55	939	3	108	1139	128
Peak-hour factor, PHF	0.81	0.81	0.81	0.50	0.50	0.50	0.77	0.77	0.77	0.98	0.98	0.98
Adj. Flow (vph)	20	6	102	0	8	104	71	1219	4	110	1162	131
RTOR Reduction (vph)	0	92	0	0	0	94	0	0	0	0	9	0
Lane Group Flow (vph)	20	16	0	0	8	10	71	1223	0	110	1284	0
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	5.5	5.5			5.5	5.5	3.7	36.0		5.0	37.3	
Effective Green, g (s)	5.5	5.5			5.5	5.5	3.7	36.0		5.0	37.3	
Actuated g/C Ratio	0.09	0.09			0.09	0.09	0.06	0.62		0.09	0.64	
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	132	150			175	149	112	2177		151	2222	
v/s Ratio Prot		0.01			0.00		0.04	0.35		c0.06	c0.37	
v/s Ratio Perm	c0.01					0.01						
v/c Ratio	0.15	0.10			0.05	0.07	0.63	0.56		0.73	0.58	
Uniform Delay, d1	24.4	24.2			24.1	24.2	26.7	6.6		26.1	6.1	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.3			0.1	0.2	11.2	0.3		16.1	0.4	
Delay (s)	24.9	24.6			24.2	24.3	37.9	6.9		42.1	6.4	
Level of Service	C	C			C	C	D	A		D	A	
Approach Delay (s)		24.6			24.3			8.6			9.2	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM Average Control Delay	10.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	58.5	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	56.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frt	1.00	1.00			0.97			0.99				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1752	1845			1791			5006				
Flt Permitted	0.95	1.00			1.00			1.00				
Satd. Flow (perm)	1752	1845			1791			5006				
Volume (vph)	62	150	0	0	99	27	37	1202	131	0	0	0
Peak-hour factor, PHF	0.78	0.78	0.78	0.79	0.79	0.79	0.91	0.91	0.91	0.92	0.92	0.92
Adj. Flow (vph)	79	192	0	0	125	34	41	1321	144	0	0	0
RTOR Reduction (vph)	0	0	0	0	12	0	0	10	0	0	0	0
Lane Group Flow (vph)	79	192	0	0	147	0	0	1496	0	0	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Prot						Perm					
Protected Phases	7	4			8			2				
Permitted Phases							2					
Actuated Green, G (s)	4.9	21.3			12.7			36.4				
Effective Green, g (s)	4.6	21.5			12.9			36.6				
Actuated g/C Ratio	0.07	0.33			0.20			0.55				
Clearance Time (s)	3.7	4.2			4.2			4.2				
Vehicle Extension (s)	2.0	7.9			7.7			6.4				
Lane Grp Cap (vph)	122	600			350			2772				
v/s Ratio Prot	c0.05	0.10			c0.08							
v/s Ratio Perm								0.30				
v/c Ratio	0.65	0.32			0.42			0.54				
Uniform Delay, d1	30.0	16.8			23.3			9.4				
Progression Factor	1.00	1.00			1.00			1.00				
Incremental Delay, d2	8.5	1.3			3.3			0.8				
Delay (s)	38.5	18.1			26.6			10.1				
Level of Service	D	B			C			B				
Approach Delay (s)		24.0			26.6			10.1			0.0	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM Average Control Delay	13.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	66.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0				
Lane Util. Factor					0.91			0.91				
Frt					0.95			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					4850			5037				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					4850			5037				
Volume (vph)	0	0	0	0	841	375	247	1040	0	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.86	0.86	0.86	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	895	399	287	1209	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	23	0	0	27	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1271	0	0	1469	0	0	0	0
Turn Type							Perm					
Protected Phases					8			2				
Permitted Phases							2					
Actuated Green, G (s)					22.6			30.5				
Effective Green, g (s)					23.2			31.1				
Actuated g/C Ratio					0.37			0.50				
Clearance Time (s)					4.6			4.6				
Vehicle Extension (s)					4.8			3.0				
Lane Grp Cap (vph)					1806			2514				
v/s Ratio Prot					c0.26							
v/s Ratio Perm								0.29				
v/c Ratio					0.70			0.58				
Uniform Delay, d1					16.6			11.0				
Progression Factor					1.00			1.00				
Incremental Delay, d2					1.5			1.0				
Delay (s)					18.2			12.0				
Level of Service					B			B				
Approach Delay (s)		0.0			18.2			12.0			0.0	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM Average Control Delay	14.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	62.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.91						0.91				
Frt		1.00						0.97				
Flt Protected		0.98						1.00				
Satd. Flow (prot)		5002						4956				
Flt Permitted		0.98						1.00				
Satd. Flow (perm)		5002						4956				
Volume (vph)	666	1336	0	0	0	0	0	622	127	0	0	0
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92
Adj. Flow (vph)	732	1468	0	0	0	0	0	648	132	0	0	0
RTOR Reduction (vph)	0	64	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	2136	0	0	0	0	0	772	0	0	0	0
Turn Type	Perm											
Protected Phases		2						8				
Permitted Phases	2											
Actuated Green, G (s)		23.2						16.9				
Effective Green, g (s)		24.6						18.0				
Actuated g/C Ratio		0.49						0.36				
Clearance Time (s)		5.4						5.1				
Vehicle Extension (s)		2.0						5.0				
Lane Grp Cap (vph)		2432						1763				
v/s Ratio Prot								c0.16				
v/s Ratio Perm		0.43										
v/c Ratio		0.88						0.44				
Uniform Delay, d1		11.7						12.4				
Progression Factor		1.00						1.00				
Incremental Delay, d2		4.9						0.4				
Delay (s)		16.6						12.8				
Level of Service		B						B				
Approach Delay (s)		16.6			0.0			12.8			0.0	
Approach LOS		B			A			B			A	

Intersection Summary				
HCM Average Control Delay	15.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	50.6	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	60.9%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	13	11	0	0	8	27	11	673	5	0	0	0
Peak Hour Factor	0.60	0.60	0.60	0.63	0.63	0.63	0.91	0.91	0.91	0.92	0.92	0.92
Hourly flow rate (vph)	22	18	0	0	13	43	12	740	5	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	40	56	382	375
Volume Left (vph)	22	0	12	0
Volume Right (vph)	0	43	0	5
Hadj (s)	0.14	-0.43	0.05	0.02
Departure Headway (s)	5.6	5.0	4.8	4.8
Degree Utilization, x	0.06	0.08	0.51	0.50
Capacity (veh/h)	604	671	739	743
Control Delay (s)	8.9	8.4	11.5	11.3
Approach Delay (s)	8.9	8.4	11.4	
Approach LOS	A	A	B	

Intersection Summary				
Delay	11.1			
HCM Level of Service	B			
Intersection Capacity Utilization	33.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				5085	3433	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				5085	3433	
Volume (vph)	0	0	0	732	484	0
Peak-hour factor, PHF	0.92	0.92	0.84	0.84	0.94	0.94
Adj. Flow (vph)	0	0	0	871	515	0
RTOR Reduction (vph)	0	0	0	0	117	0
Lane Group Flow (vph)	0	0	0	871	398	0
Turn Type						
Protected Phases				6	4	
Permitted Phases						
Actuated Green, G (s)				14.6	12.0	
Effective Green, g (s)				15.2	14.0	
Actuated g/C Ratio				0.41	0.38	
Clearance Time (s)				4.6	6.0	
Vehicle Extension (s)				5.0	6.0	
Lane Grp Cap (vph)				2078	1292	
v/s Ratio Prot				c0.17	c0.12	
v/s Ratio Perm						
v/c Ratio				0.42	0.31	
Uniform Delay, d1				7.8	8.2	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.3	0.4	
Delay (s)				8.1	8.6	
Level of Service				A	A	
Approach Delay (s)	0.0			8.1	8.6	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	8.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	37.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	34.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	421	134	219	879	433	329	759
v/c Ratio	0.48	0.27	0.62	0.53	0.54	0.73	0.29
Control Delay	32.8	6.1	41.3	28.0	22.0	51.7	14.3
Queue Delay	0.0	0.0	0.0	0.4	0.4	0.0	0.0
Total Delay	32.8	6.1	41.3	28.4	22.4	51.7	14.3
Queue Length 50th (ft)	118	0	72	288	184	104	92
Queue Length 95th (ft)	156	42	103	363	261	141	129
Internal Link Dist (ft)	719			378			1660
Turn Bay Length (ft)		275	110		40	260	
Base Capacity (vph)	1037	569	446	1658	803	515	2620
Starvation Cap Reductn	0	0	0	320	101	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.24	0.49	0.66	0.62	0.64	0.29

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	119	531	243	144	202	201	1308	895	354	844
v/c Ratio	0.31	0.85	2.93	0.24	0.32	0.70	0.98	1.07	1.20	0.63
Control Delay	25.8	36.7	916.3	23.8	7.4	25.9	38.1	58.9	153.1	25.2
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	67.6	21.0	0.0	0.0
Total Delay	25.8	36.8	916.3	23.8	7.4	25.9	105.7	79.9	153.1	25.2
Queue Length 50th (ft)	51	221	~241	60	14	94	325	~395	~247	195
Queue Length 95th (ft)	84	290	#334	102	58	m86	m291	m124	#409	276
Internal Link Dist (ft)		2033		385			269			731
Turn Bay Length (ft)	145		155		25	125			170	
Base Capacity (vph)	381	623	83	600	623	374	1337	833	295	1336
Starvation Cap Reductn	0	0	0	0	0	0	213	38	0	0
Spillback Cap Reductn	0	1	0	0	0	0	0	0	0	23
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.85	2.93	0.24	0.32	0.54	1.16	1.13	1.20	0.64

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	161	569	313	659	861	203	622
v/c Ratio	0.52	0.66	0.83	0.51	0.58	0.60	0.41
Control Delay	50.0	32.2	57.6	8.0	31.8	46.2	20.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.0	32.2	57.6	8.0	31.8	46.2	20.8
Queue Length 50th (ft)	51	145	190	50	166	66	155
Queue Length 95th (ft)	77	166	#326	90	227	104	223
Internal Link Dist (ft)		671			2243		378
Turn Bay Length (ft)			280			120	
Base Capacity (vph)	309	1107	389	1482	1491	342	1535
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.51	0.80	0.44	0.58	0.59	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	119	559	122	280	49	249	144	364	489
v/c Ratio	0.67	0.35	0.67	0.47	0.10	0.65	0.33	0.51	0.70
Control Delay	67.6	29.9	67.5	36.4	24.4	49.0	8.5	42.2	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.6	29.9	67.5	36.4	24.4	49.0	8.5	42.2	10.0
Queue Length 50th (ft)	81	102	83	157	16	158	0	120	3
Queue Length 95th (ft)	161	176	164	306	55	238	34	186	92
Internal Link Dist (ft)		179		406		179		341	
Turn Bay Length (ft)	185		150		40				110
Base Capacity (vph)	299	1598	299	596	491	477	502	947	763
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.35	0.41	0.47	0.10	0.52	0.29	0.38	0.64

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	591	72	174	219	410	219
v/c Ratio	0.77	0.10	0.76	0.19	0.90	0.38
Control Delay	24.7	3.9	49.1	5.9	46.8	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.7	3.9	49.1	5.9	46.8	5.3
Queue Length 50th (ft)	180	0	62	31	141	0
Queue Length 95th (ft)	#341	20	#148	57	#238	32
Internal Link Dist (ft)	248			664	309	
Turn Bay Length (ft)			200			
Base Capacity (vph)	764	691	237	1130	472	583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.10	0.73	0.19	0.87	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	242	381	116	448	96	1199	453	1382	221
v/c Ratio	1.65	0.61	0.59	0.64	0.55	0.67	1.44	0.85	0.26
Control Delay	344.9	24.2	39.1	17.2	50.4	26.4	226.9	31.1	8.3
Queue Delay	116.3	0.0	0.0	2.0	0.0	0.0	287.2	126.2	1.4
Total Delay	461.3	24.2	39.1	19.2	50.4	26.4	514.1	157.2	9.6
Queue Length 50th (ft)	~201	139	54	103	53	205	~355	412	22
Queue Length 95th (ft)	#347	235	#127	209	92	234	m#247	m282	m16
Internal Link Dist (ft)		502		1058		2367		110	
Turn Bay Length (ft)	125		135		115		115		
Base Capacity (vph)	147	623	198	696	315	1798	315	1620	837
Starvation Cap Reductn	0	0	0	0	0	0	97	540	434
Spillback Cap Reductn	20	0	0	128	0	19	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.91	0.61	0.59	0.79	0.30	0.67	2.08	1.28	0.55

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

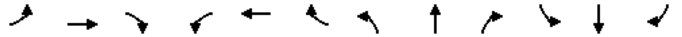
Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	1094	1280	1572	279	1013
v/c Ratio	2.62	2.65	0.73	0.84	0.43
Control Delay	753.7	765.9	14.0	44.5	6.5
Queue Delay	0.0	0.0	0.7	0.0	0.5
Total Delay	753.7	765.9	14.7	44.5	6.9
Queue Length 50th (ft)	~1113	~1257	120	145	88
Queue Length 95th (ft)	#1166	#1290	m132	m180	m94
Internal Link Dist (ft)		366	110		269
Turn Bay Length (ft)	232			75	
Base Capacity (vph)	418	483	2153	387	2336
Starvation Cap Reductn	0	0	250	0	786
Spillback Cap Reductn	129	171	6	0	724
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	3.79	4.10	0.83	0.72	0.65

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	152	150	98	21	151	119	58	622	25	136	764	249
v/c Ratio	0.76	0.30	0.20	0.17	0.51	0.34	0.39	0.42	0.04	0.70	0.44	0.28
Control Delay	60.2	26.8	7.3	39.6	36.9	8.9	42.7	17.9	8.4	55.6	16.0	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.2	26.8	7.3	39.6	36.9	8.9	42.7	17.9	8.4	55.6	16.0	3.2
Queue Length 50th (ft)	74	54	0	10	70	0	27	109	2	65	134	0
Queue Length 95th (ft)	#179	121	38	31	124	41	58	147	14	#156	213	43
Internal Link Dist (ft)		1613			1967			1346			2243	
Turn Bay Length (ft)	95		95	90		90	155		90	200		200
Base Capacity (vph)	201	678	639	181	617	603	187	1471	669	200	1721	898
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.22	0.15	0.12	0.24	0.20	0.31	0.42	0.04	0.68	0.44	0.28

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	20	108	8	104	71	1223	110	1293
v/c Ratio	0.11	0.36	0.03	0.35	0.40	0.58	0.71	0.54
Control Delay	18.0	8.7	16.8	8.0	26.3	8.7	49.8	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.0	8.7	16.8	8.0	26.3	8.7	49.8	8.9
Queue Length 50th (ft)	5	1	2	0	18	110	29	125
Queue Length 95th (ft)	16	26	6	5	41	147	#98	#224
Internal Link Dist (ft)		2570	207			1470		2367
Turn Bay Length (ft)	100				210		290	
Base Capacity (vph)	370	497	491	494	176	2156	154	2395
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.22	0.02	0.21	0.40	0.57	0.71	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	79	192	159	1506
v/c Ratio	0.41	0.30	0.37	0.51
Control Delay	34.7	14.6	21.4	12.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.7	14.6	21.4	12.3
Queue Length 50th (ft)	30	49	48	150
Queue Length 95th (ft)	61	74	85	247
Internal Link Dist (ft)		608	737	568
Turn Bay Length (ft)				
Base Capacity (vph)	454	1001	617	2954
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.17	0.19	0.26	0.51

Intersection Summary

Lane Group	WBT	NBT
Lane Group Flow (vph)	1294	1496
v/c Ratio	0.71	0.59
Control Delay	18.5	12.2
Queue Delay	0.2	0.2
Total Delay	18.7	12.4
Queue Length 50th (ft)	143	138
Queue Length 95th (ft)	187	174
Internal Link Dist (ft)	265	310
Turn Bay Length (ft)		
Base Capacity (vph)	1962	2537
Starvation Cap Reductn	150	283
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.71	0.66

Intersection Summary

Lane Group	EBT	NBT
Lane Group Flow (vph)	2200	780
v/c Ratio	0.88	0.44
Control Delay	17.9	12.9
Queue Delay	0.0	0.0
Total Delay	17.9	12.9
Queue Length 50th (ft)	196	61
Queue Length 95th (ft)	#339	87
Internal Link Dist (ft)	4045	445
Turn Bay Length (ft)		
Base Capacity (vph)	2496	1960
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.88	0.40

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	NWL
Lane Group Flow (vph)	871	515
v/c Ratio	0.42	0.37
Control Delay	8.9	6.4
Queue Delay	0.0	0.0
Total Delay	8.9	6.4
Queue Length 50th (ft)	41	22
Queue Length 95th (ft)	72	54
Internal Link Dist (ft)	3590	151
Turn Bay Length (ft)		
Base Capacity (vph)	2976	1904
Starvation Cap Reductn	0	0
Spillback Cap Reductn	32	1
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.30	0.27

Intersection Summary

LONG-TERM 2030 TRAFFIC CONDITIONS (INTERSECTION, ROADWAY SEGMENT, AND FREEWAY & RAMP SEGMENTS)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor					0.95	1.00	0.97	0.91	0.91	0.97	0.91	
Frt					1.00	0.85	1.00	0.97	0.85	1.00	0.98	
Flt Protected					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)					3395	1553	3367	3217	1413	3367	4889	
Flt Permitted					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)					3395	1553	3367	3217	1413	3367	4889	
Volume (vph)	0	0	0	198	242	96	462	586	669	302	499	75
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.77	0.77	0.77	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	215	263	104	600	761	869	328	542	82
RTOR Reduction (vph)	0	0	0	0	0	76	0	21	340	0	20	0
Lane Group Flow (vph)	0	0	0	0	478	28	600	951	318	328	604	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type				Split		Perm	Prot		Perm	Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)					25.5	25.5	16.5	47.3	47.3	13.2	44.0	
Effective Green, g (s)					26.5	26.5	16.5	48.3	48.3	13.2	45.0	
Actuated g/C Ratio					0.26	0.26	0.16	0.48	0.48	0.13	0.45	
Clearance Time (s)					5.0	5.0	4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)					7.5	7.5	2.0	8.0	8.0	2.0	7.5	
Lane Grp Cap (vph)					900	412	556	1554	682	444	2200	
v/s Ratio Prot					c0.14		c0.18	c0.30		0.10	0.12	
v/s Ratio Perm						0.02			0.22			
v/c Ratio					0.53	0.07	1.08	0.61	0.47	0.74	0.27	
Uniform Delay, d1					31.4	27.5	41.8	19.0	17.2	41.7	17.3	
Progression Factor					1.00	1.00	0.86	1.47	5.88	1.00	1.00	
Incremental Delay, d2					1.9	0.3	55.5	1.3	1.6	5.5	0.3	
Delay (s)					33.4	27.8	91.6	29.2	103.0	47.2	17.6	
Level of Service					C	C	F	C	F	D	B	
Approach Delay (s)		0.0			32.4			67.8			27.8	
Approach LOS		A			C			E			C	

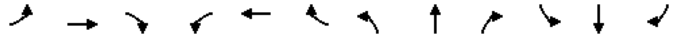
Intersection Summary				
HCM Average Control Delay	52.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	54.4%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	290	683	504	357	198	109
Peak Hour Factor	0.85	0.85	0.74	0.74	0.56	0.56
Hourly flow rate (vph)	341	804	681	482	354	195
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type					None	
Median storage veh)						
Upstream signal (ft)	799					
pX, platoon unblocked						
vC, conflicting volume			1145		2346	572
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1145		2346	572
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			0		0	57
cM capacity (veh/h)			595		0	458

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	227	917	842	322	548
Volume Left	0	0	681	0	354
Volume Right	0	804	0	0	195
cSH	1700	1700	595	1700	0
Volume to Capacity	0.13	0.54	1.15	0.19	Err
Queue Length 95th (ft)	0	0	557	0	Err
Control Delay (s)	0.0	0.0	110.6	0.0	Err
Lane LOS			F		F
Approach Delay (s)	0.0		80.0		Err
Approach LOS					F

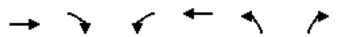
Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	81.1%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	1622		1736	1827	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1736	1622		1736	1827	1553	1736	3471	1553	1736	3471	1553
Volume (vph)	36	59	175	339	227	176	415	933	880	468	824	389
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.85	0.85	0.85	0.87	0.87	0.87
Adj. Flow (vph)	43	71	211	408	273	212	488	1098	1035	538	947	447
RTOR Reduction (vph)	0	99	0	0	0	52	0	0	360	0	0	176
Lane Group Flow (vph)	43	183	0	408	273	160	488	1098	675	538	947	271
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			6
Actuated Green, G (s)	7.0	16.7		17.0	28.2	28.2	21.0	35.3	35.3	21.0	35.3	35.3
Effective Green, g (s)	7.0	18.7		17.0	28.7	28.7	21.0	37.3	37.3	21.0	37.3	37.3
Actuated g/C Ratio	0.06	0.17		0.15	0.26	0.26	0.19	0.34	0.34	0.19	0.34	0.34
Clearance Time (s)	4.0	6.0		4.0	4.5	4.5	4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	110	276		268	477	405	331	1177	527	331	1177	527
v/s Ratio Prot	0.02	c0.11		c0.24	0.15		0.28	0.32		c0.31	0.27	
v/s Ratio Perm						0.10			c0.43			0.17
v/c Ratio	0.39	0.66		1.52	0.57	0.40	1.47	0.93	1.28	1.63	0.80	0.51
Uniform Delay, d1	49.5	42.7		46.5	35.3	33.5	44.5	35.1	36.4	44.5	33.0	29.1
Progression Factor	1.00	1.00		1.04	1.11	1.17	0.77	0.89	1.04	1.00	1.00	1.00
Incremental Delay, d2	2.3	5.9		249.9	1.3	0.5	217.3	4.3	130.3	294.9	5.9	3.5
Delay (s)	51.7	48.6		298.1	40.7	39.8	251.6	35.7	168.1	339.4	38.9	32.6
Level of Service	D	D		F	D	D	F	D	F	F	D	C
Approach Delay (s)		49.0			158.1			128.2			121.2	
Approach LOS		D			F			F			F	

Intersection Summary			
HCM Average Control Delay	126.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.28		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	104.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1553	1736	1827	1736	1553
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1827	1553	1736	1827	1736	1553
Volume (vph)	301	1106	349	569	173	16
Peak-hour factor, PHF	0.92	0.92	0.87	0.87	0.70	0.70
Adj. Flow (vph)	327	1202	401	654	247	23
RTOR Reduction (vph)	0	242	0	0	0	6
Lane Group Flow (vph)	327	960	401	654	247	17
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	55.7	55.7	25.0	84.7	16.0	16.0
Effective Green, g (s)	57.0	57.0	25.0	86.0	16.0	16.0
Actuated g/C Ratio	0.52	0.52	0.23	0.78	0.15	0.15
Clearance Time (s)	5.3	5.3	4.0	5.3	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	947	805	395	1428	253	226
v/s Ratio Prot	0.18		c0.23	0.36	c0.14	
v/s Ratio Perm		c0.62				0.01
v/c Ratio	0.35	1.19	1.02	0.46	0.98	0.08
Uniform Delay, d1	15.6	26.5	42.5	4.1	46.8	40.6
Progression Factor	0.43	0.70	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	87.7	49.2	1.1	49.5	0.1
Delay (s)	6.8	106.4	91.7	5.1	96.3	40.8
Level of Service	A	F	F	A	F	D
Approach Delay (s)	85.1			38.0	91.6	
Approach LOS	F			D	F	

Intersection Summary			
HCM Average Control Delay	68.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	94.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0		4.0		4.0		4.0	4.0	
Lane Util. Factor	0.97	0.95		1.00		0.88		0.91		0.97	0.95	
Frt	1.00	0.94		1.00		0.85		0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)	3367	3257		1736		2733		4931		3367	3471	
Flt Permitted	0.95	1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)	3367	3257		1736		2733		4931		3367	3471	
Volume (vph)	192	175	122	195	0	428	0	1097	89	106	591	0
Peak-hour factor, PHF	0.85	0.85	0.85	0.78	0.78	0.78	0.74	0.74	0.74	0.90	0.90	0.90
Adj. Flow (vph)	226	206	144	250	0	549	0	1482	120	118	657	0
RTOR Reduction (vph)	0	92	0	0	0	224	0	7	0	0	0	0
Lane Group Flow (vph)	226	258	0	250	0	325	0	1595	0	118	657	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot		custom				Prot		
Protected Phases	7	4		3		8		2		1	6	
Permitted Phases												
Actuated Green, G (s)	9.0	15.8		11.0		17.8		47.1		8.1	59.2	
Effective Green, g (s)	9.0	16.8		11.0		18.8		48.1		8.1	60.2	
Actuated g/C Ratio	0.09	0.17		0.11		0.19		0.48		0.08	0.60	
Clearance Time (s)	4.0	5.0		4.0		5.0		5.0		4.0	5.0	
Vehicle Extension (s)	6.5	6.5		2.0		4.5		5.5		2.0	6.0	
Lane Grp Cap (vph)	303	547		191		514		2372		273	2090	
v/s Ratio Prot	0.07	0.08		c0.14		c0.12		c0.32		c0.04	0.19	
v/s Ratio Perm												
v/c Ratio	0.75	0.47		1.31		0.63		0.67		0.43	0.31	
Uniform Delay, d1	44.4	37.6		44.5		37.4		19.9		43.8	9.8	
Progression Factor	1.00	1.00		1.00		1.00		1.00		0.81	0.61	
Incremental Delay, d2	13.3	2.0		171.4		3.2		1.5		0.4	0.4	
Delay (s)	57.7	39.6		215.9		40.6		21.5		35.8	6.3	
Level of Service	E	D		F		D		C		D	A	
Approach Delay (s)		46.7			95.4			21.5			10.8	
Approach LOS		D			F			C			B	

Intersection Summary				
HCM Average Control Delay	38.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	61.1%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	1.00	1.00		1.00	1.00		0.95	1.00
Frt	1.00	0.98		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1644	4893		1644	1827	1471		1780	1471		3373	1471
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (perm)	1644	4893		1644	1827	1471		1780	1471		3373	1471
Volume (vph)	94	279	40	130	267	23	22	20	32	144	104	349
Peak-hour factor, PHF	0.86	0.86	0.86	0.84	0.84	0.84	0.93	0.93	0.93	0.76	0.76	0.76
Adj. Flow (vph)	109	324	47	155	318	27	24	22	34	189	137	459
RTOR Reduction (vph)	0	12	0	0	0	5	0	0	30	0	0	357
Lane Group Flow (vph)	109	359	0	155	318	22	0	46	4	0	326	102
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6			3			4
Actuated Green, G (s)	8.9	35.0		11.1	37.2	37.2		8.7	8.7		19.7	19.7
Effective Green, g (s)	8.6	36.3		10.8	38.5	38.5		9.9	9.9		20.9	20.9
Actuated g/C Ratio	0.09	0.39		0.12	0.41	0.41		0.11	0.11		0.22	0.22
Clearance Time (s)	3.7	5.3		3.7	5.3	5.3		5.2	5.2		5.2	5.2
Vehicle Extension (s)	2.0	5.1		2.0	4.8	4.8		6.3	6.3		7.9	7.9
Lane Grp Cap (vph)	151	1892		189	749	603		188	155		751	327
v/s Ratio Prot	0.07	0.07		c0.09	c0.17			c0.03			c0.10	
v/s Ratio Perm						0.02			0.00			0.07
v/c Ratio	0.72	0.19		0.82	0.42	0.04		0.24	0.02		0.43	0.31
Uniform Delay, d1	41.5	19.1		40.6	19.8	16.6		38.6	37.7		31.4	30.5
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	13.4	0.2		22.9	0.8	0.0		2.1	0.2		1.7	2.3
Delay (s)	54.9	19.3		63.5	20.5	16.6		40.6	37.8		33.1	32.8
Level of Service	D	B		E	C	B		D	D		C	C
Approach Delay (s)		27.4			33.6			39.4			32.9	
Approach LOS		C			C			D			C	

Intersection Summary				
HCM Average Control Delay	32.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.44			
Actuated Cycle Length (s)	93.9	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	53.5%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	301	144	35	368	22	77	3	28	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.84	0.84	0.84	0.79	0.79	0.79	0.92	0.92	0.92
Hourly flow rate (vph)	11	317	152	42	438	26	97	4	35	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		799			328							
pX, platoon unblocked	0.94			0.91			0.94	0.94	0.91	0.94	0.94	0.94
vC, conflicting volume	464			468			948	961	393	986	1024	451
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	431			417			852	866	334	892	933	417
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			96			61	99	95	100	100	100
cM capacity (veh/h)	1053			1032			253	260	646	224	240	603

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	479	506	137
Volume Left	11	42	97
Volume Right	152	26	35
cSH	1053	1032	301
Volume to Capacity	0.01	0.04	0.45
Queue Length 95th (ft)	1	3	56
Control Delay (s)	0.3	1.2	26.6
Lane LOS	A	A	D
Approach Delay (s)	0.3	1.2	26.6
Approach LOS			D

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1553	1736	1827	1719	1538
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1827	1553	1736	1827	1719	1538
Volume (vph)	306	23	68	391	34	44
Peak-hour factor, PHF	0.86	0.86	0.81	0.81	0.78	0.78
Adj. Flow (vph)	356	27	84	483	44	56
RTOR Reduction (vph)	0	8	0	0	0	51
Lane Group Flow (vph)	356	19	84	483	44	5
Heavy Vehicles (%)	4%	4%	4%	4%	5%	5%
Turn Type		Perm	Prot			Prot
Protected Phases	2		1	6	4	4
Permitted Phases		2				
Actuated Green, G (s)	65.2	65.2	8.2	77.4	8.6	8.6
Effective Green, g (s)	67.2	67.2	8.2	79.4	8.6	8.6
Actuated g/C Ratio	0.70	0.70	0.09	0.83	0.09	0.09
Clearance Time (s)	6.0	6.0	4.0	6.0	4.0	4.0
Vehicle Extension (s)	8.0	8.0	2.0	8.0	2.4	2.4
Lane Grp Cap (vph)	1279	1087	148	1511	154	138
v/s Ratio Prot	0.19		c0.05	c0.26	c0.03	0.00
v/s Ratio Perm		0.01				
v/c Ratio	0.28	0.02	0.57	0.32	0.29	0.04
Uniform Delay, d1	5.4	4.4	42.2	2.0	40.8	39.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.0	3.0	0.6	0.7	0.1
Delay (s)	5.9	4.4	45.2	2.5	41.5	40.0
Level of Service	A	A	D	A	D	D
Approach Delay (s)	5.8			8.8	40.7	
Approach LOS	A			A	D	

Intersection Summary			
HCM Average Control Delay	10.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	96.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	39.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	227	149	28	374	85	79
Peak Hour Factor	0.95	0.95	0.83	0.83	0.88	0.88
Hourly flow rate (vph)	239	157	34	451	97	90
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	744					
pX, platoon unblocked			0.96		0.96	0.96
vC, conflicting volume			396		835	317
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			369		828	288
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		69	87
cM capacity (veh/h)			1129		316	718

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	396	484	186
Volume Left	0	34	97
Volume Right	157	0	90
cSH	1700	1129	432
Volume to Capacity	0.23	0.03	0.43
Queue Length 95th (ft)	0	2	53
Control Delay (s)	0.0	0.9	19.5
Lane LOS		A	C
Approach Delay (s)	0.0	0.9	19.5
Approach LOS			C

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.87		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1659		1736	1598		1736	4940		1736	3471	1553
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1736	1659		1736	1598		1736	4940		1736	3471	1553
Volume (vph)	133	50	79	86	102	511	119	1115	76	301	1022	228
Peak-hour factor, PHF	0.73	0.73	0.73	0.83	0.83	0.83	0.84	0.84	0.84	0.93	0.93	0.93
Adj. Flow (vph)	182	68	108	104	123	616	142	1327	90	324	1099	245
RTOR Reduction (vph)	0	63	0	0	164	0	0	7	0	0	0	153
Lane Group Flow (vph)	182	113	0	104	575	0	142	1410	0	324	1099	92
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	11.0	14.8		29.2	33.0		10.0	27.0		19.0	36.0	36.0
Effective Green, g (s)	11.0	16.8		29.2	35.0		10.0	29.0		19.0	38.0	38.0
Actuated g/C Ratio	0.10	0.15		0.27	0.32		0.09	0.26		0.17	0.35	0.35
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	5.8		3.0	5.8		1.5	5.8		1.5	5.8	5.8
Lane Grp Cap (vph)	174	253		461	508		158	1302		300	1199	536
v/s Ratio Prot	c0.10	0.07		0.06	c0.36		0.08	c0.29		c0.19	0.32	
v/s Ratio Perm												0.06
v/c Ratio	1.05	0.45		0.23	1.13		0.90	1.08		1.08	0.92	0.17
Uniform Delay, d1	49.5	42.4		31.6	37.5		49.5	40.5		45.5	34.5	25.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.01	0.68	0.28
Incremental Delay, d2	80.9	3.3		0.3	81.8		42.1	50.7		64.3	8.4	0.4
Delay (s)	130.4	45.7		31.8	119.3		91.6	91.2		110.1	32.0	7.3
Level of Service	F	D		C	F		F	F		F	C	A
Approach Delay (s)		88.8			108.5			91.3			43.5	
Approach LOS		F			F			F			D	

Intersection Summary					
HCM Average Control Delay	76.4	HCM Level of Service		E	
HCM Volume to Capacity ratio	1.10				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	97.5%	ICU Level of Service		F	
Analysis Period (min)	15				

c Critical Lane Group

Visalia Walmart Expansion
11: SR-198 EB Ramps @ Lovers Lane & Lovers Lane

Long-term 2030
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0						4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95						0.91		1.00	0.95	
Frt	1.00	0.87						1.00		1.00	1.00	
Flt Protected	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (prot)	1649	1495						4969		1736	3471	
Flt Permitted	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (perm)	1649	1495						4969		1736	3471	
Volume (vph)	513	0	395	0	0	0	0	1715	44	182	1156	0
Peak-hour factor, PHF	0.77	0.77	0.77	0.92	0.92	0.92	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	666	0	513	0	0	0	0	1949	50	207	1314	0
RTOR Reduction (vph)	0	31	0	0	0	0	0	2	0	0	0	0
Lane Group Flow (vph)	606	542	0	0	0	0	0	1997	0	207	1314	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	39.4	39.4						43.7		13.8	61.2	
Effective Green, g (s)	40.0	40.0						44.5		13.5	62.0	
Actuated g/C Ratio	0.36	0.36						0.40		0.12	0.56	
Clearance Time (s)	4.6	4.6						4.8		3.7	4.8	
Vehicle Extension (s)	5.0	5.0						7.4		2.0	6.2	
Lane Grp Cap (vph)	600	544						2010		213	1956	
v/s Ratio Prot	c0.37	0.36						c0.40		c0.12	0.38	
v/s Ratio Perm												
v/c Ratio	1.01	1.00						0.99		0.97	0.67	
Uniform Delay, d1	35.0	34.9						32.6		48.1	16.9	
Progression Factor	1.00	1.00						0.56		1.21	0.43	
Incremental Delay, d2	39.2	37.7						4.7		25.8	0.5	
Delay (s)	74.2	72.6						22.9		84.0	7.8	
Level of Service	E	E						C		F	A	
Approach Delay (s)		73.5			0.0			22.9			18.2	
Approach LOS		E			A			C			B	

Intersection Summary				
HCM Average Control Delay	34.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	1.00			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	80.5%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

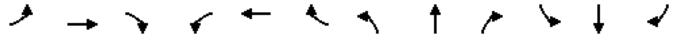
Visalia Walmart Expansion
12: Tulare Ave & Ben Maddox Way

Long-term 2030
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	1845	1568	1752	1845	1568	1736	3471	1553	1736	3471	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1752	1845	1568	1752	1845	1568	1736	3471	1553	1736	3471	1553
Volume (vph)	106	172	52	40	409	237	134	794	32	141	640	148
Peak-hour factor, PHF	0.73	0.73	0.73	0.83	0.83	0.83	0.78	0.78	0.78	0.92	0.92	0.92
Adj. Flow (vph)	145	236	71	48	493	286	172	1018	41	153	696	161
RTOR Reduction (vph)	0	0	45	0	0	98	0	0	13	0	0	107
Lane Group Flow (vph)	145	236	26	48	493	188	172	1018	28	153	696	54
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	9.0	34.2	34.2	4.7	29.9	29.9	9.0	32.1	32.1	9.0	32.1	32.1
Effective Green, g (s)	9.0	35.2	35.2	4.7	30.9	30.9	9.0	33.1	33.1	9.0	33.1	33.1
Actuated g/C Ratio	0.09	0.36	0.36	0.05	0.32	0.32	0.09	0.34	0.34	0.09	0.34	0.34
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	161	663	563	84	582	494	159	1172	525	159	1172	525
v/s Ratio Prot	c0.08	0.13		0.03	c0.27		c0.10	c0.29		0.09	0.20	
v/s Ratio Perm			0.02			0.12			0.02			0.04
v/c Ratio	0.90	0.36	0.05	0.57	0.85	0.38	1.08	0.87	0.05	0.96	0.59	0.10
Uniform Delay, d1	44.1	23.1	20.5	45.7	31.3	26.1	44.5	30.4	21.9	44.3	26.9	22.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	42.6	0.1	0.0	5.7	10.6	0.2	94.9	8.8	0.2	59.5	2.2	0.4
Delay (s)	86.6	23.2	20.5	51.4	41.9	26.3	139.4	39.2	22.1	103.8	29.1	22.7
Level of Service	F	C	C	D	D	C	F	D	C	F	C	C
Approach Delay (s)		43.1			37.1			52.7			39.4	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM Average Control Delay	44.0	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	98.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	70.5%	ICU Level of Service	C	
Analysis Period (min)	15			

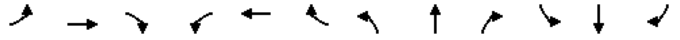
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	50	165	72	61	290	52	306	121	37	55	107	76
Peak Hour Factor	0.67	0.67	0.67	0.78	0.78	0.78	0.77	0.77	0.77	0.86	0.86	0.86
Hourly flow rate (vph)	75	246	107	78	372	67	397	157	48	64	124	88

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	428	517	603	277
Volume Left (vph)	75	78	397	64
Volume Right (vph)	107	67	48	88
Hadj (s)	-0.06	0.00	0.14	-0.09
Departure Headway (s)	8.8	8.9	9.0	9.5
Degree Utilization, x	1.05	1.27	1.51	0.73
Capacity (veh/h)	406	413	413	374
Control Delay (s)	87.7	167.3	264.1	34.0
Approach Delay (s)	87.7	167.3	264.1	34.0
Approach LOS	F	F	F	D

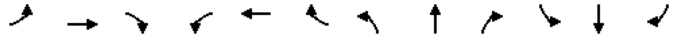
Intersection Summary				
Delay		160.3		
HCM Level of Service		F		
Intersection Capacity Utilization	76.9%	ICU Level of Service	D	
Analysis Period (min)		15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.85			1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1570			1845	1568	1736	3464		1736	3417	
Flt Permitted	0.75	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1385	1570			1845	1568	1736	3464		1736	3417	
Volume (vph)	10	1	94	0	6	104	139	1125	16	46	952	111
Peak-hour factor, PHF	0.68	0.68	0.68	0.60	0.60	0.60	0.87	0.87	0.87	0.84	0.84	0.84
Adj. Flow (vph)	15	1	138	0	10	173	160	1293	18	55	1133	132
RTOR Reduction (vph)	0	120	0	0	0	151	0	1	0	0	13	0
Lane Group Flow (vph)	15	19	0	0	10	22	160	1310	0	55	1252	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	6.1	6.1			6.1	6.1	4.1	27.5		1.7	25.1	
Effective Green, g (s)	6.1	6.1			6.1	6.1	4.1	27.5		1.7	25.1	
Actuated g/C Ratio	0.13	0.13			0.13	0.13	0.09	0.58		0.04	0.53	
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	179	202			238	202	150	2014		62	1813	
v/s Ratio Prot		0.01			0.01		c0.09	c0.38		0.03	0.37	
v/s Ratio Perm	0.01					c0.01						
v/c Ratio	0.08	0.09			0.04	0.11	1.07	0.65		0.89	0.69	
Uniform Delay, d1	18.1	18.2			18.0	18.2	21.6	6.7		22.7	8.2	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2			0.1	0.2	92.4	0.8		74.6	1.2	
Delay (s)	18.3	18.4			18.1	18.4	114.0	7.4		97.3	9.4	
Level of Service	B	B			B	B	F	A		F	A	
Approach Delay (s)		18.4			18.4			19.0			13.0	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM Average Control Delay	16.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	47.3	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	54.8%	ICU Level of Service	A	
Analysis Period (min)	15			

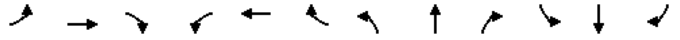
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frt	1.00	1.00			0.99			0.99				
Flt Protected	0.95	1.00			1.00			0.99				
Satd. Flow (prot)	1736	1827			1814			4924				
Flt Permitted	0.95	1.00			1.00			0.99				
Satd. Flow (perm)	1736	1827			1814			4924				
Volume (vph)	73	146	0	0	271	15	294	1334	172	0	0	0
Peak-hour factor, PHF	0.83	0.83	0.83	0.68	0.68	0.68	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	88	176	0	0	399	22	334	1516	195	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	12	0	0	0	0
Lane Group Flow (vph)	88	176	0	0	419	0	0	2033	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	Prot						Perm					
Protected Phases	7	4			8			2				
Permitted Phases							2					
Actuated Green, G (s)	6.9	33.9			23.3			31.4				
Effective Green, g (s)	6.6	34.1			23.5			31.6				
Actuated g/C Ratio	0.09	0.46			0.32			0.43				
Clearance Time (s)	3.7	4.2			4.2			4.2				
Vehicle Extension (s)	2.0	7.9			7.7			6.4				
Lane Grp Cap (vph)	155	845			578			2111				
v/s Ratio Prot	c0.05	0.10			c0.23							
v/s Ratio Perm								0.41				
v/c Ratio	0.57	0.21			0.72			0.96				
Uniform Delay, d1	32.2	11.8			22.2			20.5				
Progression Factor	1.00	1.00			1.00			1.00				
Incremental Delay, d2	2.8	0.5			7.6			12.6				
Delay (s)	35.0	12.3			29.8			33.1				
Level of Service	D	B			C			C				
Approach Delay (s)		19.9			29.8			33.1			0.0	
Approach LOS		B			C			C			A	

Intersection Summary				
HCM Average Control Delay	31.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	73.7	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	65.7%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0				
Lane Util. Factor					0.91			0.91				
Frt					0.95			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					4721			4988				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					4721			4988				
Volume (vph)	0	0	0	0	1243	686	309	1284	0	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.82	0.82	0.82	0.87	0.87	0.87	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	1516	837	355	1476	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	10	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	2343	0	0	1828	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type							Perm					
Protected Phases					8			2				
Permitted Phases							2					
Actuated Green, G (s)					25.4			30.4				
Effective Green, g (s)					26.0			31.0				
Actuated g/C Ratio					0.40			0.48				
Clearance Time (s)					4.6			4.6				
Vehicle Extension (s)					4.8			3.0				
Lane Grp Cap (vph)					1888			2379				
v/s Ratio Prot					c0.50							
v/s Ratio Perm								0.37				
v/c Ratio					1.30dr			0.77				
Uniform Delay, d1					19.5			14.0				
Progression Factor					1.00			1.00				
Incremental Delay, d2					113.2			2.5				
Delay (s)					132.7			16.5				
Level of Service					F			B				
Approach Delay (s)		0.0			132.7			16.5			0.0	
Approach LOS		A			F			B			A	

Intersection Summary				
HCM Average Control Delay	81.9	HCM Level of Service	F	
HCM Volume to Capacity ratio	0.98			
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	77.1%	ICU Level of Service	D	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.91						0.91				
Frt		1.00						0.96				
Flt Protected		0.98						1.00				
Satd. Flow (prot)		4883						4822				
Flt Permitted		0.98						1.00				
Satd. Flow (perm)		4883						4822				
Volume (vph)	741	984	0	0	0	0	0	852	336	0	0	0
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.82	0.82	0.82	0.92	0.92	0.92
Adj. Flow (vph)	797	1058	0	0	0	0	0	1039	410	0	0	0
RTOR Reduction (vph)	0	17	0	0	0	0	0	30	0	0	0	0
Lane Group Flow (vph)	0	1838	0	0	0	0	0	1419	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	Perm											
Protected Phases		2						8				
Permitted Phases	2											
Actuated Green, G (s)		23.1						20.0				
Effective Green, g (s)		24.5						21.1				
Actuated g/C Ratio		0.46						0.39				
Clearance Time (s)		5.4						5.1				
Vehicle Extension (s)		2.0						5.0				
Lane Grp Cap (vph)		2232						1898				
v/s Ratio Prot								c0.29				
v/s Ratio Perm		0.38										
v/c Ratio		0.98dl						0.75				
Uniform Delay, d1		12.7						14.0				
Progression Factor		1.00						1.00				
Incremental Delay, d2		3.6						2.0				
Delay (s)		16.3						16.0				
Level of Service		B						B				
Approach Delay (s)		16.3			0.0			16.0			0.0	
Approach LOS		B			A			B			A	

Intersection Summary				
HCM Average Control Delay	16.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	53.6	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	71.7%	ICU Level of Service	C	
Analysis Period (min)	15			

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
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)	49	26	0	0	35	41	4	973	6	0	0	0
Peak Hour Factor	0.60	0.60	0.60	0.83	0.83	0.83	0.78	0.78	0.78	0.92	0.92	0.92
Hourly flow rate (vph)	82	43	0	0	42	49	5	1247	8	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	125	92	629	631
Volume Left (vph)	82	0	5	0
Volume Right (vph)	0	49	0	8
Hadj (s)	0.16	-0.29	0.06	0.04
Departure Headway (s)	6.1	5.8	5.2	5.2
Degree Utilization, x	0.21	0.15	0.91	0.91
Capacity (veh/h)	579	611	685	687
Control Delay (s)	10.8	9.8	37.7	37.9
Approach Delay (s)	10.8	9.8	37.8	
Approach LOS	B	A	E	

Intersection Summary				
Delay	33.8			
HCM Level of Service	D			
Intersection Capacity Utilization	44.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				4988	3433	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				4988	3433	
Volume (vph)	0	0	0	1248	681	0
Peak-hour factor, PHF	0.92	0.92	0.74	0.74	0.70	0.70
Adj. Flow (vph)	0	0	0	1686	973	0
RTOR Reduction (vph)	0	0	0	0	10	0
Lane Group Flow (vph)	0	0	0	1686	963	0
Heavy Vehicles (%)	4%	4%	4%	4%	2%	2%
Turn Type						
Protected Phases				6	4	
Permitted Phases						
Actuated Green, G (s)				27.0	21.8	
Effective Green, g (s)				27.6	23.8	
Actuated g/C Ratio				0.46	0.40	
Clearance Time (s)				4.6	6.0	
Vehicle Extension (s)				5.0	6.0	
Lane Grp Cap (vph)				2318	1376	
v/s Ratio Prot				c0.34	c0.28	
v/s Ratio Perm						
v/c Ratio				0.73	0.70	
Uniform Delay, d1				12.9	14.8	
Progression Factor				1.00	1.00	
Incremental Delay, d2				1.4	2.4	
Delay (s)				14.3	17.2	
Level of Service				B	B	
Approach Delay (s)	0.0			14.3	17.2	
Approach LOS	A			B	B	

Intersection Summary			
HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	59.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	478	104	600	972	658	328	624
v/c Ratio	0.53	0.21	1.08	0.62	0.64	0.74	0.28
Control Delay	33.3	6.4	92.6	30.1	12.6	52.2	16.6
Queue Delay	0.0	0.0	0.0	0.5	0.2	0.0	0.0
Total Delay	33.3	6.4	92.6	30.6	12.8	52.2	16.6
Queue Length 50th (ft)	134	0	~236	279	103	104	83
Queue Length 95th (ft)	178	38	#296	358	240	149	110
Internal Link Dist (ft)	719			378			1660
Turn Bay Length (ft)		275	110			260	
Base Capacity (vph)	1019	539	557	1577	1023	505	2220
Starvation Cap Reductn	0	0	0	237	55	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.19	1.08	0.73	0.68	0.65	0.28

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	43	282	408	273	212	488	1098	1035	538	947	447
v/c Ratio	0.29	0.80	1.52	0.57	0.46	1.47	0.89	1.15	1.63	0.77	0.62
Control Delay	52.0	42.8	284.2	44.9	30.4	246.2	34.2	88.3	325.9	37.4	16.1
Queue Delay	0.0	0.5	0.0	0.0	0.0	8.1	34.4	68.9	0.0	0.0	0.0
Total Delay	52.0	43.3	284.2	44.9	30.4	254.2	68.5	157.2	325.9	37.4	16.1
Queue Length 50th (ft)	27	110	~411	192	100	~483	297	~628	~548	320	103
Queue Length 95th (ft)	62	179	m#511	m225	m135	m#485	m317	m#429	#725	387	201
Internal Link Dist (ft)		2033		385			269			731	
Turn Bay Length (ft)	145		155		25	125			170		
Base Capacity (vph)	154	392	268	525	496	331	1229	901	331	1229	722
Starvation Cap Reductn	0	0	0	0	0	4	202	85	0	0	0
Spillback Cap Reductn	0	12	0	0	0	0	0	108	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.74	1.52	0.52	0.43	1.49	1.07	1.31	1.63	0.77	0.62

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	327	1202	401	654	247	23
v/c Ratio	0.35	1.15	1.02	0.46	0.98	0.10
Control Delay	6.9	82.3	92.2	5.3	98.7	32.9
Queue Delay	0.8	16.8	0.0	0.0	0.0	0.0
Total Delay	7.7	99.1	92.2	5.3	98.7	32.9
Queue Length 50th (ft)	62	~830	~292	127	176	10
Queue Length 95th (ft)	m47	m74	#464	170	#222	26
Internal Link Dist (ft)	385			614	86	
Turn Bay Length (ft)						25
Base Capacity (vph)	947	1047	395	1428	253	232
Starvation Cap Reductn	355	34	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.55	1.19	1.02	0.46	0.98	0.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	226	350	250	549	1602	118	657
v/c Ratio	0.75	0.55	1.31	0.74	0.67	0.43	0.31
Control Delay	60.5	28.6	208.6	24.9	22.4	39.8	6.7
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	60.5	28.6	208.6	25.0	22.4	39.8	6.7
Queue Length 50th (ft)	73	73	~206	93	271	34	116
Queue Length 95th (ft)	#114	102	#296	109	286	67	171
Internal Link Dist (ft)		671			2243		378
Turn Bay Length (ft)			280			120	
Base Capacity (vph)	303	1274	191	1234	2379	273	2089
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	101	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.27	1.31	0.48	0.67	0.43	0.31

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

6: Noble Ave & SR-198 EB Ramps @ Ben Maddox Way

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	109	371	155	318	27	46	34	326	459
v/c Ratio	0.60	0.19	0.70	0.42	0.04	0.19	0.15	0.42	0.67
Control Delay	56.5	22.0	57.7	25.9	18.1	42.9	15.8	34.9	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.5	22.0	57.7	25.9	18.1	42.9	15.8	34.9	8.7
Queue Length 50th (ft)	64	53	91	141	7	25	0	91	0
Queue Length 95th (ft)	126	94	161	254	28	67	30	124	23
Internal Link Dist (ft)		179		406		179		341	
Turn Bay Length (ft)	185		150		40				110
Base Capacity (vph)	336	1943	344	764	620	494	432	1101	789
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.19	0.45	0.42	0.04	0.09	0.08	0.30	0.58

Intersection Summary

8: Noble Ave & Walmart East Access

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	356	27	84	483	44	56
v/c Ratio	0.27	0.02	0.51	0.32	0.24	0.26
Control Delay	7.1	2.6	47.7	2.8	40.1	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	2.6	47.7	2.8	40.1	13.9
Queue Length 50th (ft)	76	0	45	55	22	0
Queue Length 95th (ft)	127	9	80	70	48	26
Internal Link Dist (ft)	248			664	309	
Turn Bay Length (ft)			200			
Base Capacity (vph)	1306	1118	342	1564	447	441
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.02	0.25	0.31	0.10	0.13

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	182	176	104	739	142	1417	324	1099	245
v/c Ratio	1.05	0.56	0.23	1.10	0.90	1.08	1.08	0.92	0.36
Control Delay	129.6	30.8	34.8	90.5	100.3	89.4	108.3	32.7	2.0
Queue Delay	625.1	0.0	0.0	122.7	0.0	1.4	248.1	139.1	2.1
Total Delay	754.7	30.8	34.8	213.2	100.3	90.8	356.3	171.9	4.1
Queue Length 50th (ft)	~140	66	57	~470	101	~410	~257	344	13
Queue Length 95th (ft)	#205	92	103	#601	#198	#449	m#380	m#447	m15
Internal Link Dist (ft)		502		1058		2367		110	
Turn Bay Length (ft)	125		135		115		115		
Base Capacity (vph)	174	550	461	672	158	1308	300	1200	689
Starvation Cap Reductn	0	0	0	0	0	0	104	363	307
Spillback Cap Reductn	173	0	0	137	0	4	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	182.00	0.32	0.23	1.38	0.90	1.09	1.65	1.31	0.64

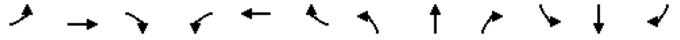
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	606	573	1999	207	1314
v/c Ratio	1.01	1.00	0.99	0.97	0.67
Control Delay	75.1	70.2	24.3	84.6	7.9
Queue Delay	55.7	196.9	100.5	0.0	1.6
Total Delay	130.8	267.2	124.8	84.6	9.5
Queue Length 50th (ft)	~455	394	186	157	192
Queue Length 95th (ft)	#534	#483	m171	m#189	m174
Internal Link Dist (ft)		366	110		269
Turn Bay Length (ft)	232			75	
Base Capacity (vph)	600	574	2012	213	1956
Starvation Cap Reductn	0	0	401	0	337
Spillback Cap Reductn	77	185	320	0	433
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.16	1.47	1.24	0.97	0.86

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

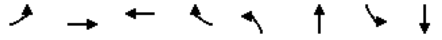


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	145	236	71	48	493	286	172	1018	41	153	696	161
v/c Ratio	0.88	0.35	0.11	0.39	0.88	0.50	1.06	0.85	0.08	0.94	0.58	0.25
Control Delay	91.0	25.4	6.4	53.4	50.4	16.1	132.0	38.7	15.2	103.4	29.1	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.0	25.4	6.4	53.4	50.4	16.1	132.0	38.7	15.2	103.4	29.1	5.1
Queue Length 50th (ft)	93	111	0	30	285	67	~125	321	10	99	194	0
Queue Length 95th (ft)	#152	142	18	60	368	122	#209	331	27	#227	254	43
Internal Link Dist (ft)		1613			1967			1346			2243	
Turn Bay Length (ft)	95		95	90		90	155		90	200		200
Base Capacity (vph)	164	674	618	155	609	613	162	1192	546	162	1192	639
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.35	0.11	0.31	0.81	0.47	1.06	0.85	0.08	0.94	0.58	0.25

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	15	139	10	173	160	1311	55	1265
v/c Ratio	0.07	0.39	0.04	0.45	1.01	0.60	0.38	0.72
Control Delay	14.7	7.2	14.0	7.3	100.9	10.7	26.8	13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	7.2	14.0	7.3	100.9	10.7	26.8	13.8
Queue Length 50th (ft)	3	0	2	0	37	60	12	112
Queue Length 95th (ft)	10	16	7	10	#124	#264	36	#232
Internal Link Dist (ft)		2570	207			1470		2367
Turn Bay Length (ft)	100				210		290	
Base Capacity (vph)	411	563	547	587	159	2189	145	1755
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.25	0.02	0.29	1.01	0.60	0.38	0.72

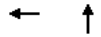
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	88	176	421	2045
v/c Ratio	0.47	0.21	0.72	0.95
Control Delay	40.4	11.8	30.5	34.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	40.4	11.8	30.5	34.4
Queue Length 50th (ft)	41	45	170	~368
Queue Length 95th (ft)	77	72	195	#503
Internal Link Dist (ft)		608	737	568
Turn Bay Length (ft)				
Base Capacity (vph)	417	1035	632	2145
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.21	0.17	0.67	0.95

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	WBT	NBT
Lane Group Flow (vph)	2353	1831
v/c Ratio	1.30dr	0.77
Control Delay	134.2	16.7
Queue Delay	32.4	0.7
Total Delay	166.7	17.4
Queue Length 50th (ft)	~438	205
Queue Length 95th (ft)	#459	247
Internal Link Dist (ft)	265	310
Turn Bay Length (ft)		
Base Capacity (vph)	1899	2381
Starvation Cap Reductn	105	232
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	1.31	0.85

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lane Group	EBT	NBT
Lane Group Flow (vph)	1855	1449
v/c Ratio	0.98dl	0.75
Control Delay	16.6	16.5
Queue Delay	0.0	0.1
Total Delay	16.6	16.6
Queue Length 50th (ft)	172	134
Queue Length 95th (ft)	230	156
Internal Link Dist (ft)	4045	445
Turn Bay Length (ft)		
Base Capacity (vph)	2249	1929
Starvation Cap Reductn	0	0
Spillback Cap Reductn	10	38
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.83	0.77

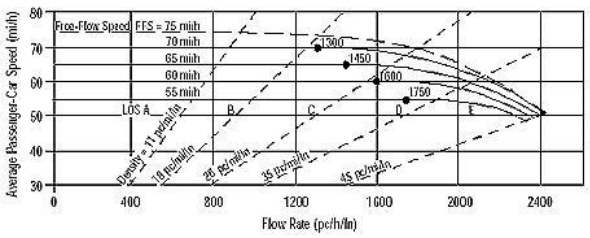
Intersection Summary

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Lane Group	WBT	NWL
Lane Group Flow (vph)	1686	973
v/c Ratio	0.73	0.70
Control Delay	15.4	18.5
Queue Delay	0.2	0.7
Total Delay	15.5	19.2
Queue Length 50th (ft)	181	157
Queue Length 95th (ft)	171	152
Internal Link Dist (ft)	3590	178
Turn Bay Length (ft)		
Base Capacity (vph)	2466	1463
Starvation Cap Reductn	0	0
Spillback Cap Reductn	153	199
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.73	0.77

Intersection Summary

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	B/W Ben Maddox Way & Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Long-term 2030
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2054 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1192	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	19.1	pc/mi/ln	S		mi/h
LOS	C		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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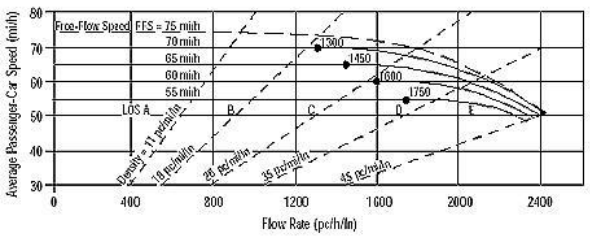
BASIC FREEWAY WORKSHEET Page 1 of 1

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	E/O Lovers Ln.
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Long-term 2030
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	1372 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	0.56	I/mi	f_{ID}	0.3	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	65.2	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	800	pc/h/ln	Design LOS		
S	65.2	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	12.3	pc/mi/ln	S		mi/h
LOS	B		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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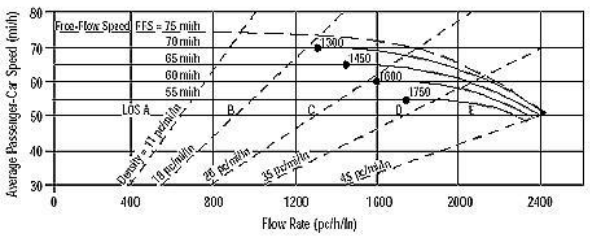
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	W/O S. Ben Maddox Way
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Long-term 2030
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2514 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1460	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	23.4	pc/mi/ln	S		mi/h
LOS	C		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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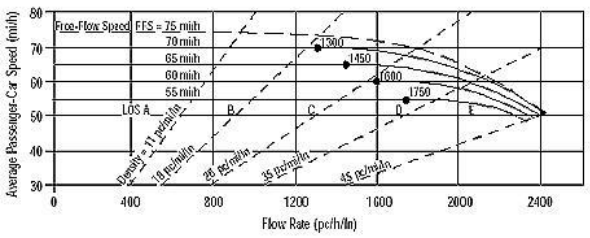
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	B/W Ben Maddox Way & Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Long-term 2030
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	3070 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1782	pc/h/ln	Design LOS		
S	62.0	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	28.8	pc/mi/ln	S		mi/h
LOS	D		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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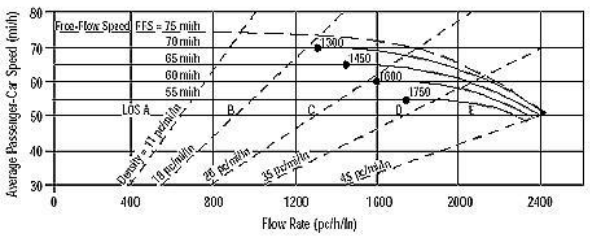

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	E/O Lovers Ln.
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Long-term 2030
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	1804 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	0.56	I/mi	f_{ID}	0.3	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	65.2	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1052	pc/h/ln	Design LOS		
S	65.2	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	16.1	pc/mi/ln	S		mi/h
LOS	B		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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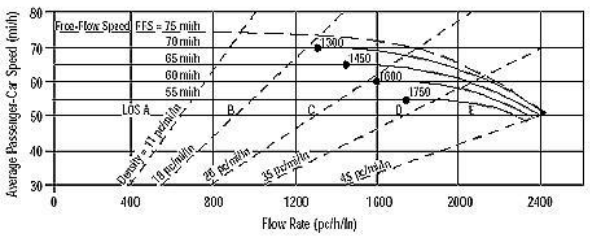

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	W/O S. Ben Maddox Way
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Long-term 2030
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	3950 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	2293	pc/h/ln	Design LOS		
S	52.8	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	43.5	pc/mi/ln	S		mi/h
LOS	E		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Long-term 2030

Project Description

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 2500 ft

Vu = 374 veh/h

Terrain Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	2514	0.90	Level	9	0	0.957	1.00	2919
Ramp	597	0.90	Level	4	0	0.980	1.00	677
UpStream	374	0.90	Level	2	0	0.990	1.00	420
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 2919 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

	Actual	Maximum	LOS F?
$V_{FI}=V_F$	2919	4800	No
V_{12}	2919	4400:All	No
$V_{FO} = V_F - V_R$	2242	4800	No
V_R	677	2000	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 27.8 (pc/ mi /ln)

LOS= C (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

D_s = 0.489 (Exhibit 25-19)

S_R= 56.3 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 56.3 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Long-term 2030

Project Description

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 2600 ft

Vu = 137 veh/h

Terrain Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	2054	0.90	Level	9	0	0.957	1.00	2385
Ramp	908	0.90	Level	4	0	0.980	1.00	1029
UpStream	137	0.90	Level	2	0	0.990	1.00	154
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 2385 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

	Actual	Maximum	LOS F?
$V_{FI}=V_F$	2385	4800	No
V_{12}	2385	4400:All	No
$V_{FO} = V_F - V_R$	1356	4800	No
V_R	1029	2000	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 22.1 (pc/ mi /ln)

LOS= C (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

D_s = 0.521 (Exhibit 25-19)

S_R= 55.4 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 55.4 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Long-term 2030

Project Description

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 3400 ft

Vu = 1455 veh/h

Terrain Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	3070	0.90	Level	9	0	0.957	1.00	3565
Ramp	307	0.90	Level	4	0	0.980	1.00	348
UpStream	1455	0.90	Level	2	0	0.990	1.00	1633
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

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

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =1.000 using Equation 0

V_{12} = 3565 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$	3565	4800	No
V_{12}	3565	4400:All	No
$V_{FO} = V_F - V_R$	3217	4800	No
V_R	348	2000	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 32.5 (pc/ mi /ln)

LOS= D (Exhibit 25-4)

Speed Estimation

D_s = 0.459 (Exhibit 25-19)

S_R= 57.1 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 57.1 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Long-term 2030

Project Description

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☐ No ☐ Off

L_{up} = ft

Vu = veh/h

Terrain

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☐ No ☐ Off

L_{down} = ft

VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	1804	0.90	Level	9	0	0.957	1.00	2095
Ramp	189	0.90	Level	4	0	0.980	1.00	214
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

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

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =1.000 using Equation 0

V_{12} = 2095 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$	2095	4800	No
V_{12}	2095	4400:All	No
$V_{FO} = V_F - V_R$	1881	4800	No
V_R	214	2000	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 20.2 (pc/ mi /ln)

LOS= C (Exhibit 25-4)

Speed Estimation

D_s = 0.447 (Exhibit 25-19)

S_R= 57.5 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 57.5 mph (Exhibit 25-15)

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor					0.95	1.00	0.97	0.91	0.91	0.97	0.91	
Frt					1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)					3483	1583	3433	3390	1441	3433	4950	
Flt Permitted					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)					3483	1583	3433	3390	1441	3433	4950	
Volume (vph)	0	0	0	205	426	162	275	938	496	383	770	166
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.94	0.86	0.86	0.86
Adj. Flow (vph)	0	0	0	223	463	176	293	998	528	445	895	193
RTOR Reduction (vph)	0	0	0	0	0	124	0	0	297	0	32	0
Lane Group Flow (vph)	0	0	0	0	686	52	293	998	231	445	1056	0
Turn Type				Split		Perm	Prot		Perm	Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)					28.6	28.6	11.6	42.8	42.8	14.6	45.8	
Effective Green, g (s)					29.6	29.6	11.6	43.8	43.8	14.6	46.8	
Actuated g/C Ratio					0.30	0.30	0.12	0.44	0.44	0.15	0.47	
Clearance Time (s)					5.0	5.0	4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)					7.5	7.5	2.0	8.0	8.0	2.0	7.5	
Lane Grp Cap (vph)					1031	469	398	1485	631	501	2317	
v/s Ratio Prot					c0.20		0.09	c0.29		c0.13	c0.21	
v/s Ratio Perm						0.03			0.16			
v/c Ratio					0.67	0.11	0.74	0.67	0.37	0.89	0.46	
Uniform Delay, d1					30.9	25.6	42.7	22.4	18.8	41.9	18.0	
Progression Factor					1.00	1.00	0.80	1.43	6.89	1.00	1.00	
Incremental Delay, d2					3.2	0.4	4.4	1.8	1.2	16.8	0.6	
Delay (s)					34.0	26.0	38.6	33.8	130.9	58.7	18.6	
Level of Service					C	C	D	C	F	E	B	
Approach Delay (s)		0.0			32.4			62.8			30.3	
Approach LOS		A			C			E			C	

Intersection Summary				
HCM Average Control Delay	44.7	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	69.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	316	485	276	512	234	67
Peak Hour Factor	0.92	0.92	0.88	0.88	0.76	0.76
Hourly flow rate (vph)	343	527	314	582	308	88
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type					None	
Median storage veh)						
Upstream signal (ft)	799					
pX, platoon unblocked						
vC, conflicting volume			871		1525	435
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			871		1525	435
tC, single (s)			4.1		6.9	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			59		0	84
cM capacity (veh/h)			770		64	566

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	229	642	508	388	396
Volume Left	0	0	314	0	308
Volume Right	0	527	0	0	88
cSH	1700	1700	770	1700	79
Volume to Capacity	0.13	0.38	0.41	0.23	4.99
Queue Length 95th (ft)	0	0	50	0	Err
Control Delay (s)	0.0	0.0	10.2	0.0	Err
Lane LOS			B		F
Approach Delay (s)	0.0		5.8		Err
Approach LOS					F

Intersection Summary				
Average Delay	1834.0			
Intersection Capacity Utilization	70.2%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1676		1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1676		1770	1863	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	95	234	468	224	190	159	210	1209	745	284	840	165
Peak-hour factor, PHF	0.80	0.80	0.80	0.87	0.87	0.87	0.92	0.92	0.92	0.89	0.89	0.89
Adj. Flow (vph)	119	292	585	257	218	183	228	1314	810	319	944	185
RTOR Reduction (vph)	0	65	0	0	0	53	0	0	289	0	0	130
Lane Group Flow (vph)	119	812	0	257	218	130	228	1314	521	319	944	56
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			6
Actuated Green, G (s)	11.7	34.0		11.0	34.8	34.8	14.0	32.0	32.0	13.0	31.0	31.0
Effective Green, g (s)	11.7	36.0		11.0	35.3	35.3	14.0	34.0	34.0	13.0	33.0	33.0
Actuated g/C Ratio	0.11	0.33		0.10	0.32	0.32	0.13	0.31	0.31	0.12	0.30	0.30
Clearance Time (s)	4.0	6.0		4.0	4.5	4.5	4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	188	549		177	598	508	225	1094	489	209	1062	475
v/s Ratio Prot	0.07	c0.48		c0.15	0.12		0.13	c0.37		c0.18	0.27	
v/s Ratio Perm						0.08			0.33			0.04
v/c Ratio	0.63	1.48		1.45	0.36	0.26	1.01	1.20	1.06	1.53	0.89	0.12
Uniform Delay, d1	47.1	37.0		49.5	28.7	27.6	48.0	38.0	38.0	48.5	36.8	27.9
Progression Factor	1.00	1.00		0.97	0.83	0.71	1.06	0.97	0.98	1.00	1.00	1.00
Incremental Delay, d2	6.8	225.1		229.6	0.3	0.2	21.4	91.4	33.7	259.6	11.1	0.5
Delay (s)	53.9	262.1		277.4	24.2	19.9	72.2	128.3	70.8	308.1	47.8	28.4
Level of Service	D	F		F	C	B	E	F	E	F	D	C
Approach Delay (s)		237.2			121.9			103.1			102.7	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	129.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.27		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	115.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	1863	1752	1568
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	1863	1752	1568
Volume (vph)	476	787	258	397	176	27
Peak-hour factor, PHF	0.94	0.94	0.83	0.83	0.88	0.88
Adj. Flow (vph)	506	837	311	478	200	31
RTOR Reduction (vph)	0	281	0	0	0	11
Lane Group Flow (vph)	506	556	311	478	200	20
Heavy Vehicles (%)	2%	2%	2%	2%	3%	3%
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	56.7	56.7	23.2	83.9	16.8	16.8
Effective Green, g (s)	58.0	58.0	23.2	85.2	16.8	16.8
Actuated g/C Ratio	0.53	0.53	0.21	0.77	0.15	0.15
Clearance Time (s)	5.3	5.3	4.0	5.3	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	982	835	373	1443	268	239
v/s Ratio Prot	0.27		c0.18	0.26	c0.11	
v/s Ratio Perm		c0.35				0.01
v/c Ratio	0.52	0.67	0.83	0.33	0.75	0.08
Uniform Delay, d1	16.9	18.9	41.6	3.8	44.6	40.0
Progression Factor	0.85	0.75	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.4	14.7	0.6	10.8	0.2
Delay (s)	14.5	14.6	56.3	4.4	55.3	40.1
Level of Service	B	B	E	A	E	D
Approach Delay (s)	14.6			24.8	53.3	
Approach LOS	B			C	D	

Intersection Summary			
HCM Average Control Delay	21.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0		4.0		4.0		4.0	4.0	
Lane Util. Factor	0.97	0.95		1.00		0.88		0.91		0.97	0.95	
Frt	1.00	0.93		1.00		0.85		0.97		1.00	1.00	
Flt Protected	0.95	1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)	3433	3280		1770		2787		4948		3433	3539	
Flt Permitted	0.95	1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)	3433	3280		1770		2787		4948		3433	3539	
Volume (vph)	193	524	501	282	0	596	0	920	201	184	791	0
Peak-hour factor, PHF	0.83	0.83	0.83	0.93	0.93	0.93	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	233	631	604	303	0	641	0	968	212	200	860	0
RTOR Reduction (vph)	0	34	0	0	0	176	0	35	0	0	0	0
Lane Group Flow (vph)	233	1201	0	303	0	465	0	1145	0	200	860	0
Turn Type	Prot			Prot		custom				Prot		
Protected Phases	7	4		3		8		2		1	6	
Permitted Phases												
Actuated Green, G (s)	9.0	36.0		11.0		38.0		29.0		6.0	39.0	
Effective Green, g (s)	9.0	37.0		11.0		39.0		30.0		6.0	40.0	
Actuated g/C Ratio	0.09	0.37		0.11		0.39		0.30		0.06	0.40	
Clearance Time (s)	4.0	5.0		4.0		5.0		5.0		4.0	5.0	
Vehicle Extension (s)	6.5	6.5		2.0		4.5		5.5		2.0	6.0	
Lane Grp Cap (vph)	309	1214		195		1087		1484		206	1416	
v/s Ratio Prot	0.07	c0.37		c0.17		0.17		c0.23		c0.06	0.24	
v/s Ratio Perm												
v/c Ratio	0.75	0.99		1.55		0.43		0.77		0.97	0.61	
Uniform Delay, d1	44.4	31.3		44.5		22.3		31.9		46.9	23.8	
Progression Factor	1.00	1.00		1.00		1.00		1.00		0.81	0.93	
Incremental Delay, d2	13.5	23.3		272.9		0.5		3.9		50.1	1.7	
Delay (s)	57.9	54.6		317.4		22.8		35.8		87.9	23.9	
Level of Service	E	D		F		C		D		F	C	
Approach Delay (s)		55.1			117.4			35.8			35.9	
Approach LOS		E			F			D			D	

Intersection Summary			
HCM Average Control Delay	58.5	HCM Level of Service	E
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	1.00	1.00		1.00	1.00		0.95	1.00
Frt	1.00	0.96		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98	1.00		0.97	1.00
Satd. Flow (prot)	1676	4900		1676	1863	1500		1802	1485		3408	1485
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98	1.00		0.97	1.00
Satd. Flow (perm)	1676	4900		1676	1863	1500		1802	1485		3408	1485
Volume (vph)	191	563	181	178	233	69	123	134	142	212	163	430
Peak-hour factor, PHF	0.91	0.91	0.91	0.95	0.95	0.95	0.78	0.78	0.78	0.88	0.88	0.88
Adj. Flow (vph)	210	619	199	187	245	73	158	172	182	241	185	489
RTOR Reduction (vph)	0	41	0	0	0	20	0	0	140	0	0	327
Lane Group Flow (vph)	210	777	0	187	245	53	0	330	42	0	426	162
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6			3			4
Actuated Green, G (s)	18.0	33.4		16.8	32.2	32.2		26.8	26.8		24.6	24.6
Effective Green, g (s)	17.7	34.7		16.5	33.5	33.5		28.0	28.0		25.8	25.8
Actuated g/C Ratio	0.15	0.29		0.14	0.28	0.28		0.23	0.23		0.21	0.21
Clearance Time (s)	3.7	5.3		3.7	5.3	5.3		5.2	5.2		5.2	5.2
Vehicle Extension (s)	2.0	5.1		2.0	4.8	4.8		6.3	6.3		7.9	7.9
Lane Grp Cap (vph)	245	1405		229	516	415		417	344		727	317
v/s Ratio Prot	c0.13	c0.16		0.11	0.13			c0.18			c0.12	
v/s Ratio Perm						0.04			0.03			0.11
v/c Ratio	0.86	0.55		0.82	0.47	0.13		0.79	0.12		0.59	0.51
Uniform Delay, d1	50.4	36.6		50.8	36.4	32.8		43.8	36.8		42.8	42.0
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	23.6	1.6		18.8	1.3	0.3		12.1	0.5		3.1	5.4
Delay (s)	74.0	38.1		69.5	37.8	33.1		55.8	37.3		45.9	47.4
Level of Service	E	D		E	D	C		E	D		D	D
Approach Delay (s)		45.5			48.9			49.2			46.7	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	47.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	121.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	12	618	287	33	394	0	158	3	56	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.90	0.90	0.90	0.84	0.84	0.84	0.92	0.92	0.92
Hourly flow rate (vph)	13	651	302	37	438	0	188	4	67	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		799			328							
pX, platoon unblocked	0.96			0.80			0.82	0.82	0.80	0.82	0.82	0.96
vC, conflicting volume	438			953			1338	1338	802	1406	1489	438
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	411			941			1330	1330	751	1414	1515	411
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			94			0	97	80	100	100	100
cM capacity (veh/h)	1096			581			102	117	327	69	91	612

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	965	474	258
Volume Left	13	37	188
Volume Right	302	0	67
cSH	1096	581	124
Volume to Capacity	0.01	0.06	2.08
Queue Length 95th (ft)	1	5	533
Control Delay (s)	0.3	1.8	571.4
Lane LOS	A	A	F
Approach Delay (s)	0.3	1.8	571.4
Approach LOS			F

Intersection Summary				
Average Delay	87.6			
Intersection Capacity Utilization	72.1%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	1863	1770	1583
Volume (vph)	619	55	115	299	128	165
Peak-hour factor, PHF	0.94	0.94	0.91	0.91	0.81	0.81
Adj. Flow (vph)	659	59	126	329	158	204
RTOR Reduction (vph)	0	22	0	0	0	175
Lane Group Flow (vph)	659	37	126	329	158	29
Turn Type		Perm	Prot			Prot
Protected Phases	2		1	6	4	4
Permitted Phases		2				
Actuated Green, G (s)	55.3	55.3	10.9	70.2	13.5	13.5
Effective Green, g (s)	57.3	57.3	10.9	72.2	13.5	13.5
Actuated g/C Ratio	0.61	0.61	0.12	0.77	0.14	0.14
Clearance Time (s)	6.0	6.0	4.0	6.0	4.0	4.0
Vehicle Extension (s)	8.0	8.0	2.0	8.0	2.4	2.4
Lane Grp Cap (vph)	1139	968	206	1436	255	228
v/s Ratio Prot	c0.35		c0.07	0.18	c0.09	0.02
v/s Ratio Perm		0.02				
v/c Ratio	0.58	0.04	0.61	0.23	0.62	0.13
Uniform Delay, d1	10.9	7.2	39.4	3.0	37.7	35.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	0.1	3.7	0.4	3.7	0.2
Delay (s)	13.1	7.3	43.1	3.4	41.4	35.1
Level of Service	B	A	D	A	D	D
Approach Delay (s)	12.6			14.4	37.9	
Approach LOS	B			B	D	

Intersection Summary				
HCM Average Control Delay	19.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	93.7	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	57.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	583	330	45	269	145	52
Peak Hour Factor	0.92	0.92	0.85	0.85	0.92	0.92
Hourly flow rate (vph)	634	359	53	316	158	57
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	744					
pX, platoon unblocked			0.76		0.76	0.76
vC, conflicting volume			992		1235	813
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			990		1308	756
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			90		0	82
cM capacity (veh/h)			534		121	312

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	992	369	214
Volume Left	0	53	158
Volume Right	359	0	57
cSH	1700	534	145
Volume to Capacity	0.58	0.10	1.48
Queue Length 95th (ft)	0	8	358
Control Delay (s)	0.0	3.1	306.5
Lane LOS		A	F
Approach Delay (s)	0.0	3.1	306.5
Approach LOS			F

Intersection Summary			
Average Delay		42.4	
Intersection Capacity Utilization		70.2%	ICU Level of Service C
Analysis Period (min)		15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.95	1.00
Frt	1.00	0.93		1.00	0.88		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1725		1770	1645		1770	5041		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1725		1770	1645		1770	5041		1770	3539	1583
Volume (vph)	237	213	207	109	103	365	78	961	59	617	1372	230
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.85	0.85	0.85	0.92	0.92	0.92
Adj. Flow (vph)	255	229	223	118	112	397	92	1131	69	671	1491	250
RTOR Reduction (vph)	0	32	0	0	116	0	0	6	0	0	0	115
Lane Group Flow (vph)	255	420	0	118	393	0	92	1194	0	671	1491	135
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	13.0	23.3		9.7	20.0		6.0	24.0		33.0	51.0	51.0
Effective Green, g (s)	13.0	25.3		9.7	22.0		6.0	26.0		33.0	53.0	53.0
Actuated g/C Ratio	0.12	0.23		0.09	0.20		0.05	0.24		0.30	0.48	0.48
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	5.8		3.0	5.8		1.5	5.8		1.5	5.8	5.8
Lane Grp Cap (vph)	209	397		156	329		97	1192		531	1705	763
v/s Ratio Prot	0.14	c0.24		0.07	c0.24		0.05	c0.24		c0.38	0.42	
v/s Ratio Perm												0.09
v/c Ratio	1.22	1.06		0.76	1.19		0.95	1.00		1.26	0.87	0.18
Uniform Delay, d1	48.5	42.4		49.0	44.0		51.8	42.0		38.5	25.5	16.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.99	0.84	0.76
Incremental Delay, d2	134.3	61.6		18.7	113.5		73.3	26.4		120.1	0.7	0.0
Delay (s)	182.8	104.0		67.7	157.5		125.1	68.4		158.3	22.0	12.3
Level of Service	F	F		E	F		F	E		F	C	B
Approach Delay (s)		132.4			140.6			72.5			58.9	
Approach LOS		F			F			E			E	

Intersection Summary				
HCM Average Control Delay	82.9	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.13			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	108.4%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0						4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95						0.91		1.00	0.95	
Frt	1.00	0.85						0.98		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1665	1490						4967		1770	3539	
Flt Permitted	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (perm)	1665	1490						4967		1770	3539	
Volume (vph)	844	0	1031	0	0	0	0	1320	243	344	1188	0
Peak-hour factor, PHF	0.79	0.79	0.79	0.92	0.92	0.92	0.95	0.95	0.95	0.87	0.87	0.87
Adj. Flow (vph)	1068	0	1305	0	0	0	0	1389	256	395	1366	0
RTOR Reduction (vph)	0	9	0	0	0	0	0	24	0	0	0	0
Lane Group Flow (vph)	1068	1296	0	0	0	0	0	1621	0	395	1366	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	52.4	52.4						29.2		15.3	48.2	
Effective Green, g (s)	53.0	53.0						30.0		15.0	49.0	
Actuated g/C Ratio	0.48	0.48						0.27		0.14	0.45	
Clearance Time (s)	4.6	4.6						4.8		3.7	4.8	
Vehicle Extension (s)	5.0	5.0						7.4		2.0	6.2	
Lane Grp Cap (vph)	802	718						1355		241	1576	
v/s Ratio Prot	0.64	c0.87						c0.33		c0.22	0.39	
v/s Ratio Perm												
v/c Ratio	1.33	1.81						1.20		1.64	0.87	
Uniform Delay, d1	28.5	28.5						40.0		47.5	27.6	
Progression Factor	1.00	1.00						0.60		1.37	0.72	
Incremental Delay, d2	157.8	367.9						89.1		289.3	0.7	
Delay (s)	186.3	396.4						113.2		354.5	20.5	
Level of Service	F	F						F		F	C	
Approach Delay (s)		301.8			0.0			113.2			95.4	
Approach LOS		F			A			F			F	

Intersection Summary				
HCM Average Control Delay	185.2	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.59			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	115.0%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	134	311	209	45	328	196	108	722	47	211	1030	220
Peak-hour factor, PHF	0.90	0.90	0.90	0.89	0.89	0.89	0.81	0.81	0.81	0.90	0.90	0.90
Adj. Flow (vph)	149	346	232	51	369	220	133	891	58	234	1144	244
RTOR Reduction (vph)	0	0	118	0	0	107	0	0	20	0	0	125
Lane Group Flow (vph)	149	346	114	51	369	113	133	891	38	234	1144	119
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	9.0	28.2	28.2	4.6	23.8	23.8	8.7	32.2	32.2	9.0	32.5	32.5
Effective Green, g (s)	9.0	29.2	29.2	4.6	24.8	24.8	8.7	33.2	33.2	9.0	33.5	33.5
Actuated g/C Ratio	0.10	0.32	0.32	0.05	0.27	0.27	0.09	0.36	0.36	0.10	0.36	0.36
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	173	591	502	89	502	427	167	1277	571	173	1289	576
v/s Ratio Prot	c0.08	0.19		0.03	c0.20		0.08	0.25		c0.13	c0.32	
v/s Ratio Perm			0.07			0.07			0.02			0.08
v/c Ratio	0.86	0.59	0.23	0.57	0.74	0.26	0.80	0.70	0.07	1.35	0.89	0.21
Uniform Delay, d1	40.9	26.3	23.1	42.7	30.6	26.4	40.8	25.1	19.3	41.5	27.5	20.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	32.0	1.0	0.1	5.4	4.8	0.1	21.2	3.2	0.2	191.7	9.3	0.8
Delay (s)	72.8	27.3	23.2	48.2	35.4	26.5	62.0	28.3	19.5	233.2	36.8	20.9
Level of Service	E	C	C	D	D	C	E	C	B	F	D	C
Approach Delay (s)		35.3			33.4			32.0			62.7	
Approach LOS		D			C			C			E	

Intersection Summary				
HCM Average Control Delay	45.0	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	92.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	72.5%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	69	261	176	42	234	11	170	133	75	71	291	90
Peak Hour Factor	0.92	0.92	0.92	0.85	0.85	0.85	0.87	0.87	0.87	0.72	0.72	0.72
Hourly flow rate (vph)	75	284	191	49	275	13	195	153	86	99	404	125

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	550	338	434	628
Volume Left (vph)	75	49	195	99
Volume Right (vph)	191	13	86	125
Hadj (s)	-0.15	0.04	0.00	-0.05
Departure Headway (s)	9.2	9.6	9.3	9.3
Degree Utilization, x	1.40	0.90	1.12	1.61
Capacity (veh/h)	403	366	398	393
Control Delay (s)	220.0	56.6	114.4	311.2
Approach Delay (s)	220.0	56.6	114.4	311.2
Approach LOS	F	F	F	F

Intersection Summary				
Delay		197.5		
HCM Level of Service		F		
Intersection Capacity Utilization	92.0%	ICU Level of Service	F	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.85			1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1589			1863	1583	1770	3514		1770	3484	
Flt Permitted	0.75	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1402	1589			1863	1583	1770	3514		1770	3484	
Volume (vph)	16	5	255	0	4	73	141	1019	50	133	1138	132
Peak-hour factor, PHF	0.81	0.81	0.81	0.50	0.50	0.50	0.77	0.77	0.77	0.98	0.98	0.98
Adj. Flow (vph)	20	6	315	0	8	146	183	1323	65	136	1161	135
RTOR Reduction (vph)	0	148	0	0	0	116	0	6	0	0	15	0
Lane Group Flow (vph)	20	173	0	0	8	30	183	1382	0	136	1281	0
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	10.0	10.0			10.0	10.0	5.0	22.9		4.0	21.9	
Effective Green, g (s)	10.0	10.0			10.0	10.0	5.0	22.9		4.0	21.9	
Actuated g/C Ratio	0.20	0.20			0.20	0.20	0.10	0.47		0.08	0.45	
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	287	325			381	324	181	1646		145	1560	
v/s Ratio Prot		c0.11			0.00		c0.10	c0.39		0.08	0.37	
v/s Ratio Perm	0.01					0.02						
v/c Ratio	0.07	0.53			0.02	0.09	1.01	0.84		0.94	0.82	
Uniform Delay, d1	15.7	17.4			15.5	15.8	21.9	11.4		22.3	11.8	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	1.7			0.0	0.1	69.8	4.0		55.7	3.6	
Delay (s)	15.8	19.0			15.6	15.9	91.7	15.3		78.0	15.4	
Level of Service	B	B			B	B	F	B		E	B	
Approach Delay (s)		18.8			15.9			24.2			21.3	
Approach LOS		B			B			C			C	

Intersection Summary						
HCM Average Control Delay	22.2	HCM Level of Service		C		
HCM Volume to Capacity ratio	0.72					
Actuated Cycle Length (s)	48.9	Sum of lost time (s)		8.0		
Intersection Capacity Utilization	69.5%	ICU Level of Service		C		
Analysis Period (min)	15					
c Critical Lane Group						

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frt	1.00	1.00			0.98			0.98				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1752	1845			1799			4968				
Flt Permitted	0.95	1.00			1.00			1.00				
Satd. Flow (perm)	1752	1845			1799			4968				
Volume (vph)	139	497	0	0	403	90	77	1557	267	0	0	0
Peak-hour factor, PHF	0.78	0.78	0.78	0.79	0.79	0.79	0.91	0.91	0.91	0.92	0.92	0.92
Adj. Flow (vph)	178	637	0	0	510	114	85	1711	293	0	0	0
RTOR Reduction (vph)	0	0	0	0	9	0	0	23	0	0	0	0
Lane Group Flow (vph)	178	637	0	0	615	0	0	2066	0	0	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Prot						Perm					
Protected Phases	7	4			8			2				
Permitted Phases							2					
Actuated Green, G (s)	12.5	42.1			25.9			30.9				
Effective Green, g (s)	12.2	42.3			26.1			31.1				
Actuated g/C Ratio	0.15	0.52			0.32			0.38				
Clearance Time (s)	3.7	4.2			4.2			4.2				
Vehicle Extension (s)	2.0	7.9			7.7			6.4				
Lane Grp Cap (vph)	263	959			577			1898				
v/s Ratio Prot	0.10	c0.35			c0.34							
v/s Ratio Perm								0.42				
v/c Ratio	0.68	0.66			1.07			1.09				
Uniform Delay, d1	32.7	14.3			27.7			25.2				
Progression Factor	1.00	1.00			1.00			1.00				
Incremental Delay, d2	5.3	3.6			56.3			49.2				
Delay (s)	38.1	17.9			84.0			74.3				
Level of Service	D	B			F			E				
Approach Delay (s)		22.3			84.0			74.3			0.0	
Approach LOS		C			F			E			A	

Intersection Summary				
HCM Average Control Delay	64.0	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.02			
Actuated Cycle Length (s)	81.4	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	82.0%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0				
Lane Util. Factor					0.91			0.91				
Frt					0.96			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					4892			5048				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					4892			5048				
Volume (vph)	0	0	0	0	1343	455	325	1871	0	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.86	0.86	0.86	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	1429	484	378	2176	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1912	0	0	2550	0	0	0	0
Turn Type							Perm					
Protected Phases					8			2				
Permitted Phases							2					
Actuated Green, G (s)					25.4			30.4				
Effective Green, g (s)					26.0			31.0				
Actuated g/C Ratio					0.40			0.48				
Clearance Time (s)					4.6			4.6				
Vehicle Extension (s)					4.8			3.0				
Lane Grp Cap (vph)					1957			2408				
v/s Ratio Prot					c0.39							
v/s Ratio Perm								0.51				
v/c Ratio					0.98			1.06				
Uniform Delay, d1					19.2			17.0				
Progression Factor					1.00			1.00				
Incremental Delay, d2					15.3			36.3				
Delay (s)					34.5			53.3				
Level of Service					C			D				
Approach Delay (s)		0.0			34.5			53.3			0.0	
Approach LOS		A			C			D			A	

Intersection Summary				
HCM Average Control Delay	45.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	1.02			
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	85.5%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.91						0.91				
Frt		1.00						0.97				
Flt Protected		0.98						1.00				
Satd. Flow (prot)		4995						4946				
Flt Permitted		0.98						1.00				
Satd. Flow (perm)		4995						4946				
Volume (vph)	1182	2070	0	0	0	0	0	1014	226	0	0	0
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92
Adj. Flow (vph)	1299	2275	0	0	0	0	0	1056	235	0	0	0
RTOR Reduction (vph)	0	16	0	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	3558	0	0	0	0	0	1290	0	0	0	0
Turn Type	Perm											
Protected Phases		2						8				
Permitted Phases	2											
Actuated Green, G (s)		23.1						20.0				
Effective Green, g (s)		24.5						21.1				
Actuated g/C Ratio		0.46						0.39				
Clearance Time (s)		5.4						5.1				
Vehicle Extension (s)		2.0						5.0				
Lane Grp Cap (vph)		2283						1947				
v/s Ratio Prot								c0.26				
v/s Ratio Perm		0.71										
v/c Ratio		1.56						0.66				
Uniform Delay, d1		14.6						13.3				
Progression Factor		1.00						1.00				
Incremental Delay, d2		253.5						1.1				
Delay (s)		268.1						14.5				
Level of Service		F						B				
Approach Delay (s)		268.1			0.0			14.5			0.0	
Approach LOS		F			A			B			A	

Intersection Summary				
HCM Average Control Delay	200.8	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.14			
Actuated Cycle Length (s)	53.6	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	96.8%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	14	11	0	0	8	29	13	1171	6	0	0	0
Peak Hour Factor	0.60	0.60	0.60	0.63	0.63	0.63	0.91	0.91	0.91	0.92	0.92	0.92
Hourly flow rate (vph)	23	18	0	0	13	46	14	1287	7	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	42	59	658	650
Volume Left (vph)	23	0	14	0
Volume Right (vph)	0	46	0	7
Hadj (s)	0.15	-0.44	0.04	0.03
Departure Headway (s)	6.0	5.4	4.8	4.8
Degree Utilization, x	0.07	0.09	0.89	0.87
Capacity (veh/h)	587	658	737	740
Control Delay (s)	9.5	9.0	31.8	30.0
Approach Delay (s)	9.5	9.0	30.9	
Approach LOS	A	A	D	

Intersection Summary				
Delay	29.3			
HCM Level of Service	D			
Intersection Capacity Utilization	47.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				5085	3433	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				5085	3433	
Volume (vph)	0	0	0	1314	484	0
Peak-hour factor, PHF	0.92	0.92	0.84	0.84	0.94	0.94
Adj. Flow (vph)	0	0	0	1564	515	0
RTOR Reduction (vph)	0	0	0	0	16	0
Lane Group Flow (vph)	0	0	0	1564	499	0
Turn Type						
Protected Phases				6	4	
Permitted Phases						
Actuated Green, G (s)				25.1	15.3	
Effective Green, g (s)				25.7	17.3	
Actuated g/C Ratio				0.50	0.34	
Clearance Time (s)				4.6	6.0	
Vehicle Extension (s)				5.0	6.0	
Lane Grp Cap (vph)				2562	1165	
v/s Ratio Prot				c0.31	c0.15	
v/s Ratio Perm						
v/c Ratio				0.61	0.43	
Uniform Delay, d1				9.1	13.0	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.6	0.7	
Delay (s)				9.7	13.7	
Level of Service				A	B	
Approach Delay (s)	0.0			9.7	13.7	
Approach LOS	A			A	B	

Intersection Summary			
HCM Average Control Delay	10.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	51.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	686	176	293	998	528	445	1088
v/c Ratio	0.67	0.30	0.74	0.67	0.57	0.88	0.46
Control Delay	34.5	5.5	42.8	34.7	14.5	62.4	18.0
Queue Delay	0.0	0.0	0.0	1.2	0.6	0.0	0.0
Total Delay	34.5	5.5	42.8	35.9	15.1	62.4	18.0
Queue Length 50th (ft)	200	0	89	353	131	144	161
Queue Length 95th (ft)	263	48	m124	428	m249	#209	189
Internal Link Dist (ft)	719			378			1660
Turn Bay Length (ft)		275	110			260	
Base Capacity (vph)	1045	598	446	1485	928	515	2352
Starvation Cap Reductn	0	0	0	264	141	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.29	0.66	0.82	0.67	0.86	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	119	877	257	218	183	228	1314	810	319	944	185
v/c Ratio	0.63	1.43	1.45	0.37	0.33	1.01	1.20	1.04	1.53	0.89	0.31
Control Delay	61.7	229.9	265.3	26.5	13.4	72.3	125.4	41.2	294.0	48.4	5.7
Queue Delay	0.0	47.0	0.0	0.0	0.0	0.0	91.7	37.3	6.6	7.9	0.0
Total Delay	61.7	276.9	265.3	26.5	13.4	72.3	217.1	78.4	300.6	56.3	5.7
Queue Length 50th (ft)	81	~797	~256	125	37	~176	~578	~219	~316	334	0
Queue Length 95th (ft)	124	#869	m#386	m172	m81	m135	m278	m117	#484	#438	49
Internal Link Dist (ft)		2033		385			269			731	
Turn Bay Length (ft)	145		155		25	125			170		
Base Capacity (vph)	225	614	177	597	561	225	1094	779	209	1062	604
Starvation Cap Reductn	0	0	0	0	0	0	160	65	0	0	0
Spillback Cap Reductn	0	42	0	0	0	0	0	0	2	98	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	1.53	1.45	0.37	0.33	1.01	1.41	1.13	1.54	0.98	0.31

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	506	837	311	478	200	31
v/c Ratio	0.52	0.75	0.83	0.33	0.75	0.12
Control Delay	16.5	5.6	60.5	4.9	61.2	26.9
Queue Delay	1.5	2.9	0.0	0.0	0.0	0.0
Total Delay	18.0	8.5	60.5	4.9	61.2	26.9
Queue Length 50th (ft)	179	71	210	86	136	11
Queue Length 95th (ft)	m168	m38	269	131	203	36
Internal Link Dist (ft)	385			614	86	
Turn Bay Length (ft)						25
Base Capacity (vph)	982	1116	451	1442	334	310
Starvation Cap Reductn	293	176	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.89	0.69	0.33	0.60	0.10

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	233	1235	303	641	1180	200	860
v/c Ratio	0.75	0.99	1.55	0.51	0.78	0.97	0.61
Control Delay	60.8	53.9	305.2	13.7	34.7	92.4	24.1
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.7
Total Delay	60.8	53.9	305.2	13.8	34.8	92.4	24.8
Queue Length 50th (ft)	76	392	~274	90	240	68	247
Queue Length 95th (ft)	#113	#472	#441	146	295	m#141	315
Internal Link Dist (ft)		671			2243		378
Turn Bay Length (ft)			280			120	
Base Capacity (vph)	309	1248	195	1263	1519	206	1416
Starvation Cap Reductn	0	0	0	0	0	0	250
Spillback Cap Reductn	0	0	0	86	1	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.99	1.55	0.54	0.78	0.97	0.74

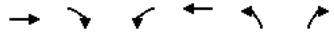
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	210	818	187	245	73	330	182	426	489
v/c Ratio	0.86	0.57	0.82	0.48	0.17	0.79	0.38	0.59	0.76
Control Delay	82.1	37.7	79.7	42.9	26.0	59.9	8.2	47.2	16.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.1	37.7	79.7	42.9	26.0	59.9	8.2	47.2	16.7
Queue Length 50th (ft)	166	197	149	172	28	249	0	166	51
Queue Length 95th (ft)	#311	268	#262	275	73	327	35	220	174
Internal Link Dist (ft)		179		406		179		341	
Turn Bay Length (ft)	185		150		40				110
Base Capacity (vph)	285	1445	282	528	445	453	509	885	693
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.57	0.66	0.46	0.16	0.73	0.36	0.48	0.71

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	659	59	126	329	158	204
v/c Ratio	0.58	0.06	0.61	0.23	0.62	0.51
Control Delay	15.0	3.4	53.0	3.8	49.4	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.0	3.4	53.0	3.8	49.4	10.2
Queue Length 50th (ft)	211	1	71	41	89	0
Queue Length 95th (ft)	425	20	137	90	143	42
Internal Link Dist (ft)	248			664	309	
Turn Bay Length (ft)			200			
Base Capacity (vph)	1139	989	359	1475	483	580
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.06	0.35	0.22	0.33	0.35

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	255	452	118	509	92	1200	671	1491	250
v/c Ratio	1.22	1.05	0.76	1.14	0.95	1.00	1.26	0.87	0.29
Control Delay	176.0	96.3	78.6	117.9	131.4	68.7	154.0	22.6	2.5
Queue Delay	563.3	0.0	0.0	141.6	0.0	38.0	520.0	177.9	3.5
Total Delay	739.3	96.3	78.6	259.5	131.4	106.7	674.1	200.4	6.1
Queue Length 50th (ft)	~222	~330	83	~335	66	~311	~595	449	9
Queue Length 95th (ft)	#384	#533	#173	#545	#157	#376	m#461	m326	m1
Internal Link Dist (ft)		502		1058		2367		110	
Turn Bay Length (ft)	125		135		115		115		
Base Capacity (vph)	209	429	161	445	97	1197	531	1705	877
Starvation Cap Reductn	0	0	0	0	0	0	254	637	528
Spillback Cap Reductn	184	0	0	98	0	113	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	10.20	1.05	0.73	1.47	0.95	1.11	2.42	1.40	0.72

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	1068	1305	1645	395	1366
v/c Ratio	1.33	1.80	1.19	1.64	0.87
Control Delay	185.1	386.7	112.3	327.8	21.1
Queue Delay	188.0	315.6	87.1	0.0	11.4
Total Delay	373.1	702.3	199.4	327.8	32.4
Queue Length 50th (ft)	~1033	~1469	~482	~418	251
Queue Length 95th (ft)	#1063	#1462	m#433	m#373	m229
Internal Link Dist (ft)		366	110		269
Turn Bay Length (ft)	232			75	
Base Capacity (vph)	802	727	1379	241	1576
Starvation Cap Reductn	0	0	101	0	211
Spillback Cap Reductn	192	333	194	0	193
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.75	3.31	1.39	1.64	1.00

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	149	346	232	51	369	220	133	891	58	234	1144	244
v/c Ratio	0.84	0.57	0.37	0.39	0.78	0.43	0.78	0.69	0.10	1.32	0.87	0.34
Control Delay	79.7	31.0	9.3	50.6	42.8	12.3	72.4	28.6	12.9	214.2	36.6	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.7	31.0	9.3	50.6	42.8	12.3	72.4	28.6	12.9	214.2	36.6	7.4
Queue Length 50th (ft)	85	174	25	28	195	32	75	221	10	~174	314	18
Queue Length 95th (ft)	#217	272	84	68	288	88	#161	294	34	#357	#523	78
Internal Link Dist (ft)		1613			1967			1346			2243	
Turn Bay Length (ft)	95		95	90		90	155		90	200		200
Base Capacity (vph)	177	655	669	166	615	621	176	1299	601	177	1313	710
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.53	0.35	0.31	0.60	0.35	0.76	0.69	0.10	1.32	0.87	0.34

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	20	321	8	146	183	1388	136	1296
v/c Ratio	0.07	0.68	0.02	0.33	1.01	0.84	0.94	0.82
Control Delay	15.4	15.7	14.5	5.8	100.9	19.4	92.3	19.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.4	15.7	14.5	5.8	100.9	19.4	92.3	19.2
Queue Length 50th (ft)	5	34	2	0	~54	165	40	153
Queue Length 95th (ft)	16	75	5	2	#142	232	#140	#332
Internal Link Dist (ft)		2570	207			1470		2367
Turn Bay Length (ft)	100				210		290	
Base Capacity (vph)	409	596	544	566	182	1657	145	1580
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.54	0.01	0.26	1.01	0.84	0.94	0.82

Intersection Summary

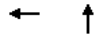
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	178	637	624	2089
v/c Ratio	0.68	0.66	1.07	1.09
Control Delay	45.9	18.3	85.4	74.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	45.9	18.3	85.4	74.6
Queue Length 50th (ft)	87	223	~352	~440
Queue Length 95th (ft)	127	262	#495	#601
Internal Link Dist (ft)		608	737	568
Turn Bay Length (ft)				
Base Capacity (vph)	409	1046	585	1922
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.44	0.61	1.07	1.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	WBT	NBT
Lane Group Flow (vph)	1913	2554
v/c Ratio	0.98	1.06
Control Delay	36.5	55.3
Queue Delay	28.6	39.0
Total Delay	65.0	94.2
Queue Length 50th (ft)	263	~419
Queue Length 95th (ft)	#382	#475
Internal Link Dist (ft)	265	310
Turn Bay Length (ft)		
Base Capacity (vph)	1958	2413
Starvation Cap Reductn	170	190
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	1.07	1.15

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT
Lane Group Flow (vph)	3574	1291
v/c Ratio	1.56	0.66
Control Delay	271.7	15.4
Queue Delay	47.5	0.9
Total Delay	319.2	16.2
Queue Length 50th (ft)	~623	117
Queue Length 95th (ft)	#719	158
Internal Link Dist (ft)	4045	445
Turn Bay Length (ft)		
Base Capacity (vph)	2298	1948
Starvation Cap Reductn	0	0
Spillback Cap Reductn	146	354
Storage Cap Reductn	0	0
Reduced v/c Ratio	1.66	0.81

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	NBL
Lane Group Flow (vph)	1564	515
v/c Ratio	0.61	0.44
Control Delay	10.6	14.5
Queue Delay	0.1	0.1
Total Delay	10.8	14.6
Queue Length 50th (ft)	109	59
Queue Length 95th (ft)	166	103
Internal Link Dist (ft)	3590	33
Turn Bay Length (ft)		
Base Capacity (vph)	2806	1516
Starvation Cap Reductn	0	0
Spillback Cap Reductn	331	175
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.63	0.38

Intersection Summary

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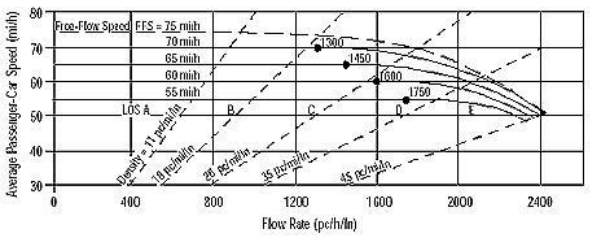

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	B/W Ben Maddox Way & Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Long-term 2030
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	3211 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1864	pc/h/ln	Design LOS		
S	61.4	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	30.4	pc/mi/ln	S		mi/h
LOS	D		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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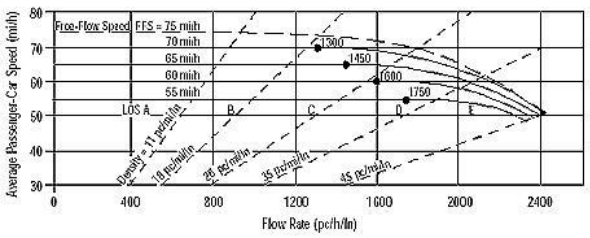

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	E/O Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Long-term 2030
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	1923 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	0.56	I/mi	f_{ID}	0.3	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	65.2	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1122	pc/h/ln	Design LOS		
S	65.2	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	17.2	pc/mi/ln	S		mi/h
LOS	B		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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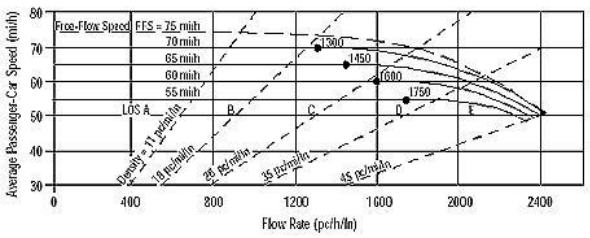

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	W/O S. Ben Maddox Way
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Long-term 2030
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	3622 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	2103	pc/h/ln	Design LOS		
S	57.9	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	36.3	pc/mi/ln	S		mi/h
LOS	E		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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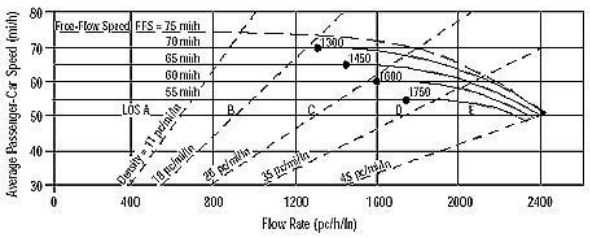

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	B/W Ben Maddox Way & Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Long-term 2030
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2377 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1380	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	22.1	pc/mi/ln	S		mi/h
LOS	C		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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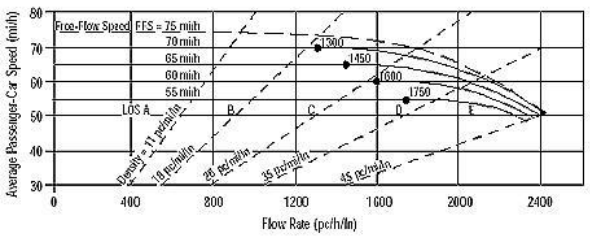

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	E/O Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Long-term 2030

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	1535 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	0.56	I/mi	f_{ID}	0.3	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	65.2	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	895	pc/h/ln	Design LOS		
S	65.2	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	13.7	pc/mi/ln	S		mi/h
LOS	B		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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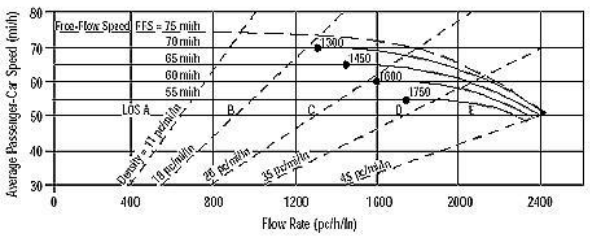
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	W/O S. Ben Maddox Way
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Long-term 2030

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2837 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1647	pc/h/ln	Design LOS		
S	62.4	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	26.4	pc/mi/ln	S		mi/h
LOS	D		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Long-term 2030

Project Description

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 2500 ft

Vu = 805 veh/h

Terrain Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	3622	0.90	Level	9	0	0.957	1.00	4206
Ramp	805	0.90	Level	4	0	0.980	1.00	912
UpStream	805	0.90	Level	2	0	0.990	1.00	903
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

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

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =1.000 using Equation 0

V_{12} = 4206 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$	4206	4800	No
V_{12}	4206	4400:All	No
$V_{FO} = V_F - V_R$	3294	4800	No
V_R	912	2000	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 38.9 (pc/ mi /ln)

LOS= E (Exhibit 25-4)

Speed Estimation

D_s = 0.510 (Exhibit 25-19)

S_R= 55.7 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 55.7 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Long-term 2030

Project Description

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{up} = 2600 ft

Vu = 394 veh/h

Terrain Level

S_{FF} = 70.0 mph S_{FR} = 35.0 mph

Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	3211	0.90	Level	9	0	0.957	1.00	3728
Ramp	1875	0.90	Level	4	0	0.980	1.00	2125
UpStream	394	0.90	Level	2	0	0.990	1.00	442
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

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

P_{FM}= using Equation

V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/ mi /ln)

LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)

S_R= mph (Exhibit 25-19)

S_0= mph (Exhibit 25-19)

S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} =1.000 using Equation 0

V_{12} = 3728 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$	3728	4800	No
V_{12}	3728	4400:All	No
$V_{FO} = V_F - V_R$	1603	4800	No
V_R	2125	2000	Yes

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 33.6 (pc/ mi /ln)

LOS= F (Exhibit 25-4)

Speed Estimation

D_s = 0.619 (Exhibit 25-19)

S_R= 52.7 mph (Exhibit 25-19)

S_0= N/A mph (Exhibit 25-19)

S = 52.7 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Long-term 2030

Project Description

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off
L_{up} = 3400 ft
Vu = 1045 veh/h

Terrain Level
S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off
L_{down} = ft
VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	2377	0.90	Level	9	0	0.957	1.00	2760
Ramp	301	0.90	Level	4	0	0.980	1.00	341
UpStream	1045	0.90	Level	2	0	0.990	1.00	1173
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 2760 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	2760	4800	No
				V_{12}	2760	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	2419	4800	No
				V_R	341	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A	D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D
D_R = (pc/ mi /ln)	D_R = 25.5 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= C (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.459 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 57.2 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 57.2 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Long-term 2030

Project Description

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☐ No ☐ Off
L_{up} = ft
Vu = veh/h

Terrain
S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☐ No ☐ Off
L_{down} = ft
VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	1535	0.90	Level	9	0	0.957	1.00	1782
Ramp	203	0.90	Level	4	0	0.980	1.00	230
UpStream								
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 1782 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	1782	4800	No
				V_{12}	1782	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	1552	4800	No
				V_R	230	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A	D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D
D_R = (pc/ mi /ln)	D_R = 17.5 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= B (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.449 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 57.4 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 57.4 mph (Exhibit 25-15)

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LONG-TERM 2030+ PROJECT TRAFFIC CONDITIONS
(INTERSECTION, ROADWAY SEGMENT, AND FREEWAY & RAMP SEGMENTS)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor					0.95	1.00	0.97	0.91	0.91	0.97	0.91	
Frt					1.00	0.85	1.00	0.97	0.85	1.00	0.98	
Flt Protected					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)					3394	1553	3367	3219	1413	3367	4891	
Flt Permitted					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)					3394	1553	3367	3219	1413	3367	4891	
Volume (vph)	0	0	0	202	242	96	479	601	685	302	512	75
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.77	0.77	0.77	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	220	263	104	622	781	890	328	557	82
RTOR Reduction (vph)	0	0	0	0	0	76	0	21	352	0	19	0
Lane Group Flow (vph)	0	0	0	0	483	28	622	970	328	328	620	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type				Split		Perm	Prot		Perm	Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)					25.5	25.5	16.5	47.3	47.3	13.2	44.0	
Effective Green, g (s)					26.5	26.5	16.5	48.3	48.3	13.2	45.0	
Actuated g/C Ratio					0.26	0.26	0.16	0.48	0.48	0.13	0.45	
Clearance Time (s)					5.0	5.0	4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)					7.5	7.5	2.0	8.0	8.0	2.0	7.5	
Lane Grp Cap (vph)					899	412	556	1555	682	444	2201	
v/s Ratio Prot					c0.14		c0.18	c0.30		0.10	0.13	
v/s Ratio Perm						0.02			0.23			
v/c Ratio					0.54	0.07	1.12	0.62	0.48	0.74	0.28	
Uniform Delay, d1					31.5	27.5	41.8	19.1	17.4	41.7	17.3	
Progression Factor					1.00	1.00	0.86	1.50	6.31	1.00	1.00	
Incremental Delay, d2					2.0	0.3	68.9	1.2	1.6	5.5	0.3	
Delay (s)					33.5	27.8	104.9	30.0	111.4	47.2	17.6	
Level of Service					C	C	F	C	F	D	B	
Approach Delay (s)		0.0			32.5			74.4			27.7	
Approach LOS		A			C			E			C	

Intersection Summary			
HCM Average Control Delay	56.3	HCM Level of Service	E
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	290	699	504	357	202	109
Peak Hour Factor	0.85	0.85	0.74	0.74	0.56	0.56
Hourly flow rate (vph)	341	822	681	482	361	195
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total (vph)	227	936	842	322	361	195
Volume Left (vph)	0	0	681	0	361	0
Volume Right (vph)	0	822	0	0	0	195
Hadj (s)	0.07	-0.55	0.47	0.07	0.57	-0.63
Departure Headway (s)	7.9	7.3	8.2	7.8	8.7	7.5
Degree Utilization, x	0.50	1.90	1.92	0.70	0.87	0.40
Capacity (veh/h)	443	498	445	450	401	472
Control Delay (s)	17.5	430.9	441.4	25.8	46.3	14.3
Approach Delay (s)	350.1		326.5		35.1	
Approach LOS	F		F		E	

Intersection Summary				
Delay	279.9			
HCM Level of Service	F			
Intersection Capacity Utilization	81.9%	ICU Level of Service		D
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	1622		1736	1827	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1736	1622		1736	1827	1553	1736	3471	1553	1736	3471	1553
Volume (vph)	36	59	175	340	227	176	415	935	881	468	826	389
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.85	0.85	0.85	0.87	0.87	0.87
Adj. Flow (vph)	43	71	211	410	273	212	488	1100	1036	538	949	447
RTOR Reduction (vph)	0	99	0	0	0	52	0	0	360	0	0	176
Lane Group Flow (vph)	43	183	0	410	273	160	488	1100	676	538	949	271
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			6
Actuated Green, G (s)	7.0	16.7		17.0	28.2	28.2	21.0	35.3	35.3	21.0	35.3	35.3
Effective Green, g (s)	7.0	18.7		17.0	28.7	28.7	21.0	37.3	37.3	21.0	37.3	37.3
Actuated g/C Ratio	0.06	0.17		0.15	0.26	0.26	0.19	0.34	0.34	0.19	0.34	0.34
Clearance Time (s)	4.0	6.0		4.0	4.5	4.5	4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	110	276		268	477	405	331	1177	527	331	1177	527
v/s Ratio Prot	0.02	c0.11		c0.24	0.15		0.28	0.32		c0.31	0.27	
v/s Ratio Perm						0.10			c0.44			0.17
v/c Ratio	0.39	0.66		1.53	0.57	0.40	1.47	0.93	1.28	1.63	0.81	0.51
Uniform Delay, d1	49.5	42.7		46.5	35.3	33.5	44.5	35.2	36.4	44.5	33.1	29.1
Progression Factor	1.00	1.00		1.04	1.11	1.17	0.77	0.89	1.04	1.00	1.00	1.00
Incremental Delay, d2	2.3	5.9		253.1	1.3	0.5	217.3	4.4	131.1	294.9	6.0	3.5
Delay (s)	51.7	48.6		301.3	40.7	39.8	251.5	35.8	168.9	339.4	39.0	32.6
Level of Service	D	D		F	D	D	F	D	F	F	D	C
Approach Delay (s)		49.0			159.8			128.5			121.1	
Approach LOS		D			F			F			F	

Intersection Summary			
HCM Average Control Delay	126.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.28		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	104.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1553	1736	1827	1736	1553
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1827	1553	1736	1827	1736	1553
Volume (vph)	302	1106	349	570	173	16
Peak-hour factor, PHF	0.92	0.92	0.87	0.87	0.70	0.70
Adj. Flow (vph)	328	1202	401	655	247	23
RTOR Reduction (vph)	0	242	0	0	0	6
Lane Group Flow (vph)	328	960	401	655	247	17
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	55.7	55.7	25.0	84.7	16.0	16.0
Effective Green, g (s)	57.0	57.0	25.0	86.0	16.0	16.0
Actuated g/C Ratio	0.52	0.52	0.23	0.78	0.15	0.15
Clearance Time (s)	5.3	5.3	4.0	5.3	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	947	805	395	1428	253	226
v/s Ratio Prot	0.18		c0.23	0.36	c0.14	
v/s Ratio Perm		c0.62				0.01
v/c Ratio	0.35	1.19	1.02	0.46	0.98	0.08
Uniform Delay, d1	15.6	26.5	42.5	4.1	46.8	40.6
Progression Factor	0.43	0.71	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	87.7	49.2	1.1	49.5	0.1
Delay (s)	6.8	106.4	91.7	5.1	96.3	40.8
Level of Service	A	F	F	A	F	D
Approach Delay (s)	85.0			38.0	91.6	
Approach LOS	F			D	F	

Intersection Summary			
HCM Average Control Delay	68.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	94.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0		4.0		4.0		4.0	4.0	
Lane Util. Factor	0.97	0.95		1.00		0.88		0.91		0.97	0.95	
Frt	1.00	0.94		1.00		0.85		0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)	3367	3266		1736		2733		4918		3367	3471	
Flt Permitted	0.95	1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)	3367	3266		1736		2733		4918		3367	3471	
Volume (vph)	192	189	122	222	0	476	0	1097	112	123	591	0
Peak-hour factor, PHF	0.85	0.85	0.85	0.78	0.78	0.78	0.74	0.74	0.74	0.90	0.90	0.90
Adj. Flow (vph)	226	222	144	285	0	610	0	1482	151	137	657	0
RTOR Reduction (vph)	0	86	0	0	0	220	0	9	0	0	0	0
Lane Group Flow (vph)	226	280	0	285	0	390	0	1624	0	137	657	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot		custom				Prot		
Protected Phases	7	4		3		8		2		1	6	
Permitted Phases												
Actuated Green, G (s)	9.0	17.4		11.0		19.4		44.9		8.7	57.6	
Effective Green, g (s)	9.0	18.4		11.0		20.4		45.9		8.7	58.6	
Actuated g/C Ratio	0.09	0.18		0.11		0.20		0.46		0.09	0.59	
Clearance Time (s)	4.0	5.0		4.0		5.0		5.0		4.0	5.0	
Vehicle Extension (s)	6.5	6.5		2.0		4.5		5.5		2.0	6.0	
Lane Grp Cap (vph)	303	601		191		558		2257		293	2034	
v/s Ratio Prot	0.07	0.09		c0.16		c0.14		c0.33		c0.04	0.19	
v/s Ratio Perm												
v/c Ratio	0.75	0.47		1.49		0.70		0.72		0.47	0.32	
Uniform Delay, d1	44.4	36.4		44.5		37.0		21.8		43.4	10.6	
Progression Factor	1.00	1.00		1.00		1.00		1.00		0.82	0.65	
Incremental Delay, d2	13.3	1.8		247.1		4.4		2.0		0.4	0.4	
Delay (s)	57.7	38.2		291.6		41.4		23.9		36.1	7.2	
Level of Service	E	D		F		D		C		D	A	
Approach Delay (s)		45.7			121.0			23.9			12.2	
Approach LOS		D			F			C			B	

Intersection Summary				
HCM Average Control Delay	47.0	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	63.5%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	1.00	1.00		1.00	1.00		0.95	1.00
Frt	1.00	0.98		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1644	4906		1644	1827	1471		1780	1471		3370	1471
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (perm)	1644	4906		1644	1827	1471		1780	1471		3370	1471
Volume (vph)	94	333	40	130	342	27	22	20	32	158	104	349
Peak-hour factor, PHF	0.86	0.86	0.86	0.84	0.84	0.84	0.93	0.93	0.93	0.76	0.76	0.76
Adj. Flow (vph)	109	387	47	155	407	32	24	22	34	208	137	459
RTOR Reduction (vph)	0	9	0	0	0	4	0	0	30	0	0	355
Lane Group Flow (vph)	109	425	0	155	407	28	0	46	4	0	345	104
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6			3			4
Actuated Green, G (s)	8.9	35.0		11.1	37.2	37.2		8.7	8.7		20.2	20.2
Effective Green, g (s)	8.6	36.3		10.8	38.5	38.5		9.9	9.9		21.4	21.4
Actuated g/C Ratio	0.09	0.38		0.11	0.41	0.41		0.10	0.10		0.23	0.23
Clearance Time (s)	3.7	5.3		3.7	5.3	5.3		5.2	5.2		5.2	5.2
Vehicle Extension (s)	2.0	5.1		2.0	4.8	4.8		6.3	6.3		7.9	7.9
Lane Grp Cap (vph)	150	1887		188	745	600		187	154		764	333
v/s Ratio Prot	0.07	0.09		c0.09	c0.22			c0.03			c0.10	
v/s Ratio Perm						0.02			0.00			0.07
v/c Ratio	0.73	0.23		0.82	0.55	0.05		0.25	0.02		0.45	0.31
Uniform Delay, d1	41.8	19.6		40.9	21.3	16.9		38.8	37.9		31.4	30.4
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	13.8	0.3		23.4	1.4	0.1		2.1	0.2		1.8	2.3
Delay (s)	55.5	19.9		64.3	22.7	16.9		40.9	38.1		33.2	32.6
Level of Service	E	B		E	C	B		D	D		C	C
Approach Delay (s)		27.0			33.2			39.7			32.9	
Approach LOS		C			C			D			C	

Intersection Summary				
HCM Average Control Delay	31.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	94.4	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	57.5%	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		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	311	201	0	524	25	0	0	31	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.84	0.84	0.84	0.79	0.79	0.79	0.92	0.92	0.92
Hourly flow rate (vph)	11	327	212	0	624	30	0	0	39	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		799			328							
pX, platoon unblocked	0.92			0.97			0.93	0.93	0.97	0.93	0.93	0.92
vC, conflicting volume	654			539			1093	1108	269	863	1199	639
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	623			501			1031	1047	224	784	1145	606
tC, single (s)	4.2			4.2			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	95	100	100	100
cM capacity (veh/h)	863			1019			173	208	759	251	185	408

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	NB 1
Volume Total	11	218	321	654	39
Volume Left	11	0	0	0	0
Volume Right	0	0	212	30	39
cSH	863	1700	1700	1700	759
Volume to Capacity	0.01	0.13	0.19	0.38	0.05
Queue Length 95th (ft)	1	0	0	0	4
Control Delay (s)	9.2	0.0	0.0	0.0	10.0
Lane LOS	A				A
Approach Delay (s)	0.2			0.0	10.0
Approach LOS					A

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	32.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1553	1736	1827	1719	1538
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1827	1553	1736	1827	1719	1538
Volume (vph)	309	33	111	356	193	51
Peak-hour factor, PHF	0.86	0.86	0.81	0.81	0.78	0.78
Adj. Flow (vph)	359	38	137	440	247	65
RTOR Reduction (vph)	0	16	0	0	0	53
Lane Group Flow (vph)	359	22	137	440	247	12
Heavy Vehicles (%)	4%	4%	4%	4%	5%	5%
Turn Type		Perm	Prot			Prot
Protected Phases	2		1	6	4	4
Permitted Phases		2				
Actuated Green, G (s)	55.7	55.7	12.1	71.8	18.8	18.8
Effective Green, g (s)	57.7	57.7	12.1	73.8	18.8	18.8
Actuated g/C Ratio	0.57	0.57	0.12	0.73	0.19	0.19
Clearance Time (s)	6.0	6.0	4.0	6.0	4.0	4.0
Vehicle Extension (s)	8.0	8.0	2.0	8.0	2.4	2.4
Lane Grp Cap (vph)	1048	891	209	1340	321	287
v/s Ratio Prot	c0.20		c0.08	0.24	c0.14	0.01
v/s Ratio Perm		0.01				
v/c Ratio	0.34	0.02	0.66	0.33	0.77	0.04
Uniform Delay, d1	11.4	9.3	42.3	4.7	38.8	33.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.1	5.5	0.7	10.0	0.0
Delay (s)	12.3	9.3	47.8	5.4	48.9	33.6
Level of Service	B	A	D	A	D	C
Approach Delay (s)	12.0			15.4	45.7	
Approach LOS	B			B	D	

Intersection Summary			
HCM Average Control Delay	21.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	100.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	233	153	28	379	88	79
Peak Hour Factor	0.95	0.95	0.83	0.83	0.88	0.88
Hourly flow rate (vph)	245	161	34	457	100	90
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	744					
pX, platoon unblocked			0.91		0.91	0.91
vC, conflicting volume			406		850	326
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			349		835	261
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		66	87
cM capacity (veh/h)			1094		297	707

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	406	490	190
Volume Left	0	34	100
Volume Right	161	0	90
cSH	1700	1094	410
Volume to Capacity	0.24	0.03	0.46
Queue Length 95th (ft)	0	2	60
Control Delay (s)	0.0	0.9	21.2
Lane LOS		A	C
Approach Delay (s)	0.0	0.9	21.2
Approach LOS			C

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.88		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1660		1736	1599		1736	4940		1736	3471	1553
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1736	1660		1736	1599		1736	4940		1736	3471	1553
Volume (vph)	136	52	81	86	104	511	121	1115	76	301	1022	230
Peak-hour factor, PHF	0.73	0.73	0.73	0.83	0.83	0.83	0.84	0.84	0.84	0.93	0.93	0.93
Adj. Flow (vph)	186	71	111	104	125	616	144	1327	90	324	1099	247
RTOR Reduction (vph)	0	62	0	0	162	0	0	7	0	0	0	154
Lane Group Flow (vph)	186	120	0	104	579	0	144	1410	0	324	1099	93
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	11.0	15.2		28.8	33.0		10.0	27.0		19.0	36.0	36.0
Effective Green, g (s)	11.0	17.2		28.8	35.0		10.0	29.0		19.0	38.0	38.0
Actuated g/C Ratio	0.10	0.16		0.26	0.32		0.09	0.26		0.17	0.35	0.35
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	5.8		3.0	5.8		1.5	5.8		1.5	5.8	5.8
Lane Grp Cap (vph)	174	260		455	509		158	1302		300	1199	536
v/s Ratio Prot	c0.11	0.07		0.06	c0.36		0.08	c0.29		c0.19	0.32	
v/s Ratio Perm												0.06
v/c Ratio	1.07	0.46		0.23	1.14		0.91	1.08		1.08	0.92	0.17
Uniform Delay, d1	49.5	42.2		31.9	37.5		49.6	40.5		45.5	34.5	25.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.01	0.68	0.27
Incremental Delay, d2	87.7	3.5		0.3	83.9		45.7	50.7		64.2	8.4	0.4
Delay (s)	137.2	45.7		32.1	121.4		95.3	91.2		110.1	32.0	7.3
Level of Service	F	D		C	F		F	F		F	C	A
Approach Delay (s)		92.0			110.4			91.6			43.5	
Approach LOS		F			F			F			D	

Intersection Summary			
HCM Average Control Delay	77.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	97.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Visalia Walmart Expansion
Long-term 2030 Plus Project
11: SR-198 EB Ramps @ Lovers Lane & Lovers Lane
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0						4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95						0.91		1.00	0.95	
Frt	1.00	0.87						1.00		1.00	1.00	
Flt Protected	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (prot)	1649	1494						4969		1736	3471	
Flt Permitted	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (perm)	1649	1494						4969		1736	3471	
Volume (vph)	513	0	395	0	0	0	0	1718	44	182	1158	0
Peak-hour factor, PHF	0.77	0.77	0.77	0.92	0.92	0.92	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	666	0	513	0	0	0	0	1952	50	207	1316	0
RTOR Reduction (vph)	0	30	0	0	0	0	0	2	0	0	0	0
Lane Group Flow (vph)	607	542	0	0	0	0	0	2000	0	207	1316	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	39.4	39.4						43.7		13.8	61.2	
Effective Green, g (s)	40.0	40.0						44.5		13.5	62.0	
Actuated g/C Ratio	0.36	0.36						0.40		0.12	0.56	
Clearance Time (s)	4.6	4.6						4.8		3.7	4.8	
Vehicle Extension (s)	5.0	5.0						7.4		2.0	6.2	
Lane Grp Cap (vph)	600	543						2010		213	1956	
v/s Ratio Prot	c0.37	0.36						c0.40		c0.12	0.38	
v/s Ratio Perm												
v/c Ratio	1.01	1.00						0.99		0.97	0.67	
Uniform Delay, d1	35.0	35.0						32.6		48.1	16.9	
Progression Factor	1.00	1.00						0.56		1.21	0.43	
Incremental Delay, d2	39.7	38.0						5.0		25.4	0.5	
Delay (s)	74.7	73.0						23.3		83.7	7.8	
Level of Service	E	E						C		F	A	
Approach Delay (s)		73.9			0.0			23.3			18.1	
Approach LOS		E			A			C			B	

Intersection Summary				
HCM Average Control Delay	34.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	1.00			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	80.6%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Visalia Walmart Expansion
Long-term 2030 Plus Project
12: Tulare Ave & Ben Maddox Way
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	1845	1568	1752	1845	1568	1736	3471	1553	1736	3471	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1752	1845	1568	1752	1845	1568	1736	3471	1553	1736	3471	1553
Volume (vph)	114	172	52	40	409	237	134	809	32	141	658	157
Peak-hour factor, PHF	0.73	0.73	0.73	0.83	0.83	0.83	0.78	0.78	0.78	0.92	0.92	0.92
Adj. Flow (vph)	156	236	71	48	493	286	172	1037	41	153	715	171
RTOR Reduction (vph)	0	0	45	0	0	98	0	0	13	0	0	113
Lane Group Flow (vph)	156	236	26	48	493	188	172	1037	28	153	715	58
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	9.0	34.2	34.2	4.7	29.9	29.9	9.0	32.1	32.1	9.0	32.1	32.1
Effective Green, g (s)	9.0	35.2	35.2	4.7	30.9	30.9	9.0	33.1	33.1	9.0	33.1	33.1
Actuated g/C Ratio	0.09	0.36	0.36	0.05	0.32	0.32	0.09	0.34	0.34	0.09	0.34	0.34
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	161	663	563	84	582	494	159	1172	525	159	1172	525
v/s Ratio Prot	c0.09	0.13		0.03	c0.27		c0.10	c0.30		0.09	0.21	
v/s Ratio Perm			0.02			0.12			0.02			0.04
v/c Ratio	0.97	0.36	0.05	0.57	0.85	0.38	1.08	0.88	0.05	0.96	0.61	0.11
Uniform Delay, d1	44.4	23.1	20.5	45.7	31.3	26.1	44.5	30.6	21.9	44.3	27.1	22.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	60.6	0.1	0.0	5.7	10.6	0.2	94.9	9.9	0.2	59.5	2.4	0.4
Delay (s)	105.0	23.2	20.5	51.4	41.9	26.3	139.4	40.6	22.1	103.8	29.4	22.7
Level of Service	F	C	C	D	D	C	F	D	C	F	C	C
Approach Delay (s)		50.3			37.1			53.5			39.3	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM Average Control Delay	45.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.90			
Actuated Cycle Length (s)	98.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	71.3%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	50	165	72	61	290	52	306	124	37	55	111	76
Peak Hour Factor	0.67	0.67	0.67	0.78	0.78	0.78	0.77	0.77	0.77	0.86	0.86	0.86
Hourly flow rate (vph)	75	246	107	78	372	67	397	161	48	64	129	88

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	428	517	606	281
Volume Left (vph)	75	78	397	64
Volume Right (vph)	107	67	48	88
Hadj (s)	-0.06	0.00	0.13	-0.09
Departure Headway (s)	8.8	8.9	9.0	9.5
Degree Utilization, x	1.05	1.28	1.52	0.74
Capacity (veh/h)	405	412	412	374
Control Delay (s)	88.9	169.2	270.6	35.1
Approach Delay (s)	88.9	169.2	270.6	35.1
Approach LOS	F	F	F	E

Intersection Summary				
Delay		163.4		
HCM Level of Service		F		
Intersection Capacity Utilization		77.3%	ICU Level of Service	D
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.85			1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1570			1845	1568	1736	3464		1736	3417	
Flt Permitted	0.75	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1385	1570			1845	1568	1736	3464		1736	3417	
Volume (vph)	10	1	94	0	6	104	139	1127	16	46	954	111
Peak-hour factor, PHF	0.68	0.68	0.68	0.60	0.60	0.60	0.87	0.87	0.87	0.84	0.84	0.84
Adj. Flow (vph)	15	1	138	0	10	173	160	1295	18	55	1136	132
RTOR Reduction (vph)	0	120	0	0	0	151	0	1	0	0	13	0
Lane Group Flow (vph)	15	19	0	0	10	22	160	1312	0	55	1255	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	6.1	6.1			6.1	6.1	4.1	27.5		1.7	25.1	
Effective Green, g (s)	6.1	6.1			6.1	6.1	4.1	27.5		1.7	25.1	
Actuated g/C Ratio	0.13	0.13			0.13	0.13	0.09	0.58		0.04	0.53	
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	179	202			238	202	150	2014		62	1813	
v/s Ratio Prot		0.01			0.01		c0.09	c0.38		0.03	0.37	
v/s Ratio Perm	0.01					c0.01						
v/c Ratio	0.08	0.09			0.04	0.11	1.07	0.65		0.89	0.69	
Uniform Delay, d1	18.1	18.2			18.0	18.2	21.6	6.7		22.7	8.2	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2			0.1	0.2	92.4	0.8		74.6	1.2	
Delay (s)	18.3	18.4			18.1	18.4	114.0	7.4		97.3	9.4	
Level of Service	B	B			B	B	F	A		F	A	
Approach Delay (s)		18.4			18.4			19.0			13.1	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM Average Control Delay	16.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	47.3	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	54.8%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frt	1.00	1.00			0.99			0.99				
Flt Protected	0.95	1.00			1.00			0.99				
Satd. Flow (prot)	1736	1827			1814			4923				
Flt Permitted	0.95	1.00			1.00			0.99				
Satd. Flow (perm)	1736	1827			1814			4923				
Volume (vph)	73	146	0	0	271	15	294	1336	173	0	0	0
Peak-hour factor, PHF	0.83	0.83	0.83	0.68	0.68	0.68	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	88	176	0	0	399	22	334	1518	197	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	13	0	0	0	0
Lane Group Flow (vph)	88	176	0	0	419	0	0	2036	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	Prot						Perm					
Protected Phases	7	4			8			2				
Permitted Phases							2					
Actuated Green, G (s)	6.9	33.9			23.3			31.4				
Effective Green, g (s)	6.6	34.1			23.5			31.6				
Actuated g/C Ratio	0.09	0.46			0.32			0.43				
Clearance Time (s)	3.7	4.2			4.2			4.2				
Vehicle Extension (s)	2.0	7.9			7.7			6.4				
Lane Grp Cap (vph)	155	845			578			2111				
v/s Ratio Prot	c0.05	0.10			c0.23							
v/s Ratio Perm								0.41				
v/c Ratio	0.57	0.21			0.72			0.96				
Uniform Delay, d1	32.2	11.8			22.2			20.5				
Progression Factor	1.00	1.00			1.00			1.00				
Incremental Delay, d2	2.8	0.5			7.6			12.9				
Delay (s)	35.0	12.3			29.8			33.4				
Level of Service	D	B			C			C				
Approach Delay (s)		19.9			29.8			33.4			0.0	
Approach LOS		B			C			C			A	

Intersection Summary				
HCM Average Control Delay	31.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	73.7	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	65.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0				
Lane Util. Factor					0.91			0.91				
Frt					0.95			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					4722			4988				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					4722			4988				
Volume (vph)	0	0	0	0	1252	689	309	1284	0	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.82	0.82	0.82	0.87	0.87	0.87	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	1527	840	355	1476	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	10	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	2357	0	0	1828	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type							Perm					
Protected Phases					8			2				
Permitted Phases							2					
Actuated Green, G (s)					25.4			30.4				
Effective Green, g (s)					26.0			31.0				
Actuated g/C Ratio					0.40			0.48				
Clearance Time (s)					4.6			4.6				
Vehicle Extension (s)					4.8			3.0				
Lane Grp Cap (vph)					1889			2379				
v/s Ratio Prot					c0.50							
v/s Ratio Perm								0.37				
v/c Ratio					1.31dr			0.77				
Uniform Delay, d1					19.5			14.0				
Progression Factor					1.00			1.00				
Incremental Delay, d2					116.2			2.5				
Delay (s)					135.7			16.5				
Level of Service					F			B				
Approach Delay (s)		0.0			135.7			16.5			0.0	
Approach LOS		A			F			B			A	

Intersection Summary				
HCM Average Control Delay	83.7	HCM Level of Service	F	
HCM Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	77.4%	ICU Level of Service	D	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.91						0.91				
Frt		1.00						0.96				
Flt Protected		0.98						1.00				
Satd. Flow (prot)		4883						4822				
Flt Permitted		0.98						1.00				
Satd. Flow (perm)		4883						4822				
Volume (vph)	741	993	0	0	0	0	0	852	337	0	0	0
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.82	0.82	0.82	0.92	0.92	0.92
Adj. Flow (vph)	797	1068	0	0	0	0	0	1039	411	0	0	0
RTOR Reduction (vph)	0	17	0	0	0	0	0	28	0	0	0	0
Lane Group Flow (vph)	0	1848	0	0	0	0	0	1422	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	Perm											
Protected Phases		2						8				
Permitted Phases	2											
Actuated Green, G (s)		23.1						20.0				
Effective Green, g (s)		24.5						21.1				
Actuated g/C Ratio		0.46						0.39				
Clearance Time (s)		5.4						5.1				
Vehicle Extension (s)		2.0						5.0				
Lane Grp Cap (vph)		2232						1898				
v/s Ratio Prot								c0.29				
v/s Ratio Perm		0.38										
v/c Ratio		0.98dl						0.75				
Uniform Delay, d1		12.7						14.0				
Progression Factor		1.00						1.00				
Incremental Delay, d2		3.7						2.0				
Delay (s)		16.4						16.0				
Level of Service		B						B				
Approach Delay (s)		16.4			0.0			16.0			0.0	
Approach LOS		B			A			B			A	

Intersection Summary				
HCM Average Control Delay	16.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	53.6	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	71.7%	ICU Level of Service	C	
Analysis Period (min)	15			

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
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)	49	26	0	0	35	41	4	974	6	0	0	0
Peak Hour Factor	0.60	0.60	0.60	0.83	0.83	0.83	0.78	0.78	0.78	0.92	0.92	0.92
Hourly flow rate (vph)	82	43	0	0	42	49	5	1249	8	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	125	92	629	632
Volume Left (vph)	82	0	5	0
Volume Right (vph)	0	49	0	8
Hadj (s)	0.16	-0.29	0.06	0.04
Departure Headway (s)	6.1	5.8	5.2	5.2
Degree Utilization, x	0.21	0.15	0.91	0.92
Capacity (veh/h)	579	611	685	687
Control Delay (s)	10.8	9.8	37.9	38.1
Approach Delay (s)	10.8	9.8	38.0	
Approach LOS	B	A	E	

Intersection Summary				
Delay	33.9			
HCM Level of Service	D			
Intersection Capacity Utilization	44.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				4988	3433	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				4988	3433	
Volume (vph)	0	0	0	1260	681	0
Peak-hour factor, PHF	0.92	0.92	0.74	0.74	0.70	0.70
Adj. Flow (vph)	0	0	0	1703	973	0
RTOR Reduction (vph)	0	0	0	0	9	0
Lane Group Flow (vph)	0	0	0	1703	964	0
Heavy Vehicles (%)	4%	4%	4%	4%	2%	2%
Turn Type						
Protected Phases				6	4	
Permitted Phases						
Actuated Green, G (s)				27.1	21.9	
Effective Green, g (s)				27.7	23.9	
Actuated g/C Ratio				0.46	0.40	
Clearance Time (s)				4.6	6.0	
Vehicle Extension (s)				5.0	6.0	
Lane Grp Cap (vph)				2318	1377	
v/s Ratio Prot				c0.34	c0.28	
v/s Ratio Perm						
v/c Ratio				0.73	0.70	
Uniform Delay, d1				13.0	14.9	
Progression Factor				1.00	1.00	
Incremental Delay, d2				1.5	2.4	
Delay (s)				14.5	17.3	
Level of Service				B	B	
Approach Delay (s)	0.0			14.5	17.3	
Approach LOS	A			B	B	

Intersection Summary			
HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	59.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	483	104	622	991	680	328	639
v/c Ratio	0.54	0.21	1.12	0.63	0.66	0.74	0.29
Control Delay	33.3	6.4	106.8	30.9	13.3	52.2	16.8
Queue Delay	0.0	0.0	0.0	0.7	0.4	0.0	0.0
Total Delay	33.3	6.4	106.8	31.6	13.6	52.2	16.8
Queue Length 50th (ft)	135	0	~253	305	128	104	86
Queue Length 95th (ft)	181	38	#310	364	241	149	113
Internal Link Dist (ft)	719			378			1660
Turn Bay Length (ft)		275	110			260	
Base Capacity (vph)	1019	539	554	1575	1034	505	2221
Starvation Cap Reductn	0	0	0	267	74	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.19	1.12	0.76	0.71	0.65	0.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	43	282	410	273	212	488	1100	1036	538	949	447
v/c Ratio	0.29	0.80	1.53	0.57	0.46	1.47	0.90	1.15	1.63	0.77	0.62
Control Delay	52.1	42.8	287.2	44.9	30.4	246.1	34.2	88.8	325.9	37.5	16.1
Queue Delay	0.0	0.5	0.0	0.0	0.0	8.1	35.1	69.0	0.0	0.0	0.0
Total Delay	52.1	43.3	287.2	44.9	30.4	254.2	69.3	157.8	325.9	37.5	16.1
Queue Length 50th (ft)	27	110	~413	192	100	~483	300	~630	~548	321	103
Queue Length 95th (ft)	62	179	m#514	m225	m135	m#485	m318	m#426	#725	388	201
Internal Link Dist (ft)		2033		385			269			731	
Turn Bay Length (ft)	145		155		25	125			170		
Base Capacity (vph)	154	392	268	525	496	331	1229	901	331	1229	722
Starvation Cap Reductn	0	0	0	0	0	4	202	85	0	0	0
Spillback Cap Reductn	0	12	0	0	0	0	0	108	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.74	1.53	0.52	0.43	1.49	1.07	1.31	1.63	0.77	0.62

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	328	1202	401	655	247	23
v/c Ratio	0.35	1.15	1.02	0.46	0.98	0.10
Control Delay	7.0	82.3	92.2	5.3	98.7	32.9
Queue Delay	0.8	16.8	0.0	0.0	0.0	0.0
Total Delay	7.8	99.1	92.2	5.3	98.7	32.9
Queue Length 50th (ft)	62	~830	~292	128	176	10
Queue Length 95th (ft)	m47	m73	#464	170	#222	26
Internal Link Dist (ft)	385			614	86	
Turn Bay Length (ft)						25
Base Capacity (vph)	947	1047	395	1428	253	232
Starvation Cap Reductn	355	34	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.55	1.19	1.02	0.46	0.98	0.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	226	366	285	610	1633	137	657
v/c Ratio	0.75	0.53	1.49	0.79	0.72	0.47	0.32
Control Delay	60.5	28.0	280.5	27.6	25.3	40.3	7.7
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	60.5	28.0	280.5	27.7	25.3	40.3	7.7
Queue Length 50th (ft)	73	78	~253	117	291	44	120
Queue Length 95th (ft)	#114	104	#344	127	314	75	178
Internal Link Dist (ft)		671			2243		378
Turn Bay Length (ft)			280			120	
Base Capacity (vph)	303	1275	191	1234	2266	294	2035
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	98	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.29	1.49	0.54	0.72	0.47	0.32

Intersection Summary

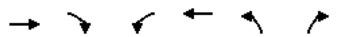
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

6: Noble Ave & SR-198 EB Ramps @ Ben Maddox Way

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	109	434	155	407	32	46	34	345	459
v/c Ratio	0.60	0.22	0.70	0.53	0.05	0.20	0.15	0.44	0.66
Control Delay	57.3	22.9	58.3	28.5	19.5	43.3	16.0	34.9	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.3	22.9	58.3	28.5	19.5	43.3	16.0	34.9	8.6
Queue Length 50th (ft)	65	65	92	194	9	26	0	97	0
Queue Length 95th (ft)	127	112	161	337	33	67	30	131	23
Internal Link Dist (ft)		179		406		179		341	
Turn Bay Length (ft)	185		150		40				110
Base Capacity (vph)	335	1935	342	761	616	491	430	1099	789
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.22	0.45	0.53	0.05	0.09	0.08	0.31	0.58

Intersection Summary

8: Noble Ave & Walmart East Access



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	359	38	137	440	247	65
v/c Ratio	0.34	0.04	0.66	0.33	0.77	0.19
Control Delay	14.7	4.8	58.4	6.3	55.5	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	4.8	58.4	6.3	55.5	10.1
Queue Length 50th (ft)	115	0	85	84	151	0
Queue Length 95th (ft)	229	17	142	152	211	25
Internal Link Dist (ft)	248			664	309	
Turn Bay Length (ft)			200			
Base Capacity (vph)	1046	905	335	1376	463	462
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.04	0.41	0.32	0.53	0.14

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	186	182	104	741	144	1417	324	1099	247
v/c Ratio	1.07	0.57	0.23	1.11	0.91	1.08	1.08	0.92	0.36
Control Delay	135.6	31.6	35.3	92.9	102.0	89.4	108.3	32.8	2.0
Queue Delay	617.8	0.0	0.0	125.3	0.0	1.4	248.1	140.5	2.1
Total Delay	753.4	31.6	35.3	218.2	102.0	90.8	356.3	173.3	4.1
Queue Length 50th (ft)	~146	71	58	~476	103	~410	~256	343	13
Queue Length 95th (ft)	#209	96	104	#607	#202	#449	m#379	m#447	m15
Internal Link Dist (ft)		502		1058		2367		110	
Turn Bay Length (ft)	125		135		115		115		
Base Capacity (vph)	174	549	454	670	158	1308	300	1199	690
Starvation Cap Reductn	0	0	0	0	0	0	104	364	306
Spillback Cap Reductn	173	0	0	138	0	4	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	186.00	0.33	0.23	1.39	0.91	1.09	1.65	1.32	0.64

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	607	572	2002	207	1316
v/c Ratio	1.01	1.00	1.00	0.97	0.67
Control Delay	75.5	70.3	24.7	84.2	8.0
Queue Delay	57.0	197.5	101.7	0.0	1.6
Total Delay	132.5	267.8	126.4	84.2	9.6
Queue Length 50th (ft)	~457	394	187	157	192
Queue Length 95th (ft)	#536	#485	m171	m#188	m175
Internal Link Dist (ft)		366	110		269
Turn Bay Length (ft)	232			75	
Base Capacity (vph)	600	573	2012	213	1956
Starvation Cap Reductn	0	0	403	0	338
Spillback Cap Reductn	78	185	320	0	433
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.16	1.47	1.24	0.97	0.86

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	156	236	71	48	493	286	172	1037	41	153	715	171
v/c Ratio	0.95	0.35	0.11	0.39	0.88	0.50	1.06	0.87	0.08	0.94	0.60	0.26
Control Delay	104.8	25.4	6.4	53.4	50.4	16.1	132.0	39.8	15.2	103.4	29.4	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.8	25.4	6.4	53.4	50.4	16.1	132.0	39.8	15.2	103.4	29.4	5.0
Queue Length 50th (ft)	101	111	0	30	285	67	~125	330	10	99	201	0
Queue Length 95th (ft)	#167	142	18	60	368	122	#209	338	27	#227	263	45
Internal Link Dist (ft)		1613			1967			1346			2243	
Turn Bay Length (ft)	95		95	90		90	155		90	200		200
Base Capacity (vph)	164	674	618	155	609	613	162	1192	546	162	1192	646
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.35	0.11	0.31	0.81	0.47	1.06	0.87	0.08	0.94	0.60	0.26

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	15	139	10	173	160	1313	55	1268
v/c Ratio	0.07	0.39	0.04	0.45	1.01	0.60	0.38	0.72
Control Delay	14.7	7.2	14.0	7.3	100.9	10.7	26.8	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	7.2	14.0	7.3	100.9	10.7	26.8	13.9
Queue Length 50th (ft)	3	0	2	0	37	60	12	113
Queue Length 95th (ft)	10	16	7	10	#124	#265	36	#232
Internal Link Dist (ft)		2570	207			1470		2367
Turn Bay Length (ft)	100				210		290	
Base Capacity (vph)	411	563	547	587	159	2189	145	1755
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.25	0.02	0.29	1.01	0.60	0.38	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	88	176	421	2049
v/c Ratio	0.47	0.21	0.72	0.96
Control Delay	40.4	11.8	30.5	34.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	40.4	11.8	30.5	34.7
Queue Length 50th (ft)	41	45	170	~370
Queue Length 95th (ft)	77	72	195	#504
Internal Link Dist (ft)		608	737	568
Turn Bay Length (ft)				
Base Capacity (vph)	417	1035	632	2145
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.21	0.17	0.67	0.96

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	NBT
Lane Group Flow (vph)	2367	1831
v/c Ratio	1.31dr	0.77
Control Delay	137.5	16.7
Queue Delay	32.6	0.7
Total Delay	170.1	17.4
Queue Length 50th (ft)	~443	205
Queue Length 95th (ft)	#463	247
Internal Link Dist (ft)	265	310
Turn Bay Length (ft)		
Base Capacity (vph)	1899	2381
Starvation Cap Reductn	105	232
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	1.32	0.85

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lane Group	EBT	NBT
Lane Group Flow (vph)	1865	1450
v/c Ratio	0.98dl	0.75
Control Delay	16.8	16.6
Queue Delay	0.0	0.1
Total Delay	16.8	16.7
Queue Length 50th (ft)	173	134
Queue Length 95th (ft)	231	157
Internal Link Dist (ft)	4045	445
Turn Bay Length (ft)		
Base Capacity (vph)	2249	1926
Starvation Cap Reductn	0	0
Spillback Cap Reductn	10	38
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.83	0.77

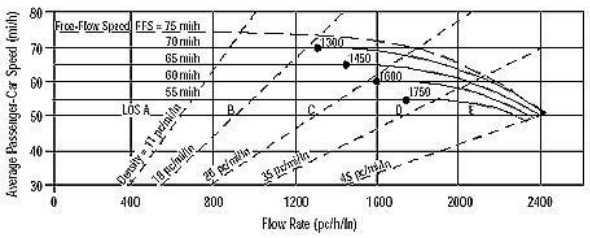
Intersection Summary

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Lane Group	WBT	NWL
Lane Group Flow (vph)	1703	973
v/c Ratio	0.74	0.70
Control Delay	15.5	18.6
Queue Delay	0.2	0.7
Total Delay	15.7	19.3
Queue Length 50th (ft)	184	157
Queue Length 95th (ft)	173	152
Internal Link Dist (ft)	3590	203
Turn Bay Length (ft)		
Base Capacity (vph)	2464	1460
Starvation Cap Reductn	0	0
Spillback Cap Reductn	161	202
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.74	0.77

Intersection Summary

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	B/W Ben Maddox Way & Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Long-term 2030 + Project

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2058 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1195	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	19.1	pc/mi/ln	S		mi/h
LOS	C		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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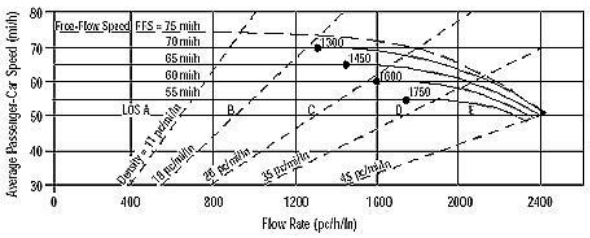
BASIC FREEWAY WORKSHEET Page 1 of 1

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	E/O Lovers Ln.
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Long-term 2030 + Project

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	1376 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	0.56	I/mi	f_{ID}	0.3	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	65.2	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	803	pc/h/ln	Design LOS		
S	65.2	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	12.3	pc/mi/ln	S		mi/h
LOS	B		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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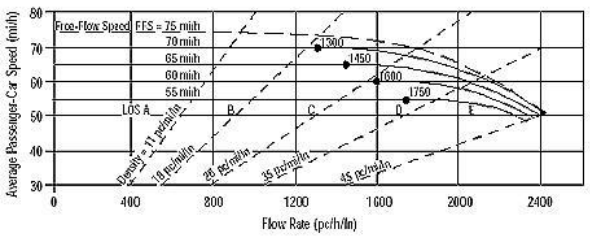
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	W/O S. Ben Maddox Way
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Long-term 2030 + Project
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2528 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1468	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	23.5	pc/mi/ln	S		mi/h
LOS	C		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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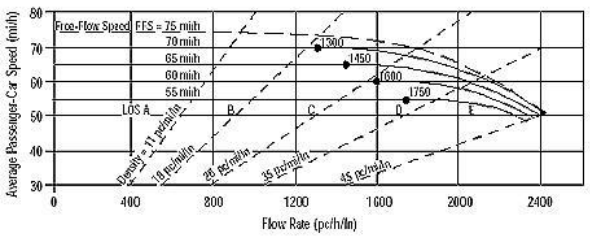
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	B/W Ben Maddox Way & Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Long-term 2030 + Project
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	3074 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1785	pc/h/ln	Design LOS		
S	61.9	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	28.8	pc/mi/ln	S		mi/h
LOS	D		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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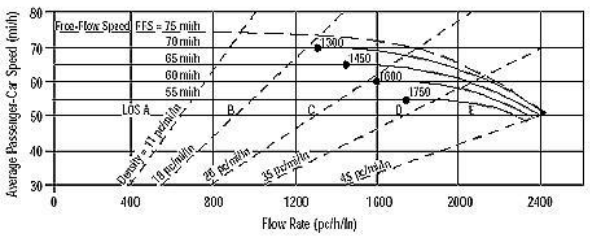

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	E/O Lovers Ln.
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Long-term 2030 + Project
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	1808 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	0.56	I/mi	f_{ID}	0.3	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	65.2	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1055	pc/h/ln	Design LOS		
S	65.2	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	16.2	pc/mi/ln	S		mi/h
LOS	B		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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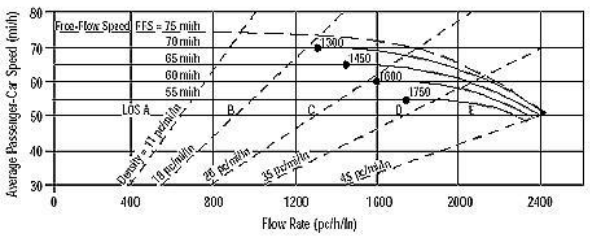

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	W/O S. Ben Maddox Way
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Long-term 2030 + Project
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	3966 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	2302	pc/h/ln	Design LOS		
S	52.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	43.9	pc/mi/ln	S		mi/h
LOS	E		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Long-term 2030 + Project

Project Description

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 2500 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = 374 veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	2528	0.90	Level	9	0	0.957	1.00	2935
Ramp	611	0.90	Level	4	0	0.980	1.00	692
UpStream	374	0.90	Level	2	0	0.990	1.00	420
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 2935 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	2935	4800	No
				V_{12}	2935	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	2243	4800	No
				V_R	692	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A	D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D
D_R = (pc/ mi /ln)	D_R = 27.9 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= C (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.490 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 56.3 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 56.3 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Long-term 2030 + Project

Project Description

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 2600 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = 141 veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	2058	0.90	Level	9	0	0.957	1.00	2390
Ramp	908	0.90	Level	4	0	0.980	1.00	1029
UpStream	141	0.90	Level	2	0	0.990	1.00	158
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 2390 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	2390	4800	No
				V_{12}	2390	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	1361	4800	No
				V_R	1029	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A	D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D
D_R = (pc/ mi /ln)	D_R = 22.1 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= C (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.521 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 55.4 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 55.4 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Long-term 2030 + Project

Project Description

Inputs

Upstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off
L_{up} = 3400 ft
Vu = 1455 veh/h

Terrain Level
S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off
L_{down} = ft
VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	3074	0.90	Level	9	0	0.957	1.00	3569
Ramp	311	0.90	Level	4	0	0.980	1.00	352
UpStream	1455	0.90	Level	2	0	0.990	1.00	1633
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 25-2 or 25-3)
P_{FM}= using Equation
V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$
D_R = (pc/ mi /ln)
LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} =1.000 using Equation 0
V_{12} = 3569 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$	3569	4800	No
V_{12}	3569	4400:All	No
$V_{FO} = V_F - V_R$	3217	4800	No
V_R	352	2000	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$
D_R = 32.5 (pc/ mi /ln)
LOS= D (Exhibit 25-4)

Speed Estimation

D_s = 0.460 (Exhibit 25-19)
S_R= 57.1 mph (Exhibit 25-19)
S_0= N/A mph (Exhibit 25-19)
S = 57.1 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	AM Peak	Analysis Year	Long-term 2030 + Project

Project Description

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☐ No ☐ Off
L_{up} = ft
Vu = veh/h

Terrain
S_{FF} = 70.0 mph S_{FR} = 35.0 mph
Sketch (show lanes, L_A, L_D,V_R,V_f)

Downstream Adj Ramp: ☐ Yes ☐ On ☐ No ☐ Off
L_{down} = ft
VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	1808	0.90	Level	9	0	0.957	1.00	2099
Ramp	189	0.90	Level	4	0	0.980	1.00	214
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
L_{EQ} = (Equation 25-2 or 25-3)
P_{FM}= using Equation
V_{12}= pc/h

Capacity Checks

	Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7	
V_{R12}		4600:All	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$
D_R = (pc/ mi /ln)
LOS = (Exhibit 25-4)

Speed Estimation

M_S = (Exibit 25-19)
S_R= mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)
S= mph (Exhibit 25-14)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-8 or 25-9)
P_{FD} =1.000 using Equation 0
V_{12} = 2099 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$V_{FI}=V_F$	2099	4800	No
V_{12}	2099	4400:All	No
$V_{FO} = V_F - V_R$	1885	4800	No
V_R	214	2000	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$
D_R = 20.3 (pc/ mi /ln)
LOS= C (Exhibit 25-4)

Speed Estimation

D_s = 0.447 (Exhibit 25-19)
S_R= 57.5 mph (Exhibit 25-19)
S_0= N/A mph (Exhibit 25-19)
S = 57.5 mph (Exhibit 25-15)

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor					0.95	1.00	0.97	0.91	0.91	0.97	0.91	
Frt					1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)					3482	1583	3433	3390	1441	3433	4951	
Flt Permitted					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)					3482	1583	3433	3390	1441	3433	4951	
Volume (vph)	0	0	0	206	426	162	283	945	503	383	775	166
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.94	0.86	0.86	0.86
Adj. Flow (vph)	0	0	0	224	463	176	301	1005	535	445	901	193
RTOR Reduction (vph)	0	0	0	0	0	124	0	0	301	0	33	0
Lane Group Flow (vph)	0	0	0	0	687	52	301	1005	234	445	1061	0
Turn Type				Split		Perm	Prot		Perm	Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)					28.6	28.6	11.7	42.8	42.8	14.6	45.7	
Effective Green, g (s)					29.6	29.6	11.7	43.8	43.8	14.6	46.7	
Actuated g/C Ratio					0.30	0.30	0.12	0.44	0.44	0.15	0.47	
Clearance Time (s)					5.0	5.0	4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)					7.5	7.5	2.0	8.0	8.0	2.0	7.5	
Lane Grp Cap (vph)					1031	469	402	1485	631	501	2312	
v/s Ratio Prot					c0.20		0.09	c0.30		c0.13	c0.21	
v/s Ratio Perm						0.03			0.16			
v/c Ratio					0.67	0.11	0.75	0.68	0.37	0.89	0.46	
Uniform Delay, d1					30.9	25.6	42.7	22.4	18.9	41.9	18.1	
Progression Factor					1.00	1.00	0.70	1.35	7.33	1.00	1.00	
Incremental Delay, d2					3.2	0.4	4.0	1.5	1.0	16.8	0.7	
Delay (s)					34.1	26.0	33.7	31.7	139.2	58.7	18.7	
Level of Service					C	C	C	C	F	E	B	
Approach Delay (s)		0.0			32.4			63.3			30.3	
Approach LOS		A			C			E			C	

Intersection Summary			
HCM Average Control Delay	45.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	316	492	276	512	235	67
Peak Hour Factor	0.92	0.92	0.88	0.88	0.76	0.76
Hourly flow rate (vph)	343	535	314	582	309	88
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total (vph)	229	649	508	388	309	88
Volume Left (vph)	0	0	314	0	309	0
Volume Right (vph)	0	535	0	0	0	88
Hadj (s)	0.03	-0.54	0.34	0.03	0.55	-0.65
Departure Headway (s)	7.5	6.9	7.7	7.3	8.7	7.5
Degree Utilization, x	0.48	1.25	1.08	0.79	0.75	0.18
Capacity (veh/h)	467	526	479	483	406	466
Control Delay (s)	16.0	149.6	90.8	31.6	32.1	11.0
Approach Delay (s)	114.8		65.1		27.4	
Approach LOS	F		F		D	

Intersection Summary					
Delay	78.3				
HCM Level of Service	F				
Intersection Capacity Utilization	70.5%	ICU Level of Service	C		
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1676		1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1676		1770	1863	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	95	234	468	224	190	159	210	1210	745	284	841	165
Peak-hour factor, PHF	0.80	0.80	0.80	0.87	0.87	0.87	0.92	0.92	0.92	0.89	0.89	0.89
Adj. Flow (vph)	119	292	585	257	218	183	228	1315	810	319	945	185
RTOR Reduction (vph)	0	65	0	0	0	53	0	0	289	0	0	130
Lane Group Flow (vph)	119	812	0	257	218	130	228	1315	521	319	945	56
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			6
Actuated Green, G (s)	11.7	34.0		11.0	34.8	34.8	14.0	32.0	32.0	13.0	31.0	31.0
Effective Green, g (s)	11.7	36.0		11.0	35.3	35.3	14.0	34.0	34.0	13.0	33.0	33.0
Actuated g/C Ratio	0.11	0.33		0.10	0.32	0.32	0.13	0.31	0.31	0.12	0.30	0.30
Clearance Time (s)	4.0	6.0		4.0	4.5	4.5	4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	188	549		177	598	508	225	1094	489	209	1062	475
v/s Ratio Prot	0.07	c0.48		c0.15	0.12		0.13	c0.37		c0.18	0.27	
v/s Ratio Perm						0.08			0.33			0.04
v/c Ratio	0.63	1.48		1.45	0.36	0.26	1.01	1.20	1.06	1.53	0.89	0.12
Uniform Delay, d1	47.1	37.0		49.5	28.7	27.6	48.0	38.0	38.0	48.5	36.8	27.9
Progression Factor	1.00	1.00		0.97	0.83	0.71	1.06	0.97	0.98	1.00	1.00	1.00
Incremental Delay, d2	6.8	225.1		229.6	0.3	0.2	21.4	91.8	33.7	259.6	11.2	0.5
Delay (s)	53.9	262.1		277.4	24.2	19.9	72.3	128.7	70.9	308.1	47.9	28.4
Level of Service	D	F		F	C	B	E	F	E	F	D	C
Approach Delay (s)		237.2			121.9			103.3			102.7	
Approach LOS		F			F			F			F	

Intersection Summary				
HCM Average Control Delay	129.8	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.27			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	116.0%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	1863	1752	1568
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	1863	1752	1568
Volume (vph)	476	787	258	397	176	27
Peak-hour factor, PHF	0.94	0.94	0.83	0.83	0.88	0.88
Adj. Flow (vph)	506	837	311	478	200	31
RTOR Reduction (vph)	0	281	0	0	0	11
Lane Group Flow (vph)	506	556	311	478	200	20
Heavy Vehicles (%)	2%	2%	2%	2%	3%	3%
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	56.7	56.7	23.2	83.9	16.8	16.8
Effective Green, g (s)	58.0	58.0	23.2	85.2	16.8	16.8
Actuated g/C Ratio	0.53	0.53	0.21	0.77	0.15	0.15
Clearance Time (s)	5.3	5.3	4.0	5.3	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	982	835	373	1443	268	239
v/s Ratio Prot	0.27		c0.18	0.26	c0.11	
v/s Ratio Perm		c0.35				0.01
v/c Ratio	0.52	0.67	0.83	0.33	0.75	0.08
Uniform Delay, d1	16.9	18.9	41.6	3.8	44.6	40.0
Progression Factor	0.85	0.75	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.4	14.7	0.6	10.8	0.2
Delay (s)	14.4	14.6	56.3	4.4	55.3	40.1
Level of Service	B	B	E	A	E	D
Approach Delay (s)	14.6			24.8	53.3	
Approach LOS	B			C	D	

Intersection Summary				
HCM Average Control Delay	21.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	69.7%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0		4.0		4.0		4.0	4.0	
Lane Util. Factor	0.97	0.95		1.00		0.88		0.91		0.97	0.95	
Frt	1.00	0.93		1.00		0.85		0.97		1.00	1.00	
Flt Protected	0.95	1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)	3433	3281		1770		2787		4944		3433	3539	
Flt Permitted	0.95	1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)	3433	3281		1770		2787		4944		3433	3539	
Volume (vph)	193	529	501	294	0	618	0	920	209	190	791	0
Peak-hour factor, PHF	0.83	0.83	0.83	0.93	0.93	0.93	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	233	637	604	316	0	665	0	968	220	207	860	0
RTOR Reduction (vph)	0	58	0	0	0	230	0	37	0	0	0	0
Lane Group Flow (vph)	233	1183	0	316	0	435	0	1151	0	207	860	0
Turn Type	Prot			Prot		custom				Prot		
Protected Phases	7	4		3		8		2		1	6	
Permitted Phases												
Actuated Green, G (s)	9.0	31.9		20.1		43.0		22.1		7.9	34.0	
Effective Green, g (s)	9.0	32.9		20.1		44.0		23.1		7.9	35.0	
Actuated g/C Ratio	0.09	0.33		0.20		0.44		0.23		0.08	0.35	
Clearance Time (s)	4.0	5.0		4.0		5.0		5.0		4.0	5.0	
Vehicle Extension (s)	6.5	6.5		2.0		4.5		5.5		2.0	6.0	
Lane Grp Cap (vph)	309	1079		356		1226		1142		271	1239	
v/s Ratio Prot	0.07	c0.36		c0.18		0.16		c0.23		0.06	c0.24	
v/s Ratio Perm												
v/c Ratio	0.75	1.10		0.89		0.36		1.01		0.76	0.69	
Uniform Delay, d1	44.4	33.5		38.9		18.6		38.5		45.1	27.9	
Progression Factor	1.00	1.00		1.00		1.00		1.00		0.83	0.94	
Incremental Delay, d2	13.5	57.5		21.9		0.3		28.6		9.6	2.8	
Delay (s)	57.9	91.1		60.7		18.9		67.0		46.9	29.2	
Level of Service	E	F		E		B		E		D	C	
Approach Delay (s)		85.8			32.4			67.0			32.6	
Approach LOS		F			C			E			C	

Intersection Summary			
HCM Average Control Delay	57.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	88.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	1.00	1.00		1.00	1.00		0.95	1.00
Frt	1.00	0.96		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98	1.00		0.97	1.00
Satd. Flow (prot)	1676	4905		1676	1863	1500		1802	1485		3407	1485
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98	1.00		0.97	1.00
Satd. Flow (perm)	1676	4905		1676	1863	1500		1802	1485		3407	1485
Volume (vph)	191	583	181	178	267	71	123	134	142	217	163	430
Peak-hour factor, PHF	0.91	0.91	0.91	0.95	0.95	0.95	0.78	0.78	0.78	0.88	0.88	0.88
Adj. Flow (vph)	210	641	199	187	281	75	158	172	182	247	185	489
RTOR Reduction (vph)	0	39	0	0	0	18	0	0	140	0	0	321
Lane Group Flow (vph)	210	801	0	187	281	57	0	330	42	0	432	168
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6			3			4
Actuated Green, G (s)	18.1	33.5		16.8	32.2	32.2		26.8	26.8		24.8	24.8
Effective Green, g (s)	17.8	34.8		16.5	33.5	33.5		28.0	28.0		26.0	26.0
Actuated g/C Ratio	0.15	0.29		0.14	0.28	0.28		0.23	0.23		0.21	0.21
Clearance Time (s)	3.7	5.3		3.7	5.3	5.3		5.2	5.2		5.2	5.2
Vehicle Extension (s)	2.0	5.1		2.0	4.8	4.8		6.3	6.3		7.9	7.9
Lane Grp Cap (vph)	246	1407		228	515	414		416	343		730	318
v/s Ratio Prot	c0.13	c0.16		0.11	0.15			c0.18			c0.13	
v/s Ratio Perm						0.04			0.03			0.11
v/c Ratio	0.85	0.57		0.82	0.55	0.14		0.79	0.12		0.59	0.53
Uniform Delay, d1	50.5	36.9		51.0	37.4	33.0		43.9	36.9		42.9	42.2
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	23.1	1.7		19.6	2.0	0.3		12.2	0.5		3.2	5.7
Delay (s)	73.6	38.5		70.6	39.4	33.3		56.1	37.4		46.1	47.9
Level of Service	E	D		E	D	C		E	D		D	D
Approach Delay (s)		45.5			49.3			49.5			47.0	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	47.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	121.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	12	572	358	0	588	3	0	0	107	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.90	0.90	0.90	0.84	0.84	0.84	0.92	0.92	0.92
Hourly flow rate (vph)	13	602	377	0	653	3	0	0	127	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		799			328							
pX, platoon unblocked	0.94			0.86			0.89	0.89	0.86	0.89	0.89	0.94
vC, conflicting volume	657			979			1471	1472	489	1109	1659	655
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	635			813			1270	1272	244	864	1482	633
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	80	100	100	100
cM capacity (veh/h)	888			696			110	146	651	176	109	397

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	NB 1
Volume Total	13	401	578	657	127
Volume Left	13	0	0	0	0
Volume Right	0	0	377	3	127
cSH	888	1700	1700	1700	651
Volume to Capacity	0.01	0.24	0.34	0.39	0.20
Queue Length 95th (ft)	1	0	0	0	18
Control Delay (s)	9.1	0.0	0.0	0.0	11.9
Lane LOS	A				B
Approach Delay (s)	0.1			0.0	11.9
Approach LOS					B

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	40.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	1863	1770	1583
Volume (vph)	611	68	158	259	332	177
Peak-hour factor, PHF	0.94	0.94	0.91	0.91	0.81	0.81
Adj. Flow (vph)	650	72	174	285	410	219
RTOR Reduction (vph)	0	43	0	0	0	162
Lane Group Flow (vph)	650	29	174	285	410	57
Turn Type		Perm	Prot			Prot
Protected Phases	2		1	6	4	4
Permitted Phases		2				
Actuated Green, G (s)	22.3	22.3	7.7	34.0	15.4	15.4
Effective Green, g (s)	24.3	24.3	7.7	36.0	15.4	15.4
Actuated g/C Ratio	0.41	0.41	0.13	0.61	0.26	0.26
Clearance Time (s)	6.0	6.0	4.0	6.0	4.0	4.0
Vehicle Extension (s)	8.0	8.0	2.0	8.0	2.4	2.4
Lane Grp Cap (vph)	762	648	229	1129	459	410
v/s Ratio Prot	c0.35		c0.10	0.15	c0.23	0.04
v/s Ratio Perm		0.02				
v/c Ratio	0.85	0.05	0.76	0.25	0.89	0.14
Uniform Delay, d1	15.9	10.6	25.0	5.4	21.2	16.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.7	0.1	12.1	0.5	19.2	0.1
Delay (s)	27.6	10.7	37.0	6.0	40.4	17.0
Level of Service	C	B	D	A	D	B
Approach Delay (s)	25.9			17.8	32.2	
Approach LOS	C			B	C	

Intersection Summary				
HCM Average Control Delay	26.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	59.4	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	69.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

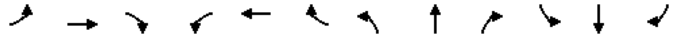
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	586	332	45	271	146	52
Peak Hour Factor	0.92	0.92	0.85	0.85	0.92	0.92
Hourly flow rate (vph)	637	361	53	319	159	57
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	744					
pX, platoon unblocked			0.65		0.65	0.65
vC, conflicting volume			998		1242	817
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			997		1373	719
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			88		0	80
cM capacity (veh/h)			451		92	278

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	998	372	215
Volume Left	0	53	159
Volume Right	361	0	57
cSH	1700	451	112
Volume to Capacity	0.59	0.12	1.93
Queue Length 95th (ft)	0	10	438
Control Delay (s)	0.0	3.7	512.8
Lane LOS		A	F
Approach Delay (s)	0.0	3.7	512.8
Approach LOS			F

Intersection Summary			
Average Delay	70.5		
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.91		1.00	0.95	1.00
Frt	1.00	0.93		1.00	0.88		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1725		1770	1645		1770	5041		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1725		1770	1645		1770	5041		1770	3539	1583
Volume (vph)	238	214	208	109	104	365	79	961	59	617	1372	231
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.85	0.85	0.85	0.92	0.92	0.92
Adj. Flow (vph)	256	230	224	118	113	397	93	1131	69	671	1491	251
RTOR Reduction (vph)	0	32	0	0	115	0	0	6	0	0	0	115
Lane Group Flow (vph)	256	422	0	118	395	0	93	1194	0	671	1491	136
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	13.0	23.3		9.7	20.0		6.0	24.0		33.0	51.0	51.0
Effective Green, g (s)	13.0	25.3		9.7	22.0		6.0	26.0		33.0	53.0	53.0
Actuated g/C Ratio	0.12	0.23		0.09	0.20		0.05	0.24		0.30	0.48	0.48
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	5.8		3.0	5.8		1.5	5.8		1.5	5.8	5.8
Lane Grp Cap (vph)	209	397		156	329		97	1192		531	1705	763
v/s Ratio Prot	0.14	c0.24		0.07	c0.24		0.05	c0.24		c0.38	0.42	
v/s Ratio Perm												0.09
v/c Ratio	1.22	1.06		0.76	1.20		0.96	1.00		1.26	0.87	0.18
Uniform Delay, d1	48.5	42.4		49.0	44.0		51.9	42.0		38.5	25.5	16.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.99	0.84	0.75
Incremental Delay, d2	136.1	63.2		18.7	115.6		76.6	26.4		120.1	0.7	0.0
Delay (s)	184.6	105.5		67.7	159.6		128.5	68.4		158.3	22.0	12.2
Level of Service	F	F		E	F		F	E		F	C	B
Approach Delay (s)		134.0			142.3			72.8			58.9	
Approach LOS		F			F			E			E	

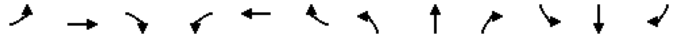
Intersection Summary					
HCM Average Control Delay	83.4	HCM Level of Service		F	
HCM Volume to Capacity ratio	1.13				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	108.5%	ICU Level of Service		G	
Analysis Period (min)	15				
c Critical Lane Group					



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0						4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95						0.91		1.00	0.95	
Frt	1.00	0.85						0.98		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1665	1490						4967		1770	3539	
Flt Permitted	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (perm)	1665	1490						4967		1770	3539	
Volume (vph)	844	0	1031	0	0	0	0	1321	243	344	1189	0
Peak-hour factor, PHF	0.79	0.79	0.79	0.92	0.92	0.92	0.95	0.95	0.95	0.87	0.87	0.87
Adj. Flow (vph)	1068	0	1305	0	0	0	0	1391	256	395	1367	0
RTOR Reduction (vph)	0	9	0	0	0	0	0	24	0	0	0	0
Lane Group Flow (vph)	1068	1296	0	0	0	0	0	1623	0	395	1367	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	52.4	52.4						29.2		15.3	48.2	
Effective Green, g (s)	53.0	53.0						30.0		15.0	49.0	
Actuated g/C Ratio	0.48	0.48						0.27		0.14	0.45	
Clearance Time (s)	4.6	4.6						4.8		3.7	4.8	
Vehicle Extension (s)	5.0	5.0						7.4		2.0	6.2	
Lane Grp Cap (vph)	802	718						1355		241	1576	
v/s Ratio Prot	0.64	c0.87						c0.33		c0.22	0.39	
v/s Ratio Perm												
v/c Ratio	1.33	1.81						1.20		1.64	0.87	
Uniform Delay, d1	28.5	28.5						40.0		47.5	27.6	
Progression Factor	1.00	1.00						0.60		1.37	0.72	
Incremental Delay, d2	157.8	367.9						89.7		289.3	0.7	
Delay (s)	186.3	396.4						113.9		354.5	20.5	
Level of Service	F	F						F		F	C	
Approach Delay (s)		301.8			0.0			113.9			95.4	
Approach LOS		F			A			F			F	

Intersection Summary				
HCM Average Control Delay	185.4	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.59			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	115.0%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	137	311	209	45	328	196	108	728	47	211	1038	224
Peak-hour factor, PHF	0.90	0.90	0.90	0.89	0.89	0.89	0.81	0.81	0.81	0.90	0.90	0.90
Adj. Flow (vph)	152	346	232	51	369	220	133	899	58	234	1153	249
RTOR Reduction (vph)	0	0	118	0	0	107	0	0	19	0	0	126
Lane Group Flow (vph)	152	346	114	51	369	113	133	899	39	234	1153	123
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	9.0	28.2	28.2	4.6	23.8	23.8	8.7	32.2	32.2	9.0	32.5	32.5
Effective Green, g (s)	9.0	29.2	29.2	4.6	24.8	24.8	8.7	33.2	33.2	9.0	33.5	33.5
Actuated g/C Ratio	0.10	0.32	0.32	0.05	0.27	0.27	0.09	0.36	0.36	0.10	0.36	0.36
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	173	591	502	89	502	427	167	1277	571	173	1289	576
v/s Ratio Prot	c0.09	0.19		0.03	c0.20		0.08	0.25		c0.13	c0.33	
v/s Ratio Perm			0.07			0.07			0.02			0.08
v/c Ratio	0.88	0.59	0.23	0.57	0.74	0.26	0.80	0.70	0.07	1.35	0.89	0.21
Uniform Delay, d1	41.0	26.3	23.1	42.7	30.6	26.4	40.8	25.2	19.3	41.5	27.6	20.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	35.1	1.0	0.1	5.4	4.8	0.1	21.2	3.3	0.2	191.7	9.8	0.8
Delay (s)	76.1	27.3	23.2	48.2	35.4	26.5	62.0	28.5	19.5	233.2	37.4	21.0
Level of Service	E	C	C	D	D	C	E	C	B	F	D	C
Approach Delay (s)		36.1			33.4			32.1			62.9	
Approach LOS		D			C			C			E	

Intersection Summary				
HCM Average Control Delay	45.3	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	92.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	72.9%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	69	261	176	42	234	11	170	134	75	71	293	90
Peak Hour Factor	0.92	0.92	0.92	0.85	0.85	0.85	0.87	0.87	0.87	0.72	0.72	0.72
Hourly flow rate (vph)	75	284	191	49	275	13	195	154	86	99	407	125

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	550	338	436	631
Volume Left (vph)	75	49	195	99
Volume Right (vph)	191	13	86	125
Hadj (s)	-0.15	0.04	0.00	-0.05
Departure Headway (s)	9.2	9.6	9.3	9.3
Degree Utilization, x	1.40	0.90	1.13	1.62
Capacity (veh/h)	403	366	399	393
Control Delay (s)	220.0	56.6	115.4	314.3
Approach Delay (s)	220.0	56.6	115.4	314.3
Approach LOS	F	F	F	F

Intersection Summary				
Delay		198.9		
HCM Level of Service		F		
Intersection Capacity Utilization	92.1%	ICU Level of Service	F	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.85			1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1589			1863	1583	1770	3514		1770	3484	
Flt Permitted	0.75	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1402	1589			1863	1583	1770	3514		1770	3484	
Volume (vph)	16	5	255	0	4	73	141	1020	50	133	1139	132
Peak-hour factor, PHF	0.81	0.81	0.81	0.50	0.50	0.50	0.77	0.77	0.77	0.98	0.98	0.98
Adj. Flow (vph)	20	6	315	0	8	146	183	1325	65	136	1162	135
RTOR Reduction (vph)	0	148	0	0	0	116	0	6	0	0	15	0
Lane Group Flow (vph)	20	173	0	0	8	30	183	1384	0	136	1282	0
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	10.0	10.0			10.0	10.0	5.0	22.9		4.0	21.9	
Effective Green, g (s)	10.0	10.0			10.0	10.0	5.0	22.9		4.0	21.9	
Actuated g/C Ratio	0.20	0.20			0.20	0.20	0.10	0.47		0.08	0.45	
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	287	325			381	324	181	1646		145	1560	
v/s Ratio Prot		c0.11			0.00		c0.10	c0.39		0.08	0.37	
v/s Ratio Perm	0.01					0.02						
v/c Ratio	0.07	0.53			0.02	0.09	1.01	0.84		0.94	0.82	
Uniform Delay, d1	15.7	17.4			15.5	15.8	21.9	11.4		22.3	11.8	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	1.7			0.0	0.1	69.8	4.1		55.7	3.6	
Delay (s)	15.8	19.0			15.6	15.9	91.7	15.5		78.0	15.4	
Level of Service	B	B			B	B	F	B		E	B	
Approach Delay (s)		18.8			15.9			24.3			21.4	
Approach LOS		B			B			C			C	

Intersection Summary						
HCM Average Control Delay	22.2	HCM Level of Service		C		
HCM Volume to Capacity ratio	0.72					
Actuated Cycle Length (s)	48.9	Sum of lost time (s)		8.0		
Intersection Capacity Utilization	69.5%	ICU Level of Service		C		
Analysis Period (min)	15					
c Critical Lane Group						

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frt	1.00	1.00			0.98			0.98				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1752	1845			1799			4968				
Flt Permitted	0.95	1.00			1.00			1.00				
Satd. Flow (perm)	1752	1845			1799			4968				
Volume (vph)	139	497	0	0	403	90	77	1558	267	0	0	0
Peak-hour factor, PHF	0.78	0.78	0.78	0.79	0.79	0.79	0.91	0.91	0.91	0.92	0.92	0.92
Adj. Flow (vph)	178	637	0	0	510	114	85	1712	293	0	0	0
RTOR Reduction (vph)	0	0	0	0	9	0	0	23	0	0	0	0
Lane Group Flow (vph)	178	637	0	0	615	0	0	2067	0	0	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Prot						Perm					
Protected Phases	7	4			8			2				
Permitted Phases							2					
Actuated Green, G (s)	12.5	42.1			25.9			30.9				
Effective Green, g (s)	12.2	42.3			26.1			31.1				
Actuated g/C Ratio	0.15	0.52			0.32			0.38				
Clearance Time (s)	3.7	4.2			4.2			4.2				
Vehicle Extension (s)	2.0	7.9			7.7			6.4				
Lane Grp Cap (vph)	263	959			577			1898				
v/s Ratio Prot	0.10	c0.35			c0.34							
v/s Ratio Perm								0.42				
v/c Ratio	0.68	0.66			1.07			1.09				
Uniform Delay, d1	32.7	14.3			27.7			25.2				
Progression Factor	1.00	1.00			1.00			1.00				
Incremental Delay, d2	5.3	3.6			56.3			49.4				
Delay (s)	38.1	17.9			84.0			74.5				
Level of Service	D	B			F			E				
Approach Delay (s)		22.3			84.0			74.5			0.0	
Approach LOS		C			F			E			A	

Intersection Summary				
HCM Average Control Delay	64.1	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.02			
Actuated Cycle Length (s)	81.4	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	82.0%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0				
Lane Util. Factor					0.91			0.91				
Frt					0.96			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					4892			5048				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					4892			5048				
Volume (vph)	0	0	0	0	1347	456	325	1871	0	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.86	0.86	0.86	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	1433	485	378	2176	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1917	0	0	2550	0	0	0	0
Turn Type							Perm					
Protected Phases					8			2				
Permitted Phases							2					
Actuated Green, G (s)					25.4			30.4				
Effective Green, g (s)					26.0			31.0				
Actuated g/C Ratio					0.40			0.48				
Clearance Time (s)					4.6			4.6				
Vehicle Extension (s)					4.8			3.0				
Lane Grp Cap (vph)					1957			2408				
v/s Ratio Prot					c0.39							
v/s Ratio Perm								0.51				
v/c Ratio					0.98			1.06				
Uniform Delay, d1					19.2			17.0				
Progression Factor					1.00			1.00				
Incremental Delay, d2					15.7			36.3				
Delay (s)					35.0			53.3				
Level of Service					C			D				
Approach Delay (s)		0.0			35.0			53.3			0.0	
Approach LOS		A			C			D			A	

Intersection Summary				
HCM Average Control Delay	45.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	1.02			
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	85.6%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.91						0.91				
Frt		1.00						0.97				
Flt Protected		0.98						1.00				
Satd. Flow (prot)		4995						4946				
Flt Permitted		0.98						1.00				
Satd. Flow (perm)		4995						4946				
Volume (vph)	1182	2073	0	0	0	0	0	1014	226	0	0	0
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92
Adj. Flow (vph)	1299	2278	0	0	0	0	0	1056	235	0	0	0
RTOR Reduction (vph)	0	16	0	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	3561	0	0	0	0	0	1290	0	0	0	0
Turn Type	Perm											
Protected Phases		2						8				
Permitted Phases	2											
Actuated Green, G (s)		23.1						20.0				
Effective Green, g (s)		24.5						21.1				
Actuated g/C Ratio		0.46						0.39				
Clearance Time (s)		5.4						5.1				
Vehicle Extension (s)		2.0						5.0				
Lane Grp Cap (vph)		2283						1947				
v/s Ratio Prot								c0.26				
v/s Ratio Perm		0.71										
v/c Ratio		1.56						0.66				
Uniform Delay, d1		14.6						13.3				
Progression Factor		1.00						1.00				
Incremental Delay, d2		254.1						1.1				
Delay (s)		268.7						14.5				
Level of Service		F						B				
Approach Delay (s)		268.7			0.0			14.5			0.0	
Approach LOS		F			A			B			A	

Intersection Summary			
HCM Average Control Delay	201.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	53.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	14	11	0	0	8	29	13	1171	6	0	0	0
Peak Hour Factor	0.60	0.60	0.60	0.63	0.63	0.63	0.91	0.91	0.91	0.92	0.92	0.92
Hourly flow rate (vph)	23	18	0	0	13	46	14	1287	7	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	42	59	658	650
Volume Left (vph)	23	0	14	0
Volume Right (vph)	0	46	0	7
Hadj (s)	0.15	-0.44	0.04	0.03
Departure Headway (s)	6.0	5.4	4.8	4.8
Degree Utilization, x	0.07	0.09	0.89	0.87
Capacity (veh/h)	587	658	737	740
Control Delay (s)	9.5	9.0	31.8	30.0
Approach Delay (s)	9.5	9.0	30.9	
Approach LOS	A	A	D	

Intersection Summary			
Delay	29.3		
HCM Level of Service	D		
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				5085	3433	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				5085	3433	
Volume (vph)	0	0	0	1319	484	0
Peak-hour factor, PHF	0.92	0.92	0.84	0.84	0.94	0.94
Adj. Flow (vph)	0	0	0	1570	515	0
RTOR Reduction (vph)	0	0	0	0	15	0
Lane Group Flow (vph)	0	0	0	1570	500	0
Turn Type						
Protected Phases				6	4	
Permitted Phases						
Actuated Green, G (s)				25.1	15.3	
Effective Green, g (s)				25.7	17.3	
Actuated g/C Ratio				0.50	0.34	
Clearance Time (s)				4.6	6.0	
Vehicle Extension (s)				5.0	6.0	
Lane Grp Cap (vph)				2562	1165	
v/s Ratio Prot				c0.31	c0.15	
v/s Ratio Perm						
v/c Ratio				0.61	0.43	
Uniform Delay, d1				9.1	13.0	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.6	0.7	
Delay (s)				9.7	13.7	
Level of Service				A	B	
Approach Delay (s)	0.0			9.7	13.7	
Approach LOS	A			A	B	

Intersection Summary			
HCM Average Control Delay	10.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	51.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	687	176	301	1005	535	445	1094
v/c Ratio	0.67	0.30	0.75	0.68	0.57	0.88	0.47
Control Delay	34.6	5.5	37.2	32.5	14.9	62.4	18.1
Queue Delay	0.0	0.0	0.0	0.9	0.6	0.0	0.0
Total Delay	34.6	5.5	37.2	33.4	15.5	62.4	18.1
Queue Length 50th (ft)	200	0	90	351	193	144	163
Queue Length 95th (ft)	263	48	m112	m385	m227	#209	190
Internal Link Dist (ft)	719			378			1660
Turn Bay Length (ft)		275	110			260	
Base Capacity (vph)	1045	598	446	1485	932	515	2347
Starvation Cap Reductn	0	0	0	223	137	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.29	0.67	0.80	0.67	0.86	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	119	877	257	218	183	228	1315	810	319	945	185
v/c Ratio	0.63	1.43	1.45	0.37	0.33	1.01	1.20	1.04	1.53	0.89	0.31
Control Delay	61.7	229.9	265.3	26.5	13.4	72.3	125.8	41.2	294.0	48.5	5.7
Queue Delay	0.0	47.0	0.0	0.0	0.0	0.0	91.8	37.3	6.6	8.1	0.0
Total Delay	61.7	276.9	265.3	26.5	13.4	72.3	217.5	78.4	300.6	56.6	5.7
Queue Length 50th (ft)	81	~797	~256	125	37	~176	~578	~219	~316	334	0
Queue Length 95th (ft)	124	#869	m#386	m172	m81	m135	m278	m117	#484	#439	49
Internal Link Dist (ft)		2033		385			269			731	
Turn Bay Length (ft)	145		155		25	125			170		
Base Capacity (vph)	225	614	177	597	561	225	1094	779	209	1062	604
Starvation Cap Reductn	0	0	0	0	0	0	160	65	0	0	0
Spillback Cap Reductn	0	42	0	0	0	0	0	0	2	98	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	1.53	1.45	0.37	0.33	1.01	1.41	1.13	1.54	0.98	0.31

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	506	837	311	478	200	31
v/c Ratio	0.52	0.75	0.83	0.33	0.75	0.12
Control Delay	16.4	5.6	60.5	4.9	61.2	26.9
Queue Delay	1.5	2.9	0.0	0.0	0.0	0.0
Total Delay	18.0	8.5	60.5	4.9	61.2	26.9
Queue Length 50th (ft)	180	71	210	86	136	11
Queue Length 95th (ft)	m168	m36	269	131	203	36
Internal Link Dist (ft)	385			614	86	
Turn Bay Length (ft)						25
Base Capacity (vph)	982	1116	451	1442	334	310
Starvation Cap Reductn	293	176	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.89	0.69	0.33	0.60	0.10

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	233	1241	316	665	1188	207	860
v/c Ratio	0.75	1.09	0.89	0.46	1.01	0.76	0.69
Control Delay	60.8	85.9	66.1	8.0	65.7	54.5	29.5
Queue Delay	0.0	0.0	0.0	0.1	0.2	0.0	0.6
Total Delay	60.8	85.9	66.1	8.1	65.9	54.5	30.1
Queue Length 50th (ft)	76	~473	192	55	~275	69	255
Queue Length 95th (ft)	#113	#529	#330	103	#377	m#122	330
Internal Link Dist (ft)		671			2243		378
Turn Bay Length (ft)			280			120	
Base Capacity (vph)	309	1139	389	1456	1179	275	1239
Starvation Cap Reductn	0	0	0	0	0	0	118
Spillback Cap Reductn	0	0	0	96	1	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	1.09	0.81	0.49	1.01	0.75	0.77

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

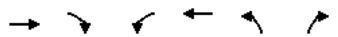
6: Noble Ave & SR-198 EB Ramps @ Ben Maddox Way

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	210	840	187	281	75	330	182	432	489
v/c Ratio	0.86	0.58	0.82	0.55	0.17	0.79	0.38	0.59	0.76
Control Delay	82.3	38.3	79.9	44.8	27.7	60.1	8.2	47.3	17.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.3	38.3	79.9	44.8	27.7	60.1	8.2	47.3	17.3
Queue Length 50th (ft)	166	206	149	203	32	251	0	169	55
Queue Length 95th (ft)	#311	277	#262	317	77	327	35	223	181
Internal Link Dist (ft)		179		406		179		341	
Turn Bay Length (ft)	185		150		40				110
Base Capacity (vph)	284	1440	281	527	442	452	509	884	689
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.58	0.67	0.53	0.17	0.73	0.36	0.49	0.71

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: Noble Ave & Walmart East Access



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	650	72	174	285	410	219
v/c Ratio	0.85	0.10	0.76	0.25	0.90	0.38
Control Delay	30.1	3.9	49.1	6.3	46.8	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.1	3.9	49.1	6.3	46.8	5.3
Queue Length 50th (ft)	208	0	62	42	141	0
Queue Length 95th (ft)	#393	20	#148	74	#238	32
Internal Link Dist (ft)	248			664	309	
Turn Bay Length (ft)			200			
Base Capacity (vph)	764	691	237	1130	472	583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.10	0.73	0.25	0.87	0.38

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	256	454	118	510	93	1200	671	1491	251
v/c Ratio	1.22	1.06	0.76	1.15	0.96	1.00	1.26	0.87	0.29
Control Delay	177.7	97.6	78.6	119.7	134.0	68.7	154.0	22.6	2.5
Queue Delay	561.3	0.0	0.0	142.8	0.0	38.0	520.0	177.9	3.6
Total Delay	739.0	97.6	78.6	262.5	134.0	106.7	674.1	200.4	6.1
Queue Length 50th (ft)	~223	~333	83	~338	67	~311	~595	448	9
Queue Length 95th (ft)	#385	#537	#173	#549	#159	#376	m#461	m326	m1
Internal Link Dist (ft)		502		1058		2367		110	
Turn Bay Length (ft)	125		135		115		115		
Base Capacity (vph)	209	429	161	444	97	1197	531	1705	878
Starvation Cap Reductn	0	0	0	0	0	0	254	637	528
Spillback Cap Reductn	186	0	0	98	0	113	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	11.13	1.06	0.73	1.47	0.96	1.11	2.42	1.40	0.72

Intersection Summary

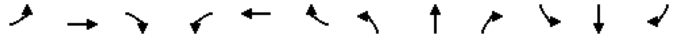
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	1068	1305	1647	395	1367
v/c Ratio	1.33	1.80	1.19	1.64	0.87
Control Delay	185.1	386.7	112.9	327.8	21.1
Queue Delay	188.0	315.6	87.3	0.0	11.5
Total Delay	373.1	702.3	200.2	327.8	32.6
Queue Length 50th (ft)	~1033	~1469	~483	~418	251
Queue Length 95th (ft)	#1063	#1462	m#434	m#373	m229
Internal Link Dist (ft)		366	110		269
Turn Bay Length (ft)	232			75	
Base Capacity (vph)	802	727	1379	241	1576
Starvation Cap Reductn	0	0	101	0	211
Spillback Cap Reductn	192	333	194	0	193
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.75	3.31	1.39	1.64	1.00

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

12: Tulare Ave & Ben Maddox Way



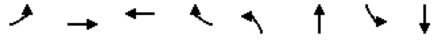
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	152	346	232	51	369	220	133	899	58	234	1153	249
v/c Ratio	0.86	0.57	0.37	0.39	0.78	0.43	0.78	0.69	0.10	1.32	0.88	0.35
Control Delay	82.3	31.0	9.3	50.6	42.8	12.3	72.4	28.8	13.1	214.2	37.1	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.3	31.0	9.3	50.6	42.8	12.3	72.4	28.8	13.1	214.2	37.1	7.5
Queue Length 50th (ft)	86	174	25	28	195	32	75	224	10	~174	317	19
Queue Length 95th (ft)	#223	272	84	68	288	88	#161	297	35	#357	#530	81
Internal Link Dist (ft)		1613			1967			1346			2243	
Turn Bay Length (ft)	95		95	90		90	155		90	200		200
Base Capacity (vph)	177	655	669	166	615	621	176	1299	600	177	1313	712
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.53	0.35	0.31	0.60	0.35	0.76	0.69	0.10	1.32	0.88	0.35

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

14: Tulare Ave & Lovers Lane



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	20	321	8	146	183	1390	136	1297
v/c Ratio	0.07	0.68	0.02	0.33	1.01	0.84	0.94	0.83
Control Delay	15.4	15.7	14.5	5.8	100.9	19.5	92.3	19.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.4	15.7	14.5	5.8	100.9	19.5	92.3	19.2
Queue Length 50th (ft)	5	34	2	0	~54	165	40	154
Queue Length 95th (ft)	16	75	5	2	#142	233	#140	#332
Internal Link Dist (ft)		2570	207			1470		2367
Turn Bay Length (ft)	100				210		290	
Base Capacity (vph)	409	596	544	566	182	1657	145	1580
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.54	0.01	0.26	1.01	0.84	0.94	0.82

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	178	637	624	2090
v/c Ratio	0.68	0.66	1.07	1.09
Control Delay	45.9	18.3	85.4	74.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	45.9	18.3	85.4	74.8
Queue Length 50th (ft)	87	223	~352	~441
Queue Length 95th (ft)	127	262	#495	#601
Internal Link Dist (ft)		608	737	568
Turn Bay Length (ft)				
Base Capacity (vph)	409	1046	585	1922
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.44	0.61	1.07	1.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	NBT
Lane Group Flow (vph)	1918	2554
v/c Ratio	0.98	1.06
Control Delay	37.0	55.3
Queue Delay	29.3	39.0
Total Delay	66.3	94.2
Queue Length 50th (ft)	264	~419
Queue Length 95th (ft)	#384	#475
Internal Link Dist (ft)	265	310
Turn Bay Length (ft)		
Base Capacity (vph)	1958	2413
Starvation Cap Reductn	170	190
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	1.07	1.15

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT
Lane Group Flow (vph)	3577	1291
v/c Ratio	1.56	0.66
Control Delay	272.3	15.4
Queue Delay	47.5	0.9
Total Delay	319.8	16.2
Queue Length 50th (ft)	~623	117
Queue Length 95th (ft)	#720	158
Internal Link Dist (ft)	4045	445
Turn Bay Length (ft)		
Base Capacity (vph)	2298	1948
Starvation Cap Reductn	0	0
Spillback Cap Reductn	146	354
Storage Cap Reductn	0	0
Reduced v/c Ratio	1.66	0.81

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	NWL
Lane Group Flow (vph)	1570	515
v/c Ratio	0.62	0.44
Control Delay	10.7	14.5
Queue Delay	0.1	0.1
Total Delay	10.8	14.6
Queue Length 50th (ft)	110	59
Queue Length 95th (ft)	167	103
Internal Link Dist (ft)	3590	149
Turn Bay Length (ft)		
Base Capacity (vph)	2805	1515
Starvation Cap Reductn	0	0
Spillback Cap Reductn	336	178
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.64	0.39

Intersection Summary

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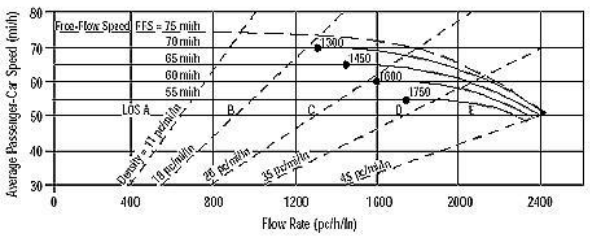

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	
Agency or Company	Kimley-Horn and Associates
Date Performed	7/6/2009
Analysis Time Period	PM Peak

Site Information

Highway/Direction of Travel	SR-198 EB
From/To	B/W Ben Maddox Way & Lovers Ln
Jurisdiction	City of Visalia
Analysis Year	Long-term 2030 + Project

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	3213 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	1.10	I/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0	mi/h
f_{LC}	0.0	mi/h
f_{ID}	3.0	mi/h
f_N	4.5	mi/h
FFS	62.5	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1865	pc/h/ln
S	61.3	mi/h
D = v_p / S	30.4	pc/mi/ln
LOS	D	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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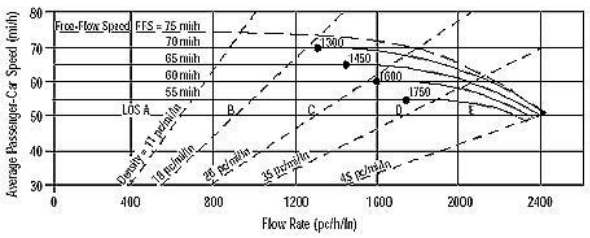

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information

Analyst	
Agency or Company	Kimley-Horn and Associates
Date Performed	7/6/2009
Analysis Time Period	PM Peak

Site Information

Highway/Direction of Travel	SR-198 EB
From/To	E/O Lovers Ln
Jurisdiction	City of Visalia
Analysis Year	Long-term 2030 + Project

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	1925 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.56	I/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0	mi/h
f_{LC}	0.0	mi/h
f_{ID}	0.3	mi/h
f_N	4.5	mi/h
FFS	65.2	mi/h

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1123	pc/h/ln
S	65.2	mi/h
D = v_p / S	17.2	pc/mi/ln
LOS	B	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		mi/h
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v_p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
f_p - Page 23-12	f_N - Exhibit 23-6
LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7

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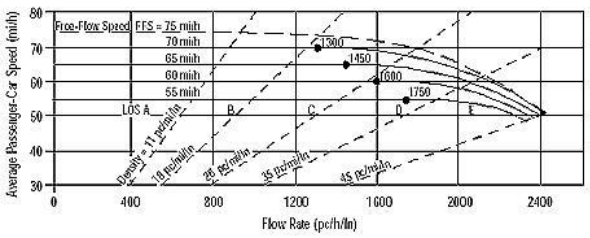

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 EB
Agency or Company	Kimley-Horn and Associates	From/To	W/O S. Ben Maddox Way
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Long-term 2030 + Project
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	3627 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	2106	pc/h/ln	Design LOS		
S	57.8	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	36.4	pc/mi/ln	S		mi/h
LOS	E		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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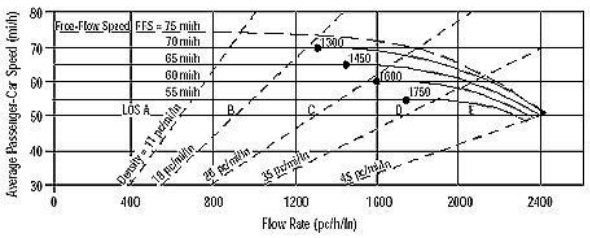

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	B/W Ben Maddox Way & Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Long-term 2030 + Project
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2378 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1381	pc/h/ln	Design LOS		
S	62.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	22.1	pc/mi/ln	S		mi/h
LOS	C		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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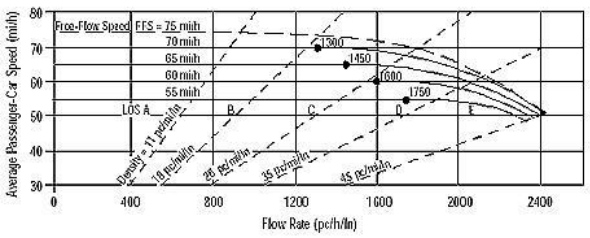

Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	E/O Lovers Ln
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Long-term 2030 + Project
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	1536 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.952

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	0.56	I/mi	f_{ID}	0.3	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	65.2	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	896	pc/h/ln	Design LOS		
S	65.2	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	13.7	pc/mi/ln	S		mi/h
LOS	B		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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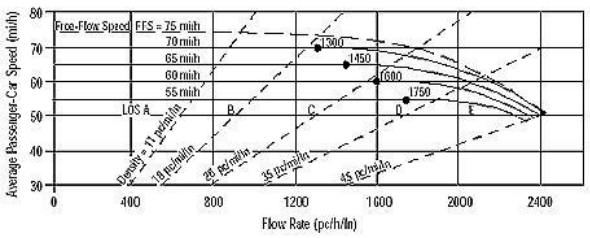
BASIC FREEWAY WORKSHEET Page 1 of 1

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S, D
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	SR-198 WB
Agency or Company	Kimley-Horn and Associates	From/To	W/O S. Ben Maddox Way
Date Performed	7/6/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Long-term 2030 + Project
Project Description			

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	2844 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	9
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.957

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0	mi/h
Interchange Density	1.10	I/mi	f_{ID}	3.0	mi/h
Number of Lanes, N	2		f_N	4.5	mi/h
FFS (measured)		mi/h	FFS	62.5	mi/h
Base free-flow Speed, BFFS	70.0	mi/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1651	pc/h/ln	Design LOS		
S	62.4	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
D = v_p / S	26.4	pc/mi/ln	S		mi/h
LOS	D		D = v_p / S		pc/mi/ln
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Long-term 2030 + Project

Project Description

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 2500 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = 805 veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	3627	0.90	Level	9	0	0.957	1.00	4211
Ramp	810	0.90	Level	4	0	0.980	1.00	918
UpStream	805	0.90	Level	2	0	0.990	1.00	903
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 4211 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	4211	4800	No
				V_{12}	4211	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	3293	4800	No
				V_R	918	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A	D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D
D_R = (pc/ mi /ln)	D_R = 38.9 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= E (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.511 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 55.7 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 55.7 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Eastbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Long-term 2030 + Project

Project Description

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 2600 ft	S_{FF} = 70.0 mph S_{FR} = 35.0 mph	L_{down} = ft
Vu = 396 veh/h	Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	3213	0.90	Level	9	0	0.957	1.00	3731
Ramp	1875	0.90	Level	4	0	0.980	1.00	2125
UpStream	396	0.90	Level	2	0	0.990	1.00	444
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 3731 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	3731	4800	No
				V_{12}	3731	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	1606	4800	No
				V_R	2125	2000	Yes

Level of Service Determination (if not F)	Level of Service Determination (if not F)
D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A	D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D
D_R = (pc/ mi /ln)	D_R = 33.6 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= F (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.619 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 52.7 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 52.7 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Ben Maddox Way
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Long-term 2030 + Project

Project Description

Inputs

Upstream Adj Ramp	Terrain Level	Downstream Adj Ramp
☑ Yes ☑ On		☐ Yes ☐ On
☐ No ☐ Off		☑ No ☐ Off
L_{up} = 3400 ft		L_{down} = ft
Vu = 1045 veh/h	S_{FF} = 70.0 mph S_{FR} = 35.0 mph Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	2378	0.90	Level	9	0	0.957	1.00	2761
Ramp	302	0.90	Level	4	0	0.980	1.00	342
UpStream	1045	0.90	Level	2	0	0.990	1.00	1173
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 2761 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	2761	4800	No
				V_{12}	2761	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	2419	4800	No
				V_R	342	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
D_R = (pc/ mi /ln)	D_R = 25.5 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= C (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.459 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 57.2 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 57.2 mph (Exhibit 25-15)

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RAMPS AND RAMP JUNCTIONS WORKSHEET Page 1 of 1

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst		Freeway/Dir of Travel	Westbound SR-198
Agency or Company	Kimley-Horn and Associates	Junction	Lovers Ln
Date Performed	7/29/2009	Jurisdiction	City of Visalia
Analysis Time Period	PM Peak	Analysis Year	Long-term 2030 + Project

Project Description

Inputs

Upstream Adj Ramp	Terrain	Downstream Adj Ramp
☐ Yes ☐ On		☐ Yes ☐ On
☐ No ☐ Off		☐ No ☐ Off
L_{up} = ft		L_{down} = ft
Vu = veh/h	S_{FF} = 70.0 mph S_{FR} = 35.0 mph Sketch (show lanes, L_A, L_D,V_R,V_f)	VD = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	Truck	%Rv	f_{HV}	f_p	v=V/PHF f_{HV} f_p
Freeway	1536	0.90	Level	9	0	0.957	1.00	1783
Ramp	203	0.90	Level	4	0	0.980	1.00	230
UpStream								
DownStream								

Merge Areas	Diverge Areas
Estimation of v_{12}	**Estimation of v_{12}**
$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
L_{EQ} = (Equation 25-2 or 25-3)	L_{EQ} = (Equation 25-8 or 25-9)
P_{FM}= using Equation	P_{FD} =1.000 using Equation 0
V_{12}= pc/h	V_{12} = 1783 pc/h

Capacity Checks

	Actual	Maximum	LOS F?		Actual	Maximum	LOS F?
V_{FO}		See Exhibit 25-7		$V_{FI}=V_F$	1783	4800	No
				V_{12}	1783	4400:All	No
V_{R12}		4600:All		$V_{FO} = V_F - V_R$	1553	4800	No
				V_R	230	2000	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
D_R = (pc/ mi /ln)	D_R = 17.6 (pc/ mi /ln)
LOS = (Exhibit 25-4)	LOS= B (Exhibit 25-4)

Speed Estimation	Speed Estimation
M_S = (Exibit 25-19)	D_s = 0.449 (Exhibit 25-19)
S_R= mph (Exhibit 25-19)	S_R= 57.4 mph (Exhibit 25-19)
S_0= mph (Exhibit 25-19)	S_0= N/A mph (Exhibit 25-19)
S= mph (Exhibit 25-14)	S = 57.4 mph (Exhibit 25-15)

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LONG-TERM 2030 + PROJECT (MITIGATED) TRAFFIC CONDITIONS (INTERSECTIONS)

1: Mineral King Ave & Ben Maddox Way

Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor					0.95	1.00	0.97	0.91	0.91	0.97	0.91	
Frt					1.00	0.85	1.00	0.97	0.85	1.00	0.98	
Flt Protected					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)					3394	1553	3367	3213	1413	3367	4891	
Flt Permitted					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)					3394	1553	3367	3213	1413	3367	4891	
Volume (vph)	0	0	0	202	242	96	479	601	685	302	512	75
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.77	0.77	0.77	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	220	263	104	622	781	890	328	557	82
RTOR Reduction (vph)	0	0	0	0	0	77	0	23	337	0	17	0
Lane Group Flow (vph)	0	0	0	0	483	27	622	985	326	328	622	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type				Split		Perm	Prot		Perm	Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)					24.7	24.7	22.2	48.1	48.1	13.2	39.1	
Effective Green, g (s)					25.7	25.7	22.2	49.1	49.1	13.2	40.1	
Actuated g/C Ratio					0.26	0.26	0.22	0.49	0.49	0.13	0.40	
Clearance Time (s)					5.0	5.0	4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)					7.5	7.5	2.0	8.0	8.0	2.0	7.5	
Lane Grp Cap (vph)					872	399	747	1578	694	444	1961	
v/s Ratio Prot					c0.14		c0.18	c0.31		0.10	0.13	
v/s Ratio Perm						0.02			0.23			
v/c Ratio					0.55	0.07	0.83	0.62	0.47	0.74	0.32	
Uniform Delay, d1					32.2	28.1	37.1	18.7	16.8	41.7	20.6	
Progression Factor					1.00	1.00	0.91	1.65	7.69	1.00	1.00	
Incremental Delay, d2					2.2	0.3	4.9	1.2	1.4	5.5	0.4	
Delay (s)					34.4	28.4	38.8	32.0	130.9	47.2	21.0	
Level of Service					C	C	D	C	F	D	C	
Approach Delay (s)		0.0			33.3			62.4			29.9	
Approach LOS		A			C			E			C	

Intersection Summary			
HCM Average Control Delay	49.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

2: Mineral King Ave & SR-198 WB Ramps @ Ben Maddox Way

Timing Plan: AM PEAK

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	290	699	504	357	202	109
Peak Hour Factor	0.85	0.85	0.74	0.74	0.56	0.56
Hourly flow rate (vph)	341	822	681	482	361	195
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total (vph)	227	936	842	322	361	195
Volume Left (vph)	0	0	681	0	361	0
Volume Right (vph)	0	822	0	0	0	195
Hadj (s)	0.07	-0.55	0.47	0.07	0.57	-0.63
Departure Headway (s)	7.9	7.3	8.2	7.8	8.7	7.5
Degree Utilization, x	0.50	1.90	1.92	0.70	0.87	0.40
Capacity (veh/h)	443	498	445	450	401	472
Control Delay (s)	17.5	430.9	441.4	25.8	46.3	14.3
Approach Delay (s)	350.1		326.5		35.1	
Approach LOS	F		F		E	

Intersection Summary					
Delay	279.9				
HCM Level of Service	F				
Intersection Capacity Utilization	81.9%	ICU Level of Service		D	
Analysis Period (min)	15				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	3471	1553	1736	3471	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1736	1827	1553	1736	1827	1553	1736	3471	1553	1736	3471	1553
Volume (vph)	36	59	175	340	227	176	415	935	881	468	826	389
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.85	0.85	0.85	0.87	0.87	0.87
Adj. Flow (vph)	43	71	211	410	273	212	488	1100	1036	538	949	447
RTOR Reduction (vph)	0	0	182	0	0	53	0	0	341	0	0	167
Lane Group Flow (vph)	43	71	29	410	273	159	488	1100	695	538	949	280
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	4.9	13.0	13.0	17.0	26.6	26.6	21.0	39.0	39.0	21.0	39.0	39.0
Effective Green, g (s)	4.9	15.0	15.0	17.0	27.1	27.1	21.0	41.0	41.0	21.0	41.0	41.0
Actuated g/C Ratio	0.04	0.14	0.14	0.15	0.25	0.25	0.19	0.37	0.37	0.19	0.37	0.37
Clearance Time (s)	4.0	6.0	6.0	4.0	4.5	4.5	4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	77	249	212	268	450	383	331	1294	579	331	1294	579
v/s Ratio Prot	c0.02	0.04		c0.24	c0.15		0.28	0.32		c0.31	0.27	
v/s Ratio Perm			0.02			0.10			c0.45			0.18
v/c Ratio	0.56	0.29	0.14	1.53	0.61	0.42	1.47	0.85	1.20	1.63	0.73	0.48
Uniform Delay, d1	51.5	42.7	41.8	46.5	36.7	34.8	44.5	31.7	34.5	44.5	29.8	26.4
Progression Factor	1.00	1.00	1.00	1.04	1.10	1.16	0.77	0.90	1.15	1.00	1.00	1.00
Incremental Delay, d2	8.5	0.6	0.3	253.1	1.9	0.6	215.0	0.7	92.1	294.9	3.7	2.9
Delay (s)	60.0	43.3	42.1	301.3	42.4	41.0	249.3	29.4	131.9	339.4	33.5	29.3
Level of Service	E	D	D	F	D	D	F	C	F	F	C	C
Approach Delay (s)		44.7			160.7			110.7			117.6	
Approach LOS		D			F			F			F	

Intersection Summary				
HCM Average Control Delay	117.1	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.25			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	95.5%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1553	1736	1827	1736	1553
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1827	1553	1736	1827	1736	1553
Volume (vph)	302	1106	349	570	173	16
Peak-hour factor, PHF	0.92	0.92	0.87	0.87	0.70	0.70
Adj. Flow (vph)	328	1202	401	655	247	23
RTOR Reduction (vph)	0	242	0	0	0	6
Lane Group Flow (vph)	328	960	401	655	247	17
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	55.7	55.7	25.0	84.7	16.0	16.0
Effective Green, g (s)	57.0	57.0	25.0	86.0	16.0	16.0
Actuated g/C Ratio	0.52	0.52	0.23	0.78	0.15	0.15
Clearance Time (s)	5.3	5.3	4.0	5.3	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	947	805	395	1428	253	226
v/s Ratio Prot	0.18		c0.23	0.36	c0.14	
v/s Ratio Perm		c0.62				0.01
v/c Ratio	0.35	1.19	1.02	0.46	0.98	0.08
Uniform Delay, d1	15.6	26.5	42.5	4.1	46.8	40.6
Progression Factor	0.47	0.73	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	87.7	49.2	1.1	49.5	0.1
Delay (s)	7.3	107.0	91.7	5.1	96.3	40.8
Level of Service	A	F	F	A	F	D
Approach Delay (s)	85.6			38.0	91.6	
Approach LOS	F			D	F	

Intersection Summary				
HCM Average Control Delay	68.6	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.11			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	94.5%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0		4.0		4.0		4.0	4.0	
Lane Util. Factor	0.97	0.95		1.00		0.88		0.91		0.97	0.95	
Frt	1.00	0.94		1.00		0.85		0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)	3367	3266		1736		2733		4918		3367	3471	
Flt Permitted	0.95	1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)	3367	3266		1736		2733		4918		3367	3471	
Volume (vph)	192	189	122	222	0	476	0	1097	112	123	591	0
Peak-hour factor, PHF	0.85	0.85	0.85	0.78	0.78	0.78	0.74	0.74	0.74	0.90	0.90	0.90
Adj. Flow (vph)	226	222	144	285	0	610	0	1482	151	137	657	0
RTOR Reduction (vph)	0	103	0	0	0	221	0	10	0	0	0	0
Lane Group Flow (vph)	226	263	0	285	0	389	0	1623	0	137	657	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot		custom				Prot		
Protected Phases	7	4		3		8		2		1	6	
Permitted Phases												
Actuated Green, G (s)	12.0	16.3		16.0		20.3		41.0		8.7	53.7	
Effective Green, g (s)	12.0	17.3		16.0		21.3		42.0		8.7	54.7	
Actuated g/C Ratio	0.12	0.17		0.16		0.21		0.42		0.09	0.55	
Clearance Time (s)	4.0	5.0		4.0		5.0		5.0		4.0	5.0	
Vehicle Extension (s)	6.5	6.5		2.0		4.5		5.5		2.0	6.0	
Lane Grp Cap (vph)	404	565		278		582		2066		293	1899	
v/s Ratio Prot	0.07	0.08		c0.16		c0.14		c0.33		c0.04	0.19	
v/s Ratio Perm												
v/c Ratio	0.56	0.46		1.03		0.67		0.79		0.47	0.35	
Uniform Delay, d1	41.5	37.2		42.0		36.1		25.1		43.4	12.7	
Progression Factor	1.00	1.00		1.00		1.00		1.00		0.76	0.47	
Incremental Delay, d2	4.0	1.9		60.6		3.5		3.1		0.4	0.5	
Delay (s)	45.5	39.1		102.6		39.6		28.2		33.3	6.4	
Level of Service	D	D		F		D		C		C	A	
Approach Delay (s)		41.5			59.7			28.2			11.1	
Approach LOS		D			E			C			B	

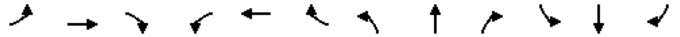
Intersection Summary				
HCM Average Control Delay	33.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	63.5%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	1.00	1.00		1.00	1.00		0.95	1.00
Frt	1.00	0.98		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1644	4906		1644	1827	1471		1780	1471		3370	1471
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (perm)	1644	4906		1644	1827	1471		1780	1471		3370	1471
Volume (vph)	94	333	40	130	342	27	22	20	32	158	104	349
Peak-hour factor, PHF	0.86	0.86	0.86	0.84	0.84	0.84	0.93	0.93	0.93	0.76	0.76	0.76
Adj. Flow (vph)	109	387	47	155	407	32	24	22	34	208	137	459
RTOR Reduction (vph)	0	9	0	0	0	4	0	0	30	0	0	355
Lane Group Flow (vph)	109	425	0	155	407	28	0	46	4	0	345	104
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6			3			4
Actuated Green, G (s)	8.9	35.0		11.1	37.2	37.2		8.7	8.7		20.2	20.2
Effective Green, g (s)	8.6	36.3		10.8	38.5	38.5		9.9	9.9		21.4	21.4
Actuated g/C Ratio	0.09	0.38		0.11	0.41	0.41		0.10	0.10		0.23	0.23
Clearance Time (s)	3.7	5.3		3.7	5.3	5.3		5.2	5.2		5.2	5.2
Vehicle Extension (s)	2.0	5.1		2.0	4.8	4.8		6.3	6.3		7.9	7.9
Lane Grp Cap (vph)	150	1887		188	745	600		187	154		764	333
v/s Ratio Prot	0.07	0.09		c0.09	c0.22			c0.03			c0.10	
v/s Ratio Perm						0.02			0.00			0.07
v/c Ratio	0.73	0.23		0.82	0.55	0.05		0.25	0.02		0.45	0.31
Uniform Delay, d1	41.8	19.6		40.9	21.3	16.9		38.8	37.9		31.4	30.4
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	13.8	0.3		23.4	1.4	0.1		2.1	0.2		1.8	2.3
Delay (s)	55.5	19.9		64.3	22.7	16.9		40.9	38.1		33.2	32.6
Level of Service	E	B		E	C	B		D	D		C	C
Approach Delay (s)		27.0			33.2			39.7			32.9	
Approach LOS		C			C			D			C	

Intersection Summary				
HCM Average Control Delay	31.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	94.4	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	57.5%	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		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	311	201	0	524	25	0	0	31	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.84	0.84	0.84	0.79	0.79	0.79	0.92	0.92	0.92
Hourly flow rate (vph)	11	327	212	0	624	30	0	0	39	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		799			328							
pX, platoon unblocked	0.92			0.97			0.93	0.93	0.97	0.93	0.93	0.92
vC, conflicting volume	654			539			1093	1108	269	863	1199	639
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	624			501			1031	1047	224	784	1144	608
tC, single (s)	4.2			4.2			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	95	100	100	100
cM capacity (veh/h)	865			1019			173	209	759	252	186	409

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	NB 1
Volume Total	11	218	321	654	39
Volume Left	11	0	0	0	0
Volume Right	0	0	212	30	39
cSH	865	1700	1700	1700	759
Volume to Capacity	0.01	0.13	0.19	0.38	0.05
Queue Length 95th (ft)	1	0	0	0	4
Control Delay (s)	9.2	0.0	0.0	0.0	10.0
Lane LOS	A				A
Approach Delay (s)	0.2			0.0	10.0
Approach LOS					A

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	32.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1553	1736	1827	1719	1538
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1827	1553	1736	1827	1719	1538
Volume (vph)	309	33	111	356	193	51
Peak-hour factor, PHF	0.86	0.86	0.81	0.81	0.78	0.78
Adj. Flow (vph)	359	38	137	440	247	65
RTOR Reduction (vph)	0	16	0	0	0	53
Lane Group Flow (vph)	359	22	137	440	247	12
Heavy Vehicles (%)	4%	4%	4%	4%	5%	5%
Turn Type		Perm	Prot			Prot
Protected Phases	2		1	6	4	4
Permitted Phases		2				
Actuated Green, G (s)	63.3	63.3	12.9	80.2	20.3	20.3
Effective Green, g (s)	65.3	65.3	12.9	82.2	20.3	20.3
Actuated g/C Ratio	0.59	0.59	0.12	0.74	0.18	0.18
Clearance Time (s)	6.0	6.0	4.0	6.0	4.0	4.0
Vehicle Extension (s)	8.0	8.0	2.0	8.0	2.4	2.4
Lane Grp Cap (vph)	1080	918	203	1359	316	283
v/s Ratio Prot	0.20		c0.08	c0.24	c0.14	0.01
v/s Ratio Perm		0.01				
v/c Ratio	0.33	0.02	0.67	0.32	0.78	0.04
Uniform Delay, d1	11.5	9.4	46.8	4.8	43.0	37.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	0.0	6.8	0.6	11.4	0.0
Delay (s)	12.3	9.4	53.6	5.4	54.4	37.1
Level of Service	B	A	D	A	D	D
Approach Delay (s)	12.1			16.8	50.8	
Approach LOS	B			B	D	

Intersection Summary			
HCM Average Control Delay	23.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	110.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.95			1.00	0.94	
Flt Protected	1.00			1.00	0.97	
Satd. Flow (prot)	1729			1821	1682	
Flt Permitted	1.00			0.96	0.97	
Satd. Flow (perm)	1729			1748	1682	
Volume (vph)	233	153	28	379	88	79
Peak-hour factor, PHF	0.95	0.95	0.83	0.83	0.88	0.88
Adj. Flow (vph)	245	161	34	457	100	90
RTOR Reduction (vph)	53	0	0	0	54	0
Lane Group Flow (vph)	353	0	0	491	136	0
Heavy Vehicles (%)	4%	4%	4%	4%	3%	3%
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	13.8			13.8	8.0	
Effective Green, g (s)	13.8			13.8	8.0	
Actuated g/C Ratio	0.46			0.46	0.27	
Clearance Time (s)	4.0			4.0	4.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	801			809	452	
v/s Ratio Prot	0.20				c0.08	
v/s Ratio Perm				c0.28		
v/c Ratio	0.44			0.61	0.30	
Uniform Delay, d1	5.4			6.0	8.7	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.4			1.3	0.4	
Delay (s)	5.8			7.3	9.0	
Level of Service	A			A	A	
Approach Delay (s)	5.8			7.3	9.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	7.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	29.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	1827	1553	1736	1827	1553	1736	4940		1736	3471	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1736	1827	1553	1736	1827	1553	1736	4940		1736	3471	1553
Volume (vph)	136	52	81	86	104	511	121	1115	76	301	1022	230
Peak-hour factor, PHF	0.73	0.73	0.73	0.83	0.83	0.83	0.84	0.84	0.84	0.93	0.93	0.93
Adj. Flow (vph)	186	71	111	104	125	616	144	1327	90	324	1099	247
RTOR Reduction (vph)	0	0	97	0	0	232	0	7	0	0	0	153
Lane Group Flow (vph)	186	71	14	104	125	384	144	1410	0	324	1099	94
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	13.3	12.2	12.2	31.2	30.1	30.1	10.0	27.0		19.6	36.6	36.6
Effective Green, g (s)	13.3	14.2	14.2	31.2	32.1	32.1	10.0	29.0		19.6	38.6	38.6
Actuated g/C Ratio	0.12	0.13	0.13	0.28	0.29	0.29	0.09	0.26		0.18	0.35	0.35
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	5.8	5.8	3.0	5.8	5.8	1.5	5.8		1.5	5.8	5.8
Lane Grp Cap (vph)	210	236	200	492	533	453	158	1302		309	1218	545
v/s Ratio Prot	c0.11	0.04		0.06	0.07		0.08	c0.29		c0.19	0.32	
v/s Ratio Perm			0.01			c0.25						0.06
v/c Ratio	0.89	0.30	0.07	0.21	0.23	0.85	0.91	1.08		1.05	0.90	0.17
Uniform Delay, d1	47.6	43.4	42.1	30.0	29.6	36.6	49.6	40.5		45.2	33.9	24.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	0.71	0.27
Incremental Delay, d2	32.8	1.9	0.4	0.2	0.6	15.5	45.7	50.7		55.2	7.8	0.5
Delay (s)	80.4	45.3	42.5	30.2	30.2	52.1	95.3	91.2		100.7	31.9	7.1
Level of Service	F	D	D	C	C	D	F	F		F	C	A
Approach Delay (s)		62.2			46.2			91.6			41.6	
Approach LOS		E			D			F			D	

Intersection Summary			
HCM Average Control Delay	61.7	HCM Level of Service	E
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Visalia Walmart Expansion
2030 + Project (Mitigated)
11: SR-198 EB Ramps @ Lovers Lane & Lovers Lane
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0						4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00						0.91		1.00	0.95	
Frt	1.00	0.85						1.00		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1736	1553						4969		1736	3471	
Flt Permitted	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (perm)	1736	1553						4969		1736	3471	
Volume (vph)	513	0	395	0	0	0	0	1718	44	182	1158	0
Peak-hour factor, PHF	0.77	0.77	0.77	0.92	0.92	0.92	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	666	0	513	0	0	0	0	1952	50	207	1316	0
RTOR Reduction (vph)	0	30	0	0	0	0	0	2	0	0	0	0
Lane Group Flow (vph)	666	483	0	0	0	0	0	2000	0	207	1316	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	39.4	39.4						43.7		13.8	61.2	
Effective Green, g (s)	40.0	40.0						44.5		13.5	62.0	
Actuated g/C Ratio	0.36	0.36						0.40		0.12	0.56	
Clearance Time (s)	4.6	4.6						4.8		3.7	4.8	
Vehicle Extension (s)	5.0	5.0						7.4		2.0	6.2	
Lane Grp Cap (vph)	631	565						2010		213	1956	
v/s Ratio Prot	c0.38	0.31						c0.40		c0.12	0.38	
v/s Ratio Perm												
v/c Ratio	1.06	0.86						0.99		0.97	0.67	
Uniform Delay, d1	35.0	32.3						32.6		48.1	16.9	
Progression Factor	1.00	1.00						0.51		1.25	0.47	
Incremental Delay, d2	51.3	13.1						5.0		32.1	0.8	
Delay (s)	86.3	45.5						21.6		92.2	8.7	
Level of Service	F	D						C		F	A	
Approach Delay (s)		68.6			0.0			21.6			20.1	
Approach LOS		E			A			C			C	

Intersection Summary				
HCM Average Control Delay	32.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	1.02			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	82.7%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Visalia Walmart Expansion
2030 + Project (Mitigated)
12: Tulare Ave & Ben Maddox Way
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	1845	1568	1752	1845	1568	1736	3471	1553	1736	3471	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1752	1845	1568	1752	1845	1568	1736	3471	1553	1736	3471	1553
Volume (vph)	114	172	52	40	409	237	134	809	32	141	658	157
Peak-hour factor, PHF	0.73	0.73	0.73	0.83	0.83	0.83	0.78	0.78	0.78	0.92	0.92	0.92
Adj. Flow (vph)	156	236	71	48	493	286	172	1037	41	153	715	171
RTOR Reduction (vph)	0	0	45	0	0	98	0	0	13	0	0	113
Lane Group Flow (vph)	156	236	26	48	493	188	172	1037	28	153	715	58
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	9.0	34.2	34.2	4.7	29.9	29.9	9.0	32.1	32.1	9.0	32.1	32.1
Effective Green, g (s)	9.0	35.2	35.2	4.7	30.9	30.9	9.0	33.1	33.1	9.0	33.1	33.1
Actuated g/C Ratio	0.09	0.36	0.36	0.05	0.32	0.32	0.09	0.34	0.34	0.09	0.34	0.34
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	161	663	563	84	582	494	159	1172	525	159	1172	525
v/s Ratio Prot	c0.09	0.13		0.03	c0.27		c0.10	c0.30		0.09	0.21	
v/s Ratio Perm			0.02			0.12			0.02			0.04
v/c Ratio	0.97	0.36	0.05	0.57	0.85	0.38	1.08	0.88	0.05	0.96	0.61	0.11
Uniform Delay, d1	44.4	23.1	20.5	45.7	31.3	26.1	44.5	30.6	21.9	44.3	27.1	22.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	60.6	0.1	0.0	5.7	10.6	0.2	94.9	9.9	0.2	59.5	2.4	0.4
Delay (s)	105.0	23.2	20.5	51.4	41.9	26.3	139.4	40.6	22.1	103.8	29.4	22.7
Level of Service	F	C	C	D	D	C	F	D	C	F	C	C
Approach Delay (s)		50.3			37.1			53.5			39.3	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM Average Control Delay	45.2	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.90			
Actuated Cycle Length (s)	98.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	71.3%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Visalia Walmart Expansion
13: Tulare Ave & Pinkham Rd

2030 + Project (Mitigated)
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.97			0.98			0.99			0.96	
Flt Protected		0.99			0.99			0.97			0.99	
Satd. Flow (prot)		1767			1799			1767			1747	
Flt Permitted		0.78			0.84			0.64			0.81	
Satd. Flow (perm)		1395			1529			1166			1436	
Volume (vph)	50	165	72	61	290	52	306	124	37	55	111	76
Peak-hour factor, PHF	0.67	0.67	0.67	0.78	0.78	0.78	0.77	0.77	0.77	0.86	0.86	0.86
Adj. Flow (vph)	75	246	107	78	372	67	397	161	48	64	129	88
RTOR Reduction (vph)	0	15	0	0	7	0	0	4	0	0	20	0
Lane Group Flow (vph)	0	413	0	0	510	0	0	602	0	0	261	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		27.4			27.4			41.1			41.1	
Effective Green, g (s)		28.4			28.4			42.1			42.1	
Actuated g/C Ratio		0.36			0.36			0.54			0.54	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		505			553			625			770	
v/s Ratio Prot												
v/s Ratio Perm		0.30			c0.33			c0.52			0.18	
v/c Ratio		0.82			0.92			0.96			0.34	
Uniform Delay, d1		22.7			24.0			17.5			10.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		9.9			21.0			27.0			0.3	
Delay (s)		32.6			45.0			44.4			10.6	
Level of Service		C			D			D			B	
Approach Delay (s)		32.6			45.0			44.4			10.6	
Approach LOS		C			D			D			B	

Intersection Summary			
HCM Average Control Delay	36.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	78.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

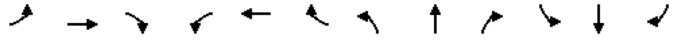
Visalia Walmart Expansion
14: Tulare Ave & Lovers Lane

2030 + Project (Mitigated)
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.85			1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1570			1845	1568	1736	3464		1736	3417	
Flt Permitted	0.75	1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1385	1570			1845	1568	1736	3464		1736	3417	
Volume (vph)	10	1	94	0	6	104	139	1127	16	46	954	111
Peak-hour factor, PHF	0.68	0.68	0.68	0.60	0.60	0.60	0.87	0.87	0.87	0.84	0.84	0.84
Adj. Flow (vph)	15	1	138	0	10	173	160	1295	18	55	1136	132
RTOR Reduction (vph)	0	120	0	0	0	151	0	1	0	0	13	0
Lane Group Flow (vph)	15	19	0	0	10	22	160	1312	0	55	1255	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	6.1	6.1			6.1	6.1	4.1	27.5		1.7	25.1	
Effective Green, g (s)	6.1	6.1			6.1	6.1	4.1	27.5		1.7	25.1	
Actuated g/C Ratio	0.13	0.13			0.13	0.13	0.09	0.58		0.04	0.53	
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	179	202			238	202	150	2014		62	1813	
v/s Ratio Prot		0.01			0.01		c0.09	c0.38		0.03	0.37	
v/s Ratio Perm	0.01					c0.01						
v/c Ratio	0.08	0.09			0.04	0.11	1.07	0.65		0.89	0.69	
Uniform Delay, d1	18.1	18.2			18.0	18.2	21.6	6.7		22.7	8.2	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2			0.1	0.2	92.4	0.8		74.6	1.2	
Delay (s)	18.3	18.4			18.1	18.4	114.0	7.4		97.3	9.4	
Level of Service	B	B			B	B	F	A		F	A	
Approach Delay (s)		18.4			18.4			19.0			13.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	16.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	47.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	54.8%	ICU Level of Service	A
Analysis Period (min)	15		

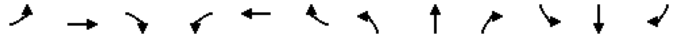
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frt	1.00	1.00			0.99			0.99				
Flt Protected	0.95	1.00			1.00			0.99				
Satd. Flow (prot)	1736	1827			1814			4923				
Flt Permitted	0.95	1.00			1.00			0.99				
Satd. Flow (perm)	1736	1827			1814			4923				
Volume (vph)	73	146	0	0	271	15	294	1336	173	0	0	0
Peak-hour factor, PHF	0.83	0.83	0.83	0.68	0.68	0.68	0.88	0.88	0.88	0.92	0.92	0.92
Adj. Flow (vph)	88	176	0	0	399	22	334	1518	197	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	13	0	0	0	0
Lane Group Flow (vph)	88	176	0	0	419	0	0	2036	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	Prot						Perm					
Protected Phases	7	4			8			2				
Permitted Phases							2					
Actuated Green, G (s)	6.9	33.9			23.3			31.4				
Effective Green, g (s)	6.6	34.1			23.5			31.6				
Actuated g/C Ratio	0.09	0.46			0.32			0.43				
Clearance Time (s)	3.7	4.2			4.2			4.2				
Vehicle Extension (s)	2.0	7.9			7.7			6.4				
Lane Grp Cap (vph)	155	845			578			2111				
v/s Ratio Prot	c0.05	0.10			c0.23							
v/s Ratio Perm								0.41				
v/c Ratio	0.57	0.21			0.72			0.96				
Uniform Delay, d1	32.2	11.8			22.2			20.5				
Progression Factor	1.00	1.00			1.00			1.00				
Incremental Delay, d2	2.8	0.5			7.6			12.9				
Delay (s)	35.0	12.3			29.8			33.4				
Level of Service	D	B			C			C				
Approach Delay (s)		19.9			29.8			33.4			0.0	
Approach LOS		B			C			C			A	

Intersection Summary				
HCM Average Control Delay	31.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	73.7	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	65.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0				
Lane Util. Factor					0.91			0.91				
Frt					0.95			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					4722			4988				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					4722			4988				
Volume (vph)	0	0	0	0	1252	689	309	1284	0	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.82	0.82	0.82	0.87	0.87	0.87	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	1527	840	355	1476	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	3	0	0	10	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	2364	0	0	1821	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type							Perm					
Protected Phases					8			2				
Permitted Phases							2					
Actuated Green, G (s)					31.4			24.4				
Effective Green, g (s)					32.0			25.0				
Actuated g/C Ratio					0.49			0.38				
Clearance Time (s)					4.6			4.6				
Vehicle Extension (s)					4.8			3.0				
Lane Grp Cap (vph)					2325			1918				
v/s Ratio Prot					c0.50							
v/s Ratio Perm								0.37				
v/c Ratio					1.08dr			0.95				
Uniform Delay, d1					16.5			19.4				
Progression Factor					1.00			1.00				
Incremental Delay, d2					23.0			11.7				
Delay (s)					39.5			31.1				
Level of Service					D			C				
Approach Delay (s)		0.0			39.5			31.1			0.0	
Approach LOS		A			D			C			A	

Intersection Summary				
HCM Average Control Delay	35.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	77.4%	ICU Level of Service	D	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.91						0.91				
Frt		1.00						0.96				
Flt Protected		0.98						1.00				
Satd. Flow (prot)		4883						4822				
Flt Permitted		0.98						1.00				
Satd. Flow (perm)		4883						4822				
Volume (vph)	741	993	0	0	0	0	0	852	337	0	0	0
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.82	0.82	0.82	0.92	0.92	0.92
Adj. Flow (vph)	797	1068	0	0	0	0	0	1039	411	0	0	0
RTOR Reduction (vph)	0	17	0	0	0	0	0	28	0	0	0	0
Lane Group Flow (vph)	0	1848	0	0	0	0	0	1422	0	0	0	0
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	0%	0%	0%
Turn Type	Perm											
Protected Phases		2						8				
Permitted Phases	2											
Actuated Green, G (s)		23.1						20.0				
Effective Green, g (s)		24.5						21.1				
Actuated g/C Ratio		0.46						0.39				
Clearance Time (s)		5.4						5.1				
Vehicle Extension (s)		2.0						5.0				
Lane Grp Cap (vph)		2232						1898				
v/s Ratio Prot								c0.29				
v/s Ratio Perm		0.38										
v/c Ratio		0.98dl						0.75				
Uniform Delay, d1		12.7						14.0				
Progression Factor		1.00						1.00				
Incremental Delay, d2		3.7						2.0				
Delay (s)		16.4						16.0				
Level of Service		B						B				
Approach Delay (s)		16.4			0.0			16.0			0.0	
Approach LOS		B			A			B			A	

Intersection Summary				
HCM Average Control Delay	16.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	53.6	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	71.7%	ICU Level of Service	C	
Analysis Period (min)	15			

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
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)	49	26	0	0	35	41	4	974	6	0	0	0
Peak Hour Factor	0.60	0.60	0.60	0.83	0.83	0.83	0.78	0.78	0.78	0.92	0.92	0.92
Hourly flow rate (vph)	82	43	0	0	42	49	5	1249	8	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	125	92	629	632
Volume Left (vph)	82	0	5	0
Volume Right (vph)	0	49	0	8
Hadj (s)	0.16	-0.29	0.06	0.04
Departure Headway (s)	6.1	5.8	5.2	5.2
Degree Utilization, x	0.21	0.15	0.91	0.92
Capacity (veh/h)	579	611	685	687
Control Delay (s)	10.8	9.8	37.9	38.1
Approach Delay (s)	10.8	9.8	38.0	
Approach LOS	B	A	E	

Intersection Summary				
Delay	33.9			
HCM Level of Service	D			
Intersection Capacity Utilization	44.6%	ICU Level of Service	A	
Analysis Period (min)	15			

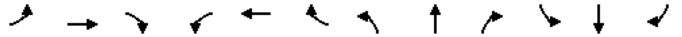
Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				4988	3433	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				4988	3433	
Volume (vph)	0	0	0	1260	681	0
Peak-hour factor, PHF	0.92	0.92	0.74	0.74	0.70	0.70
Adj. Flow (vph)	0	0	0	1703	973	0
RTOR Reduction (vph)	0	0	0	0	9	0
Lane Group Flow (vph)	0	0	0	1703	964	0
Heavy Vehicles (%)	4%	4%	4%	4%	2%	2%
Turn Type						
Protected Phases				6	4	
Permitted Phases						
Actuated Green, G (s)				27.1	21.9	
Effective Green, g (s)				27.7	23.9	
Actuated g/C Ratio				0.46	0.40	
Clearance Time (s)				4.6	6.0	
Vehicle Extension (s)				5.0	6.0	
Lane Grp Cap (vph)				2318	1377	
v/s Ratio Prot				c0.34	c0.28	
v/s Ratio Perm						
v/c Ratio				0.73	0.70	
Uniform Delay, d1				13.0	14.9	
Progression Factor				1.00	1.00	
Incremental Delay, d2				1.5	2.4	
Delay (s)				14.5	17.3	
Level of Service				B	B	
Approach Delay (s)	0.0			14.5	17.3	
Approach LOS	A			B	B	

Intersection Summary			
HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	59.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	483	104	622	1008	663	328	639
v/c Ratio	0.55	0.22	0.83	0.63	0.64	0.74	0.32
Control Delay	34.4	6.8	40.6	32.5	14.6	52.2	21.3
Queue Delay	0.0	0.0	0.0	1.1	0.6	0.0	0.0
Total Delay	34.4	6.8	40.6	33.6	15.1	52.2	21.3
Queue Length 50th (ft)	135	0	208	339	171	104	101
Queue Length 95th (ft)	186	39	218	363	252	149	139
Internal Link Dist (ft)	719			378			1660
Turn Bay Length (ft)		275	110			260	
Base Capacity (vph)	951	510	875	1601	1032	505	1981
Starvation Cap Reductn	0	0	0	337	111	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.20	0.71	0.80	0.72	0.65	0.32

Intersection Summary



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	43	71	211	410	273	212	488	1100	1036	538	949	447
v/c Ratio	0.37	0.32	0.56	1.53	0.61	0.49	1.47	0.82	1.11	1.63	0.71	0.58
Control Delay	58.2	46.2	11.8	287.2	46.4	31.0	243.9	29.4	69.5	325.9	32.9	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	8.1	17.5	42.4	0.0	0.0	0.0
Total Delay	58.2	46.2	11.8	287.2	46.4	31.0	251.9	47.0	111.9	325.9	32.9	14.5
Queue Length 50th (ft)	29	47	0	~413	192	100	~483	231	~582	~548	287	90
Queue Length 95th (ft)	62	78	48	m#514	m225	m135	m#476	m309	m#623	#725	388	201
Internal Link Dist (ft)		2033			385			269			731	
Turn Bay Length (ft)	145			155		25	125			170		
Base Capacity (vph)	121	332	455	268	501	477	331	1345	934	331	1345	765
Starvation Cap Reductn	0	0	0	0	0	0	4	263	62	0	0	0
Spillback Cap Reductn	0	12	0	0	0	0	0	0	76	0	8	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.22	0.46	1.53	0.54	0.44	1.49	1.02	1.21	1.63	0.71	0.58

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	328	1202	401	655	247	23
v/c Ratio	0.35	1.15	1.02	0.46	0.98	0.10
Control Delay	7.5	82.5	92.2	5.3	98.7	32.9
Queue Delay	0.8	19.9	0.0	0.0	0.0	0.0
Total Delay	8.3	102.4	92.2	5.3	98.7	32.9
Queue Length 50th (ft)	74	~210	~292	128	176	10
Queue Length 95th (ft)	m50	m125	#464	170	#222	26
Internal Link Dist (ft)	385			614	86	
Turn Bay Length (ft)						25
Base Capacity (vph)	947	1047	395	1428	253	232
Starvation Cap Reductn	356	40	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.55	1.19	1.02	0.46	0.98	0.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	226	366	285	610	1633	137	657
v/c Ratio	0.56	0.55	1.03	0.76	0.79	0.47	0.35
Control Delay	47.4	27.0	103.5	25.7	29.6	37.4	6.8
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Total Delay	47.4	27.0	103.5	25.9	29.6	37.4	6.8
Queue Length 50th (ft)	71	73	~195	114	315	29	128
Queue Length 95th (ft)	103	101	#286	125	331	63	185
Internal Link Dist (ft)		671			2243		378
Turn Bay Length (ft)			280			120	
Base Capacity (vph)	404	1099	278	1139	2075	294	1899
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	84	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.33	1.03	0.58	0.79	0.47	0.35

Intersection Summary

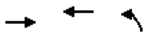
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	109	434	155	407	32	46	34	345	459
v/c Ratio	0.60	0.22	0.70	0.53	0.05	0.20	0.15	0.44	0.66
Control Delay	57.3	22.9	58.3	28.5	19.5	43.3	16.0	34.9	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.3	22.9	58.3	28.5	19.5	43.3	16.0	34.9	8.6
Queue Length 50th (ft)	65	65	92	194	9	26	0	97	0
Queue Length 95th (ft)	127	112	161	337	33	67	30	131	23
Internal Link Dist (ft)		179		406		179		341	
Turn Bay Length (ft)	185		150		40				110
Base Capacity (vph)	335	1935	342	761	616	491	430	1099	789
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.22	0.45	0.53	0.05	0.09	0.08	0.31	0.58

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	359	38	137	440	247	65
v/c Ratio	0.33	0.04	0.68	0.32	0.78	0.19
Control Delay	14.6	4.6	63.8	6.2	60.2	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.6	4.6	63.8	6.2	60.2	10.3
Queue Length 50th (ft)	122	0	94	90	168	0
Queue Length 95th (ft)	229	17	145	153	215	26
Internal Link Dist (ft)	248			664	309	
Turn Bay Length (ft)			200			
Base Capacity (vph)	1080	933	308	1359	430	433
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.04	0.44	0.32	0.57	0.15

Intersection Summary



Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	406	491	190
v/c Ratio	0.48	0.62	0.38
Control Delay	6.4	10.1	9.7
Queue Delay	0.0	0.0	0.0
Total Delay	6.4	10.1	9.7
Queue Length 50th (ft)	24	44	13
Queue Length 95th (ft)	80	113	59
Internal Link Dist (ft)	664	1978	2236
Turn Bay Length (ft)			
Base Capacity (vph)	1227	1214	760
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.33	0.40	0.25

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	186	71	111	104	125	616	144	1417	324	1099	247
v/c Ratio	0.89	0.30	0.37	0.21	0.23	0.90	0.91	1.08	1.05	0.90	0.35
Control Delay	88.4	46.2	11.7	31.9	29.7	34.2	101.8	89.4	99.8	32.9	2.1
Queue Delay	659.7	0.0	0.0	0.0	0.0	27.5	0.0	1.0	226.6	128.1	1.7
Total Delay	748.0	46.2	11.7	31.9	29.7	61.6	101.8	90.4	326.4	161.0	3.7
Queue Length 50th (ft)	~146	46	0	55	64	206	103	~410	~249	416	13
Queue Length 95th (ft)	#209	71	26	96	102	307	#202	#449	m#399	#513	m17
Internal Link Dist (ft)		502			1058			2367		110	
Turn Bay Length (ft)	125		125	135			115		115		
Base Capacity (vph)	210	548	544	492	581	718	158	1308	309	1217	697
Starvation Cap Reductn	0	0	0	0	0	0	0	0	104	363	295
Spillback Cap Reductn	152	0	0	0	0	126	0	3	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	3.21	0.13	0.20	0.21	0.22	1.04	0.91	1.09	1.58	1.29	0.61

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	666	513	2002	207	1316
v/c Ratio	1.06	0.86	1.00	0.97	0.67
Control Delay	86.3	45.6	23.1	92.7	8.9
Queue Delay	66.0	123.6	88.3	0.0	1.6
Total Delay	152.3	169.2	111.4	92.7	10.5
Queue Length 50th (ft)	~516	307	177	154	174
Queue Length 95th (ft)	#566	353	m178	m#222	m182
Internal Link Dist (ft)		366	110		269
Turn Bay Length (ft)	232			75	
Base Capacity (vph)	631	595	2012	213	1956
Starvation Cap Reductn	0	0	363	0	304
Spillback Cap Reductn	83	192	320	0	433
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.22	1.27	1.21	0.97	0.86

Intersection Summary

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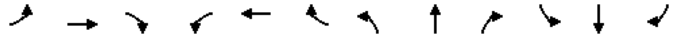
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	156	236	71	48	493	286	172	1037	41	153	715	171
v/c Ratio	0.95	0.35	0.11	0.39	0.88	0.50	1.06	0.87	0.08	0.94	0.60	0.26
Control Delay	104.8	25.4	6.4	53.4	50.4	16.1	132.0	39.8	15.2	103.4	29.4	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.8	25.4	6.4	53.4	50.4	16.1	132.0	39.8	15.2	103.4	29.4	5.0
Queue Length 50th (ft)	101	111	0	30	285	67	~125	330	10	99	201	0
Queue Length 95th (ft)	#167	142	18	60	368	122	#209	338	27	#227	263	45
Internal Link Dist (ft)		1613			1967			1346			2243	
Turn Bay Length (ft)	95		95	90		90	155		90	200		200
Base Capacity (vph)	164	674	618	155	609	613	162	1192	546	162	1192	646
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.35	0.11	0.31	0.81	0.47	1.06	0.87	0.08	0.94	0.60	0.26

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	428	517	606	281
v/c Ratio	0.81	0.91	0.97	0.36
Control Delay	35.6	46.6	50.0	10.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	35.6	46.6	50.0	10.7
Queue Length 50th (ft)	176	232	278	64
Queue Length 95th (ft)	183	#305	#390	108
Internal Link Dist (ft)	1967	2570	503	2236
Turn Bay Length (ft)				
Base Capacity (vph)	544	586	625	790
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.79	0.88	0.97	0.36

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	15	139	10	173	160	1313	55	1268
v/c Ratio	0.07	0.39	0.04	0.45	1.01	0.60	0.38	0.72
Control Delay	14.7	7.2	14.0	7.3	100.9	10.7	26.8	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	7.2	14.0	7.3	100.9	10.7	26.8	13.9
Queue Length 50th (ft)	3	0	2	0	37	60	12	113
Queue Length 95th (ft)	10	16	7	10	#124	#265	36	#232
Internal Link Dist (ft)		2570	207			1470		2367
Turn Bay Length (ft)	100				210		290	
Base Capacity (vph)	411	563	547	587	159	2189	145	1755
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.25	0.02	0.29	1.01	0.60	0.38	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	88	176	421	2049
v/c Ratio	0.47	0.21	0.72	0.96
Control Delay	40.4	11.8	30.5	34.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	40.4	11.8	30.5	34.7
Queue Length 50th (ft)	41	45	170	~370
Queue Length 95th (ft)	77	72	195	#504
Internal Link Dist (ft)		608	737	568
Turn Bay Length (ft)				
Base Capacity (vph)	417	1035	632	2145
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.21	0.17	0.67	0.96

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	NBT
Lane Group Flow (vph)	2367	1831
v/c Ratio	1.08dr	0.95
Control Delay	41.4	32.3
Queue Delay	64.3	0.0
Total Delay	105.7	32.3
Queue Length 50th (ft)	~338	248
Queue Length 95th (ft)	#393	#336
Internal Link Dist (ft)	265	310
Turn Bay Length (ft)		
Base Capacity (vph)	2328	1928
Starvation Cap Reductn	308	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	1.17	0.95

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lane Group	EBT	NBT
Lane Group Flow (vph)	1865	1450
v/c Ratio	0.98dl	0.75
Control Delay	16.8	16.6
Queue Delay	0.1	0.4
Total Delay	16.9	17.0
Queue Length 50th (ft)	173	134
Queue Length 95th (ft)	231	157
Internal Link Dist (ft)	4045	445
Turn Bay Length (ft)		
Base Capacity (vph)	2249	1926
Starvation Cap Reductn	0	0
Spillback Cap Reductn	35	132
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.84	0.81

Intersection Summary

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Lane Group	WBT	NWL
Lane Group Flow (vph)	1703	973
v/c Ratio	0.74	0.70
Control Delay	15.5	18.6
Queue Delay	1.0	1.7
Total Delay	16.5	20.2
Queue Length 50th (ft)	184	157
Queue Length 95th (ft)	173	152
Internal Link Dist (ft)	3590	241
Turn Bay Length (ft)		
Base Capacity (vph)	2464	1460
Starvation Cap Reductn	0	0
Spillback Cap Reductn	460	303
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.85	0.84

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor					0.95	1.00	0.97	0.91	0.91	0.97	0.91	
Frt					1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)					3482	1583	3433	3374	1441	3433	4951	
Flt Permitted					0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)					3482	1583	3433	3374	1441	3433	4951	
Volume (vph)	0	0	0	206	426	162	283	945	503	383	775	166
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.94	0.86	0.86	0.86
Adj. Flow (vph)	0	0	0	224	463	176	301	1005	535	445	901	193
RTOR Reduction (vph)	0	0	0	0	0	124	0	2	87	0	33	0
Lane Group Flow (vph)	0	0	0	0	687	52	301	1036	415	445	1061	0
Turn Type				Split		Perm	Prot		Perm	Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)					28.6	28.6	11.7	42.8	42.8	14.6	45.7	
Effective Green, g (s)					29.6	29.6	11.7	43.8	43.8	14.6	46.7	
Actuated g/C Ratio					0.30	0.30	0.12	0.44	0.44	0.15	0.47	
Clearance Time (s)					5.0	5.0	4.0	5.0	5.0	4.0	5.0	
Vehicle Extension (s)					7.5	7.5	2.0	8.0	8.0	2.0	7.5	
Lane Grp Cap (vph)					1031	469	402	1478	631	501	2312	
v/s Ratio Prot					c0.20		0.09	c0.31		c0.13	c0.21	
v/s Ratio Perm						0.03			0.29			
v/c Ratio					0.67	0.11	0.75	0.70	0.66	0.89	0.46	
Uniform Delay, d1					30.9	25.6	42.7	22.8	22.2	41.9	18.1	
Progression Factor					1.00	1.00	0.70	1.35	1.52	1.00	1.00	
Incremental Delay, d2					3.2	0.4	4.0	1.7	3.2	16.8	0.7	
Delay (s)					34.1	26.0	33.7	32.4	36.9	58.7	18.7	
Level of Service					C	C	C	C	D	E	B	
Approach Delay (s)		0.0			32.4			33.8			30.3	
Approach LOS		A			C			C			C	

Intersection Summary			
HCM Average Control Delay	32.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	316	492	276	512	235	67
Peak Hour Factor	0.92	0.92	0.88	0.88	0.76	0.76
Hourly flow rate (vph)	343	535	314	582	309	88
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total (vph)	229	649	508	388	309	88
Volume Left (vph)	0	0	314	0	309	0
Volume Right (vph)	0	535	0	0	0	88
Hadj (s)	0.03	-0.54	0.34	0.03	0.55	-0.65
Departure Headway (s)	7.5	6.9	7.7	7.3	8.7	7.5
Degree Utilization, x	0.48	1.25	1.08	0.79	0.75	0.18
Capacity (veh/h)	467	526	479	483	406	466
Control Delay (s)	16.0	149.6	90.8	31.6	32.1	11.0
Approach Delay (s)	114.8		65.1		27.4	
Approach LOS	F		F		D	

Intersection Summary			
Delay	78.3		
HCM Level of Service	F		
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	95	234	468	224	190	159	210	1210	745	284	841	165
Peak-hour factor, PHF	0.80	0.80	0.80	0.87	0.87	0.87	0.92	0.92	0.92	0.89	0.89	0.89
Adj. Flow (vph)	119	292	585	257	218	183	228	1315	810	319	945	185
RTOR Reduction (vph)	0	0	195	0	0	56	0	0	289	0	0	126
Lane Group Flow (vph)	119	292	390	257	218	127	228	1315	521	319	945	59
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	11.7	29.5	29.5	11.0	30.3	30.3	16.6	32.0	32.0	17.5	32.9	32.9
Effective Green, g (s)	11.7	31.5	31.5	11.0	30.8	30.8	16.6	34.0	34.0	17.5	34.9	34.9
Actuated g/C Ratio	0.11	0.29	0.29	0.10	0.28	0.28	0.15	0.31	0.31	0.16	0.32	0.32
Clearance Time (s)	4.0	6.0	6.0	4.0	4.5	4.5	4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	188	533	453	177	522	443	267	1094	489	282	1123	502
v/s Ratio Prot	0.07	0.16		c0.15	0.12		0.13	c0.37		c0.18	0.27	
v/s Ratio Perm			c0.25			0.08			0.33			0.04
v/c Ratio	0.63	0.55	0.86	1.45	0.42	0.29	0.85	1.20	1.06	1.13	0.84	0.12
Uniform Delay, d1	47.1	33.2	37.2	49.5	32.3	31.0	45.5	38.0	38.0	46.2	35.0	26.6
Progression Factor	1.00	1.00	1.00	1.16	0.80	0.68	1.04	0.97	0.98	1.00	1.00	1.00
Incremental Delay, d2	6.8	1.2	15.4	230.3	0.5	0.3	2.6	91.8	33.7	93.7	7.7	0.5
Delay (s)	53.9	34.4	52.5	287.6	26.3	21.5	50.1	128.7	71.0	140.0	42.7	27.1
Level of Service	D	C	D	F	C	C	D	F	E	F	D	C
Approach Delay (s)		47.4			127.1			101.2			62.1	
Approach LOS		D			F			F			E	

Intersection Summary				
HCM Average Control Delay	84.1	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.06			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	87.2%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	1863	1752	1568
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	1863	1752	1568
Volume (vph)	476	787	258	397	176	27
Peak-hour factor, PHF	0.94	0.94	0.83	0.83	0.88	0.88
Adj. Flow (vph)	506	837	311	478	200	31
RTOR Reduction (vph)	0	369	0	0	0	9
Lane Group Flow (vph)	506	468	311	478	200	22
Heavy Vehicles (%)	2%	2%	2%	2%	3%	3%
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	40.3	40.3	23.2	67.5	33.2	33.2
Effective Green, g (s)	41.6	41.6	23.2	68.8	33.2	33.2
Actuated g/C Ratio	0.38	0.38	0.21	0.63	0.30	0.30
Clearance Time (s)	5.3	5.3	4.0	5.3	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	705	599	373	1165	529	473
v/s Ratio Prot	0.27		c0.18	0.26	c0.11	
v/s Ratio Perm		c0.30				0.01
v/c Ratio	0.72	0.78	0.83	0.41	0.38	0.05
Uniform Delay, d1	29.2	30.2	41.6	10.4	30.3	27.2
Progression Factor	0.98	1.02	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1	2.1	14.7	0.2	2.1	0.2
Delay (s)	29.6	32.8	56.3	10.6	32.3	27.4
Level of Service	C	C	E	B	C	C
Approach Delay (s)	31.6			28.6	31.7	
Approach LOS	C			C	C	

Intersection Summary				
HCM Average Control Delay	30.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	69.7%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0		4.0		4.0		4.0	4.0	
Lane Util. Factor	0.97	0.95		1.00		0.88		0.91		0.97	0.95	
Frt	1.00	0.93		1.00		0.85		0.97		1.00	1.00	
Flt Protected	0.95	1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)	3433	3281		1770		2787		4944		3433	3539	
Flt Permitted	0.95	1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)	3433	3281		1770		2787		4944		3433	3539	
Volume (vph)	193	529	501	294	0	618	0	920	209	190	791	0
Peak-hour factor, PHF	0.83	0.83	0.83	0.93	0.93	0.93	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	233	637	604	316	0	665	0	968	220	207	860	0
RTOR Reduction (vph)	0	58	0	0	0	230	0	37	0	0	0	0
Lane Group Flow (vph)	233	1183	0	316	0	435	0	1151	0	207	860	0
Turn Type	Prot			Prot		custom				Prot		
Protected Phases	7	4		3		8		2		1	6	
Permitted Phases												
Actuated Green, G (s)	9.0	31.9		20.1		43.0		22.1		7.9	34.0	
Effective Green, g (s)	9.0	32.9		20.1		44.0		23.1		7.9	35.0	
Actuated g/C Ratio	0.09	0.33		0.20		0.44		0.23		0.08	0.35	
Clearance Time (s)	4.0	5.0		4.0		5.0		5.0		4.0	5.0	
Vehicle Extension (s)	6.5	6.5		2.0		4.5		5.5		2.0	6.0	
Lane Grp Cap (vph)	309	1079		356		1226		1142		271	1239	
v/s Ratio Prot	0.07	c0.36		c0.18		0.16		c0.23		0.06	c0.24	
v/s Ratio Perm												
v/c Ratio	0.75	1.10		0.89		0.36		1.01		0.76	0.69	
Uniform Delay, d1	44.4	33.5		38.9		18.6		38.5		45.1	27.9	
Progression Factor	1.00	1.00		1.00		1.00		1.00		0.83	0.94	
Incremental Delay, d2	13.5	57.5		21.9		0.3		28.6		9.6	2.8	
Delay (s)	57.9	91.1		60.7		18.9		67.0		46.9	29.2	
Level of Service	E	F		E		B		E		D	C	
Approach Delay (s)		85.8			32.4			67.0			32.6	
Approach LOS		F			C			E			C	

Intersection Summary			
HCM Average Control Delay	57.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	88.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1900	1800	1800	1900	1800	1800	1900	1800	1800	1900	1800
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	1.00	1.00		1.00	1.00		0.95	1.00
Frt	1.00	0.96		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98	1.00		0.97	1.00
Satd. Flow (prot)	1676	4905		1676	1863	1500		1802	1485		3407	1485
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98	1.00		0.97	1.00
Satd. Flow (perm)	1676	4905		1676	1863	1500		1802	1485		3407	1485
Volume (vph)	191	583	181	178	267	71	123	134	142	217	163	430
Peak-hour factor, PHF	0.91	0.91	0.91	0.95	0.95	0.95	0.78	0.78	0.78	0.88	0.88	0.88
Adj. Flow (vph)	210	641	199	187	281	75	158	172	182	247	185	489
RTOR Reduction (vph)	0	39	0	0	0	18	0	0	139	0	0	320
Lane Group Flow (vph)	210	801	0	187	281	57	0	330	43	0	432	169
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6			3			4
Actuated Green, G (s)	18.3	31.8		16.6	30.1	30.1		27.3	27.3		24.8	24.8
Effective Green, g (s)	18.0	33.1		16.3	31.4	31.4		28.5	28.5		26.0	26.0
Actuated g/C Ratio	0.15	0.28		0.14	0.26	0.26		0.24	0.24		0.22	0.22
Clearance Time (s)	3.7	5.3		3.7	5.3	5.3		5.2	5.2		5.2	5.2
Vehicle Extension (s)	2.0	5.1		2.0	4.8	4.8		6.3	6.3		7.9	7.9
Lane Grp Cap (vph)	252	1354		228	488	393		428	353		739	322
v/s Ratio Prot	c0.13	c0.16		0.11	0.15			c0.18			c0.13	
v/s Ratio Perm						0.04			0.03			0.11
v/c Ratio	0.83	0.59		0.82	0.58	0.15		0.77	0.12		0.58	0.52
Uniform Delay, d1	49.5	37.6		50.4	38.5	34.0		42.7	35.9		42.1	41.5
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	19.6	1.9		19.6	2.5	0.3		10.7	0.5		3.1	5.5
Delay (s)	69.1	39.5		70.0	41.0	34.3		53.3	36.4		45.2	47.0
Level of Service	E	D		E	D	C		D	D		D	D
Approach Delay (s)		45.4			50.0			47.3			46.1	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	46.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	119.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	12	572	358	0	588	3	0	0	107	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.90	0.90	0.90	0.84	0.84	0.84	0.92	0.92	0.92
Hourly flow rate (vph)	13	602	377	0	653	3	0	0	127	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		799			328							
pX, platoon unblocked	0.94			0.86			0.89	0.89	0.86	0.89	0.89	0.94
vC, conflicting volume	657			979			1471	1472	489	1109	1659	655
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	635			810			1269	1270	239	861	1481	633
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	81	100	100	100
cM capacity (veh/h)	888			696			110	146	653	176	109	397

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	NB 1
Volume Total	13	401	578	657	127
Volume Left	13	0	0	0	0
Volume Right	0	0	377	3	127
cSH	888	1700	1700	1700	653
Volume to Capacity	0.01	0.24	0.34	0.39	0.19
Queue Length 95th (ft)	1	0	0	0	18
Control Delay (s)	9.1	0.0	0.0	0.0	11.8
Lane LOS	A				B
Approach Delay (s)	0.1			0.0	11.8
Approach LOS					B

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	40.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	1583	1770	1863	1770	1583
Volume (vph)	611	68	158	259	332	177
Peak-hour factor, PHF	0.94	0.94	0.91	0.91	0.81	0.81
Adj. Flow (vph)	650	72	174	285	410	219
RTOR Reduction (vph)	0	43	0	0	0	162
Lane Group Flow (vph)	650	29	174	285	410	57
Turn Type		Perm	Prot			Prot
Protected Phases	2		1	6	4	4
Permitted Phases		2				
Actuated Green, G (s)	22.3	22.3	7.7	34.0	15.4	15.4
Effective Green, g (s)	24.3	24.3	7.7	36.0	15.4	15.4
Actuated g/C Ratio	0.41	0.41	0.13	0.61	0.26	0.26
Clearance Time (s)	6.0	6.0	4.0	6.0	4.0	4.0
Vehicle Extension (s)	8.0	8.0	2.0	8.0	2.4	2.4
Lane Grp Cap (vph)	762	648	229	1129	459	410
v/s Ratio Prot	c0.35		c0.10	0.15	c0.23	0.04
v/s Ratio Perm		0.02				
v/c Ratio	0.85	0.05	0.76	0.25	0.89	0.14
Uniform Delay, d1	15.9	10.6	25.0	5.4	21.2	16.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.7	0.1	12.1	0.5	19.2	0.1
Delay (s)	27.6	10.7	37.0	6.0	40.4	17.0
Level of Service	C	B	D	A	D	B
Approach Delay (s)	25.9			17.8	32.2	
Approach LOS	C			B	C	

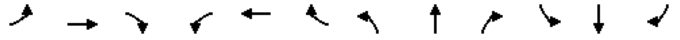
Intersection Summary				
HCM Average Control Delay	26.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	59.4	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	69.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.95			1.00	0.96	
Flt Protected	1.00			0.99	0.96	
Satd. Flow (prot)	1772			1850	1733	
Flt Permitted	1.00			0.64	0.96	
Satd. Flow (perm)	1772			1185	1733	
Volume (vph)	586	332	45	271	146	52
Peak-hour factor, PHF	0.92	0.92	0.85	0.85	0.92	0.92
Adj. Flow (vph)	637	361	53	319	159	57
RTOR Reduction (vph)	32	0	0	0	23	0
Lane Group Flow (vph)	966	0	0	372	193	0
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	30.7			30.7	10.6	
Effective Green, g (s)	30.7			30.7	10.6	
Actuated g/C Ratio	0.62			0.62	0.22	
Clearance Time (s)	4.0			4.0	4.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	1103			738	373	
v/s Ratio Prot	c0.55				c0.11	
v/s Ratio Perm				0.31		
v/c Ratio	0.88			0.50	0.52	
Uniform Delay, d1	7.7			5.1	17.1	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	8.0			0.5	1.2	
Delay (s)	15.7			5.7	18.3	
Level of Service	B			A	B	
Approach Delay (s)	15.7			5.7	18.3	
Approach LOS	B			A	B	

Intersection Summary				
HCM Average Control Delay	13.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	49.3	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	70.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	5041		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	5041		1770	3539	1583
Volume (vph)	238	214	208	109	104	365	79	961	59	617	1372	231
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.85	0.85	0.85	0.92	0.92	0.92
Adj. Flow (vph)	256	230	224	118	113	397	93	1131	69	671	1491	251
RTOR Reduction (vph)	0	0	113	0	0	333	0	6	0	0	0	115
Lane Group Flow (vph)	256	230	111	118	113	64	93	1194	0	671	1491	136
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	17.2	23.3	23.3	9.7	15.8	15.8	6.0	24.0		33.0	51.0	51.0
Effective Green, g (s)	17.2	25.3	25.3	9.7	17.8	17.8	6.0	26.0		33.0	53.0	53.0
Actuated g/C Ratio	0.16	0.23	0.23	0.09	0.16	0.16	0.05	0.24		0.30	0.48	0.48
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	3.0	5.8	5.8	3.0	5.8	5.8	1.5	5.8		1.5	5.8	5.8
Lane Grp Cap (vph)	277	428	364	156	301	256	97	1192		531	1705	763
v/s Ratio Prot	c0.14	c0.12		c0.07	0.06		0.05	c0.24		c0.38	0.42	
v/s Ratio Perm			0.07			0.04						0.09
v/c Ratio	0.92	0.54	0.30	0.76	0.38	0.25	0.96	1.00		1.26	0.87	0.18
Uniform Delay, d1	45.8	37.2	35.1	49.0	41.1	40.3	51.9	42.0		38.5	25.5	16.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.99	0.84	0.76
Incremental Delay, d2	34.4	2.9	1.3	18.7	2.1	1.4	76.6	26.4		120.1	0.7	0.0
Delay (s)	80.2	40.1	36.3	67.7	43.2	41.7	128.5	68.4		158.3	22.2	12.4
Level of Service	F	D	D	E	D	D	F	E		F	C	B
Approach Delay (s)		53.4			46.8			72.8			59.0	
Approach LOS		D			D			E			E	

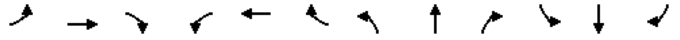
Intersection Summary				
HCM Average Control Delay	60.2	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.04			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	88.9%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0						4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00						0.91		1.00	0.95	
Frt	1.00	0.85						0.98		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1752	1568						4967		1770	3539	
Flt Permitted	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (perm)	1752	1568						4967		1770	3539	
Volume (vph)	844	0	1031	0	0	0	0	1321	243	344	1189	0
Peak-hour factor, PHF	0.79	0.79	0.79	0.92	0.92	0.92	0.95	0.95	0.95	0.87	0.87	0.87
Adj. Flow (vph)	1068	0	1305	0	0	0	0	1391	256	395	1367	0
RTOR Reduction (vph)	0	9	0	0	0	0	0	24	0	0	0	0
Lane Group Flow (vph)	1068	1296	0	0	0	0	0	1623	0	395	1367	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	52.4	52.4						29.2		15.3	48.2	
Effective Green, g (s)	53.0	53.0						30.0		15.0	49.0	
Actuated g/C Ratio	0.48	0.48						0.27		0.14	0.45	
Clearance Time (s)	4.6	4.6						4.8		3.7	4.8	
Vehicle Extension (s)	5.0	5.0						7.4		2.0	6.2	
Lane Grp Cap (vph)	844	755						1355		241	1576	
v/s Ratio Prot	0.61	c0.83						c0.33		c0.22	0.39	
v/s Ratio Perm												
v/c Ratio	1.27	1.72						1.20		1.64	0.87	
Uniform Delay, d1	28.5	28.5						40.0		47.5	27.6	
Progression Factor	1.00	1.00						0.49		1.36	0.70	
Incremental Delay, d2	128.9	328.2						92.0		293.6	2.3	
Delay (s)	157.4	356.7						111.6		358.0	21.7	
Level of Service	F	F						F		F	C	
Approach Delay (s)		267.0			0.0			111.6			97.1	
Approach LOS		F			A			F			F	

Intersection Summary				
HCM Average Control Delay	170.9	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.55			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	123.8%	ICU Level of Service	H	
Analysis Period (min)	15			

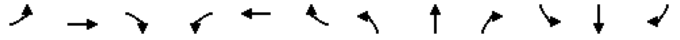
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	137	311	209	45	328	196	108	728	47	211	1038	224
Peak-hour factor, PHF	0.90	0.90	0.90	0.89	0.89	0.89	0.81	0.81	0.81	0.90	0.90	0.90
Adj. Flow (vph)	152	346	232	51	369	220	133	899	58	234	1153	249
RTOR Reduction (vph)	0	0	118	0	0	107	0	0	19	0	0	126
Lane Group Flow (vph)	152	346	114	51	369	113	133	899	39	234	1153	123
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	9.0	28.2	28.2	4.6	23.8	23.8	8.7	32.2	32.2	9.0	32.5	32.5
Effective Green, g (s)	9.0	29.2	29.2	4.6	24.8	24.8	8.7	33.2	33.2	9.0	33.5	33.5
Actuated g/C Ratio	0.10	0.32	0.32	0.05	0.27	0.27	0.09	0.36	0.36	0.10	0.36	0.36
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	173	591	502	89	502	427	167	1277	571	173	1289	576
v/s Ratio Prot	c0.09	0.19		0.03	c0.20		0.08	0.25		c0.13	c0.33	
v/s Ratio Perm			0.07			0.07			0.02			0.08
v/c Ratio	0.88	0.59	0.23	0.57	0.74	0.26	0.80	0.70	0.07	1.35	0.89	0.21
Uniform Delay, d1	41.0	26.3	23.1	42.7	30.6	26.4	40.8	25.2	19.3	41.5	27.6	20.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	35.1	1.0	0.1	5.4	4.8	0.1	21.2	3.3	0.2	191.7	9.8	0.8
Delay (s)	76.1	27.3	23.2	48.2	35.4	26.5	62.0	28.5	19.5	233.2	37.4	21.0
Level of Service	E	C	C	D	D	C	E	C	B	F	D	C
Approach Delay (s)		36.1			33.4			32.1			62.9	
Approach LOS		D			C			C			E	

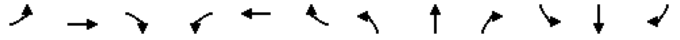
Intersection Summary				
HCM Average Control Delay	45.3	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	92.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	72.9%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group



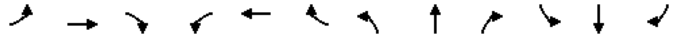
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.95			0.99			0.97			0.97	
Flt Protected		0.99			0.99			0.98			0.99	
Satd. Flow (prot)		1763			1840			1773			1799	
Flt Permitted		0.89			0.84			0.55			0.88	
Satd. Flow (perm)		1587			1555			995			1589	
Volume (vph)	69	261	176	42	234	11	170	134	75	71	293	90
Peak-hour factor, PHF	0.92	0.92	0.92	0.85	0.85	0.85	0.87	0.87	0.87	0.72	0.72	0.72
Adj. Flow (vph)	75	284	191	49	275	13	195	154	86	99	407	125
RTOR Reduction (vph)	0	24	0	0	2	0	0	11	0	0	11	0
Lane Group Flow (vph)	0	526	0	0	335	0	0	424	0	0	620	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		27.4			27.4			41.1			41.1	
Effective Green, g (s)		28.4			28.4			42.1			42.1	
Actuated g/C Ratio		0.36			0.36			0.54			0.54	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		574			563			534			852	
v/s Ratio Prot												
v/s Ratio Perm		c0.33			0.22			c0.43			0.39	
v/c Ratio		0.92			0.60			0.79			0.73	
Uniform Delay, d1		23.9			20.4			14.7			13.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		19.3			1.7			11.6			5.4	
Delay (s)		43.3			22.1			26.3			19.3	
Level of Service		D			C			C			B	
Approach Delay (s)		43.3			22.1			26.3			19.3	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM Average Control Delay	28.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	78.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.95			1.00	
Frt	1.00	0.85			1.00	0.85	1.00	0.99			1.00	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00			0.95	
Satd. Flow (prot)	1770	1589			1863	1583	1770	3514			1770	
Flt Permitted	0.75	1.00			1.00	1.00	0.95	1.00			0.95	
Satd. Flow (perm)	1402	1589			1863	1583	1770	3514			1770	
Volume (vph)	16	5	255	0	4	73	141	1020	50	133	1139	132
Peak-hour factor, PHF	0.81	0.81	0.81	0.50	0.50	0.50	0.77	0.77	0.77	0.98	0.98	0.98
Adj. Flow (vph)	20	6	315	0	8	146	183	1325	65	136	1162	135
RTOR Reduction (vph)	0	148	0	0	0	116	0	6	0	0	15	0
Lane Group Flow (vph)	20	173	0	0	8	30	183	1384	0	136	1282	0
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	10.0	10.0			10.0	10.0	5.0	22.9		4.0	21.9	
Effective Green, g (s)	10.0	10.0			10.0	10.0	5.0	22.9		4.0	21.9	
Actuated g/C Ratio	0.20	0.20			0.20	0.20	0.10	0.47		0.08	0.45	
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	287	325			381	324	181	1646		145	1560	
v/s Ratio Prot		c0.11			0.00		c0.10	c0.39		0.08	0.37	
v/s Ratio Perm	0.01					0.02						
v/c Ratio	0.07	0.53			0.02	0.09	1.01	0.84		0.94	0.82	
Uniform Delay, d1	15.7	17.4			15.5	15.8	21.9	11.4		22.3	11.8	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	1.7			0.0	0.1	69.8	4.1		55.7	3.6	
Delay (s)	15.8	19.0			15.6	15.9	91.7	15.5		78.0	15.4	
Level of Service	B	B			B	B	F	B		E	B	
Approach Delay (s)		18.8			15.9			24.3			21.4	
Approach LOS		B			B			C			C	

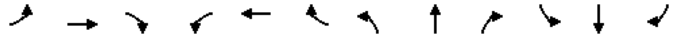
Intersection Summary			
HCM Average Control Delay	22.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	48.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0				
Lane Util. Factor	1.00	1.00			1.00			0.91				
Frt	1.00	1.00			0.98			0.98				
Flt Protected	0.95	1.00			1.00			1.00				
Satd. Flow (prot)	1752	1845			1799			4968				
Flt Permitted	0.95	1.00			1.00			1.00				
Satd. Flow (perm)	1752	1845			1799			4968				
Volume (vph)	139	497	0	0	403	90	77	1558	267	0	0	0
Peak-hour factor, PHF	0.78	0.78	0.78	0.79	0.79	0.79	0.91	0.91	0.91	0.92	0.92	0.92
Adj. Flow (vph)	178	637	0	0	510	114	85	1712	293	0	0	0
RTOR Reduction (vph)	0	0	0	0	9	0	0	25	0	0	0	0
Lane Group Flow (vph)	178	637	0	0	615	0	0	2065	0	0	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Prot						Perm					
Protected Phases	7	4			8			2				
Permitted Phases							2					
Actuated Green, G (s)	9.3	43.0			30.0			38.6				
Effective Green, g (s)	9.0	43.2			30.2			38.8				
Actuated g/C Ratio	0.10	0.48			0.34			0.43				
Clearance Time (s)	3.7	4.2			4.2			4.2				
Vehicle Extension (s)	2.0	7.9			7.7			6.4				
Lane Grp Cap (vph)	175	886			604			2142				
v/s Ratio Prot	c0.10	0.35			c0.34							
v/s Ratio Perm								0.42				
v/c Ratio	1.02	0.72			1.02			0.96				
Uniform Delay, d1	40.5	18.6			29.9			24.9				
Progression Factor	1.00	1.00			1.00			1.00				
Incremental Delay, d2	72.6	5.0			41.4			12.6				
Delay (s)	113.1	23.6			71.3			37.6				
Level of Service	F	C			E			D				
Approach Delay (s)		43.1			71.3			37.6			0.0	
Approach LOS		D			E			D			A	

Intersection Summary				
HCM Average Control Delay	44.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	82.0%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0				
Lane Util. Factor					0.91			0.91				
Frt					0.96			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					4892			5048				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					4892			5048				
Volume (vph)	0	0	0	0	1347	456	325	1871	0	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.94	0.94	0.86	0.86	0.86	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	1433	485	378	2176	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1917	0	0	2550	0	0	0	0
Turn Type							Perm					
Protected Phases					8			2				
Permitted Phases							2					
Actuated Green, G (s)					25.4			30.4				
Effective Green, g (s)					26.0			31.0				
Actuated g/C Ratio					0.40			0.48				
Clearance Time (s)					4.6			4.6				
Vehicle Extension (s)					4.8			3.0				
Lane Grp Cap (vph)					1957			2408				
v/s Ratio Prot					c0.39							
v/s Ratio Perm								0.51				
v/c Ratio					0.98			1.06				
Uniform Delay, d1					19.2			17.0				
Progression Factor					1.00			1.00				
Incremental Delay, d2					15.7			36.3				
Delay (s)					35.0			53.3				
Level of Service					C			D				
Approach Delay (s)		0.0			35.0			53.3			0.0	
Approach LOS		A			C			D			A	

Intersection Summary				
HCM Average Control Delay	45.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	1.02			
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	85.6%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.91						0.91				
Frt		1.00						0.97				
Flt Protected		0.98						1.00				
Satd. Flow (prot)		4995						4946				
Flt Permitted		0.98						1.00				
Satd. Flow (perm)		4995						4946				
Volume (vph)	1182	2073	0	0	0	0	0	1014	226	0	0	0
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92
Adj. Flow (vph)	1299	2278	0	0	0	0	0	1056	235	0	0	0
RTOR Reduction (vph)	0	1	0	0	0	0	0	9	0	0	0	0
Lane Group Flow (vph)	0	3576	0	0	0	0	0	1282	0	0	0	0
Turn Type	Perm											
Protected Phases		2						8				
Permitted Phases	2											
Actuated Green, G (s)		88.6						30.9				
Effective Green, g (s)		90.0						32.0				
Actuated g/C Ratio		0.69						0.25				
Clearance Time (s)		5.4						5.1				
Vehicle Extension (s)		2.0						5.0				
Lane Grp Cap (vph)		3458						1217				
v/s Ratio Prot								c0.26				
v/s Ratio Perm		0.72										
v/c Ratio		1.06dl						1.05				
Uniform Delay, d1		20.0						49.0				
Progression Factor		1.00						1.00				
Incremental Delay, d2		25.0						41.1				
Delay (s)		45.0						90.1				
Level of Service		D						F				
Approach Delay (s)		45.0			0.0			90.1			0.0	
Approach LOS		D			A			F			A	

Intersection Summary			
HCM Average Control Delay	57.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
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)	14	11	0	0	8	29	13	1171	6	0	0	0
Peak Hour Factor	0.60	0.60	0.60	0.63	0.63	0.63	0.91	0.91	0.91	0.92	0.92	0.92
Hourly flow rate (vph)	23	18	0	0	13	46	14	1287	7	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total (vph)	42	59	658	650
Volume Left (vph)	23	0	14	0
Volume Right (vph)	0	46	0	7
Hadj (s)	0.15	-0.44	0.04	0.03
Departure Headway (s)	6.0	5.4	4.8	4.8
Degree Utilization, x	0.07	0.09	0.89	0.87
Capacity (veh/h)	587	658	737	740
Control Delay (s)	9.5	9.0	31.8	30.0
Approach Delay (s)	9.5	9.0	30.9	
Approach LOS	A	A	D	

Intersection Summary			
Delay	29.3		
HCM Level of Service	D		
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		

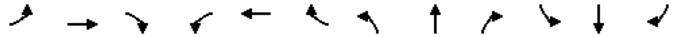
Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				5085	3433	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				5085	3433	
Volume (vph)	0	0	0	1319	484	0
Peak-hour factor, PHF	0.92	0.92	0.84	0.84	0.94	0.94
Adj. Flow (vph)	0	0	0	1570	515	0
RTOR Reduction (vph)	0	0	0	0	15	0
Lane Group Flow (vph)	0	0	0	1570	500	0
Turn Type						
Protected Phases				6	4	
Permitted Phases						
Actuated Green, G (s)				25.1	15.3	
Effective Green, g (s)				25.7	17.3	
Actuated g/C Ratio				0.50	0.34	
Clearance Time (s)				4.6	6.0	
Vehicle Extension (s)				5.0	6.0	
Lane Grp Cap (vph)				2562	1165	
v/s Ratio Prot				c0.31	c0.15	
v/s Ratio Perm						
v/c Ratio				0.61	0.43	
Uniform Delay, d1				9.1	13.0	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.6	0.7	
Delay (s)				9.7	13.7	
Level of Service				A	B	
Approach Delay (s)	0.0			9.7	13.7	
Approach LOS	A			A	B	

Intersection Summary			
HCM Average Control Delay	10.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	51.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	687	176	301	1038	502	445	1094
v/c Ratio	0.67	0.30	0.75	0.70	0.70	0.88	0.47
Control Delay	34.6	5.5	37.2	33.1	28.0	62.4	18.1
Queue Delay	0.0	0.0	0.0	1.1	0.7	0.0	0.0
Total Delay	34.6	5.5	37.2	34.1	28.7	62.4	18.1
Queue Length 50th (ft)	200	0	90	364	248	144	163
Queue Length 95th (ft)	263	48	m112	m397	m298	#209	190
Internal Link Dist (ft)	719			378			1660
Turn Bay Length (ft)		275	110		40	260	
Base Capacity (vph)	1045	598	446	1480	717	515	2347
Starvation Cap Reductn	0	0	0	215	50	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.29	0.67	0.82	0.75	0.86	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	119	292	585	257	218	183	228	1315	810	319	945	185
v/c Ratio	0.63	0.55	0.90	1.45	0.42	0.37	0.85	1.20	1.04	1.13	0.84	0.29
Control Delay	61.7	36.5	37.9	270.3	27.9	13.7	52.6	125.8	41.2	137.6	43.8	5.6
Queue Delay	0.0	0.0	1.6	0.0	0.0	0.0	0.0	91.8	37.3	4.9	1.5	0.0
Total Delay	61.7	36.5	39.5	270.3	27.9	13.7	52.6	217.6	78.5	142.5	45.3	5.6
Queue Length 50th (ft)	81	164	216	~255	121	35	~176	~579	~219	~316	334	0
Queue Length 95th (ft)	124	212	283	#390	177	85	m139	m293	m123	#484	#439	49
Internal Link Dist (ft)		2033			385			269			731	
Turn Bay Length (ft)	145			155		25	125			170		
Base Capacity (vph)	225	610	702	177	564	534	267	1094	779	282	1123	628
Starvation Cap Reductn	0	0	0	0	0	0	0	160	65	0	0	0
Spillback Cap Reductn	0	0	35	0	0	0	0	0	0	3	66	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.48	0.88	1.45	0.39	0.34	0.85	1.41	1.13	1.14	0.89	0.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	506	837	311	478	200	31
v/c Ratio	0.72	0.86	0.83	0.41	0.38	0.06
Control Delay	29.7	11.7	60.5	10.9	37.7	25.0
Queue Delay	5.4	7.5	0.0	0.0	0.0	0.0
Total Delay	35.1	19.2	60.5	10.9	37.7	25.0
Queue Length 50th (ft)	224	121	210	98	132	11
Queue Length 95th (ft)	m229	m76	269	131	203	36
Internal Link Dist (ft)	385			614	86	
Turn Bay Length (ft)						25
Base Capacity (vph)	847	1044	451	1376	533	486
Starvation Cap Reductn	274	171	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.96	0.69	0.35	0.38	0.06

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	233	1241	316	665	1188	207	860
v/c Ratio	0.75	1.09	0.89	0.46	1.01	0.76	0.69
Control Delay	60.8	85.9	66.1	8.0	65.7	54.5	29.5
Queue Delay	0.0	0.0	0.0	0.1	0.5	0.0	0.6
Total Delay	60.8	85.9	66.1	8.1	66.2	54.5	30.1
Queue Length 50th (ft)	76	~473	192	55	~275	69	255
Queue Length 95th (ft)	#113	#529	#330	103	#377	m#122	330
Internal Link Dist (ft)		671			2243		378
Turn Bay Length (ft)			280			120	
Base Capacity (vph)	309	1139	389	1456	1179	275	1239
Starvation Cap Reductn	0	0	0	0	0	0	118
Spillback Cap Reductn	0	0	0	141	2	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	1.09	0.81	0.51	1.01	0.75	0.77

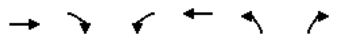
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	210	840	187	281	75	330	182	432	489
v/c Ratio	0.84	0.61	0.82	0.58	0.18	0.77	0.37	0.58	0.76
Control Delay	78.3	39.5	79.3	47.4	29.8	57.1	7.9	46.6	17.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.3	39.5	79.3	47.4	29.8	57.1	7.9	46.6	17.2
Queue Length 50th (ft)	166	208	148	204	33	245	0	167	55
Queue Length 95th (ft)	#288	283	#262	329	81	321	34	223	181
Internal Link Dist (ft)		179		406		179		341	
Turn Bay Length (ft)	185		150		40				110
Base Capacity (vph)	310	1385	285	486	409	481	529	892	690
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.61	0.66	0.58	0.18	0.69	0.34	0.48	0.71

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	650	72	174	285	410	219
v/c Ratio	0.85	0.10	0.76	0.25	0.90	0.38
Control Delay	30.1	3.9	49.1	6.3	46.8	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.1	3.9	49.1	6.3	46.8	5.3
Queue Length 50th (ft)	208	0	62	42	141	0
Queue Length 95th (ft)	#393	20	#148	74	#238	32
Internal Link Dist (ft)	248			664	309	
Turn Bay Length (ft)			200			
Base Capacity (vph)	764	691	237	1130	472	583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.10	0.73	0.25	0.87	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL
Lane Group Flow (vph)	998	372	216
v/c Ratio	0.89	0.60	0.55
Control Delay	20.4	11.3	22.0
Queue Delay	0.0	0.0	0.0
Total Delay	20.4	11.3	22.0
Queue Length 50th (ft)	184	54	55
Queue Length 95th (ft)	#545	137	110
Internal Link Dist (ft)	664	1978	2236
Turn Bay Length (ft)			
Base Capacity (vph)	1195	666	535
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.84	0.56	0.40

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	256	230	224	118	113	397	93	1200	671	1491	251
v/c Ratio	0.92	0.54	0.47	0.76	0.38	0.67	0.96	1.00	1.26	0.87	0.29
Control Delay	85.8	42.7	16.8	78.6	43.8	10.2	134.0	68.7	154.0	22.7	2.5
Queue Delay	245.2	0.0	0.0	0.0	0.0	7.4	0.0	38.0	516.1	177.9	3.4
Total Delay	331.0	42.7	16.8	78.6	43.8	17.6	134.0	106.7	670.1	200.6	5.9
Queue Length 50th (ft)	181	144	44	83	72	0	67	~311	~595	452	9
Queue Length 95th (ft)	#385	225	118	#173	122	86	#159	#376	m#474	m335	m1
Internal Link Dist (ft)		502			1058			2367		110	
Turn Bay Length (ft)	125		125	135			115		115		
Base Capacity (vph)	277	429	478	161	373	634	97	1197	531	1705	878
Starvation Cap Reductn	0	0	0	0	0	0	0	0	253	637	525
Spillback Cap Reductn	113	0	0	0	0	191	0	113	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.56	0.54	0.47	0.73	0.30	0.90	0.96	1.11	2.41	1.40	0.71

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

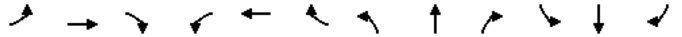
Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Group Flow (vph)	1068	1305	1647	395	1367
v/c Ratio	1.27	1.71	1.19	1.64	0.87
Control Delay	156.6	348.3	112.1	331.9	22.2
Queue Delay	178.3	354.7	87.3	0.0	7.9
Total Delay	334.9	703.0	199.4	331.9	30.1
Queue Length 50th (ft)	~951	~1367	~480	~417	232
Queue Length 95th (ft)	#979	#1360	m#512	m#471	m248
Internal Link Dist (ft)		366	110		269
Turn Bay Length (ft)	232			75	
Base Capacity (vph)	844	764	1379	241	1576
Starvation Cap Reductn	0	0	52	0	171
Spillback Cap Reductn	202	353	194	0	187
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.66	3.18	1.39	1.64	0.98

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	152	346	232	51	369	220	133	899	58	234	1153	249
v/c Ratio	0.86	0.57	0.37	0.39	0.78	0.43	0.78	0.69	0.10	1.32	0.88	0.35
Control Delay	82.3	31.0	9.3	50.6	42.8	12.3	72.4	28.8	13.1	214.2	37.1	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.3	31.0	9.3	50.6	42.8	12.3	72.4	28.8	13.1	214.2	37.1	7.5
Queue Length 50th (ft)	86	174	25	28	195	32	75	224	10	~174	317	19
Queue Length 95th (ft)	#223	272	84	68	288	88	#161	297	35	#357	#530	81
Internal Link Dist (ft)		1613			1967			1346			2243	
Turn Bay Length (ft)	95		95	90		90	155		90	200		200
Base Capacity (vph)	177	655	669	166	615	621	176	1299	600	177	1313	712
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.53	0.35	0.31	0.60	0.35	0.76	0.69	0.10	1.32	0.88	0.35

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	550	337	435	631
v/c Ratio	0.92	0.59	0.81	0.73
Control Delay	44.7	25.0	29.5	20.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	44.7	25.0	29.5	20.2
Queue Length 50th (ft)	237	130	163	223
Queue Length 95th (ft)	#430	197	#329	237
Internal Link Dist (ft)	1967	2570	503	2236
Turn Bay Length (ft)				
Base Capacity (vph)	622	591	537	862
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.88	0.57	0.81	0.73

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	20	321	8	146	183	1390	136	1297
v/c Ratio	0.07	0.68	0.02	0.33	1.01	0.84	0.94	0.83
Control Delay	15.4	15.7	14.5	5.8	100.9	19.5	92.3	19.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.4	15.7	14.5	5.8	100.9	19.5	92.3	19.2
Queue Length 50th (ft)	5	34	2	0	~54	165	40	154
Queue Length 95th (ft)	16	75	5	2	#142	233	#140	#332
Internal Link Dist (ft)		2570	207			1470		2367
Turn Bay Length (ft)	100				210		290	
Base Capacity (vph)	409	596	544	566	182	1657	145	1580
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.54	0.01	0.26	1.01	0.84	0.94	0.82

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	178	637	624	2090
v/c Ratio	1.02	0.72	1.02	0.96
Control Delay	115.5	24.3	72.3	37.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	115.5	24.3	72.3	37.8
Queue Length 50th (ft)	~105	276	~360	405
Queue Length 95th (ft)	#191	321	#465	#532
Internal Link Dist (ft)		608	737	568
Turn Bay Length (ft)				
Base Capacity (vph)	175	886	612	2167
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.02	0.72	1.02	0.96

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	WBT	NBT
Lane Group Flow (vph)	1918	2554
v/c Ratio	0.98	1.06
Control Delay	37.0	55.3
Queue Delay	29.3	39.0
Total Delay	66.3	94.2
Queue Length 50th (ft)	264	~419
Queue Length 95th (ft)	#384	#475
Internal Link Dist (ft)	265	310
Turn Bay Length (ft)		
Base Capacity (vph)	1958	2413
Starvation Cap Reductn	170	190
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	1.07	1.15

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	NBT
Lane Group Flow (vph)	3577	1291
v/c Ratio	1.06dl	1.05
Control Delay	45.8	87.1
Queue Delay	20.0	111.7
Total Delay	65.7	198.9
Queue Length 50th (ft)	~1186	~432
Queue Length 95th (ft)	#1256	#530
Internal Link Dist (ft)	4045	445
Turn Bay Length (ft)		
Base Capacity (vph)	3458	1227
Starvation Cap Reductn	0	0
Spillback Cap Reductn	154	242
Storage Cap Reductn	0	0
Reduced v/c Ratio	1.08	1.31

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Lane Group	WBT	NWL
Lane Group Flow (vph)	1570	515
v/c Ratio	0.62	0.44
Control Delay	10.7	14.5
Queue Delay	0.1	0.1
Total Delay	10.8	14.6
Queue Length 50th (ft)	110	59
Queue Length 95th (ft)	167	103
Internal Link Dist (ft)	3590	83
Turn Bay Length (ft)		
Base Capacity (vph)	2805	1515
Starvation Cap Reductn	0	0
Spillback Cap Reductn	336	178
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.64	0.39

Intersection Summary

SIGNAL WARRANT ANALYSIS

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS (2006 MUTCD)

MAJOR STREET: **Mineral King Ave** WB EB # OF APPROACH LANES: **2**

MINOR STREET: **SR-198 Ramps WB Ramps @ Ben Maddox Way** NB SB # OF APPROACH LANES: **1**

CITY, STATE: **Visalia, CA**

COMMENTS: **Existing Conditions**

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **N**

	MAJOR ST TWO-WAY TRAFFIC	MINOR ST TRAFFIC HEAVY LEG	Ped Count CROSSING MAJOR ST	WARRANT 1 - Condition A, Part 1			WARRANT 1 - Condition B, Part 1			WARRANT 1 - Condition A, Part 2			WARRANT 1 - Condition B, Part 2			WARRANT 2 Four-Hour	WARRANT 3 Peak Hour	WARRANT 4	
				MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET			Ped Volume (Four-hour)	Ped Volume (Peak-hour)
THRESHOLD VALUES →				**600**	**150**		**900**	**75**		**480**	**120**		**720**	**60**		**60**	**75**	**100**	**190**
06:30 AM TO 07:30 AM																			
07:30 AM TO 08:30 AM																			
08:30 AM TO 09:30 AM	1,349	139		Y			Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	**Y**			
09:30 AM TO 10:30 AM																			
10:30 AM TO 11:30 AM																			
11:00 AM TO 12:00 PM																			
12:30 PM TO 01:30 PM																			
01:30 PM TO 02:30 PM																			
02:30 PM TO 03:30 PM																			
03:30 PM TO 04:30 PM																			
04:30 PM TO 05:30 PM	1,048	107		Y			Y	Y	**Y**	Y			Y	Y	**Y**				
05:30 PM TO 06:30 PM																			
06:30 PM TO 07:30 PM																			
07:30 PM TO 08:30 PM																			
08:30 PM TO 09:30 PM																			
09:30 PM TO 10:30 PM																			
	2,397	246		2	0	**0**	2	2	**2**	2	1	**1**	2	2	**2**	**1**	**0**	**0**	**0**
				8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS NEEDED for both Condition A & B						4 HRS NEEDED	1 HR NEEDED	4 HRS NEEDED	1 HR NEEDED
				NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**

01/04/10

Kimley-Horn and Associates

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS (2006 MUTCD)

MAJOR STREET: **Mineral King Ave** WB EB # OF APPROACH LANES: **1**

MINOR STREET: **SR-198 Ramps WB Ramps @ Lovers Lane** NB SB # OF APPROACH LANES: **1**

CITY, STATE: **Visalia, CA**

COMMENTS: **Existing Conditions**

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**
85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **Y**

			MAJOR ST TWO-WAY TRAFFIC	MINOR ST TRAFFIC HEAVY LEG	Ped Count CROSSING MAJOR ST	WARRANT 1 - Condition A, Part 1			WARRANT 1 - Condition B, Part 1			WARRANT 1 - Condition A, Part 2			WARRANT 1 - Condition B, Part 2			WARRANT 2 Four-Hour	WARRANT 3 Peak Hour	WARRANT 4	
						MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET			Ped Volume (Four-hour)	Ped Volume (Peak-hour)
THRESHOLD VALUES						**350**	**105**		**525**	**53**		**280**	**84**		**420**	**42**		**60**	**75**	**100**	**190**
06:30 AM	TO	07:30 AM																			
07:30 AM	TO	08:30 AM																			
08:30 AM	TO	09:30 AM	1,316	92		Y			Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	**Y**	**Y**		
09:30 AM	TO	10:30 AM																			
10:30 AM	TO	11:30 AM																			
11:00 AM	TO	12:00 PM																			
12:30 PM	TO	01:30 PM																			
01:30 PM	TO	02:30 PM																			
02:30 PM	TO	03:30 PM																			
03:30 PM	TO	04:30 PM																			
04:30 PM	TO	05:30 PM	1,126	134		Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	**Y**	**Y**		
05:30 PM	TO	06:30 PM																			
06:30 PM	TO	07:30 PM																			
07:30 PM	TO	08:30 PM																			
08:30 PM	TO	09:30 PM																			
09:30 PM	TO	10:30 PM																			
			2,442	226		2	1	**1**	2	2	**2**	2	2	**2**	2	2	**2**	**2**	**2**	**0**	**0**
						8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS NEEDED for both Condition A & B						4 HRS NEEDED	1 HR NEEDED	4 HRS NEEDED	1 HR NEEDED
						NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**

01/04/10
Kimley-Horn and Associates

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS (2006 MUTCD)

MAJOR STREET: **Noble Avenue** WB EB # OF APPROACH LANES: **1**

MINOR STREET: **Walmart West Driveway** NB SB # OF APPROACH LANES: **1**

CITY, STATE: **Visalia, CA**

COMMENTS: **Existing Conditions**

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**
85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **N**

	MAJOR ST TWO-WAY TRAFFIC	MINOR ST TRAFFIC HEAVY LEG	Ped Count CROSSING MAJOR ST	WARRANT 1 - Condition A, Part 1			WARRANT 1 - Condition B, Part 1			WARRANT 1 - Condition A, Part 2			WARRANT 1 - Condition B, Part 2			WARRANT 2 Four-Hour	WARRANT 3 Peak Hour	WARRANT 4	
				MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET			Ped Volume (Four-hour)	Ped Volume (Peak-hour)
THRESHOLD VALUES →				**500**	**150**		**750**	**75**		**400**	**120**		**600**	**60**		**60**	**75**	**100**	**190**
06:30 AM TO 07:30 AM																			
07:30 AM TO 08:30 AM																			
08:30 AM TO 09:30 AM	600	108		Y				Y		Y			Y	Y	**Y**				
09:30 AM TO 10:30 AM																			
10:30 AM TO 11:30 AM																			
11:00 AM TO 12:00 PM																			
12:30 PM TO 01:30 PM																			
01:30 PM TO 02:30 PM																			
02:30 PM TO 03:30 PM																			
03:30 PM TO 04:30 PM																			
04:30 PM TO 05:30 PM	1,098	217		Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	**Y**	**Y**		
05:30 PM TO 06:30 PM																			
06:30 PM TO 07:30 PM																			
07:30 PM TO 08:30 PM																			
08:30 PM TO 09:30 PM																			
09:30 PM TO 10:30 PM																			
	1,698	325		2	1	**1**	1	2	**1**	2	1	**1**	2	2	**2**	**1**	**1**	**0**	**0**
				8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS NEEDED for both Condition A & B						4 HRS NEEDED	1 HR NEEDED	4 HRS NEEDED	1 HR NEEDED
				NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**

01/04/10
Kimley-Horn and Associates

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS (2006 MUTCD)

MAJOR STREET: **Noble Avenue** WB EB # OF APPROACH LANES: **1**

MINOR STREET: **Pinkham Road** NB SB # OF APPROACH LANES: **1**

CITY, STATE: **Visalia, CA**

COMMENTS: **Existing Conditions**

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**
85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **Y**

	MAJOR ST TWO-WAY TRAFFIC	MINOR ST TRAFFIC HEAVY LEG	Ped Count CROSSING MAJOR ST	WARRANT 1 - Condition A, Part 1			WARRANT 1 - Condition B, Part 1			WARRANT 1 - Condition A, Part 2			WARRANT 1 - Condition B, Part 2			WARRANT 2 Four-Hour	WARRANT 3 Peak Hour	WARRANT 4	
				MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET			Ped Volume (Four-hour)	Ped Volume (Peak-hour)
THRESHOLD VALUES →				**350**	**105**		**525**	**53**		**280**	**84**		**420**	**42**		**60**	**75**	**100**	**190**
06:30 AM TO 07:30 AM																			
07:30 AM TO 08:30 AM																			
08:30 AM TO 09:30 AM	463	144		Y	Y	**Y**		Y		Y	Y	**Y**	Y	Y	**Y**	**Y**			
09:30 AM TO 10:30 AM																			
10:30 AM TO 11:30 AM																			
11:00 AM TO 12:00 PM																			
12:30 PM TO 01:30 PM																			
01:30 PM TO 02:30 PM																			
02:30 PM TO 03:30 PM																			
03:30 PM TO 04:30 PM																			
04:30 PM TO 05:30 PM	892	132		Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	**Y**	**Y**		
05:30 PM TO 06:30 PM																			
06:30 PM TO 07:30 PM																			
07:30 PM TO 08:30 PM																			
08:30 PM TO 09:30 PM																			
09:30 PM TO 10:30 PM																			
	1,355	276		2	2	**2**	1	2	**1**	2	2	**2**	2	2	**2**	**2**	**1**	**0**	**0**
				8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS NEEDED for both Condition A & B						4 HRS NEEDED	1 HR NEEDED	4 HRS NEEDED	1 HR NEEDED
				NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**

01/04/10
Kimley-Horn and Associates

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS (2006 MUTCD)

MAJOR STREET: **Tulare Avenue** WB EB # OF APPROACH LANES: **1**

MINOR STREET: **Pinkham Road** NB SB # OF APPROACH LANES: **1**

CITY, STATE: **Visalia, CA**

COMMENTS: **Existing Conditions**

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**
85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **N**

	MAJOR ST TWO-WAY TRAFFIC	MINOR ST TRAFFIC HEAVY LEG	Ped Count CROSSING MAJOR ST	WARRANT 1 - Condition A, Part 1			WARRANT 1 - Condition B, Part 1			WARRANT 1 - Condition A, Part 2			WARRANT 1 - Condition B, Part 2			WARRANT 2 Four-Hour	WARRANT 3 Peak Hour	WARRANT 4	
				MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET			Ped Volume (Four-hour)	Ped Volume (Peak-hour)
THRESHOLD VALUES →				**500**	**150**		**750**	**75**		**400**	**120**		**600**	**60**		**60**	**75**	**100**	**190**
06:30 AM TO 07:30 AM																			
07:30 AM TO 08:30 AM																			
08:30 AM TO 09:30 AM	507	261		Y	Y	**Y**		Y		Y	Y	**Y**		Y		**Y**			
09:30 AM TO 10:30 AM																			
10:30 AM TO 11:30 AM																			
11:00 AM TO 12:00 PM																			
12:30 PM TO 01:30 PM																			
01:30 PM TO 02:30 PM																			
02:30 PM TO 03:30 PM																			
03:30 PM TO 04:30 PM																			
04:30 PM TO 05:30 PM	309	246			Y			Y			Y			Y					
05:30 PM TO 06:30 PM																			
06:30 PM TO 07:30 PM																			
07:30 PM TO 08:30 PM																			
08:30 PM TO 09:30 PM																			
09:30 PM TO 10:30 PM																			
	816	507		1	2	**1**	0	2	**0**	1	2	**1**	0	2	**0**	**1**	**0**	**0**	**0**
				8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS NEEDED for both Condition A & B						4 HRS NEEDED	1 HR NEEDED	4 HRS NEEDED	1 HR NEEDED
				NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**

01/04/10
Kimley-Horn and Associates

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS (2006 MUTCD)

MAJOR STREET: **Lovers Lane** NB SB # OF APPROACH LANES: **2**

MINOR STREET: **Tulare Avenue** WB EB # OF APPROACH LANES: **1**

CITY, STATE: **Visalia, CA**

COMMENTS: **Existing Conditions**

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**
85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **Y**

	MAJOR ST TWO-WAY TRAFFIC	MINOR ST TRAFFIC HEAVY LEG	Ped Count CROSSING MAJOR ST	WARRANT 1 - Condition A, Part 1			WARRANT 1 - Condition B, Part 1			WARRANT 1 - Condition A, Part 2			WARRANT 1 - Condition B, Part 2			WARRANT 2 Four-Hour	WARRANT 3 Peak Hour	WARRANT 4	
				MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET			Ped Volume (Four-hour)	Ped Volume (Peak-hour)
THRESHOLD VALUES →				**420**	**105**		**630**	**53**		**336**	**84**		**504**	**42**		**60**	**75**	**100**	**190**
06:30 AM TO 07:30 AM																			
07:30 AM TO 08:30 AM																			
08:30 AM TO 09:30 AM	1349	79		Y			Y	Y	**Y**	Y			Y	Y	**Y**	**Y**	**Y**		
09:30 AM TO 10:30 AM																			
10:30 AM TO 11:30 AM																			
11:00 AM TO 12:00 PM																			
12:30 PM TO 01:30 PM																			
01:30 PM TO 02:30 PM																			
02:30 PM TO 03:30 PM																			
03:30 PM TO 04:30 PM																			
04:30 PM TO 05:30 PM	1,476	68		Y			Y	Y	**Y**	Y			Y	Y	**Y**	**Y**			
05:30 PM TO 06:30 PM																			
06:30 PM TO 07:30 PM																			
07:30 PM TO 08:30 PM																			
08:30 PM TO 09:30 PM																			
09:30 PM TO 10:30 PM																			
	2,825	147		2	0	**0**	2	2	**2**	2	0	**0**	2	2	**2**	**2**	**1**	**0**	**0**
				8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS NEEDED for both Condition A & B						4 HRS NEEDED	1 HR NEEDED	4 HRS NEEDED	1 HR NEEDED
				NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**

01/04/10
Kimley-Horn and Associates

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS (2006 MUTCD)

MAJOR STREET: **Court Street** NB SB # OF APPROACH LANES: **2**

MINOR STREET: **Myrtle Avenue** WB EB # OF APPROACH LANES: **1**

CITY, STATE: **Visalia, CA**

COMMENTS: **Existing Conditions**

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **N**

	MAJOR ST TWO-WAY TRAFFIC	MINOR ST TRAFFIC HEAVY LEG	Ped Count CROSSING MAJOR ST	WARRANT 1 - Condition A, Part 1			WARRANT 1 - Condition B, Part 1			WARRANT 1 - Condition A, Part 2			WARRANT 1 - Condition B, Part 2			WARRANT 2 Four-Hour	WARRANT 3 Peak Hour	WARRANT 4	
				MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET			Ped Volume (Four-hour)	Ped Volume (Peak-hour)
THRESHOLD VALUES →				**600**	**150**		**900**	**75**		**480**	**120**		**720**	**60**		**60**	**75**	**100**	**190**
06:30 AM TO 07:30 AM																			
07:30 AM TO 08:30 AM																			
08:30 AM TO 09:30 AM	634	76		Y				Y		Y				Y					
09:30 AM TO 10:30 AM																			
10:30 AM TO 11:30 AM																			
11:00 AM TO 12:00 PM																			
12:30 PM TO 01:30 PM																			
01:30 PM TO 02:30 PM																			
02:30 PM TO 03:30 PM																			
03:30 PM TO 04:30 PM																			
04:30 PM TO 05:30 PM	617	35		Y						Y									
05:30 PM TO 06:30 PM																			
06:30 PM TO 07:30 PM																			
07:30 PM TO 08:30 PM																			
08:30 PM TO 09:30 PM																			
09:30 PM TO 10:30 PM																			
	1,251	111		2	0	**0**	0	1	**0**	2	0	**0**	0	1	**0**	**0**	**0**	**0**	**0**
				8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS NEEDED for both Condition A & B						4 HRS NEEDED	1 HR NEEDED	4 HRS NEEDED	1 HR NEEDED
				NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**

01/04/10

Kimley-Horn and Associates

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS (2006 MUTCD)

MAJOR STREET: **Mineral King Ave** WB EB # OF APPROACH LANES: **2**

MINOR STREET: **SR-198 Ramps WB Ramps @ Ben Maddox Way** NB SB # OF APPROACH LANES: **1**

CITY, STATE: **Visalia, CA**

COMMENTS: **Near-Term 2010**

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **N**

	MAJOR ST TWO-WAY TRAFFIC	MINOR ST TRAFFIC HEAVY LEG	Ped Count CROSSING MAJOR ST	WARRANT 1 - Condition A, Part 1			WARRANT 1 - Condition B, Part 1			WARRANT 1 - Condition A, Part 2			WARRANT 1 - Condition B, Part 2			WARRANT 2 Four-Hour	WARRANT 3 Peak Hour	WARRANT 4	
				MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET			Ped Volume (Four-hour)	Ped Volume (Peak-hour)
THRESHOLD VALUES →				**600**	**150**		**900**	**75**		**480**	**120**		**720**	**60**		**60**	**75**	**100**	**190**
06:30 AM TO 07:30 AM																			
07:30 AM TO 08:30 AM																			
08:30 AM TO 09:30 AM	1,446	143		Y			Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	**Y**			
09:30 AM TO 10:30 AM																			
10:30 AM TO 11:30 AM																			
11:00 AM TO 12:00 PM																			
12:30 PM TO 01:30 PM																			
01:30 PM TO 02:30 PM																			
02:30 PM TO 03:30 PM																			
03:30 PM TO 04:30 PM																			
04:30 PM TO 05:30 PM	1,168	111		Y			Y	Y	**Y**	Y			Y	Y	**Y**	**Y**			
05:30 PM TO 06:30 PM																			
06:30 PM TO 07:30 PM																			
07:30 PM TO 08:30 PM																			
08:30 PM TO 09:30 PM																			
09:30 PM TO 10:30 PM																			
	2,614	254		2	0	**0**	2	2	**2**	2	1	**1**	2	2	**2**	**2**	**0**	**0**	**0**
				8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS NEEDED for both Condition A & B						4 HRS NEEDED	1 HR NEEDED	4 HRS NEEDED	1 HR NEEDED
				NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**

01/04/10

Kimley-Horn and Associates

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS (2006 MUTCD)

MAJOR STREET: **Tulare Avenue** WB EB # OF APPROACH LANES: **1**

MINOR STREET: **Pinkham Road** NB SB # OF APPROACH LANES: **1**

CITY, STATE: **Visalia, CA**

COMMENTS: **Near-Term 2010**

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**
85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **N**

	MAJOR ST TWO-WAY TRAFFIC	MINOR ST TRAFFIC HEAVY LEG	Ped Count CROSSING MAJOR ST	WARRANT 1 - Condition A, Part 1			WARRANT 1 - Condition B, Part 1			WARRANT 1 - Condition A, Part 2			WARRANT 1 - Condition B, Part 2			WARRANT 2 Four-Hour	WARRANT 3 Peak Hour	WARRANT 4	
				MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET			Ped Volume (Four-hour)	Ped Volume (Peak-hour)
THRESHOLD VALUES →				**500**	**150**		**750**	**75**		**400**	**120**		**600**	**60**		**60**	**75**	**100**	**190**
06:30 AM TO 07:30 AM																			
07:30 AM TO 08:30 AM																			
08:30 AM TO 09:30 AM	525	271		Y	Y	**Y**		Y		Y	Y	**Y**		Y		**Y**			
09:30 AM TO 10:30 AM																			
10:30 AM TO 11:30 AM																			
11:00 AM TO 12:00 PM																			
12:30 PM TO 01:30 PM																			
01:30 PM TO 02:30 PM																			
02:30 PM TO 03:30 PM																			
03:30 PM TO 04:30 PM																			
04:30 PM TO 05:30 PM	349	178			Y			Y			Y			Y					
05:30 PM TO 06:30 PM																			
06:30 PM TO 07:30 PM																			
07:30 PM TO 08:30 PM																			
08:30 PM TO 09:30 PM																			
09:30 PM TO 10:30 PM																			
	874	449		1	2	**1**	0	2	**0**	1	2	**1**	0	2	**0**	**1**	**0**	**0**	**0**
				8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS NEEDED for both Condition A & B						4 HRS NEEDED	1 HR NEEDED	4 HRS NEEDED	1 HR NEEDED
				NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**

01/04/10
Kimley-Horn and Associates

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS (2006 MUTCD)

MAJOR STREET: **Court Street** NB SB # OF APPROACH LANES: **2**

MINOR STREET: **Myrtle Avenue** WB EB # OF APPROACH LANES: **1**

CITY, STATE: **Visalia, CA**

COMMENTS: **Near-Term 2010**

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **N**

	MAJOR ST TWO-WAY TRAFFIC	MINOR ST TRAFFIC HEAVY LEG	Ped Count CROSSING MAJOR ST	WARRANT 1 - Condition A, Part 1			WARRANT 1 - Condition B, Part 1			WARRANT 1 - Condition A, Part 2			WARRANT 1 - Condition B, Part 2			WARRANT 2 Four-Hour	WARRANT 3 Peak Hour	WARRANT 4	
				MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET			Ped Volume (Four-hour)	Ped Volume (Peak-hour)
THRESHOLD VALUES →				**600**	**150**		**900**	**75**		**480**	**120**		**720**	**60**		**60**	**75**	**100**	**190**
06:30 AM TO 07:30 AM																			
07:30 AM TO 08:30 AM																			
08:30 AM TO 09:30 AM	694	76		Y				Y		Y				Y					
09:30 AM TO 10:30 AM																			
10:30 AM TO 11:30 AM																			
11:00 AM TO 12:00 PM																			
12:30 PM TO 01:30 PM																			
01:30 PM TO 02:30 PM																			
02:30 PM TO 03:30 PM																			
03:30 PM TO 04:30 PM																			
04:30 PM TO 05:30 PM	647	35		Y						Y									
05:30 PM TO 06:30 PM																			
06:30 PM TO 07:30 PM																			
07:30 PM TO 08:30 PM																			
08:30 PM TO 09:30 PM																			
09:30 PM TO 10:30 PM																			
	1,341	111		2	0	**0**	0	1	**0**	2	0	**0**	0	1	**0**	**0**	**0**	**0**	**0**
				8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS NEEDED for both Condition A & B						4 HRS NEEDED	1 HR NEEDED	4 HRS NEEDED	1 HR NEEDED
				NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**

01/04/10

Kimley-Horn and Associates

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS (2006 MUTCD)

MAJOR STREET: **Mineral King Ave** WB EB # OF APPROACH LANES: **2**

MINOR STREET: **SR-198 Ramps WB Ramps @ Ben Maddox Way** NB SB # OF APPROACH LANES: **1**

CITY, STATE: **Visalia, CA**

COMMENTS: **Near-Term 2010 + Project**

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **N**

	MAJOR ST TWO-WAY TRAFFIC	MINOR ST TRAFFIC HEAVY LEG	Ped Count CROSSING MAJOR ST	WARRANT 1 - Condition A, Part 1			WARRANT 1 - Condition B, Part 1			WARRANT 1 - Condition A, Part 2			WARRANT 1 - Condition B, Part 2			WARRANT 2 Four-Hour	WARRANT 3 Peak Hour	WARRANT 4	
				MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET			Ped Volume (Four-hour)	Ped Volume (Peak-hour)
THRESHOLD VALUES →				**600**	**150**		**900**	**75**		**480**	**120**		**720**	**60**		**60**	**75**	**100**	**190**
06:30 AM TO 07:30 AM																			
07:30 AM TO 08:30 AM																			
08:30 AM TO 09:30 AM	1,462	147		Y			Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	**Y**	**Y**		
09:30 AM TO 10:30 AM																			
10:30 AM TO 11:30 AM																			
11:00 AM TO 12:00 PM																			
12:30 PM TO 01:30 PM																			
01:30 PM TO 02:30 PM																			
02:30 PM TO 03:30 PM																			
03:30 PM TO 04:30 PM																			
04:30 PM TO 05:30 PM	1,176	112		Y			Y	Y	**Y**	Y			Y	Y	**Y**	**Y**			
05:30 PM TO 06:30 PM																			
06:30 PM TO 07:30 PM																			
07:30 PM TO 08:30 PM																			
08:30 PM TO 09:30 PM																			
09:30 PM TO 10:30 PM																			
	2,638	259		2	0	**0**	2	2	**2**	2	1	**1**	2	2	**2**	**2**	**1**	**0**	**0**
				8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS NEEDED for both Condition A & B						4 HRS NEEDED	1 HR NEEDED	4 HRS NEEDED	1 HR NEEDED
				NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**

01/04/10

Kimley-Horn and Associates

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS (2006 MUTCD)

MAJOR STREET: **Tulare Avenue** WB EB # OF APPROACH LANES: **1**

MINOR STREET: **Pinkham Road** NB SB # OF APPROACH LANES: **1**

CITY, STATE: **Visalia, CA**

COMMENTS: **Near-Term 2010 + Project**

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**
85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **N**

	MAJOR ST TWO-WAY TRAFFIC	MINOR ST TRAFFIC HEAVY LEG	Ped Count CROSSING MAJOR ST	WARRANT 1 - Condition A, Part 1			WARRANT 1 - Condition B, Part 1			WARRANT 1 - Condition A, Part 2			WARRANT 1 - Condition B, Part 2			WARRANT 2 Four-Hour	WARRANT 3 Peak Hour	WARRANT 4	
				MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET			Ped Volume (Four-hour)	Ped Volume (Peak-hour)
THRESHOLD VALUES →				**500**	**150**		**750**	**75**		**400**	**120**		**600**	**60**		**60**	**75**	**100**	**190**
06:30 AM TO 07:30 AM																			
07:30 AM TO 08:30 AM																			
08:30 AM TO 09:30 AM	525	274		Y	Y	**Y**		Y		Y	Y	**Y**		Y		**Y**			
09:30 AM TO 10:30 AM																			
10:30 AM TO 11:30 AM																			
11:00 AM TO 12:00 PM																			
12:30 PM TO 01:30 PM																			
01:30 PM TO 02:30 PM																			
02:30 PM TO 03:30 PM																			
03:30 PM TO 04:30 PM																			
04:30 PM TO 05:30 PM	349	179			Y			Y			Y			Y					
05:30 PM TO 06:30 PM																			
06:30 PM TO 07:30 PM																			
07:30 PM TO 08:30 PM																			
08:30 PM TO 09:30 PM																			
09:30 PM TO 10:30 PM																			
	874	453		1	2	**1**	0	2	**0**	1	2	**1**	0	2	**0**	**1**	**0**	**0**	**0**
				8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS NEEDED for both Condition A & B						4 HRS NEEDED	1 HR NEEDED	4 HRS NEEDED	1 HR NEEDED
				NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**

01/04/10
Kimley-Horn and Associates

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS (2006 MUTCD)

MAJOR STREET: **Court Street** NB SB # OF APPROACH LANES: **2**

MINOR STREET: **Myrtle Avenue** WB EB # OF APPROACH LANES: **1**

CITY, STATE: **Visalia, CA**

COMMENTS: **Near-Term 2010 + Project**

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**
85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **N**

	MAJOR ST TWO-WAY TRAFFIC	MINOR ST TRAFFIC HEAVY LEG	Ped Count CROSSING MAJOR ST	WARRANT 1 - Condition A, Part 1			WARRANT 1 - Condition B, Part 1			WARRANT 1 - Condition A, Part 2			WARRANT 1 - Condition B, Part 2			WARRANT 2 Four-Hour	WARRANT 3 Peak Hour	WARRANT 4	
				MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET			Ped Volume (Four-hour)	Ped Volume (Peak-hour)
THRESHOLD VALUES →				**600**	**150**		**900**	**75**		**480**	**120**		**720**	**60**		**60**	**75**	**100**	**190**
06:30 AM TO 07:30 AM																			
07:30 AM TO 08:30 AM																			
08:30 AM TO 09:30 AM	694	76		Y				Y		Y				Y					
09:30 AM TO 10:30 AM																			
10:30 AM TO 11:30 AM																			
11:00 AM TO 12:00 PM																			
12:30 PM TO 01:30 PM																			
01:30 PM TO 02:30 PM																			
02:30 PM TO 03:30 PM																			
03:30 PM TO 04:30 PM																			
04:30 PM TO 05:30 PM	647	35		Y						Y									
05:30 PM TO 06:30 PM																			
06:30 PM TO 07:30 PM																			
07:30 PM TO 08:30 PM																			
08:30 PM TO 09:30 PM																			
09:30 PM TO 10:30 PM																			
	1,341	111		2	0	**0**	0	1	**0**	2	0	**0**	0	1	**0**	**0**	**0**	**0**	**0**
				8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS NEEDED for both Condition A & B						4 HRS NEEDED	1 HR NEEDED	4 HRS NEEDED	1 HR NEEDED
				NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**

01/04/10
Kimley-Horn and Associates

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS (2006 MUTCD)

MAJOR STREET: **Tulare Avenue** WB EB # OF APPROACH LANES: **1**

MINOR STREET: **Pinkham Road** NB SB # OF APPROACH LANES: **1**

CITY, STATE: **Visalia, CA**

COMMENTS: **Near-Term 2015**

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **N**

	MAJOR ST TWO-WAY TRAFFIC	MINOR ST TRAFFIC HEAVY LEG	Ped Count CROSSING MAJOR ST	WARRANT 1 - Condition A, Part 1			WARRANT 1 - Condition B, Part 1			WARRANT 1 - Condition A, Part 2			WARRANT 1 - Condition B, Part 2			WARRANT 2 Four-Hour	WARRANT 3 Peak Hour	WARRANT 4	
				MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET			Ped Volume (Four-hour)	Ped Volume (Peak-hour)
THRESHOLD VALUES →				**500**	**150**		**750**	**75**		**400**	**120**		**600**	**60**		**60**	**75**	**100**	**190**
06:30 AM TO 07:30 AM																			
07:30 AM TO 08:30 AM																			
08:30 AM TO 09:30 AM	541	291		Y	Y	**Y**		Y		Y	Y	**Y**		Y		**Y**			
09:30 AM TO 10:30 AM																			
10:30 AM TO 11:30 AM																			
11:00 AM TO 12:00 PM																			
12:30 PM TO 01:30 PM																			
01:30 PM TO 02:30 PM																			
02:30 PM TO 03:30 PM																			
03:30 PM TO 04:30 PM																			
04:30 PM TO 05:30 PM	377	191			Y			Y			Y			Y					
05:30 PM TO 06:30 PM																			
06:30 PM TO 07:30 PM																			
07:30 PM TO 08:30 PM																			
08:30 PM TO 09:30 PM																			
09:30 PM TO 10:30 PM																			
	918	482		1	2	**1**	0	2	**0**	1	2	**1**	0	2	**0**	**1**	**0**	**0**	**0**
				8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS NEEDED for both Condition A & B						4 HRS NEEDED	1 HR NEEDED	4 HRS NEEDED	1 HR NEEDED
				NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**

01/04/10

Kimley-Horn and Associates

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS (2006 MUTCD)

MAJOR STREET: **Court Street** NB SB # OF APPROACH LANES: **2**

MINOR STREET: **Myrtle Avenue** WB EB # OF APPROACH LANES: **1**

CITY, STATE: **Visalia, CA**

COMMENTS: **Near-Term 2015**

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **N**

	MAJOR ST TWO-WAY TRAFFIC	MINOR ST TRAFFIC HEAVY LEG	Ped Count CROSSING MAJOR ST	WARRANT 1 - Condition A, Part 1			WARRANT 1 - Condition B, Part 1			WARRANT 1 - Condition A, Part 2			WARRANT 1 - Condition B, Part 2			WARRANT 2 Four-Hour	WARRANT 3 Peak Hour	WARRANT 4	
				MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET			Ped Volume (Four-hour)	Ped Volume (Peak-hour)
THRESHOLD VALUES →				**600**	**150**		**900**	**75**		**480**	**120**		**720**	**60**		**60**	**75**	**100**	**190**
06:30 AM TO 07:30 AM																			
07:30 AM TO 08:30 AM																			
08:30 AM TO 09:30 AM	755	76		Y				Y		Y			Y	Y	**Y**				
09:30 AM TO 10:30 AM																			
10:30 AM TO 11:30 AM																			
11:00 AM TO 12:00 PM																			
12:30 PM TO 01:30 PM																			
01:30 PM TO 02:30 PM																			
02:30 PM TO 03:30 PM																			
03:30 PM TO 04:30 PM																			
04:30 PM TO 05:30 PM	689	35		Y						Y									
05:30 PM TO 06:30 PM																			
06:30 PM TO 07:30 PM																			
07:30 PM TO 08:30 PM																			
08:30 PM TO 09:30 PM																			
09:30 PM TO 10:30 PM																			
	1,444	111		2	0	**0**	0	1	**0**	2	0	**0**	1	1	**1**	**0**	**0**	**0**	**0**
				8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS NEEDED for both Condition A & B						4 HRS NEEDED	1 HR NEEDED	4 HRS NEEDED	1 HR NEEDED
				NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**

01/04/10

Kimley-Horn and Associates

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS (2006 MUTCD)

MAJOR STREET: **Tulare Avenue** WB EB # OF APPROACH LANES: **1**

MINOR STREET: **Pinkham Road** NB SB # OF APPROACH LANES: **1**

CITY, STATE: **Visalia, CA**

COMMENTS: **Near-Term 2015+ Project**

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **N**

	MAJOR ST TWO-WAY TRAFFIC	MINOR ST TRAFFIC HEAVY LEG	Ped Count CROSSING MAJOR ST	WARRANT 1 - Condition A, Part 1			WARRANT 1 - Condition B, Part 1			WARRANT 1 - Condition A, Part 2			WARRANT 1 - Condition B, Part 2			WARRANT 2 Four-Hour	WARRANT 3 Peak Hour	WARRANT 4	
				MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET			Ped Volume (Four-hour)	Ped Volume (Peak-hour)
THRESHOLD VALUES →				**500**	**150**		**750**	**75**		**400**	**120**		**600**	**60**		**60**	**75**	**100**	**190**
06:30 AM TO 07:30 AM																			
07:30 AM TO 08:30 AM																			
08:30 AM TO 09:30 AM	541	294		Y	Y	**Y**		Y		Y	Y	**Y**		Y		**Y**			
09:30 AM TO 10:30 AM																			
10:30 AM TO 11:30 AM																			
11:00 AM TO 12:00 PM																			
12:30 PM TO 01:30 PM																			
01:30 PM TO 02:30 PM																			
02:30 PM TO 03:30 PM																			
03:30 PM TO 04:30 PM																			
04:30 PM TO 05:30 PM	377	192			Y			Y			Y			Y					
05:30 PM TO 06:30 PM																			
06:30 PM TO 07:30 PM																			
07:30 PM TO 08:30 PM																			
08:30 PM TO 09:30 PM																			
09:30 PM TO 10:30 PM																			
	918	486		1	2	**1**	0	2	**0**	1	2	**1**	0	2	**0**	**1**	**0**	**0**	**0**
				8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS NEEDED for both Condition A & B						4 HRS NEEDED	1 HR NEEDED	4 HRS NEEDED	1 HR NEEDED
				NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**

01/04/10

Kimley-Horn and Associates

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS (2006 MUTCD)

MAJOR STREET: **Court Street** NB SB # OF APPROACH LANES: **2**

MINOR STREET: **Myrtle Avenue** WB EB # OF APPROACH LANES: **1**

CITY, STATE: **Visalia, CA**

COMMENTS: **Near-Term 2015+Project**

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **N**

	MAJOR ST TWO-WAY TRAFFIC	MINOR ST TRAFFIC HEAVY LEG	Ped Count CROSSING MAJOR ST	WARRANT 1 - Condition A, Part 1			WARRANT 1 - Condition B, Part 1			WARRANT 1 - Condition A, Part 2			WARRANT 1 - Condition B, Part 2			WARRANT 2 Four-Hour	WARRANT 3 Peak Hour	WARRANT 4	
				MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET			Ped Volume (Four-hour)	Ped Volume (Peak-hour)
THRESHOLD VALUES →				**600**	**150**		**900**	**75**		**480**	**120**		**720**	**60**		**60**	**75**	**100**	**190**
06:30 AM TO 07:30 AM																			
07:30 AM TO 08:30 AM																			
08:30 AM TO 09:30 AM	756	76		Y				Y		Y			Y	Y	**Y**				
09:30 AM TO 10:30 AM																			
10:30 AM TO 11:30 AM																			
11:00 AM TO 12:00 PM																			
12:30 PM TO 01:30 PM																			
01:30 PM TO 02:30 PM																			
02:30 PM TO 03:30 PM																			
03:30 PM TO 04:30 PM																			
04:30 PM TO 05:30 PM	689	35		Y						Y									
05:30 PM TO 06:30 PM																			
06:30 PM TO 07:30 PM																			
07:30 PM TO 08:30 PM																			
08:30 PM TO 09:30 PM																			
09:30 PM TO 10:30 PM																			
	1,445	111		2	0	**0**	0	1	**0**	2	0	**0**	1	1	**1**	**0**	**0**	**0**	**0**
				8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS NEEDED for both Condition A & B						4 HRS NEEDED	1 HR NEEDED	4 HRS NEEDED	1 HR NEEDED
				NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**

01/04/10

Kimley-Horn and Associates

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS (2006 MUTCD)

MAJOR STREET: **Tulare Avenue** WB EB # OF APPROACH LANES: **1**

MINOR STREET: **Pinkham Road** NB SB # OF APPROACH LANES: **1**

CITY, STATE: **Visalia, CA**

COMMENTS: **Long-Term 2030**

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**
85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **N**

	MAJOR ST TWO-WAY TRAFFIC	MINOR ST TRAFFIC HEAVY LEG	Ped Count CROSSING MAJOR ST	WARRANT 1 - Condition A, Part 1			WARRANT 1 - Condition B, Part 1			WARRANT 1 - Condition A, Part 2			WARRANT 1 - Condition B, Part 2			WARRANT 2 Four-Hour	WARRANT 3 Peak Hour	WARRANT 4	
				MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET			Ped Volume (Four-hour)	Ped Volume (Peak-hour)
THRESHOLD VALUES →				**500**	**150**		**750**	**75**		**400**	**120**		**600**	**60**		**60**	**75**	**100**	**190**
06:30 AM TO 07:30 AM																			
07:30 AM TO 08:30 AM																			
08:30 AM TO 09:30 AM	690	464		Y	Y	**Y**		Y		Y	Y	**Y**	Y	Y	**Y**	**Y**	**Y**		
09:30 AM TO 10:30 AM																			
10:30 AM TO 11:30 AM																			
11:00 AM TO 12:00 PM																			
12:30 PM TO 01:30 PM																			
01:30 PM TO 02:30 PM																			
02:30 PM TO 03:30 PM																			
03:30 PM TO 04:30 PM																			
04:30 PM TO 05:30 PM	793	378		Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	**Y**	**Y**		
05:30 PM TO 06:30 PM																			
06:30 PM TO 07:30 PM																			
07:30 PM TO 08:30 PM																			
08:30 PM TO 09:30 PM																			
09:30 PM TO 10:30 PM																			
	1,483	842		2	2	**2**	1	2	**1**	2	2	**2**	2	2	**2**	**2**	**2**	**0**	**0**
				8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS NEEDED for both Condition A & B						4 HRS NEEDED	1 HR NEEDED	4 HRS NEEDED	1 HR NEEDED
				NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**

01/04/10
Kimley-Horn and Associates

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS (2006 MUTCD)

MAJOR STREET: **Court Street** NB SB # OF APPROACH LANES: **2**

MINOR STREET: **Myrtle Avenue** WB EB # OF APPROACH LANES: **1**

CITY, STATE: **Visalia, CA**

COMMENTS: **Long-Term 2030**

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**
85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **N**

			MAJOR ST TWO-WAY TRAFFIC	MINOR ST TRAFFIC HEAVY LEG	Ped Count CROSSING MAJOR ST	WARRANT 1 - Condition A, Part 1			WARRANT 1 - Condition B, Part 1			WARRANT 1 - Condition A, Part 2			WARRANT 1 - Condition B, Part 2			WARRANT 2 Four-Hour	WARRANT 3 Peak Hour	WARRANT 4	
						MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET			Ped Volume (Four-hour)	Ped Volume (Peak-hour)
THRESHOLD VALUES						**600**	**150**		**900**	**75**		**480**	**120**		**720**	**60**		**60**	**75**	**100**	**190**
06:30 AM	TO	07:30 AM																			
07:30 AM	TO	08:30 AM																			
08:30 AM	TO	09:30 AM	983	76		Y			Y	Y	**Y**	Y			Y	Y	**Y**				
09:30 AM	TO	10:30 AM																			
10:30 AM	TO	11:30 AM																			
11:00 AM	TO	12:00 PM																			
12:30 PM	TO	01:30 PM																			
01:30 PM	TO	02:30 PM																			
02:30 PM	TO	03:30 PM																			
03:30 PM	TO	04:30 PM																			
04:30 PM	TO	05:30 PM	1,190	37		Y			Y			Y			Y						
05:30 PM	TO	06:30 PM																			
06:30 PM	TO	07:30 PM																			
07:30 PM	TO	08:30 PM																			
08:30 PM	TO	09:30 PM																			
09:30 PM	TO	10:30 PM																			
			2,173	113		2	0	**0**	2	1	**1**	2	0	**0**	2	1	**1**	**0**	**0**	**0**	**0**
						8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS NEEDED for both Condition A & B						4 HRS NEEDED	1 HR NEEDED	4 HRS NEEDED	1 HR NEEDED
						NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**

01/04/10
Kimley-Horn and Associates

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS (2006 MUTCD)

MAJOR STREET: **Court Street** NB SB # OF APPROACH LANES: **2**

MINOR STREET: **Myrtle Avenue** WB EB # OF APPROACH LANES: **1**

CITY, STATE: **Visalia, CA**

COMMENTS: **Long-Term 2030+Project**

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**
85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **N**

			MAJOR ST TWO-WAY TRAFFIC	MINOR ST TRAFFIC HEAVY LEG	Ped Count CROSSING MAJOR ST	WARRANT 1 - Condition A, Part 1			WARRANT 1 - Condition B, Part 1			WARRANT 1 - Condition A, Part 2			WARRANT 1 - Condition B, Part 2			WARRANT 2 Four-Hour	WARRANT 3 Peak Hour	WARRANT 4	
						MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET			Ped Volume (Four-hour)	Ped Volume (Peak-hour)
THRESHOLD VALUES						**600**	**150**		**900**	**75**		**480**	**120**		**720**	**60**		**60**	**75**	**100**	**190**
06:30 AM	TO	07:30 AM																			
07:30 AM	TO	08:30 AM																			
08:30 AM	TO	09:30 AM	984	76		Y			Y	Y	**Y**	Y			Y	Y	**Y**				
09:30 AM	TO	10:30 AM																			
10:30 AM	TO	11:30 AM																			
11:00 AM	TO	12:00 PM																			
12:30 PM	TO	01:30 PM																			
01:30 PM	TO	02:30 PM																			
02:30 PM	TO	03:30 PM																			
03:30 PM	TO	04:30 PM																			
04:30 PM	TO	05:30 PM	1,190	37		Y			Y			Y			Y						
05:30 PM	TO	06:30 PM																			
06:30 PM	TO	07:30 PM																			
07:30 PM	TO	08:30 PM																			
08:30 PM	TO	09:30 PM																			
09:30 PM	TO	10:30 PM																			
			2,174	113		2	0	**0**	2	1	**1**	2	0	**0**	2	1	**1**	**0**	**0**	**0**	**0**
						8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS NEEDED for both Condition A & B						4 HRS NEEDED	1 HR NEEDED	4 HRS NEEDED	1 HR NEEDED
						NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**	**NOT SATISFIED**

01/04/10
Kimley-Horn and Associates

QUEUING SUMMARY

Queuing Summary

Visalia Walmart Expansion

Scenarios Analyzed	Turning Movement	Mineral King Avenue												Noble Avenue																		Tulare Avenue									Court Street		
		#1 - Ben Maddox Way			#2 - SR-198 WB Ramps (near Ben Maddox)			#3 - Lovers Lane			#4 - SR-198 WB Ramps (near Lovers Lane)			#5 - Ben Maddox Way			#6 - SR-198 EB Ramps (near Ben Maddox)			#7 - West Walmart Access			#8 - East Walmart Access			#9 - Pinkham Road			#10 - Lovers Lane			#11 - SR-198 EB Ramps/Lovers Lane			#12 - Ben Maddox Way			#13 - Pinkham Road			#14 - Lovers Lane			#15 - E. Acequia Avenue		
		Link	AM	PM	Link	AM	PM	Link	AM	PM	Link	AM	PM	Link	AM	PM	Link	AM	PM	Link	AM	PM	Link	AM	PM	Link	AM	PM	Link	AM	PM	Link	AM	PM	Link	AM	PM	Link	AM	PM	Link	AM	PM
Existing	EBL							145	<25	56							185	84	140										125	**166**	**229**	232	**260**	**606**	95	113	**158**							50	35	59
	EBR																						125	<25	<25										95	<25	36									
	WBL							155	178	**249**				280	87	279	150	60	137				200	80	137				135	40	58				90	<25	<25									
	WBR	275	<25	29				25	**52**	**53**							40	<25	49																90	47	39									
	NBL	175	122	116				125	**206**	65																			115	63	87				155	71	57				210	<25	<25			
	NBR	40	**335**	**179**										180	<25	37													105	<25	<25				90	<25	<25									
	SBL	185	**282**	**241**				170	**273**	180				90	**141**	**273**													115	**204**	**183**	75	**124**	**175**	200	124	128				290	<25	<25			
	SBR																																		200	33	41									
Near-Term (2010)	EBL							145	<25	59							185	87	144										125	**198**	**297**	232	**315**	**817**	95	**131**	**169**				100	<25	<25	50	35	59
	EBR																						125	<25	25										95	<25	38									
	WBL							155	**229**	**290**				280	98	**303**	150	67	144				200	80	137				135	47	98				90	27	30				120	<25	<25			
	WBR	275	<25	30				25	**56**	**56**							40	<25	50																90	48	40									
	NBL	110	125	120				125	**192**	70																			115	68	90				155	71	57				210	30	34			
	NBR	40	**366**	**188**										180	<25	39													105	<25	30				90	<25	<25									
	SBL	185	**318**	**288**				170	**309**	**212**				90	**143**	**273**													115	**254**	**273**	75	**117**	**179**	200	126	137				290	<25	<25			
	SBR																																		200	34	43									
Near-Term (2010) + Project	EBL							145	<25	59							185	89	144	35	<25	<25							125	**204**	**300**	232	**315**	**817**	95	**142**	**174**				100	<25	<25	50	35	59
	EBR																																		95	<25	38									
	WBL							155	**229**	**290**				280	147	**321**	150	69	144				200	142	201				135	47	98				90	27	30				120	<25	<25			
	WBR	275	<25	30				25	**56**	**56**							40	<25	53																90	48	40									
	NBL	110	131	125				125	**192**	70																			115	69	90				155	71	57				210	30	34			
	NBR	40	**388**	**184**										180	<25	40													105	<25	30				90	<25	<25									
	SBL	185	**318**	**288**				170	**309**	**212**				90	**175**	**284**													115	**253**	**273**	75	**117**	**179**	200	126	137				290	<25	<25			
	SBR																																		200	34	43									
Near-Term (2015)	EBL							145	38	84							185	102	160	35	<25	<25							125	**227**	**346**	232	**421**	**1166**	95	**138**	**175**				100	<25	<25	50	35	61
	EBR																																		95	<25	38									
	WBL							155	**244**	**333**				280	137	**436**	150	87	163				200	80	137				135	50	94				90	27	31				120	<25	<25			
	WBR	275	38	42				25	**57**	**58**							40	<25	51																90	50	41									
	NBL	110	104	99				125	**163**	61																			115	73	92				155	71	58				210	36	41			
	NBR																												105	27	42				90	<25	<25									
	SBL	260	147	141				170	**579**	**409**				120	65	98													115	**248**	**249**	75	**117**	**180**	200	135	156				290	36	98			
	SBR																																		200	34	43									
Near-Term (2015) + Project	EBL							145	38	84							185	102	161	35	<25	<25							125	**231**	**347**	232	**421**	**1166**	95	**150**	**179**				100	<25	<25	50	35	61
	EBR																																		95	<25	38									
	WBL							155	**248**	**334**				280	187	**456**	150	87	164				200	142	201				135	50	94				90	27	31				120	<25	<25			
	WBR	275	38	42				25	**57**	**58**							40	<25	55																90	50	41									
	NBL	110	111	102				125	**163**	61																			115	75	92				155	71	58				210	36	41			
	NBR																												105	27	42				90	<25	<25									
	SBL	260	148	141				170	**579**	**409**				120	73	101													115	**246**	**247**	75	**116**	**180**	200	135	156				290	36	98			
	SBR																																		200	35	43									
Long-Term	EBL							145	62	124							185	126	**311**	35	<25	<25							125	**205**	**384**	232	**534**	**1063**	95	**152**	**217**				100	<25	<25	50	**77**	**127**
	EBR																																		95	<25	84									
	WBL							155	**511**	**386**				280	**296**	**441**	150	161	**262**				200	80	137				135	96	**173**				90	60	68				120	<25	<25			
	WBR	275	38	48				25	**135**	**81**							40	28	**73**																90	**122**	88									
	NBL	110	**296**	124				125	**485**	135																			115	**198**	**157**				155	**209**	161				210	124	142			
	NBR																																		90	27	34									
	SBL	260	149	209				170	**725**	**484**				120	67	**141**													115	**380**	**461**	75	**189**	**373**	200	**227**	**357**				290	36	140			
	SBR																																		200	43	78									
Long-Term + Project	EBL							145	62	124							185	127	**311**	35	<25	<25							125	**209**	**385**	232	**536**	**1063**	95	**167**	**223**				100	<25	<25	50	**77**	**127**
	EBR																																		95	<25	84									
	WBL							155	**514**	**386**				280	**344**	**460**	150	161	**262**				200	142	201				135	96	**173**				90	60	68				120	<25	<25			
	WBR	275	38	48				25	**135**	**81**							40	33	**77**																90	**122**	88									
	NBL	110	**310**	127				125	**485**	135																			115	**202**	**159**				155	**209**	161				210	124	142			
	NBR																																		90	27	35									
	SBL	260	149	209				170	**725**	**484**				120	75	**146**													115	**379**	**461**	75	**188**	**373**	200	**227**	**357**				290	36	140			
	SBR																																		200	45	81									

SATURDAY TURNING MOVEMENT VOLUMES

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

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

Turning Movement Report

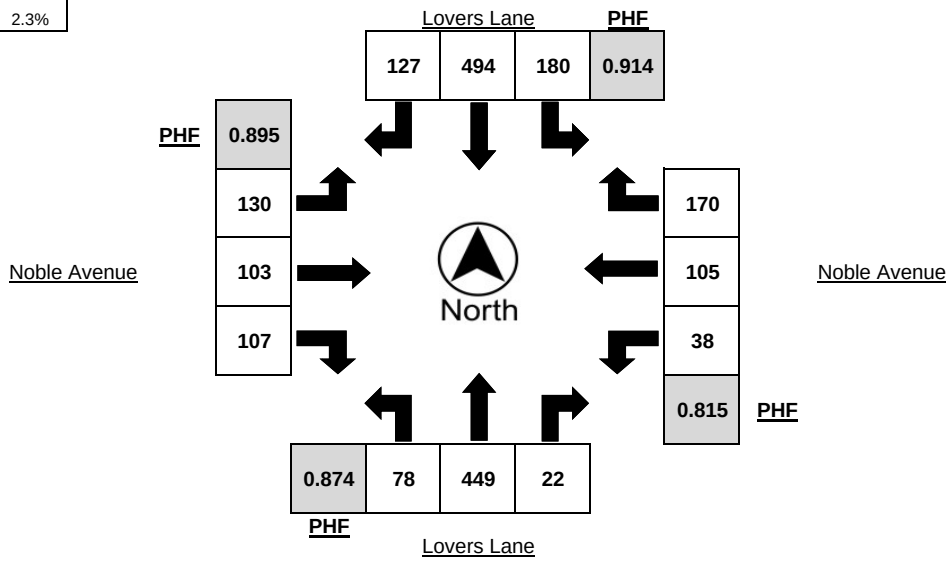
Prepared For: Erica McKinnon
Kimley-Horn and Associates, Inc
6130 Stoneridge Mall Road, Suite 370
Pleasanton, CA 94588

LOCATION Noble Avenue @ Lovers Lane
LATITUDE 36.326611°
COUNTY Tulare
LONGITUDE -119.260786°
COLLECTION DATE 1/30/2010
WEATHER Partly Cloudy/Sunny

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:00 PM - 12:15 PM	16	104	7	2	47	130	51	3	42	36	18	0	9	16	32	0
12:15 PM - 12:30 PM	17	85	6	5	40	124	39	2	40	26	16	1	8	16	30	0
12:30 PM - 12:45 PM	21	106	5	2	46	137	33	6	26	21	25	3	5	23	39	0
12:45 PM - 1:00 PM	27	113	1	6	49	131	39	3	29	28	32	5	11	29	43	1
1:00 PM - 1:15 PM	16	132	9	3	42	106	27	10	39	29	27	0	15	28	53	0
1:15 PM - 1:30 PM	14	98	7	2	43	120	28	2	36	25	23	2	7	25	35	1
1:30 PM - 1:45 PM	29	129	4	3	32	112	37	2	35	25	23	1	10	26	24	0
1:45 PM - 2:00 PM	17	92	10	1	43	132	35	1	42	26	29	1	7	25	32	0
TOTAL	**157**	**859**	**49**	**24**	**342**	**992**	**289**	**29**	**289**	**216**	**193**	**13**	**72**	**188**	**288**	**2**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:30 PM - 1:30 PM	78	449	22	13	180	494	127	21	130	103	107	10	38	105	170	2

	PHF	Trucks
MID DAY	0.941	2.3%



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

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

Turning Movement Report

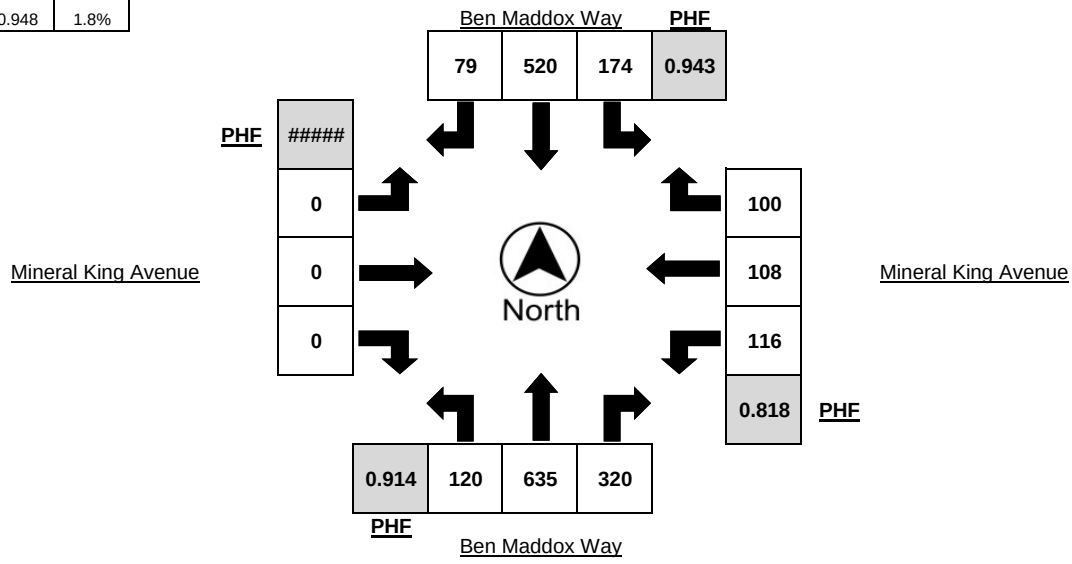
Prepared For: Erica McKinnon
Kimley-Horn and Associates, Inc
6130 Stoneridge Mall Road, Suite 370
Pleasanton, CA 94588

LOCATION Mineral King Avenue @ Ben Maddox Way
LATITUDE 36.327314°
COUNTY Tulare
LONGITUDE -119.278572°
COLLECTION DATE 1/30/2010
WEATHER Partly Cloudy/Sunny

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:00 PM - 12:15 PM	33	159	77	5	43	126	20	4	0	0	0	0	39	29	20	2
12:15 PM - 12:30 PM	30	156	68	5	51	135	19	4	0	0	0	0	16	29	18	1
12:30 PM - 12:45 PM	26	156	76	1	34	144	21	1	0	0	0	0	31	15	28	0
12:45 PM - 1:00 PM	31	164	99	10	46	115	19	4	0	0	0	0	30	35	34	2
1:00 PM - 1:15 PM	30	168	98	5	30	124	16	3	0	0	0	0	27	26	27	4
1:15 PM - 1:30 PM	28	145	78	7	35	118	15	7	0	0	0	0	22	27	13	1
1:30 PM - 1:45 PM	28	139	68	0	30	126	16	4	0	0	0	0	31	28	14	3
1:45 PM - 2:00 PM	30	143	61	5	38	98	11	3	0	0	0	0	28	22	16	1
TOTAL	**236**	**1230**	**625**	**38**	**307**	**986**	**137**	**30**	**0**	**0**	**0**	**0**	**224**	**211**	**170**	**14**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:00 PM - 1:00 PM	120	635	320	21	174	520	79	13	0	0	0	0	116	108	100	5

	PHF	**Trucks**
MID DAY	0.948	1.8%



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Turning Movement Report

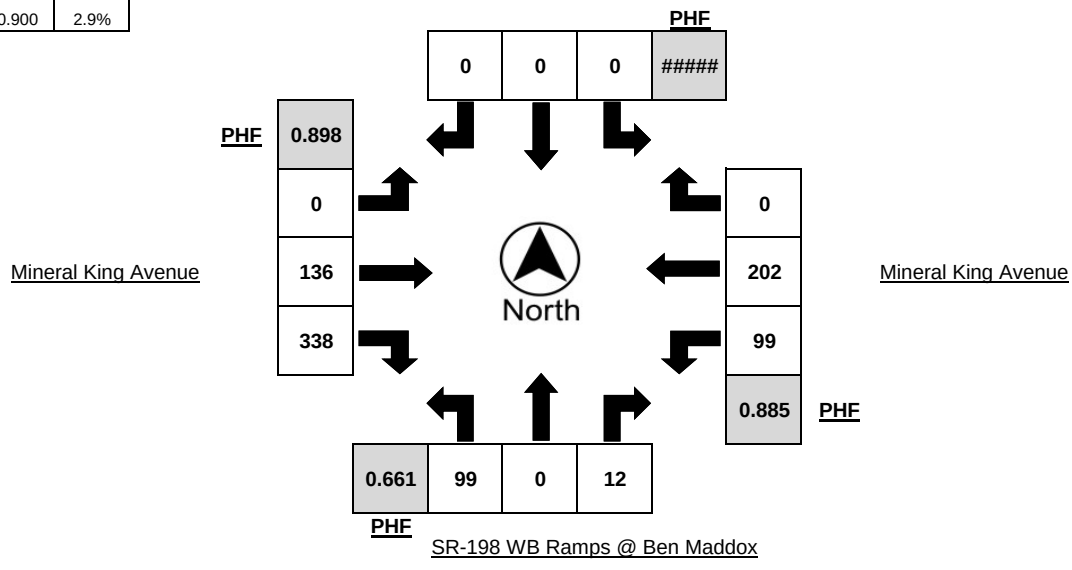
Prepared For: Erica McKinnon
Kimley-Horn and Associates, Inc
6130 Stoneridge Mall Road, Suite 370
Pleasanton, CA 94588

LOCATION Mineral King Ave @ SR-198 WB Ramps (BM)
LATITUDE 36.327295°
COUNTY Tulare
LONGITUDE -119.275843°
COLLECTION DATE 1/30/2010
WEATHER Partly Cloudy/Sunny

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:00 PM - 12:15 PM	21	0	7	1	0	0	0	0	0	45	73	3	36	58	0	3
12:15 PM - 12:30 PM	20	0	2	2	0	0	0	0	0	32	76	6	19	36	0	4
12:30 PM - 12:45 PM	25	0	0	0	0	0	0	0	0	38	72	2	25	43	0	1
12:45 PM - 1:00 PM	40	0	2	2	0	0	0	0	0	37	90	4	29	48	0	1
1:00 PM - 1:15 PM	22	0	5	1	0	0	0	0	0	31	101	4	19	66	0	6
1:15 PM - 1:30 PM	12	0	5	0	0	0	0	0	0	30	75	3	26	45	0	2
1:30 PM - 1:45 PM	16	0	5	1	0	0	0	0	0	20	66	2	25	54	0	3
1:45 PM - 2:00 PM	17	0	3	1	0	0	0	0	0	25	77	3	30	54	0	2
TOTAL	**173**	**0**	**29**	**8**	**0**	**0**	**0**	**0**	**0**	**258**	**630**	**27**	**209**	**404**	**0**	**22**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:30 PM - 1:30 PM	99	0	12	3	0	0	0	0	0	136	338	13	99	202	0	10

	PHF	Trucks
MID DAY	0.900	2.9%



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Turning Movement Report

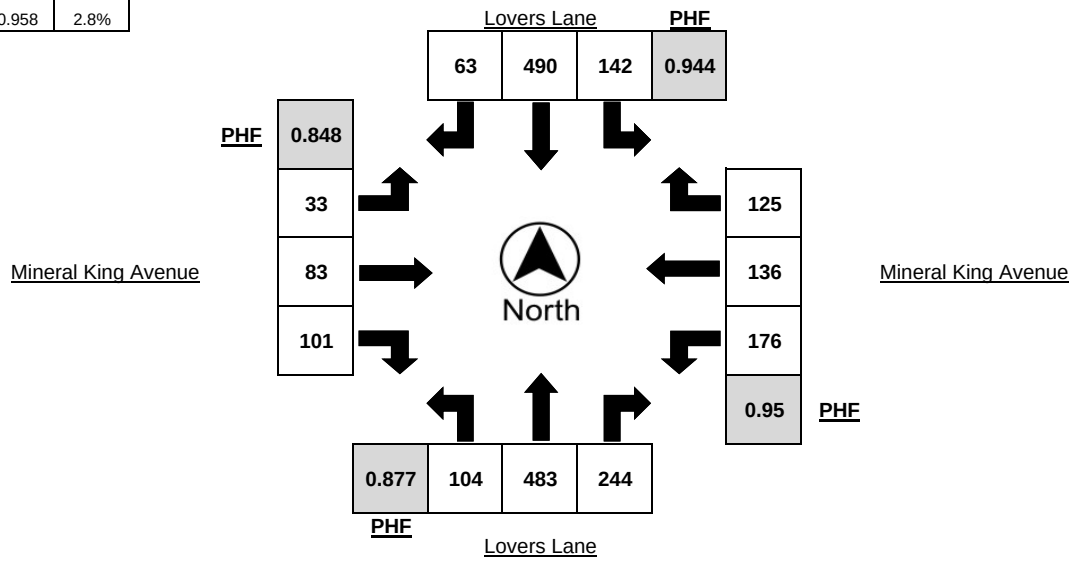
Prepared For: Erica McKinnon
Kimley-Horn and Associates, Inc
6130 Stoneridge Mall Road, Suite 370
Pleasanton, CA 94588

LOCATION Mineral King Avenue @ Lovers Lane
LATITUDE 36.328106°
COUNTY Tulare
LONGITUDE -119.260756°
COLLECTION DATE 1/30/2010
WEATHER Partly Cloudy/Sunny

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:00 PM - 12:15 PM	30	111	67	7	35	126	17	1	12	24	28	4	46	34	35	3
12:15 PM - 12:30 PM	13	107	59	7	39	133	12	3	8	15	22	1	35	33	32	4
12:30 PM - 12:45 PM	28	120	59	7	41	107	17	8	5	26	23	0	54	33	25	3
12:45 PM - 1:00 PM	33	145	59	7	27	124	17	2	8	18	28	4	41	36	33	1
1:00 PM - 1:15 PM	30	153	80	6	36	101	7	10	10	32	29	2	36	25	19	5
1:15 PM - 1:30 PM	37	101	69	6	34	94	19	3	5	21	42	2	44	23	15	1
1:30 PM - 1:45 PM	22	122	69	6	29	105	24	5	3	18	20	2	43	18	25	2
1:45 PM - 2:00 PM	24	135	62	7	41	109	23	3	8	16	27	3	42	32	29	0
TOTAL	**217**	**994**	**524**	**53**	**282**	**899**	**136**	**35**	**59**	**170**	**219**	**18**	**341**	**234**	**213**	**19**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:00 PM - 1:00 PM	104	483	244	28	142	490	63	14	33	83	101	9	176	136	125	11

	PHF	Trucks
MID DAY	0.958	2.8%



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www.metrotrafficdata.com

Turning Movement Report

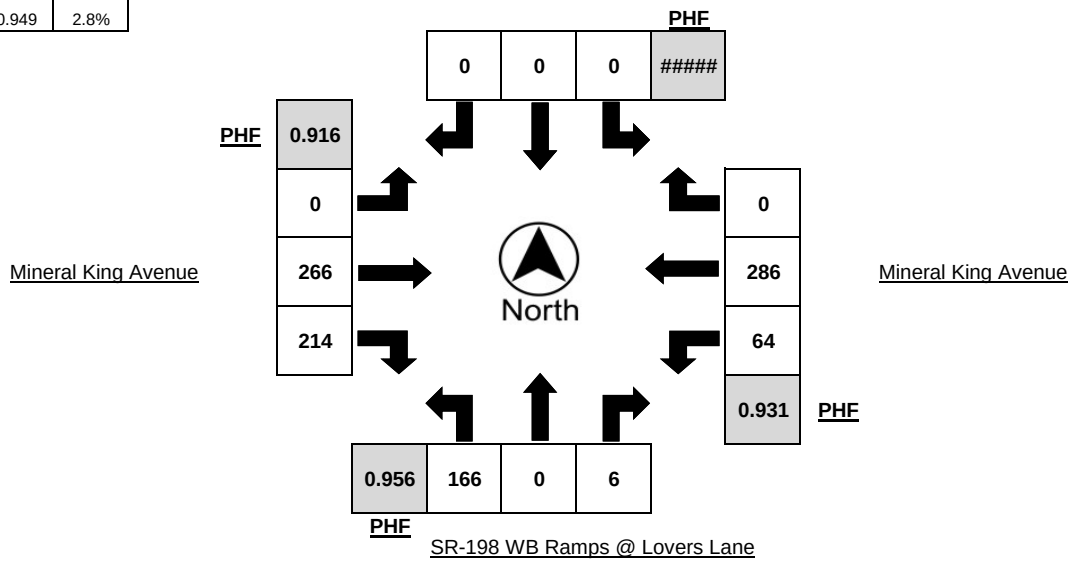
Prepared For: Erica McKinnon
Kimley-Horn and Associates, Inc
6130 Stoneridge Mall Road, Suite 370
Pleasanton, CA 94588

LOCATION Mineral King Ave @ SR-198 WB Ramps (Lovers)
LATITUDE 36.328219°
COUNTY Tulare
LONGITUDE -119.259225°
COLLECTION DATE 1/30/2010
WEATHER Partly Cloudy/Sunny

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:00 PM - 12:15 PM	42	0	3	1	0	0	0	0	0	80	44	5	12	71	0	2
12:15 PM - 12:30 PM	39	0	2	1	0	0	0	0	0	66	50	6	19	66	0	2
12:30 PM - 12:45 PM	44	0	1	2	0	0	0	0	0	68	63	4	17	71	0	0
12:45 PM - 1:00 PM	41	0	0	1	0	0	0	0	0	52	57	3	16	78	0	1
1:00 PM - 1:15 PM	27	0	1	1	0	0	0	0	0	87	61	4	13	50	0	3
1:15 PM - 1:30 PM	30	0	1	0	0	0	0	0	0	60	63	1	15	55	0	1
1:30 PM - 1:45 PM	31	0	0	1	0	0	0	0	0	67	52	4	16	57	0	2
1:45 PM - 2:00 PM	31	0	2	0	0	0	0	0	0	67	53	2	17	76	0	0
TOTAL	**285**	**0**	**10**	**7**	**0**	**0**	**0**	**0**	**0**	**547**	**443**	**29**	**125**	**524**	**0**	**11**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:00 PM - 1:00 PM	166	0	6	5	0	0	0	0	0	266	214	18	64	286	0	5

	PHF	**Trucks**
MID DAY	0.949	2.8%



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Turning Movement Report

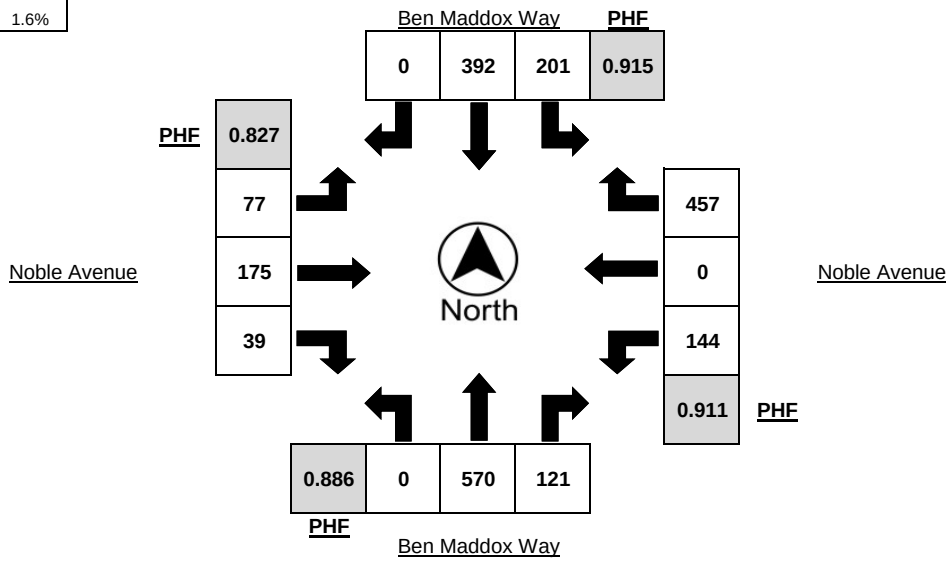
Prepared For: Erica McKinnon
Kimley-Horn and Associates, Inc
6130 Stoneridge Mall Road, Suite 370
Pleasanton, CA 94588

LOCATION Noble Avenue @ Ben Maddox Way
LATITUDE 36.326088°
COUNTY Tulare
LONGITUDE -119.278572°
COLLECTION DATE 1/30/2010
WEATHER Partly Cloudy/Sunny

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:00 PM - 12:15 PM	0	127	20	2	50	95	0	3	12	25	5	1	31	0	67	2
12:15 PM - 12:30 PM	0	134	30	3	51	111	0	2	23	42	8	3	48	0	117	4
12:30 PM - 12:45 PM	0	118	36	0	44	85	0	2	17	33	6	1	39	0	111	1
12:45 PM - 1:00 PM	0	146	32	3	55	107	0	0	17	47	10	1	32	0	119	4
1:00 PM - 1:15 PM	0	172	23	5	51	89	0	3	20	53	15	1	25	0	110	1
1:15 PM - 1:30 PM	0	139	22	5	38	97	0	4	21	44	14	1	44	0	110	4
1:30 PM - 1:45 PM	0	109	31	2	56	92	0	6	18	59	10	0	38	0	91	2
1:45 PM - 2:00 PM	0	120	31	1	53	88	0	1	19	52	16	1	49	0	91	2
TOTAL	**0**	**1065**	**225**	**21**	**398**	**764**	**0**	**21**	**147**	**355**	**84**	**9**	**306**	**0**	**816**	**20**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:15 PM - 1:15 PM	0	570	121	11	201	392	0	7	77	175	39	6	144	0	457	10

	PHF	Trucks
MID DAY	0.963	1.6%



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Turning Movement Report

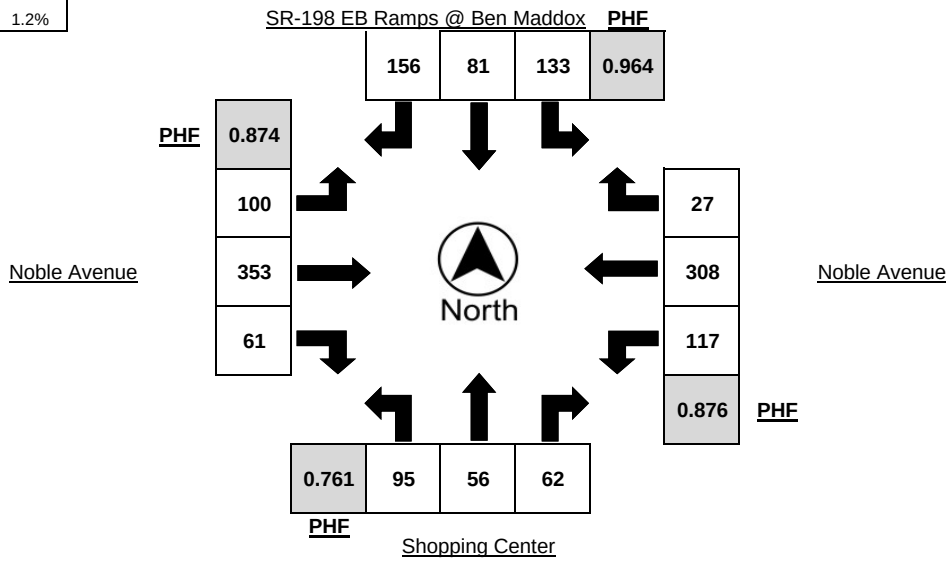
Prepared For: Erica McKinnon
Kimley-Horn and Associates, Inc
6130 Stoneridge Mall Road, Suite 370
Pleasanton, CA 94588

LOCATION Noble Ave @ SR-198 EB Ramps (BM)
LATITUDE 36.325395°
COUNTY Tulare
LONGITUDE -119.275907°
COLLECTION DATE 1/30/2010
WEATHER Partly Cloudy/Sunny

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:00 PM - 12:15 PM	27	10	17	0	34	21	41	1	25	95	12	2	31	65	7	2
12:15 PM - 12:30 PM	27	11	16	0	42	15	49	1	22	74	18	1	23	77	1	3
12:30 PM - 12:45 PM	27	13	21	1	32	12	50	2	30	89	5	1	32	71	2	0
12:45 PM - 1:00 PM	15	8	12	0	33	22	42	3	24	92	19	1	23	82	2	2
1:00 PM - 1:15 PM	29	21	20	0	37	18	33	1	28	86	15	0	26	67	4	0
1:15 PM - 1:30 PM	25	10	12	0	30	19	47	4	19	79	15	2	31	77	11	1
1:30 PM - 1:45 PM	19	14	18	0	31	22	41	3	22	109	16	2	29	72	6	0
1:45 PM - 2:00 PM	22	11	12	0	35	22	35	1	31	79	15	2	31	92	6	2
TOTAL	**191**	**98**	**128**	**1**	**274**	**151**	**338**	**16**	**201**	**703**	**115**	**11**	**226**	**603**	**39**	**10**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
1:00 PM - 2:00 PM	95	56	62	0	133	81	156	9	100	353	61	6	117	308	27	3

	PHF	Trucks
MID DAY	0.971	1.2%



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Turning Movement Report

Prepared For: Erica McKinnon
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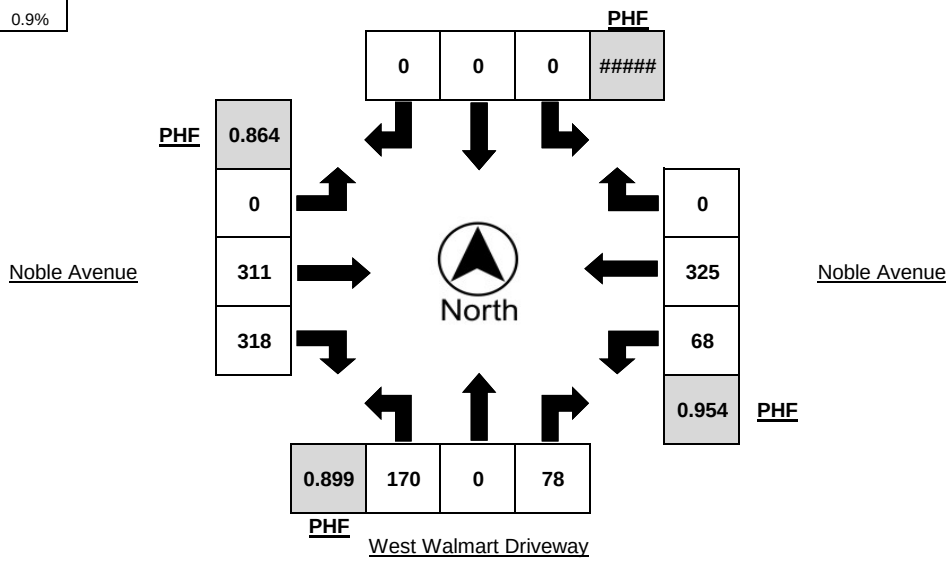
6130 Stoneridge Mall Road, Suite 370
Pleasanton, CA 94588

LOCATION Noble Ave @ West Walmart Driveway
LATITUDE 36.325939°
COUNTY Tulare
LONGITUDE -119.273267°
COLLECTION DATE 1/30/2010
WEATHER Partly Cloudy/Sunny

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:00 PM - 12:15 PM	42	0	17	1	0	0	0	0	0	87	88	3	18	91	0	2
12:15 PM - 12:30 PM	45	0	12	1	0	0	0	0	0	69	74	2	16	68	0	1
12:30 PM - 12:45 PM	43	0	15	0	0	0	0	0	0	83	86	3	12	72	0	0
12:45 PM - 1:00 PM	44	0	25	0	0	0	0	0	0	86	71	3	21	82	0	2
1:00 PM - 1:15 PM	41	0	16	0	0	0	0	0	0	78	78	0	13	82	0	0
1:15 PM - 1:30 PM	43	0	20	0	0	0	0	0	0	66	68	3	20	81	0	1
1:30 PM - 1:45 PM	42	0	17	0	0	0	0	0	0	81	101	2	14	80	0	1
1:45 PM - 2:00 PM	62	0	15	0	0	0	0	0	0	85	60	2	11	85	0	1
TOTAL	**362**	**0**	**137**	**2**	**0**	**0**	**0**	**0**	**0**	**635**	**626**	**18**	**125**	**641**	**0**	**8**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:45 PM - 1:45 PM	170	0	78	0	0	0	0	0	0	311	318	8	68	325	0	4

	PHF	Trucks
MID DAY	0.948	0.9%



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Turning Movement Report

Prepared For: Erica McKinnon
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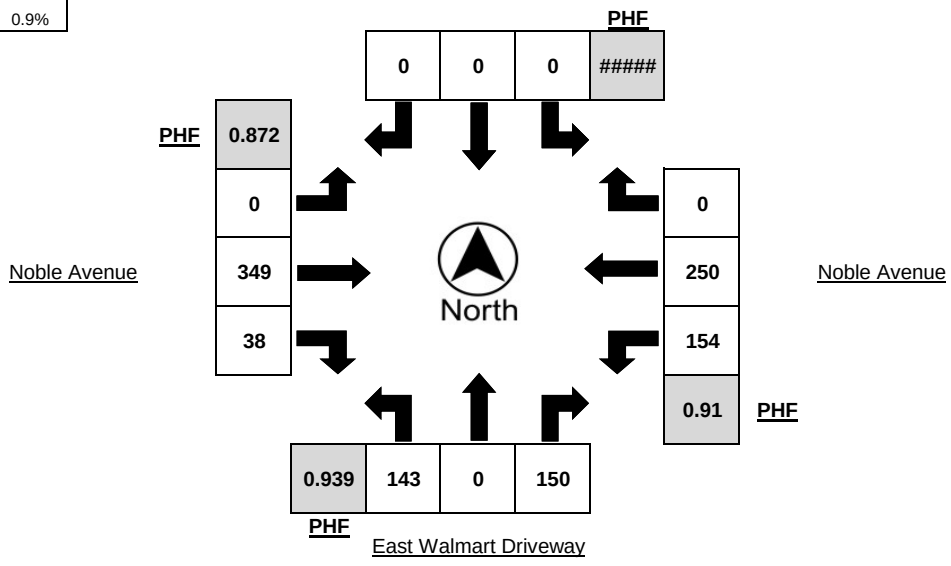
6130 Stoneridge Mall Road, Suite 370
Pleasanton, CA 94588

LOCATION Noble Ave @ East Walmart Driveway
LATITUDE 36.326109°
COUNTY Tulare
LONGITUDE -119.272144°
COLLECTION DATE 1/30/2010
WEATHER Partly Cloudy/Sunny

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:00 PM - 12:15 PM	43	0	36	0	0	0	0	0	0	100	9	2	29	68	0	1
12:15 PM - 12:30 PM	27	0	32	0	0	0	0	0	0	71	6	3	26	60	0	0
12:30 PM - 12:45 PM	29	0	30	0	0	0	0	0	0	89	11	2	27	54	0	1
12:45 PM - 1:00 PM	36	0	38	1	0	0	0	0	0	97	14	2	47	62	0	0
1:00 PM - 1:15 PM	32	0	45	0	0	0	0	0	0	85	8	0	48	63	0	2
1:15 PM - 1:30 PM	35	0	29	0	0	0	0	0	0	81	5	2	24	62	0	0
1:30 PM - 1:45 PM	40	0	38	0	0	0	0	0	0	86	11	2	35	63	0	1
1:45 PM - 2:00 PM	33	0	38	1	0	0	0	0	0	91	13	2	41	57	0	0
TOTAL	**275**	**0**	**286**	**2**	**0**	**0**	**0**	**0**	**0**	**700**	**77**	**15**	**277**	**489**	**0**	**5**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:45 PM - 1:45 PM	143	0	150	1	0	0	0	0	0	349	38	6	154	250	0	3

	PHF	Trucks
MID DAY	0.922	0.9%



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

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

Turning Movement Report

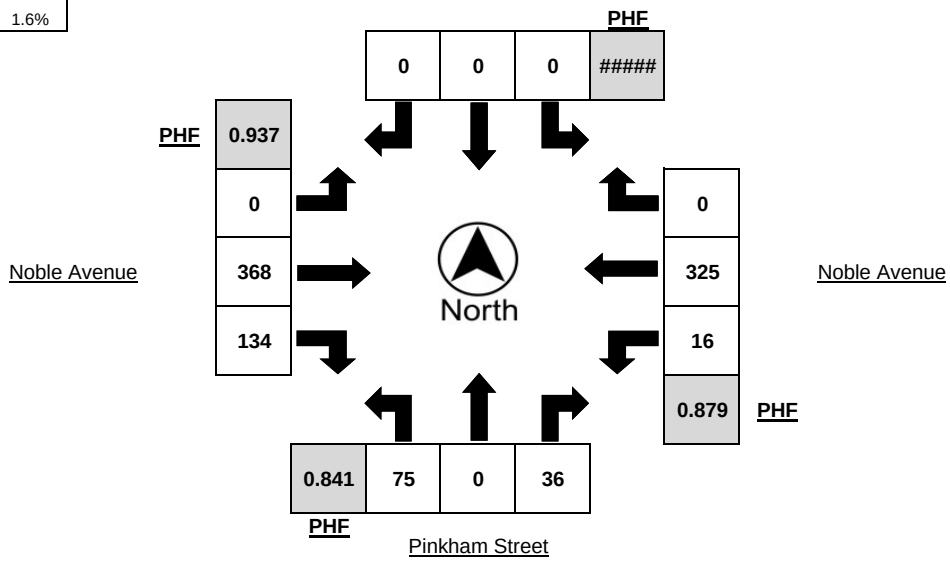
Prepared For: Erica McKinnon
Kimley-Horn and Associates, Inc
6130 Stoneridge Mall Road, Suite 370
Pleasanton, CA 94588

LOCATION Noble Avenue @ Pinkham Street
LATITUDE 36.326389°
COUNTY Tulare
LONGITUDE -119.269689°
COLLECTION DATE 1/30/2010
WEATHER Partly Cloudy/Sunny

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:00 PM - 12:15 PM	14	0	6	0	0	0	0	0	0	95	39	2	4	83	0	1
12:15 PM - 12:30 PM	14	0	13	1	0	0	0	0	0	75	30	3	4	69	0	0
12:30 PM - 12:45 PM	12	0	8	1	0	0	0	0	0	83	32	2	6	78	0	1
12:45 PM - 1:00 PM	19	0	11	3	0	0	0	0	0	101	33	1	4	93	0	0
1:00 PM - 1:15 PM	18	0	9	1	0	0	0	0	0	99	33	0	3	77	0	2
1:15 PM - 1:30 PM	21	0	12	1	0	0	0	0	0	79	37	3	3	70	0	0
1:30 PM - 1:45 PM	17	0	4	1	0	0	0	0	0	89	31	2	6	85	0	1
1:45 PM - 2:00 PM	13	0	7	0	0	0	0	0	0	86	42	2	6	73	0	0
TOTAL	**128**	**0**	**70**	**8**	**0**	**0**	**0**	**0**	**0**	**707**	**277**	**15**	**36**	**628**	**0**	**5**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:45 PM - 1:45 PM	75	0	36	6	0	0	0	0	0	368	134	6	16	325	0	3

	PHF	**Trucks**
MID DAY	0.914	1.6%



Metro Traffic Data Inc.
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Turning Movement Report

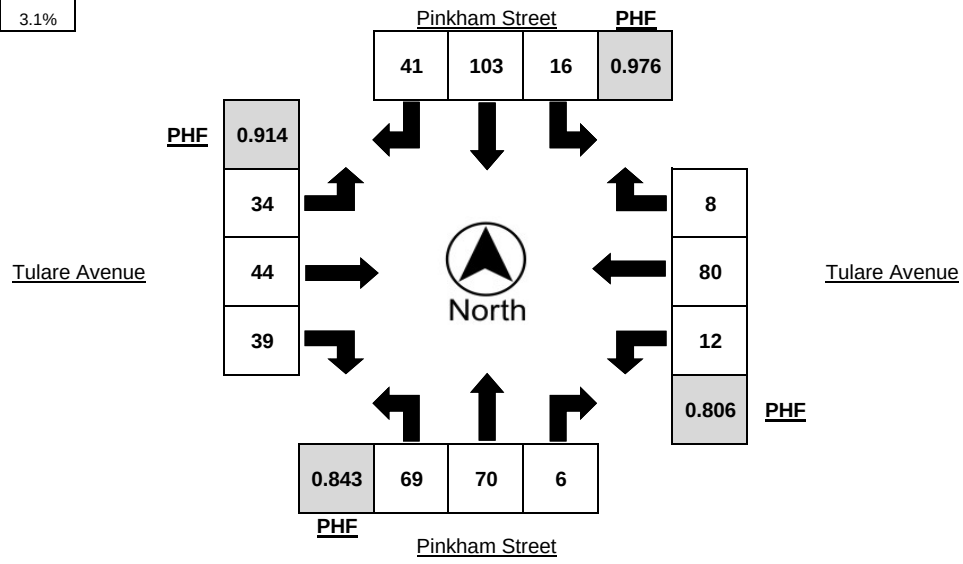
Prepared For: Erica McKinnon
Kimley-Horn and Associates, Inc
6130 Stoneridge Mall Road, Suite 370
Pleasanton, CA 94588

LOCATION Tulare Avenue @ Pinkham Street
LATITUDE 36.320045°
COUNTY Tulare
LONGITUDE -119.269602°
COLLECTION DATE 1/30/2010
WEATHER Partly Cloudy/Sunny

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:00 PM - 12:15 PM	21	21	1	1	6	26	9	1	8	7	15	1	3	18	1	0
12:15 PM - 12:30 PM	16	17	1	2	5	22	12	0	11	16	5	0	6	14	2	0
12:30 PM - 12:45 PM	14	11	2	3	3	26	11	3	7	6	14	0	2	21	2	0
12:45 PM - 1:00 PM	18	21	2	1	2	29	9	0	8	15	5	4	1	27	3	0
1:00 PM - 1:15 PM	14	19	1	0	2	14	13	0	14	7	6	1	0	19	1	0
1:15 PM - 1:30 PM	22	22	4	2	2	24	11	4	7	8	6	0	0	24	1	0
1:30 PM - 1:45 PM	16	16	1	0	1	26	11	1	10	7	10	2	3	21	2	0
1:45 PM - 2:00 PM	13	11	2	0	6	33	8	1	11	11	7	1	0	18	4	1
TOTAL	**134**	**138**	**14**	**9**	**27**	**200**	**84**	**10**	**76**	**77**	**68**	**9**	**15**	**162**	**16**	**1**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:00 PM - 1:00 PM	69	70	6	7	16	103	41	4	34	44	39	5	12	80	8	0

	PHF	**Trucks**
MID DAY	0.932	3.1%



Metro Traffic Data Inc.
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Turning Movement Report

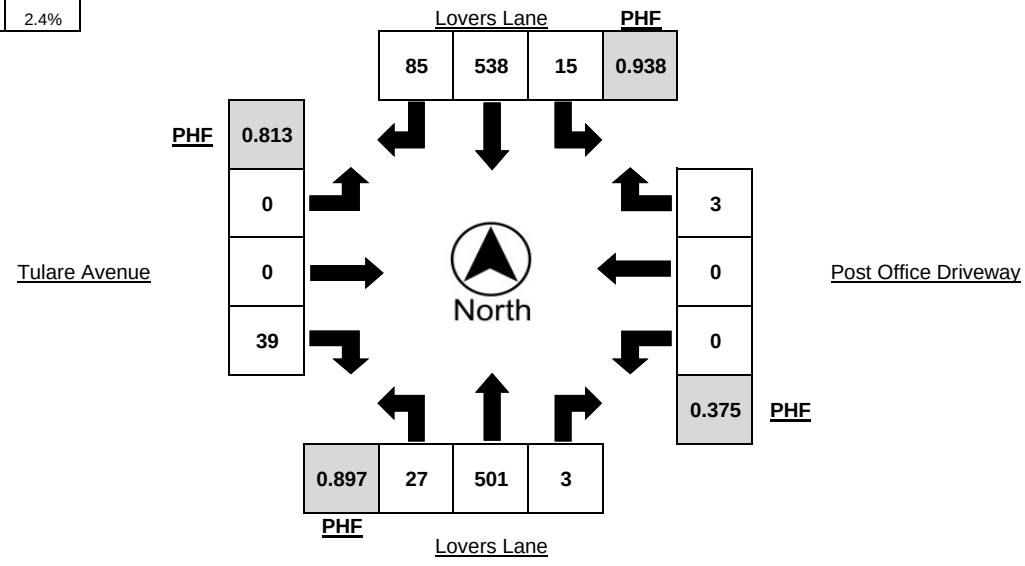
Prepared For: Erica McKinnon
Kimley-Horn and Associates, Inc
6130 Stoneridge Mall Road, Suite 370
Pleasanton, CA 94588

LOCATION Tulare Avenue @ Lovers Lane
LATITUDE 36.319792°
COUNTY Tulare
LONGITUDE -119.260909°
COLLECTION DATE 1/30/2010
WEATHER Partly Cloudy/Sunny

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:00 PM - 12:15 PM	8	95	1	2	1	135	20	4	0	0	8	0	0	0	1	0
12:15 PM - 12:30 PM	4	98	0	5	1	131	18	2	1	0	16	0	0	0	1	0
12:30 PM - 12:45 PM	5	133	2	4	4	137	18	4	0	0	6	0	0	0	3	0
12:45 PM - 1:00 PM	11	133	0	3	3	138	29	3	0	0	12	0	0	0	1	0
1:00 PM - 1:15 PM	5	121	0	2	5	138	20	5	0	0	12	1	0	0	0	0
1:15 PM - 1:30 PM	4	107	2	3	2	123	17	5	0	0	8	0	0	0	2	0
1:30 PM - 1:45 PM	7	140	1	4	5	139	19	2	0	0	7	1	0	0	0	0
1:45 PM - 2:00 PM	6	102	1	2	2	140	16	2	0	0	13	0	0	0	2	0
TOTAL	**50**	**929**	**7**	**25**	**23**	**1081**	**157**	**27**	**1**	**0**	**82**	**2**	**0**	**0**	**10**	**0**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:45 PM - 1:45 PM	27	501	3	12	15	538	85	15	0	0	39	2	0	0	3	0

	PHF	**Trucks**
MID DAY	0.926	2.4%



Metro Traffic Data Inc.
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Turning Movement Report

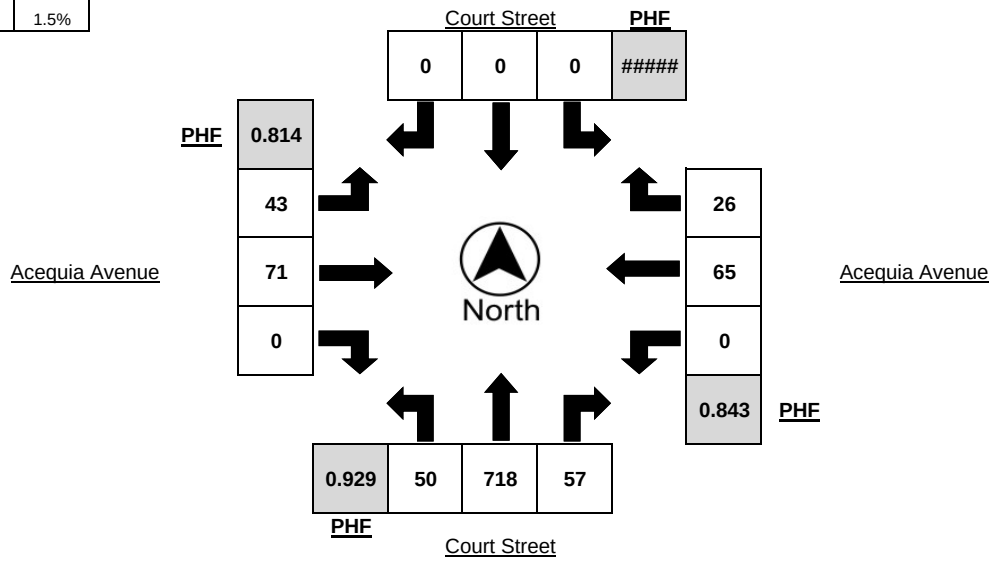
Prepared For: Erica McKinnon
Kimley-Horn and Associates, Inc
6130 Stoneridge Mall Road, Suite 370
Pleasanton, CA 94588

LOCATION Court Street @ Acequia Avenue
LATITUDE 36.329170°
COUNTY Tulare
LONGITUDE -119.292371°
COLLECTION DATE 1/30/2010
WEATHER Partly Cloudy/Sunny

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:00 PM - 12:15 PM	14	194	11	3	0	0	0	0	16	19	0	1	0	18	7	1
12:15 PM - 12:30 PM	14	157	16	1	0	0	0	0	10	15	0	2	0	22	5	0
12:30 PM - 12:45 PM	6	176	15	3	0	0	0	0	9	16	0	0	0	15	3	0
12:45 PM - 1:00 PM	16	191	15	3	0	0	0	0	8	21	0	1	0	10	11	0
1:00 PM - 1:15 PM	11	159	11	1	0	0	0	0	16	19	0	1	0	14	6	0
1:15 PM - 1:30 PM	8	153	15	1	0	0	0	0	10	12	0	1	0	13	4	0
1:30 PM - 1:45 PM	12	134	13	2	0	0	0	0	15	19	0	2	0	17	4	0
1:45 PM - 2:00 PM	12	157	13	3	0	0	0	0	5	15	0	1	0	20	2	0
TOTAL	**93**	**1321**	**109**	**17**	**0**	**0**	**0**	**0**	**89**	**136**	**0**	**9**	**0**	**129**	**42**	**1**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:00 PM - 1:00 PM	50	718	57	10	0	0	0	0	43	71	0	4	0	65	26	1

	PHF	**Trucks**
MID DAY	0.923	1.5%



Metro Traffic Data Inc.
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Turning Movement Report

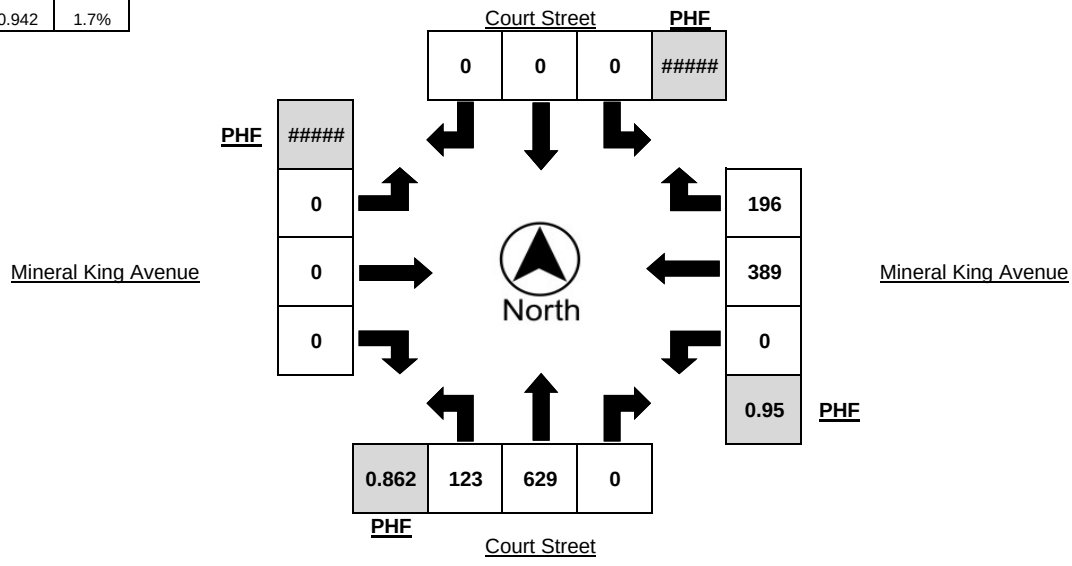
Prepared For: Erica McKinnon
Kimley-Horn and Associates, Inc
6130 Stoneridge Mall Road, Suite 370
Pleasanton, CA 94588

LOCATION Court Street @ Mineral King Avenue
LATITUDE 36.327358°
COUNTY Tulare
LONGITUDE -119.292310°
COLLECTION DATE 1/30/2010
WEATHER Partly Cloudy/Sunny

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:00 PM - 12:15 PM	37	181	0	5	0	0	0	0	0	0	0	0	0	93	44	5
12:15 PM - 12:30 PM	31	136	0	1	0	0	0	0	0	0	0	0	0	99	45	1
12:30 PM - 12:45 PM	28	142	0	2	0	0	0	0	0	0	0	0	0	98	56	3
12:45 PM - 1:00 PM	27	170	0	3	0	0	0	0	0	0	0	0	0	99	51	3
1:00 PM - 1:15 PM	34	136	0	4	0	0	0	0	0	0	0	0	0	104	36	1
1:15 PM - 1:30 PM	34	132	0	1	0	0	0	0	0	0	0	0	0	109	42	1
1:30 PM - 1:45 PM	25	138	0	3	0	0	0	0	0	0	0	0	0	94	38	6
1:45 PM - 2:00 PM	32	128	0	2	0	0	0	0	0	0	0	0	0	111	54	3
TOTAL	**248**	**1163**	**0**	**21**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**807**	**366**	**23**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:00 PM - 1:00 PM	123	629	0	11	0	0	0	0	0	0	0	0	0	389	196	12

	PHF	Trucks
MID DAY	0.942	1.7%



Metro Traffic Data Inc.
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Turning Movement Report

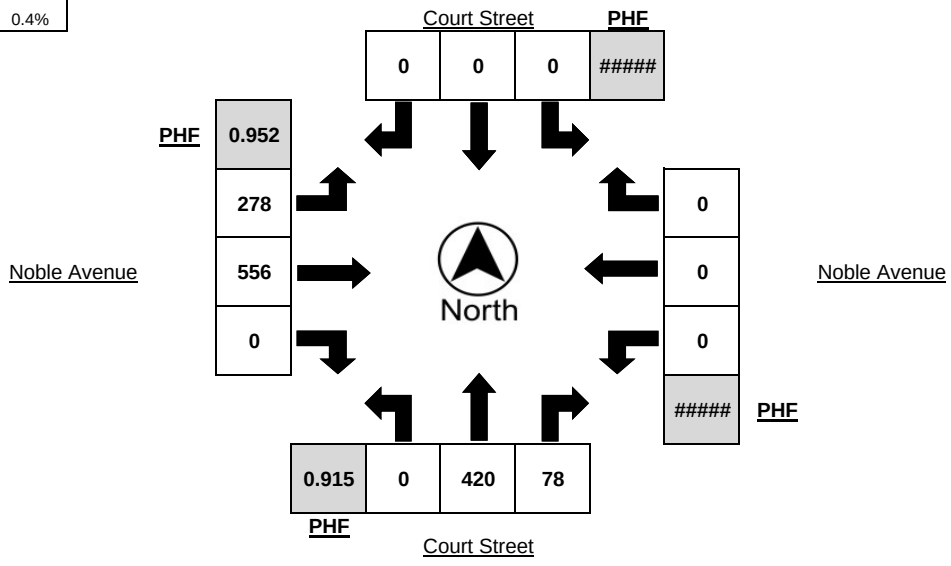
Prepared For: Erica McKinnon
Kimley-Horn and Associates, Inc
6130 Stoneridge Mall Road, Suite 370
Pleasanton, CA 94588

LOCATION Court Street @ Noble Avenue
LATITUDE 36.326378°
COUNTY Tulare
LONGITUDE -119.292331°
COLLECTION DATE 1/30/2010
WEATHER Partly Cloudy/Sunny

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:00 PM - 12:15 PM	0	138	17	0	0	0	0	0	79	135	0	3	0	0	0	0
12:15 PM - 12:30 PM	0	95	17	0	0	0	0	0	67	120	0	0	0	0	0	0
12:30 PM - 12:45 PM	0	95	16	0	0	0	0	0	70	127	0	0	0	0	0	0
12:45 PM - 1:00 PM	0	119	12	0	0	0	0	0	68	144	0	1	0	0	0	0
1:00 PM - 1:15 PM	0	101	19	1	0	0	0	0	78	141	0	1	0	0	0	0
1:15 PM - 1:30 PM	0	105	31	0	0	0	0	0	62	144	0	2	0	0	0	0
1:30 PM - 1:45 PM	0	99	11	0	0	0	0	0	60	116	0	2	0	0	0	0
1:45 PM - 2:00 PM	0	98	13	0	0	0	0	0	61	108	0	1	0	0	0	0
TOTAL	**0**	**850**	**136**	**1**	**0**	**0**	**0**	**0**	**545**	**1035**	**0**	**10**	**0**	**0**	**0**	**0**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:30 PM - 1:30 PM	0	420	78	1	0	0	0	0	278	556	0	4	0	0	0	0

	PHF	**Trucks**
MID DAY	0.971	0.4%



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Turning Movement Report

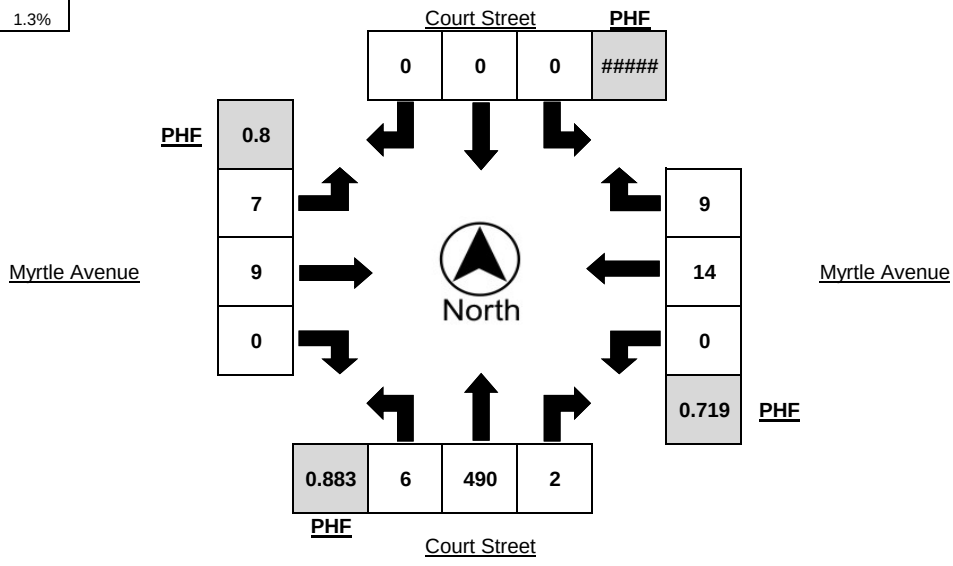
Prepared For: Erica McKinnon
Kimley-Horn and Associates, Inc
6130 Stoneridge Mall Road, Suite 370
Pleasanton, CA 94588

LOCATION Court Street @ Myrtle Avenue
LATITUDE 36.324890°
COUNTY Tulare
LONGITUDE -119.292301°
COLLECTION DATE 1/30/2010
WEATHER Partly Cloudy/Sunny

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:00 PM - 12:15 PM	2	132	1	5	0	0	0	0	2	2	0	0	0	1	1	0
12:15 PM - 12:30 PM	1	103	0	0	0	0	0	0	1	2	0	0	0	2	3	0
12:30 PM - 12:45 PM	2	116	0	1	0	0	0	0	1	3	0	0	0	6	2	0
12:45 PM - 1:00 PM	1	139	1	1	0	0	0	0	3	2	0	0	0	5	3	0
1:00 PM - 1:15 PM	0	96	1	2	0	0	0	0	3	4	0	0	0	4	2	0
1:15 PM - 1:30 PM	1	120	2	1	0	0	0	0	6	5	0	0	0	3	5	0
1:30 PM - 1:45 PM	1	119	1	3	0	0	0	0	2	3	0	0	0	2	3	0
1:45 PM - 2:00 PM	1	107	0	3	0	0	0	0	0	3	0	0	0	2	4	0
TOTAL	**9**	**932**	**6**	**16**	**0**	**0**	**0**	**0**	**18**	**24**	**0**	**0**	**0**	**25**	**23**	**0**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:00 PM - 1:00 PM	6	490	2	7	0	0	0	0	7	9	0	0	0	14	9	0

	PHF	**Trucks**
MID DAY	0.872	1.3%



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Turning Movement Report

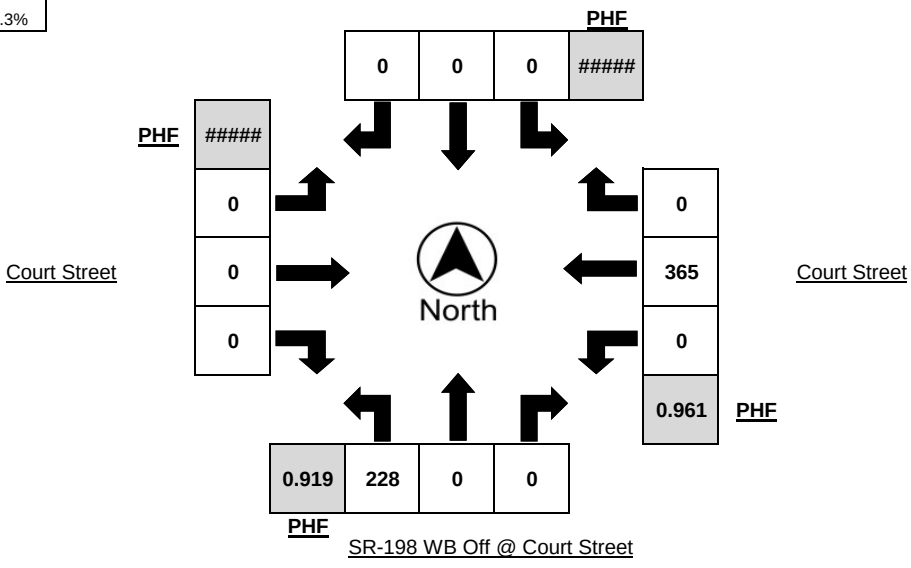
Prepared For: Erica McKinnon
Kimley-Horn and Associates, Inc
6130 Stoneridge Mall Road, Suite 370
Pleasanton, CA 94588

LOCATION Mineral King Ave @ SR-198 WB Off (Court)
LATITUDE 36.327351°
COUNTY Tulare
LONGITUDE -119.291381°
COLLECTION DATE 1/30/2010
WEATHER Partly Cloudy/Sunny

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:00 PM - 12:15 PM	50	0	0	1	0	0	0	0	0	0	0	0	0	89	0	4
12:15 PM - 12:30 PM	56	0	0	0	0	0	0	0	0	0	0	0	0	93	0	1
12:30 PM - 12:45 PM	58	0	0	1	0	0	0	0	0	0	0	0	0	91	0	2
12:45 PM - 1:00 PM	62	0	0	0	0	0	0	0	0	0	0	0	0	86	0	3
1:00 PM - 1:15 PM	48	0	0	0	0	0	0	0	0	0	0	0	0	95	0	1
1:15 PM - 1:30 PM	60	0	0	0	0	0	0	0	0	0	0	0	0	93	0	1
1:30 PM - 1:45 PM	52	0	0	2	0	0	0	0	0	0	0	0	0	83	0	4
1:45 PM - 2:00 PM	58	0	0	1	0	0	0	0	0	0	0	0	0	99	0	2
TOTAL	**444**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**729**	**0**	**18**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:30 PM - 1:30 PM	228	0	0	1	0	0	0	0	0	0	0	0	0	365	0	7

	PHF	Trucks
MID DAY	0.969	1.3%



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www.metrotrafficdata.com

Turning Movement Report

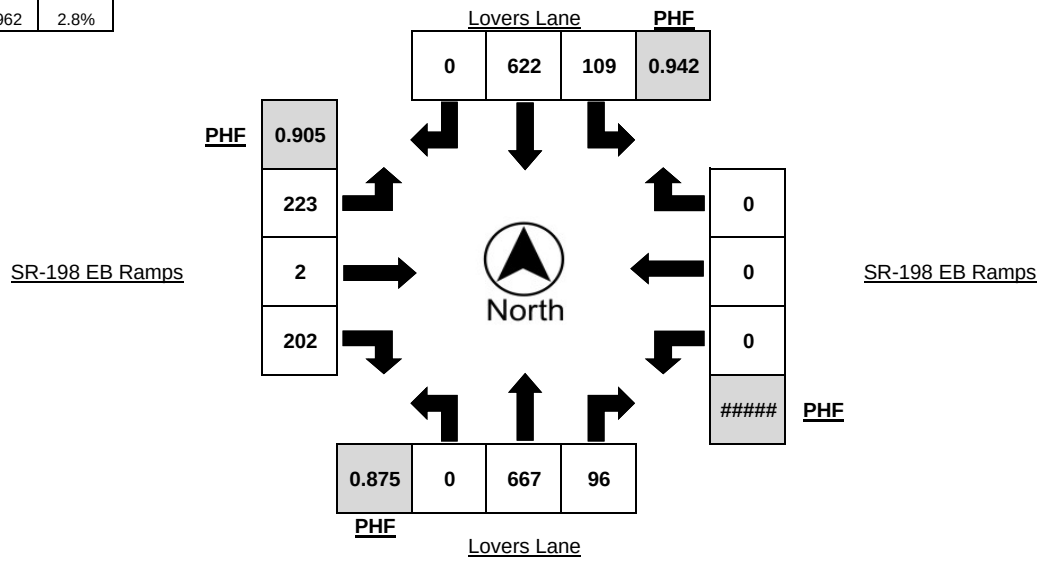
Prepared For: Erica McKinnon
Kimley-Horn and Associates, Inc
6130 Stoneridge Mall Road, Suite 370
Pleasanton, CA 94588

LOCATION Lovers Lane @ SR-198 EB Ramps
LATITUDE 36.327142°
COUNTY Tulare
LONGITUDE -119.260789°
COLLECTION DATE 1/30/2010
WEATHER Partly Cloudy/Sunny

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:00 PM - 12:15 PM	0	166	15	3	24	180	0	2	43	0	38	5	0	0	0	0
12:15 PM - 12:30 PM	0	130	31	5	28	161	0	4	52	0	41	3	0	0	0	0
12:30 PM - 12:45 PM	0	150	24	7	21	166	0	7	60	0	55	1	0	0	0	0
12:45 PM - 1:00 PM	0	174	27	10	28	166	0	2	50	0	54	1	0	0	0	0
1:00 PM - 1:15 PM	0	190	28	3	21	140	0	7	64	2	52	5	0	0	0	0
1:15 PM - 1:30 PM	0	153	17	7	39	150	0	3	49	0	41	1	0	0	0	0
1:30 PM - 1:45 PM	0	170	30	5	20	150	0	3	50	0	35	1	0	0	0	0
1:45 PM - 2:00 PM	0	156	24	3	21	163	0	3	76	0	46	2	0	0	0	0
TOTAL	**0**	**1289**	**196**	**43**	**202**	**1276**	**0**	**31**	**444**	**2**	**362**	**19**	**0**	**0**	**0**	**0**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:30 PM - 1:30 PM	0	667	96	27	109	622	0	19	223	2	202	8	0	0	0	0

	PHF	Trucks
MID DAY	0.962	2.8%



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

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

Turning Movement Report

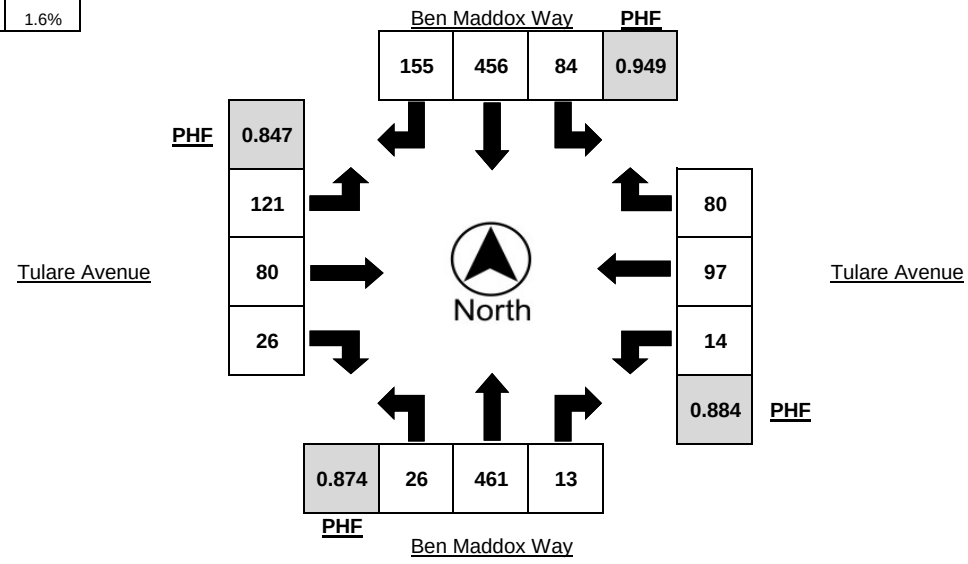
Prepared For: Erica McKinnon
Kimley-Horn and Associates, Inc
6130 Stoneridge Mall Road, Suite 370
Pleasanton, CA 94588

LOCATION Tulare Avenue @ Ben Maddox Way
LATITUDE 36.320117°
COUNTY Tulare
LONGITUDE -119.276552°
COLLECTION DATE 1/30/2010
WEATHER Partly Cloudy/Sunny

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:00 PM - 12:15 PM	7	104	2	1	19	117	42	2	40	16	8	1	5	27	13	1
12:15 PM - 12:30 PM	10	130	3	1	14	118	46	3	22	25	4	1	3	25	19	0
12:30 PM - 12:45 PM	5	105	3	0	28	111	41	1	31	14	7	0	6	18	15	2
12:45 PM - 1:00 PM	3	111	6	1	19	106	29	4	41	20	6	2	4	25	22	0
1:00 PM - 1:15 PM	8	115	1	6	23	121	39	2	27	21	9	3	1	29	24	0
1:15 PM - 1:30 PM	10	98	5	2	21	108	35	4	32	14	15	1	6	33	19	3
1:30 PM - 1:45 PM	5	113	3	0	27	101	39	3	32	19	7	2	4	27	21	0
1:45 PM - 2:00 PM	8	102	3	1	21	103	40	2	24	19	12	2	3	26	17	2
TOTAL	**56**	**878**	**26**	**12**	**172**	**885**	**311**	**21**	**249**	**148**	**68**	**12**	**32**	**210**	**150**	**8**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
12:15 PM - 1:15 PM	26	461	13	8	84	456	155	10	121	80	26	6	14	97	80	2

	PHF	**Trucks**
MID DAY	0.962	1.6%



SATURDAY TRIP GENERATION

Trip Generation Planner (ITE 8th Edition) - Summary Report

Kimley-Horn and Associates, Inc.

Weekday Trip Generation
Trips Based on Average Rates/Equations

Project Name **Visalia Walmart Expansion**
Project Number **097311005.3**

						Rates		Total Trips				Net Trips after Pass-By			
ITE Code	Land Use Type	Land Use Description	Independent Variable	No. of Units	Avg Rate or Eq	Daily Rate	MID Rate	Daily Trips	MID Trips	MID Trips In	MID Trips Out	Daily Trips	MID Trips	MID Trips In	MID Trips Out
813	Select Use	Free Standing Discount Superstore	1,000 Sq Ft	181.64	Avg	64.07	5.64	11638	1024	512	512	11638	737	369	369
815	Select Use	Free Standing Discount Store	1,000 Sq Ft	-126.78	Avg	71.07	7.39	-9012	-937	-478	-459	-9012	-722	-368	-353
	Select Use														
	Select Use														