

HCM Signalized Intersection Capacity Analysis Forecast Conditions - AM Peak Hour (2031)  
 1: Hunt Club & Conroy 6/10/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	2.4	3.6	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Fr't	1.00	0.99		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	3344		1530	3320		1597	3539	1239	1656	3438	1538
Flt Permitted	0.95	1.00		0.95	1.00		0.57	1.00	1.00	0.14	1.00	1.00
Satd. Flow (perm)	3467	3344		1530	3320		959	3539	1239	243	3438	1538
Volume (vph)	313	889	40	71	783	23	31	818	88	11	224	180
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	340	966	43	77	851	25	34	889	96	12	243	196
RTOR Reduction (vph)	0	3	0	0	2	0	0	0	11	0	0	0
Lane Group Flow (vph)	340	1006	0	77	874	0	34	889	85	12	243	196
Heavy Vehicles (%)	1%	7%	13%	18%	8%	17%	13%	2%	13%	9%	5%	5%
Turn Type	Prot			Prot			Perm		Perm	Perm		Free
Protected Phases	5	2		1	6			8				4
Permitted Phases							8		8	4		Free
Actuated Green, G (s)	14.6	46.2		8.3	39.9		26.1	26.1	26.1	26.1	26.1	100.0
Effective Green, g (s)	17.2	48.4		10.9	42.1		28.7	28.7	28.7	28.7	28.7	100.0
Actuated g/C Ratio	0.17	0.48		0.11	0.42		0.29	0.29	0.29	0.29	0.29	1.00
Clearance Time (s)	6.6	6.2		6.6	6.2		6.6	6.6	6.6	6.6	6.6	
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)	596	1618		167	1398		275	1016	356	70	987	1538
v/s Ratio Prot	c0.10	c0.30		0.05	0.26			c0.25			0.07	
v/s Ratio Perm							0.04		0.07	0.05		0.13
v/c Ratio	0.57	0.62		0.46	0.63		0.12	0.88	0.24	0.17	0.25	0.13
Uniform Delay, d1	38.0	19.0		41.8	22.8		26.4	33.9	27.3	26.7	27.4	0.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.82	0.88	1.00
Incremental Delay, d2	1.3	1.8		2.0	2.1		0.2	8.5	0.3	1.2	0.1	0.2
Delay (s)	39.3	20.9		43.8	24.9		26.6	42.5	27.6	23.0	24.3	0.2
Level of Service	D	C		D	C		C	D	C	C	C	A
Approach Delay (s)		25.5			26.4			40.5			13.8	
Approach LOS		C			C			D			B	
<b>Intersection Summary</b>												
HCM Average Control Delay			28.4			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			68.6%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis Forecast Conditions - AM Peak Hour (2031)  
 2: Lorry Greenberg & Conroy 6/10/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	2.4	3.6	3.6	2.4
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Fr <sub>t</sub>	1.00	0.94		1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Fl <sub>t</sub> Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1578		1703	1541		1719	3539	1359	1719	3312	1320
Fl <sub>t</sub> Permitted	0.41	1.00		0.72	1.00		0.46	1.00	1.00	0.11	1.00	1.00
Satd. Flow (perm)	769	1578		1288	1541		839	3539	1359	193	3312	1320
Volume (vph)	192	32	22	66	39	210	39	1380	62	94	441	79
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	209	35	24	72	42	228	42	1500	67	102	479	86
RTOR Reduction (vph)	0	17	0	0	11	0	0	0	3	0	0	13
Lane Group Flow (vph)	209	42	0	72	259	0	42	1500	64	102	479	73
Heavy Vehicles (%)	2%	22%	0%	6%	33%	3%	5%	2%	3%	5%	9%	6%
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		4			8			2				6
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	25.5	25.5		25.5	25.5		61.7	61.7	61.7	61.7	61.7	61.7
Effective Green, g (s)	28.4	28.4		28.4	28.4		63.6	63.6	63.6	63.6	63.6	63.6
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.64	0.64	0.64	0.64	0.64	0.64
Clearance Time (s)	6.9	6.9		6.9	6.9		5.9	5.9	5.9	5.9	5.9	5.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	218	448		366	438		534	2251	864	123	2106	840
v/s Ratio Prot		0.03			0.17			0.42				0.14
v/s Ratio Perm	c0.27			0.06			0.05		0.05	c0.53		0.06
v/c Ratio	0.96	0.09		0.20	0.59		0.08	0.67	0.07	0.83	0.23	0.09
Uniform Delay, d <sub>1</sub>	35.2	26.3		27.1	30.8		7.0	11.5	7.0	14.0	7.7	7.0
Progression Factor	1.00	1.00		1.00	1.00		0.26	0.27	0.20	1.37	0.93	0.91
Incremental Delay, d <sub>2</sub>	48.7	0.1		0.3	2.1		0.2	1.3	0.1	44.7	0.2	0.2
Delay (s)	83.9	26.4		27.4	33.0		2.0	4.3	1.5	63.8	7.4	6.6
Level of Service	F	C		C	C		A	A	A	E	A	A
Approach Delay (s)		71.3			31.8			4.1			15.9	
Approach LOS		E			C			A			B	
<b>Intersection Summary</b>												
HCM Average Control Delay			16.4			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)				8.0		
Intersection Capacity Utilization			85.5%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis Forecast Conditions - AM Peak Hour (2031)

3: Johnston & Conroy

11/26/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	2.4	3.6	3.6	2.4
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Flt	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	1900	1553	1612	1900	1599	1805	3539	1400	1626	3374	1333
Flt Permitted	0.73	1.00	1.00	0.74	1.00	1.00	0.46	1.00	1.00	0.14	1.00	1.00
Satd. Flow (perm)	1351	1900	1553	1258	1900	1599	882	3539	1400	233	3374	1333
Volume (vph)	270	22	30	25	45	279	34	1259	22	54	441	146
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	293	24	33	27	49	303	37	1368	24	59	479	159
RTOR Reduction (vph)	0	0	24	0	0	33	0	0	1	0	0	29
Lane Group Flow (vph)	293	24	9	27	49	270	37	1368	23	59	479	130
Heavy Vehicles (%)	2%	0%	4%	12%	0%	1%	0%	2%	0%	11%	7%	5%
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		4			8			2				6
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	25.1	25.1	25.1	25.1	25.1	25.1	62.0	62.0	62.0	62.0	62.0	62.0
Effective Green, g (s)	28.0	28.0	28.0	28.0	28.0	28.0	64.0	64.0	64.0	64.0	64.0	64.0
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.28	0.28	0.64	0.64	0.64	0.64	0.64	0.64
Clearance Time (s)	6.9	6.9	6.9	6.9	6.9	6.9	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	378	532	435	352	532	448	564	2265	896	149	2159	853
v/s Ratio Prot		0.01			0.03			c0.39				0.14
v/s Ratio Perm	c0.22		0.01	0.02		0.17	0.04		0.02	0.25		0.10
v/c Ratio	0.78	0.05	0.02	0.08	0.09	0.60	0.07	0.60	0.03	0.40	0.22	0.15
Uniform Delay, d1	33.1	26.3	26.1	26.5	26.6	31.2	6.8	10.6	6.6	8.7	7.6	7.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.87	0.68	0.88	1.00	1.00	1.00
Incremental Delay, d2	9.6	0.0	0.0	0.1	0.1	2.3	0.2	0.9	0.0	7.7	0.2	0.4
Delay (s)	42.7	26.3	26.1	26.6	26.7	33.5	6.1	8.1	5.8	16.4	7.8	7.6
Level of Service	D	C	C	C	C	C	A	A	A	B	A	A
Approach Delay (s)		40.0			32.1			8.0			8.5	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM Average Control Delay	15.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis Forecast Conditions - AM Peak Hour (2031)  
 4: Thurston & Conroy 6/10/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↕	↗	↖	↕	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	2.4
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.86		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1635		1736	1482		1805	3539	1583	1787	3374	1308
Flt Permitted	0.74	1.00		0.75	1.00		0.18	1.00	1.00	0.06	1.00	1.00
Satd. Flow (perm)	1408	1635		1367	1482		341	3539	1583	116	3374	1308
Volume (vph)	43	1	12	49	0	23	59	1952	384	72	1251	256
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	1	13	53	0	25	64	2122	417	78	1360	278
RTOR Reduction (vph)	0	12	0	0	6	0	0	0	0	0	0	9
Lane Group Flow (vph)	47	2	0	53	19	0	64	2122	417	78	1360	269
Heavy Vehicles (%)	0%	0%	0%	4%	0%	9%	0%	2%	2%	1%	7%	7%
Turn Type	Perm			Perm			Perm		Free	Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		Free	6		6
Actuated Green, G (s)	7.8	7.8		7.8	7.8		79.4	79.4	100.0	79.4	79.4	79.4
Effective Green, g (s)	10.7	10.7		10.7	10.7		81.3	81.3	100.0	81.3	81.3	81.3
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.81	0.81	1.00	0.81	0.81	0.81
Clearance Time (s)	6.9	6.9		6.9	6.9		5.9	5.9		5.9	5.9	5.9
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)	151	175		146	159		277	2877	1583	94	2743	1063
v/s Ratio Prot		0.00			0.01			0.60			0.40	
v/s Ratio Perm	0.03			c0.04			0.19		0.26	c0.67		0.21
v/c Ratio	0.31	0.01		0.36	0.12		0.23	0.74	0.26	0.83	0.50	0.25
Uniform Delay, d1	41.2	39.9		41.5	40.4		2.2	4.4	0.0	5.4	2.9	2.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.65	0.98	1.12
Incremental Delay, d2	1.2	0.0		1.5	0.3		1.9	1.7	0.4	49.6	0.6	0.5
Delay (s)	42.4	40.0		43.0	40.7		4.1	6.1	0.4	58.5	3.4	3.0
Level of Service	D	D		D	D		A	A	A	E	A	A
Approach Delay (s)		41.9			42.3			5.1			5.9	
Approach LOS		D			D			A			A	

Intersection Summary

HCM Average Control Delay	6.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis Forecast Conditions - AM Peak Hour (2031)  
 5: Saint Laurent & Conroy 6/10/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑	↗	↘	↑	↗	↘	↑↑↑	↗	↘	↑↑	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	2.4	3.6	3.6	2.4
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.95	1.00
Flt	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)	1289	1900	1615	1597	1881	1442	1805	5085	1372	1787	3343	1308
Flt Permitted	0.71	1.00	1.00	0.70	1.00	1.00	0.15	1.00	1.00	0.16	1.00	1.00
Satd. Flow (perm)	959	1900	1615	1170	1881	1442	277	5085	1372	308	3343	1308
Volume (vph)	5	75	63	71	72	76	136	1319	200	105	1380	46
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	82	68	77	78	83	148	1434	217	114	1500	50
RTOR Reduction (vph)	0	0	0	0	0	34	0	0	11	0	0	2
Lane Group Flow (vph)	5	82	68	77	78	49	148	1434	206	114	1500	48
Heavy Vehicles (%)	40%	0%	0%	13%	1%	12%	0%	2%	2%	1%	8%	7%
Turn Type	Perm		Free	Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		4			8			2				6
Permitted Phases	4		Free	8		8	2		2	6		6
Actuated Green, G (s)	10.2	10.2	100.0	10.2	10.2	10.2	76.5	76.5	76.5	76.5	76.5	76.5
Effective Green, g (s)	13.1	13.1	100.0	13.1	13.1	13.1	78.9	78.9	78.9	78.9	78.9	78.9
Actuated g/C Ratio	0.13	0.13	1.00	0.13	0.13	0.13	0.79	0.79	0.79	0.79	0.79	0.79
Clearance Time (s)	6.9	6.9		6.9	6.9	6.9	6.4	6.4	6.4	6.4	6.4	6.4
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)	126	249	1615	153	246	189	219	4012	1083	243	2638	1032
v/s Ratio Prot		0.04			0.04			0.28			0.45	
v/s Ratio Perm	0.01		0.04	c0.07		0.03	c0.53		0.15	0.37		0.04
v/c Ratio	0.04	0.33	0.04	0.50	0.32	0.26	0.68	0.36	0.19	0.47	0.57	0.05
Uniform Delay, d1	38.0	39.5	0.0	40.4	39.4	39.1	4.8	3.1	2.6	3.5	4.0	2.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.64	0.21	0.10	1.22	1.19	0.78
Incremental Delay, d2	0.1	0.8	0.0	2.6	0.7	0.7	11.1	0.2	0.3	6.3	0.9	0.1
Delay (s)	38.1	40.2	0.0	43.0	40.1	39.8	14.2	0.8	0.5	10.6	5.7	1.9
Level of Service	D	D	A	D	D	D	B	A	A	B	A	A
Approach Delay (s)		22.5			41.0			1.9			5.9	
Approach LOS		C			D			A			A	

**Intersection Summary**

HCM Average Control Delay	6.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis Forecast Conditions - AM Peak Hour (2031)  
 7: Walkley & Heatherington 6/10/2010


























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗			↖	↗
Ideal Flow (vphpl)	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	0.95	1.00	1.00	1.00			1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.87			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	1.00
Satd. Flow (prot)	1752	3321		1719	3252	1615	1736	1601			1687	1553
Flt Permitted	0.26	1.00		0.40	1.00	1.00	0.74	1.00			0.87	1.00
Satd. Flow (perm)	477	3321		716	3252	1615	1359	1601			1498	1553
Volume (vph)	64	539	62	82	911	10	137	10	88	8	11	26
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	70	586	67	89	990	11	149	11	96	9	12	28
RTOR Reduction (vph)	0	9	0	0	0	0	0	76	0	0	0	22
Lane Group Flow (vph)	70	644	0	89	990	11	149	31	0	0	21	6
Heavy Vehicles (%)	3%	6%	16%	5%	11%	0%	4%	0%	3%	0%	18%	4%
Turn Type	Perm			Perm		Free	Perm			Perm		Perm
Protected Phases		2			6			8				4
Permitted Phases	2			6		Free	8			4		4
Actuated Green, G (s)	37.6	37.6		37.6	37.6	60.0	10.1	10.1			10.1	10.1
Effective Green, g (s)	39.7	39.7		39.7	39.7	60.0	12.3	12.3			12.3	12.3
Actuated g/C Ratio	0.66	0.66		0.66	0.66	1.00	0.21	0.21			0.21	0.21
Clearance Time (s)	6.1	6.1		6.1	6.1		6.2	6.2			6.2	6.2
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	316	2197		474	2152	1615	279	328			307	318
v/s Ratio Prot		0.19			c0.30			0.02				
v/s Ratio Perm	0.15			0.12		0.01	c0.11				0.01	0.00
v/c Ratio	0.22	0.29		0.19	0.46	0.01	0.53	0.09			0.07	0.02
Uniform Delay, d1	4.0	4.3		3.9	4.9	0.0	21.3	19.3			19.2	19.0
Progression Factor	2.16	2.21		1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	1.6	0.3		0.9	0.7	0.0	2.0	0.1			0.1	0.0
Delay (s)	10.3	9.7		4.8	5.6	0.0	23.3	19.5			19.3	19.1
Level of Service	B	A		A	A	A	C	B			B	B
Approach Delay (s)		9.8			5.5			21.7			19.2	
Approach LOS		A			A			C			B	

Intersection Summary

HCM Average Control Delay	9.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis Forecast Conditions - AM Peak Hour (2031)  
 8: Walkley & Albion N 6/14/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Ideal Flow (vphpl)	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	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.87		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3438	1495	1703	3459		1530	1419		1805	1758	
Flt Permitted	0.38	1.00	1.00	0.43	1.00		0.73	1.00		0.59	1.00	
Satd. Flow (perm)	715	3438	1495	769	3459		1173	1419		1125	1758	
Volume (vph)	20	523	573	446	604	20	182	20	111	20	20	20
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	568	623	485	657	22	198	22	121	22	22	22
RTOR Reduction (vph)	0	0	0	0	2	0	0	95	0	0	17	0
Lane Group Flow (vph)	22	568	623	485	677	0	198	48	0	22	27	0
Heavy Vehicles (%)	0%	5%	8%	6%	4%	0%	18%	0%	20%	0%	0%	0%
Turn Type	Perm		Free	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		Free	6			8			4		
Actuated Green, G (s)	61.0	61.0	90.0	61.0	61.0		17.6	17.6		17.6	17.6	
Effective Green, g (s)	62.9	62.9	90.0	62.9	62.9		19.1	19.1		19.1	19.1	
Actuated g/C Ratio	0.70	0.70	1.00	0.70	0.70		0.21	0.21		0.21	0.21	
Clearance Time (s)	5.9	5.9		5.9	5.9		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	500	2403	1495	537	2417		249	301		239	373	
v/s Ratio Prot		0.17			0.20			0.03			0.02	
v/s Ratio Perm	0.03		0.42	c0.63			c0.17			0.02		
v/c Ratio	0.04	0.24	0.42	0.90	0.28		0.80	0.16		0.09	0.07	
Uniform Delay, d1	4.2	4.9	0.0	11.1	5.1		33.6	28.9		28.5	28.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2	0.9	21.1	0.3		15.9	0.2		0.2	0.1	
Delay (s)	4.4	5.1	0.9	32.1	5.4		49.5	29.1		28.7	28.4	
Level of Service	A	A	A	C	A		D	C		C	C	
Approach Delay (s)		2.9			16.5			41.0			28.5	
Approach LOS		A			B			D			C	
<b>Intersection Summary</b>												
HCM Average Control Delay			13.9			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)				8.0		
Intersection Capacity Utilization			65.9%			ICU Level of Service				C		
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis Forecast Conditions - AM Peak Hour (2031)  
 9: Johnston & Albion 6/10/2010



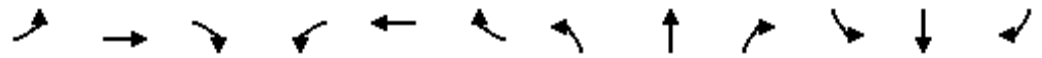
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	248	159	36	104	494	11	127	295	123	3	47	48
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	270	173	39	113	537	12	138	321	134	3	51	52

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	482	662	592	107
Volume Left (vph)	270	113	138	3
Volume Right (vph)	39	12	134	52
Hadj (s)	0.24	0.07	-0.06	0.17
Departure Headway (s)	8.0	7.8	7.7	9.7
Degree Utilization, x	1.07	1.43	1.26	0.29
Capacity (veh/h)	439	475	477	366
Control Delay (s)	89.2	229.4	158.2	16.6
Approach Delay (s)	89.2	229.4	158.2	16.6
Approach LOS	F	F	F	C

Intersection Summary			
Delay		157.6	
HCM Level of Service		F	
Intersection Capacity Utilization	103.4%		ICU Level of Service G
Analysis Period (min)		15	



HCM Unsignalized Intersection Capacity Analysis Forecast Conditions - AM Peak Hour (2031)  
 10: Cahill & Albion 6/10/2010



































Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	9	31	29	61	127	68	46	414	39	28	126	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	34	32	66	138	74	50	450	42	30	137	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	75	278	542	177
Volume Left (vph)	10	66	50	30
Volume Right (vph)	32	74	42	10
Hadj (s)	-0.13	0.02	0.08	0.07
Departure Headway (s)	6.5	6.1	5.5	6.1
Degree Utilization, x	0.14	0.47	0.82	0.30
Capacity (veh/h)	490	541	646	532
Control Delay (s)	10.5	14.5	28.6	11.6
Approach Delay (s)	10.5	14.5	28.6	11.6
Approach LOS	B	B	D	B

Intersection Summary			
Delay	20.9		
HCM Level of Service	C		
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		

























HCM Signalized Intersection Capacity Analysis Forecast Conditions - AM Peak Hour (2031)  
 11: Walkley & Bank 6/10/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 			  		 	 	
Ideal Flow (vphpl)	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	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.91	1.00	0.97	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)	3400	3438	1538	3242	3406	1509	1719	4988	1553	3335	3343	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3400	3438	1538	3242	3406	1509	1719	4988	1553	3335	3343	1553
Volume (vph)	416	636	122	112	431	315	149	1485	205	388	962	192
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	452	691	133	122	468	342	162	1614	223	422	1046	209
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	452	691	133	122	468	342	162	1614	223	422	1046	209
Heavy Vehicles (%)	3%	5%	5%	8%	6%	7%	5%	4%	4%	5%	8%	4%
Turn Type	Prot		Free	Prot		Free	Prot		Free	Prot		Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Actuated Green, G (s)	11.7	22.7	110.0	9.3	20.3	110.0	13.4	48.3	110.0	4.6	39.5	110.0
Effective Green, g (s)	14.0	25.0	110.0	11.6	22.6	110.0	15.8	50.4	110.0	7.0	41.6	110.0
Actuated g/C Ratio	0.13	0.23	1.00	0.11	0.21	1.00	0.14	0.46	1.00	0.06	0.38	1.00
Clearance Time (s)	6.3	6.3		6.3	6.3		6.4	6.1		6.4	6.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	433	781	1538	342	700	1509	247	2285	1553	212	1264	1553
v/s Ratio Prot	c0.13	c0.20		0.04	0.14		c0.09	0.32		c0.13	c0.31	
v/s Ratio Perm			0.09			c0.23			0.14			0.13
v/c Ratio	1.04	0.88	0.09	0.36	0.67	0.23	0.66	0.71	0.14	1.99	0.83	0.13
Uniform Delay, d1	48.0	41.1	0.0	45.7	40.3	0.0	44.5	23.9	0.0	51.5	31.0	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	55.2	11.7	0.1	0.6	2.4	0.3	6.1	1.9	0.2	462.2	6.3	0.2
Delay (s)	103.2	52.8	0.1	46.4	42.7	0.3	50.7	25.7	0.2	513.7	37.3	0.2
Level of Service	F	D	A	D	D	A	D	C	A	F	D	A
Approach Delay (s)		65.1			27.6			24.9			152.5	
Approach LOS		E			C			C			F	

Intersection Summary		
HCM Average Control Delay	70.4	HCM Level of Service E
HCM Volume to Capacity ratio	0.91	
Actuated Cycle Length (s)	110.0	Sum of lost time (s) 12.0
Intersection Capacity Utilization	76.9%	ICU Level of Service D
Analysis Period (min)	15	

c Critical Lane Group























HCM Signalized Intersection Capacity Analysis Forecast Conditions - AM Peak Hour (2031)  
 12: Johnston & Bank 6/10/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	1863	1538	1626	1863	1568	1787	3471	1380	1656	3343	1583
Flt Permitted	0.45	1.00	1.00	0.72	1.00	1.00	0.44	1.00	1.00	0.11	1.00	1.00
Satd. Flow (perm)	853	1863	1538	1224	1863	1568	834	3471	1380	190	3343	1583
Volume (vph)	95	59	21	66	144	535	224	1374	59	413	477	63
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	103	64	23	72	157	582	243	1493	64	449	518	68
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	13	0	0	24
Lane Group Flow (vph)	103	64	23	72	157	582	243	1493	51	449	518	44
Heavy Vehicles (%)	1%	2%	5%	11%	2%	3%	1%	4%	17%	9%	8%	2%
Turn Type	Perm		Free	Perm		Free	pm+pt		Perm	pm+pt		Perm
Protected Phases		4			8		5	2		1		6
Permitted Phases	4		Free	8		Free	2		2	6		6
Actuated Green, G (s)	16.5	16.5	120.0	16.5	16.5	120.0	86.0	76.1	76.1	87.2	76.7	76.7
Effective Green, g (s)	18.4	18.4	120.0	18.4	18.4	120.0	89.0	77.6	77.6	90.2	78.2	78.2
Actuated g/C Ratio	0.15	0.15	1.00	0.15	0.15	1.00	0.74	0.65	0.65	0.75	0.65	0.65
Clearance Time (s)	5.9	5.9		5.9	5.9		5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	131	286	1538	188	286	1568	709	2245	892	289	2179	1032
v/s Ratio Prot		0.03			0.08		0.03	0.43		c0.16	0.15	
v/s Ratio Perm	c0.12		0.01	0.06		c0.37	0.22		0.04	c1.01		0.03
v/c Ratio	0.79	0.22	0.01	0.38	0.55	0.37	0.34	0.67	0.06	1.55	0.24	0.04
Uniform Delay, d1	48.9	44.5	0.0	45.7	47.0	0.0	4.7	13.1	7.8	28.2	8.6	7.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.96	1.91	2.30	1.00	1.00	1.00
Incremental Delay, d2	26.0	0.4	0.0	1.3	2.2	0.7	0.2	1.3	0.1	265.5	0.3	0.1
Delay (s)	74.9	44.9	0.0	47.0	49.1	0.7	9.4	26.4	18.0	293.8	8.9	7.6
Level of Service	E	D	A	D	D	A	A	C	B	F	A	A
Approach Delay (s)		55.7			14.2			23.8			132.4	
Approach LOS		E			B			C			F	

Intersection Summary		
HCM Average Control Delay	52.7	HCM Level of Service D
HCM Volume to Capacity ratio	1.38	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 8.0
Intersection Capacity Utilization	90.9%	ICU Level of Service E
Analysis Period (min)	15	

c Critical Lane Group
































HCM Signalized Intersection Capacity Analysis Forecast Conditions - AM Peak Hour (2031)  
 13: Dazé & Bank 6/10/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00		1.00	1.00		1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00		0.85	1.00		0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95		1.00	0.95		1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1752		1482	1687		1553	1770	3522		1805	3223	1553
Flt Permitted	0.95		1.00	0.95		1.00	0.45	1.00		0.17	1.00	1.00
Satd. Flow (perm)	1752		1482	1687		1553	840	3522		325	3223	1553
Volume (vph)	150	0	35	54	0	144	105	1325	38	32	426	68
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	163	0	38	59	0	157	114	1440	41	35	463	74
RTOR Reduction (vph)	0	0	32	0	0	46	0	1	0	0	0	24
Lane Group Flow (vph)	163	0	6	59	0	111	114	1480	0	35	463	50
Heavy Vehicles (%)	3%	0%	9%	7%	0%	4%	2%	2%	5%	0%	12%	4%
Turn Type	custom		custom	custom		custom	pm+pt			Perm		Perm
Protected Phases							5	2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	15.7		15.7	15.7		15.7	91.9	91.9		78.8	78.8	78.8
Effective Green, g (s)	17.8		17.8	17.8		17.8	94.2	94.2		81.1	81.1	81.1
Actuated g/C Ratio	0.15		0.15	0.15		0.15	0.79	0.79		0.68	0.68	0.68
Clearance Time (s)	6.1		6.1	6.1		6.1	6.3	6.3		6.3	6.3	6.3
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)	260		220	250		230	730	2765		220	2178	1050
v/s Ratio Prot							0.01	c0.42			0.14	
v/s Ratio Perm	c0.09		0.00	0.03		0.07	0.11			0.11		0.03
v/c Ratio	0.63		0.03	0.24		0.48	0.16	0.54		0.16	0.21	0.05
Uniform Delay, d1	48.0		43.7	45.1		46.9	3.1	4.8		7.1	7.4	6.5
Progression Factor	1.00		1.00	1.00		1.00	0.88	0.66		0.87	0.85	0.66
Incremental Delay, d2	4.7		0.0	0.5		1.6	0.1	0.5		1.5	0.2	0.1
Delay (s)	52.6		43.7	45.6		48.5	2.8	3.7		7.6	6.5	4.4
Level of Service	D		D	D		D	A	A		A	A	A
Approach Delay (s)		51.0				47.7		3.6			6.3	
Approach LOS		D				D		A			A	

Intersection Summary		
HCM Average Control Delay	11.6	HCM Level of Service B
HCM Volume to Capacity ratio	0.55	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 8.0
Intersection Capacity Utilization	65.1%	ICU Level of Service C
Analysis Period (min)	15	

c Critical Lane Group


























HCM Signalized Intersection Capacity Analysis      Forecast Conditions - AM Peak Hour (2031)  
 14: Hunt Club & Bank      6/10/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 		 	 		 	 	
Ideal Flow (vphpl)	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	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	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)	3273	3282	1509	1597	3282	1524	3335	3471	1524	3213	3282	1417
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)	3273	3282	1509	1597	3282	1524	3335	3471	1524	3213	3282	1417
Volume (vph)	192	1337	287	45	1126	183	386	1172	36	70	376	99
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	209	1453	312	49	1224	199	420	1274	39	76	409	108
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	209	1453	312	49	1224	199	420	1274	39	76	409	108
Heavy Vehicles (%)	7%	10%	7%	13%	10%	6%	5%	4%	6%	9%	10%	14%
Turn Type	Prot		Free	Prot		Free	Prot		Free	Prot		Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Actuated Green, G (s)	12.5	39.9	120.0	5.3	32.7	120.0	13.5	46.0	120.0	2.8	35.3	120.0
Effective Green, g (s)	14.9	42.5	120.0	7.7	35.3	120.0	16.0	48.5	120.0	5.3	37.8	120.0
Actuated g/C Ratio	0.12	0.35	1.00	0.06	0.29	1.00	0.13	0.40	1.00	0.04	0.31	1.00
Clearance Time (s)	6.4	6.6		6.4	6.6		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	406	1162	1509	102	965	1524	445	1403	1524	142	1034	1417
v/s Ratio Prot	c0.06	c0.44		0.03	0.37		c0.13	c0.37		0.02	0.12	
v/s Ratio Perm			0.21			0.13			0.03			0.08
v/c Ratio	0.51	1.25	0.21	0.48	1.27	0.13	0.94	0.91	0.03	0.54	0.40	0.08
Uniform Delay, d1	49.2	38.8	0.0	54.2	42.4	0.0	51.6	33.7	0.0	56.1	32.2	0.0
Progression Factor	1.00	1.00	1.00	1.22	0.86	1.00	1.00	1.00	1.00	1.08	1.23	1.00
Incremental Delay, d2	1.1	120.0	0.3	2.5	126.8	0.1	28.7	10.2	0.0	3.8	1.1	0.1
Delay (s)	50.3	158.7	0.3	68.7	163.4	0.1	80.3	43.8	0.0	64.2	40.6	0.1
Level of Service	D	F	A	E	F	A	F	D	A	E	D	A
Approach Delay (s)		122.2			138.2			51.7			36.2	
Approach LOS		F			F			D			D	

Intersection Summary		
HCM Average Control Delay	96.3	HCM Level of Service F
HCM Volume to Capacity ratio	1.01	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 12.0
Intersection Capacity Utilization	90.7%	ICU Level of Service E
Analysis Period (min)	15	

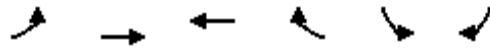
c Critical Lane Group

HCM Signalized Intersection Capacity Analysis      Forecast Conditions - AM Peak Hour (2031)  
 15: Hunt Club & Albion      6/10/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1656	3406	1538	1719	3374	1568	1467	1627		1752	1551	
Flt Permitted	0.11	1.00	1.00	0.18	1.00	1.00	0.26	1.00		0.22	1.00	
Satd. Flow (perm)	192	3406	1538	330	3374	1568	403	1627		398	1551	
Volume (vph)	372	1120	22	188	1281	31	13	76	159	35	78	141
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	404	1217	24	204	1392	34	14	83	173	38	85	153
RTOR Reduction (vph)	0	0	0	0	0	0	0	65	0	0	57	0
Lane Group Flow (vph)	404	1217	24	204	1392	34	14	191	0	38	181	0
Heavy Vehicles (%)	9%	6%	5%	5%	7%	3%	23%	7%	4%	3%	3%	15%
Turn Type	pm+pt		Free	pm+pt		Free	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		Free	6		Free	8			4		
Actuated Green, G (s)	90.0	75.4	120.0	80.8	70.8	120.0	17.5	17.5		17.5	17.5	
Effective Green, g (s)	92.3	76.9	120.0	83.7	72.3	120.0	19.7	19.7		19.7	19.7	
Actuated g/C Ratio	0.77	0.64	1.00	0.70	0.60	1.00	0.16	0.16		0.16	0.16	
Clearance Time (s)	5.4	5.5		5.4	5.5		6.2	6.2		6.2	6.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	343	2183	1538	362	2033	1568	66	267		65	255	
v/s Ratio Prot	c0.16	0.36		0.05	0.41			c0.12			0.12	
v/s Ratio Perm	c0.75		0.02	0.34		0.02	0.03			0.10		
v/c Ratio	1.18	0.56	0.02	0.56	0.68	0.02	0.21	0.71		0.58	0.71	
Uniform Delay, d1	31.5	12.0	0.0	8.1	16.1	0.0	43.4	47.5		46.4	47.5	
Progression Factor	1.65	0.80	1.00	1.74	0.52	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	83.0	0.1	0.0	1.8	1.7	0.0	1.6	8.8		12.7	9.0	
Delay (s)	134.8	9.7	0.0	15.9	10.0	0.0	45.0	56.2		59.1	56.4	
Level of Service	F	A	A	B	B	A	D	E		E	E	
Approach Delay (s)		40.3			10.5			55.7			56.8	
Approach LOS		D			B			E			E	

Intersection Summary			
HCM Average Control Delay	29.9	HCM Level of Service	C
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	91.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



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	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1656	3343	3374	1302	1583	1615
Flt Permitted	0.15	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	262	3343	3374	1302	1583	1615
Volume (vph)	35	1291	1376	62	87	56
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	1403	1496	67	95	61
RTOR Reduction (vph)	0	0	0	11	0	53
Lane Group Flow (vph)	38	1403	1496	56	95	8
Heavy Vehicles (%)	9%	8%	7%	24%	14%	0%
Turn Type	Perm			Perm		Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	95.7	95.7	95.7	95.7	12.6	12.6
Effective Green, g (s)	97.7	97.7	97.7	97.7	14.3	14.3
Actuated g/C Ratio	0.81	0.81	0.81	0.81	0.12	0.12
Clearance Time (s)	6.0	6.0	6.0	6.0	5.7	5.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	213	2722	2747	1060	189	192
v/s Ratio Prot		0.42	c0.44		c0.06	
v/s Ratio Perm	0.15			0.04		0.01
v/c Ratio	0.18	0.52	0.54	0.05	0.50	0.04
Uniform Delay, d1	2.4	3.6	3.7	2.2	49.5	46.8
Progression Factor	1.64	2.53	0.61	0.29	1.00	1.00
Incremental Delay, d2	1.5	0.6	0.6	0.1	2.1	0.1
Delay (s)	5.5	9.6	2.9	0.7	51.6	46.9
Level of Service	A	A	A	A	D	D
Approach Delay (s)		9.5	2.8		49.8	
Approach LOS		A	A		D	

Intersection Summary			
HCM Average Control Delay	8.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.0%	ICU Level of Service	A
Analysis Period (min)	15		






















c Critical Lane Group

HCM Signalized Intersection Capacity Analysis Forecast Conditions - AM Peak Hour (2031)  
 17: Hunt Club & Lorry Greenberg 6/10/2010





















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	2.4	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
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	0.95		1.00	1.00		1.00	1.00	
Fr't	1.00	1.00	0.85	1.00	1.00		1.00	0.89		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1597	3374	1120	1687	3330		1805	1692		1752	1579	
Flt Permitted	0.16	1.00	1.00	0.21	1.00		0.25	1.00		0.65	1.00	
Satd. Flow (perm)	275	3374	1120	370	3330		484	1692		1201	1579	
Volume (vph)	96	1077	8	30	1222	25	39	24	64	39	8	241
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	104	1171	9	33	1328	27	42	26	70	42	9	262
RTOR Reduction (vph)	0	0	1	0	1	0	0	57	0	0	56	0
Lane Group Flow (vph)	104	1171	8	33	1354	0	42	39	0	42	215	0
Heavy Vehicles (%)	13%	7%	25%	7%	8%	12%	0%	0%	0%	3%	0%	3%
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Actuated Green, G (s)	86.7	86.7	86.7	86.7	86.7		20.4	20.4		20.4	20.4	
Effective Green, g (s)	88.9	88.9	88.9	88.9	88.9		23.1	23.1		23.1	23.1	
Actuated g/C Ratio	0.74	0.74	0.74	0.74	0.74		0.19	0.19		0.19	0.19	
Clearance Time (s)	6.2	6.2	6.2	6.2	6.2		6.7	6.7		6.7	6.7	
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)	204	2500	830	274	2467		93	326		231	304	
v/s Ratio Prot		0.35			c0.41			0.02			c0.14	
v/s Ratio Perm	0.38		0.01	0.09			0.09			0.03		
v/c Ratio	0.51	0.47	0.01	0.12	0.55		0.45	0.12		0.18	0.71	
Uniform Delay, d1	6.5	6.2	4.1	4.4	6.8		42.8	40.1		40.5	45.3	
Progression Factor	0.88	0.70	1.03	1.76	1.76		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.7	0.6	0.0	0.8	0.8		3.5	0.2		0.4	7.3	
Delay (s)	13.4	4.9	4.2	8.6	12.7		46.3	40.2		40.9	52.6	
Level of Service	B	A	A	A	B		D	D		D	D	
Approach Delay (s)		5.6			12.6			42.1			51.1	
Approach LOS		A			B			D			D	
<b>Intersection Summary</b>												
HCM Average Control Delay			14.9			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			79.9%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												



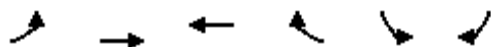
HCM Signalized Intersection Capacity Analysis Forecast Conditions - AM Peak Hour (2031)  
 18: Hunt Club & Pike 6/10/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	2.4	3.6	3.6	2.4	3.6	3.6	3.6	3.6	3.6	3.6
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	1.00	0.95	1.00		1.00			1.00	
Fr <sub>t</sub>	1.00	1.00	0.85	1.00	1.00	0.85		0.99			0.89	
Fl <sub>t</sub> Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96			0.99	
Satd. Flow (prot)	1787	3374	1400	1805	3252	1400		1807			1625	
Fl <sub>t</sub> Permitted	0.20	1.00	1.00	0.17	1.00	1.00		0.53			0.94	
Satd. Flow (perm)	368	3374	1400	314	3252	1400		990			1540	
Volume (vph)	78	1288	4	7	1163	17	17	3	2	32	0	154
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	85	1400	4	8	1264	18	18	3	2	35	0	167
RTOR Reduction (vph)	0	0	0	0	0	1	0	2	0	0	86	0
Lane Group Flow (vph)	85	1400	4	8	1264	17	0	21	0	0	116	0
Heavy Vehicles (%)	1%	7%	0%	0%	11%	0%	0%	0%	0%	3%	0%	3%
Turn Type	Perm		Perm	Perm		Perm	Perm			Perm		
Protected Phases		2			6			8				4
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	93.2	93.2	93.2	93.2	93.2	93.2		14.3			14.3	
Effective Green, g (s)	95.2	95.2	95.2	95.2	95.2	95.2		16.8			16.8	
Actuated g/C Ratio	0.79	0.79	0.79	0.79	0.79	0.79		0.14			0.14	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0		6.5			6.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	292	2677	1111	249	2580	1111		139			216	
v/s Ratio Prot		c0.41			0.39							
v/s Ratio Perm	0.23		0.00	0.03		0.01		0.02			c0.08	
v/c Ratio	0.29	0.52	0.00	0.03	0.49	0.02		0.15			0.54	
Uniform Delay, d <sub>1</sub>	3.3	4.4	2.6	2.6	4.2	2.6		45.3			48.0	
Progression Factor	2.31	2.36	1.81	1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d <sub>2</sub>	2.4	0.7	0.0	0.2	0.7	0.0		0.5			2.6	
Delay (s)	10.0	11.0	4.6	2.9	4.9	2.6		45.9			50.5	
Level of Service	B	B	A	A	A	A		D			D	
Approach Delay (s)		11.0			4.8			45.9			50.5	
Approach LOS		B			A			D			D	
<b>Intersection Summary</b>												
HCM Average Control Delay			11.3				HCM Level of Service				B	
HCM Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)			8.0		
Intersection Capacity Utilization			64.8%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis Forecast Conditions - AM Peak Hour (2031)  
 19: Walkley & Ryder 6/10/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	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	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.98		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.99		1.00	0.92		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1769	3347		1700	3432		1638	1645		1768	1447	
Flt Permitted	0.05	1.00		0.16	1.00		0.63	1.00		0.71	1.00	
Satd. Flow (perm)	93	3347		294	3432		1081	1645		1328	1447	
Volume (vph)	45	1073	235	34	1880	155	45	30	31	49	0	91
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	1166	255	37	2043	168	49	33	34	53	0	99
RTOR Reduction (vph)	0	9	0	0	3	0	0	30	0	0	9	0
Lane Group Flow (vph)	49	1412	0	37	2208	0	49	37	0	53	90	0
Confl. Peds. (#/hr)	2		10	10		2	13		1	1		13
Confl. Bikes (#/hr)			6			10			9			9
Heavy Vehicles (%)	2%	5%	1%	6%	4%	1%	9%	0%	10%	2%	0%	7%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	78.3	78.3		78.3	78.3		9.9	9.9		9.9	9.9	
Effective Green, g (s)	80.1	80.1		80.1	80.1		11.9	11.9		11.9	11.9	
Actuated g/C Ratio	0.80	0.80		0.80	0.80		0.12	0.12		0.12	0.12	
Clearance Time (s)	5.8	5.8		5.8	5.8		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	74	2681		235	2749		129	196		158	172	
v/s Ratio Prot		0.42			c0.64			0.02			c0.06	
v/s Ratio Perm	0.53			0.13			0.05			0.04		
v/c Ratio	0.66	0.53		0.16	0.80		0.38	0.19		0.34	0.52	
Uniform Delay, d1	4.2	3.4		2.3	5.6		40.6	39.7		40.4	41.4	
Progression Factor	1.05	0.78		0.48	0.59		1.00	1.00		1.00	1.00	
Incremental Delay, d2	34.3	0.7		1.0	1.8		1.9	0.5		1.3	2.9	
Delay (s)	38.7	3.3		2.1	5.1		42.5	40.2		41.7	44.3	
Level of Service	D	A		A	A		D	D		D	D	
Approach Delay (s)		4.5			5.1			41.2			43.4	
Approach LOS		A			A			D			D	
<b>Intersection Summary</b>												
HCM Average Control Delay			7.4			HCM Level of Service				A		
HCM Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			78.5%			ICU Level of Service				D		
Analysis Period (min)			15									

c Critical Lane Group



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	
Lane Util. Factor		0.95	0.95	0.88	0.97	
Frbp, ped/bikes		1.00	1.00	0.98	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	
Frt		1.00	1.00	0.85	0.99	
Flt Protected		1.00	1.00	1.00	0.95	
Satd. Flow (prot)		3374	3374	2671	3424	
Flt Permitted		1.00	1.00	1.00	0.95	
Satd. Flow (perm)		3374	3374	2671	3424	
Volume (vph)	0	636	1042	947	722	36
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	691	1133	1029	785	39
RTOR Reduction (vph)	0	0	0	0	3	0
Lane Group Flow (vph)	0	691	1133	1029	821	0
Confl. Bikes (#/hr)				7		5
Heavy Vehicles (%)	0%	7%	7%	4%	2%	0%
Turn Type				Free		
Protected Phases		2	6		4	
Permitted Phases				Free		
Actuated Green, G (s)		48.0	48.0	100.0	40.0	
Effective Green, g (s)		50.0	50.0	100.0	42.0	
Actuated g/C Ratio		0.50	0.50	1.00	0.42	
Clearance Time (s)		6.0	6.0		6.0	
Lane Grp Cap (vph)		1687	1687	2671	1438	
v/s Ratio Prot		0.20	0.34		0.24	
v/s Ratio Perm				0.39		
v/c Ratio		0.41	0.67	0.39	0.57	
Uniform Delay, d1		15.7	18.8	0.0	22.1	
Progression Factor		1.00	1.12	1.00	1.00	
Incremental Delay, d2		0.7	1.4	0.3	1.6	
Delay (s)		16.5	22.4	0.3	23.8	
Level of Service		B	C	A	C	
Approach Delay (s)		16.5	11.9		23.8	
Approach LOS		B	B		C	

**Intersection Summary**

HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis Forecast Conditions - AM Peak Hour (2031)  
 21: E-W Collector (S of Rail Corridor) & Conroy 6/10/2010



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	0.40	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	737	3539	3539	1583
Volume (vph)	106	10	61	1739	581	653
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	115	11	66	1890	632	710
RTOR Reduction (vph)	0	8	0	0	0	284
Lane Group Flow (vph)	115	3	66	1890	632	426
Turn Type		Perm	Perm			Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	16.0	16.0	36.0	36.0	36.0	36.0
Effective Green, g (s)	16.0	16.0	36.0	36.0	36.0	36.0
Actuated g/C Ratio	0.27	0.27	0.60	0.60	0.60	0.60
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	472	422	442	2123	2123	950
v/s Ratio Prot	c0.06			c0.53	0.18	
v/s Ratio Perm		0.00	0.09			0.27
v/c Ratio	0.24	0.01	0.15	0.89	0.30	0.45
Uniform Delay, d1	17.3	16.2	5.3	10.3	5.8	6.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	0.0	0.7	6.1	0.4	1.5
Delay (s)	18.5	16.2	6.0	16.4	6.2	8.1
Level of Service	B	B	A	B	A	A
Approach Delay (s)	18.3			16.1	7.2	
Approach LOS	B			B	A	

**Intersection Summary**

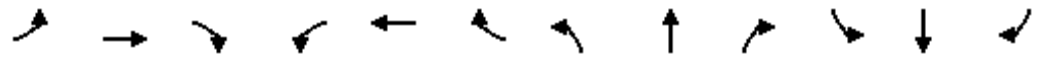
HCM Average Control Delay	12.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis Forecast Conditions - PM Peak Hour (2031)  
 1: Hunt Club & Conroy 6/10/2010

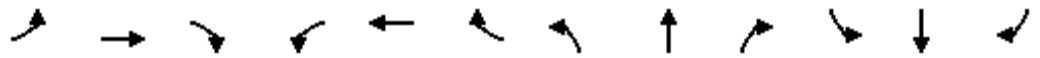
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	2.4	3.6	3.6	3.6
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Fr't	1.00	0.99		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3386		1752	3498		1530	3505	1284	1736	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.14	1.00	1.00	0.50	1.00	1.00
Satd. Flow (perm)	3433	3386		1752	3498		223	3505	1284	906	3539	1583
Volume (vph)	248	1277	51	148	832	14	50	302	92	72	895	444
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	270	1388	55	161	904	15	54	328	100	78	973	483
RTOR Reduction (vph)	0	3	0	0	1	0	0	0	33	0	0	0
Lane Group Flow (vph)	270	1440	0	161	918	0	54	328	67	78	973	483
Heavy Vehicles (%)	2%	6%	6%	3%	3%	0%	18%	3%	9%	4%	2%	2%
Turn Type	Prot			Prot			Perm		Perm	Perm		Free
Protected Phases	5	2		1	6			8				4
Permitted Phases							8		8	4		Free
Actuated Green, G (s)	12.5	35.7		13.6	36.8		26.3	26.3	26.3	26.3	26.3	95.0
Effective Green, g (s)	15.1	37.9		16.2	39.0		28.9	28.9	28.9	28.9	28.9	95.0
Actuated g/C Ratio	0.16	0.40		0.17	0.41		0.30	0.30	0.30	0.30	0.30	1.00
Clearance Time (s)	6.6	6.2		6.6	6.2		6.6	6.6	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	546	1351		299	1436		68	1066	391	276	1077	1583
v/s Ratio Prot	0.08	c0.43		c0.09	0.26			0.09			c0.27	
v/s Ratio Perm							0.24		0.05	0.09		c0.31
v/c Ratio	0.49	1.07		0.54	0.64		0.79	0.31	0.17	0.28	0.90	0.31
Uniform Delay, d1	36.5	28.6		36.0	22.4		30.3	25.4	24.3	25.2	31.7	0.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.04	1.11	1.00
Incremental Delay, d2	0.7	44.1		1.9	2.2		45.6	0.2	0.2	0.5	8.9	0.4
Delay (s)	37.2	72.7		37.9	24.6		75.9	25.5	24.5	26.5	44.2	0.4
Level of Service	D	E		D	C		E	C	C	C	D	A
Approach Delay (s)		67.1			26.5			31.0			29.5	
Approach LOS		E			C			C			C	
<b>Intersection Summary</b>												
HCM Average Control Delay			42.4	HCM Level of Service				D				
HCM Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			95.0	Sum of lost time (s)				12.0				
Intersection Capacity Utilization			91.5%	ICU Level of Service				F				
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis Forecast Conditions - PM Peak Hour (2031)  
 2: Lorry Greenberg & Conroy 6/10/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↕	↗	↖	↕	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	2.4	3.6	3.6	2.4
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.96		1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	1592		1770	1653		1805	3539	1400	1787	3539	1386
Flt Permitted	0.46	1.00		0.69	1.00		0.15	1.00	1.00	0.40	1.00	1.00
Satd. Flow (perm)	859	1592		1294	1653		286	3539	1400	758	3539	1386
Volume (vph)	89	60	22	55	52	111	21	493	96	244	1448	157
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	97	65	24	60	57	121	23	536	104	265	1574	171
RTOR Reduction (vph)	0	12	0	0	101	0	0	0	13	0	0	6
Lane Group Flow (vph)	97	77	0	60	77	0	23	536	91	265	1574	165
Heavy Vehicles (%)	1%	18%	5%	2%	10%	0%	0%	2%	0%	1%	2%	1%
Turn Type	Perm			Perm			Perm		Perm	pm+pt		Perm
Protected Phases		4			8			2		1		6
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	13.1	13.1		13.1	13.1		56.4	56.4	56.4	69.1	69.1	69.1
Effective Green, g (s)	16.0	16.0		16.0	16.0		58.3	58.3	58.3	71.0	71.0	71.0
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.61	0.61	0.61	0.75	0.75	0.75
Clearance Time (s)	6.9	6.9		6.9	6.9		5.9	5.9	5.9	5.9	5.9	5.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	145	268		218	278		176	2172	859	661	2645	1036
v/s Ratio Prot		0.05			0.05			0.15		0.04		0.44
v/s Ratio Perm	0.11			0.05			0.08		0.07	0.26		0.12
v/c Ratio	0.67	0.29		0.28	0.28		0.13	0.25	0.11	0.40	0.60	0.16
Uniform Delay, d1	37.0	34.5		34.4	34.5		7.7	8.4	7.6	3.9	5.5	3.4
Progression Factor	1.00	1.00		1.00	1.00		0.14	0.13	0.00	0.51	0.31	0.38
Incremental Delay, d2	11.1	0.6		0.7	0.5		1.4	0.3	0.2	0.4	0.9	0.3
Delay (s)	48.1	35.1		35.1	35.0		2.5	1.4	0.3	2.4	2.6	1.6
Level of Service	D	D		D	D		A	A	A	A	A	A
Approach Delay (s)		41.9			35.0			1.2			2.5	
Approach LOS		D			D			A			A	

Intersection Summary		
HCM Average Control Delay	7.1	HCM Level of Service
HCM Volume to Capacity ratio	0.61	A
Actuated Cycle Length (s)	95.0	Sum of lost time (s)
Intersection Capacity Utilization	79.6%	8.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		D



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑	↗	↘	↑	↗	↘	↑↑	↗	↘	↑↑	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	2.4	3.6	3.6	2.4
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Flt	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	1900	1553	1612	1900	1599	1805	3539	1400	1626	3374	1333
Flt Permitted	0.71	1.00	1.00	0.70	1.00	1.00	0.11	1.00	1.00	0.39	1.00	1.00
Satd. Flow (perm)	1319	1900	1553	1192	1900	1599	203	3539	1400	672	3374	1333
Volume (vph)	222	77	64	37	69	143	43	576	39	297	1423	356
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	241	84	70	40	75	155	47	626	42	323	1547	387
RTOR Reduction (vph)	0	0	22	0	0	116	0	0	5	0	0	20
Lane Group Flow (vph)	241	84	48	40	75	39	47	626	37	323	1547	367
Heavy Vehicles (%)	2%	0%	4%	12%	0%	1%	0%	2%	0%	11%	7%	5%
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		4			8			2				6
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	22.5	22.5	22.5	22.5	22.5	22.5	64.6	64.6	64.6	64.6	64.6	64.6
Effective Green, g (s)	25.4	25.4	25.4	25.4	25.4	25.4	66.6	66.6	66.6	66.6	66.6	66.6
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.25	0.25	0.67	0.67	0.67	0.67	0.67	0.67
Clearance Time (s)	6.9	6.9	6.9	6.9	6.9	6.9	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	335	483	394	303	483	406	135	2357	932	448	2247	888
v/s Ratio Prot		0.04			0.04			0.18				0.46
v/s Ratio Perm	c0.18		0.03	0.03		0.02	0.23		0.03	c0.48		0.28
v/c Ratio	0.72	0.17	0.12	0.13	0.16	0.10	0.35	0.27	0.04	0.72	0.69	0.41
Uniform Delay, d1	34.0	29.1	28.7	28.8	29.0	28.5	7.3	6.8	5.7	10.7	10.3	7.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.22	1.04	1.24	1.00	1.00	1.00
Incremental Delay, d2	7.2	0.2	0.1	0.2	0.2	0.1	6.8	0.3	0.1	9.6	1.7	1.4
Delay (s)	41.3	29.3	28.8	29.0	29.1	28.6	15.6	7.3	7.2	20.4	12.0	9.1
Level of Service	D	C	C	C	C	C	B	A	A	C	B	A
Approach Delay (s)		36.5			28.8			7.9			12.7	
Approach LOS		D			C			A			B	

Intersection Summary		
HCM Average Control Delay	15.6	HCM Level of Service B
HCM Volume to Capacity ratio	0.72	
Actuated Cycle Length (s)	100.0	Sum of lost time (s) 8.0
Intersection Capacity Utilization	76.6%	ICU Level of Service D
Analysis Period (min)	15	
c Critical Lane Group		



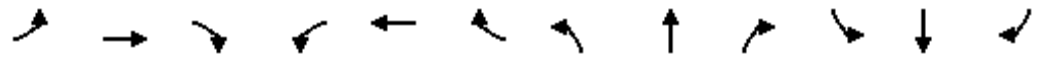
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↘		↗	↘		↗	↑↑	↗	↗	↑↑	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	2.4
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.85		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1615		1787	1568		1805	3471	1568	1719	3539	1400
Flt Permitted	0.71	1.00		0.72	1.00		0.07	1.00	1.00	0.10	1.00	1.00
Satd. Flow (perm)	1350	1615		1354	1568		136	3471	1568	180	3539	1400
Volume (vph)	235	0	52	353	0	65	12	1339	128	19	2160	50
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	255	0	57	384	0	71	13	1455	139	21	2348	54
RTOR Reduction (vph)	0	2	0	0	21	0	0	0	0	0	0	2
Lane Group Flow (vph)	255	55	0	384	50	0	13	1455	139	21	2348	52
Heavy Vehicles (%)	0%	0%	0%	1%	0%	3%	0%	4%	3%	5%	2%	0%
Turn Type	Perm			Perm			Perm		Free	Perm		Perm
Protected Phases		4			8			2				6
Permitted Phases	4			8			2		Free	6		6
Actuated Green, G (s)	28.4	28.4		28.4	28.4		53.8	53.8	95.0	53.8	53.8	53.8
Effective Green, g (s)	31.3	31.3		31.3	31.3		55.7	55.7	95.0	55.7	55.7	55.7
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.59	0.59	1.00	0.59	0.59	0.59
Clearance Time (s)	6.9	6.9		6.9	6.9		5.9	5.9		5.9	5.9	5.9
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)	445	532		446	517		80	2035	1568	106	2075	821
v/s Ratio Prot		0.03			0.03			0.42			c0.66	
v/s Ratio Perm	0.19			c0.28			0.10		0.09	0.12		0.04
v/c Ratio	0.57	0.10		0.86	0.10		0.16	0.71	0.09	0.20	1.13	0.06
Uniform Delay, d1	26.3	22.1		29.8	22.1		9.0	14.0	0.0	9.2	19.6	8.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.78	0.72	0.86
Incremental Delay, d2	1.8	0.1		15.5	0.1		4.3	2.2	0.1	3.4	64.7	0.1
Delay (s)	28.1	22.2		45.4	22.1		13.3	16.2	0.1	10.5	78.9	7.3
Level of Service	C	C		D	C		B	B	A	B	E	A
Approach Delay (s)		27.0			41.7			14.8			76.7	
Approach LOS		C			D			B			E	

**Intersection Summary**

HCM Average Control Delay	49.4	HCM Level of Service	D
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	92.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

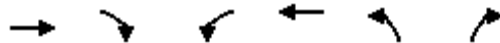


HCM Signalized Intersection Capacity Analysis Forecast Conditions - PM Peak Hour (2031)  
 5: Saint Laurent & Conroy 6/10/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑↑↑	↗	↖	↑↑	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	2.4	3.6	3.6	2.4
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.95	1.00
Flt	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)	1687	1900	1615	1787	1863	1599	1805	5085	1261	1703	3539	1346
Flt Permitted	0.72	1.00	1.00	0.52	1.00	1.00	0.08	1.00	1.00	0.10	1.00	1.00
Satd. Flow (perm)	1283	1900	1615	983	1863	1599	151	5085	1261	182	3539	1346
Volume (vph)	15	68	244	262	49	136	29	1554	95	36	1517	23
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	74	265	285	53	148	32	1689	103	39	1649	25
RTOR Reduction (vph)	0	0	0	0	0	2	0	0	6	0	0	1
Lane Group Flow (vph)	16	74	265	285	53	146	32	1689	97	39	1649	24
Heavy Vehicles (%)	7%	0%	0%	1%	2%	1%	0%	2%	11%	6%	2%	4%
Turn Type	Perm		Free pm+pt		Perm	Perm		Perm	Perm		Perm	Perm
Protected Phases		4		3	8		2			6		6
Permitted Phases	4		Free	8		8	2		2	6		6
Actuated Green, G (s)	8.3	8.3	95.0	23.7	23.7	23.7	58.0	58.0	58.0	58.0	58.0	58.0
Effective Green, g (s)	11.2	11.2	95.0	26.6	26.6	26.6	60.4	60.4	60.4	60.4	60.4	60.4
Actuated g/C Ratio	0.12	0.12	1.00	0.28	0.28	0.28	0.64	0.64	0.64	0.64	0.64	0.64
Clearance Time (s)	6.9	6.9		5.7	6.9	6.9	6.4	6.4	6.4	6.4	6.4	6.4
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	224	1615	372	522	448	96	3233	802	116	2250	856
v/s Ratio Prot		0.04		c0.09	0.03			0.33			c0.47	
v/s Ratio Perm	0.01		0.16	c0.12		0.09	0.21		0.08	0.21		0.02
v/c Ratio	0.11	0.33	0.16	0.77	0.10	0.33	0.33	0.52	0.12	0.34	0.73	0.03
Uniform Delay, d1	37.4	38.5	0.0	29.9	25.3	27.1	8.0	9.4	6.8	8.0	11.8	6.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.15	1.02	1.19	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.9	0.2	9.1	0.1	0.4	6.9	0.5	0.2	7.7	2.2	0.1
Delay (s)	37.7	39.3	0.2	39.0	25.4	27.5	16.1	10.1	8.4	15.7	14.0	6.5
Level of Service	D	D	A	D	C	C	B	B	A	B	B	A
Approach Delay (s)		10.1			34.0			10.1			13.9	
Approach LOS		B			C			B			B	

Intersection Summary		
HCM Average Control Delay	14.2	HCM Level of Service B
HCM Volume to Capacity ratio	0.74	
Actuated Cycle Length (s)	95.0	Sum of lost time (s) 8.0
Intersection Capacity Utilization	69.8%	ICU Level of Service C
Analysis Period (min)	15	
c Critical Lane Group		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↓	↑↑	↑↓	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	0.97	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3438	1583	3433	3505	3467	1553
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3438	1583	3433	3505	3467	1553
Volume (vph)	1246	513	557	1263	543	234
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1354	558	605	1373	590	254
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1354	558	605	1373	590	254
Heavy Vehicles (%)	5%	2%	2%	3%	1%	4%
Turn Type		Free	Prot			Free
Protected Phases	2		1	6	8	
Permitted Phases		Free				Free
Actuated Green, G (s)	47.2	110.0	22.3	75.7	21.9	110.0
Effective Green, g (s)	49.2	110.0	24.5	77.7	24.3	110.0
Actuated g/C Ratio	0.45	1.00	0.22	0.71	0.22	1.00
Clearance Time (s)	6.0		6.2	6.0	6.4	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1538	1583	765	2476	766	1553
v/s Ratio Prot	c0.39		c0.18	0.39	c0.17	
v/s Ratio Perm		0.35				0.16
v/c Ratio	0.88	0.35	0.79	0.55	0.77	0.16
Uniform Delay, d1	27.7	0.0	40.3	7.8	40.2	0.0
Progression Factor	0.95	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.3	0.3	5.6	0.9	4.8	0.2
Delay (s)	30.6	0.3	45.9	8.7	45.0	0.2
Level of Service	C	A	D	A	D	A
Approach Delay (s)	21.7			20.1	31.5	
Approach LOS	C			C	C	

**Intersection Summary**

HCM Average Control Delay	22.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis Forecast Conditions - PM Peak Hour (2031)  
 7: Walkley & Heatherington 6/10/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗			↖	↗
Ideal Flow (vphpl)	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	0.95	1.00	1.00	1.00			1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.88			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.97	1.00
Satd. Flow (prot)	1805	3390		1752	3505	1615	1597	1607			1786	1599
Flt Permitted	0.19	1.00		0.26	1.00	1.00	0.71	1.00			0.77	1.00
Satd. Flow (perm)	369	3390		482	3505	1615	1195	1607			1416	1599
Volume (vph)	93	913	93	118	949	20	80	19	78	38	28	106
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	101	992	101	128	1032	22	87	21	85	41	30	115
RTOR Reduction (vph)	0	6	0	0	0	0	0	71	0	0	0	96
Lane Group Flow (vph)	101	1087	0	128	1032	22	87	35	0	0	71	19
Heavy Vehicles (%)	0%	5%	5%	3%	3%	0%	13%	0%	5%	3%	4%	1%
Turn Type	pm+pt			Perm		Free	Perm			Perm		Perm
Protected Phases	5	2			6			8				4
Permitted Phases	2			6		Free	8			4		4
Actuated Green, G (s)	48.4	48.4		37.6	37.6	70.0	9.3	9.3			9.3	9.3
Effective Green, g (s)	50.5	50.5		39.7	39.7	70.0	11.5	11.5			11.5	11.5
Actuated g/C Ratio	0.72	0.72		0.57	0.57	1.00	0.16	0.16			0.16	0.16
Clearance Time (s)	6.0	6.1		6.1	6.1		6.2	6.2			6.2	6.2
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	406	2446		273	1988	1615	196	264			233	263
v/s Ratio Prot	0.02	c0.32			c0.29			0.02				
v/s Ratio Perm	0.16			0.27		0.01	c0.07				0.05	0.01
v/c Ratio	0.25	0.44		0.47	0.52	0.01	0.44	0.13			0.30	0.07
Uniform Delay, d1	4.4	4.0		8.9	9.3	0.0	26.4	25.0			25.7	24.7
Progression Factor	1.91	1.72		1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	0.3	0.5		5.7	1.0	0.0	1.6	0.2			0.7	0.1
Delay (s)	8.7	7.4		14.6	10.3	0.0	28.0	25.2			26.5	24.9
Level of Service	A	A		B	B	A	C	C			C	C
Approach Delay (s)		7.5			10.5			26.5			25.5	
Approach LOS		A			B			C			C	

Intersection Summary

HCM Average Control Delay	11.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	70.0	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 Forecast Conditions - PM Peak Hour (2031)  
 8: Walkley & Albion N 6/14/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	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	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.86		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3539	1495	1770	3529		1736	1568		1805	1758	
Flt Permitted	0.17	1.00	1.00	0.29	1.00		0.73	1.00		0.34	1.00	
Satd. Flow (perm)	314	3539	1495	534	3529		1331	1568		642	1758	
Volume (vph)	20	672	210	193	893	20	556	20	431	20	20	20
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	730	228	210	971	22	604	22	468	22	22	22
RTOR Reduction (vph)	0	0	0	0	2	0	0	58	0	0	12	0
Lane Group Flow (vph)	22	730	228	210	991	0	604	432	0	22	32	0
Heavy Vehicles (%)	0%	2%	8%	2%	2%	0%	4%	0%	4%	0%	0%	0%
Turn Type	Perm		Free	Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2		Free	6			8			4		
Actuated Green, G (s)	25.1	25.1	65.0	25.1	25.1		28.5	28.5		28.5	28.5	
Effective Green, g (s)	27.0	27.0	65.0	27.0	27.0		30.0	30.0		30.0	30.0	
Actuated g/C Ratio	0.42	0.42	1.00	0.42	0.42		0.46	0.46		0.46	0.46	
Clearance Time (s)	5.9	5.9		5.9	5.9		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	130	1470	1495	222	1466		614	724		296	811	
v/s Ratio Prot		0.21			0.28			0.28			0.02	
v/s Ratio Perm	0.07		0.15	c0.39			c0.45			0.03		
v/c Ratio	0.17	0.50	0.15	0.95	0.68		0.98	0.60		0.07	0.04	
Uniform Delay, d1	11.9	14.0	0.0	18.3	15.4		17.3	13.0		9.8	9.6	
Progression Factor	1.71	1.95	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	0.8	0.2	47.8	2.5		32.0	1.3		0.1	0.0	
Delay (s)	22.4	28.1	0.2	66.1	18.0		49.2	14.3		9.9	9.6	
Level of Service	C	C	A	E	B		D	B		A	A	
Approach Delay (s)		21.5			26.4			33.6			9.7	
Approach LOS		C			C			C			A	
<b>Intersection Summary</b>												
HCM Average Control Delay			27.0			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.97									
Actuated Cycle Length (s)			65.0			Sum of lost time (s)				8.0		
Intersection Capacity Utilization			81.1%			ICU Level of Service				D		
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis Forecast Conditions - PM Peak Hour (2031)  
 9: Johnston & Albion 6/10/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	56	490	106	36	278	110	49	60	129	13	268	232
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	61	533	115	39	302	120	53	65	140	14	291	252

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	709	461	259	558
Volume Left (vph)	61	39	53	14
Volume Right (vph)	115	120	140	252
Hadj (s)	-0.03	-0.13	-0.26	-0.23
Departure Headway (s)	8.7	8.6	9.3	8.5
Degree Utilization, x	1.71	1.10	0.67	1.31
Capacity (veh/h)	419	430	379	430
Control Delay (s)	350.6	102.8	29.2	182.2
Approach Delay (s)	350.6	102.8	29.2	182.2
Approach LOS	F	F	D	F

Intersection Summary			
Delay		203.9	
HCM Level of Service		F	
Intersection Capacity Utilization	92.3%		ICU Level of Service F
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis Forecast Conditions - PM Peak Hour (2031)  
 10: Cahill & Albion 6/10/2010

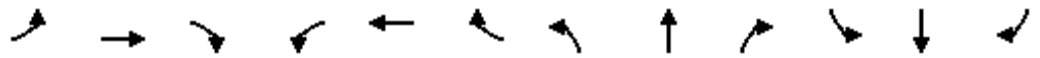


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	17	107	104	49	66	37	55	183	59	71	429	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	116	113	53	72	40	60	199	64	77	466	11

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	248	165	323	554
Volume Left (vph)	18	53	60	77
Volume Right (vph)	113	40	64	11
Hadj (s)	-0.26	-0.03	0.02	0.04
Departure Headway (s)	7.0	7.5	6.7	6.2
Degree Utilization, x	0.48	0.34	0.60	0.96
Capacity (veh/h)	487	447	516	571
Control Delay (s)	16.2	14.4	19.2	52.4
Approach Delay (s)	16.2	14.4	19.2	52.4
Approach LOS	C	B	C	F

Intersection Summary			
Delay		32.3	
HCM Level of Service		D	
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis Forecast Conditions - PM Peak Hour (2031)  
 11: Walkley & Bank 6/10/2010

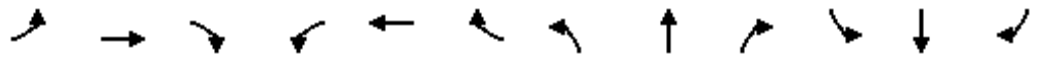


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑↑	↖	↖↗	↑↑	↖	↖	↑↑↑	↖	↖↗	↑↑	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.91	1.00	0.97	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)	3467	3471	1583	3467	3539	1553	1787	5085	1568	3400	3574	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)	3467	3471	1583	3467	3539	1553	1787	5085	1568	3400	3574	1583
Volume (vph)	347	534	278	226	836	339	230	1358	225	242	1646	484
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	377	580	302	246	909	368	250	1476	245	263	1789	526
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	377	580	302	246	909	368	250	1476	245	263	1789	526
Heavy Vehicles (%)	1%	4%	2%	1%	2%	4%	1%	2%	3%	3%	1%	2%
Turn Type	Prot		Free	Prot		Free	Prot		Free	Prot		Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Actuated Green, G (s)	13.7	23.5	130.0	12.9	22.7	130.0	16.6	59.9	130.0	8.6	51.9	130.0
Effective Green, g (s)	16.0	25.8	130.0	15.2	25.0	130.0	19.0	62.0	130.0	11.0	54.0	130.0
Actuated g/C Ratio	0.12	0.20	1.00	0.12	0.19	1.00	0.15	0.48	1.00	0.08	0.42	1.00
Clearance Time (s)	6.3	6.3		6.3	6.3		6.4	6.1		6.4	6.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	427	689	1583	405	681	1553	261	2425	1568	288	1485	1583
v/s Ratio Prot	c0.11	0.17		0.07	c0.26		c0.14	0.29		0.08	c0.50	
v/s Ratio Perm			0.19			0.24			0.16			c0.33
v/c Ratio	0.88	0.84	0.19	0.61	1.33	0.24	0.96	0.61	0.16	0.91	1.20	0.33
Uniform Delay, d1	56.1	50.1	0.0	54.6	52.5	0.0	55.1	25.1	0.0	59.0	38.0	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.9	9.2	0.3	2.6	160.5	0.4	43.7	1.1	0.2	31.3	98.8	0.6
Delay (s)	75.0	59.3	0.3	57.1	213.0	0.4	98.8	26.2	0.2	90.3	136.8	0.6
Level of Service	E	E	A	E	F	A	F	C	A	F	F	A
Approach Delay (s)		49.8			136.5			32.2			104.2	
Approach LOS		D			F			C			F	

Intersection Summary		
HCM Average Control Delay	82.2	HCM Level of Service F
HCM Volume to Capacity ratio	1.15	
Actuated Cycle Length (s)	130.0	Sum of lost time (s) 16.0
Intersection Capacity Utilization	104.6%	ICU Level of Service G
Analysis Period (min)	15	

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis Forecast Conditions - PM Peak Hour (2031)  
 12: Johnston & Bank 6/10/2010

























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑	↗	↘	↑	↗	↘	↑↑	↗	↘	↑↑	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1881	1599	1752	1900	1553	1736	3505	1482	1770	3539	1615
Flt Permitted	0.64	1.00	1.00	0.40	1.00	1.00	0.13	1.00	1.00	0.19	1.00	1.00
Satd. Flow (perm)	1223	1881	1599	738	1900	1553	240	3505	1482	347	3539	1615
Volume (vph)	156	185	156	94	90	506	54	923	71	449	1407	191
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	201	170	102	98	550	59	1003	77	488	1529	208
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	27	0	0	37
Lane Group Flow (vph)	170	201	170	102	98	550	59	1003	50	488	1529	171
Heavy Vehicles (%)	0%	1%	1%	3%	0%	4%	4%	3%	9%	2%	2%	0%
Turn Type	Perm		Free	Perm		Free	pm+pt		Perm	pm+pt		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		Free	8		Free	2		2	6		6
Actuated Green, G (s)	20.6	20.6	120.0	20.6	20.6	120.0	67.2	62.0	62.0	88.0	77.3	77.3
Effective Green, g (s)	22.5	22.5	120.0	22.5	22.5	120.0	70.2	63.5	63.5	89.5	78.8	78.8
Actuated g/C Ratio	0.19	0.19	1.00	0.19	0.19	1.00	0.59	0.53	0.53	0.75	0.66	0.66
Clearance Time (s)	5.9	5.9		5.9	5.9		5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	229	353	1599	138	356	1553	224	1855	784	520	2324	1061
v/s Ratio Prot		0.11			0.05		0.01	0.29		c0.17	0.43	
v/s Ratio Perm	c0.14		0.11	0.14		0.35	0.14		0.03	c0.53		0.11
v/c Ratio	0.74	0.57	0.11	0.74	0.28	0.35	0.26	0.54	0.06	0.94	0.66	0.16
Uniform Delay, d1	46.0	44.3	0.0	46.0	41.8	0.0	11.7	18.6	13.8	22.9	12.5	7.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.64	1.81	2.79	1.00	1.00	1.00
Incremental Delay, d2	12.2	2.1	0.1	18.6	0.4	0.6	0.6	1.0	0.1	24.8	1.5	0.3
Delay (s)	58.2	46.5	0.1	64.6	42.2	0.6	19.8	34.7	38.6	47.7	13.9	8.2
Level of Service	E	D	A	E	D	A	B	C	D	D	B	A
Approach Delay (s)		35.6			14.8			34.2			20.8	
Approach LOS		D			B			C			C	

Intersection Summary		
HCM Average Control Delay	24.8	HCM Level of Service C
HCM Volume to Capacity ratio	0.89	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 8.0
Intersection Capacity Utilization	81.8%	ICU Level of Service D
Analysis Period (min)	15	

c Critical Lane Group


































HCM Signalized Intersection Capacity Analysis Forecast Conditions - PM Peak Hour (2031)  
 13: Dazé & Bank 6/10/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00		1.00	1.00		1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00		0.85	1.00		0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95		1.00	0.95		1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770		1615	1719		1583	1787	3500		1770	3574	1583
Flt Permitted	0.95		1.00	0.95		1.00	0.14	1.00		0.24	1.00	1.00
Satd. Flow (perm)	1770		1615	1719		1583	264	3500		445	3574	1583
Volume (vph)	122	0	58	60	0	65	131	995	92	150	1230	100
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	133	0	63	65	0	71	142	1082	100	163	1337	109
RTOR Reduction (vph)	0	0	55	0	0	62	0	3	0	0	0	37
Lane Group Flow (vph)	133	0	8	65	0	9	142	1179	0	163	1337	72
Heavy Vehicles (%)	2%	0%	0%	5%	0%	2%	1%	2%	0%	2%	1%	2%
Turn Type	custom		custom	custom		custom	pm+pt			Perm		Perm
Protected Phases							5	2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	13.9		13.9	13.9		13.9	93.7	93.7		77.1	77.1	77.1
Effective Green, g (s)	16.0		16.0	16.0		16.0	96.0	96.0		79.4	79.4	79.4
Actuated g/C Ratio	0.13		0.13	0.13		0.13	0.80	0.80		0.66	0.66	0.66
Clearance Time (s)	6.1		6.1	6.1		6.1	6.3	6.3		6.3	6.3	6.3
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)	236		215	229		211	371	2800		294	2365	1047
v/s Ratio Prot							0.04	c0.34			c0.37	
v/s Ratio Perm	c0.08		0.01	0.04		0.01	0.27			0.37		0.05
v/c Ratio	0.56		0.04	0.28		0.04	0.38	0.42		0.55	0.57	0.07
Uniform Delay, d1	48.7		45.3	46.8		45.3	7.1	3.6		10.8	11.0	7.2
Progression Factor	1.00		1.00	1.00		1.00	2.48	0.78		0.90	0.95	1.76
Incremental Delay, d2	3.1		0.1	0.7		0.1	0.5	0.4		6.0	0.8	0.1
Delay (s)	51.8		45.4	47.5		45.4	18.1	3.2		15.7	11.2	12.8
Level of Service	D		D	D		D	B	A		B	B	B
Approach Delay (s)		49.7				46.4		4.8			11.7	
Approach LOS		D				D		A			B	

Intersection Summary		
HCM Average Control Delay	12.7	HCM Level of Service B
HCM Volume to Capacity ratio	0.55	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 12.0
Intersection Capacity Utilization	59.6%	ICU Level of Service B
Analysis Period (min)	15	



























c Critical Lane Group

HCM Signalized Intersection Capacity Analysis Forecast Conditions - PM Peak Hour (2031)  
 14: Hunt Club & Bank 6/10/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 		 	 		 	 	
Ideal Flow (vphpl)	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	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	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)	3303	3374	1599	1770	3471	1583	3467	3539	1583	3467	3505	1538
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)	3303	3374	1599	1770	3471	1583	3467	3539	1583	3467	3505	1538
Volume (vph)	169	1346	421	87	1371	135	380	908	50	196	1145	131
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	184	1463	458	95	1490	147	413	987	54	213	1245	142
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	184	1463	458	95	1490	147	413	987	54	213	1245	142
Heavy Vehicles (%)	6%	7%	1%	2%	4%	2%	1%	2%	2%	1%	3%	5%
Turn Type	Prot		Free	Prot		Free	Prot		Free	Prot		Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Actuated Green, G (s)	11.6	37.4	120.0	5.6	31.4	120.0	14.5	44.5	120.0	6.5	36.5	120.0
Effective Green, g (s)	14.0	40.0	120.0	8.0	34.0	120.0	17.0	47.0	120.0	9.0	39.0	120.0
Actuated g/C Ratio	0.12	0.33	1.00	0.07	0.28	1.00	0.14	0.39	1.00	0.08	0.32	1.00
Clearance Time (s)	6.4	6.6		6.4	6.6		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	385	1125	1599	118	983	1583	491	1386	1583	260	1139	1538
v/s Ratio Prot	0.06	c0.43		c0.05	c0.43		c0.12	0.28		0.06	c0.36	
v/s Ratio Perm			0.29			0.09			0.03			0.09
v/c Ratio	0.48	1.30	0.29	0.81	1.52	0.09	0.84	0.71	0.03	0.82	1.09	0.09
Uniform Delay, d1	49.6	40.0	0.0	55.2	43.0	0.0	50.2	30.8	0.0	54.7	40.5	0.0
Progression Factor	1.00	1.00	1.00	0.98	1.03	1.00	1.00	1.00	1.00	0.97	1.06	1.00
Incremental Delay, d2	0.9	141.8	0.5	22.9	235.7	0.1	12.3	3.1	0.0	16.1	54.5	0.1
Delay (s)	50.5	181.8	0.5	77.1	279.9	0.1	62.5	33.9	0.0	69.3	97.3	0.1
Level of Service	D	F	A	E	F	A	E	C	A	E	F	A
Approach Delay (s)		130.9			245.0			40.8			84.9	
Approach LOS		F			F			D			F	
<b>Intersection Summary</b>												
HCM Average Control Delay			129.9			HCM Level of Service			F			
HCM Volume to Capacity ratio			1.19									
Actuated Cycle Length (s)			120.0	Sum of lost time (s)				20.0				
Intersection Capacity Utilization			100.9%	ICU Level of Service			G					
Analysis Period (min)			15									

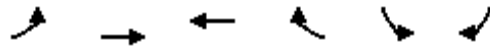
c Critical Lane Group

HCM Signalized Intersection Capacity Analysis      Forecast Conditions - PM Peak Hour (2031)  
 15: Hunt Club & Albion      6/10/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1612	3438	1509	1787	3505	1568	1687	1680		1687	1593	
Flt Permitted	0.13	1.00	1.00	0.07	1.00	1.00	0.12	1.00		0.27	1.00	
Satd. Flow (perm)	213	3438	1509	126	3505	1568	222	1680		479	1593	
Volume (vph)	180	1442	15	291	1117	34	15	102	211	31	134	352
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	196	1567	16	316	1214	37	16	111	229	34	146	383
RTOR Reduction (vph)	0	0	0	0	0	0	0	62	0	0	78	0
Lane Group Flow (vph)	196	1567	16	316	1214	37	16	278	0	34	451	0
Heavy Vehicles (%)	12%	5%	7%	1%	3%	3%	7%	1%	2%	7%	2%	8%
Turn Type	pm+pt		Free pm+pt		Free		Perm				Perm	
Protected Phases	5	2		1	6				8			4
Permitted Phases	2		Free	6		Free	8			4		
Actuated Green, G (s)	69.9	55.1	120.0	76.3	58.3	120.0	29.8	29.8		29.8	29.8	
Effective Green, g (s)	72.8	56.6	120.0	79.2	59.8	120.0	32.0	32.0		32.0	32.0	
Actuated g/C Ratio	0.61	0.47	1.00	0.66	0.50	1.00	0.27	0.27		0.27	0.27	
Clearance Time (s)	5.4	5.5		5.4	5.5		6.2	6.2		6.2	6.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	318	1622	1509	352	1747	1568	59	448		128	425	
v/s Ratio Prot	0.08	c0.46		c0.15	0.35			0.17			c0.28	
v/s Ratio Perm	0.29		0.01	0.45		0.02	0.07			0.07		
v/c Ratio	0.62	0.97	0.01	0.90	0.69	0.02	0.27	0.62		0.27	1.06	
Uniform Delay, d1	16.2	30.8	0.0	38.7	23.1	0.0	34.8	38.7		34.7	44.0	
Progression Factor	2.09	0.63	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	2.5	0.0	24.2	2.3	0.0	2.5	2.7		1.1	60.5	
Delay (s)	34.1	21.9	0.0	62.9	25.4	0.0	37.3	41.4		35.8	104.5	
Level of Service	C	C	A	E	C	A	D	D		D	F	
Approach Delay (s)		23.0			32.4			41.2			100.3	
Approach LOS		C			C			D			F	

Intersection Summary			
HCM Average Control Delay	38.2	HCM Level of Service	D
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	94.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



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	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1736	3406	3539	1524	1570	1568
Flt Permitted	0.13	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	243	3406	3539	1524	1570	1568
Volume (vph)	57	1655	1434	82	102	40
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	62	1799	1559	89	111	43
RTOR Reduction (vph)	0	0	0	17	0	23
Lane Group Flow (vph)	62	1799	1559	72	111	20
Heavy Vehicles (%)	4%	6%	2%	6%	15%	3%
Turn Type	Perm			Perm		Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	63.6	63.6	63.6	63.6	9.7	9.7
Effective Green, g (s)	65.6	65.6	65.6	65.6	11.4	11.4
Actuated g/C Ratio	0.77	0.77	0.77	0.77	0.13	0.13
Clearance Time (s)	6.0	6.0	6.0	6.0	5.7	5.7
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	188	2629	2731	1176	211	210
v/s Ratio Prot		c0.53	0.44		c0.07	
v/s Ratio Perm	0.26			0.05		0.01
v/c Ratio	0.33	0.68	0.57	0.06	0.53	0.10
Uniform Delay, d1	3.0	4.7	4.0	2.3	34.3	32.3
Progression Factor	1.00	1.00	0.73	1.49	1.00	1.00
Incremental Delay, d2	4.6	1.5	0.6	0.1	2.4	0.2
Delay (s)	7.6	6.2	3.5	3.5	36.6	32.5
Level of Service	A	A	A	A	D	C
Approach Delay (s)		6.2	3.5		35.5	
Approach LOS		A	A		D	

**Intersection Summary**

HCM Average Control Delay	6.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis Forecast Conditions - PM Peak Hour (2031)  
 17: Hunt Club & Lorry Greenberg 6/10/2010






















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Ideal Flow (vphpl)	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	1.00		1.00	0.90		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1703	3425		1703	3460		1805	1615		1719	1585	
Flt Permitted	0.09	1.00		0.19	1.00		0.44	1.00		0.73	1.00	
Satd. Flow (perm)	157	3425		334	3460		828	1615		1328	1585	
Volume (vph)	180	1265	51	54	1316	32	10	12	21	38	23	147
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	196	1375	55	59	1430	35	11	13	23	41	25	160
RTOR Reduction (vph)	0	2	0	0	1	0	0	19	0	0	135	0
Lane Group Flow (vph)	196	1428	0	59	1464	0	11	17	0	41	50	0
Heavy Vehicles (%)	6%	5%	0%	6%	4%	3%	0%	0%	10%	5%	0%	5%
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	61.6	61.6		46.7	46.7		10.5	10.5		10.5	10.5	
Effective Green, g (s)	63.8	63.8		48.9	48.9		13.2	13.2		13.2	13.2	
Actuated g/C Ratio	0.75	0.75		0.58	0.58		0.16	0.16		0.16	0.16	
Clearance Time (s)	6.0	6.2		6.2	6.2		6.7	6.7		6.7	6.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	316	2571		192	1991		129	251		206	246	
v/s Ratio Prot	0.08	c0.42			c0.42			0.01			c0.03	
v/s Ratio Perm	0.39			0.18			0.01			0.03		
v/c Ratio	0.62	0.56		0.31	0.74		0.09	0.07		0.20	0.20	
Uniform Delay, d1	16.0	4.5		9.3	13.3		30.7	30.6		31.3	31.3	
Progression Factor	2.09	0.98		1.10	1.20		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.8	0.7		3.3	2.0		0.3	0.1		0.5	0.4	
Delay (s)	36.4	5.1		13.6	18.0		31.0	30.8		31.8	31.7	
Level of Service	D	A		B	B		C	C		C	C	
Approach Delay (s)		8.9			17.8			30.8			31.7	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM Average Control Delay	14.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis Forecast Conditions - PM Peak Hour (2031)  
 18: Hunt Club & Pike 6/10/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.97			0.90	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (prot)	1752	3402		1805	3490			1789			1688	
Flt Permitted	0.13	1.00		0.13	1.00			0.84			0.92	
Satd. Flow (perm)	236	3402		238	3490			1550			1570	
Volume (vph)	116	1411	16	17	1375	39	9	2	3	35	1	104
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	126	1534	17	18	1495	42	10	2	3	38	1	113
RTOR Reduction (vph)	0	1	0	0	1	0	0	2	0	0	27	0
Lane Group Flow (vph)	126	1550	0	18	1536	0	0	13	0	0	125	0
Heavy Vehicles (%)	3%	6%	0%	0%	3%	3%	0%	0%	0%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	60.3	60.3		60.3	60.3			12.2			12.2	
Effective Green, g (s)	62.3	62.3		62.3	62.3			14.7			14.7	
Actuated g/C Ratio	0.73	0.73		0.73	0.73			0.17			0.17	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.5			6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	173	2493		174	2558			268			272	
v/s Ratio Prot		0.46			0.44							
v/s Ratio Perm	c0.53			0.08				0.01			c0.08	
v/c Ratio	0.73	0.62		0.10	0.60			0.05			0.46	
Uniform Delay, d1	6.5	5.6		3.3	5.4			29.3			31.6	
Progression Factor	1.74	1.72		1.00	1.00			1.00			1.00	
Incremental Delay, d2	21.4	1.1		1.2	1.1			0.1			1.2	
Delay (s)	32.7	10.6		4.5	6.5			29.4			32.8	
Level of Service	C	B		A	A			C			C	
Approach Delay (s)		12.3			6.4			29.4			32.8	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM Average Control Delay	10.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

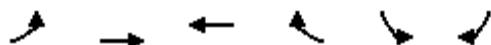
HCM Signalized Intersection Capacity Analysis Forecast Conditions - PM Peak Hour (2031)  
 19: Walkley & Ryder 6/10/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↗↘		↗	↗↘		↗	↘		↗	↘	
Ideal Flow (vphpl)	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	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.95		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1804	3424		1687	3481		1761	1744		1734	1462	
Flt Permitted	0.11	1.00		0.05	1.00		0.47	1.00		0.51	1.00	
Satd. Flow (perm)	209	3424		83	3481		873	1744		935	1462	
Volume (vph)	51	1916	150	14	1490	64	69	82	45	71	3	137
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	2083	163	15	1620	70	75	89	49	77	3	149
RTOR Reduction (vph)	0	3	0	0	2	0	0	9	0	0	30	0
Lane Group Flow (vph)	55	2243	0	15	1688	0	75	129	0	77	122	0
Confl. Peds. (#/hr)	3		23	23		3	6		1	1		6
Confl. Bikes (#/hr)			5			6			10			12
Heavy Vehicles (%)	0%	4%	2%	7%	3%	2%	2%	0%	6%	4%	0%	7%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	84.0	84.0		84.0	84.0		14.2	14.2		14.2	14.2	
Effective Green, g (s)	85.8	85.8		85.8	85.8		16.2	16.2		16.2	16.2	
Actuated g/C Ratio	0.78	0.78		0.78	0.78		0.15	0.15		0.15	0.15	
Clearance Time (s)	5.8	5.8		5.8	5.8		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	163	2671		65	2715		129	257		138	215	
v/s Ratio Prot		c0.66			0.49			0.07			0.08	
v/s Ratio Perm	0.26			0.18			c0.09			0.08		
v/c Ratio	0.34	0.84		0.23	0.62		0.58	0.50		0.56	0.57	
Uniform Delay, d1	3.6	7.7		3.2	5.2		43.7	43.2		43.6	43.6	
Progression Factor	1.18	1.25		1.08	1.33		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.6	2.8		6.4	0.9		6.5	1.5		4.8	3.4	
Delay (s)	8.8	12.4		9.9	7.7		50.3	44.7		48.4	47.1	
Level of Service	A	B		A	A		D	D		D	D	
Approach Delay (s)		12.3			7.7			46.7			47.5	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM Average Control Delay	14.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	88.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	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	
Lane Util. Factor		0.95	0.95	0.88	0.97	
Frbp, ped/bikes		1.00	1.00	0.98	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	
Frt		1.00	1.00	0.85	1.00	
Flt Protected		1.00	1.00	1.00	0.95	
Satd. Flow (prot)		3471	3539	2724	3362	
Flt Permitted		1.00	1.00	1.00	0.95	
Satd. Flow (perm)		3471	3539	2724	3362	
Volume (vph)	0	1114	819	700	757	13
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1211	890	761	823	14
RTOR Reduction (vph)	0	0	0	0	1	0
Lane Group Flow (vph)	0	1211	890	761	836	0
Confl. Peds. (#/hr)					7	2
Confl. Bikes (#/hr)				7		
Heavy Vehicles (%)	0%	4%	2%	2%	4%	15%
Turn Type				Free		
Protected Phases		2	6		4	
Permitted Phases				Free		
Actuated Green, G (s)		55.0	55.0	110.0	47.0	
Effective Green, g (s)		55.0	55.0	110.0	47.0	
Actuated g/C Ratio		0.50	0.50	1.00	0.43	
Clearance Time (s)		4.0	4.0		4.0	
Lane Grp Cap (vph)		1736	1770	2724	1436	
v/s Ratio Prot		c0.35	0.25		c0.25	
v/s Ratio Perm				0.28		
v/c Ratio		0.70	0.50	0.28	0.58	
Uniform Delay, d1		21.1	18.4	0.0	24.0	
Progression Factor		1.00	1.01	1.00	1.00	
Incremental Delay, d2		2.4	0.8	0.2	1.7	
Delay (s)		23.5	19.3	0.2	25.7	
Level of Service		C	B	A	C	
Approach Delay (s)		23.5	10.5		25.7	
Approach LOS		C	B		C	
<b>Intersection Summary</b>						
HCM Average Control Delay			18.2		HCM Level of Service	B
HCM Volume to Capacity ratio			0.64			
Actuated Cycle Length (s)			110.0		Sum of lost time (s)	8.0
Intersection Capacity Utilization			59.5%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						



HCM Signalized Intersection Capacity Analysis Forecast Conditions - PM Peak Hour (2031)  
 21: E-W Collector (S of Rail Corridor) & Conroy 6/10/2010



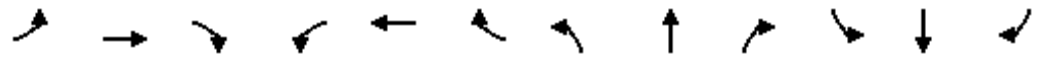
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1770	3539	3539	1583
Flt Permitted	0.95	1.00	0.06	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	106	3539	3539	1583
Volume (vph)	603	56	12	883	2011	128
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	655	61	13	960	2186	139
RTOR Reduction (vph)	0	4	0	0	0	58
Lane Group Flow (vph)	655	57	13	960	2186	81
Turn Type		Perm	Perm			Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	42.0	42.0	70.0	70.0	70.0	70.0
Effective Green, g (s)	42.0	42.0	70.0	70.0	70.0	70.0
Actuated g/C Ratio	0.35	0.35	0.58	0.58	0.58	0.58
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	620	554	62	2064	2064	923
v/s Ratio Prot	c0.37			0.27	c0.62	
v/s Ratio Perm		0.04	0.12			0.05
v/c Ratio	1.06	0.10	0.21	0.47	1.06	0.09
Uniform Delay, d1	39.0	26.3	11.9	14.3	25.0	11.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	52.0	0.4	7.5	0.8	37.6	0.2
Delay (s)	91.0	26.7	19.4	15.1	62.6	11.2
Level of Service	F	C	B	B	E	B
Approach Delay (s)	85.5			15.1	59.6	
Approach LOS	F			B	E	

Intersection Summary

HCM Average Control Delay	53.4	HCM Level of Service	D
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	120.0	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

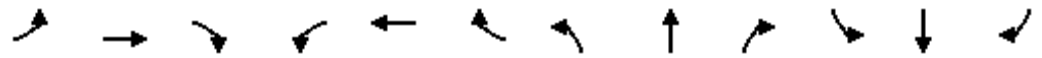
HCM Signalized Intersection Capacity Analysis Forecast Conditions - AM Peak Hour (2031) UPRG  
 2: Lorry Greenberg & Conroy 6/14/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↕	↗	↖	↕	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	2.4	3.6	3.6	2.4
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.94		1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1578		1703	1541		1719	3539	1359	1719	3312	1320
Flt Permitted	0.17	1.00		0.72	1.00		0.48	1.00	1.00	0.06	1.00	1.00
Satd. Flow (perm)	324	1578		1288	1541		866	3539	1359	110	3312	1320
Volume (vph)	192	32	22	66	39	210	39	1380	62	94	441	79
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	209	35	24	72	42	228	42	1500	67	102	479	86
RTOR Reduction (vph)	0	16	0	0	126	0	0	0	3	0	0	12
Lane Group Flow (vph)	209	43	0	72	144	0	42	1500	64	102	479	74
Heavy Vehicles (%)	2%	22%	0%	6%	33%	3%	5%	2%	3%	5%	9%	6%
Turn Type	pm+pt			Perm			Perm		Perm	pm+pt		Perm
Protected Phases	7	4			8			2		1		6
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	34.7	34.7		16.1	16.1		60.0	60.0	60.0	72.5	72.5	72.5
Effective Green, g (s)	37.6	37.6		19.0	19.0		61.9	61.9	61.9	74.4	74.4	74.4
Actuated g/C Ratio	0.31	0.31		0.16	0.16		0.52	0.52	0.52	0.62	0.62	0.62
Clearance Time (s)	4.0	6.9		6.9	6.9		5.9	5.9	5.9	4.0	5.9	5.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	277	494		204	244		447	1826	701	182	2053	818
v/s Ratio Prot	c0.09	0.03			0.09			c0.42		c0.04		0.14
v/s Ratio Perm	c0.14			0.06			0.05		0.05	0.31		0.06
v/c Ratio	0.75	0.09		0.35	0.59		0.09	0.82	0.09	0.56	0.23	0.09
Uniform Delay, d1	33.6	29.1		45.0	46.9		14.8	24.4	14.8	21.3	10.1	9.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.1	0.1		1.1	3.6		0.4	4.3	0.3	3.9	0.3	0.2
Delay (s)	44.7	29.2		46.1	50.5		15.2	28.7	15.0	25.2	10.4	9.4
Level of Service	D	C		D	D		B	C	B	C	B	A
Approach Delay (s)		41.3			49.6			27.8			12.5	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM Average Control Delay	28.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis Forecast Conditions - AM Peak Hour (2031) UPRG  
 4: Thurston & Conroy 6/14/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↕	↗	↖	↕	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	2.4
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.86		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1635		1736	1482		1805	3539	1583	1787	3374	1308
Flt Permitted	0.74	1.00		0.75	1.00		0.18	1.00	1.00	0.06	1.00	1.00
Satd. Flow (perm)	1408	1635		1367	1482		341	3539	1583	116	3374	1308
Volume (vph)	43	1	12	49	0	23	59	1952	384	72	1251	256
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	1	13	53	0	25	64	2122	417	78	1360	278
RTOR Reduction (vph)	0	12	0	0	6	0	0	0	0	0	0	9
Lane Group Flow (vph)	47	2	0	53	19	0	64	2122	417	78	1360	269
Heavy Vehicles (%)	0%	0%	0%	4%	0%	9%	0%	2%	2%	1%	7%	7%
Turn Type	Perm			Perm			Perm		Free	Perm		Perm
Protected Phases		4			8			2				6
Permitted Phases	4			8			2		Free	6		6
Actuated Green, G (s)	7.8	7.8		7.8	7.8		79.4	79.4	100.0	79.4	79.4	79.4
Effective Green, g (s)	10.7	10.7		10.7	10.7		81.3	81.3	100.0	81.3	81.3	81.3
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.81	0.81	1.00	0.81	0.81	0.81
Clearance Time (s)	6.9	6.9		6.9	6.9		5.9	5.9		5.9	5.9	5.9
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)	151	175		146	159		277	2877	1583	94	2743	1063
v/s Ratio Prot		0.00			0.01			0.60				0.40
v/s Ratio Perm	0.03			c0.04			0.19		0.26	c0.67		0.21
v/c Ratio	0.31	0.01		0.36	0.12		0.23	0.74	0.26	0.83	0.50	0.25
Uniform Delay, d1	41.2	39.9		41.5	40.4		2.2	4.4	0.0	5.4	2.9	2.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.65	0.98	1.12
Incremental Delay, d2	1.2	0.0		1.5	0.3		1.9	1.7	0.4	49.6	0.6	0.5
Delay (s)	42.4	40.0		43.0	40.7		4.1	6.1	0.4	58.5	3.4	3.0
Level of Service	D	D		D	D		A	A	A	E	A	A
Approach Delay (s)		41.9			42.3			5.1			5.9	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM Average Control Delay	6.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis Forecast Conditions - AM Peak Hour (2031) UPRG  
 8: Walkley & Albion N 6/14/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗↗	↖	↖	↗↗		↖	↖		↖	↖	
Ideal Flow (vphpl)	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	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.87		1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	3438	1495	1703	3459		1530	1419		1805	1758	
Flt Permitted	0.38	1.00	1.00	0.43	1.00		0.73	1.00		0.59	1.00	
Satd. Flow (perm)	715	3438	1495	769	3459		1173	1419		1125	1758	
Volume (vph)	20	523	573	446	604	20	182	20	111	20	20	20
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	568	623	485	657	22	198	22	121	22	22	22
RTOR Reduction (vph)	0	0	0	0	2	0	0	95	0	0	17	0
Lane Group Flow (vph)	22	568	623	485	677	0	198	48	0	22	27	0
Heavy Vehicles (%)	0%	5%	8%	6%	4%	0%	18%	0%	20%	0%	0%	0%
Turn Type	Perm		Free	Perm			Perm			Perm		Perm
Protected Phases		2			6			8			4	
Permitted Phases	2		Free	6			8			4		
Actuated Green, G (s)	61.0	61.0	90.0	61.0	61.0		17.6	17.6		17.6	17.6	
Effective Green, g (s)	62.9	62.9	90.0	62.9	62.9		19.1	19.1		19.1	19.1	
Actuated g/C Ratio	0.70	0.70	1.00	0.70	0.70		0.21	0.21		0.21	0.21	
Clearance Time (s)	5.9	5.9		5.9	5.9		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	500	2403	1495	537	2417		249	301		239	373	
v/s Ratio Prot		0.17			0.20			0.03			0.02	
v/s Ratio Perm	0.03		0.42	c0.63			c0.17			0.02		
v/c Ratio	0.04	0.24	0.42	0.90	0.28		0.80	0.16		0.09	0.07	
Uniform Delay, d1	4.2	4.9	0.0	11.1	5.1		33.6	28.9		28.5	28.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.2	0.9	21.1	0.3		15.9	0.2		0.2	0.1	
Delay (s)	4.4	5.1	0.9	32.1	5.4		49.5	29.1		28.7	28.4	
Level of Service	A	A	A	C	A		D	C		C	C	
Approach Delay (s)		2.9			16.5			41.0			28.5	
Approach LOS		A			B			D			C	

**Intersection Summary**

HCM Average Control Delay	13.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis Forecast Conditions - AM Peak Hour (2031) UPRG  
 9: Johnston & Albion 6/14/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷		↶	↷		↶	↷	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	1.00		1.00	0.96		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1556	1794		1752	1840		1770	1785		1805	1374	
Flt Permitted	0.36	1.00		0.63	1.00		0.69	1.00		0.22	1.00	
Satd. Flow (perm)	588	1794		1153	1840		1286	1785		422	1374	
Volume (vph)	248	159	36	104	494	11	127	295	123	3	47	48
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	270	173	39	113	537	12	138	321	134	3	51	52
RTOR Reduction (vph)	0	13	0	0	1	0	0	25	0	0	36	0
Lane Group Flow (vph)	270	199	0	113	548	0	138	430	0	3	67	0
Heavy Vehicles (%)	16%	3%	3%	3%	3%	0%	2%	0%	6%	0%	0%	55%
Turn Type	Perm		Perm		Perm		Perm		Perm		Perm	
Protected Phases	4		8		8		2		2		6	
Permitted Phases	4		8		8		2		2		6	
Actuated Green, G (s)	34.0	34.0		34.0	34.0		18.0	18.0		18.0	18.0	
Effective Green, g (s)	34.0	34.0		34.0	34.0		18.0	18.0		18.0	18.0	
Actuated g/C Ratio	0.57	0.57		0.57	0.57		0.30	0.30		0.30	0.30	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	333	1017		653	1043		386	536		127	412	
v/s Ratio Prot		0.11			0.30			c0.24			0.05	
v/s Ratio Perm	c0.46			0.10			0.11			0.01		
v/c Ratio	0.81	0.20		0.17	0.53		0.36	0.80		0.02	0.16	
Uniform Delay, d1	10.4	6.3		6.2	8.0		16.5	19.4		14.8	15.4	
Progression Factor	1.66	0.53		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.4	0.3		0.6	1.9		2.6	12.0		0.3	0.8	
Delay (s)	30.7	3.7		6.8	9.9		19.0	31.3		15.1	16.3	
Level of Service	C	A		A	A		B	C		B	B	
Approach Delay (s)		18.8			9.4			28.5			16.3	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM Average Control Delay	18.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	60.0	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 Forecast Conditions - AM Peak Hour (2031) UPRG  
 11: Walkley & Bank  
 6/14/2010



























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↕	↗	↖↗	↕	↗	↖	↕	↗	↖↗	↕	↗
Ideal Flow (vphpl)	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	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.91	1.00	0.97	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)	3400	3438	1538	3242	3406	1509	1719	4988	1553	3335	3343	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3400	3438	1538	3242	3406	1509	1719	4988	1553	3335	3343	1553
Volume (vph)	416	636	122	112	431	315	149	1485	205	388	962	192
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	452	691	133	122	468	342	162	1614	223	422	1046	209
RTOR Reduction (vph)	0	0	95	0	0	177	0	0	118	0	0	125
Lane Group Flow (vph)	452	691	38	122	468	165	162	1614	105	422	1046	84
Heavy Vehicles (%)	3%	5%	5%	8%	6%	7%	5%	4%	4%	5%	8%	4%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	15.7	29.4	29.4	6.7	20.4	20.4	12.4	44.2	44.2	14.6	46.4	46.4
Effective Green, g (s)	18.0	31.7	31.7	9.0	22.7	22.7	14.8	46.3	46.3	17.0	48.5	48.5
Actuated g/C Ratio	0.15	0.26	0.26	0.08	0.19	0.19	0.12	0.39	0.39	0.14	0.40	0.40
Clearance Time (s)	6.3	6.3	6.3	6.3	6.3	6.3	6.4	6.1	6.1	6.4	6.1	6.1
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)	510	908	406	243	644	285	212	1925	599	472	1351	628
v/s Ratio Prot	c0.13	c0.20		0.04	0.14		0.09	c0.32		c0.13	0.31	
v/s Ratio Perm			0.02			0.11			0.07			0.05
v/c Ratio	0.89	0.76	0.09	0.50	0.73	0.58	0.76	0.84	0.18	0.89	0.77	0.13
Uniform Delay, d1	50.0	40.7	33.3	53.3	45.7	44.3	50.9	33.5	24.3	50.6	31.0	22.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.19	0.82	1.20	1.00	1.00	1.00
Incremental Delay, d2	16.7	3.8	0.1	1.6	4.1	2.9	5.5	1.6	0.2	19.0	4.4	0.4
Delay (s)	66.7	44.5	33.4	55.0	49.8	47.2	65.9	29.0	29.3	69.6	35.4	23.0
Level of Service	E	D	C	D	D	D	E	C	C	E	D	C
Approach Delay (s)		51.2			49.5			32.0			42.4	
Approach LOS		D			D			C			D	

Intersection Summary		
HCM Average Control Delay	41.9	HCM Level of Service D
HCM Volume to Capacity ratio	0.82	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 12.0
Intersection Capacity Utilization	76.9%	ICU Level of Service D
Analysis Period (min)	15	


































c Critical Lane Group

HCM Signalized Intersection Capacity Analysis Forecast Conditions - AM Peak Hour (2031) UPRG  
 12: Johnston & Bank 6/14/2010

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1787	1863	1538	1626	1863	1568	1787	3471	1380	1656	3343	1583	
Flt Permitted	0.46	1.00	1.00	0.72	1.00	1.00	0.46	1.00	1.00	0.07	1.00	1.00	
Satd. Flow (perm)	864	1863	1538	1224	1863	1568	866	3471	1380	114	3343	1583	
Volume (vph)	95	59	21	66	144	535	224	1374	59	413	477	63	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	103	64	23	72	157	582	243	1493	64	449	518	68	
RTOR Reduction (vph)	0	0	19	0	0	5	0	0	16	0	0	24	
Lane Group Flow (vph)	103	64	4	72	157	577	243	1493	48	449	518	44	
Heavy Vehicles (%)	1%	2%	5%	11%	2%	3%	1%	4%	17%	9%	8%	2%	
Turn Type	Perm		Perm	Perm		pm+ov	pm+pt		Perm	pm+pt		Perm	
Protected Phases		4			8	1	5	2		1		6	
Permitted Phases	4		4	8		8	2		2	6		6	
Actuated Green, G (s)	16.9	16.9	16.9	16.9	16.9	47.3	65.1	55.8	55.8	91.7	76.9	76.9	
Effective Green, g (s)	18.8	18.8	18.8	18.8	18.8	50.7	68.1	57.3	57.3	93.2	78.4	78.4	
Actuated g/C Ratio	0.16	0.16	0.16	0.16	0.16	0.42	0.57	0.48	0.48	0.78	0.65	0.65	
Clearance Time (s)	5.9	5.9	5.9	5.9	5.9	5.5	5.5	5.5	5.5	5.5	5.5	5.5	
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	292	241	192	292	715	574	1657	659	498	2184	1034	
v/s Ratio Prot		0.03			0.08	c0.21	0.04	0.43		c0.24	0.15		
v/s Ratio Perm	0.12		0.00	0.06		0.15	0.20		0.03	c0.46		0.03	
v/c Ratio	0.76	0.22	0.01	0.38	0.54	0.81	0.42	0.90	0.07	0.90	0.24	0.04	
Uniform Delay, d1	48.5	44.2	42.8	45.3	46.6	30.4	13.0	28.7	17.0	36.2	8.5	7.4	
Progression Factor	1.00	1.00	1.00	1.15	1.14	0.98	0.57	0.73	0.67	0.34	1.14	1.98	
Incremental Delay, d2	22.2	0.4	0.0	1.1	1.8	6.2	0.4	7.3	0.2	14.7	0.2	0.1	
Delay (s)	70.6	44.6	42.8	53.1	54.8	36.1	7.8	28.2	11.5	26.9	9.9	14.7	
Level of Service	E	D	D	D	D	D	A	C	B	C	A	B	
Approach Delay (s)		58.5			41.2			24.9			17.6		
Approach LOS		E			D			C			B		
<b>Intersection Summary</b>													
HCM Average Control Delay	28.0		HCM Level of Service					C					
HCM Volume to Capacity ratio	0.86												
Actuated Cycle Length (s)	120.0				Sum of lost time (s)				4.0				
Intersection Capacity Utilization	90.9%				ICU Level of Service				E				
Analysis Period (min)	15												

c Critical Lane Group

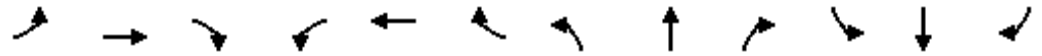
HCM Signalized Intersection Capacity Analysis Forecast Conditions - AM Peak Hour (2031) UPRG  
 14: Hunt Club & Bank  
 6/14/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  			  		 	 		 	 	
Ideal Flow (vphpl)	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	0.97	0.91	1.00	1.00	0.91	1.00	0.97	0.95	1.00	0.97	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)	3273	4715	1509	1597	4715	1524	3335	3471	1524	3213	3282	1417
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)	3273	4715	1509	1597	4715	1524	3335	3471	1524	3213	3282	1417
Volume (vph)	192	1337	287	45	1126	183	386	1172	36	70	376	99
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	209	1453	312	49	1224	199	420	1274	39	76	409	108
RTOR Reduction (vph)	0	0	201	0	0	58	0	0	12	0	0	78
Lane Group Flow (vph)	209	1453	111	49	1224	141	420	1274	27	76	409	30
Heavy Vehicles (%)	7%	10%	7%	13%	10%	6%	5%	4%	6%	9%	10%	14%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	8.6	40.0	40.0	4.5	35.9	35.9	18.3	47.1	47.1	2.4	31.2	31.2
Effective Green, g (s)	11.0	42.6	42.6	6.9	38.5	38.5	20.8	49.6	49.6	4.9	33.7	33.7
Actuated g/C Ratio	0.09	0.36	0.36	0.06	0.32	0.32	0.17	0.41	0.41	0.04	0.28	0.28
Clearance Time (s)	6.4	6.6	6.6	6.4	6.6	6.6	6.5	6.5	6.5	6.5	6.5	6.5
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)	300	1674	536	92	1513	489	578	1435	630	131	922	398
v/s Ratio Prot	c0.06	c0.31		0.03	0.26		c0.13	c0.37		0.02	0.12	
v/s Ratio Perm			0.07			0.09			0.02			0.02
v/c Ratio	0.70	0.87	0.21	0.53	0.81	0.29	0.73	0.89	0.04	0.58	0.44	0.08
Uniform Delay, d1	52.9	36.1	26.9	55.0	37.4	30.5	46.9	32.6	21.0	56.5	35.4	31.7
Progression Factor	1.00	1.00	1.00	0.92	0.81	0.84	1.00	1.00	1.00	0.67	1.16	3.25
Incremental Delay, d2	6.9	5.1	0.2	4.2	2.4	0.2	4.5	8.5	0.1	6.3	1.5	0.4
Delay (s)	59.8	41.1	27.1	55.0	32.6	25.7	51.4	41.1	21.1	44.3	42.6	103.3
Level of Service	E	D	C	E	C	C	D	D	C	D	D	F
Approach Delay (s)		40.9			32.4			43.2			53.9	
Approach LOS		D			C			D			D	
<b>Intersection Summary</b>												
HCM Average Control Delay			40.7	HCM Level of Service				D				
HCM Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			120.0	Sum of lost time (s)				12.0				
Intersection Capacity Utilization			79.6%	ICU Level of Service				D				
Analysis Period (min)			15									

c Critical Lane Group



HCM Signalized Intersection Capacity Analysis Forecast Conditions - AM Peak Hour (2031) UPRG  
 15: Hunt Club & Albion 6/14/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗	↘	↗		↘	↗	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1656	3406	1538	1719	3374	1568	1467	1627		1752	1551	
Flt Permitted	0.07	1.00	1.00	0.22	1.00	1.00	0.25	1.00		0.21	1.00	
Satd. Flow (perm)	120	3406	1538	401	3374	1568	392	1627		384	1551	
Volume (vph)	372	1120	22	188	1281	31	13	76	159	35	78	141
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	404	1217	24	204	1392	34	14	83	173	38	85	153
RTOR Reduction (vph)	0	0	0	0	0	0	0	65	0	0	56	0
Lane Group Flow (vph)	404	1217	24	204	1392	34	14	191	0	38	182	0
Heavy Vehicles (%)	9%	6%	5%	5%	7%	3%	23%	7%	4%	3%	3%	15%
Turn Type	pm+pt		Free	pm+pt		Free	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		Free	6		Free	8			4		
Actuated Green, G (s)	91.1	75.7	120.0	68.4	58.4	120.0	17.2	17.2		17.2	17.2	
Effective Green, g (s)	92.6	77.2	120.0	71.3	59.9	120.0	19.4	19.4		19.4	19.4	
Actuated g/C Ratio	0.77	0.64	1.00	0.59	0.50	1.00	0.16	0.16		0.16	0.16	
Clearance Time (s)	5.4	5.5		5.4	5.5		6.2	6.2		6.2	6.2	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	460	2191	1538	363	1684	1568	63	263		62	251	
v/s Ratio Prot	c0.21	0.36		0.05	0.41			0.12			c0.12	
v/s Ratio Perm	c0.47		0.02	0.28		0.02	0.04			0.10		
v/c Ratio	0.88	0.56	0.02	0.56	0.83	0.02	0.22	0.72		0.61	0.72	
Uniform Delay, d1	35.7	11.9	0.0	11.3	25.6	0.0	43.7	47.8		46.8	47.8	
Progression Factor	0.28	2.24	1.00	1.32	0.63	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.9	0.6	0.0	1.7	4.2	0.0	1.8	9.5		16.6	9.9	
Delay (s)	21.0	27.2	0.0	16.6	20.3	0.0	45.5	57.3		63.4	57.7	
Level of Service	C	C	A	B	C	A	D	E		E	E	
Approach Delay (s)		25.3			19.4			56.7			58.5	
Approach LOS		C			B			E			E	

Intersection Summary			
HCM Average Control Delay	27.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	91.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis Forecast Conditions - AM Peak Hour (2031) UPRG  
 21: E-W Collector (S of Rail Corridor) & Conroy 6/14/2010



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	0.40	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	737	3539	3539	1583
Volume (vph)	106	10	61	1739	581	653
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	115	11	66	1890	632	710
RTOR Reduction (vph)	0	8	0	0	0	284
Lane Group Flow (vph)	115	3	66	1890	632	426
Turn Type		Perm	Perm			Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	16.0	16.0	36.0	36.0	36.0	36.0
Effective Green, g (s)	16.0	16.0	36.0	36.0	36.0	36.0
Actuated g/C Ratio	0.27	0.27	0.60	0.60	0.60	0.60
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	472	422	442	2123	2123	950
v/s Ratio Prot	c0.06			c0.53	0.18	
v/s Ratio Perm		0.00	0.09			0.27
v/c Ratio	0.24	0.01	0.15	0.89	0.30	0.45
Uniform Delay, d1	17.3	16.2	5.3	10.3	5.8	6.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	0.0	0.7	6.1	0.4	1.5
Delay (s)	18.5	16.2	6.0	16.4	6.2	8.1
Level of Service	B	B	A	B	A	A
Approach Delay (s)	18.3			16.1	7.2	
Approach LOS	B			B	A	

**Intersection Summary**

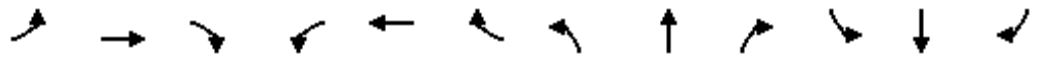
HCM Average Control Delay	12.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis Conditions - PM Peak Hour (2031) UPGRADES  
 1: Hunt Club & Conroy 6/14/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	2.4	3.6	3.6	3.6
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	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Flt	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)	3433	3406	1524	3400	3505	1615	1530	3505	1284	1736	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.10	1.00	1.00	0.55	1.00	1.00
Satd. Flow (perm)	3433	3406	1524	3400	3505	1615	156	3505	1284	1011	3539	1583
Volume (vph)	248	1277	51	148	832	14	50	302	92	72	895	444
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	270	1388	55	161	904	15	54	328	100	78	973	483
RTOR Reduction (vph)	0	0	24	0	0	9	0	0	26	0	0	0
Lane Group Flow (vph)	270	1388	31	161	904	6	54	328	74	78	973	483
Heavy Vehicles (%)	2%	6%	6%	3%	3%	0%	18%	3%	9%	4%	2%	2%
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	Perm		Free
Protected Phases	5	2		1	6		3	8			4	
Permitted Phases			2			6	8		8	4		Free
Actuated Green, G (s)	12.1	52.4	52.4	6.4	46.7	46.7	41.8	41.8	41.8	34.6	34.6	120.0
Effective Green, g (s)	14.7	54.6	54.6	9.0	48.9	48.9	44.4	44.4	44.4	37.2	37.2	120.0
Actuated g/C Ratio	0.12	0.46	0.46	0.08	0.41	0.41	0.37	0.37	0.37	0.31	0.31	1.00
Clearance Time (s)	6.6	6.2	6.2	6.6	6.2	6.2	4.0	6.6	6.6	6.6	6.6	
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)	421	1550	693	255	1428	658	94	1297	475	313	1097	1583
v/s Ratio Prot	0.08	c0.41		0.05	c0.26		0.02	0.09			c0.27	
v/s Ratio Perm			0.02			0.00	0.20		0.06	0.08		c0.31
v/c Ratio	0.64	0.90	0.04	0.63	0.63	0.01	0.57	0.25	0.15	0.25	0.89	0.31
Uniform Delay, d1	50.1	30.1	18.2	53.9	28.4	21.1	29.5	26.3	25.3	31.0	39.4	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.3	8.4	0.1	5.0	2.1	0.0	8.2	0.1	0.2	0.4	8.9	0.5
Delay (s)	53.5	38.5	18.3	58.9	30.5	21.2	37.8	26.4	25.4	31.4	48.3	0.5
Level of Service	D	D	B	E	C	C	D	C	C	C	D	A
Approach Delay (s)		40.2			34.6			27.5			32.4	
Approach LOS		D			C			C			C	
<b>Intersection Summary</b>												
HCM Average Control Delay			35.2									HCM Level of Service D
HCM Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			120.0									Sum of lost time (s) 8.0
Intersection Capacity Utilization			83.7%									ICU Level of Service E
Analysis Period (min)			15									
c Critical Lane Group												

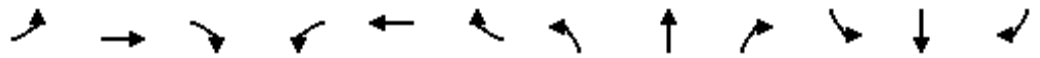
HCM Signalized Intersection Capacity Analysis Conditions - PM Peak Hour (2031) UPGRADES  
 4: Thurston & Conroy 6/14/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↑↑	↗	↖	↑↑↑	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	2.4
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.91	1.00
Frt	1.00	0.85		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1615		1787	1568		1805	3471	1568	1719	5085	1400
Flt Permitted	0.71	1.00		0.62	1.00		0.06	1.00	1.00	0.08	1.00	1.00
Satd. Flow (perm)	1350	1615		1170	1568		114	3471	1568	153	5085	1400
Volume (vph)	235	0	52	353	0	65	12	1339	128	19	2160	50
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	255	0	57	384	0	71	13	1455	139	21	2348	54
RTOR Reduction (vph)	0	34	0	0	19	0	0	0	62	0	0	3
Lane Group Flow (vph)	255	23	0	384	52	0	13	1455	77	21	2348	51
Heavy Vehicles (%)	0%	0%	0%	1%	0%	3%	0%	4%	3%	5%	2%	0%
Turn Type	Perm			pm+pt			Perm		Perm	Perm		Perm
Protected Phases		4		3	8			2				6
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	22.5	22.5		42.5	42.5		64.7	64.7	64.7	64.7	64.7	64.7
Effective Green, g (s)	25.4	25.4		45.4	45.4		66.6	66.6	66.6	66.6	66.6	66.6
Actuated g/C Ratio	0.21	0.21		0.38	0.38		0.55	0.55	0.55	0.55	0.55	0.55
Clearance Time (s)	6.9	6.9		4.0	6.9		5.9	5.9	5.9	5.9	5.9	5.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	286	342		525	593		63	1926	870	85	2822	777
v/s Ratio Prot		0.01		c0.10	0.03			0.42			c0.46	
v/s Ratio Perm	c0.19			0.18			0.11		0.05	0.14		0.04
v/c Ratio	0.89	0.07		0.73	0.09		0.21	0.76	0.09	0.25	0.83	0.07
Uniform Delay, d1	46.0	37.8		30.5	24.0		13.4	20.5	12.5	13.8	22.1	12.3
Progression Factor	1.00	1.00		1.00	1.00		0.71	0.80	0.49	1.00	1.00	1.00
Incremental Delay, d2	27.3	0.1		5.2	0.1		5.4	2.1	0.1	6.8	3.0	0.2
Delay (s)	73.3	37.9		35.7	24.1		14.9	18.4	6.3	20.6	25.1	12.5
Level of Service	E	D		D	C		B	B	A	C	C	B
Approach Delay (s)		66.8			33.9			17.3			24.8	
Approach LOS		E			C			B			C	

Intersection Summary			
HCM Average Control Delay	25.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis Conditions - PM Peak Hour (2031) UPGRADES  
 8: Walkley & Albion N 6/14/2010

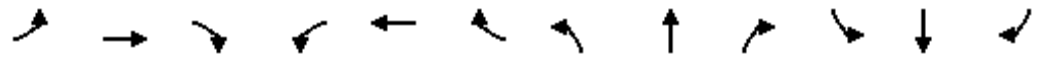


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑		↘	↗	↗	↘	↗	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.95	0.95	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3539	1495	1770	3529		1649	1663	1553	1805	1758	
Flt Permitted	0.17	1.00	1.00	0.29	1.00		0.95	0.54	1.00	0.56	1.00	
Satd. Flow (perm)	331	3539	1495	534	3529		1649	946	1553	1056	1758	
Volume (vph)	20	672	210	193	893	20	556	20	431	20	20	20
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	730	228	210	971	22	604	22	468	22	22	22
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	79	0	19	0
Lane Group Flow (vph)	22	730	228	210	991	0	302	324	389	22	25	0
Heavy Vehicles (%)	0%	2%	8%	2%	2%	0%	4%	0%	4%	0%	0%	0%
Turn Type	Perm		Free	Perm			Prot		Perm	Perm		
Protected Phases		2			6		3	8				4
Permitted Phases	2		Free	6					8	4		
Actuated Green, G (s)	43.9	43.9	100.0	43.9	43.9		29.0	44.7	44.7	11.7	11.7	
Effective Green, g (s)	45.8	45.8	100.0	45.8	45.8		29.0	46.2	46.2	13.2	13.2	
Actuated g/C Ratio	0.46	0.46	1.00	0.46	0.46		0.29	0.46	0.46	0.13	0.13	
Clearance Time (s)	5.9	5.9		5.9	5.9		4.0	5.5	5.5	5.5	5.5	
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)	152	1621	1495	245	1616		478	645	717	139	232	
v/s Ratio Prot		0.21			0.28		c0.18	0.15			0.01	
v/s Ratio Perm	0.07		0.15	c0.39				0.09	c0.25	0.02		
v/c Ratio	0.14	0.45	0.15	0.86	0.61		0.63	0.50	0.54	0.16	0.11	
Uniform Delay, d1	15.7	18.5	0.0	24.2	20.4		30.9	18.8	19.3	38.5	38.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.0	0.9	0.2	30.0	1.8		2.7	0.6	0.8	0.5	0.2	
Delay (s)	17.7	19.4	0.2	54.2	22.2		33.6	19.5	20.2	39.0	38.4	
Level of Service	B	B	A	D	C		C	B	C	D	D	
Approach Delay (s)		14.9			27.8			23.7			38.6	
Approach LOS		B			C			C			D	

Intersection Summary		
HCM Average Control Delay	22.9	HCM Level of Service C
HCM Volume to Capacity ratio	0.72	
Actuated Cycle Length (s)	100.0	Sum of lost time (s) 8.0
Intersection Capacity Utilization	66.2%	ICU Level of Service C
Analysis Period (min)	15	

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis Conditions - PM Peak Hour (2031) UPGRADES  
 9: Johnston & Albion 6/14/2010



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.96		1.00	0.90		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1421	1834		1787	1806		1736	1694		1805	1728	
Flt Permitted	0.42	1.00		0.21	1.00		0.24	1.00		0.63	1.00	
Satd. Flow (perm)	631	1834		391	1806		442	1694		1196	1728	
Volume (vph)	56	490	106	36	278	110	49	60	129	13	268	232
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	61	533	115	39	302	120	53	65	140	14	291	252
RTOR Reduction (vph)	0	17	0	0	32	0	0	87	0	0	69	0
Lane Group Flow (vph)	61	631	0	39	390	0	53	118	0	14	474	0
Heavy Vehicles (%)	27%	1%	0%	1%	1%	0%	4%	0%	1%	0%	0%	5%
Turn Type	Perm		Perm		Perm		Perm		Perm		Perm	
Protected Phases	4		8		8		2		2		6	
Permitted Phases	4		8		8		2		2		6	
Actuated Green, G (s)	20.0	20.0		20.0	20.0		17.0	17.0		17.0	17.0	
Effective Green, g (s)	20.0	20.0		20.0	20.0		17.0	17.0		17.0	17.0	
Actuated g/C Ratio	0.44	0.44		0.44	0.44		0.38	0.38		0.38	0.38	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	280	815		174	803		167	640		452	653	
v/s Ratio Prot	c0.34				0.22		0.07				c0.27	
v/s Ratio Perm	0.10		0.10		0.12		0.12		0.01		0.01	
v/c Ratio	0.22	0.77		0.22	0.49		0.32	0.18		0.03	0.73	
Uniform Delay, d1	7.7	10.6		7.7	8.9		9.9	9.4		8.8	12.0	
Progression Factor	1.07	1.34		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	5.1		3.0	2.1		4.9	0.6		0.1	6.9	
Delay (s)	9.5	19.3		10.7	11.0		14.8	10.0		8.9	18.9	
Level of Service	A	B		B	B		B	A		A	B	
Approach Delay (s)	18.4				10.9		11.0				18.7	
Approach LOS	B				B		B				B	

Intersection Summary			
HCM Average Control Delay	15.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis Conditions - PM Peak Hour (2031) UPGRADES  
 10: Cahill & Albion 6/14/2010

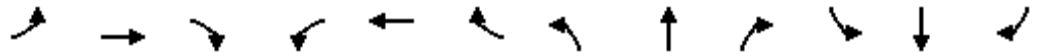


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Sign Control		Stop			Stop		Stop	Stop		Stop	Stop	
Volume (vph)	17	107	104	49	66	37	55	183	59	71	429	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	116	113	53	72	40	60	199	64	77	466	11

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	248	165	60	263	77	477
Volume Left (vph)	18	53	60	0	77	0
Volume Right (vph)	113	40	0	64	0	11
Hadj (s)	-0.26	-0.03	0.50	-0.05	0.55	0.00
Departure Headway (s)	6.6	7.1	7.5	6.9	7.2	6.6
Degree Utilization, x	0.46	0.33	0.12	0.51	0.15	0.87
Capacity (veh/h)	498	462	454	479	485	536
Control Delay (s)	15.1	13.5	10.4	15.7	10.3	38.4
Approach Delay (s)	15.1	13.5	14.7		34.5	
Approach LOS	C	B	B		D	

Intersection Summary	
Delay	23.1
HCM Level of Service	C
Intersection Capacity Utilization	58.9%
ICU Level of Service	B
Analysis Period (min)	15

HCM Signalized Intersection Capacity Analysis Conditions - PM Peak Hour (2031) UPGRADES  
 11: Walkley & Bank 6/14/2010



























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑↑↑	↖	↖↗	↑↑↑	↖	↖↗	↑↑↑	↖	↖↗	↑↑↑	↖
Ideal Flow (vphpl)	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	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	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)	3467	4988	1583	3467	5085	1553	3467	5085	1568	3400	5136	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)	3467	4988	1583	3467	5085	1553	3467	5085	1568	3400	5136	1583
Volume (vph)	347	534	278	226	836	339	230	1358	225	242	1646	484
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	377	580	302	246	909	368	250	1476	245	263	1789	526
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	377	580	302	246	909	368	250	1476	245	263	1789	526
Heavy Vehicles (%)	1%	4%	2%	1%	2%	4%	1%	2%	3%	3%	1%	2%
Turn Type	Prot		Free	Prot		Free	Prot		Free	Prot		Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Actuated Green, G (s)	12.7	23.4	120.0	12.0	22.7	120.0	12.0	47.3	120.0	12.2	47.5	120.0
Effective Green, g (s)	15.0	25.7	120.0	14.3	25.0	120.0	14.4	49.4	120.0	14.6	49.6	120.0
Actuated g/C Ratio	0.12	0.21	1.00	0.12	0.21	1.00	0.12	0.41	1.00	0.12	0.41	1.00
Clearance Time (s)	6.3	6.3		6.3	6.3		6.4	6.1		6.4	6.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	433	1068	1583	413	1059	1553	416	2093	1568	414	2123	1583
v/s Ratio Prot	c0.11	0.12		0.07	c0.18		0.07	0.29		c0.08	c0.35	
v/s Ratio Perm			0.19			0.24			0.16			c0.33
v/c Ratio	0.87	0.54	0.19	0.60	0.86	0.24	0.60	0.71	0.16	0.64	0.84	0.33
Uniform Delay, d1	51.5	41.9	0.0	50.1	45.8	0.0	50.1	29.3	0.0	50.2	31.7	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.1	0.6	0.3	2.3	7.0	0.4	2.4	2.0	0.2	3.2	4.3	0.6
Delay (s)	68.7	42.5	0.3	52.4	52.8	0.4	52.5	31.3	0.2	53.3	36.0	0.6
Level of Service	E	D	A	D	D	A	D	C	A	D	D	A
Approach Delay (s)		40.2			40.1			30.1			30.5	
Approach LOS		D			D			C			C	

Intersection Summary		
HCM Average Control Delay	34.1	HCM Level of Service C
HCM Volume to Capacity ratio	0.80	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 12.0
Intersection Capacity Utilization	79.5%	ICU Level of Service D
Analysis Period (min)	15	

c Critical Lane Group



























HCM Signalized Intersection Capacity Analysis Conditions - PM Peak Hour (2031) UPGRADES  
 12: Johnston & Bank 6/14/2010

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1805	1881	1599	1752	1900	1553	1736	3505	1482	1770	3539	1615	
Flt Permitted	0.69	1.00	1.00	0.48	1.00	1.00	0.13	1.00	1.00	0.12	1.00	1.00	
Satd. Flow (perm)	1314	1881	1599	877	1900	1553	230	3505	1482	233	3539	1615	
Volume (vph)	156	185	156	94	90	506	54	923	71	449	1407	191	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	170	201	170	102	98	550	59	1003	77	488	1529	208	
RTOR Reduction (vph)	0	0	114	0	0	361	0	0	35	0	0	48	
Lane Group Flow (vph)	170	201	56	102	98	189	59	1003	42	488	1529	160	
Heavy Vehicles (%)	0%	1%	1%	3%	0%	4%	4%	3%	9%	2%	2%	0%	
Turn Type	Perm		Perm	Perm		Perm	pm+pt		Perm	pm+pt		Perm	
Protected Phases		4			8		5	2		1		6	
Permitted Phases	4		4	8		8	2		2	6		6	
Actuated Green, G (s)	17.7	17.7	17.7	17.7	17.7	17.7	38.4	34.4	34.4	60.9	51.4	51.4	
Effective Green, g (s)	19.6	19.6	19.6	19.6	19.6	19.6	41.4	35.9	35.9	62.4	52.9	52.9	
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22	0.22	0.46	0.40	0.40	0.69	0.59	0.59	
Clearance Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.5	5.5	5.5	5.5	5.5	5.5	
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)	286	410	348	191	414	338	198	1398	591	546	2080	949	
v/s Ratio Prot		0.11			0.05		0.02	0.29		c0.22	0.43		
v/s Ratio Perm	c0.13		0.03	0.12		0.12	0.12		0.03	c0.40		0.10	
v/c Ratio	0.59	0.49	0.16	0.53	0.24	0.56	0.30	0.72	0.07	0.89	0.74	0.17	
Uniform Delay, d1	31.6	30.8	28.5	31.2	29.0	31.3	14.1	22.8	16.7	22.6	13.5	8.5	
Progression Factor	1.00	1.00	1.00	1.02	1.02	1.36	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.3	0.9	0.2	2.6	0.3	1.8	0.8	3.2	0.2	16.9	2.4	0.4	
Delay (s)	34.9	31.8	28.7	34.4	29.9	44.3	15.0	26.0	17.0	39.5	15.8	8.9	
Level of Service	C	C	C	C	C	D	B	C	B	D	B	A	
Approach Delay (s)		31.8			41.1			24.8			20.4		
Approach LOS		C			D			C			C		
<b>Intersection Summary</b>													
HCM Average Control Delay			26.1									HCM Level of Service	C
HCM Volume to Capacity ratio			0.81										
Actuated Cycle Length (s)			90.0									Sum of lost time (s)	8.0
Intersection Capacity Utilization			81.8%									ICU Level of Service	D
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis Conditions - PM Peak Hour (2031) UPGRADES  
 14: Hunt Club & Bank 6/14/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	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	0.97	0.91	1.00	1.00	0.91	1.00	0.97	0.91	1.00	0.97	0.91	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)	3303	4848	1599	1770	4988	1583	3467	5085	1583	3467	5036	1538
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)	3303	4848	1599	1770	4988	1583	3467	5085	1583	3467	5036	1538
Volume (vph)	169	1346	421	87	1371	135	380	908	50	196	1145	131
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	184	1463	458	95	1490	147	413	987	54	213	1245	142
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	184	1463	458	95	1490	147	413	987	54	213	1245	142
Heavy Vehicles (%)	6%	7%	1%	2%	4%	2%	1%	2%	2%	1%	3%	5%
Turn Type	Prot		Free	Prot		Free	Prot		Free	Prot		Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Actuated Green, G (s)	8.6	40.2	120.0	6.7	38.3	120.0	14.5	38.9	120.0	8.2	32.6	120.0
Effective Green, g (s)	11.0	42.8	120.0	9.1	40.9	120.0	17.0	41.4	120.0	10.7	35.1	120.0
Actuated g/C Ratio	0.09	0.36	1.00	0.08	0.34	1.00	0.14	0.34	1.00	0.09	0.29	1.00
Clearance Time (s)	6.4	6.6		6.4	6.6		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	303	1729	1599	134	1700	1583	491	1754	1583	309	1473	1538
v/s Ratio Prot	0.06	c0.30		0.05	c0.30		c0.12	0.19		0.06	c0.25	
v/s Ratio Perm			0.29			0.09			0.03			0.09
v/c Ratio	0.61	0.85	0.29	0.71	0.88	0.09	0.84	0.56	0.03	0.69	0.85	0.09
Uniform Delay, d1	52.4	35.6	0.0	54.2	37.2	0.0	50.2	31.9	0.0	53.0	39.9	0.0
Progression Factor	1.00	1.00	1.00	1.28	1.42	1.00	1.00	1.00	1.00	1.12	1.12	1.00
Incremental Delay, d2	3.4	4.0	0.5	11.3	3.8	0.1	12.3	1.3	0.0	5.6	5.5	0.1
Delay (s)	55.8	39.6	0.5	80.5	56.7	0.1	62.5	33.3	0.0	64.8	50.1	0.1
Level of Service	E	D	A	F	E	A	E	C	A	E	D	A
Approach Delay (s)		32.5			53.2			40.3			47.6	
Approach LOS		C			D			D			D	
<b>Intersection Summary</b>												
HCM Average Control Delay			42.9				HCM Level of Service				D	
HCM Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)				16.0	
Intersection Capacity Utilization			80.0%				ICU Level of Service				D	
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis Conditions - PM Peak Hour (2031) UPGRADES  
 15: Hunt Club & Albion 6/14/2010

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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)	1612	3438	1509	1787	3505	1568	1687	1680		1687	1863	1495
Flt Permitted	0.17	1.00	1.00	0.06	1.00	1.00	0.55	1.00		0.16	1.00	1.00
Satd. Flow (perm)	288	3438	1509	113	3505	1568	978	1680		290	1863	1495
Volume (vph)	180	1442	15	291	1117	34	15	102	211	31	134	352
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	196	1567	16	316	1214	37	16	111	229	34	146	383
RTOR Reduction (vph)	0	0	0	0	0	0	0	68	0	0	0	229
Lane Group Flow (vph)	196	1567	16	316	1214	37	16	272	0	34	146	154
Heavy Vehicles (%)	12%	5%	7%	1%	3%	3%	7%	1%	2%	7%	2%	8%
Turn Type	pm+pt		Free	pm+pt		Free	Perm			Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		Free	6		Free	8			4		4
Actuated Green, G (s)	72.5	61.0	120.0	85.0	68.1	120.0	23.3	23.3		23.3	23.3	23.3
Effective Green, g (s)	75.4	62.5	120.0	86.5	69.6	120.0	25.5	25.5		25.5	25.5	25.5
Actuated g/C Ratio	0.63	0.52	1.00	0.72	0.58	1.00	0.21	0.21		0.21	0.21	0.21
Clearance Time (s)	5.4	5.5		5.4	5.5		6.2	6.2		6.2	6.2	6.2
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)	323	1791	1509	360	2033	1568	208	357		62	396	318
v/s Ratio Prot	0.07	0.46		c0.15	0.35			c0.16			0.08	
v/s Ratio Perm	0.32		0.01	c0.49		0.02	0.02			0.12		0.10
v/c Ratio	0.61	0.87	0.01	0.88	0.60	0.02	0.08	0.76		0.55	0.37	0.48
Uniform Delay, d1	11.7	25.3	0.0	38.4	16.2	0.0	37.8	44.4		42.1	40.4	41.5
Progression Factor	1.64	1.03	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.9	4.0	0.0	20.7	1.3	0.0	0.2	9.3		9.6	0.6	1.2
Delay (s)	21.2	29.9	0.0	59.1	17.5	0.0	38.0	53.7		51.7	41.0	42.6
Level of Service	C	C	A	E	B	A	D	D		D	D	D
Approach Delay (s)		28.7			25.5			53.0			42.7	
Approach LOS		C			C			D			D	

Intersection Summary		
HCM Average Control Delay	31.4	HCM Level of Service C
HCM Volume to Capacity ratio	0.84	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 8.0
Intersection Capacity Utilization	91.7%	ICU Level of Service F
Analysis Period (min)	15	

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis Conditions - PM Peak Hour (2031) UPGRADES  
 21: E-W Collector (S of Rail Corridor) & Conroy 6/14/2010



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	0.91	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	5085	1583
Flt Permitted	0.95	1.00	0.07	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	128	3539	5085	1583
Volume (vph)	603	56	12	883	2011	128
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	655	61	13	960	2186	139
RTOR Reduction (vph)	0	1	0	0	0	72
Lane Group Flow (vph)	655	60	13	960	2186	67
Turn Type		Perm	Perm			Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	54.0	54.0	58.0	58.0	58.0	58.0
Effective Green, g (s)	54.0	54.0	58.0	58.0	58.0	58.0
Actuated g/C Ratio	0.45	0.45	0.48	0.48	0.48	0.48
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	797	712	62	1711	2458	765
v/s Ratio Prot	c0.37			0.27	c0.43	
v/s Ratio Perm		0.04	0.10			0.04
v/c Ratio	0.82	0.08	0.21	0.56	0.89	0.09
Uniform Delay, d1	28.8	18.9	17.8	22.0	28.1	16.7
Progression Factor	1.00	1.00	1.00	1.00	0.67	1.13
Incremental Delay, d2	9.3	0.2	7.5	1.3	3.1	0.1
Delay (s)	38.1	19.1	25.4	23.3	22.0	19.0
Level of Service	D	B	C	C	C	B
Approach Delay (s)	36.5			23.3	21.8	
Approach LOS	D			C	C	

**Intersection Summary**

HCM Average Control Delay	24.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

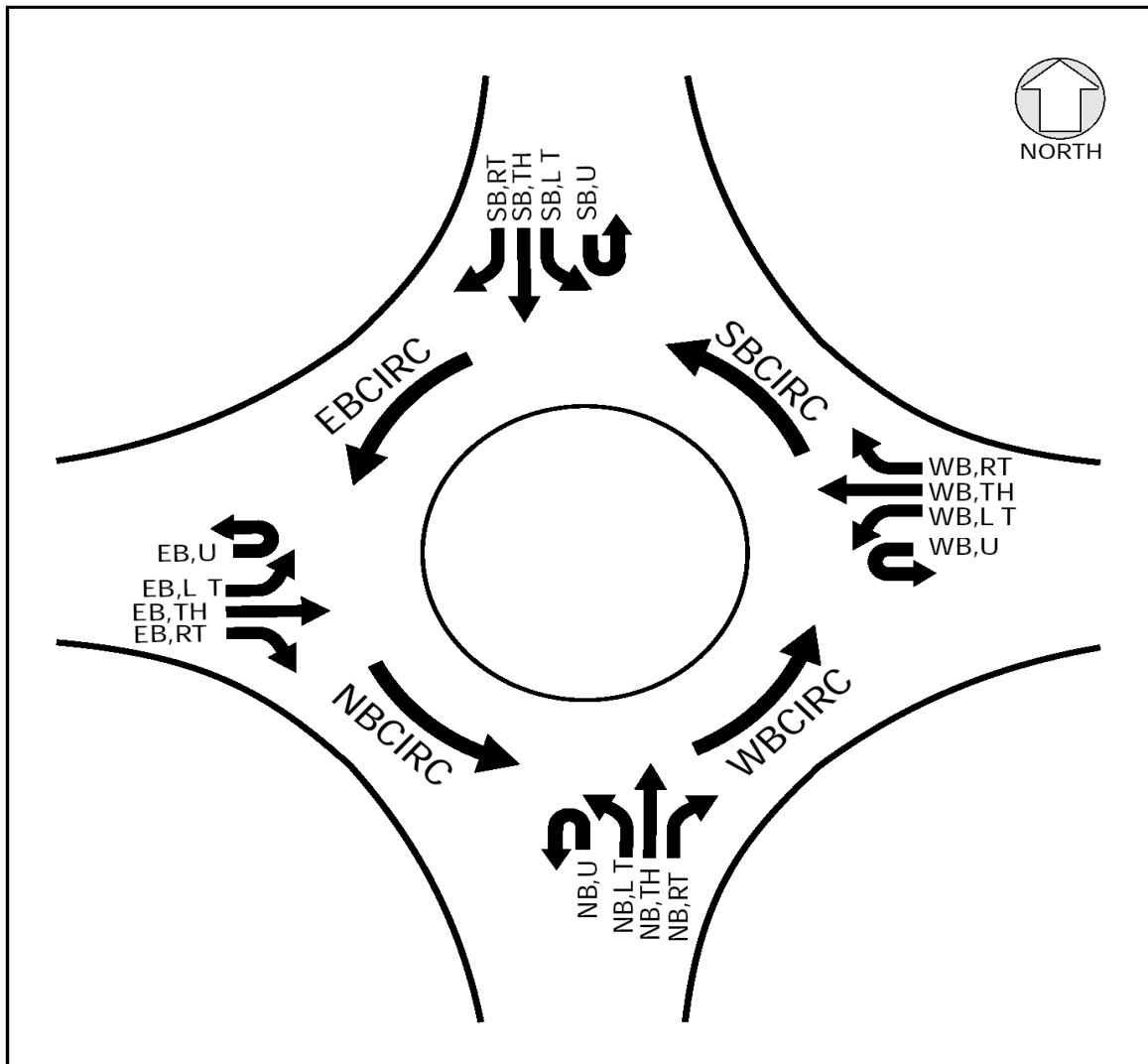
## Roundabout Movement Volumes

Project: Johnston Road Land Use Study - Transportation Study

Date: 15-Jun-10

Table 1: Roundabout Movement Volumes (2031 - Background Growth and Johnston Road Site fully)  
Intersection: Albion Road South / Johnston Road

Intersection Leg	Time of Day	Movement					
South Leg	Peak Period	NB-LT	NB-TH	NB-RT	NB-Uturn	NB-Circ	NB-Entry
	AM Peak	127	295	123	0	410	545
	PM Peak	49	60	129	0	559	238
North Leg	Peak Period	SB-LT	SB-TH	SB-RT	SB-Uturn	SB-Circ	SB-Entry
	AM Peak	3	47	48	0	725	98
	PM Peak	13	268	232	0	363	513
West Leg	Peak Period	EB-LT	EB-TH	EB-RT	EB-Uturn	EB-Circ	EB-Entry
	AM Peak	248	159	36	0	154	443
	PM Peak	56	490	106	0	317	652
East Leg	Peak Period	WB-LT	WB-TH	WB-RT	WB-Uturn	WB-Circ	WB-Entry
	AM Peak	104	494	11	0	670	609
	PM Peak	36	278	110	0	165	424



**Roundabout Capacity Analysis - Single Lane Roundabout**

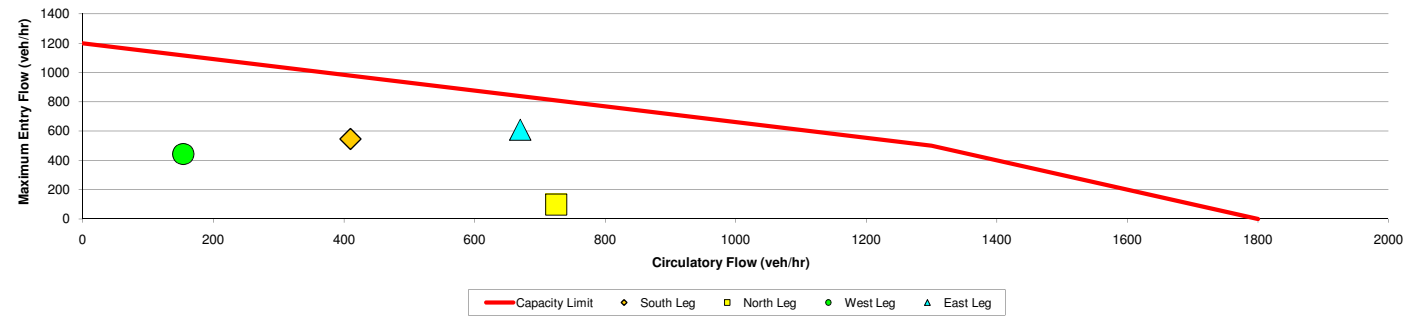
*Morning Peak Hour*

South Leg	Maximum Entry Flow	Actual Entry Flow (y)	Degree of Saturation	slope of line (m)	Circulatory Flow (x)	Capacity (veh/hr)	Control Delay (s)	Queue Length (Average)	Queue Length (95th percentile)	y-intercept (b)
0 to 1,300 Entry Flow	979	545	0.56	-0.54	410	1,200	5.5	0.8	2.5	1,200
1,300 to 1,800 Entry Flow	NA	NA	NA	-1.00	NA	1,200	NA	NA	NA	500
0 to 1,300 Entry Flow	979	545	0.56	-0.54	410	1,200	5.5	0.8	2.5	1,200
North Leg	Maximum Entry Flow	Actual Entry Flow (y)	Degree of Saturation	slope of line (m)	Circulatory Flow (x)	Capacity (veh/hr)	Control Delay (s)	Queue Length (Average)	Queue Length (95th percentile)	y-intercept (b)
0 to 1,300 Entry Flow	810	98	0.12	-0.54	725	1,200	3.3	0.1	0.3	1,200
1,300 to 1,800 Entry Flow	NA	NA	NA	-1.00	NA	1,200	NA	NA	NA	500
0 to 1,300 Entry Flow	810	98	0.12	-0.54	725	1,200	3.3	0.1	0.3	1,200
West Leg	Maximum Entry Flow	Actual Entry Flow (y)	Degree of Saturation	slope of line (m)	Circulatory Flow (x)	Capacity (veh/hr)	Control Delay (s)	Queue Length (Average)	Queue Length (95th percentile)	y-intercept (b)
0 to 1,300 Entry Flow	1,117	443	0.40	-0.54	154	1,200	4.8	0.6	1.7	1,200
1,300 to 1,800 Entry Flow	NA	NA	NA	-1.00	NA	1,200	NA	NA	NA	500
0 to 1,300 Entry Flow	1,117	443	0.40	-0.54	154	1,200	4.8	0.6	1.7	1,200
East Leg	Maximum Entry Flow	Actual Entry Flow (y)	Degree of Saturation	slope of line (m)	Circulatory Flow (x)	Capacity (veh/hr)	Control Delay (s)	Queue Length (Average)	Queue Length (95th percentile)	y-intercept (b)
0 to 1,300 Entry Flow	839	609	0.73	-0.54	670	1,200	6.1	1.0	3.1	1,200
1,300 to 1,800 Entry Flow	NA	NA	NA	-1.00	NA	1,200	NA	NA	NA	500
0 to 1,300 Entry Flow	839	609	0.73	-0.54	670	1,200	6.1	1.0	3.1	1,200

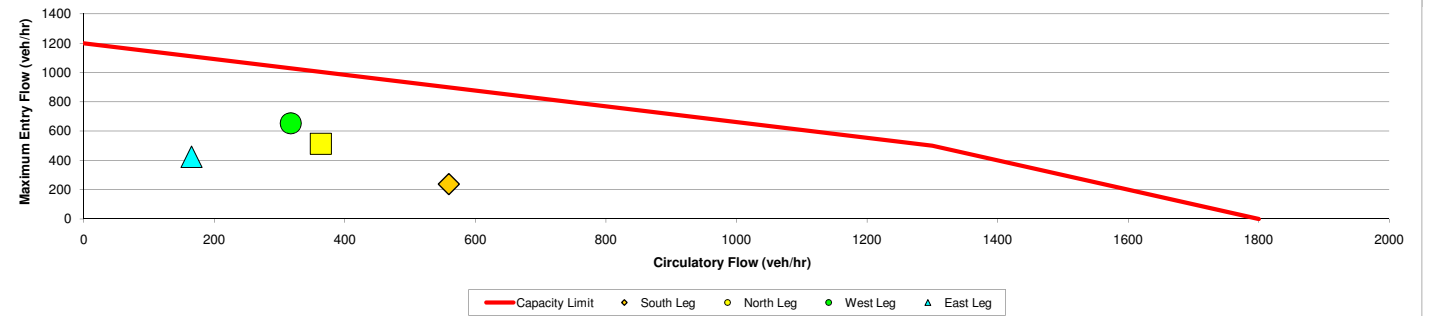
*Afternoon Peak Hour*

South Leg	Maximum Entry Flow	Actual Entry Flow (y)	Degree of Saturation	slope of line (m)	Circulatory Flow (x)	Capacity (veh/hr)	Control Delay (s)	Queue Length (Average)	Queue Length (95th percentile)	y-intercept (b)
0 to 1,300 Entry Flow	899	238	0.26	-0.54	559	1,200	3.7	0.2	0.7	1,200
1,300 to 1,800 Entry Flow	NA	NA	NA	-1.00	NA	1,200	NA	NA	NA	500
0 to 1,300 Entry Flow	899	238	0.26	-0.54	559	1,200	3.7	0.2	0.7	1,200
North Leg	Maximum Entry Flow	Actual Entry Flow (y)	Degree of Saturation	slope of line (m)	Circulatory Flow (x)	Capacity (veh/hr)	Control Delay (s)	Queue Length (Average)	Queue Length (95th percentile)	y-intercept (b)
0 to 1,300 Entry Flow	1,005	513	0.51	-0.54	363	1,200	5.2	0.7	2.2	1,200
1,300 to 1,800 Entry Flow	NA	NA	NA	-1.00	NA	1,200	NA	NA	NA	500
0 to 1,300 Entry Flow	1,005	513	0.51	-0.54	363	1,200	5.2	0.7	2.2	1,200
West Leg	Maximum Entry Flow	Actual Entry Flow (y)	Degree of Saturation	slope of line (m)	Circulatory Flow (x)	Capacity (veh/hr)	Control Delay (s)	Queue Length (Average)	Queue Length (95th percentile)	y-intercept (b)
0 to 1,300 Entry Flow	1,029	652	0.63	-0.54	317	1,200	6.6	1.2	3.5	1,200
1,300 to 1,800 Entry Flow	NA	NA	NA	-1.00	NA	1,200	NA	NA	NA	500
0 to 1,300 Entry Flow	1,029	652	0.63	-0.54	317	1,200	6.6	1.2	3.5	1,200
East Leg	Maximum Entry Flow	Actual Entry Flow (y)	Degree of Saturation	slope of line (m)	Circulatory Flow (x)	Capacity (veh/hr)	Control Delay (s)	Queue Length (Average)	Queue Length (95th percentile)	y-intercept (b)
0 to 1,300 Entry Flow	1,111	424	0.38	-0.54	165	1,200	4.6	0.5	1.6	1,200
1,300 to 1,800 Entry Flow	NA	NA	NA	-1.00	NA	1,200	NA	NA	NA	500
0 to 1,300 Entry Flow	1,111	424	0.38	-0.54	165	1,200	4.6	0.5	1.6	1,200

Capacity Analysis - Single-Lane Roundabout  
Morning Peak Hour



Capacity Analysis - Single-Lane Roundabout  
Afternoon Peak Hour



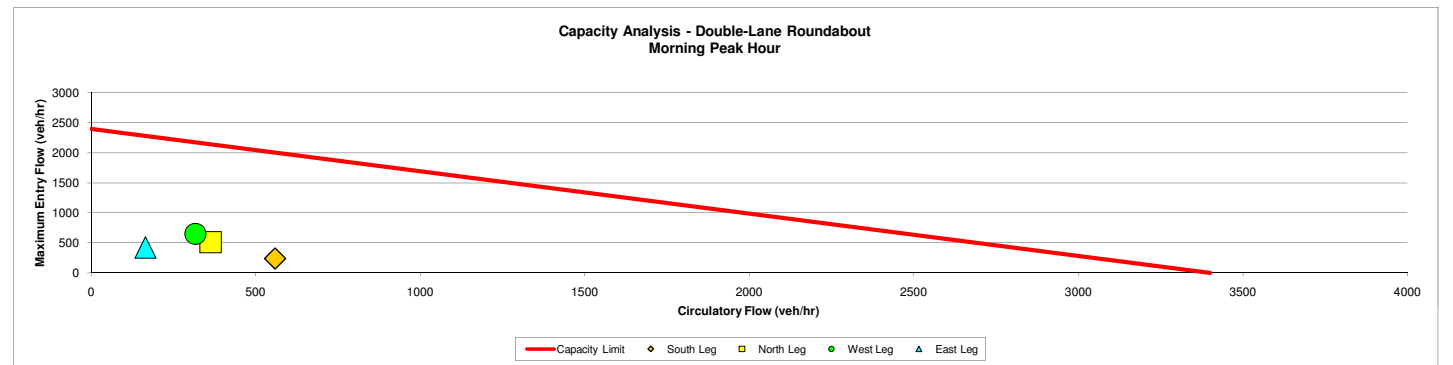
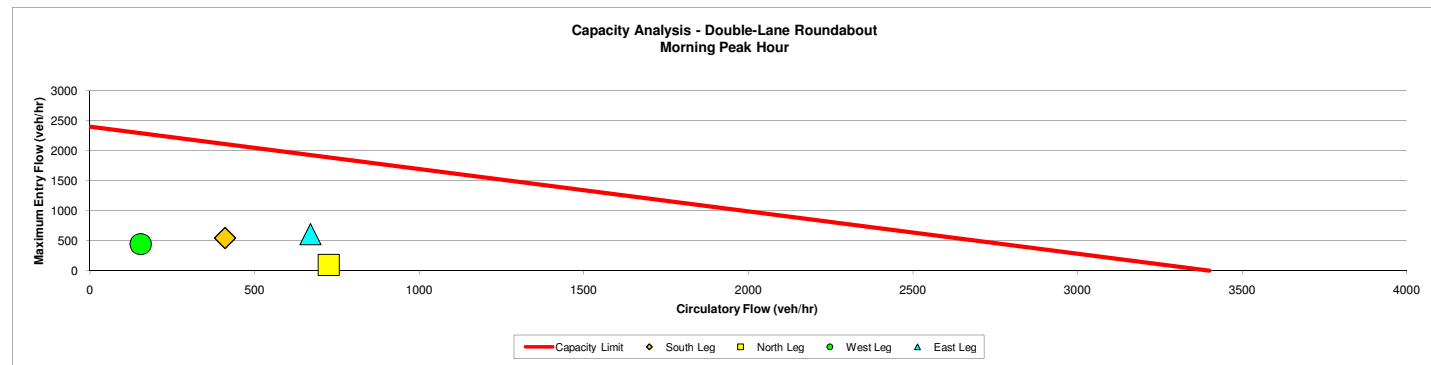
**Roundabout Capacity Analysis - Double Lane Roundabout**

*Morning Peak Hour*

South Leg	Maximum Entry Flow (y)	Actual Entry Flow (y)	Degree of Saturation	slope of line (m)	Circulatory Flow (x)	Capacity (veh/hr)	Control Delay (s)	Queue Length (Average)	Queue Length (95th percentile)	y-intercept (b)
0 to 2,400 Entry Flow	2,111	545	0.26	-0.71	410	2,400	1.9	0.3	0.0	2,400
North Leg	Maximum Entry Flow (y)	Actual Entry Flow (y)	Degree of Saturation	slope of line (m)	Circulatory Flow (x)	Capacity (veh/hr)	Control Delay (s)	Queue Length (Average)	Queue Length (95th percentile)	y-intercept (b)
0 to 2,400 Entry Flow	1,888	98	0.05	-0.71	725	2,400	1.6	0.0	0.0	2,400
West Leg	Maximum Entry Flow (y)	Actual Entry Flow (y)	Degree of Saturation	slope of line (m)	Circulatory Flow (x)	Capacity (veh/hr)	Control Delay (s)	Queue Length (Average)	Queue Length (95th percentile)	y-intercept (b)
0 to 2,400 Entry Flow	2,291	443	0.19	-0.71	154	2,400	1.8	0.2	0.0	2,400
East Leg	Maximum Entry Flow (y)	Actual Entry Flow (y)	Degree of Saturation	slope of line (m)	Circulatory Flow (x)	Capacity (veh/hr)	Control Delay (s)	Queue Length (Average)	Queue Length (95th percentile)	y-intercept (b)
0 to 2,400 Entry Flow	1,927	609	0.32	-0.71	670	2,400	2.0	0.3	0.0	2,400

*Afternoon Peak Hour*

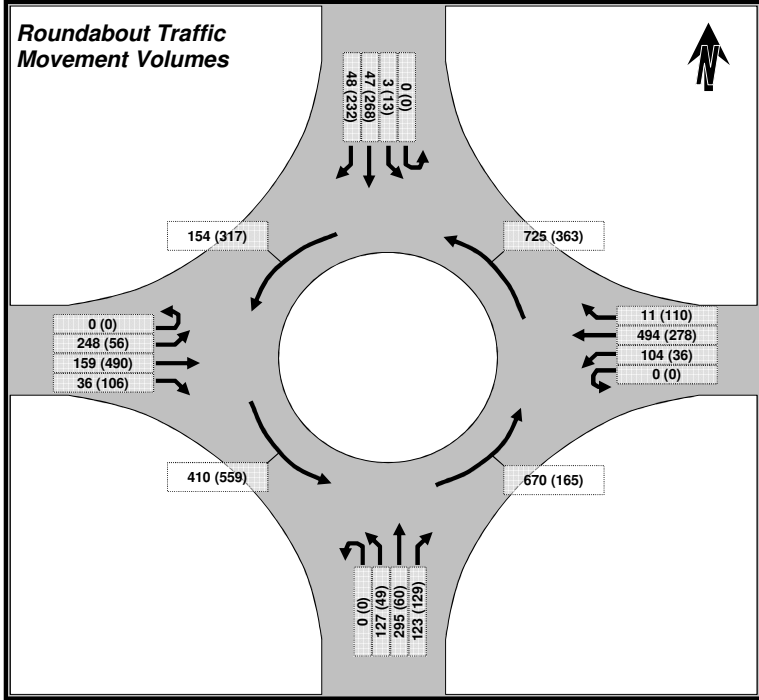
South Leg	Maximum Entry Flow (y)	Actual Entry Flow (y)	Degree of Saturation	slope of line (m)	Circulatory Flow (x)	Capacity (veh/hr)	Control Delay (s)	Queue Length (Average)	Queue Length (95th percentile)	y-intercept (b)
0 to 2,400 Entry Flow	2,005	238	0.12	-0.71	559	2,400	1.7	0.1	0.0	2,400
North Leg	Maximum Entry Flow (y)	Actual Entry Flow (y)	Degree of Saturation	slope of line (m)	Circulatory Flow (x)	Capacity (veh/hr)	Control Delay (s)	Queue Length (Average)	Queue Length (95th percentile)	y-intercept (b)
0 to 2,400 Entry Flow	2,144	513	0.24	-0.71	363	2,400	1.9	0.3	0.0	2,400
West Leg	Maximum Entry Flow (y)	Actual Entry Flow (y)	Degree of Saturation	slope of line (m)	Circulatory Flow (x)	Capacity (veh/hr)	Control Delay (s)	Queue Length (Average)	Queue Length (95th percentile)	y-intercept (b)
0 to 2,400 Entry Flow	2,176	652	0.30	-0.71	317	2,400	2.1	0.4	0.0	2,400
East Leg	Maximum Entry Flow (y)	Actual Entry Flow (y)	Degree of Saturation	slope of line (m)	Circulatory Flow (x)	Capacity (veh/hr)	Control Delay (s)	Queue Length (Average)	Queue Length (95th percentile)	y-intercept (b)
0 to 2,400 Entry Flow	2,284	424	0.19	-0.71	165	2,400	1.8	0.2	0.0	2,400



# Intersection Performance Analysis Summary Report Single Lane Roundabout

Project Name: Johnston Road Land Use Study - Transportation
Project Number: OT-08-025
Date of Analysis: June 15, 2010
Intersection: #9 - Albion Road South / Johnston Road
Scenario: (Mattamy HMB Site In Place)
Horizon Year: 2031
Time of Day: Peak Hours (AM and PM)

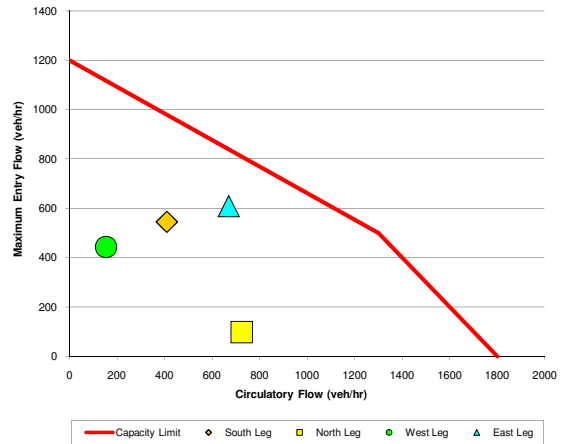
## Roundabout Traffic Movement Volumes



## Performance Characteristics

North Leg	
Degree of Saturation	0.12 (0.51)
Control Delay	3.3 (5.2)
Queue Length (50th Percentile)	0.1 (0.7)
Queue Length (95th Percentile)	0.3 (2.2)
South Leg	
Degree of Saturation	0.56 (0.26)
Control Delay	5.5 (3.7)
Queue Length (50th Percentile)	0.8 (0.2)
Queue Length (95th Percentile)	2.5 (0.7)
East Leg	
Degree of Saturation	0.73 (0.38)
Control Delay	6.1 (4.6)
Queue Length (50th Percentile)	1 (0.5)
Queue Length (95th Percentile)	3.1 (1.6)
West Leg	
Degree of Saturation	0.4 (0.63)
Control Delay	4.8 (6.6)
Queue Length (50th Percentile)	0.6 (1.2)
Queue Length (95th Percentile)	1.7 (3.5)

Capacity Analysis - Single-Lane Roundabout Morning Peak Hour



Capacity Analysis - Single-Lane Roundabout Afternoon Peak Hour

