

Appendix I  
**Traffic Data**

# **TECHNICAL TRANSPORTATION APPENDIX**

**James Donlon Boulevard Extension EIR**

March 2012

1021-1822A

**FEHR & PEERS**

## **Table of Contents**

Appendix A	Traffic Counts
Appendix B	CCTALOS Calculation Worksheets
Appendix C	Synchro Calculation Worksheets
Appendix D	Analysis Validation Memorandum

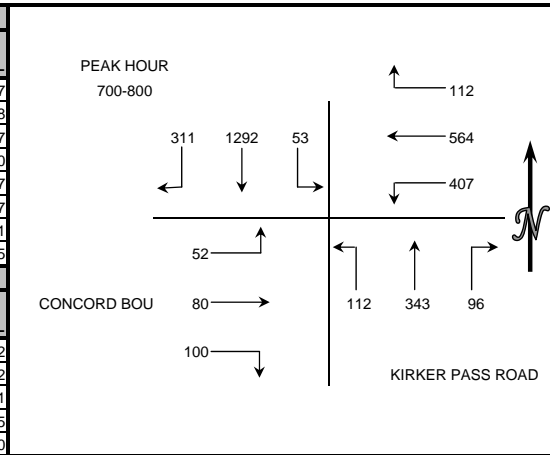
# **APPENDIX A**

## **TRAFFIC COUNTS**

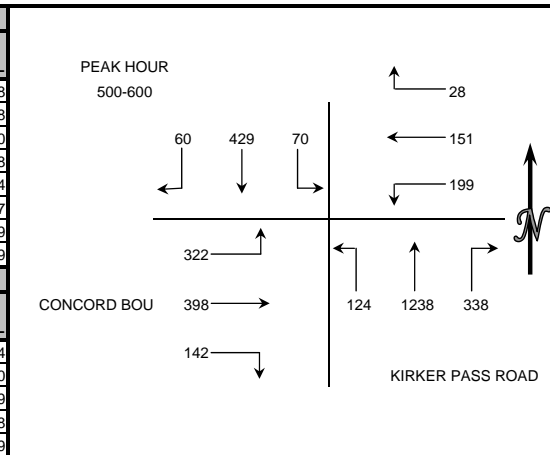
## INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: FEHR & PEERS  
 PROJECT: PITTSBURG AND CONCORD TRAFFIC COUNTS  
 DATE: WEDNESDAY JUNE 6, 2007  
 PERIODS: 7:00 AM TO 9:00 AM AND 4:00 PM TO 6:00 PM  
 INTERSECTION: N/S KIRKER PASS ROAD  
 E/W CONCORD BOULEVARD  
 CITY: CONCORD

15 MIN COUNTS														7:00 AM TO 9:00 AM
PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL	
700-715	66	313	2	36	132	80	12	68	27	22	23	6	787	
715-730	88	331	8	46	161	116	24	83	23	25	12	11	928	
730-745	61	336	29	16	140	107	36	95	24	19	22	12	897	
745-800	96	312	14	14	131	104	24	97	38	34	23	23	910	
800-815	32	247	8	10	104	82	37	91	29	20	35	22	717	
815-830	45	273	15	22	86	88	29	69	49	40	39	22	777	
830-845	46	273	11	19	69	71	30	56	29	44	30	13	691	
845-900	16	186	11	12	83	69	18	76	34	51	31	8	595	
HOUR TOTALS														
TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL	
700-800	311	1292	53	112	564	407	96	343	112	100	80	52	3522	
715-815	277	1226	59	86	536	409	121	366	114	98	92	68	3452	
730-830	234	1168	66	62	461	381	126	352	140	113	119	79	3301	
745-845	219	1105	48	65	390	345	120	313	145	138	127	80	3095	
800-900	139	979	45	63	342	310	114	292	141	155	135	65	2780	



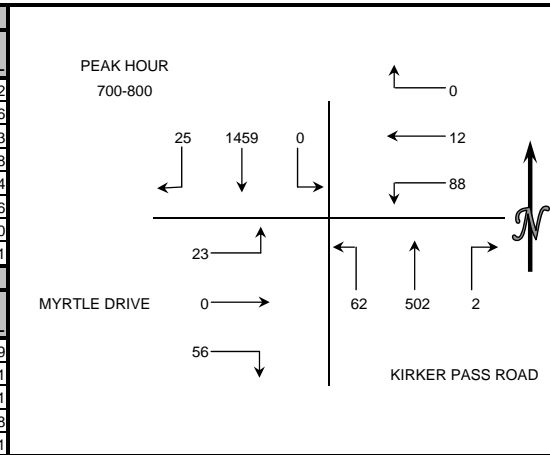
15 MIN COUNTS														4:00 PM TO 6:00 PM
PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL	
400-415	13	98	6	16	34	50	65	316	25	39	70	46	778	
415-430	24	115	16	21	44	55	69	339	50	58	96	71	958	
430-445	21	114	12	13	35	49	69	345	34	39	125	84	940	
445-500	11	101	18	1	41	39	60	296	31	23	80	47	748	
500-515	17	95	20	7	42	54	68	319	33	27	90	62	834	
515-530	9	107	21	2	34	60	93	337	25	33	101	85	907	
530-545	15	111	17	12	39	57	84	330	30	35	92	97	919	
545-600	19	116	12	7	36	28	93	252	36	47	115	78	839	
HOUR TOTALS														
TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL	
400-500	69	428	52	51	154	193	263	1296	140	159	371	248	3424	
415-515	73	425	66	42	162	197	266	1299	148	147	391	264	3480	
430-530	58	417	71	23	152	202	290	1297	123	122	396	278	3429	
445-545	52	414	76	22	156	210	305	1282	119	118	363	291	3408	
500-600	60	429	70	28	151	199	338	1238	124	142	398	322	3499	



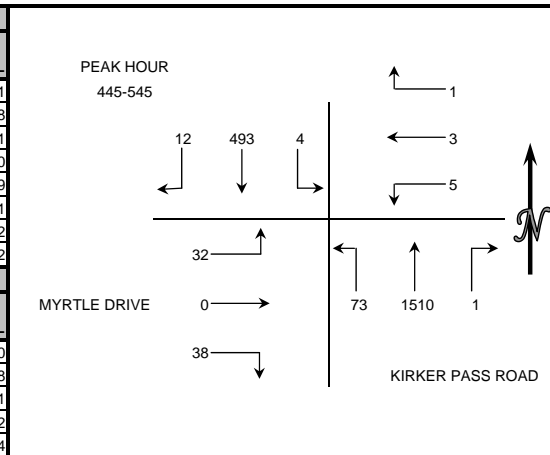
## INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: FEHR & PEERS  
 PROJECT: PITTSBURG AND CONCORD TRAFFIC COUNTS  
 DATE: WEDNESDAY JUNE 6, 2007  
 PERIODS: 7:00 AM TO 9:00 AM AND 4:00 PM TO 6:00 PM  
 INTERSECTION: N/S KIRKER PASS ROAD  
 E/W MYRTLE DRIVE  
 CITY: CONCORD

15 MIN COUNTS														7:00 AM TO 9:00 AM
PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL	
700-715	3	365	0	0	1	18	1	97	15	9	0	3	512	
715-730	4	375	0	0	2	21	1	143	9	14	0	7	576	
730-745	12	364	0	0	9	37	0	124	22	11	0	4	583	
745-800	6	355	0	0	0	12	0	138	16	22	0	9	558	
800-815	2	311	1	1	0	0	2	135	7	11	0	4	474	
815-830	7	313	0	0	0	0	1	123	7	12	0	3	466	
830-845	7	270	0	0	0	1	1	121	11	12	0	7	430	
845-900	4	198	0	0	0	0	2	100	18	9	0	0	331	
HOUR TOTALS														
TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL	
700-800	25	1459	0	0	12	88	2	502	62	56	0	23	2229	
715-815	24	1405	1	1	11	70	3	540	54	58	0	24	2191	
730-830	27	1343	1	1	9	49	3	520	52	56	0	20	2081	
745-845	22	1249	1	1	0	13	4	517	41	57	0	23	1928	
800-900	20	1092	1	1	0	1	6	479	43	44	0	14	1701	



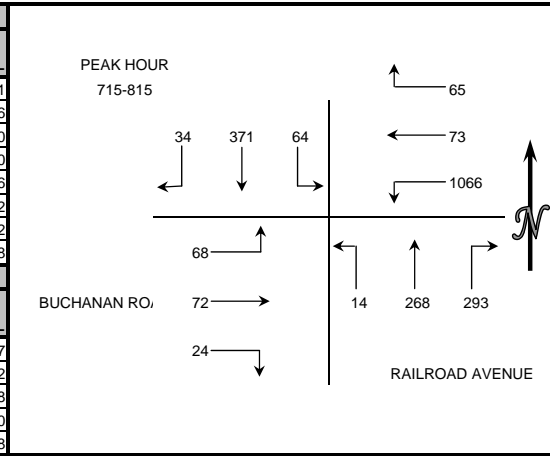
15 MIN COUNTS														4:00 PM TO 6:00 PM
PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL	
400-415	2	116	0	0	0	1	0	373	28	9	0	12	541	
415-430	1	114	0	0	0	2	0	343	14	5	0	9	488	
430-445	3	114	1	0	0	1	0	354	12	5	0	11	501	
445-500	3	128	1	0	0	2	1	389	18	10	0	8	560	
500-515	2	121	1	1	0	1	0	418	25	7	0	13	589	
515-530	7	125	1	0	2	2	0	352	20	6	0	6	521	
530-545	0	119	1	0	1	0	0	351	10	15	0	5	502	
545-600	1	123	0	0	0	1	1	332	15	5	0	4	482	
HOUR TOTALS														
TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL	
400-500	9	472	2	0	0	6	1	1459	72	29	0	40	2090	
415-515	9	477	3	1	0	6	1	1504	69	27	0	41	2138	
430-530	15	488	4	1	2	6	1	1513	75	28	0	38	2171	
445-545	12	493	4	1	3	5	1	1510	73	38	0	32	2172	
500-600	10	488	3	1	3	4	1	1453	70	33	0	28	2094	



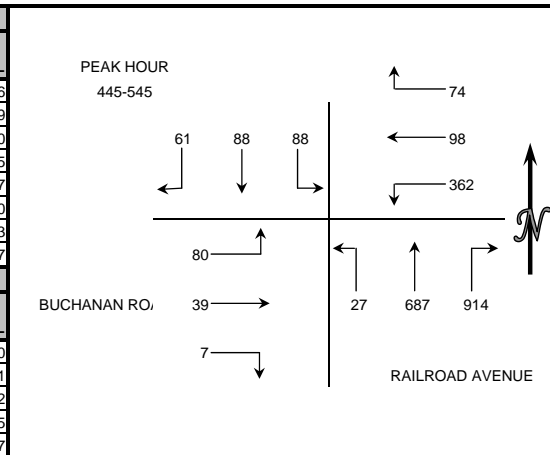
## INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: FEHR & PEERS  
 PROJECT: PITTSBURG AND CONCORD TRAFFIC COUNTS  
 DATE: WEDNESDAY JUNE 6, 2007  
 PERIODS: 7:00 AM TO 9:00 AM AND 4:00 PM TO 6:00 PM  
 INTERSECTION: N/S RAILROAD AVENUE  
 E/W BUCHANAN ROAD  
 CITY: PITTSBURG

15 MIN COUNTS														7:00 AM TO 9:00 AM
PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL	
700-715	6	89	4	15	26	254	59	47	5	16	6	14	541	
715-730	9	100	11	15	26	291	65	66	3	10	12	28	636	
730-745	8	94	25	19	15	271	71	62	5	5	22	13	610	
745-800	4	97	11	16	17	257	92	72	4	4	20	16	610	
800-815	13	80	17	15	15	247	65	68	2	5	18	11	556	
815-830	13	89	21	28	16	194	71	62	7	4	20	17	542	
830-845	16	90	20	21	14	173	51	50	2	5	28	12	482	
845-900	8	63	11	24	17	155	54	52	6	2	18	8	418	
HOUR TOTALS														
TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL	
700-800	27	380	51	65	84	1073	287	247	17	35	60	71	2397	
715-815	34	371	64	65	73	1066	293	268	14	24	72	68	2412	
730-830	38	360	74	78	63	969	299	264	18	18	80	57	2318	
745-845	46	356	69	80	62	871	279	252	15	18	86	56	2190	
800-900	50	322	69	88	62	769	241	232	17	16	84	48	1998	



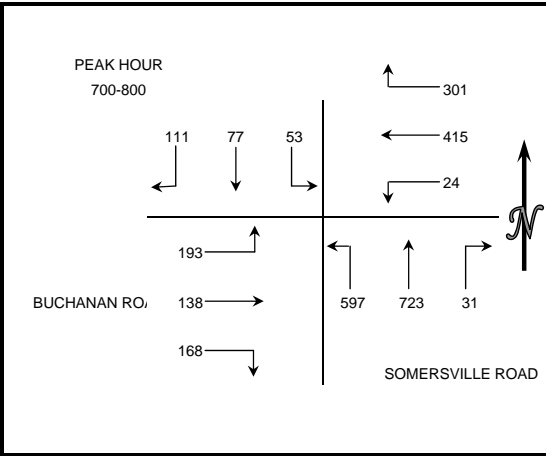
15 MIN COUNTS														4:00 PM TO 6:00 PM
PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL	
400-415	15	41	41	21	33	80	257	141	11	6	13	17	676	
415-430	11	24	24	27	30	85	204	115	2	3	17	17	559	
430-445	18	29	29	22	31	85	199	126	2	4	11	14	570	
445-500	13	25	25	25	24	95	254	154	8	1	8	23	655	
500-515	17	19	19	15	27	83	234	170	5	3	8	17	617	
515-530	13	24	24	22	21	89	219	196	6	2	16	18	650	
530-545	18	20	20	12	26	95	207	167	8	1	7	22	603	
545-600	16	18	18	20	24	111	170	121	6	4	29	30	567	
HOUR TOTALS														
TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL	
400-500	57	119	119	95	118	345	914	536	23	14	49	71	2460	
415-515	59	97	97	89	112	348	891	565	17	11	44	71	2401	
430-530	61	97	97	84	103	352	906	646	21	10	43	72	2492	
445-545	61	88	88	74	98	362	914	687	27	7	39	80	2525	
500-600	64	81	81	69	98	378	830	654	25	10	60	87	2437	



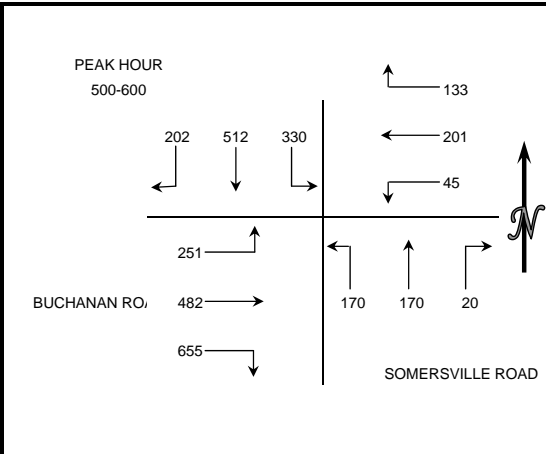
## INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: FEHR & PEERS  
 PROJECT: PITTSBURG AND CONCORD TRAFFIC COUNTS  
 DATE: WEDNESDAY JUNE 6, 2007  
 PERIODS: 7:00 AM TO 9:00 AM AND 4:00 PM TO 6:00 PM  
 INTERSECTION: N/S SOMERSVILLE ROAD  
 E/W BUCHANAN ROAD  
 CITY: PITTSBURG

15 MIN COUNTS														7:00 AM TO 9:00 AM
PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL	
700-715	20	18	13	80	113	6	12	175	153	34	16	31	671	
715-730	25	19	8	72	105	3	9	184	148	37	26	45	681	
730-745	34	24	10	79	116	6	6	194	161	48	55	64	797	
745-800	32	16	22	70	81	9	4	170	135	49	41	53	682	
800-815	21	22	26	60	88	5	1	169	138	18	39	44	631	
815-830	21	27	12	45	87	14	5	132	146	38	36	51	614	
830-845	32	26	17	45	79	3	1	116	120	38	46	56	579	
845-900	18	21	20	42	66	5	5	88	90	21	43	53	472	
HOUR TOTALS														
TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL	
700-800	111	77	53	301	415	24	31	723	597	168	138	193	2831	
715-815	112	81	66	281	390	23	20	717	582	152	161	206	2791	
730-830	108	89	70	254	372	34	16	665	580	153	171	212	2724	
745-845	106	91	77	220	335	31	11	587	539	143	162	204	2506	
800-900	92	96	75	192	320	27	12	505	494	115	164	204	2296	



15 MIN COUNTS														4:00 PM TO 6:00 PM
PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL	
400-415	60	98	82	34	48	10	7	40	44	139	132	76	770	
415-430	50	102	85	28	46	9	8	48	42	122	100	62	702	
430-445	59	122	84	32	48	14	1	55	43	144	125	79	806	
445-500	59	131	84	32	53	8	4	54	41	145	122	68	801	
500-515	48	122	84	28	68	5	4	42	41	151	114	40	747	
515-530	43	127	89	40	52	16	5	33	44	158	114	52	773	
530-545	55	123	84	37	34	13	4	58	47	186	125	77	843	
545-600	56	140	73	28	47	11	7	37	38	160	129	82	808	
HOUR TOTALS														
TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL	
400-500	228	453	335	126	195	41	20	197	170	550	479	285	3079	
415-515	216	477	337	120	215	36	17	199	167	562	461	249	3056	
430-530	209	502	341	132	221	43	14	184	169	598	475	239	3127	
445-545	205	503	341	137	207	42	17	187	173	640	475	237	3164	
500-600	202	512	330	133	201	45	20	170	170	655	482	251	3171	

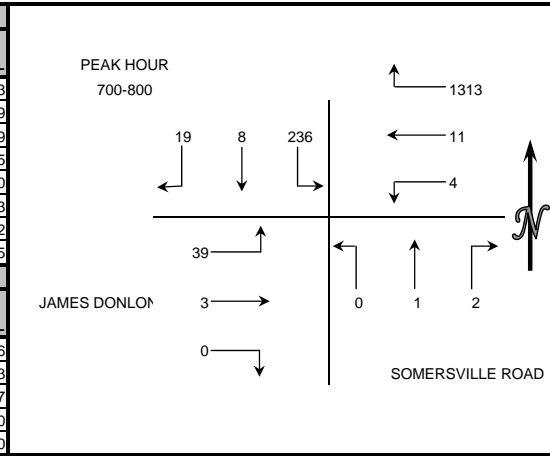




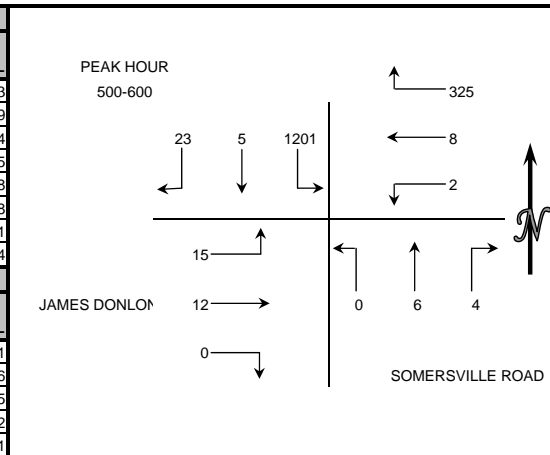
## INTERSECTION TURNING MOVEMENT COUNT SUMMARY

CLIENT: FEHR & PEERS  
 PROJECT: PITTSBURG AND CONCORD TRAFFIC COUNTS  
 DATE: WEDNESDAY JUNE 6, 2007  
 PERIODS: 7:00 AM TO 9:00 AM AND 4:00 PM TO 6:00 PM  
 INTERSECTION: N/S SOMERSVILLE ROAD  
 E/W JAMES DONLON BOULEVARD  
 CITY: PITTSBURG

15 MIN COUNTS														7:00 AM TO 9:00 AM
PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL	
700-715	8	1	52	337	3	0	0	0	0	0	1	11	413	
715-730	1	1	53	320	5	0	1	0	0	0	0	8	389	
730-745	5	1	59	341	2	0	1	1	0	0	0	9	419	
745-800	5	5	72	315	1	4	0	0	0	0	2	11	415	
800-815	8	1	58	320	2	7	1	0	0	0	0	3	400	
815-830	4	5	49	242	4	0	2	1	1	0	1	4	313	
830-845	5	0	65	232	3	0	0	0	0	0	1	6	312	
845-900	9	1	43	209	2	1	1	0	0	0	1	8	275	
HOUR TOTALS														
TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL	
700-800	19	8	236	1313	11	4	2	1	0	0	3	39	1636	
715-815	19	8	242	1296	10	11	3	1	0	0	2	31	1623	
730-830	22	12	238	1218	9	11	4	2	1	0	3	27	1547	
745-845	22	11	244	1109	10	11	3	1	1	0	4	24	1440	
800-900	26	7	215	1003	11	8	4	1	1	0	3	21	1300	



15 MIN COUNTS														4:00 PM TO 6:00 PM
PERIOD	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL	
400-415	7	2	250	79	3	2	3	0	0	0	4	3	353	
415-430	2	1	256	94	0	0	0	0	0	0	5	11	369	
430-445	4	0	266	92	1	1	2	3	0	0	1	4	374	
445-500	1	1	277	79	2	0	0	1	0	0	2	2	365	
500-515	6	2	284	95	1	0	0	1	0	0	5	4	398	
515-530	8	0	291	78	2	1	0	1	0	0	3	4	388	
530-545	4	2	305	66	1	1	2	4	0	0	2	4	391	
545-600	5	1	321	86	4	0	2	0	0	0	2	3	424	
HOUR TOTALS														
TIME	1 SBRT	2 SBTH	3 SBLT	4 WBRT	5 WBTH	6 WBLT	7 NBRT	8 NBTH	9 NBLT	10 EBRT	11 EBTH	12 EBLT	TOTAL	
400-500	14	4	1049	344	6	3	5	4	0	0	12	20	1461	
415-515	13	4	1083	360	4	1	2	5	0	0	13	21	1506	
430-530	19	3	1118	344	6	2	2	6	0	0	11	14	1525	
445-545	19	5	1157	318	6	2	2	7	0	0	12	14	1542	
500-600	23	5	1201	325	8	2	4	6	0	0	12	15	1601	



**APPENDIX B**  
**CCTALOS CALCULATION**  
**WORKSHEETS**

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #1 Concord Blvd / Kirker Pass Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.699
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 76 Level Of Service: B
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Concord Boulevard and Kirker Pass Road with various movement details.

Volume Module: Table showing traffic volume data including Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table showing Sat/Lane, Adjustment, Lanes, and Final Sat values.

Capacity Analysis Module: Table showing Vol/Sat, Crit Volume, and Crit Moves.

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #2 Myrtle Dr / Kirker Pass Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.337
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 34 Level Of Service: A
\*\*\*\*\*

Table with columns for Street Name (Myrtle Drive, Kirker Pass Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #3 Railroad Ave-Kirker Pass Rd / Buchanan Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.554
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 51 Level Of Service: A
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Railroad Avenue / Kirker Pass Road and Buchanan Road with various movement and control details.

Volume Module: Table showing traffic volume data including Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume across different movements.

Saturation Flow Module: Table showing saturation flow data including Sat/Lane, Adjustment, Lanes, and Final Sat. values for different movements.

Capacity Analysis Module: Table showing capacity analysis data including Vol/Sat, Crit Volume, and Crit Moves for different movements.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #4 Somersville Rd / Buchanan Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.798
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 113 Level Of Service: C
\*\*\*\*\*

Table with columns for Street Name (Somersville Road, Buchanan Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #8 Clayton Rd / Kirker Pass-Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.593
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 56 Level Of Service: A
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Clayton Road and Kirker Pass Road / Ygnacio Valley with various movement and control details.

Volume Module: Table showing traffic volume data including Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume across multiple lanes.

Saturation Flow Module: Table showing saturation flow data including Sat/Lane, Adjustment, Lanes, and Final Sat. values.

Capacity Analysis Module: Table showing capacity analysis data including Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #9 Alberta Way-Pine Hollow Dr / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.788
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 108 Level Of Service: C
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Alberta Way / Pine Hollow Drive and Ygnacio Valley Road with various movement details.

Volume Module: Table showing traffic volume data for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume across different movements.

Saturation Flow Module: Table showing saturation flow data for Sat/Lane, Adjustment, Lanes, and Final Sat. across different movements.

Capacity Analysis Module: Table showing capacity analysis data for Vol/Sat, Crit Volume, and Crit Moves across different movements.

\*\*\*\*\*



Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #10 Ayers Rd / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.935
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: E
\*\*\*\*\*

Table with columns for Street Name (Ayers Road, Ygnacio Valley Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #11 Cowell Rd / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.833
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 137 Level Of Service: D
\*\*\*\*\*

Table with columns for Street Name (Cowell Road, Ygnacio Valley Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #12 Clayton Rd / Treat Blvd-Denkinger Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.704
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 77 Level Of Service: C
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Clayton Road and Treat Boulevard / Denkinger Road with various movement and control details.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume. Rows include Clayton Road and Treat Boulevard / Denkinger Road.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat. Rows include Clayton Road and Treat Boulevard / Denkinger Road.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves. Rows include Clayton Road and Treat Boulevard / Denkinger Road.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #13 Cowell Rd / Treat Blvd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.834
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 137 Level Of Service: D
\*\*\*\*\*

Table with columns for Street Name (Cowell Road, Treat Boulevard), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table showing traffic volume data including Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table showing saturation flow data including Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table showing capacity analysis data including Vol/Sat, Crit Volume, and Crit Moves.

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #14 Oak Grove Rd / Treat Blvd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.960
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: E
\*\*\*\*\*

Table with columns for Street Name (Oak Grove Road, Treat Boulevard), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #1 Concord Blvd / Kirker Pass Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.645
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 64 Level Of Service: B
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Concord Boulevard and Kirker Pass Road with various movement details.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #2 Myrtle Dr / Kirker Pass Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.439
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 41 Level Of Service: A
\*\*\*\*\*

Table with columns for Street Name (Myrtle Drive, Kirker Pass Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #3 Railroad Ave-Kirker Pass Rd / Buchanan Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.638
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 63 Level Of Service: B
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Railroad Avenue / Kirker Pass Road and Buchanan Road with various movement and control details.

Volume Module: Table showing Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume across different movements.

Saturation Flow Module: Table showing Sat/Lane, Adjustment, Lanes, and Final Sat. values for different movements.

Capacity Analysis Module: Table showing Vol/Sat, Crit Volume, and Crit Moves for different movements.

\*\*\*\*\*



Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #4 Somersville Rd / Buchanan Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.744
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 89 Level Of Service: C
\*\*\*\*\*

Table with columns for Street Name (Somersville Road, Buchanan Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #8 Clayton Rd / Kirker Pass-Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.642
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 64 Level Of Service: B
\*\*\*\*\*

Street Name: Clayton Road Kirker Pass Road / Ygnacio Valley
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Control: Protected Protected Protected Protected
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0
Lanes: 2 0 2 1 0 2 0 3 0 1 2 0 3 0 1

Volume Module:
Base Vol: 215 391 111 550 840 23 144 1399 506 224 367 181
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 215 391 111 550 840 23 144 1399 506 224 367 181
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 215 391 111 550 840 23 144 1399 506 224 367 181
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 215 391 111 550 840 23 144 1399 506 224 367 181
RTOR Reduct: 0 0 0 0 0 23 0 0 118 0 0 181
RTOR Vol: 215 391 111 550 840 0 144 1399 388 224 367 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 215 391 111 550 840 0 144 1399 388 224 367 0

Saturation Flow Module:
Sat/Lane: 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650
Adjustment: 0.91 1.00 1.00 0.91 1.00 1.00 0.91 1.00 1.00 0.91 1.00 1.00
Lanes: 2.00 2.34 0.66 2.00 3.00 1.00 2.00 3.00 1.00 2.00 3.00 1.00
Final Sat.: 3000 3855 1095 3000 4950 1650 3000 4950 1650 3000 4950 1650

Capacity Analysis Module:
Vol/Sat: 0.07 0.10 0.10 0.18 0.17 0.00 0.05 0.28 0.24 0.07 0.07 0.00
Crit Volume: 167 275 466 112
Crit Moves: \*\*\*\* \*\*\*\* \*\*\*\* \*\*\*\*
\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #9 Alberta Way-Pine Hollow Dr / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.789
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 108 Level Of Service: C
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Alberta Way / Pine Hollow Drive and Ygnacio Valley Road with various movement and control details.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume. Rows list various adjustment factors and resulting volumes.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat. Rows show saturation flow values and adjustments for different lane configurations.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves. Rows provide capacity analysis metrics for the intersection.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #10 Ayers Rd / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.802
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 115 Level Of Service: D
\*\*\*\*\*

Table with columns for Street Name (Ayers Road, Ygnacio Valley Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #11 Cowell Rd / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.930
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: E
\*\*\*\*\*

Table with columns for Street Name (Cowell Road, Ygnacio Valley Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #12 Clayton Rd / Treat Blvd-Denkinger Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.745
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 89 Level Of Service: C
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Clayton Road and Treat Boulevard / Denkinge Road with various movement and control details.

Volume Module: Table showing traffic volume data including Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume across different movements.

Saturation Flow Module: Table showing saturation flow data including Sat/Lane, Adjustment, Lanes, and Final Sat. for various movements.

Capacity Analysis Module: Table showing capacity analysis data including Vol/Sat, Crit Volume, and Crit Moves for different movements.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #13 Cowell Rd / Treat Blvd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.748
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 90 Level Of Service: C
\*\*\*\*\*

Table with columns for Street Name (Cowell Road, Treat Boulevard), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #14 Oak Grove Rd / Treat Blvd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.775
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 101 Level Of Service: C
\*\*\*\*\*

Table with columns for Street Name (Oak Grove Road, Treat Boulevard), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control (Protected), Rights (Include), and various timing parameters like Min. Green, Y+R, and Lanes.

Volume Module: Table showing traffic volume data for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume across different movements.

Saturation Flow Module: Table showing saturation flow data for Sat/Lane, Adjustment, Lanes, and Final Sat. across different movements.

Capacity Analysis Module: Table showing capacity analysis data for Vol/Sat, Crit Volume, and Crit Moves across different movements.

\*\*\*\*\*



Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #1 Concord Blvd / Kirker Pass Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.810
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 120 Level Of Service: D
\*\*\*\*\*

Table with columns for Street Name (Concord Boulevard, Kirker Pass Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control (Protected), Rights (Include), and various timing parameters like Min. Green, Y+R, and Lanes.

Volume Module: Table showing traffic volume and adjustment factors for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table showing Sat/Lane, Adjustment, Lanes, and Final Sat. values.

Capacity Analysis Module: Table showing Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #2 Myrtle Dr / Kirker Pass Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.386
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 37 Level Of Service: A
\*\*\*\*\*

Table with columns for Street Name (Myrtle Drive, Kirker Pass Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #3 Railroad Ave-Kirker Pass Rd / Buchanan Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.642
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 64 Level Of Service: B
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Railroad Avenue / Kirker Pass Road and Buchanan Road with various movement and control details.

Volume Module: Table showing traffic volume data for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume across different movements.

Saturation Flow Module: Table showing saturation flow data for Sat/Lane, Adjustment, Lanes, and Final Sat. across different movements.

Capacity Analysis Module: Table showing capacity analysis data for Vol/Sat, Crit Volume, and Crit Moves across different movements.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #4 Somersville Rd / Buchanan Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 1.024
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: F
\*\*\*\*\*

Table with columns for Street Name (Somersville Road, Buchanan Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #6 Kirker Pass Rd / Kirker Pass-James Donlon Ext
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.584
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 55 Level Of Service: A
\*\*\*\*\*

Street Name: Kirker Pass Road Kirker Pass Road / James Donlon E
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Control: Protected Protected Protected Protected
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0
Lanes: 1 0 2 0 0 0 0 2 0 1 1 0 0 0 1 0 0 0 0 0

Volume Module:
Base Vol: 10 700 0 0 1670 50 160 0 40 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 10 700 0 0 1670 50 160 0 40 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 10 700 0 0 1670 50 160 0 40 0 0 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 10 700 0 0 1670 50 160 0 40 0 0 0
RTOR Reduct: 0 0 0 0 0 50 0 0 10 0 0 0
RTOR Vol: 10 700 0 0 1670 0 160 0 30 0 0 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 10 700 0 0 1670 0 160 0 30 0 0 0

Saturation Flow Module:
Sat/Lane: 1720 1720 1720 1720 1720 1720 1720 1720 1720 1720 1720 1720
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 2.00 0.00 0.00 2.00 1.00 1.00 0.00 1.00 0.00 0.00 0.00
Final Sat.: 1720 3440 0 0 3440 1720 1720 0 1720 0 0 0

Capacity Analysis Module:
Vol/Sat: 0.01 0.20 0.00 0.00 0.49 0.00 0.09 0.00 0.02 0.00 0.00 0.00
Crit Volume: 10 835 160 0
Crit Moves: \*\*\*\* \*\*\*\* \*\*\*\*
\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #8 Clayton Rd / Kirker Pass-Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.727
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 83 Level Of Service: C
\*\*\*\*\*

Street Name: Clayton Road Kirker Pass Road / Ygnacio Valley
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Control: Protected Protected Protected Protected
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0
Lanes: 2 0 2 1 0 2 0 3 0 1 2 0 3 0 1

Volume Module:
Base Vol: 440 1220 150 250 350 40 150 300 170 310 1130 660
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 440 1220 150 250 350 40 150 300 170 310 1130 660
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 440 1220 150 250 350 40 150 300 170 310 1130 660
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 440 1220 150 250 350 40 150 300 170 310 1130 660
RTOR Reduct: 0 0 0 0 0 40 0 0 170 0 0 138
RTOR Vol: 440 1220 150 250 350 0 150 300 0 310 1130 523
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 440 1220 150 250 350 0 150 300 0 310 1130 523

Saturation Flow Module:
Sat/Lane: 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650
Adjustment: 0.91 1.00 1.00 0.91 1.00 1.00 0.91 1.00 1.00 0.91 1.00 1.00
Lanes: 2.00 2.67 0.33 2.00 3.00 1.00 2.00 3.00 1.00 2.00 3.00 1.00
Final Sat.: 3000 4408 542 3000 4950 1650 3000 4950 1650 3000 4950 1650

Capacity Analysis Module:
Vol/Sat: 0.15 0.28 0.28 0.08 0.07 0.00 0.05 0.06 0.00 0.10 0.23 0.32
Crit Volume: 457 125 75 522
Crit Moves: \*\*\*\* \*\*

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #9 Alberta Way-Pine Hollow Dr / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.820
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 127 Level Of Service: D
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Alberta Way / Pine Hollow Drive and Ygnacio Valley Road with various movement details.

Volume Module: Table showing traffic volume data for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume across different movements.

Saturation Flow Module: Table showing saturation flow data for Sat/Lane, Adjustment, Lanes, and Final Sat. across different movements.

Capacity Analysis Module: Table showing capacity analysis data for Vol/Sat, Crit Volume, and Crit Moves across different movements.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #10 Ayers Rd / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.976
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: E
\*\*\*\*\*

Table with columns for Street Name (Ayers Road, Ygnacio Valley Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*



Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #11 Cowell Rd / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.908
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: E
\*\*\*\*\*

Table with columns for Street Name (Cowell Road, Ygnacio Valley Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #12 Clayton Rd / Treat Blvd-Denkinger Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.745
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 89 Level Of Service: C
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Clayton Road and Treat Boulevard / Denkinger Road with various movement and control details.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume. Rows list various volume and adjustment factors.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat. Rows list saturation flow and adjustment values.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves. Rows list capacity analysis results.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #13 Cowell Rd / Treat Blvd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.852
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 154 Level Of Service: D
\*\*\*\*\*

Table with columns for Street Name (Cowell Road, Treat Boulevard), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #14 Oak Grove Rd / Treat Blvd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 1.055
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: F
\*\*\*\*\*

Table with columns for Street Name (Oak Grove Road, Treat Boulevard), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table showing Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume for each approach.

Saturation Flow Module: Table showing Sat/Lane, Adjustment, Lanes, and Final Sat. for each approach.

Capacity Analysis Module: Table showing Vol/Sat, Crit Volume, and Crit Moves for each approach.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #1 Concord Blvd / Kirker Pass Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.727
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 84 Level Of Service: C
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Concord Boulevard and Kirker Pass Road with various movement and control details.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume. Rows list various volume and adjustment factors.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat. Rows show saturation flow and adjustment values.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves. Rows show capacity analysis results.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #2 Myrtle Dr / Kirker Pass Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.453
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 42 Level Of Service: A
\*\*\*\*\*

Table with columns for Street Name (Myrtle Drive, Kirker Pass Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #3 Railroad Ave-Kirker Pass Rd / Buchanan Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.694
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 74 Level Of Service: B
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Railroad Avenue / Kirker Pass Road and Buchanan Road with various movement and control details.

Volume Module: Table showing Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume across different movements.

Saturation Flow Module: Table showing Sat/Lane, Adjustment, Lanes, and Final Sat. values for different movements.

Capacity Analysis Module: Table showing Vol/Sat, Crit Volume, and Crit Moves for different movements.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #4 Somersville Rd / Buchanan Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.876
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: D
\*\*\*\*\*

Table with columns for Street Name (Somersville Road, Buchanan Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*



Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #6 Kirker Pass Rd / Kirker Pass-James Donlon Ext
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.520
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 48 Level Of Service: A
\*\*\*\*\*

Street Name: Kirker Pass Road Kirker Pass Road / James Donlon E
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Control: Protected Protected Protected Protected
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0
Lanes: 1 0 2 0 0 0 0 2 0 1 1 0 0 0 1 0 0 0 0 0

Volume Module:
Base Vol: 40 1590 0 0 700 170 100 0 30 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 40 1590 0 0 700 170 100 0 30 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 40 1590 0 0 700 170 100 0 30 0 0 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 40 1590 0 0 700 170 100 0 30 0 0 0
RTOR Reduct: 0 0 0 0 0 100 0 0 30 0 0 0
RTOR Vol: 40 1590 0 0 700 70 100 0 0 0 0 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 40 1590 0 0 700 70 100 0 0 0 0 0

Saturation Flow Module:
Sat/Lane: 1720 1720 1720 1720 1720 1720 1720 1720 1720 1720 1720 1720
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 2.00 0.00 0.00 2.00 1.00 1.00 0.00 1.00 0.00 0.00 0.00
Final Sat.: 1720 3440 0 0 3440 1720 1720 0 1720 0 0 0

Capacity Analysis Module:
Vol/Sat: 0.02 0.46 0.00 0.00 0.20 0.04 0.06 0.00 0.00 0.00 0.00 0.00
Crit Volume: 795 0 100 0
Crit Moves: \*\*\*\* \*\*\*\* \*\*\*\*

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #8 Clayton Rd / Kirker Pass-Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.699
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 76 Level Of Service: B
\*\*\*\*\*

Street Name: Clayton Road Kirker Pass Road / Ygnacio Valley
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Control: Protected Protected Protected Protected
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0
Lanes: 2 0 2 1 0 2 0 3 0 1 2 0 3 0 1

Volume Module:
Base Vol: 220 420 140 590 890 30 160 1430 510 300 410 250
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 220 420 140 590 890 30 160 1430 510 300 410 250
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 220 420 140 590 890 30 160 1430 510 300 410 250
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 220 420 140 590 890 30 160 1430 510 300 410 250
RTOR Reduct: 0 0 0 0 0 30 0 0 121 0 0 250
RTOR Vol: 220 420 140 590 890 0 160 1430 389 300 410 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 220 420 140 590 890 0 160 1430 389 300 410 0

Saturation Flow Module:
Sat/Lane: 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650
Adjustment: 0.91 1.00 1.00 0.91 1.00 1.00 0.91 1.00 1.00 0.91 1.00 1.00
Lanes: 2.00 2.25 0.75 2.00 3.00 1.00 2.00 3.00 1.00 2.00 3.00 1.00
Final Sat.: 3000 3713 1238 3000 4950 1650 3000 4950 1650 3000 4950 1650

Capacity Analysis Module:
Vol/Sat: 0.07 0.11 0.11 0.20 0.18 0.00 0.05 0.29 0.24 0.10 0.08 0.00
Crit Volume: 187 295 477 150
Crit Moves: \*\*\*\* \*\*\*\* \*\*\*\* \*\*\*\*

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #9 Alberta Way-Pine Hollow Dr / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.843
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 145 Level Of Service: D
\*\*\*\*\*

Street Name: Alberta Way / Pine Hollow Drive Ygnacio Valley Road
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Control: Protected Protected Protected Protected
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0
Lanes: 2 0 0 1 0 1 0 1 0 1 1 0 2 0 1 1 0 2 0 1

Volume Module:
Base Vol: 210 170 50 60 190 60 110 2050 440 60 630 30
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 210 170 50 60 190 60 110 2050 440 60 630 30
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 210 170 50 60 190 60 110 2050 440 60 630 30
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 210 170 50 60 190 60 110 2050 440 60 630 30
RTOR Reduct: 0 0 0 0 0 60 0 0 116 0 0 30
RTOR Vol: 210 170 50 60 190 0 110 2050 325 60 630 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 210 170 50 60 190 0 110 2050 325 60 630 0

Saturation Flow Module:
Sat/Lane: 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650
Adjustment: 0.91 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 2.00 0.77 0.23 1.00 1.00 1.00 1.00 2.00 1.00 1.00 2.00 1.00
Final Sat.: 3000 1275 375 1650 1650 1650 1650 3300 1650 1650 3300 1650

Capacity Analysis Module:
Vol/Sat: 0.07 0.13 0.13 0.04 0.12 0.00 0.07 0.62 0.20 0.04 0.19 0.00
Crit Volume: 105 190 1025 60
Crit Moves: \*\*\*\* \*\*\*\* \*\*\*\* \*\*\*\*
\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #10 Ayers Rd / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.833
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 137 Level Of Service: D
\*\*\*\*\*

Table with columns for Street Name (Ayers Road, Ygnacio Valley Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #11 Cowell Rd / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.980
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: E
\*\*\*\*\*

Table with columns for Street Name (Cowell Road, Ygnacio Valley Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #12 Clayton Rd / Treat Blvd-Denkinger Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.776
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 102 Level Of Service: C
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Clayton Road and Treat Boulevard / Denkinger Road with various movement and control details.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume. Rows list various volume and adjustment factors.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat. Rows list saturation flow and adjustment values.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves. Rows list capacity analysis results.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #13 Cowell Rd / Treat Blvd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.775
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 101 Level Of Service: C
\*\*\*\*\*

Table with columns for Street Name (Cowell Road, Treat Boulevard), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #14 Oak Grove Rd / Treat Blvd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.817
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 125 Level Of Service: D
\*\*\*\*\*

Table with columns for Street Name (Oak Grove Road, Treat Boulevard), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*



Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #1 Concord Blvd / Kirker Pass Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.820
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 127 Level Of Service: D
\*\*\*\*\*

Table with columns for Street Name (Concord Boulevard, Kirker Pass Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #2 Myrtle Dr / Kirker Pass Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.388
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 37 Level Of Service: A
\*\*\*\*\*

Table with columns for Street Name (Myrtle Drive, Kirker Pass Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #3 Railroad Ave-Kirker Pass Rd / Buchanan Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.366
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 36 Level Of Service: A
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include North Bound, South Bound, East Bound, and West Bound movements.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #4 Somersville Rd / Buchanan Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.633
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 62 Level Of Service: B
\*\*\*\*\*

Table with columns for Street Name (Somersville Road, Buchanan Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #5 Somersville Rd / James Donlon Blvd [With Project (signalized)]
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.511
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 47 Level Of Service: A
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Somersville Road and James Donlon Boulevard with various movement and control details.

Volume Module: Table showing traffic volume data including Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table showing saturation flow data including Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table showing capacity analysis data including Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #6 Kirker Pass Rd / Kirker Pass-James Donlon Ext
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.567
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 53 Level Of Service: A
\*\*\*\*\*

Street Name: Kirker Pass Road Kirker Pass Road / James Donlon E
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Control: Protected Protected Protected Protected
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0
Lanes: 1 0 2 0 1 1 0 2 0 1 1 0 1 0 1

Volume Module:
Base Vol: 10 310 360 20 760 40 120 40 40 920 10 130
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 10 310 360 20 760 40 120 40 40 920 10 130
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 10 310 360 20 760 40 120 40 40 920 10 130
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 10 310 360 20 760 40 120 40 40 920 10 130
RTOR Reduct: 0 0 360 0 0 40 0 0 10 0 0 20
RTOR Vol: 10 310 0 20 760 0 120 40 30 920 10 110
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 10 310 0 20 760 0 120 40 30 920 10 110

Saturation Flow Module:
Sat/Lane: 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.91 1.00 1.00
Lanes: 1.00 2.00 1.00 1.00 2.00 1.00 1.00 1.00 1.00 2.00 1.00 1.00
Final Sat.: 1650 3300 1650 1650 3300 1650 1650 1650 1650 3000 1650 1650

Capacity Analysis Module:
Vol/Sat: 0.01 0.09 0.00 0.01 0.23 0.00 0.07 0.02 0.02 0.31 0.01 0.07
Crit Volume: 10 380 40 460
Crit Moves: \*\*\*\* \*\*\*\* \*\*\*\* \*\*\*\*
\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #7 Ventura Dr / James Donlon Ext
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.406
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 38 Level Of Service: A
\*\*\*\*\*

Table with columns for Street Name (Ventura Drive, James Donlon Extension), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #8 Clayton Rd / Kirker Pass-Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.747
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 90 Level Of Service: C
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Clayton Road and Kirker Pass Road / Ygnacio Valley with various movement and control details.

Volume Module: Table showing traffic volume data including Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume across different approaches.

Saturation Flow Module: Table showing saturation flow data including Sat/Lane, Adjustment, Lanes, and Final Sat. for different approaches.

Capacity Analysis Module: Table showing capacity analysis data including Vol/Sat, Crit Volume, and Crit Moves for different approaches.

\*\*\*\*\*



Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #9 Alberta Way-Pine Hollow Dr / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.832
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 136 Level Of Service: D
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Alberta Way / Pine Hollow Drive and Ygnacio Valley Road with various movement and control details.

Volume Module: Table showing traffic volume and adjustment factors for various movements and lanes, including Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table showing saturation flow rates and adjustment factors for different lane configurations and traffic conditions.

Capacity Analysis Module: Table showing volume-to-saturation ratios, critical volumes, and critical moves for the intersection.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #10 Ayers Rd / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.985
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: E
\*\*\*\*\*

Table with columns for Street Name (Ayers Road, Ygnacio Valley Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #11 Cowell Rd / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.915
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: E
\*\*\*\*\*

Table with columns for Street Name (Cowell Road, Ygnacio Valley Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #12 Clayton Rd / Treat Blvd-Denkinger Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.746
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 90 Level Of Service: C
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Clayton Road and Treat Boulevard / Denkinge Road with various movement and control details.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume. Rows list various volume and adjustment factors.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat. Rows show saturation flow and adjustment values.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves. Rows show capacity analysis results.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #13 Cowell Rd / Treat Blvd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.855
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 157 Level Of Service: D
\*\*\*\*\*

Table with columns for Street Name (Cowell Road, Treat Boulevard), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #14 Oak Grove Rd / Treat Blvd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 1.057
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: F
\*\*\*\*\*

Table with columns for Street Name (Oak Grove Road, Treat Boulevard), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #1 Concord Blvd / Kirker Pass Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.763
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 96 Level Of Service: C
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Concord Boulevard and Kirker Pass Road with various movement details.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #2 Myrtle Dr / Kirker Pass Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.491
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 45 Level Of Service: A
\*\*\*\*\*

Table with columns for Street Name (Myrtle Drive, Kirker Pass Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*



Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #3 Railroad Ave-Kirker Pass Rd / Buchanan Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.398
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 38 Level Of Service: A
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include North Bound, South Bound, East Bound, and West Bound movements.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #4 Somersville Rd / Buchanan Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.536
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 49 Level Of Service: A
\*\*\*\*\*

Table with columns for Street Name (Somersville Road, Buchanan Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #5 Somersville Rd / James Donlon Blvd [With Project (signalized)]
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.697
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 75 Level Of Service: B
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Somersville Road and James Donlon Boulevard with various movement details.

Volume Module: Table showing Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume across different approaches.

Saturation Flow Module: Table showing Sat/Lane, Adjustment, Lanes, and Final Sat. values for different approaches.

Capacity Analysis Module: Table showing Vol/Sat, Crit Volume, and Crit Moves for different approaches.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #6 Kirker Pass Rd / Kirker Pass-James Donlon Ext
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.606
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 58 Level Of Service: B
\*\*\*\*\*

Street Name: Kirker Pass Road Kirker Pass Road / James Donlon E
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Control: Protected Protected Protected Protected
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0
Lanes: 1 0 2 0 1 1 0 2 0 1 1 0 1 0 1

Volume Module:
Base Vol: 40 660 950 20 320 130 70 30 30 480 50 40
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 40 660 950 20 320 130 70 30 30 480 50 40
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 40 660 950 20 320 130 70 30 30 480 50 40
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 40 660 950 20 320 130 70 30 30 480 50 40
RTOR Reduct: 0 0 264 0 0 70 0 0 30 0 0 20
RTOR Vol: 40 660 686 20 320 60 70 30 0 480 50 20
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 40 660 686 20 320 60 70 30 0 480 50 20

Saturation Flow Module:
Sat/Lane: 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.91 1.00 1.00
Lanes: 1.00 2.00 1.00 1.00 2.00 1.00 1.00 1.00 1.00 2.00 1.00 1.00
Final Sat.: 1650 3300 1650 1650 3300 1650 1650 1650 1650 3000 1650 1650

Capacity Analysis Module:
Vol/Sat: 0.02 0.20 0.42 0.01 0.10 0.04 0.04 0.02 0.00 0.16 0.03 0.01
Crit Volume: 686 20 30 240
Crit Moves: \*\*\*\* \*\*

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #7 Ventura Dr / James Donlon Ext
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.412
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 39 Level Of Service: A
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Ventura Drive and James Donlon Extension with North, South, East, and West bound movements.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #8 Clayton Rd / Kirker Pass-Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.726
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 83 Level Of Service: C
\*\*\*\*\*

Street Name: Clayton Road Kirker Pass Road / Ygnacio Valley
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Control: Protected Protected Protected Protected
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0
Lanes: 2 0 2 1 0 2 0 3 0 1 2 0 3 0 1

Volume Module:
Base Vol: 220 440 140 620 890 30 150 1480 510 310 450 290
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 220 440 140 620 890 30 150 1480 510 310 450 290
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 220 440 140 620 890 30 150 1480 510 310 450 290
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 220 440 140 620 890 30 150 1480 510 310 450 290
RTOR Reduct: 0 0 0 0 0 30 0 0 121 0 0 290
RTOR Vol: 220 440 140 620 890 0 150 1480 389 310 450 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 220 440 140 620 890 0 150 1480 389 310 450 0

Saturation Flow Module:
Sat/Lane: 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650
Adjustment: 0.91 1.00 1.00 0.91 1.00 1.00 0.91 1.00 1.00 0.91 1.00 1.00
Lanes: 2.00 2.28 0.72 2.00 3.00 1.00 2.00 3.00 1.00 2.00 3.00 1.00
Final Sat.: 3000 3755 1195 3000 4950 1650 3000 4950 1650 3000 4950 1650

Capacity Analysis Module:
Vol/Sat: 0.07 0.12 0.12 0.21 0.18 0.00 0.05 0.30 0.24 0.10 0.09 0.00
Crit Volume: 193 310 493 155
Crit Moves: \*\*\*\* \*\*\*\* \*\*\*\* \*\*\*\*

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #9 Alberta Way-Pine Hollow Dr / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.852
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 154 Level Of Service: D
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Alberta Way / Pine Hollow Drive and Ygnacio Valley Road with various movement and control details.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume. Rows list various adjustment factors and resulting volumes.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat. Rows show saturation flow values and adjustments for different lane configurations.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves. Rows provide capacity analysis metrics for the intersection.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #10 Ayers Rd / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.842
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 145 Level Of Service: D
\*\*\*\*\*

Table with columns for Street Name (Ayers Road, Ygnacio Valley Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*



Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #11 Cowell Rd / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.990
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: E
\*\*\*\*\*

Table with columns for Street Name (Cowell Road, Ygnacio Valley Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #12 Clayton Rd / Treat Blvd-Denkinger Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.787
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 107 Level Of Service: C
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Clayton Road and Treat Boulevard / Denkinger Road with various movement and control details.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume. Rows list various volume and adjustment factors.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat. Rows list saturation flow and adjustment values.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves. Rows list capacity analysis results.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #13 Cowell Rd / Treat Blvd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.778
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 103 Level Of Service: C
\*\*\*\*\*

Table with columns for Street Name (Cowell Road, Treat Boulevard), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #14 Oak Grove Rd / Treat Blvd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.822
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 128 Level Of Service: D
\*\*\*\*\*

Table with columns for Street Name (Oak Grove Road, Treat Boulevard), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #1 Concord Blvd / Kirker Pass Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.929
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: E
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Concord Boulevard and Kirker Pass Road with various movement details.

Volume Module: Table showing traffic volume data including Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table showing saturation flow data including Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table showing capacity analysis data including Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #2 Myrtle Dr / Kirker Pass Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.388
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 37 Level Of Service: A
\*\*\*\*\*

Table with columns for Street Name (Myrtle Drive, Kirker Pass Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #3 Railroad Ave-Kirker Pass Rd / Buchanan Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.787
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 107 Level Of Service: C
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Railroad Avenue / Kirker Pass Road and Buchanan Road with various movement and control details.

Volume Module: Table showing traffic volume and adjustment factors for different movements and approaches.

Saturation Flow Module: Table showing saturation flow rates and adjustment factors for different lanes and approaches.

Capacity Analysis Module: Table showing volume-to-saturation ratios, critical volumes, and critical moves for different movements.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #4 Somersville Rd / Buchanan Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 1.061
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: F
\*\*\*\*\*

Table with columns for Street Name (Somersville Road, Buchanan Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*



Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #6 Kirker Pass Rd / Kirker Pass-James Donlon Ext
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.605
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 58 Level Of Service: B
\*\*\*\*\*

Street Name: Kirker Pass Road Kirker Pass Road / James Donlon E
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Control: Protected Protected Protected Protected
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0
Lanes: 1 0 2 0 0 0 0 2 0 1 1 0 0 0 1 0 0 0 0 0

Volume Module:
Base Vol: 10 1040 0 0 1740 50 160 0 40 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 10 1040 0 0 1740 50 160 0 40 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 10 1040 0 0 1740 50 160 0 40 0 0 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 10 1040 0 0 1740 50 160 0 40 0 0 0
RTOR Reduct: 0 0 0 0 0 50 0 0 10 0 0 0
RTOR Vol: 10 1040 0 0 1740 0 160 0 30 0 0 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 10 1040 0 0 1740 0 160 0 30 0 0 0

Saturation Flow Module:
Sat/Lane: 1720 1720 1720 1720 1720 1720 1720 1720 1720 1720 1720 1720
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 2.00 0.00 0.00 2.00 1.00 1.00 0.00 1.00 0.00 0.00 0.00
Final Sat.: 1720 3440 0 0 3440 1720 1720 0 1720 0 0 0

Capacity Analysis Module:
Vol/Sat: 0.01 0.30 0.00 0.00 0.51 0.00 0.09 0.00 0.02 0.00 0.00 0.00
Crit Volume: 10 870 160 0
Crit Moves: \*\*\*\* \*\*\*\* \*\*\*\*
\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #8 Clayton Rd / Kirker Pass-Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.829
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 133 Level Of Service: D
\*\*\*\*\*

Street Name: Clayton Road Kirker Pass Road / Ygnacio Valley
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Control: Protected Protected Protected Protected
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0
Lanes: 2 0 2 1 0 2 0 3 0 1 2 0 3 0 1

Volume Module:
Base Vol: 640 1240 170 330 440 70 160 400 180 280 1540 810
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 640 1240 170 330 440 70 160 400 180 280 1540 810
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 640 1240 170 330 440 70 160 400 180 280 1540 810
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 640 1240 170 330 440 70 160 400 180 280 1540 810
RTOR Reduct: 0 0 0 0 0 70 0 0 180 0 0 182
RTOR Vol: 640 1240 170 330 440 0 160 400 0 280 1540 629
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 640 1240 170 330 440 0 160 400 0 280 1540 629

Saturation Flow Module:
Sat/Lane: 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650
Adjustment: 0.91 1.00 1.00 0.91 1.00 1.00 0.91 1.00 1.00 0.91 1.00 1.00
Lanes: 2.00 2.64 0.36 2.00 3.00 1.00 2.00 3.00 1.00 2.00 3.00 1.00
Final Sat.: 3000 4353 597 3000 4950 1650 3000 4950 1650 3000 4950 1650

Capacity Analysis Module:
Vol/Sat: 0.21 0.28 0.28 0.11 0.09 0.00 0.05 0.08 0.00 0.09 0.31 0.38
Crit Volume: 470 165 80 629
Crit Moves: \*\*\*\* \*\*

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #9 Alberta Way-Pine Hollow Dr / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.861
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 164 Level Of Service: D
\*\*\*\*\*

Street Name: Alberta Way / Pine Hollow Drive Ygnacio Valley Road
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Control: Protected Protected Protected Protected
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0
Lanes: 2 0 0 1 0 1 0 1 0 1 1 0 3 0 1 1 0 3 0 1

Volume Module:
Base Vol: 680 310 50 130 130 270 100 580 270 70 2330 50
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 680 310 50 130 130 270 100 580 270 70 2330 50
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 680 310 50 130 130 270 100 580 270 70 2330 50
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 680 310 50 130 130 270 100 580 270 70 2330 50
RTOR Reduct: 0 0 0 0 0 100 0 0 270 0 0 50
RTOR Vol: 680 310 50 130 130 170 100 580 0 70 2330 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 680 310 50 130 130 170 100 580 0 70 2330 0

Saturation Flow Module:
Sat/Lane: 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650
Adjustment: 0.91 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 2.00 0.86 0.14 1.00 1.00 1.00 1.00 3.00 1.00 1.00 3.00 1.00
Final Sat.: 3000 1421 229 1650 1650 1650 1650 4950 1650 1650 4950 1650

Capacity Analysis Module:
Vol/Sat: 0.23 0.22 0.22 0.08 0.08 0.10 0.06 0.12 0.00 0.04 0.47 0.00
Crit Volume: 340 170 100 777
Crit Moves: \*\*\*\* \*\*\*\* \*\*\*\* \*\*\*\*
\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #10 Ayers Rd / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.984
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: E
\*\*\*\*\*

Table with columns for Street Name (Ayers Road, Ygnacio Valley Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #11 Cowell Rd / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.864
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 167 Level Of Service: D
\*\*\*\*\*

Table with columns for Street Name (Cowell Road, Ygnacio Valley Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #12 Clayton Rd / Treat Blvd-Denkinger Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.991
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: E
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Clayton Road and Treat Boulevard / Denkinge Road with various movement details.

Volume Module: Table showing traffic volume adjustments including Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table showing saturation flow values for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table showing Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #13 Cowell Rd / Treat Blvd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 1.004
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: F
\*\*\*\*\*

Table with columns for Street Name (Cowell Road, Treat Boulevard), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #14 Oak Grove Rd / Treat Blvd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 1.266
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: F
\*\*\*\*\*

Table with columns for Street Name (Oak Grove Road, Treat Boulevard), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table showing Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume for each movement.

Saturation Flow Module: Table showing Sat/Lane, Adjustment, Lanes, and Final Sat. for each movement.

Capacity Analysis Module: Table showing Vol/Sat, Crit Volume, and Crit Moves for each movement.

\*\*\*\*\*



Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #1 Concord Blvd / Kirker Pass Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.859
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 161 Level Of Service: D
\*\*\*\*\*

Table with columns for Street Name (Concord Boulevard, Kirker Pass Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control (Protected), Rights (Include), and various timing parameters like Min. Green, Y+R, and Lanes.

Volume Module: Table showing Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume across different approaches.

Saturation Flow Module: Table showing Sat/Lane, Adjustment, Lanes, and Final Sat. for each approach.

Capacity Analysis Module: Table showing Vol/Sat, Crit Volume, and Crit Moves for each approach.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #2 Myrtle Dr / Kirker Pass Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.584
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 55 Level Of Service: A
\*\*\*\*\*

Table with columns for Street Name (Myrtle Drive, Kirker Pass Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #3 Railroad Ave-Kirker Pass Rd / Buchanan Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.833
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 137 Level Of Service: D
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Railroad Avenue / Kirker Pass Road and Buchanan Road with various movement and control details.

Volume Module: Table showing traffic volume adjustments including Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table showing saturation flow values for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table showing capacity analysis values for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #4 Somersville Rd / Buchanan Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 1.048
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: F
\*\*\*\*\*

Table with columns for Street Name (Somersville Road, Buchanan Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #6 Kirker Pass Rd / Kirker Pass-James Donlon Ext
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.625
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 61 Level Of Service: B
\*\*\*\*\*

Street Name: Kirker Pass Road Kirker Pass Road / James Donlon E
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Control: Protected Protected Protected Protected
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0
Lanes: 1 0 2 0 0 0 0 2 0 1 1 0 0 0 1 0 0 0 0 0

Volume Module:
Base Vol: 40 1950 0 0 1320 170 100 0 30 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 40 1950 0 0 1320 170 100 0 30 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 40 1950 0 0 1320 170 100 0 30 0 0 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 40 1950 0 0 1320 170 100 0 30 0 0 0
RTOR Reduct: 0 0 0 0 0 100 0 0 30 0 0 0
RTOR Vol: 40 1950 0 0 1320 70 100 0 0 0 0 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 40 1950 0 0 1320 70 100 0 0 0 0 0

Saturation Flow Module:
Sat/Lane: 1720 1720 1720 1720 1720 1720 1720 1720 1720 1720 1720 1720
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 1.00 2.00 0.00 0.00 2.00 1.00 1.00 0.00 1.00 0.00 0.00 0.00
Final Sat.: 1720 3440 0 0 3440 1720 1720 0 1720 0 0 0

Capacity Analysis Module:
Vol/Sat: 0.02 0.57 0.00 0.00 0.38 0.04 0.06 0.00 0.00 0.00 0.00 0.00
Crit Volume: 975 0 100 0
Crit Moves: \*\*\*\* \*\*\*\* \*\*\*\*
\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #8 Clayton Rd / Kirker Pass-Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.888
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: D
\*\*\*\*\*

Street Name: Clayton Road Kirker Pass Road / Ygnacio Valley
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Control: Protected Protected Protected Protected
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0
Lanes: 2 0 2 1 0 2 0 3 0 1 2 0 3 0 1

Volume Module:
Base Vol: 260 480 140 810 1040 40 240 1860 720 350 650 340
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 260 480 140 810 1040 40 240 1860 720 350 650 340
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 260 480 140 810 1040 40 240 1860 720 350 650 340
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 260 480 140 810 1040 40 240 1860 720 350 650 340
RTOR Reduct: 0 0 0 0 0 40 0 0 143 0 0 340
RTOR Vol: 260 480 140 810 1040 0 240 1860 577 350 650 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 260 480 140 810 1040 0 240 1860 577 350 650 0

Saturation Flow Module:
Sat/Lane: 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650
Adjustment: 0.91 1.00 1.00 0.91 1.00 1.00 0.91 1.00 1.00 0.91 1.00 1.00
Lanes: 2.00 2.32 0.68 2.00 3.00 1.00 2.00 3.00 1.00 2.00 3.00 1.00
Final Sat.: 3000 3832 1118 3000 4950 1650 3000 4950 1650 3000 4950 1650

Capacity Analysis Module:
Vol/Sat: 0.09 0.13 0.13 0.27 0.21 0.00 0.08 0.38 0.35 0.12 0.13 0.00
Crit Volume: 207 405 620 175
Crit Moves: \*\*\*\* \*\*\*\* \*\*\*\* \*\*\*\*

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #9 Alberta Way-Pine Hollow Dr / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.803
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 116 Level Of Service: D
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Alberta Way / Pine Hollow Drive and Ygnacio Valley Road with various movement details.

Volume Module: Table showing traffic volume and adjustment factors for various movements and lanes.

Saturation Flow Module: Table showing saturation flow rates and adjustment factors for different lane configurations.

Capacity Analysis Module: Table showing volume-to-saturation ratios, critical volumes, and critical moves for each movement.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #10 Ayers Rd / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.733
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 85 Level Of Service: C
\*\*\*\*\*

Table with columns for Street Name (Ayers Road, Ygnacio Valley Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*



Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #11 Cowell Rd / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.965
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: E
\*\*\*\*\*

Table with columns for Street Name (Cowell Road, Ygnacio Valley Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #12 Clayton Rd / Treat Blvd-Denkinger Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 1.020
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: F
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Clayton Road and Treat Boulevard / Denkinge Road with various movement and control details.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume. Rows list various volume and adjustment factors.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat. Rows list saturation flow and adjustment values.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves. Rows list capacity analysis results.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #13 Cowell Rd / Treat Blvd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.949
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: E
\*\*\*\*\*

Table with columns for Street Name (Cowell Road, Treat Boulevard), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #14 Oak Grove Rd / Treat Blvd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 1.003
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: F
\*\*\*\*\*

Table with columns for Street Name (Oak Grove Road, Treat Boulevard), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #1 Concord Blvd / Kirker Pass Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.933
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: E
\*\*\*\*\*

Table with columns for Street Name (Concord Boulevard, Kirker Pass Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control (Protected), Rights (Include), and various timing parameters like Min. Green, Y+R, and Lanes.

Volume Module: Table showing Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume for each approach.

Saturation Flow Module: Table showing Sat/Lane, Adjustment, Lanes, and Final Sat. for each approach.

Capacity Analysis Module: Table showing Vol/Sat, Crit Volume, and Crit Moves for each approach.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #2 Myrtle Dr / Kirker Pass Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.388
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 37 Level Of Service: A
\*\*\*\*\*

Table with columns for Street Name (Myrtle Drive, Kirker Pass Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #3 Railroad Ave-Kirker Pass Rd / Buchanan Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.604
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 58 Level Of Service: B
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Railroad Avenue / Kirker Pass Road and Buchanan Road with various movement and control details.

Volume Module: Table showing Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume for various movements.

Saturation Flow Module: Table showing Sat/Lane, Adjustment, Lanes, and Final Sat. for different movements.

Capacity Analysis Module: Table showing Vol/Sat, Crit Volume, and Crit Moves for various movements.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #4 Somersville Rd / Buchanan Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.812
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 121 Level Of Service: D
\*\*\*\*\*

Table with columns for Street Name (Somersville Road, Buchanan Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*



Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #5 Somersville Rd / James Donlon Blvd [With Project (signalized)]
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.595
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 56 Level Of Service: A
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Somersville Road and James Donlon Boulevard with various movement and control details.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume. Rows list various volume and adjustment factors.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat. Rows show saturation flow and adjustment values.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves. Rows show capacity analysis results.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #6 Kirker Pass Rd / Kirker Pass-James Donlon Ext
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.573
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 53 Level Of Service: A
\*\*\*\*\*

Street Name: Kirker Pass Road Kirker Pass Road / James Donlon E
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Control: Protected Protected Protected Protected
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0
Lanes: 1 0 2 0 1 1 0 2 0 1 1 0 1 0 1

Volume Module:
Base Vol: 10 620 460 30 780 40 120 40 40 920 10 330
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 10 620 460 30 780 40 120 40 40 920 10 330
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 10 620 460 30 780 40 120 40 40 920 10 330
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 10 620 460 30 780 40 120 40 40 920 10 330
RTOR Reduct: 0 0 460 0 0 40 0 0 10 0 0 30
RTOR Vol: 10 620 0 30 780 0 120 40 30 920 10 300
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 10 620 0 30 780 0 120 40 30 920 10 300

Saturation Flow Module:
Sat/Lane: 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.91 1.00 1.00
Lanes: 1.00 2.00 1.00 1.00 2.00 1.00 1.00 1.00 1.00 2.00 1.00 1.00
Final Sat.: 1650 3300 1650 1650 3300 1650 1650 1650 1650 3000 1650 1650

Capacity Analysis Module:
Vol/Sat: 0.01 0.19 0.00 0.02 0.24 0.00 0.07 0.02 0.02 0.31 0.01 0.18
Crit Volume: 10 390 40 460
Crit Moves: \*\*\*\* \*\*\*\* \*\*\*\* \*\*\*\*
\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #7 Ventura Dr / James Donlon Ext
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.506
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 46 Level Of Service: A
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Ventura Drive and James Donlon Extension with North, South, East, and West bound movements.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #8 Clayton Rd / Kirker Pass-Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.805
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 117 Level Of Service: D
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Clayton Road and Kirker Pass Road / Ygnacio Valley with various movement and control details.

Volume Module: Table showing traffic volume data including Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume across different approaches.

Saturation Flow Module: Table showing saturation flow data including Sat/Lane, Adjustment, Lanes, and Final Sat. for different approaches.

Capacity Analysis Module: Table showing capacity analysis data including Vol/Sat, Crit Volume, and Crit Moves for different approaches.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #9 Alberta Way-Pine Hollow Dr / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.871
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 177 Level Of Service: D
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Alberta Way / Pine Hollow Drive and Ygnacio Valley Road with various movement and control details.

Volume Module: Table showing traffic volume and adjustment factors for various movements and lanes, including Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table showing saturation flow rates and adjustment factors for different lane configurations, including Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table showing capacity analysis metrics such as Vol/Sat, Crit Volume, and Crit Moves for different movements.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #10 Ayers Rd / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.994
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: E
\*\*\*\*\*

Table with columns for Street Name (Ayers Road, Ygnacio Valley Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #11 Cowell Rd / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.875
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: D
\*\*\*\*\*

Table with columns for Street Name (Cowell Road, Ygnacio Valley Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #12 Clayton Rd / Treat Blvd-Denkinger Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.994
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: E
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Clayton Road and Treat Boulevard / Denkinger Road with various movement details.

Volume Module: Table showing traffic volume adjustments including Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table showing saturation flow values for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table showing capacity analysis values for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*



Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #13 Cowell Rd / Treat Blvd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 1.007
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: F
\*\*\*\*\*

Table with columns for Street Name (Cowell Road, Treat Boulevard), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #14 Oak Grove Rd / Treat Blvd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 1.270
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: F
\*\*\*\*\*

Table with columns for Street Name (Oak Grove Road, Treat Boulevard), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #1 Concord Blvd / Kirker Pass Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.878
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: D
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Concord Boulevard and Kirker Pass Road with various movement details.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #2 Myrtle Dr / Kirker Pass Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.622
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 60 Level Of Service: B
\*\*\*\*\*

Table with columns for Street Name (Myrtle Drive, Kirker Pass Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #3 Railroad Ave-Kirker Pass Rd / Buchanan Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.498
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 45 Level Of Service: A
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Railroad Avenue / Kirker Pass Road and Buchanan Road with various movement and control details.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume. Rows list various volume and adjustment factors.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat. Rows show saturation flow and adjustment values.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves. Rows show capacity analysis results.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #4 Somersville Rd / Buchanan Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.706
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 78 Level Of Service: C
\*\*\*\*\*

Table with columns for Street Name (Somersville Road, Buchanan Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #5 Somersville Rd / James Donlon Blvd [With Project (signalized)]
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.848
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 150 Level Of Service: D
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Somersville Road and James Donlon Boulevard with North, South, East, and West bound movements.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume. Rows include various adjustment factors and volumes.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat. Rows include saturation flow values and adjustments.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves. Rows include capacity analysis results.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #6 Kirker Pass Rd / Kirker Pass-James Donlon Ext
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.691
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 74 Level Of Service: B
\*\*\*\*\*

Street Name: Kirker Pass Road Kirker Pass Road / James Donlon E
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Control: Protected Protected Protected Protected
Rights: Include Include Include Include
Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0
Lanes: 1 0 2 0 1 1 0 2 0 1 1 0 1 0 1

Volume Module:
Base Vol: 40 970 980 130 730 130 70 30 30 660 50 50
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 40 970 980 130 730 130 70 30 30 660 50 50
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 40 970 980 130 730 130 70 30 30 660 50 50
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 40 970 980 130 730 130 70 30 30 660 50 50
RTOR Reduct: 0 0 363 0 0 70 0 0 30 0 0 50
RTOR Vol: 40 970 617 130 730 60 70 30 0 660 50 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 40 970 617 130 730 60 70 30 0 660 50 0

Saturation Flow Module:
Sat/Lane: 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.91 1.00 1.00
Lanes: 1.00 2.00 1.00 1.00 2.00 1.00 1.00 1.00 1.00 2.00 1.00 1.00
Final Sat.: 1650 3300 1650 1650 3300 1650 1650 1650 1650 3000 1650 1650

Capacity Analysis Module:
Vol/Sat: 0.02 0.29 0.37 0.08 0.22 0.04 0.04 0.02 0.00 0.22 0.03 0.00
Crit Volume: 617 130 30 330
Crit Moves: \*\*\*\* \*\*\*\* \*\*\*\* \*\*\*\*
\*\*\*\*\*



Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #7 Ventura Dr / James Donlon Ext
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.494
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 45 Level Of Service: A
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Ventura Drive and James Donlon Extension with North, South, East, and West bound movements.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume. Rows include various adjustment factors and volumes.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat. Rows include saturation flow values and lane adjustments.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves. Rows include capacity analysis results.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #8 Clayton Rd / Kirker Pass-Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.925
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: E
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Clayton Road and Kirker Pass Road / Ygnacio Valley with North, South, East, and West bound movements.

Volume Module: Table showing Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume for various approaches.

Saturation Flow Module: Table showing Sat/Lane, Adjustment, Lanes, and Final Sat. for different approaches.

Capacity Analysis Module: Table showing Vol/Sat, Crit Volume, and Crit Moves for different approaches.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #9 Alberta Way-Pine Hollow Dr / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.827
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 132 Level Of Service: D
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Alberta Way / Pine Hollow Drive and Ygnacio Valley Road with various movement details.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #10 Ayers Rd / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.749
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 91 Level Of Service: C
\*\*\*\*\*

Table with columns for Street Name (Ayers Road, Ygnacio Valley Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #11 Cowell Rd / Ygnacio Valley Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.986
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: E
\*\*\*\*\*

Table with columns for Street Name (Cowell Road, Ygnacio Valley Road), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #12 Clayton Rd / Treat Blvd-Denkinger Rd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 1.024
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: F
\*\*\*\*\*

Table with columns for Street Name, Approach, Movement, Control, Rights, Min. Green, Y+R, and Lanes. Rows include Clayton Road and Treat Boulevard / Denkinger Road with various movement and control details.

Volume Module: Table showing traffic volume and adjustment factors for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table showing saturation flow, adjustment factors, lanes, and final saturation values for each approach.

Capacity Analysis Module: Table showing volume/saturation, critical volume, and critical moves for each approach.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #13 Cowell Rd / Treat Blvd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 0.956
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: E
\*\*\*\*\*

Table with columns for Street Name (Cowell Road, Treat Boulevard), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*

Level Of Service Computation Report
CCTALOS Method (Base Volume Alternative)

\*\*\*\*\*
Intersection #14 Oak Grove Rd / Treat Blvd
\*\*\*\*\*

Cycle (sec): 100 Critical Vol./Cap.(X): 1.006
Loss Time (sec): 0 Average Delay (sec/veh): xxxxxx
Optimal Cycle: 180 Level Of Service: F
\*\*\*\*\*

Table with columns for Street Name (Oak Grove Road, Treat Boulevard), Approach (North Bound, South Bound, East Bound, West Bound), Movement (L, T, R), Control, Rights, Min. Green, Y+R, and Lanes.

Volume Module: Table with columns for Base Vol, Growth Adj, Initial Bse, User Adj, PHF Adj, PHF Volume, Reduct Vol, Reduced Vol, RTOR Reduct, RTOR Vol, PCE Adj, MLF Adj, and Final Volume.

Saturation Flow Module: Table with columns for Sat/Lane, Adjustment, Lanes, and Final Sat.

Capacity Analysis Module: Table with columns for Vol/Sat, Crit Volume, and Crit Moves.

\*\*\*\*\*



**APPENDIX C**  
**SYNCHRO CALCULATION**  
**WORKSHEETS**

# HCM Signalized Intersection Capacity Analysis

## 1: Kirker Pass Road & Concord Boulevard

12/21/2011



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	0.91		1.00	0.91		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.97	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.97		1.00	1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4891		1770	4913		1770	3539	1543	1770	3198	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4891		1770	4913		1770	3539	1543	1770	3198	
Volume (vph)	112	343	96	53	1292	311	407	564	112	52	80	100
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	118	361	101	56	1360	327	428	594	118	55	84	105
RTOR Reduction (vph)	0	29	0	0	24	0	0	0	86	0	98	0
Lane Group Flow (vph)	118	433	0	56	1663	0	428	594	32	55	91	0
Confl. Peds. (#/hr)			5			5			5			5
Turn Type	Prot			Prot			Prot		Perm		Prot	
Protected Phases	5	2		1	6		3	8			7	4
Permitted Phases									8			
Actuated Green, G (s)	14.8	75.8		8.5	69.5		39.4	41.1	41.1	8.6	10.3	
Effective Green, g (s)	14.8	75.8		8.5	69.5		39.4	41.1	41.1	8.6	10.3	
Actuated g/C Ratio	0.10	0.51		0.06	0.46		0.26	0.27	0.27	0.06	0.07	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	175	2472		100	2276		465	970	423	101	220	
v/s Ratio Prot	c0.07	0.09		0.03	c0.34		c0.24	c0.17		0.03	0.03	
v/s Ratio Perm									0.02			
v/c Ratio	0.67	0.18		0.56	0.73		0.92	0.61	0.08	0.54	0.41	
Uniform Delay, d1	65.3	20.1		68.9	32.7		53.8	47.5	40.4	68.8	67.0	
Progression Factor	1.00	1.00		0.44	1.54		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	9.8	0.2		5.1	1.5		23.6	1.2	0.1	5.9	1.3	
Delay (s)	75.1	20.3		35.1	51.9		77.3	48.7	40.5	74.7	68.2	
Level of Service	E	C		D	D		E	D	D	E	E	
Approach Delay (s)		31.4			51.4			58.6			69.7	
Approach LOS		C			D			E			E	

### Intersection Summary

HCM Average Control Delay	51.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 2: Kirker Pass Road & Myrtle Drive

12/21/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
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
Lane Util. Factor	1.00	0.95	0.91		1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	5069		1770	1543
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	5069		1770	1543
Volume (vph)	62	502	1459	25	23	56
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	65	523	1520	26	24	58
RTOR Reduction (vph)	0	0	1	0	0	30
Lane Group Flow (vph)	65	523	1545	0	24	28
Confl. Peds. (#/hr)				5		5
Turn Type	Prot					Perm
Protected Phases	5	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	8.8	70.5	57.7		16.0	16.0
Effective Green, g (s)	8.8	70.5	57.7		71.5	71.5
Actuated g/C Ratio	0.06	0.47	0.38		0.48	0.48
Clearance Time (s)	4.0	4.0	4.0		59.5	59.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	104	1663	1950		844	735
v/s Ratio Prot	c0.04	0.15	c0.30		0.01	
v/s Ratio Perm						c0.02
v/c Ratio	0.62	0.31	0.79		0.03	0.04
Uniform Delay, d1	69.0	24.7	40.8		20.8	20.9
Progression Factor	0.86	0.80	1.00		1.00	1.00
Incremental Delay, d2	11.1	0.5	3.4		0.1	0.1
Delay (s)	70.3	20.2	44.2		20.9	21.0
Level of Service	E	C	D		C	C
Approach Delay (s)		25.7	44.2		21.0	
Approach LOS		C	D		C	

### Intersection Summary

HCM Average Control Delay	38.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 3: Buchanan Road & Kirker Pass Road

12/21/2011

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	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1513	1681	1697	1551	1770	3539	1548	1770	3539	1527
Flt Permitted	0.95	1.00	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1513	1681	1697	1551	1770	3539	1548	1770	3539	1527
Volume (vph)	71	60	35	1073	84	65	17	247	287	51	380	27
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	76	64	37	1141	89	69	18	263	305	54	404	29
RTOR Reduction (vph)	0	0	34	0	0	22	0	0	250	0	0	23
Lane Group Flow (vph)	76	64	3	599	631	47	18	263	55	54	404	6
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8			2			6
Actuated Green, G (s)	6.8	6.8	6.8	36.5	36.5	36.5	2.6	13.4	13.4	4.9	15.7	15.7
Effective Green, g (s)	7.3	7.3	7.3	37.5	37.5	37.5	2.6	14.4	14.4	4.9	16.7	16.7
Actuated g/C Ratio	0.09	0.09	0.09	0.47	0.47	0.47	0.03	0.18	0.18	0.06	0.21	0.21
Clearance Time (s)	4.5	4.5	4.5	5.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
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)	161	170	138	787	794	726	57	636	278	108	738	318
v/s Ratio Prot	c0.04	0.03		0.36	c0.37		0.01	0.07		c0.03	c0.11	
v/s Ratio Perm			0.00			0.03			0.04			0.00
v/c Ratio	0.47	0.38	0.02	0.76	0.79	0.07	0.32	0.41	0.20	0.50	0.55	0.02
Uniform Delay, d1	34.6	34.3	33.2	17.6	18.0	11.7	37.9	29.1	27.9	36.4	28.3	25.2
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	2.2	1.4	0.1	4.4	5.5	0.0	3.2	0.4	0.3	3.6	0.8	0.0
Delay (s)	36.7	35.7	33.2	22.0	23.6	11.7	41.1	29.5	28.3	40.0	29.2	25.2
Level of Service	D	D	C	C	C	B	D	C	C	D	C	C
Approach Delay (s)		35.6			22.2			29.2			30.1	
Approach LOS		D			C			C			C	
<b>Intersection Summary</b>												
HCM Average Control Delay			26.3									HCM Level of Service C
HCM Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			80.1									Sum of lost time (s) 12.0
Intersection Capacity Utilization			67.9%									ICU Level of Service C
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
 4: Buchanan Road & Somersville Road

12/21/2011

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	0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.97		1.00	1.00	0.97	1.00	1.00		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	1.00	0.85	1.00	0.99		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3158		1770	1863	1536	1770	3513		1770	3131	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3158		1770	1863	1536	1770	3513		1770	3131	
Volume (vph)	193	138	168	24	415	301	597	723	31	53	77	111
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	217	155	189	27	466	338	671	812	35	60	87	125
RTOR Reduction (vph)	0	123	0	0	0	177	0	3	0	0	113	0
Lane Group Flow (vph)	217	221	0	27	466	161	671	844	0	60	99	0
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	12.0	34.7		3.0	25.7	25.7	36.0	38.4		6.7	9.1	
Effective Green, g (s)	12.0	34.7		3.0	25.7	25.7	36.0	38.4		6.7	9.1	
Actuated g/C Ratio	0.12	0.35		0.03	0.26	0.26	0.36	0.39		0.07	0.09	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	215	1109		54	485	400	645	1365		120	288	
v/s Ratio Prot	c0.12	0.07		0.02	c0.25		c0.38	c0.24		0.03	0.03	
v/s Ratio Perm						0.10						
v/c Ratio	1.01	0.20		0.50	0.96	0.40	1.04	0.62		0.50	0.34	
Uniform Delay, d1	43.4	22.4		47.2	36.1	30.2	31.4	24.3		44.4	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	63.8	0.1		7.1	30.9	0.7	46.3	0.8		3.3	0.7	
Delay (s)	107.2	22.5		54.3	67.0	30.9	77.7	25.1		47.7	42.8	
Level of Service	F	C		D	E	C	E	C		D	D	
Approach Delay (s)		55.2			51.9			48.4			43.8	
Approach LOS		E			D			D			D	
<b>Intersection Summary</b>												
HCM Average Control Delay			50.1				HCM Level of Service				D	
HCM Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			98.8				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												

HCM Unsignalized Intersection Capacity Analysis  
 5: James Donlon Boulevard & Somersville Road

12/21/2011



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)	39	3	0	4	11	1313	0	1	2	236	8	19
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	40	3	0	4	11	1340	0	1	2	241	8	19
Pedestrians	5			5			5			5		
Lane Width (ft)	12.0			12.0			12.0			12.0		
Walking Speed (ft/s)	4.0			4.0			4.0			4.0		
Percent Blockage	0			0			0			0		
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	517	513	28	513	521	12	33				8	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	517	513	28	513	521	12	33				8	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	0	99	100	99	97	0	100				85	
cM capacity (veh/h)	0	392	1039	409	388	1060	1573				1605	

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	40	2	1	4	11	1340	3	268
Volume Left	40	0	0	4	0	0	0	241
Volume Right	0	0	0	0	0	1340	2	19
cSH	0	392	392	409	388	1060	1573	1605
Volume to Capacity	Err	0.01	0.00	0.01	0.03	1.26	0.00	0.15
Queue Length 95th (ft)	Err	0	0	1	2	1149	0	13
Control Delay (s)	Err	14.2	14.2	13.9	14.6	141.8	0.0	7.0
Lane LOS	F	B	B	B	B	F		A
Approach Delay (s)	Err	140.4			0.0			7.0
Approach LOS	F	F						

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	100.0%	ICU Level of Service	G
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis  
 1: Kirker Pass Road & Concord Boulevard

12/21/2011

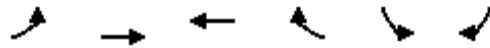
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.97	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.98		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4894		1770	4976		1770	3539	1543	1770	3415	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4894		1770	4976		1770	3539	1543	1770	3415	
Volume (vph)	124	1238	338	70	429	60	199	151	28	322	398	100
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	131	1303	356	74	452	63	209	159	29	339	419	105
RTOR Reduction (vph)	0	29	0	0	10	0	0	0	26	0	15	0
Lane Group Flow (vph)	131	1630	0	74	505	0	209	159	3	339	509	0
Confl. Peds. (#/hr)			5			5			5			5
Turn Type	Prot			Prot			Prot		Perm		Prot	
Protected Phases	5	2		1	6		3	8			7	4
Permitted Phases									8			
Actuated Green, G (s)	15.9	74.9		10.7	69.7		21.9	16.1	16.1	32.3	26.5	
Effective Green, g (s)	15.9	74.9		10.7	69.7		21.9	16.1	16.1	32.3	26.5	
Actuated g/C Ratio	0.11	0.50		0.07	0.46		0.15	0.11	0.11	0.22	0.18	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	188	2444		126	2312		258	380	166	381	603	
v/s Ratio Prot	c0.07	c0.33		0.04	0.10		0.12	0.04		c0.19	c0.15	
v/s Ratio Perm									0.00			
v/c Ratio	0.70	0.67		0.59	0.22		0.81	0.42	0.02	0.89	0.84	
Uniform Delay, d1	64.7	28.2		67.5	23.9		62.0	62.6	59.9	57.1	59.8	
Progression Factor	1.00	1.00		0.58	1.72		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	10.7	1.5		6.7	0.2		17.2	0.7	0.0	21.5	10.5	
Delay (s)	75.4	29.6		45.8	41.4		79.3	63.3	59.9	78.6	70.2	
Level of Service	E	C		D	D		E	E	E	E	E	
Approach Delay (s)		33.0			41.9			71.5			73.5	
Approach LOS		C			D			E			E	
<b>Intersection Summary</b>												
HCM Average Control Delay			48.3			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			74.1%			ICU Level of Service				D		
Analysis Period (min)			15									

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 2: Kirker Pass Road &

12/21/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
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
Lane Util. Factor	1.00	0.95	0.91		1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	5066		1770	1543
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	5066		1770	1543
Volume (vph)	70	1453	488	10	28	33
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	73	1514	508	10	29	34
RTOR Reduction (vph)	0	0	1	0	0	18
Lane Group Flow (vph)	73	1514	517	0	29	16
Confl. Peds. (#/hr)				5		5
Turn Type	Prot			Perm		
Protected Phases	5	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	10.3	70.5	56.2		71.5	71.5
Effective Green, g (s)	10.3	70.5	56.2		71.5	71.5
Actuated g/C Ratio	0.07	0.47	0.37		0.48	0.48
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	122	1663	1898		844	735
v/s Ratio Prot	0.04	c0.43	0.10		c0.02	
v/s Ratio Perm						0.01
v/c Ratio	0.60	0.91	0.27		0.03	0.02
Uniform Delay, d1	67.8	36.8	32.7		20.9	20.8
Progression Factor	1.18	0.80	1.00		1.00	1.00
Incremental Delay, d2	5.7	6.9	0.4		0.1	0.1
Delay (s)	85.9	36.2	33.0		21.0	20.8
Level of Service	F	D	C		C	C
Approach Delay (s)		38.5	33.0		20.9	
Approach LOS		D	C		C	

### Intersection Summary

HCM Average Control Delay	36.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



HCM Signalized Intersection Capacity Analysis  
 3: Buchanan Road & Railroad Avenue

12/21/2011

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	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1516	1681	1718	1551	1770	3539	1549	1770	3539	1528
Flt Permitted	0.95	1.00	1.00	0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1516	1681	1718	1551	1770	3539	1549	1770	3539	1528
Volume (vph)	87	60	10	378	98	69	25	654	830	81	81	64
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	93	64	11	402	104	73	27	696	883	86	86	68
RTOR Reduction (vph)	0	0	10	0	0	56	0	0	495	0	0	39
Lane Group Flow (vph)	93	64	1	246	260	17	27	696	388	86	86	29
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8			2			6
Actuated Green, G (s)	6.8	6.8	6.8	16.6	16.6	16.6	2.7	26.6	26.6	7.3	31.2	31.2
Effective Green, g (s)	7.3	7.3	7.3	17.6	17.6	17.6	2.7	27.6	27.6	7.3	32.2	32.2
Actuated g/C Ratio	0.10	0.10	0.10	0.23	0.23	0.23	0.04	0.36	0.36	0.10	0.42	0.42
Clearance Time (s)	4.5	4.5	4.5	5.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
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)	170	179	146	390	399	360	63	1289	564	170	1503	649
v/s Ratio Prot	c0.05	0.03		0.15	c0.15		0.02	0.20		c0.05	0.02	
v/s Ratio Perm			0.00			0.01			c0.25			0.02
v/c Ratio	0.55	0.36	0.01	0.63	0.65	0.05	0.43	0.54	0.69	0.51	0.06	0.04
Uniform Delay, d1	32.7	32.1	31.0	26.2	26.3	22.6	35.8	19.1	20.4	32.5	12.9	12.8
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	3.6	1.2	0.0	3.3	3.8	0.1	4.6	0.4	3.5	2.4	0.0	0.0
Delay (s)	36.2	33.3	31.0	29.5	30.1	22.6	40.4	19.5	23.9	34.9	12.9	12.8
Level of Service	D	C	C	C	C	C	D	B	C	C	B	B
Approach Delay (s)		34.8			28.9			22.3			20.7	
Approach LOS		C			C			C			C	
<b>Intersection Summary</b>												
HCM Average Control Delay			24.4				HCM Level of Service			C		
HCM Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			75.8				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			76.2%				ICU Level of Service			D		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
4: Buchanan Rd & Somersville Road

12/21/2011

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	0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.97		1.00	1.00	0.97	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3143		1770	1863	1537	1770	3474		1770	3343	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3143		1770	1863	1537	1770	3474		1770	3343	
Volume (vph)	251	482	655	45	201	133	170	170	20	330	512	202
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	282	542	736	51	226	149	191	191	22	371	575	227
RTOR Reduction (vph)	0	234	0	0	0	115	0	8	0	0	40	0
Lane Group Flow (vph)	282	1044	0	51	226	34	191	205	0	371	762	0
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	17.9	35.2		3.6	20.9	20.9	13.2	15.3		22.6	24.7	
Effective Green, g (s)	17.9	35.2		3.6	20.9	20.9	13.2	15.3		22.6	24.7	
Actuated g/C Ratio	0.19	0.38		0.04	0.23	0.23	0.14	0.17		0.24	0.27	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	342	1193		69	420	347	252	573		432	891	
v/s Ratio Prot	c0.16	c0.33		0.03	0.12		0.11	0.06		c0.21	c0.23	
v/s Ratio Perm						0.02						
v/c Ratio	0.82	0.88		0.74	0.54	0.10	0.76	0.36		0.86	0.85	
Uniform Delay, d1	35.9	26.7		44.1	31.6	28.4	38.2	34.3		33.5	32.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	14.8	7.4		33.5	1.3	0.1	12.3	0.4		15.5	8.0	
Delay (s)	50.7	34.1		77.6	33.0	28.5	50.5	34.7		49.0	40.3	
Level of Service	D	C		E	C	C	D	C		D	D	
Approach Delay (s)		37.1			36.8			42.2			43.1	
Approach LOS		D			D			D			D	
<b>Intersection Summary</b>												
HCM Average Control Delay			39.6				HCM Level of Service				D	
HCM Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			92.7				Sum of lost time (s)				8.0	
Intersection Capacity Utilization			82.0%				ICU Level of Service				D	
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis  
 5: James Donlon Boulevard & Somersville Road

12/21/2011



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)	15	12	0	2	8	325	0	6	4	1201	5	23
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	15	12	0	2	8	332	0	6	4	1226	5	23
Pedestrians	5			5			5			5		
Lane Width (ft)	12.0			12.0			12.0			12.0		
Walking Speed (ft/s)	4.0			4.0			4.0			4.0		
Percent Blockage	0			0			0			0		
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2490	2488	27	2492	2498	18	34				15	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2490	2488	27	2492	2498	18	34				15	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	0	0	100	0	0	68	100				23	
cM capacity (veh/h)	0	7	1040	0	7	1051	1572				1596	

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	
Volume Total	15	8	4	2	8	332	10	1254	
Volume Left	15	0	0	2	0	0	0	1226	
Volume Right	0	0	0	0	0	332	4	23	
cSH	0	7	7	0	7	1051	1572	1596	
Volume to Capacity	Err	1.21	0.61	Err	1.23	0.32	0.00	0.77	
Queue Length 95th (ft)	Err	46	27	Err	46	34	0	210	
Control Delay (s)	Err	1127.9	841.8	Err	1147.7	10.0	0.0	14.2	
Lane LOS	F	F	F	F	F	A		B	
Approach Delay (s)	Err				Err			0.0	14.2
Approach LOS	F				F				

Intersection Summary

Average Delay	Err	
Intersection Capacity Utilization	89.9%	ICU Level of Service E
Analysis Period (min)	15	

HCM Signalized Intersection Capacity Analysis  
 1: Kirker Pass Road & Concord Boulevard

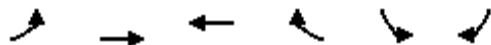
12/21/2011

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	0.91		1.00	0.91		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.97	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.98		1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4891		1770	4941		1770	3539	1543	1770	3188	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4891		1770	4941		1770	3539	1543	1770	3188	
Volume (vph)	120	430	120	60	1500	290	500	570	150	70	90	120
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	120	430	120	60	1500	290	500	570	150	70	90	120
RTOR Reduction (vph)	0	31	0	0	18	0	0	0	105	0	112	0
Lane Group Flow (vph)	120	519	0	60	1772	0	500	570	45	70	98	0
Confl. Peds. (#/hr)			5			5			5			5
Turn Type	Prot			Prot			Prot		Perm		Prot	
Protected Phases	5	2		1	6		3	8			7	4
Permitted Phases									8			
Actuated Green, G (s)	14.8	71.0		8.6	64.8		43.9	45.1	45.1	9.3	10.5	
Effective Green, g (s)	14.8	71.0		8.6	64.8		43.9	45.1	45.1	9.3	10.5	
Actuated g/C Ratio	0.10	0.47		0.06	0.43		0.29	0.30	0.30	0.06	0.07	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	175	2315		101	2135		518	1064	464	110	223	
v/s Ratio Prot	c0.07	0.11		0.03	c0.36		c0.28	c0.16		0.04	0.03	
v/s Ratio Perm									0.03			
v/c Ratio	0.69	0.22		0.59	0.83		0.97	0.54	0.10	0.64	0.44	
Uniform Delay, d1	65.4	23.3		69.0	37.7		52.3	43.7	37.8	68.7	66.9	
Progression Factor	1.00	1.00		0.43	1.50		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	10.6	0.2		5.6	2.4		30.6	0.5	0.1	11.5	1.4	
Delay (s)	76.0	23.5		35.5	59.0		82.9	44.2	37.9	80.2	68.3	
Level of Service	E	C		D	E		F	D	D	F	E	
Approach Delay (s)		32.9			58.3			59.3			71.3	
Approach LOS		C			E			E			E	
<b>Intersection Summary</b>												
HCM Average Control Delay			55.3			HCM Level of Service				E		
HCM Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			90.9%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 2: Kirker Pass Road & Myrtle Drive

12/21/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
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
Lane Util. Factor	1.00	0.95	0.91		1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	5068		1770	1543
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	5068		1770	1543
Volume (vph)	70	630	1660	30	30	60
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	70	630	1660	30	30	60
RTOR Reduction (vph)	0	0	1	0	0	31
Lane Group Flow (vph)	70	630	1689	0	30	29
Confl. Peds. (#/hr)				5		5
Turn Type	Prot			Perm		
Protected Phases	5	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	8.9	70.5	57.6		16.0	16.0
Effective Green, g (s)	8.9	70.5	57.6		71.5	71.5
Actuated g/C Ratio	0.06	0.47	0.38		0.48	0.48
Clearance Time (s)	4.0	4.0	4.0		59.5	59.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	105	1663	1946		844	735
v/s Ratio Prot	c0.04	0.18	c0.33		0.02	
v/s Ratio Perm						c0.02
v/c Ratio	0.67	0.38	0.87		0.04	0.04
Uniform Delay, d1	69.1	25.6	42.7		20.9	20.9
Progression Factor	0.88	0.78	1.00		1.00	1.00
Incremental Delay, d2	14.6	0.6	5.6		0.1	0.1
Delay (s)	75.1	20.6	48.2		21.0	21.0
Level of Service	E	C	D		C	C
Approach Delay (s)		26.0	48.2		21.0	
Approach LOS		C	D		C	

### Intersection Summary

HCM Average Control Delay	41.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 3: Buchanan Rd & Kirker Pass Road


























12/21/2011

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	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1509	1681	1697	1550	1770	3539	1547	1770	3539	1526
Flt Permitted	0.95	1.00	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1509	1681	1697	1550	1770	3539	1547	1770	3539	1526
Volume (vph)	80	60	40	1110	90	70	30	360	520	70	580	30
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	80	60	40	1110	90	70	30	360	520	70	580	30
RTOR Reduction (vph)	0	0	37	0	0	27	0	0	392	0	0	22
Lane Group Flow (vph)	80	60	3	584	616	43	30	360	128	70	580	8
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8			2			6
Actuated Green, G (s)	6.6	6.6	6.6	34.3	34.3	34.3	3.4	19.6	19.6	4.9	21.1	21.1
Effective Green, g (s)	7.1	7.1	7.1	35.3	35.3	35.3	3.4	20.6	20.6	4.9	22.1	22.1
Actuated g/C Ratio	0.08	0.08	0.08	0.42	0.42	0.42	0.04	0.25	0.25	0.06	0.26	0.26
Clearance Time (s)	4.5	4.5	4.5	5.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
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)	150	158	128	707	714	652	72	869	380	103	932	402
v/s Ratio Prot	c0.05	0.03		0.35	c0.36		0.02	0.10		c0.04	c0.16	
v/s Ratio Perm			0.00			0.03			0.08			0.01
v/c Ratio	0.53	0.38	0.03	0.83	0.86	0.07	0.42	0.41	0.34	0.68	0.62	0.02
Uniform Delay, d1	36.8	36.3	35.2	21.6	22.1	14.5	39.3	26.6	26.0	38.7	27.2	22.9
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	3.6	1.5	0.1	7.8	10.5	0.0	3.9	0.3	0.5	16.4	1.3	0.0
Delay (s)	40.4	37.8	35.3	29.4	32.6	14.5	43.2	26.9	26.6	55.1	28.5	22.9
Level of Service	D	D	D	C	C	B	D	C	C	E	C	C
Approach Delay (s)		38.4			30.1			27.2			31.0	
Approach LOS		D			C			C			C	
<b>Intersection Summary</b>												
HCM Average Control Delay			30.0									C
HCM Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			83.9						12.0			
Intersection Capacity Utilization			73.0%									D
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
4: Buchanan Rd & Somersville Road

12/21/2011

												
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	0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.96		1.00	1.00	0.96	1.00	1.00		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.99		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3116		1770	1863	1522	1770	3511		1770	3105	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3116		1770	1863	1522	1770	3511		1770	3105	
Volume (vph)	490	150	200	30	420	310	610	900	40	80	120	170
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	490	150	200	30	420	310	610	900	40	80	120	170
RTOR Reduction (vph)	0	111	0	0	0	157	0	2	0	0	157	0
Lane Group Flow (vph)	490	239	0	30	420	153	610	938	0	80	133	0
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	37.0	65.2		5.4	33.6	33.6	49.0	48.8		11.3	11.1	
Effective Green, g (s)	37.0	65.2		5.4	33.6	33.6	49.0	48.8		11.3	11.1	
Actuated g/C Ratio	0.25	0.44		0.04	0.23	0.23	0.33	0.33		0.08	0.08	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	446	1385		65	427	349	591	1168		136	235	
v/s Ratio Prot	c0.28	0.08		0.02	c0.23		c0.34	c0.27		0.05	0.04	
v/s Ratio Perm						0.10						
v/c Ratio	1.10	0.17		0.46	0.98	0.44	1.03	0.80		0.59	0.57	
Uniform Delay, d1	54.8	24.5		69.2	56.3	48.5	48.8	44.6		65.5	65.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	72.1	0.1		5.1	39.0	0.9	45.5	4.1		6.4	3.1	
Delay (s)	126.9	24.6		74.3	95.2	49.3	94.4	48.7		71.8	68.6	
Level of Service	F	C		E	F	D	F	D		E	E	
Approach Delay (s)		84.3			75.7			66.7			69.3	
Approach LOS		F			E			E			E	
<b>Intersection Summary</b>												
HCM Average Control Delay			73.1				HCM Level of Service				E	
HCM Volume to Capacity ratio			1.00									
Actuated Cycle Length (s)			146.7				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			106.9%				ICU Level of Service			G		
Analysis Period (min)			15									
c	Critical Lane Group											

HCM Unsignalized Intersection Capacity Analysis  
 5: James Donlon Boulevard & Somersville Road

12/21/2011



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)	70	40	10	10	40	1330	20	30	20	290	10	20
Peak Hour 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
Hourly flow rate (vph)	70	40	10	10	40	1330	20	30	20	290	10	20
Pedestrians	5			5			5			5		
Lane Width (ft)	12.0			12.0			12.0			12.0		
Walking Speed (ft/s)	4.0			4.0			4.0			4.0		
Percent Blockage	0			0			0			0		
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	710	700	30	720	700	50	35				55	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	710	700	30	720	700	50	35				55	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	0	86	99	96	86	0	99				81	
cM capacity (veh/h)	0	289	1036	255	289	1010	1570				1544	

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	70	27	23	10	40	1330	70	320
Volume Left	70	0	0	10	0	0	20	290
Volume Right	0	0	10	0	0	1330	20	20
cSH	0	289	418	255	289	1010	1570	1544
Volume to Capacity	Err	0.09	0.06	0.04	0.14	1.32	0.01	0.19
Queue Length 95th (ft)	Err	8	4	3	12	1250	1	17
Control Delay (s)	Err	18.7	14.1	19.7	19.5	164.8	2.2	7.3
Lane LOS	F	C	B	C	C	F	A	A
Approach Delay (s)	Err	159.5			2.2			7.3
Approach LOS	F	F						

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	102.0%	ICU Level of Service	G
Analysis Period (min)	15		



HCM Signalized Intersection Capacity Analysis  
6: Montreux Driveway & Kirker Pass Road

12/21/2011



Movement	EBL	EBR	NBL	NBT	SBT	SBR
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	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583
Volume (vph)	160	40	10	700	1670	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	160	40	10	700	1670	50
RTOR Reduction (vph)	0	35	0	0	0	9
Lane Group Flow (vph)	160	5	10	700	1670	41
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	10.8	10.8	1.3	60.1	54.8	54.8
Effective Green, g (s)	10.8	10.8	1.3	60.1	54.8	54.8
Actuated g/C Ratio	0.14	0.14	0.02	0.76	0.69	0.69
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)	242	217	29	2696	2458	1099
v/s Ratio Prot	c0.09		0.01	c0.20	c0.47	
v/s Ratio Perm		0.00				0.03
v/c Ratio	0.66	0.03	0.34	0.26	0.68	0.04
Uniform Delay, d1	32.3	29.5	38.4	2.8	7.0	3.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.6	0.0	7.0	0.2	1.5	0.1
Delay (s)	38.9	29.5	45.4	3.0	8.5	3.8
Level of Service	D	C	D	A	A	A
Approach Delay (s)	37.1			3.6	8.4	
Approach LOS	D			A	A	

**Intersection Summary**

HCM Average Control Delay	9.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	78.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
 1: Kirker Pass Road & Concord Boulevard

12/21/2011

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	0.91		1.00	0.91		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.97	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.98		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4874		1770	4989		1770	3539	1543	1770	3396	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4874		1770	4989		1770	3539	1543	1770	3396	
Volume (vph)	130	1280	400	110	580	70	250	170	40	340	430	130
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	130	1280	400	110	580	70	250	170	40	340	430	130
RTOR Reduction (vph)	0	35	0	0	9	0	0	0	35	0	20	0
Lane Group Flow (vph)	130	1645	0	110	641	0	250	170	5	340	540	0
Confl. Peds. (#/hr)			5			5			5			5
Turn Type	Prot			Prot			Prot		Perm		Prot	
Protected Phases	5	2		1	6		3	8			7	4
Permitted Phases									8			
Actuated Green, G (s)	15.8	70.1		12.1	66.4		24.4	19.5	19.5	32.3	27.4	
Effective Green, g (s)	15.8	70.1		12.1	66.4		24.4	19.5	19.5	32.3	27.4	
Actuated g/C Ratio	0.11	0.47		0.08	0.44		0.16	0.13	0.13	0.22	0.18	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	186	2278		143	2208		288	460	201	381	620	
v/s Ratio Prot	c0.07	c0.34		0.06	0.13		0.14	0.05		c0.19	c0.16	
v/s Ratio Perm									0.00			
v/c Ratio	0.70	0.72		0.77	0.29		0.87	0.37	0.03	0.89	0.87	
Uniform Delay, d1	64.8	32.1		67.6	26.7		61.2	59.6	57.0	57.2	59.6	
Progression Factor	1.00	1.00		0.55	1.75		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	10.9	2.0		20.9	0.3		23.0	0.5	0.1	22.2	12.8	
Delay (s)	75.7	34.1		57.9	47.1		84.2	60.1	57.0	79.3	72.4	
Level of Service	E	C		E	D		F	E	E	E	E	
Approach Delay (s)		37.1			48.6			73.0			75.0	
Approach LOS		D			D			E			E	
<b>Intersection Summary</b>												
HCM Average Control Delay			52.2				HCM Level of Service				D	
HCM Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			150.0				Sum of lost time (s)				12.0	
Intersection Capacity Utilization			83.2%				ICU Level of Service				E	
Analysis Period (min)			15									

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 2: Kirker Pass Road & Myrtle Street

12/21/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
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
Lane Util. Factor	1.00	0.95	0.91		1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	5058		1770	1543
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	5058		1770	1543
Volume (vph)	70	1500	690	20	30	40
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	70	1500	690	20	30	40
RTOR Reduction (vph)	0	0	2	0	0	21
Lane Group Flow (vph)	70	1500	708	0	30	19
Confl. Peds. (#/hr)				5		5
Turn Type	Prot			Perm		
Protected Phases	5	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	8.9	70.5	57.6		71.5	71.5
Effective Green, g (s)	8.9	70.5	57.6		71.5	71.5
Actuated g/C Ratio	0.06	0.47	0.38		0.48	0.48
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	105	1663	1942		844	735
v/s Ratio Prot	0.04	c0.42	0.14		c0.02	
v/s Ratio Perm						0.01
v/c Ratio	0.67	0.90	0.36		0.04	0.03
Uniform Delay, d1	69.1	36.6	33.1		20.9	20.8
Progression Factor	1.25	0.74	1.00		1.00	1.00
Incremental Delay, d2	10.4	6.0	0.5		0.1	0.1
Delay (s)	97.1	33.0	33.6		21.0	20.9
Level of Service	F	C	C		C	C
Approach Delay (s)		35.8	33.6		20.9	
Approach LOS		D	C		C	

























### Intersection Summary

HCM Average Control Delay	34.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 3: Buchanan Rd & Kirker Pass Road

12/21/2011

												
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	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1499	1681	1714	1550	1770	3539	1548	1770	3539	1527
Flt Permitted	0.95	1.00	1.00	0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1499	1681	1714	1550	1770	3539	1548	1770	3539	1527
Volume (vph)	100	60	20	450	100	70	30	800	860	130	410	120
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	100	60	20	450	100	70	30	800	860	130	410	120
RTOR Reduction (vph)	0	0	19	0	0	53	0	0	462	0	0	65
Lane Group Flow (vph)	100	60	1	268	282	17	30	800	398	130	410	55
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8			2			6
Actuated Green, G (s)	5.3	5.3	5.3	18.4	18.4	18.4	2.5	31.7	31.7	7.0	36.2	36.2
Effective Green, g (s)	5.8	5.8	5.8	19.4	19.4	19.4	2.5	32.7	32.7	7.0	37.2	37.2
Actuated g/C Ratio	0.07	0.07	0.07	0.24	0.24	0.24	0.03	0.40	0.40	0.09	0.46	0.46
Clearance Time (s)	4.5	4.5	4.5	5.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
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)	127	134	107	403	411	372	55	1430	626	153	1627	702
v/s Ratio Prot	c0.06	0.03		0.16	c0.16		0.02	0.23		c0.07	0.12	
v/s Ratio Perm			0.00			0.01			c0.26			0.04
v/c Ratio	0.79	0.45	0.01	0.67	0.69	0.05	0.55	0.56	0.64	0.85	0.25	0.08
Uniform Delay, d1	36.9	36.0	34.9	27.8	28.0	23.6	38.6	18.6	19.3	36.4	13.3	12.2
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	26.7	2.4	0.1	4.1	4.7	0.1	10.6	0.5	2.1	33.2	0.1	0.0
Delay (s)	63.7	38.4	34.9	31.9	32.7	23.7	49.2	19.0	21.4	69.6	13.4	12.3
Level of Service	E	D	C	C	C	C	D	B	C	E	B	B
Approach Delay (s)		52.1			31.3			20.8			24.3	
Approach LOS		D			C			C			C	

**Intersection Summary**

HCM Average Control Delay	25.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	80.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
4: Buchanan Rd & Somersville Road

12/21/2011



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	0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.97		1.00	1.00	0.97	1.00	1.00		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.98		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)	1770	3130		1770	1863	1534	1770	3472		1770	3321	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3130		1770	1863	1534	1770	3472		1770	3321	
Volume (vph)	340	500	710	50	220	150	200	170	20	330	670	300
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	340	500	710	50	220	150	200	170	20	330	670	300
RTOR Reduction (vph)	0	186	0	0	0	118	0	7	0	0	47	0
Lane Group Flow (vph)	340	1024	0	50	220	32	200	183	0	330	923	0
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	23.2	38.5		6.7	22.0	22.0	7.2	17.9		23.5	34.2	
Effective Green, g (s)	23.2	38.5		6.7	22.0	22.0	7.2	17.9		23.5	34.2	
Actuated g/C Ratio	0.23	0.38		0.07	0.21	0.21	0.07	0.17		0.23	0.33	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	400	1175		116	399	329	124	606		405	1107	
v/s Ratio Prot	c0.19	c0.33		0.03	0.12		c0.11	0.05		c0.19	c0.28	
v/s Ratio Perm						0.02						
v/c Ratio	0.85	0.95dr		0.43	0.55	0.10	1.61	0.30		0.81	0.83	
Uniform Delay, d1	38.0	29.8		46.1	35.9	32.3	47.7	36.9		37.5	31.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.4	7.3		2.6	1.6	0.1	309.8	0.3		11.9	5.5	
Delay (s)	53.5	37.0		48.7	37.6	32.5	357.5	37.2		49.4	37.1	
Level of Service	D	D		D	D	C	F	D		D	D	
Approach Delay (s)		40.7			37.1			201.5			40.2	
Approach LOS		D			D			F			D	

Intersection Summary

HCM Average Control Delay	57.2	HCM Level of Service	E
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	102.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	93.5%	ICU Level of Service	F
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis  
 5: James Donlon Boulevard & Somersville Road

12/21/2011



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)	40	80	0	10	30	360	20	20	10	1390	10	50
Peak Hour 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
Hourly flow rate (vph)	40	80	0	10	30	360	20	20	10	1390	10	50
Pedestrians	5			5			5			5		
Lane Width (ft)	12.0			12.0			12.0			12.0		
Walking Speed (ft/s)	4.0			4.0			4.0			4.0		
Percent Blockage	0			0			0			0		
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2905	2895	45	2930	2915	35	65				35	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2905	2895	45	2930	2915	35	65				35	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	0	0	100	0	0	65	99				11	
cM capacity (veh/h)	0	2	1016	0	2	1029	1531				1570	

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	40	53	27	10	30	360	50	1450
Volume Left	40	0	0	10	0	0	20	1390
Volume Right	0	0	0	0	0	360	10	50
cSH	0	2	2	0	2	1029	1531	1570
Volume to Capacity	Err	29.90	14.95	Err	17.33	0.35	0.01	0.89
Queue Length 95th (ft)	Err	Err	Err	Err	Err	40	1	355
Control Delay (s)	Err	Err	Err	Err	Err	10.4	3.0	21.2
Lane LOS	F	F	F	F	F	B	A	C
Approach Delay (s)	Err	Err			3.0			21.2
Approach LOS	F	F						

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	103.5%	ICU Level of Service	G
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis  
6: Montreux Driveway & Kirker Pass Road

12/21/2011



Movement	EBL	EBR	NBL	NBT	SBT	SBR
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	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583
Volume (vph)	100	30	40	1590	700	170
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	100	30	40	1590	700	170
RTOR Reduction (vph)	0	27	0	0	0	50
Lane Group Flow (vph)	100	3	40	1590	700	120
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	9.1	9.1	2.9	64.9	58.0	58.0
Effective Green, g (s)	9.1	9.1	2.9	64.9	58.0	58.0
Actuated g/C Ratio	0.11	0.11	0.04	0.79	0.71	0.71
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)	196	176	63	2801	2503	1120
v/s Ratio Prot	c0.06		0.02	c0.45	0.20	
v/s Ratio Perm		0.00				0.08
v/c Ratio	0.51	0.02	0.63	0.57	0.28	0.11
Uniform Delay, d1	34.3	32.5	39.0	3.2	4.4	3.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	0.0	19.1	0.8	0.3	0.2
Delay (s)	36.6	32.5	58.1	4.1	4.7	4.0
Level of Service	D	C	E	A	A	A
Approach Delay (s)	35.6			5.4	4.5	
Approach LOS	D			A	A	

Intersection Summary

HCM Average Control Delay	6.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	82.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
 1: Kirker Pass Road & Concord Boulevard

12/21/2011



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	0.91		1.00	0.91		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.97	1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.98		1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4901		1770	4938		1770	3539	1543	1770	3176	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4901		1770	4938		1770	3539	1543	1770	3176	
Volume (vph)	120	460	120	60	1510	300	500	570	150	80	90	130
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	120	460	120	60	1510	300	500	570	150	80	90	130
RTOR Reduction (vph)	0	28	0	0	18	0	0	0	107	0	122	0
Lane Group Flow (vph)	120	552	0	60	1792	0	500	570	43	80	98	0
Confl. Peds. (#/hr)			5			5			5			5
Turn Type	Prot			Prot			Prot		Perm		Prot	
Protected Phases	5	2		1	6		3	8			7	4
Permitted Phases									8			
Actuated Green, G (s)	14.8	71.7		8.6	65.5		43.9	42.6	42.6	11.1	9.8	
Effective Green, g (s)	14.8	71.7		8.6	65.5		43.9	42.6	42.6	11.1	9.8	
Actuated g/C Ratio	0.10	0.48		0.06	0.44		0.29	0.28	0.28	0.07	0.07	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	175	2343		101	2156		518	1005	438	131	207	
v/s Ratio Prot	c0.07	0.11		0.03	c0.36		c0.28	c0.16		0.05	0.03	
v/s Ratio Perm									0.03			
v/c Ratio	0.69	0.24		0.59	0.83		0.97	0.57	0.10	0.61	0.48	
Uniform Delay, d1	65.4	23.0		69.0	37.4		52.3	45.8	39.5	67.4	67.6	
Progression Factor	1.00	1.00		0.44	1.49		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	10.6	0.2		5.6	2.4		30.6	0.7	0.1	8.2	1.7	
Delay (s)	76.0	23.3		35.9	58.3		82.9	46.6	39.6	75.5	69.3	
Level of Service	E	C		D	E		F	D	D	E	E	
Approach Delay (s)		32.3			57.6			60.6			71.0	
Approach LOS		C			E			E			E	

Intersection Summary

HCM Average Control Delay	55.1	HCM Level of Service	E
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	91.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



# HCM Signalized Intersection Capacity Analysis

## 2: Kirker Pass Road & Myrtle Drive

12/21/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
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
Lane Util. Factor	1.00	0.95	0.91		1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	5068		1770	1543
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	5068		1770	1543
Volume (vph)	70	640	1670	30	30	60
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	70	640	1670	30	30	60
RTOR Reduction (vph)	0	0	1	0	0	31
Lane Group Flow (vph)	70	640	1699	0	30	29
Confl. Peds. (#/hr)				5		5
Turn Type	Prot			Perm		
Protected Phases	5	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	8.9	70.5	57.6		16.0	16.0
Effective Green, g (s)	8.9	70.5	57.6		71.5	71.5
Actuated g/C Ratio	0.06	0.47	0.38		0.48	0.48
Clearance Time (s)	4.0	4.0	4.0		59.5	59.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	105	1663	1946		844	735
v/s Ratio Prot	c0.04	0.18	c0.34		0.02	
v/s Ratio Perm						c0.02
v/c Ratio	0.67	0.38	0.87		0.04	0.04
Uniform Delay, d1	69.1	25.7	42.8		20.9	20.9
Progression Factor	0.88	0.78	1.00		1.00	1.00
Incremental Delay, d2	14.5	0.7	5.8		0.1	0.1
Delay (s)	75.4	20.6	48.6		21.0	21.0
Level of Service	E	C	D		C	C
Approach Delay (s)		26.0	48.6		21.0	
Approach LOS		C	D		C	

### Intersection Summary

HCM Average Control Delay	41.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 3: Buchanan Rd & Kirker Pass Road

12/21/2011

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	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Frbp, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.97	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1863	1528	1681	1720	1555	1770	3539	1553	1770	3539	1534	
Flt Permitted	0.95	1.00	1.00	0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	1863	1528	1681	1720	1555	1770	3539	1553	1770	3539	1534	
Volume (vph)	80	70	40	460	130	180	30	360	300	20	280	30	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj. Flow (vph)	80	70	40	460	130	180	30	360	300	20	280	30	
RTOR Reduction (vph)	0	0	35	0	0	126	0	0	221	0	0	23	
Lane Group Flow (vph)	80	70	5	287	303	54	30	360	79	20	280	7	
Confl. Peds. (#/hr)			10			10			10			10	
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm	
Protected Phases	7	7		8	8		5	2		1	6		
Permitted Phases			7			8			2			6	
Actuated Green, G (s)	6.6	6.6	6.6	15.8	15.8	15.8	2.0	13.7	13.7	0.9	12.6	12.6	
Effective Green, g (s)	7.1	7.1	7.1	16.8	16.8	16.8	2.0	14.7	14.7	0.9	13.6	13.6	
Actuated g/C Ratio	0.13	0.13	0.13	0.30	0.30	0.30	0.04	0.26	0.26	0.02	0.25	0.25	
Clearance Time (s)	4.5	4.5	4.5	5.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	
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)	226	238	195	509	521	471	64	937	411	29	867	376	
v/s Ratio Prot	c0.05	0.04		0.17	c0.18		c0.02	c0.10		0.01	0.08		
v/s Ratio Perm			0.00			0.04			0.05			0.00	
v/c Ratio	0.35	0.29	0.03	0.56	0.58	0.12	0.47	0.38	0.19	0.69	0.32	0.02	
Uniform Delay, d1	22.1	21.9	21.2	16.3	16.4	14.0	26.2	16.7	15.8	27.2	17.2	15.9	
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	1.0	0.7	0.1	1.4	1.7	0.1	5.3	0.3	0.2	51.3	0.2	0.0	
Delay (s)	23.1	22.6	21.2	17.7	18.0	14.1	31.6	17.0	16.0	78.4	17.4	15.9	
Level of Service	C	C	C	B	B	B	C	B	B	E	B	B	
Approach Delay (s)		22.5			17.0			17.2			21.0		
Approach LOS		C			B			B			C		
<b>Intersection Summary</b>													
HCM Average Control Delay			18.3									HCM Level of Service	B
HCM Volume to Capacity ratio			0.43										
Actuated Cycle Length (s)			55.5									Sum of lost time (s)	12.0
Intersection Capacity Utilization			57.6%									ICU Level of Service	B
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 4: Buchanan Rd & Somersville Road

12/21/2011



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	0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.98		1.00	1.00	0.97	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.99		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	3165		1770	1863	1538	1770	3514		1770	3385	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3165		1770	1863	1538	1770	3514		1770	3385	
Volume (vph)	480	40	60	10	10	310	10	490	20	180	280	80
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	480	40	60	10	10	310	10	490	20	180	280	80
RTOR Reduction (vph)	0	34	0	0	0	267	0	2	0	0	16	0
Lane Group Flow (vph)	480	66	0	10	10	43	10	508	0	180	344	0
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	28.4	39.8		0.6	12.0	12.0	1.1	20.8		13.0	32.7	
Effective Green, g (s)	28.4	39.8		0.6	12.0	12.0	1.1	20.8		13.0	32.7	
Actuated g/C Ratio	0.31	0.44		0.01	0.13	0.13	0.01	0.23		0.14	0.36	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	557	1397		12	248	205	22	810		255	1227	
v/s Ratio Prot	c0.27	0.02		0.01	0.01		0.01	c0.14		c0.10	0.10	
v/s Ratio Perm						c0.03						
v/c Ratio	0.86	0.05		0.83	0.04	0.21	0.45	0.63		0.71	0.28	
Uniform Delay, d1	29.1	14.4		44.8	34.1	34.9	44.3	31.2		36.8	20.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.9	0.0		168.3	0.1	0.5	14.2	1.5		8.6	0.1	
Delay (s)	42.0	14.4		213.1	34.1	35.4	58.4	32.7		45.4	20.5	
Level of Service	D	B		F	C	D	E	C		D	C	
Approach Delay (s)		37.2			40.7			33.2			28.8	
Approach LOS		D			D			C			C	

Intersection Summary

HCM Average Control Delay	34.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 5: James Donlon Extension & Somersville Road

12/21/2011



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	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	0.99		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		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)	3433	3539	1535	1770	3539	1554	1770	1656		1770	1863	1554
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)	3433	3539	1535	1770	3539	1554	1770	1656		1770	1863	1554
Volume (vph)	150	340	10	10	1080	360	40	10	20	190	10	190
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	150	340	10	10	1080	360	40	10	20	190	10	190
RTOR Reduction (vph)	0	0	4	0	0	62	0	19	0	0	0	161
Lane Group Flow (vph)	150	340	6	10	1080	298	40	11	0	190	10	29
Confl. Peds. (#/hr)			5			5			5			5
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)	6.8	39.9	39.9	0.6	33.7	33.7	2.8	2.6		10.9	10.7	10.7
Effective Green, g (s)	6.8	39.9	39.9	0.6	33.7	33.7	2.8	2.6		10.9	10.7	10.7
Actuated g/C Ratio	0.10	0.57	0.57	0.01	0.48	0.48	0.04	0.04		0.16	0.15	0.15
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	333	2017	875	15	1704	748	71	62		276	285	238
v/s Ratio Prot	c0.04	0.10		0.01	c0.31		0.02	0.01		c0.11	0.01	
v/s Ratio Perm			0.00			0.19						c0.02
v/c Ratio	0.45	0.17	0.01	0.67	0.63	0.40	0.56	0.17		0.69	0.04	0.12
Uniform Delay, d1	29.8	7.2	6.5	34.6	13.5	11.6	33.0	32.7		27.9	25.3	25.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.0	0.0	0.0	75.9	0.8	0.3	9.8	1.3		7.0	0.1	0.2
Delay (s)	30.8	7.2	6.5	110.5	14.3	12.0	42.8	34.0		34.9	25.3	25.8
Level of Service	C	A	A	F	B	B	D	C		C	C	C
Approach Delay (s)		14.3			14.4			39.1			30.2	
Approach LOS		B			B			D			C	

Intersection Summary

HCM Average Control Delay	17.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
6: James Donlon Extension & Kirker Pass Road

12/21/2011



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	0.97	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	3433	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	3433	1863	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	120	40	40	920	10	130	10	310	360	20	760	40
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	120	40	40	920	10	130	10	310	360	20	760	40
RTOR Reduction (vph)	0	0	37	0	0	77	0	0	0	0	0	29
Lane Group Flow (vph)	120	40	3	920	10	53	10	310	360	20	760	11
Turn Type	Prot		Perm	Prot		Perm	Prot		Free	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			Free			6
Actuated Green, G (s)	6.0	5.5	5.5	29.2	28.7	28.7	0.7	18.4	70.5	1.4	19.1	19.1
Effective Green, g (s)	6.0	5.5	5.5	29.2	28.7	28.7	0.7	18.4	70.5	1.4	19.1	19.1
Actuated g/C Ratio	0.09	0.08	0.08	0.41	0.41	0.41	0.01	0.26	1.00	0.02	0.27	0.27
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	151	145	123	1422	758	644	18	924	1583	35	959	429
v/s Ratio Prot	0.07	0.02		c0.27	0.01		0.01	0.09		0.01	c0.21	
v/s Ratio Perm			0.00			0.03			c0.23			0.01
v/c Ratio	0.79	0.28	0.03	0.65	0.01	0.08	0.56	0.34	0.23	0.57	0.79	0.03
Uniform Delay, d1	31.6	30.6	30.0	16.5	12.5	12.8	34.7	21.1	0.0	34.3	23.9	18.9
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	24.3	1.0	0.1	1.0	0.0	0.3	32.3	0.2	0.3	20.6	4.6	0.0
Delay (s)	56.0	31.7	30.1	17.5	12.5	13.1	67.0	21.3	0.3	54.8	28.4	18.9
Level of Service	E	C	C	B	B	B	E	C	A	D	C	B
Approach Delay (s)		45.9			17.0			10.9			28.6	
Approach LOS		D			B			B			C	

Intersection Summary

HCM Average Control Delay	21.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	70.5	Sum of lost time (s)	4.0
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
 7: James Donlon Extension & Ventura Drive

12/21/2011



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	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.98		1.00	0.90		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3526		1770	3458		1770	1676		1770	1676	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3526		1770	3458		1770	1676		1770	1676	
Volume (vph)	10	400	10	10	1000	180	40	10	20	20	10	20
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	400	10	10	1000	180	40	10	20	20	10	20
RTOR Reduction (vph)	0	1	0	0	9	0	0	20	0	0	20	0
Lane Group Flow (vph)	10	409	0	10	1171	0	40	10	0	20	10	0
Turn Type	Prot		Prot		Prot		Prot		Prot			
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	0.8	55.0		0.8	55.0		0.8	1.5		0.8	1.5	
Effective Green, g (s)	0.8	55.0		0.8	55.0		0.8	1.5		0.8	1.5	
Actuated g/C Ratio	0.01	0.74		0.01	0.74		0.01	0.02		0.01	0.02	
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)	19	2617		19	2567		19	34		19	34	
v/s Ratio Prot	c0.01	0.12		0.01	c0.34		c0.02	c0.01		0.01	0.01	
v/s Ratio Perm												
v/c Ratio	0.53	0.16		0.53	0.46		2.11	0.31		1.05	0.31	
Uniform Delay, d1	36.5	2.8		36.5	3.7		36.6	35.8		36.6	35.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	23.9	0.0		23.9	0.1		638.0	5.1		224.0	5.1	
Delay (s)	60.3	2.8		60.3	3.9		674.7	40.8		260.7	40.8	
Level of Service	E	A		E	A		F	D		F	D	
Approach Delay (s)	4.2			4.3			403.0			128.8		
Approach LOS	A			A			F			F		

Intersection Summary

HCM Average Control Delay	24.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	74.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	48.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 1: Kirker Pass Road & Concord Boulevard

12/21/2011



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	0.91		1.00	0.91		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.97	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.98		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4885		1770	4978		1770	3539	1543	1770	3387	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4885		1770	4978		1770	3539	1543	1770	3387	
Volume (vph)	130	1380	400	130	660	90	250	180	40	340	430	140
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	130	1380	400	130	660	90	250	180	40	340	430	140
RTOR Reduction (vph)	0	33	0	0	11	0	0	0	35	0	21	0
Lane Group Flow (vph)	130	1747	0	130	739	0	250	180	5	340	549	0
Confl. Peds. (#/hr)			5			5			5			5
Turn Type	Prot			Prot			Prot		Perm		Prot	
Protected Phases	5	2		1	6		3	8			7	4
Permitted Phases									8			
Actuated Green, G (s)	15.8	68.7		13.3	66.2		24.4	19.7	19.7	32.3	27.6	
Effective Green, g (s)	15.8	68.7		13.3	66.2		24.4	19.7	19.7	32.3	27.6	
Actuated g/C Ratio	0.11	0.46		0.09	0.44		0.16	0.13	0.13	0.22	0.18	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	186	2237		157	2197		288	465	203	381	623	
v/s Ratio Prot	0.07	c0.36		c0.07	0.15		0.14	0.05		c0.19	c0.16	
v/s Ratio Perm									0.00			
v/c Ratio	0.70	0.78		0.83	0.34		0.87	0.39	0.03	0.89	0.88	
Uniform Delay, d1	64.8	34.3		67.2	27.5		61.2	59.6	56.8	57.2	59.6	
Progression Factor	1.00	1.00		0.51	1.70		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	10.9	2.8		27.1	0.4		23.0	0.5	0.1	22.2	13.7	
Delay (s)	75.7	37.1		61.6	47.0		84.2	60.2	56.8	79.3	73.3	
Level of Service	E	D		E	D		F	E	E	E	E	
Approach Delay (s)		39.7			49.2			72.7			75.6	
Approach LOS		D			D			E			E	

### Intersection Summary

HCM Average Control Delay	53.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 2: Kirker Pass Road & Myrtle Drive

12/21/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
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
Lane Util. Factor	1.00	0.95	0.91		1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	5062		1770	1543
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	5062		1770	1543
Volume (vph)	80	1610	810	20	40	40
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	80	1610	810	20	40	40
RTOR Reduction (vph)	0	0	2	0	0	21
Lane Group Flow (vph)	80	1610	828	0	40	19
Confl. Peds. (#/hr)				5		5
Turn Type	Prot			Perm		
Protected Phases	5	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	10.6	70.5	55.9		71.5	71.5
Effective Green, g (s)	10.6	70.5	55.9		71.5	71.5
Actuated g/C Ratio	0.07	0.47	0.37		0.48	0.48
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	125	1663	1886		844	735
v/s Ratio Prot	0.05	c0.45	0.16		c0.02	
v/s Ratio Perm						0.01
v/c Ratio	0.64	0.97	0.44		0.05	0.03
Uniform Delay, d1	67.8	38.7	35.3		21.0	20.8
Progression Factor	1.28	0.68	1.00		1.00	1.00
Incremental Delay, d2	6.8	11.4	0.7		0.1	0.1
Delay (s)	93.8	37.7	36.0		21.1	20.9
Level of Service	F	D	D		C	C
Approach Delay (s)		40.4	36.0		21.0	
Approach LOS		D	D		C	

### Intersection Summary

HCM Average Control Delay	38.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



HCM Signalized Intersection Capacity Analysis  
3: Buchanan Rd & Kirker Pass Road

























12/21/2011

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	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1527	1681	1736	1551	1770	3539	1549	1770	3539	1528
Flt Permitted	0.95	1.00	1.00	0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1527	1681	1736	1551	1770	3539	1549	1770	3539	1528
Volume (vph)	100	80	20	110	50	40	30	290	360	170	200	120
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	100	80	20	110	50	40	30	290	360	170	200	120
RTOR Reduction (vph)	0	0	18	0	0	35	0	0	223	0	0	60
Lane Group Flow (vph)	100	80	2	78	82	5	30	290	137	170	200	60
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8			2			6
Actuated Green, G (s)	8.8	8.8	8.8	8.7	8.7	8.7	2.9	27.7	27.7	11.5	36.3	36.3
Effective Green, g (s)	9.3	9.3	9.3	9.7	9.7	9.7	2.9	28.7	28.7	11.5	37.3	37.3
Actuated g/C Ratio	0.12	0.12	0.12	0.13	0.13	0.13	0.04	0.38	0.38	0.15	0.50	0.50
Clearance Time (s)	4.5	4.5	4.5	5.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
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)	219	230	189	217	224	200	68	1351	591	271	1755	758
v/s Ratio Prot	c0.06	0.04		0.05	c0.05		0.02	0.08		c0.10	0.06	
v/s Ratio Perm			0.00			0.00			c0.09			0.04
v/c Ratio	0.46	0.35	0.01	0.36	0.37	0.03	0.44	0.21	0.23	0.63	0.11	0.08
Uniform Delay, d1	30.6	30.2	28.9	29.9	29.9	28.6	35.4	15.7	15.8	29.8	10.1	9.9
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	1.5	0.9	0.0	1.0	1.0	0.1	4.5	0.1	0.2	4.5	0.0	0.0
Delay (s)	32.1	31.1	28.9	30.9	31.0	28.7	39.9	15.7	16.0	34.3	10.2	10.0
Level of Service	C	C	C	C	C	C	D	B	B	C	B	A
Approach Delay (s)		31.4			30.5			16.9			18.5	
Approach LOS		C			C			B			B	
<b>Intersection Summary</b>												
HCM Average Control Delay			21.0				HCM Level of Service			C		
HCM Volume to Capacity ratio			0.37									
Actuated Cycle Length (s)			75.2				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			50.7%				ICU Level of Service			A		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
4: Buchanan Rd & Somersville Road

12/21/2011

												
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	0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.98		1.00	1.00	0.97	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3166		1770	1863	1541	1770	3450		1770	3373	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3166		1770	1863	1541	1770	3450		1770	3373	
Volume (vph)	370	170	260	60	80	280	50	180	30	330	530	170
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	370	170	260	60	80	280	50	180	30	330	530	170
RTOR Reduction (vph)	0	166	0	0	0	240	0	11	0	0	30	0
Lane Group Flow (vph)	370	264	0	60	80	40	50	199	0	330	670	0
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	22.3	29.3		4.5	11.5	11.5	4.4	12.2		19.2	27.0	
Effective Green, g (s)	22.3	29.3		4.5	11.5	11.5	4.4	12.2		19.2	27.0	
Actuated g/C Ratio	0.27	0.36		0.06	0.14	0.14	0.05	0.15		0.24	0.33	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	486	1142		98	264	218	96	518		419	1122	
v/s Ratio Prot	c0.21	0.08		0.03	c0.04		0.03	0.06		c0.19	c0.20	
v/s Ratio Perm						0.03						
v/c Ratio	0.76	0.23		0.61	0.30	0.18	0.52	0.38		0.79	0.60	
Uniform Delay, d1	27.0	18.1		37.5	31.3	30.7	37.4	31.1		29.1	22.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.9	0.1		10.8	0.7	0.4	5.0	0.5		9.5	0.9	
Delay (s)	33.9	18.2		48.3	31.9	31.1	42.4	31.6		38.5	23.4	
Level of Service	C	B		D	C	C	D	C		D	C	
Approach Delay (s)		25.5			33.7			33.7			28.3	
Approach LOS		C			C			C			C	
<b>Intersection Summary</b>												
HCM Average Control Delay			28.9			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			81.2			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			67.0%			ICU Level of Service				C		
Analysis Period (min)			15									
c	Critical Lane Group											

HCM Signalized Intersection Capacity Analysis  
5: James Donlon Extension & Somersville Road

12/21/2011



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	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	0.99		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		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)	3433	3539	1531	1770	3539	1552	1770	1706		1770	1863	1552
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)	3433	3539	1531	1770	3539	1552	1770	1706		1770	1863	1552
Volume (vph)	50	1140	10	10	420	190	30	10	10	550	10	230
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	50	1140	10	10	420	190	30	10	10	550	10	230
RTOR Reduction (vph)	0	0	6	0	0	64	0	10	0	0	0	153
Lane Group Flow (vph)	50	1140	4	10	420	126	30	10	0	550	10	77
Confl. Peds. (#/hr)			5			5			5			5
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	3.9	37.2	37.2	0.6	33.9	33.9	2.5	2.3		28.8	28.6	28.6
Effective Green, g (s)	3.9	37.2	37.2	0.6	33.9	33.9	2.5	2.3		28.8	28.6	28.6
Actuated g/C Ratio	0.05	0.44	0.44	0.01	0.40	0.40	0.03	0.03		0.34	0.34	0.34
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	158	1551	671	13	1413	620	52	46		600	628	523
v/s Ratio Prot	c0.01	c0.32		0.01	0.12		0.02	0.01		c0.31	0.01	
v/s Ratio Perm			0.00			0.08						c0.05
v/c Ratio	0.32	0.74	0.01	0.77	0.30	0.20	0.58	0.22		0.92	0.02	0.15
Uniform Delay, d1	39.2	19.8	13.4	42.1	17.4	16.7	40.7	40.4		26.9	18.8	19.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.2	1.8	0.0	128.6	0.1	0.2	14.6	2.5		18.8	0.0	0.1
Delay (s)	40.4	21.6	13.4	170.7	17.5	16.8	55.2	42.9		45.7	18.8	19.8
Level of Service	D	C	B	F	B	B	E	D		D	B	B
Approach Delay (s)		22.3			19.8			50.3			37.8	
Approach LOS		C			B			D			D	

Intersection Summary

HCM Average Control Delay	26.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	84.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 6: James Donlon Extension & Kirker Pass Road

12/21/2011

























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	0.97	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	3433	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	3433	1863	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	70	30	30	480	50	40	40	660	950	20	320	130
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	70	30	30	480	50	40	40	660	950	20	320	130
RTOR Reduction (vph)	0	0	26	0	0	23	0	0	0	0	0	100
Lane Group Flow (vph)	70	30	4	480	50	17	40	660	950	20	320	30
Turn Type	Prot		Perm	Prot		Perm	Prot		Free	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			Free			6
Actuated Green, G (s)	4.9	9.0	9.0	27.1	31.2	31.2	3.9	18.8	73.1	2.2	17.1	17.1
Effective Green, g (s)	4.9	9.0	9.0	27.1	31.2	31.2	3.9	18.8	73.1	2.2	17.1	17.1
Actuated g/C Ratio	0.07	0.12	0.12	0.37	0.43	0.43	0.05	0.26	1.00	0.03	0.23	0.23
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	119	229	195	1273	795	676	94	910	1583	53	828	370
v/s Ratio Prot	0.04	0.02		0.14	0.03		0.02	c0.19		0.01	0.09	
v/s Ratio Perm			0.00			0.01			c0.60			0.02
v/c Ratio	0.59	0.13	0.02	0.38	0.06	0.03	0.43	0.73	0.60	0.38	0.39	0.08
Uniform Delay, d1	33.1	28.6	28.2	16.8	12.3	12.1	33.5	24.8	0.0	34.8	23.6	21.9
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	7.2	0.3	0.0	0.9	0.2	0.1	3.1	2.9	1.7	4.5	0.3	0.1
Delay (s)	40.4	28.8	28.2	17.7	12.5	12.2	36.6	27.7	1.7	39.2	23.9	22.0
Level of Service	D	C	C	B	B	B	D	C	A	D	C	C
Approach Delay (s)		34.9			16.8			12.9			24.0	
Approach LOS		C			B			B			C	

Intersection Summary

HCM Average Control Delay	16.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	73.1	Sum of lost time (s)	0.0
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
7: James Donlon Extension & Ventura Drive

12/21/2011

												
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	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.98		1.00	0.93		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3534		1770	3477		1770	1723		1770	1676	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3534		1770	3477		1770	1723		1770	1676	
Volume (vph)	20	970	10	10	530	70	20	10	10	160	10	20
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	970	10	10	530	70	20	10	10	160	10	20
RTOR Reduction (vph)	0	0	0	0	9	0	0	10	0	0	16	0
Lane Group Flow (vph)	20	980	0	10	591	0	20	10	0	160	14	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	0.9	28.9		0.6	28.6		0.6	1.1		10.3	10.8	
Effective Green, g (s)	0.9	28.9		0.6	28.6		0.6	1.1		10.3	10.8	
Actuated g/C Ratio	0.02	0.51		0.01	0.50		0.01	0.02		0.18	0.19	
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)	28	1795		19	1748		19	33		320	318	
v/s Ratio Prot	c0.01	c0.28		0.01	0.17		0.01	c0.01		c0.09	0.01	
v/s Ratio Perm												
v/c Ratio	0.71	0.55		0.53	0.34		1.05	0.31		0.50	0.04	
Uniform Delay, d1	27.9	9.5		28.0	8.5		28.1	27.5		21.0	18.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	60.5	0.3		23.9	0.1		224.0	5.3		1.2	0.1	
Delay (s)	88.4	9.9		51.9	8.6		252.2	32.8		22.2	18.9	
Level of Service	F	A		D	A		F	C		C	B	
Approach Delay (s)		11.4			9.3			142.5			21.7	
Approach LOS		B			A			F			C	
<b>Intersection Summary</b>												
HCM Average Control Delay			14.6	HCM Level of Service				B				
HCM Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			56.9	Sum of lost time (s)				12.0				
Intersection Capacity Utilization			49.3%	ICU Level of Service				A				
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 1: Kirker Pass Road & Concord Boulevard

12/21/2011



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	0.91		1.00	0.91		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.97	1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.98		1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4935		1770	4990		1770	3539	1543	1770	3151	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4935		1770	4990		1770	3539	1543	1770	3151	
Volume (vph)	120	640	130	60	1670	200	600	580	230	120	110	190
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	120	640	130	60	1670	200	600	580	230	120	110	190
RTOR Reduction (vph)	0	19	0	0	9	0	0	0	161	0	127	0
Lane Group Flow (vph)	120	751	0	60	1861	0	600	580	69	120	173	0
Confl. Peds. (#/hr)			5			5			5			5
Turn Type	Prot			Prot			Prot		Perm		Prot	
Protected Phases	5	2		1	6		3	8			7	4
Permitted Phases									8			
Actuated Green, G (s)	13.9	68.4		7.9	62.4		45.0	45.2	45.2	12.5	12.7	
Effective Green, g (s)	13.9	68.4		7.9	62.4		45.0	45.2	45.2	12.5	12.7	
Actuated g/C Ratio	0.09	0.46		0.05	0.42		0.30	0.30	0.30	0.08	0.08	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	164	2250		93	2076		531	1066	465	148	267	
v/s Ratio Prot	c0.07	0.15		0.03	c0.37		c0.34	c0.16		0.07	0.05	
v/s Ratio Perm									0.04			
v/c Ratio	0.73	0.33		0.65	0.90		1.13	0.54	0.15	0.81	0.65	
Uniform Delay, d1	66.2	26.2		69.7	40.8		52.5	43.8	38.3	67.6	66.5	
Progression Factor	1.00	1.00		0.45	1.46		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	15.4	0.4		9.5	4.4		80.0	0.6	0.1	27.4	5.3	
Delay (s)	81.7	26.6		41.0	64.0		132.5	44.4	38.5	95.0	71.8	
Level of Service	F	C		D	E		F	D	D	F	E	
Approach Delay (s)		34.0			63.3			80.9			78.4	
Approach LOS		C			E			F			E	

### Intersection Summary

HCM Average Control Delay	64.4	HCM Level of Service	E
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	100.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 2: Kirker Pass Road & Myrtle Drive

12/21/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
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
Lane Util. Factor	1.00	0.95	0.91		1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	5068		1770	1543
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	5068		1770	1543
Volume (vph)	70	980	1670	30	30	90
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	70	980	1670	30	30	90
RTOR Reduction (vph)	0	0	1	0	0	47
Lane Group Flow (vph)	70	980	1699	0	30	43
Confl. Peds. (#/hr)				5		5
Turn Type	Prot			Perm		
Protected Phases	5	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	8.7	70.5	57.8		16.0	16.0
Effective Green, g (s)	8.7	70.5	57.8		71.5	71.5
Actuated g/C Ratio	0.06	0.47	0.39		0.48	0.48
Clearance Time (s)	4.0	4.0	4.0		59.5	59.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	103	1663	1953		844	735
v/s Ratio Prot	0.04	c0.28	c0.34		0.02	
v/s Ratio Perm						c0.03
v/c Ratio	0.68	0.59	0.87		0.04	0.06
Uniform Delay, d1	69.3	29.1	42.6		20.9	21.1
Progression Factor	1.04	0.79	1.00		1.00	1.00
Incremental Delay, d2	15.6	1.5	5.6		0.1	0.2
Delay (s)	87.6	24.4	48.2		21.0	21.3
Level of Service	F	C	D		C	C
Approach Delay (s)		28.6	48.2		21.2	
Approach LOS		C	D		C	

### Intersection Summary

HCM Average Control Delay	39.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



HCM Signalized Intersection Capacity Analysis  
 3: Buchanan Road & Kirker Pass Road

12/21/2011



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	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1508	1681	1697	1548	1770	3539	1545	1770	3539	1523
Flt Permitted	0.95	1.00	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1508	1681	1697	1548	1770	3539	1545	1770	3539	1523
Volume (vph)	100	60	40	1170	90	90	30	870	610	70	580	30
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	100	60	40	1170	90	90	30	870	610	70	580	30
RTOR Reduction (vph)	0	0	37	0	0	34	0	0	312	0	0	21
Lane Group Flow (vph)	100	60	3	614	646	56	30	870	298	70	580	9
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8			2			6
Actuated Green, G (s)	7.2	7.2	7.2	37.4	37.4	37.4	3.7	25.7	25.7	5.0	27.0	27.0
Effective Green, g (s)	7.7	7.7	7.7	38.4	38.4	38.4	3.7	26.7	26.7	5.0	28.0	28.0
Actuated g/C Ratio	0.08	0.08	0.08	0.41	0.41	0.41	0.04	0.28	0.28	0.05	0.30	0.30
Clearance Time (s)	4.5	4.5	4.5	5.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
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)	145	153	124	688	695	634	70	1007	440	94	1056	455
v/s Ratio Prot	c0.06	0.03		0.37	c0.38		0.02	c0.25		c0.04	0.16	
v/s Ratio Perm			0.00			0.04			0.19			0.01
v/c Ratio	0.69	0.39	0.03	0.89	0.93	0.09	0.43	0.86	0.68	0.74	0.55	0.02
Uniform Delay, d1	41.9	40.8	39.6	25.8	26.4	17.0	44.0	31.8	29.7	43.8	27.6	23.2
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	12.8	1.7	0.1	13.9	18.7	0.1	4.2	7.8	4.1	27.0	0.6	0.0
Delay (s)	54.7	42.5	39.7	39.7	45.1	17.0	48.2	39.6	33.8	70.7	28.2	23.2
Level of Service	D	D	D	D	D	B	D	D	C	E	C	C
Approach Delay (s)		48.0			40.8			37.5			32.4	
Approach LOS		D			D			D			C	

Intersection Summary

HCM Average Control Delay	38.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	93.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



HCM Signalized Intersection Capacity Analysis  
 4: Buchanan Road & Somersville Road

12/21/2011

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	0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.96		1.00	1.00	0.96	1.00	1.00		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	1.00	0.85	1.00	0.99		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3122		1770	1863	1521	1770	3513		1770	3131	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3122		1770	1863	1521	1770	3513		1770	3131	
Volume (vph)	500	180	230	30	450	360	630	990	40	100	140	170
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	500	180	230	30	450	360	630	990	40	100	140	170
RTOR Reduction (vph)	0	129	0	0	0	153	0	2	0	0	149	0
Lane Group Flow (vph)	500	281	0	30	450	207	630	1028	0	100	161	0
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	37.0	65.2		5.5	33.7	33.7	49.0	49.7		12.2	12.9	
Effective Green, g (s)	37.0	65.2		5.5	33.7	33.7	49.0	49.7		12.2	12.9	
Actuated g/C Ratio	0.25	0.44		0.04	0.23	0.23	0.33	0.33		0.08	0.09	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	441	1370		66	422	345	584	1175		145	272	
v/s Ratio Prot	c0.28	0.09		0.02	c0.24		c0.36	c0.29		0.06	0.05	
v/s Ratio Perm						0.14						
v/c Ratio	1.13	0.21		0.45	1.07	0.60	1.08	0.87		0.69	0.59	
Uniform Delay, d1	55.8	25.7		70.1	57.4	51.4	49.8	46.5		66.4	65.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	84.8	0.1		4.9	62.6	2.8	60.3	7.5		12.8	3.4	
Delay (s)	140.6	25.8		75.0	120.0	54.2	110.1	54.0		79.2	68.8	
Level of Service	F	C		E	F	D	F	D		E	E	
Approach Delay (s)		88.9			90.2			75.3			71.3	
Approach LOS		F			F			E			E	
<b>Intersection Summary</b>												
HCM Average Control Delay			81.4				HCM Level of Service				F	
HCM Volume to Capacity ratio			1.06									
Actuated Cycle Length (s)			148.6			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			110.5%			ICU Level of Service				H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis  
 5: James Donlon Boulevard & Somersville Road

12/21/2011



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)	190	50	10	10	40	1400	30	50	20	300	20	60
Peak Hour 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
Hourly flow rate (vph)	190	50	10	10	40	1400	30	50	20	300	20	60
Pedestrians	5			5			5			5		
Lane Width (ft)	12.0			12.0			12.0			12.0		
Walking Speed (ft/s)	4.0			4.0			4.0			4.0		
Percent Blockage	0			0			0			0		
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	800	790	60	815	810	70	85				75	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	800	790	60	815	810	70	85				75	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	0	80	99	95	84	0	98				80	
cM capacity (veh/h)	0	251	997	206	245	984	1505				1518	

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	190	33	27	10	40	1400	100	380
Volume Left	190	0	0	10	0	0	30	300
Volume Right	0	0	10	0	0	1400	20	60
cSH	0	251	349	206	245	984	1505	1518
Volume to Capacity	Err	0.13	0.08	0.05	0.16	1.42	0.02	0.20
Queue Length 95th (ft)	Err	11	6	4	14	1515	2	18
Control Delay (s)	Err	21.5	16.2	23.4	22.6	210.2	2.3	6.6
Lane LOS	F	C	C	C	C	F	A	A
Approach Delay (s)	Err	203.7			2.3			6.6
Approach LOS	F	F						

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	114.3%	ICU Level of Service	H
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis  
6: Montreux Driveway & Kirker Pass Road

12/21/2011



Movement	EBL	EBR	NBL	NBT	SBT	SBR
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	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583
Volume (vph)	160	40	10	1040	1740	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	160	40	10	1040	1740	50
RTOR Reduction (vph)	0	35	0	0	0	9
Lane Group Flow (vph)	160	5	10	1040	1740	41
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	10.8	10.8	1.3	60.1	54.8	54.8
Effective Green, g (s)	10.8	10.8	1.3	60.1	54.8	54.8
Actuated g/C Ratio	0.14	0.14	0.02	0.76	0.69	0.69
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)	242	217	29	2696	2458	1099
v/s Ratio Prot	c0.09		0.01	c0.29	c0.49	
v/s Ratio Perm		0.00				0.03
v/c Ratio	0.66	0.03	0.34	0.39	0.71	0.04
Uniform Delay, d1	32.3	29.5	38.4	3.2	7.2	3.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.6	0.0	7.0	0.4	1.8	0.1
Delay (s)	38.9	29.5	45.4	3.6	9.0	3.8
Level of Service	D	C	D	A	A	A
Approach Delay (s)	37.1			4.0	8.8	
Approach LOS	D			A	A	

Intersection Summary

HCM Average Control Delay	9.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	78.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 1: Kirker Pass Road & Concord Boulevard

12/21/2011



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	0.91		1.00	0.91		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.97	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.98		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4901		1770	4958		1770	3539	1543	1770	3396	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4901		1770	4958		1770	3539	1543	1770	3396	
Volume (vph)	180	1680	440	180	960	160	250	210	40	360	430	130
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	180	1680	440	180	960	160	250	210	40	360	430	130
RTOR Reduction (vph)	0	31	0	0	14	0	0	0	35	0	20	0
Lane Group Flow (vph)	180	2089	0	180	1106	0	250	210	5	360	540	0
Confl. Peds. (#/hr)			5			5			5			5
Turn Type	Prot			Prot			Prot		Perm		Prot	
Protected Phases	5	2		1	6		3	8			7	4
Permitted Phases									8			
Actuated Green, G (s)	18.8	65.0		17.2	63.4		24.4	17.9	17.9	33.9	27.4	
Effective Green, g (s)	18.8	65.0		17.2	63.4		24.4	17.9	17.9	33.9	27.4	
Actuated g/C Ratio	0.13	0.43		0.11	0.42		0.16	0.12	0.12	0.23	0.18	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	222	2124		203	2096		288	422	184	400	620	
v/s Ratio Prot	0.10	c0.43		c0.10	0.22		0.14	0.06		c0.20	c0.16	
v/s Ratio Perm									0.00			
v/c Ratio	0.81	0.98		0.89	0.53		0.87	0.50	0.03	0.90	0.87	
Uniform Delay, d1	63.9	42.0		65.4	32.2		61.2	61.8	58.3	56.4	59.6	
Progression Factor	1.00	1.00		0.50	1.75		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	19.6	16.0		29.3	0.8		23.0	0.9	0.1	22.6	12.8	
Delay (s)	83.5	58.0		61.7	57.2		84.2	62.8	58.4	79.0	72.4	
Level of Service	F	E		E	E		F	E	E	E	E	
Approach Delay (s)		60.0			57.8			73.1			75.0	
Approach LOS		E			E			E			E	

### Intersection Summary

HCM Average Control Delay	63.5	HCM Level of Service	E
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	95.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 2: Kirker Pass Road & Myrtle Drive

12/21/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
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
Lane Util. Factor	1.00	0.95	0.91		1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	5062		1770	1543
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	5062		1770	1543
Volume (vph)	80	1930	1240	30	40	40
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	80	1930	1240	30	40	40
RTOR Reduction (vph)	0	0	2	0	0	23
Lane Group Flow (vph)	80	1930	1268	0	40	17
Confl. Peds. (#/hr)				5		5
Turn Type	Prot			Perm		
Protected Phases	5	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	10.7	77.0	62.3		65.0	65.0
Effective Green, g (s)	10.7	77.0	62.3		65.0	65.0
Actuated g/C Ratio	0.07	0.51	0.42		0.43	0.43
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	126	1817	2102		767	669
v/s Ratio Prot	0.05	c0.55	0.25		c0.02	
v/s Ratio Perm						0.01
v/c Ratio	0.63	1.06	0.60		0.05	0.03
Uniform Delay, d1	67.8	36.5	34.2		24.6	24.4
Progression Factor	1.42	0.48	1.00		1.00	1.00
Incremental Delay, d2	3.7	33.1	1.3		0.1	0.1
Delay (s)	99.6	50.6	35.5		24.8	24.4
Level of Service	F	D	D		C	C
Approach Delay (s)		52.5	35.5		24.6	
Approach LOS		D	D		C	

### Intersection Summary

HCM Average Control Delay	45.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 3: Buchanan Rd & Kirker Pass Road

12/21/2011

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	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1503	1681	1705	1546	1770	3539	1543	1770	3539	1519
Flt Permitted	0.95	1.00	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1503	1681	1705	1546	1770	3539	1543	1770	3539	1519
Volume (vph)	100	60	30	700	100	70	30	1310	860	180	950	120
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	100	60	30	700	100	70	30	1310	860	180	950	120
RTOR Reduction (vph)	0	0	28	0	0	42	0	0	296	0	0	54
Lane Group Flow (vph)	100	60	2	390	410	28	30	1310	564	180	950	66
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8			2			6
Actuated Green, G (s)	7.5	7.5	7.5	26.0	26.0	26.0	4.6	42.6	42.6	10.0	48.0	48.0
Effective Green, g (s)	8.0	8.0	8.0	27.0	27.0	27.0	4.6	43.6	43.6	10.0	49.0	49.0
Actuated g/C Ratio	0.08	0.08	0.08	0.26	0.26	0.26	0.04	0.42	0.42	0.10	0.47	0.47
Clearance Time (s)	4.5	4.5	4.5	5.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
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)	135	142	115	434	440	399	78	1475	643	169	1658	712
v/s Ratio Prot	c0.06	0.03		0.23	c0.24		0.02	c0.37		c0.10	0.27	
v/s Ratio Perm			0.00			0.02			0.37			0.04
v/c Ratio	0.74	0.42	0.02	0.90	0.93	0.07	0.38	0.89	0.88	1.07	0.57	0.09
Uniform Delay, d1	47.3	46.1	44.7	37.5	37.9	29.3	48.6	28.2	28.0	47.3	20.2	15.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	19.5	2.0	0.1	20.8	26.6	0.1	3.1	6.9	12.9	87.6	0.5	0.1
Delay (s)	66.7	48.1	44.7	58.3	64.5	29.4	51.8	35.1	40.9	134.9	20.7	15.5
Level of Service	E	D	D	E	E	C	D	D	D	F	C	B
Approach Delay (s)		57.4			58.9			37.6			36.6	
Approach LOS		E			E			D			D	
<b>Intersection Summary</b>												
HCM Average Control Delay			42.3				HCM Level of Service				D	
HCM Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			104.6			Sum of lost time (s)				16.0		
Intersection Capacity Utilization			84.9%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
 4: Buchanan Rd & Somersville Road

12/21/2011

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	0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.97		1.00	1.00	0.97	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3111		1770	1863	1529	1770	3471		1770	3361	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3111		1770	1863	1529	1770	3471		1770	3361	
Volume (vph)	340	500	750	110	400	350	200	170	20	460	1010	330
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	340	500	750	110	400	350	200	170	20	460	1010	330
RTOR Reduction (vph)	0	127	0	0	0	274	0	7	0	0	26	0
Lane Group Flow (vph)	340	1123	0	110	400	76	200	183	0	460	1314	0
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	23.0	38.6		10.4	26.0	26.0	7.0	21.4		33.6	48.0	
Effective Green, g (s)	23.0	38.6		10.4	26.0	26.0	7.0	21.4		33.6	48.0	
Actuated g/C Ratio	0.19	0.32		0.09	0.22	0.22	0.06	0.18		0.28	0.40	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	339	1001		153	404	331	103	619		496	1344	
v/s Ratio Prot	c0.19	c0.36		0.06	0.21		c0.11	0.05		0.26	c0.39	
v/s Ratio Perm						0.05						
v/c Ratio	1.00	1.24dr		0.72	0.99	0.23	1.94	0.29		0.93	0.98	
Uniform Delay, d1	48.5	40.7		53.4	46.9	38.7	56.5	42.8		42.0	35.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	49.6	68.2		14.9	42.0	0.4	457.2	0.3		23.5	19.1	
Delay (s)	98.1	108.9		68.3	88.9	39.1	513.7	43.0		65.5	54.6	
Level of Service	F	F		E	F	D	F	D		E	D	
Approach Delay (s)		106.6			66.0			284.4			57.4	
Approach LOS		F			E			F			E	
<b>Intersection Summary</b>												
HCM Average Control Delay			94.9				HCM Level of Service				F	
HCM Volume to Capacity ratio			1.11									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				16.0		
Intersection Capacity Utilization			107.8%			ICU Level of Service				G		
Analysis Period (min)			15									
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis  
 5: James Donlon Boulevard & Somersville Road

12/21/2011



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)	50	90	40	10	50	360	20	20	20	1600	70	190
Peak Hour 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
Hourly flow rate (vph)	50	90	40	10	50	360	20	20	20	1600	70	190
Pedestrians	5			5			5			5		
Lane Width (ft)	12.0			12.0			12.0			12.0		
Walking Speed (ft/s)	4.0			4.0			4.0			4.0		
Percent Blockage	0			0			0			0		
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	3470	3455	175	3530	3540	40	265				45	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	3470	3455	175	3530	3540	40	265				45	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	0	0	95	0	0	65	98				0	
cM capacity (veh/h)	0	0	861	0	0	1023	1294				1557	

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	50	60	70	10	50	360	60	1860
Volume Left	50	0	0	10	0	0	20	1600
Volume Right	0	0	40	0	0	360	20	190
cSH	0	0	0	0	0	1023	1294	1557
Volume to Capacity	Err	Err	Err	Err	Err	0.35	0.02	1.03
Queue Length 95th (ft)	Err	Err	Err	Err	Err	40	1	684
Control Delay (s)	Err	Err	Err	Err	Err	10.4	2.7	48.1
Lane LOS	F	F	F	F	F	B	A	E
Approach Delay (s)	Err			Err			2.7	48.1
Approach LOS	F			F				

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	127.3%	ICU Level of Service	H
Analysis Period (min)	15		



# HCM Signalized Intersection Capacity Analysis

## 6: Montreux Driveway & Kirker Pass Road

12/21/2011



Movement	EBL	EBR	NBL	NBT	SBT	SBR
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	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1770	3539	3539	1583
Volume (vph)	100	30	40	1950	1320	170
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	100	30	40	1950	1320	170
RTOR Reduction (vph)	0	27	0	0	0	38
Lane Group Flow (vph)	100	3	40	1950	1320	132
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	9.1	9.1	2.9	64.9	58.0	58.0
Effective Green, g (s)	9.1	9.1	2.9	64.9	58.0	58.0
Actuated g/C Ratio	0.11	0.11	0.04	0.79	0.71	0.71
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)	196	176	63	2801	2503	1120
v/s Ratio Prot	c0.06		0.02	c0.55	0.37	
v/s Ratio Perm		0.00				0.08
v/c Ratio	0.51	0.02	0.63	0.70	0.53	0.12
Uniform Delay, d1	34.3	32.5	39.0	4.0	5.6	3.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	0.0	19.1	1.5	0.8	0.2
Delay (s)	36.6	32.5	58.1	5.4	6.4	4.0
Level of Service	D	C	E	A	A	A
Approach Delay (s)	35.6			6.5	6.1	
Approach LOS	D			A	A	





























### Intersection Summary

HCM Average Control Delay	7.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	82.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 1: Kirker Pass Road & Concord Boulevard

12/21/2011

												
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	0.91		1.00	0.91		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.97	1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4946		1770	5000		1770	3539	1543	1770	3144	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4946		1770	5000		1770	3539	1543	1770	3144	
Volume (vph)	110	700	130	60	1710	180	600	580	240	130	110	200
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	110	700	130	60	1710	180	600	580	240	130	110	200
RTOR Reduction (vph)	0	17	0	0	8	0	0	0	168	0	127	0
Lane Group Flow (vph)	110	813	0	60	1882	0	600	580	72	130	183	0
Confl. Peds. (#/hr)			5			5			5			5
Turn Type	Prot			Prot			Prot		Perm		Prot	
Protected Phases	5	2		1	6		3	8			7	4
Permitted Phases									8			
Actuated Green, G (s)	13.2	68.1		7.8	62.7		45.0	45.3	45.3	12.8	13.1	
Effective Green, g (s)	13.2	68.1		7.8	62.7		45.0	45.3	45.3	12.8	13.1	
Actuated g/C Ratio	0.09	0.45		0.05	0.42		0.30	0.30	0.30	0.09	0.09	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	156	2245		92	2090		531	1069	466	151	275	
v/s Ratio Prot	c0.06	0.16		0.03	c0.38		c0.34	0.16		0.07	c0.06	
v/s Ratio Perm									0.05			
v/c Ratio	0.71	0.36		0.65	0.90		1.13	0.54	0.16	0.86	0.67	
Uniform Delay, d1	66.5	26.8		69.8	40.7		52.5	43.7	38.3	67.7	66.3	
Progression Factor	1.00	1.00		0.46	1.46		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	13.5	0.5		10.3	4.6		80.0	0.6	0.2	36.3	6.0	
Delay (s)	80.0	27.2		42.6	64.0		132.5	44.3	38.5	104.0	72.3	
Level of Service	F	C		D	E		F	D	D	F	E	
Approach Delay (s)		33.4			63.3			80.6			81.7	
Approach LOS		C			E			F			F	
<b>Intersection Summary</b>												
HCM Average Control Delay			64.3			HCM Level of Service				E		
HCM Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			100.1%			ICU Level of Service			G			
Analysis Period (min)			15									

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 2: Kirker Pass Road & Myrtle Drive

12/21/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
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
Lane Util. Factor	1.00	0.95	0.91		1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	5068		1770	1543
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	5068		1770	1543
Volume (vph)	70	1070	1670	30	30	90
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	70	1070	1670	30	30	90
RTOR Reduction (vph)	0	0	1	0	0	47
Lane Group Flow (vph)	70	1070	1699	0	30	43
Confl. Peds. (#/hr)				5		5
Turn Type	Prot			Perm		
Protected Phases	5	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	8.7	70.5	57.8		16.0	16.0
Effective Green, g (s)	8.7	70.5	57.8		71.5	71.5
Actuated g/C Ratio	0.06	0.47	0.39		0.48	0.48
Clearance Time (s)	4.0	4.0	4.0		59.5	59.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	103	1663	1953		844	735
v/s Ratio Prot	0.04	c0.30	c0.34		0.02	
v/s Ratio Perm						c0.03
v/c Ratio	0.68	0.64	0.87		0.04	0.06
Uniform Delay, d1	69.3	30.2	42.6		20.9	21.1
Progression Factor	1.08	0.78	1.00		1.00	1.00
Incremental Delay, d2	15.4	1.8	5.6		0.1	0.2
Delay (s)	90.4	25.5	48.2		21.0	21.3
Level of Service	F	C	D		C	C
Approach Delay (s)		29.5	48.2		21.2	
Approach LOS		C	D		C	

### Intersection Summary

HCM Average Control Delay	39.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 3: Buchanan Rd & Kirker Pass Road

12/21/2011



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	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1521	1681	1718	1551	1770	3539	1549	1770	3539	1528
Flt Permitted	0.95	1.00	1.00	0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1521	1681	1718	1551	1770	3539	1549	1770	3539	1528
Volume (vph)	120	80	40	510	130	190	30	1010	450	20	280	30
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	120	80	40	510	130	190	30	1010	450	20	280	30
RTOR Reduction (vph)	0	0	36	0	0	138	0	0	198	0	0	19
Lane Group Flow (vph)	120	80	4	312	328	52	30	1010	252	20	280	11
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8			2			6
Actuated Green, G (s)	7.7	7.7	7.7	19.7	19.7	19.7	2.0	27.8	27.8	2.0	27.8	27.8
Effective Green, g (s)	8.2	8.2	8.2	20.7	20.7	20.7	2.0	28.8	28.8	2.0	28.8	28.8
Actuated g/C Ratio	0.11	0.11	0.11	0.27	0.27	0.27	0.03	0.38	0.38	0.03	0.38	0.38
Clearance Time (s)	4.5	4.5	4.5	5.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
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)	192	202	165	460	470	424	47	1346	589	47	1346	581
v/s Ratio Prot	c0.07	0.04		0.19	c0.19		c0.02	c0.29		0.01	0.08	
v/s Ratio Perm			0.00			0.03			0.16			0.01
v/c Ratio	0.62	0.40	0.03	0.68	0.70	0.12	0.64	0.75	0.43	0.43	0.21	0.02
Uniform Delay, d1	32.3	31.4	30.2	24.5	24.7	20.7	36.5	20.3	17.3	36.3	15.8	14.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.2	1.3	0.1	4.0	4.5	0.1	25.1	2.4	0.5	6.1	0.1	0.0
Delay (s)	38.5	32.7	30.2	28.5	29.2	20.8	61.6	22.7	17.9	42.4	15.9	14.7
Level of Service	D	C	C	C	C	C	E	C	B	D	B	B
Approach Delay (s)		35.2			27.0			22.0			17.4	
Approach LOS		D			C			C			B	

Intersection Summary

HCM Average Control Delay	24.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	75.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 4: Buchanan Rd & Somersville Road

12/21/2011

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	0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.98		1.00	1.00	0.97	1.00	1.00		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	1.00	0.85	1.00	0.99		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)	1770	3133		1770	1863	1532	1770	3492		1770	3325	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3133		1770	1863	1532	1770	3492		1770	3325	
Volume (vph)	490	90	160	30	320	370	330	630	50	190	280	120
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	490	90	160	30	320	370	330	630	50	190	280	120
RTOR Reduction (vph)	0	82	0	0	0	230	0	5	0	0	40	0
Lane Group Flow (vph)	490	168	0	30	320	140	330	675	0	190	360	0
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	32.6	54.1		2.2	23.7	23.7	23.8	25.1		14.1	15.4	
Effective Green, g (s)	32.6	54.1		2.2	23.7	23.7	23.8	25.1		14.1	15.4	
Actuated g/C Ratio	0.29	0.49		0.02	0.21	0.21	0.21	0.23		0.13	0.14	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	518	1520		35	396	326	378	786		224	459	
v/s Ratio Prot	c0.28	0.05		0.02	c0.17		c0.19	c0.19		0.11	0.11	
v/s Ratio Perm						0.09						
v/c Ratio	0.95	0.11		0.86	0.81	0.43	0.87	0.86		0.85	0.79	
Uniform Delay, d1	38.6	15.6		54.5	41.7	38.0	42.4	41.5		47.7	46.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	26.4	0.0		94.8	11.5	0.9	19.4	9.3		24.6	8.6	
Delay (s)	65.0	15.6		149.3	53.2	39.0	61.8	50.8		72.2	55.0	
Level of Service	E	B		F	D	D	E	D		E	E	
Approach Delay (s)		48.3			49.9			54.4			60.6	
Approach LOS		D			D			D			E	
<b>Intersection Summary</b>												
HCM Average Control Delay			53.0				HCM Level of Service				D	
HCM Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			111.5			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

HCM Signalized Intersection Capacity Analysis  
 5: James Donlon Extension & Somersville Road

12/21/2011



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	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	0.99		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		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)	3433	3539	1533	1770	3539	1553	1770	1655		1770	1863	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)	3433	3539	1533	1770	3539	1553	1770	1655		1770	1863	1553
Volume (vph)	320	350	20	10	1170	680	70	10	20	190	20	260
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	320	350	20	10	1170	680	70	10	20	190	20	260
RTOR Reduction (vph)	0	0	8	0	0	116	0	19	0	0	0	226
Lane Group Flow (vph)	320	350	12	10	1170	564	70	11	0	190	20	34
Confl. Peds. (#/hr)			5			5			5			5
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)	10.8	45.1	45.1	0.7	35.0	35.0	6.2	3.1		13.4	10.3	10.3
Effective Green, g (s)	10.8	45.1	45.1	0.7	35.0	35.0	6.2	3.1		13.4	10.3	10.3
Actuated g/C Ratio	0.14	0.58	0.58	0.01	0.45	0.45	0.08	0.04		0.17	0.13	0.13
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	474	2038	883	16	1582	694	140	66		303	245	204
v/s Ratio Prot	c0.09	0.10		0.01	0.33		0.04	0.01		c0.11	0.01	
v/s Ratio Perm			0.01			c0.36						c0.02
v/c Ratio	0.68	0.17	0.01	0.62	0.74	0.81	0.50	0.16		0.63	0.08	0.17
Uniform Delay, d1	32.1	7.8	7.1	38.7	17.9	18.8	34.6	36.3		30.1	29.8	30.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.8	0.0	0.0	57.6	1.9	7.2	2.8	1.2		4.0	0.1	0.4
Delay (s)	35.9	7.9	7.1	96.3	19.7	26.1	37.4	37.5		34.1	30.0	30.6
Level of Service	D	A	A	F	B	C	D	D		C	C	C
Approach Delay (s)		20.8			22.5			37.4			32.0	
Approach LOS		C			C			D			C	

Intersection Summary

HCM Average Control Delay	24.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	78.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
6: James Donlon Extension & Kirker Pass Road

12/21/2011



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	0.97	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	3433	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	3433	1863	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	120	40	40	920	10	330	10	620	460	30	780	40
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	120	40	40	920	10	330	10	620	460	30	780	40
RTOR Reduction (vph)	0	0	38	0	0	147	0	0	0	0	0	29
Lane Group Flow (vph)	120	40	2	920	10	183	10	620	460	30	780	11
Turn Type	Prot		Perm	Prot		Perm	Prot		Free	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			Free			6
Actuated Green, G (s)	7.9	3.2	3.2	35.5	30.8	30.8	0.6	21.1	77.5	1.7	22.2	22.2
Effective Green, g (s)	7.9	3.2	3.2	35.5	30.8	30.8	0.6	21.1	77.5	1.7	22.2	22.2
Actuated g/C Ratio	0.10	0.04	0.04	0.46	0.40	0.40	0.01	0.27	1.00	0.02	0.29	0.29
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	180	77	65	1573	740	629	14	964	1583	39	1014	453
v/s Ratio Prot	0.07	0.02		c0.27	0.01		0.01	0.18		0.02	c0.22	
v/s Ratio Perm			0.00			0.12			c0.29			0.01
v/c Ratio	0.67	0.52	0.03	0.58	0.01	0.29	0.71	0.64	0.29	0.77	0.77	0.03
Uniform Delay, d1	33.5	36.4	35.7	15.5	14.1	15.9	38.4	24.9	0.0	37.7	25.3	19.9
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	9.0	5.8	0.2	1.6	0.0	1.2	100.1	1.5	0.5	60.6	3.6	0.0
Delay (s)	42.5	42.2	35.8	17.1	14.2	17.1	138.5	26.4	0.5	98.3	28.9	19.9
Level of Service	D	D	D	B	B	B	F	C	A	F	C	B
Approach Delay (s)		41.1			17.1			16.5			30.9	
Approach LOS		D			B			B			C	

Intersection Summary

HCM Average Control Delay	21.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	77.5	Sum of lost time (s)	4.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



# HCM Signalized Intersection Capacity Analysis

## 7: James Donlon Extension & Ventura Drive

12/21/2011



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	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.89		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3519		1770	3465		1770	1653		1770	1653	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3519		1770	3465		1770	1653		1770	1653	
Volume (vph)	30	500	20	10	1230	200	50	10	30	20	10	30
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	500	20	10	1230	200	50	10	30	20	10	30
RTOR Reduction (vph)	0	2	0	0	9	0	0	28	0	0	29	0
Lane Group Flow (vph)	30	518	0	10	1421	0	50	12	0	20	11	0
Turn Type	Prot		Prot		Prot		Prot		Prot			
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	1.6	55.9		0.8	55.1		1.6	4.7		0.8	3.9	
Effective Green, g (s)	1.6	55.9		0.8	55.1		1.6	4.7		0.8	3.9	
Actuated g/C Ratio	0.02	0.71		0.01	0.70		0.02	0.06		0.01	0.05	
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)	36	2516		18	2441		36	99		18	82	
v/s Ratio Prot	c0.02	0.15		0.01	c0.41		c0.03	c0.01		0.01	0.01	
v/s Ratio Perm												
v/c Ratio	0.83	0.21		0.56	0.58		1.39	0.12		1.11	0.14	
Uniform Delay, d1	38.2	3.7		38.5	5.8		38.3	34.8		38.7	35.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	85.2	0.0		32.3	0.4		284.7	0.5		250.0	0.8	
Delay (s)	123.4	3.8		70.8	6.1		323.0	35.3		288.7	36.3	
Level of Service	F	A		E	A		F	D		F	D	
Approach Delay (s)	10.3			6.6			195.2			120.5		
Approach LOS	B			A			F			F		

### Intersection Summary

HCM Average Control Delay	18.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	78.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



# HCM Signalized Intersection Capacity Analysis

## 1: Kirker Pass Road & Concord Boulevard

12/21/2011



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	0.91		1.00	0.91		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.97	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.98		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4903		1770	4954		1770	3539	1543	1770	3387	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4903		1770	4954		1770	3539	1543	1770	3387	
Volume (vph)	190	1750	450	180	1100	190	250	210	60	370	430	140
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	190	1750	450	180	1100	190	250	210	60	370	430	140
RTOR Reduction (vph)	0	30	0	0	15	0	0	0	54	0	21	0
Lane Group Flow (vph)	190	2170	0	180	1275	0	250	210	6	370	549	0
Confl. Peds. (#/hr)			5			5			5			5
Turn Type	Prot			Prot			Prot		Perm		Prot	
Protected Phases	5	2		1	6		3	8			7	4
Permitted Phases									8			
Actuated Green, G (s)	20.5	70.0		16.0	65.5		22.6	16.0	16.0	32.0	25.4	
Effective Green, g (s)	20.5	70.0		16.0	65.5		22.6	16.0	16.0	32.0	25.4	
Actuated g/C Ratio	0.14	0.47		0.11	0.44		0.15	0.11	0.11	0.21	0.17	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	242	2288		189	2163		267	377	165	378	574	
v/s Ratio Prot	c0.11	c0.44		c0.10	0.26		0.14	0.06		c0.21	c0.16	
v/s Ratio Perm									0.00			
v/c Ratio	0.79	0.95		0.95	0.59		0.94	0.56	0.04	0.98	0.96	
Uniform Delay, d1	62.6	38.3		66.6	32.0		63.0	63.6	60.1	58.7	61.8	
Progression Factor	1.00	1.00		0.53	1.84		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	15.3	10.1		44.9	0.9		37.9	1.8	0.1	40.2	26.8	
Delay (s)	77.9	48.3		80.0	60.0		100.9	65.4	60.2	98.8	88.6	
Level of Service	E	D		E	E		F	E	E	F	F	
Approach Delay (s)		50.7			62.5			81.9			92.6	
Approach LOS		D			E			F			F	

### Intersection Summary

HCM Average Control Delay	64.4	HCM Level of Service	E
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	97.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 2: Kirker Pass Road & Myrtle Drive

12/21/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
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
Lane Util. Factor	1.00	0.95	0.91		1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	5065		1770	1543
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	5065		1770	1543
Volume (vph)	80	2060	1400	30	40	40
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	80	2060	1400	30	40	40
RTOR Reduction (vph)	0	0	2	0	0	24
Lane Group Flow (vph)	80	2060	1428	0	40	16
Confl. Peds. (#/hr)				5		5
Turn Type	Prot			Perm		
Protected Phases	5	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	10.7	81.0	66.3		61.0	61.0
Effective Green, g (s)	10.7	81.0	66.3		61.0	61.0
Actuated g/C Ratio	0.07	0.54	0.44		0.41	0.41
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	126	1911	2239		720	627
v/s Ratio Prot	0.05	c0.58	0.28		c0.02	
v/s Ratio Perm						0.01
v/c Ratio	0.63	1.08	0.64		0.06	0.03
Uniform Delay, d1	67.8	34.5	32.5		27.0	26.7
Progression Factor	1.37	0.53	1.00		1.00	1.00
Incremental Delay, d2	3.6	39.2	1.4		0.1	0.1
Delay (s)	96.7	57.3	33.9		27.2	26.8
Level of Service	F	E	C		C	C
Approach Delay (s)		58.8	33.9		27.0	
Approach LOS		E	C		C	

























Intersection Summary

HCM Average Control Delay	48.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
3: Buchanan Rd & Kirker Pass Road

12/21/2011

												
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	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1519	1681	1695	1550	1770	3539	1547	1770	3539	1525
Flt Permitted	0.95	1.00	1.00	0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1519	1681	1695	1550	1770	3539	1547	1770	3539	1525
Volume (vph)	100	50	30	300	20	20	30	620	530	180	700	130
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	100	50	30	300	20	20	30	620	530	180	700	130
RTOR Reduction (vph)	0	0	27	0	0	17	0	0	301	0	0	60
Lane Group Flow (vph)	100	50	3	156	164	3	30	620	229	180	700	70
Conf. Peds. (#/hr)			10			10			10			10
Turn Type	Split		Perm	Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	7		8	8		5	2		1	6	
Permitted Phases			7			8			2			6
Actuated Green, G (s)	8.2	8.2	8.2	11.6	11.6	11.6	2.5	36.0	36.0	11.3	44.8	44.8
Effective Green, g (s)	8.7	8.7	8.7	12.6	12.6	12.6	2.5	37.0	37.0	11.3	45.8	45.8
Actuated g/C Ratio	0.10	0.10	0.10	0.15	0.15	0.15	0.03	0.43	0.43	0.13	0.54	0.54
Clearance Time (s)	4.5	4.5	4.5	5.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
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)	180	189	154	247	249	228	52	1530	669	234	1894	816
v/s Ratio Prot	c0.06	0.03		0.09	c0.10		0.02	c0.18		c0.10	0.20	
v/s Ratio Perm			0.00			0.00			0.15			0.05
v/c Ratio	0.56	0.26	0.02	0.63	0.66	0.01	0.58	0.41	0.34	0.77	0.37	0.09
Uniform Delay, d1	36.6	35.5	34.6	34.3	34.5	31.2	41.0	16.7	16.2	35.9	11.5	9.7
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	3.7	0.8	0.1	5.2	6.2	0.0	14.6	0.2	0.3	14.1	0.1	0.0
Delay (s)	40.3	36.2	34.7	39.5	40.6	31.2	55.6	16.9	16.5	50.0	11.7	9.7
Level of Service	D	D	C	D	D	C	E	B	B	D	B	A
Approach Delay (s)		38.2			39.6			17.7			18.2	
Approach LOS		D			D			B			B	
<b>Intersection Summary</b>												
HCM Average Control Delay			22.0				HCM Level of Service				C	
HCM Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			85.6				Sum of lost time (s)				16.0	
Intersection Capacity Utilization			61.8%				ICU Level of Service				B	
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
4: Buchanan Rd & Somersville Road

12/21/2011



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	0.95		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.98		1.00	1.00	0.97	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	1.00	0.85	1.00	0.98		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	3210		1770	1863	1535	1770	3448		1770	3382	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3210		1770	1863	1535	1770	3448		1770	3382	
Volume (vph)	370	310	340	120	120	350	50	180	30	570	730	210
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	370	310	340	120	120	350	50	180	30	570	730	210
RTOR Reduction (vph)	0	169	0	0	0	310	0	11	0	0	22	0
Lane Group Flow (vph)	370	481	0	120	120	40	50	199	0	570	918	0
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	24.2	26.3		9.3	11.4	11.4	4.6	13.2		35.1	43.7	
Effective Green, g (s)	24.2	26.3		9.3	11.4	11.4	4.6	13.2		35.1	43.7	
Actuated g/C Ratio	0.24	0.26		0.09	0.11	0.11	0.05	0.13		0.35	0.44	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	429	845		165	213	175	82	456		622	1479	
v/s Ratio Prot	c0.21	c0.15		0.07	0.06		0.03	0.06		c0.32	c0.27	
v/s Ratio Perm						0.03						
v/c Ratio	0.86	0.57		0.73	0.56	0.23	0.61	0.44		0.92	0.62	
Uniform Delay, d1	36.3	31.9		44.1	41.9	40.2	46.8	39.9		31.0	21.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	16.2	0.9		14.8	3.4	0.7	12.2	0.7		18.3	0.8	
Delay (s)	52.4	32.8		58.8	45.3	40.9	59.0	40.6		49.3	22.5	
Level of Service	D	C		E	D	D	E	D		D	C	
Approach Delay (s)		39.9			45.4			44.1			32.6	
Approach LOS		D			D			D			C	

Intersection Summary

HCM Average Control Delay	37.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	99.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 5: James Donlon Extension & Somersville Road

3/1/2012



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	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.98	1.00	0.99		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		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)	3433	3539	1526	1770	3539	1549	1770	1652		1770	1863	1549
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)	3433	3539	1526	1770	3539	1549	1770	1652		1770	1863	1549
Volume (vph)	100	1140	130	10	630	190	30	10	20	790	70	310
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	100	1140	130	10	630	190	30	10	20	790	70	310
RTOR Reduction (vph)	0	0	85	0	0	49	0	19	0	0	0	132
Lane Group Flow (vph)	100	1140	45	10	630	141	30	11	0	790	70	178
Conf. Peds. (#/hr)			5			5			5			5
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	6.1	37.0	37.0	0.7	31.6	31.6	4.4	4.2		48.3	48.1	48.1
Effective Green, g (s)	6.1	37.0	37.0	0.7	31.6	31.6	4.4	4.2		48.3	48.1	48.1
Actuated g/C Ratio	0.06	0.35	0.35	0.01	0.30	0.30	0.04	0.04		0.45	0.45	0.45
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	197	1233	532	12	1053	461	73	65		805	844	702
v/s Ratio Prot	c0.03	c0.32		0.01	0.18		0.02	0.01		c0.45	0.04	
v/s Ratio Perm			0.03			0.09						c0.11
v/c Ratio	0.51	0.92	0.09	0.83	0.60	0.31	0.41	0.17		0.98	0.08	0.25
Uniform Delay, d1	48.6	33.3	23.2	52.7	31.9	28.8	49.6	49.3		28.5	16.5	17.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.1	11.6	0.1	168.3	0.9	0.4	3.7	1.2		27.0	0.0	0.2
Delay (s)	50.6	44.9	23.3	221.0	32.8	29.2	53.4	50.5		55.5	16.6	18.1
Level of Service	D	D	C	F	C	C	D	D		E	B	B
Approach Delay (s)		43.3			34.2			51.9			43.3	
Approach LOS		D			C			D			D	

**Intersection Summary**

HCM Average Control Delay	41.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	106.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	95.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
6: James Donlon Extension & Kirker Pass Road

12/21/2011

























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	0.97	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	3433	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	3433	1863	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	70	30	30	660	50	50	40	970	980	130	730	130
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	70	30	30	660	50	50	40	970	980	130	730	130
RTOR Reduction (vph)	0	0	28	0	0	33	0	0	0	0	0	82
Lane Group Flow (vph)	70	30	2	660	50	17	40	970	980	130	730	48
Turn Type	Prot		Perm	Prot		Perm	Prot		Free	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			Free			6
Actuated Green, G (s)	4.4	4.3	4.3	29.3	29.2	29.2	3.2	27.3	84.2	7.3	31.4	31.4
Effective Green, g (s)	4.4	4.3	4.3	29.3	29.2	29.2	3.2	27.3	84.2	7.3	31.4	31.4
Actuated g/C Ratio	0.05	0.05	0.05	0.35	0.35	0.35	0.04	0.32	1.00	0.09	0.37	0.37
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	92	95	81	1195	646	549	67	1147	1583	153	1320	590
v/s Ratio Prot	0.04	0.02		0.19	0.03		0.02	c0.27		0.07	0.21	
v/s Ratio Perm			0.00			0.01			c0.62			0.03
v/c Ratio	0.76	0.32	0.02	0.55	0.08	0.03	0.60	0.85	0.62	0.85	0.55	0.08
Uniform Delay, d1	39.4	38.5	37.9	22.2	18.5	18.2	39.9	26.5	0.0	37.9	20.9	17.1
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	30.3	1.9	0.1	1.8	0.2	0.1	13.5	5.9	1.8	33.2	0.5	0.1
Delay (s)	69.7	40.4	38.0	24.0	18.7	18.3	53.4	32.4	1.8	71.1	21.4	17.1
Level of Service	E	D	D	C	B	B	D	C	A	E	C	B
Approach Delay (s)		55.6			23.3			17.8			27.3	
Approach LOS		E			C			B			C	

Intersection Summary

HCM Average Control Delay	22.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	84.2	Sum of lost time (s)	4.0
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
7: James Donlon Extension & Ventura Drive

12/21/2011

												
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	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.93		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3514		1770	3493		1770	1723		1770	1653	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3514		1770	3493		1770	1723		1770	1653	
Volume (vph)	40	1000	50	30	730	70	20	10	10	240	10	30
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	40	1000	50	30	730	70	20	10	10	240	10	30
RTOR Reduction (vph)	0	4	0	0	7	0	0	10	0	0	24	0
Lane Group Flow (vph)	40	1046	0	30	793	0	20	10	0	240	16	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	1.9	26.4		1.3	25.8		0.6	1.1		11.7	12.2	
Effective Green, g (s)	1.9	26.4		1.3	25.8		0.6	1.1		11.7	12.2	
Actuated g/C Ratio	0.03	0.47		0.02	0.46		0.01	0.02		0.21	0.22	
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)	60	1642		41	1595		19	34		367	357	
v/s Ratio Prot	c0.02	c0.30		0.02	0.23		0.01	c0.01		c0.14	0.01	
v/s Ratio Perm												
v/c Ratio	0.67	0.64		0.73	0.50		1.05	0.30		0.65	0.05	
Uniform Delay, d1	27.0	11.4		27.4	10.8		27.9	27.3		20.5	17.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	24.5	0.8		49.4	0.2		224.0	4.9		4.2	0.1	
Delay (s)	51.5	12.2		76.9	11.0		252.0	32.2		24.7	17.6	
Level of Service	D	B		E	B		F	C		C	B	
Approach Delay (s)		13.7			13.4			142.1			23.7	
Approach LOS		B			B			F			C	
<b>Intersection Summary</b>												
HCM Average Control Delay			17.1			HCM Level of Service					B	
HCM Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			56.5			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			59.9%			ICU Level of Service					B	
Analysis Period (min)			15									
c Critical Lane Group												

**APPENDIX D**  
**ANALYSIS VALIDATION**  
**MEMORANDUM**



## MEMORANDUM

Date: November 23, 2011

To: William Conyers and Kristie Wheeler, RBF Consulting

From: Sam Tabibnia and Sarah Nadiranto

**Subject: James Donlon Boulevard Extension Project EIR - Analysis Validity**

1021-1822A

Fehr & Peers submitted the Transportation/Traffic chapter of the James Donlon Boulevard Extension Administrative Draft Environmental Impact Report (ADEIR) in July 2008. The analysis presented in the ADEIR was based on data collected in 2007. Since the ADEIR was based on data collected over four years ago, Fehr & Peers has collected more recent data to confirm that the assumptions used in the ADEIR continue to be valid. Our analysis focuses on comparing traffic volumes at key intersections and the results of the Contra Costa Transportation Authority (CCTA) Countywide Travel Demand Model to determine.

Our analysis shows the following:

- Traffic volumes in 2011 are about the same or slightly less than in 2007, confirming that the existing conditions analysis presented in the DEIR continues to be valid.
- The most recent version of the CCTA Model forecasts similar or less growth in traffic volumes than forecasted in 2007, confirming that the future volume forecasts presented in the DEIR continue to be valid.

Overall, our work confirms that the analysis presented in the ADEIR is conservative and continues to remain valid. The rest of this memorandum describes our analysis in more detail.

### EXISTING INTERSECTION VOLUMES

The ADEIR collected weekday traffic counts at 12 study intersections during the AM peak period (7:00 AM to 9:00 AM) and PM peak period (4:00 PM to 6:00 PM) in June 2007 and November 2007. Fehr & Peers collected traffic counts at two of the intersections in November 2011. The 2011 traffic counts were collected at the Railroad Avenue/Buchanan Road and Kirker Pass Road/Concord Boulevard intersections only because they are major intersections in the study and are most likely to show changes in traffic volumes.

Table 1 compared the AM and PM peak hour intersection volumes between 2007 and 2011 counts. The overall intersection volume at the Railroad Avenue/Buchanan Road decreases by less than one percent during the AM peak hour and increases by less than one percent during the PM peak hour; while the intersection volume at the Kirker Pass Road/Concord Boulevard intersection decreases during both AM and PM peak hours. The overall difference between the 2007 and 2011 volumes are within the daily fluctuations expected at these intersections.

TABLE 1 INTERSECTION VOLUME SUMMARY						
Intersection	AM Intersection Volume			PM Intersection Volume		
	2007 <sup>1</sup>	2011 <sup>2</sup>	% Change	2007 <sup>1</sup>	2011 <sup>2</sup>	% Change
1. Railroad Avenue / Buchanan Road	2,397	2,382	- <1%	2,437	2,445	+ < 1%
2. Kirker Pass Road / Concord Boulevard	3,522	3,241	- 8%	3,457	3,359	- 3%
Notes:						
1. Intersection volumes based on counts collected in 2007 and shown on Figure 4.13-2 of the ADEIR.						
2. Intersection volumes based on counts collected in November 2011.						
Fehr & Peers, 2011						

Considering that intersection traffic volumes have not changed substantially since 2007, the existing conditions analysis presented in the ADEIR remain valid.

#### MODEL VALIDATION

The 2015 and 2030 traffic volume forecasts presented in the ADEIR were developed using the CCTA Model released in Spring 2007. The land use database in this version of the model is consistent with the Association of Bay Area Governments' (ABAG) *Projections 2005* (P'2005). Since then, ABAG has published *Projections 2009* (P'2009). The CCTA Model has been updated to reflect the new P'2009 land uses.

Consistent with CCTA guidelines, the future traffic volumes presented in the ADEIR were based on the growth between the base and future years as forecasted by the CCTA model. Tables 2 and 3 compare the growth on ten roadway segments between the base and future years as forecasted by the P'2005 and P'2009 based models for AM and PM peak hours, respectively. Note that the P'2009 based model extends five more years to 2035 than the P'2005 based model.

As shown in Tables 2 and 3, although the more recent P'2009 based forecasts extend five more years into the future, it forecasts less traffic growth than the P'2005 based model that was used for the ADEIR. Considering that traffic volume growth forecasts have not increased since 2007, the 2015 and 2030 conditions analyses presented in the ADEIR represent conservative conditions and remain valid.

Please contact us with comments or questions.

#### Attachment A –2011 Traffic Counts

**TABLE 2  
 AM PEAK HOUR MODEL VALIDATION**

Roadway Segment	2005 Projections <sup>1</sup>			2009 Projections <sup>2</sup>		
	2005 Base Year	2030 Future Year	Model Growth	2005 Base Year	2035 Future Year	Model Growth
SR-4 (east of Loveridge Road)	7,330	13,310	+ 5,980	7,530	13,500	+ 5,970
James Donlon Drive (east of Somersville Road)	50	510	+ 460	430	580	+ 150
Somersville Road (north of James Donlon Drive)	70	740	+ 670	470	710	+ 240
Buchanan Road (east of Railroad Avenue)	1,260	1,620	+ 360	1,430	1,590	+ 160
Railroad Avenue (north of Buchanan Road)	1,220	2,680	+ 1,460	1,540	2,750	+ 1,210
Railroad Avenue (south of Buchanan Road)	2,430	4,200	+ 1,770	2,880	4,240	+ 1,360
Buchanan Road (west of Somersville Road)	1,290	1,820	+ 530	1,540	1,800	+ 260
Somersville Road (north of Buchanan Road)	960	2,070	+ 1,110	1,520	2,000	+ 480
Concord Avenue (east of Kirker Pass Road)	400	800	+ 400	470	720	+ 250
Concord Avenue (west of Kirker Pass Road)	960	1,150	+ 190	1,170	1,330	+ 160

Notes:

1. CCTA Model forecasts based on P'2005 land uses.
  2. CCTA Model forecasts based on P'2009 land uses.
- Fehr & Peer, 2011.

**TABLE 3  
 PM PEAK HOUR MODEL VALIDATION**

Roadway Segment	2005 Projections <sup>1</sup>			2009 Projections <sup>2</sup>		
	2005 Base Year	2030 Future Year	Model Growth	2005 Base Year	2035 Future Year	Model Growth
SR-4 (east of Loveridge Road)	7,840	14,710	+ 6,870	8,970	14,730	+ 5,760
James Donlon Drive (east of Somersville Road)	70	490	+ 420	350	520	+ 170
Somersville Road (north of James Donlon Drive)	100	710	+ 610	410	640	+ 230
Buchanan Road (east of Railroad Avenue)	1,490	1,710	+ 220	1,630	1,710	+ 80
Railroad Avenue (north of Buchanan Road)	850	2,840	+ 1,990	1,440	2,790	+ 1,350
Railroad Avenue (south of Buchanan Road)	2,220	4,350	+ 2,130	2,950	4,270	+ 1,320
Buchanan Road (west of Somersville Road)	1,700	1,860	+ 160	1,870	1,850	- 20
Somersville Road (north of Buchanan Road)	930	1,530	+ 600	1,520	1,550	+ 30
Concord Avenue (east of Kirker Pass Road)	510	860	+ 350	590	810	+ 220
Concord Avenue (west of Kirker Pass Road)	780	1,150	+ 370	900	1,230	+ 330

Notes:  
 1. CCTA Model forecasts based on P'2005 land uses.  
 2. CCTA Model forecasts based on P'2009 land uses.  
 Fehr & Peer, 2011.

# **Attachment A**

## **2011 Traffic Counts**

# All Traffic Data

(916) 771-8700

City of Pittsburg

File Name : 11-7483-001 Railroad-Buchanan

Site Code : 00000000

Start Date : 11/2/2011

Page No : 1

## Groups Printed- Unshifted

Start Time	Railroad Avenue Southbound				Buchanan Road Westbound				Railroad Avenue Northbound				Buchanan Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00	6	109	13	128	237	15	15	267	1	72	58	131	14	6	12	32	558
07:15	17	145	7	169	257	15	23	295	3	71	81	155	13	20	3	36	655
07:30	31	99	12	142	196	11	12	219	2	75	86	163	16	27	9	52	576
07:45	9	95	13	117	228	22	27	277	4	95	67	166	13	14	6	33	593
Total	63	448	45	556	918	63	77	1058	10	313	292	615	56	67	30	153	2382
08:00	16	114	12	142	188	24	16	228	4	79	68	151	13	14	5	32	553
08:15	7	66	21	94	193	18	21	232	9	79	41	129	11	16	9	36	491
08:30	9	61	5	75	170	23	9	202	1	43	29	73	10	13	11	34	384
08:45	13	61	8	82	100	15	8	123	2	46	18	66	8	9	3	20	291
Total	45	302	46	393	651	80	54	785	16	247	156	419	42	52	28	122	1719
16:00	27	51	23	101	84	25	29	138	6	75	210	291	12	15	3	30	560
16:15	32	54	13	99	78	22	14	114	5	131	222	358	15	13	6	34	605
16:30	27	60	16	103	72	33	26	131	2	146	213	361	11	16	4	31	626
16:45	32	58	20	110	66	22	12	100	5	139	239	383	13	16	3	32	625
Total	118	223	72	413	300	102	81	483	18	491	884	1393	51	60	16	127	2416
17:00	20	69	19	108	123	23	24	170	9	155	194	358	24	25	2	51	687
17:15	42	54	21	117	105	33	16	154	7	176	230	413	20	9	1	30	714
17:30	18	36	7	61	23	8	5	36	8	83	103	194	3	6	2	11	302
17:45	22	43	16	81	94	20	17	131	6	158	170	334	11	9	2	22	568
Total	102	202	63	367	345	84	62	491	30	572	697	1299	58	49	7	114	2271
Grand Total	328	1175	226	1729	2214	329	274	2817	74	1623	2029	3726	207	228	81	516	8788
Apprch %	19	68	13.1		78.6	11.7	9.7		2	43.6	54.5		40.1	44.2	15.7		
Total %	3.7	13.4	2.6	19.7	25.2	3.7	3.1	32.1	0.8	18.5	23.1	42.4	2.4	2.6	0.9	5.9	

# All Traffic Data

(916) 771-8700

City of Concord

File Name : 11-7483-002 Kirker Pass-Concord

Site Code : 00000000

Start Date : 11/2/2011

Page No : 1

## Groups Printed- Unshifted

Start Time	Kirker Pass Road Southbound				Concord Boulevard Westbound				Kirker Pass Road Northbound				Concord Boulevard Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00	4	379	60	443	87	68	17	172	11	87	21	119	13	7	17	37	771
07:15	7	328	68	403	70	87	26	183	26	74	17	117	14	13	17	44	747
07:30	11	307	86	404	92	119	39	250	24	89	21	134	10	19	42	71	859
07:45	13	312	71	396	91	86	20	197	33	107	49	189	16	28	38	82	864
Total	35	1326	285	1646	340	360	102	802	94	357	108	559	53	67	114	234	3241
08:00	16	212	62	290	55	77	19	151	41	109	38	188	28	27	21	76	705
08:15	7	275	39	321	50	88	15	153	28	93	17	138	30	35	34	99	711
08:30	8	227	35	270	92	57	15	164	22	78	28	128	12	25	37	74	636
08:45	4	195	32	231	53	44	7	104	25	68	35	128	16	18	23	57	520
Total	35	909	168	1112	250	266	56	572	116	348	118	582	86	105	115	306	2572
16:00	12	93	20	125	38	25	13	76	30	248	74	352	35	47	35	117	670
16:15	8	93	17	118	33	22	7	62	31	262	81	374	37	44	26	107	661
16:30	15	97	18	130	49	26	10	85	34	289	87	410	52	56	35	143	768
16:45	20	124	18	162	38	28	4	70	29	273	97	399	49	64	46	159	790
Total	55	407	73	535	158	101	34	293	124	1072	339	1535	173	211	142	526	2889
17:00	13	102	18	133	43	32	8	83	40	306	98	444	62	72	46	180	840
17:15	22	124	19	165	52	33	6	91	33	318	85	436	65	66	55	186	878
17:30	14	100	11	125	38	34	12	84	25	340	96	461	49	100	42	191	861
17:45	13	109	12	134	36	31	12	79	30	289	83	402	58	60	47	165	780
Total	62	435	60	557	169	130	38	337	128	1253	362	1743	234	298	190	722	3359
Grand Total	187	3077	586	3850	917	857	230	2004	462	3030	927	4419	546	681	561	1788	12061
Apprch %	4.9	79.9	15.2		45.8	42.8	11.5		10.5	68.6	21		30.5	38.1	31.4		
Total %	1.6	25.5	4.9	31.9	7.6	7.1	1.9	16.6	3.8	25.1	7.7	36.6	4.5	5.6	4.7	14.8	