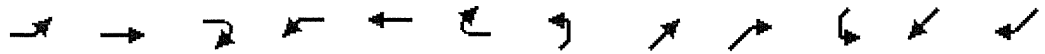


HCM Signalized Intersection Capacity Analysis

37: US 6 & I-70 B

10/23/2008



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	227	183	72	250	340	151	77	878	196	74	270	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.5	6.0	6.0	4.5	6.0	6.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	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)	3060	3154	1411	3060	3154	1411	3060	4532	1411	3060	4532	1411
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)	3060	3154	1411	3060	3154	1411	3060	4532	1411	3060	4532	1411
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor (vph)	281%	246%	217%	246%	246%	246%	217%	217%	217%	281%	281%	281%
Adj. Flow (vph)	725	512	178	699	950	422	190	2165	483	236	862	163
RTOR Reduction (vph)	0	0	135	0	0	202	0	0	105	0	0	87
Lane Group Flow (vph)	725	512	43	699	950	220	190	2165	378	236	862	76
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
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)	28.0	34.0	34.0	31.0	37.0	37.0	14.0	38.4	38.4	16.1	40.5	40.5
Effective Green, g (s)	28.0	34.0	34.0	31.0	37.0	37.0	14.0	38.4	38.4	16.1	40.5	40.5
Actuated g/C Ratio	0.20	0.24	0.24	0.22	0.26	0.26	0.10	0.27	0.27	0.12	0.29	0.29
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.5	6.0	6.0	4.5	6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0	5.0	4.0	4.0	3.0	0.2	0.2	3.0	0.2	0.2
Lane Grp Cap (vph)	612	766	343	678	834	373	306	1243	387	352	1311	408
v/s Ratio Prot	c0.24	0.16		0.23	c0.30		0.06	c0.48		c0.08	0.19	
v/s Ratio Perm			0.03			0.16			0.27			0.05
v/c Ratio	1.18	0.67	0.13	1.03	1.14	0.59	0.62	1.74	0.98	0.67	0.66	0.19
Uniform Delay, d1	56.0	47.9	41.4	54.5	51.5	44.9	60.5	50.8	50.3	59.4	43.7	37.4
Progression Factor	1.00	1.00	1.00	1.14	0.89	0.63	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	98.9	2.4	0.2	40.3	75.2	2.5	3.9	337.2	40.2	5.0	2.6	1.0
Delay (s)	154.9	50.3	41.6	102.4	120.9	30.9	64.3	388.0	90.5	64.4	46.3	38.4
Level of Service	F	D	D	F	F	C	E	F	F	E	D	D
Approach Delay (s)		102.8			96.3			315.7			48.6	
Approach LOS		F			F			F			D	

Intersection Summary		
HCM Average Control Delay	171.7	HCM Level of Service F
HCM Volume to Capacity ratio	1.28	
Actuated Cycle Length (s)	140.0	Sum of lost time (s) 20.5
Intersection Capacity Utilization	110.5%	ICU Level of Service H
Analysis Period (min)	15	
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis

4: US 6 & 32 1/2 Rd

10/23/2008



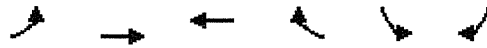
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	43	360	85	100	575	26	90	0	63	8	1	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	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	0.85		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	
Satd. Flow (prot)	1752	3505	1568	3400	3505	1568	1770	1583		1770	1590	
Flt Permitted	0.09	1.00	1.00	0.24	1.00	1.00	0.38	1.00		0.68	1.00	
Satd. Flow (perm)	167	3505	1568	847	3505	1568	716	1583		1266	1590	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor (vph)	170%	246%	170%	170%	246%	170%	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	82	995	162	191	1589	50	172	0	120	15	2	88
RTOR Reduction (vph)	0	0	58	0	0	5	0	102	0	0	82	0
Lane Group Flow (vph)	82	995	104	191	1589	45	172	18	0	15	8	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt			pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8			4		
Actuated Green, G (s)	96.8	89.5	89.5	97.4	89.8	89.8	27.9	21.3		11.8	10.2	
Effective Green, g (s)	96.8	89.5	89.5	97.4	89.8	89.8	27.9	21.3		11.8	10.2	
Actuated g/C Ratio	0.69	0.64	0.64	0.70	0.64	0.64	0.20	0.15		0.08	0.07	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	198	2241	1002	728	2248	1006	238	241		112	116	
v/s Ratio Prot	c0.02	0.28		0.01	c0.45		c0.07	0.01		0.00	0.01	
v/s Ratio Perm	0.26		0.07	0.17		0.03	c0.08			0.01		
v/c Ratio	0.41	0.44	0.10	0.26	0.71	0.04	0.72	0.08		0.13	0.07	
Uniform Delay, d1	14.3	12.7	9.8	8.0	16.5	9.3	49.9	50.9		59.2	60.5	
Progression Factor	2.11	1.14	2.24	1.06	0.88	1.11	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.4	0.1	0.2	1.8	0.1	10.3	0.1		0.5	0.3	
Delay (s)	31.0	14.9	22.0	8.7	16.3	10.4	60.2	51.0		59.7	60.8	
Level of Service	C	B	C	A	B	B	E	D		E	E	
Approach Delay (s)		16.9			15.3			56.5			60.6	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM Average Control Delay	20.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

5: US 6 & Access 2

10/23/2008

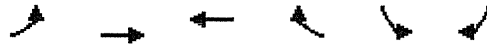


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑		↑
Volume (veh/h)	0	530	900	20	0	20
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	979	1663	37	0	37
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		976	501			
pX, platoon unblocked	0.73				0.73	0.73
vC, conflicting volume	1700				2153	832
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1218				1839	28
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	95
cM capacity (veh/h)	415				49	759
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1
Volume Total	490	490	832	832	37	37
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	37	37
cSH	1700	1700	1700	1700	1700	759
Volume to Capacity	0.29	0.29	0.49	0.49	0.02	0.05
Queue Length 95th (ft)	0	0	0	0	0	4
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	10.0
Lane LOS						A
Approach Delay (s)	0.0		0.0			10.0
Approach LOS						A
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			52.3%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

12: US 6 & Lois St

10/23/2008



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	25	340	525	11	0	93
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	48	1062	1640	21	0	178
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		711	547			
pX, platoon unblocked	0.89				0.92	0.89
vC, conflicting volume	1661				2277	830
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1492				1668	557
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	88				100	58
cM capacity (veh/h)	392				71	421
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	48	531	531	1093	568	178
Volume Left	48	0	0	0	0	0
Volume Right	0	0	0	0	21	178
cSH	392	1700	1700	1700	1700	421
Volume to Capacity	0.12	0.31	0.31	0.64	0.33	0.42
Queue Length 95th (ft)	10	0	0	0	0	51
Control Delay (s)	15.5	0.0	0.0	0.0	0.0	19.7
Lane LOS	C					C
Approach Delay (s)	0.7			0.0		19.7
Approach LOS						C

Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			57.4%	ICU Level of Service		B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

16: US 6 & Holland St

10/23/2008



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	5	350	525	2	0	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	9	1081	1622	4	0	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		1053	205			
pX, platoon unblocked	0.90				0.93	0.90
vC, conflicting volume	1625				2183	813
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1466				1614	558
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				100	95
cM capacity (veh/h)	405				86	424

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	9	541	541	1081	544	21
Volume Left	9	0	0	0	0	0
Volume Right	0	0	0	0	4	21
cSH	405	1700	1700	1700	1700	424
Volume to Capacity	0.02	0.32	0.32	0.64	0.32	0.05
Queue Length 95th (ft)	2	0	0	0	0	4
Control Delay (s)	14.1	0.0	0.0	0.0	0.0	13.9
Lane LOS	B					B
Approach Delay (s)	0.1			0.0		13.9
Approach LOS						B

Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			50.5%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

17: US 6 & 5th St

10/23/2008



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	350	2	10	525	20	10	0	10	20	0	20
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	1.00		1.00	1.00	0.85	1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3503		1752	3505	1583	1770	1583		1770	1583	
Flt Permitted	0.15	1.00		0.26	1.00	1.00	0.95	1.00		0.75	1.00	
Satd. Flow (perm)	272	3503		484	3505	1583	1770	1583		1389	1583	
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
Growth Factor (vph)	170%	278%	170%	170%	278%	170%	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	18	1058	4	18	1586	37	18	0	18	37	0	37
RTOR Reduction (vph)	0	0	0	0	0	4	0	17	0	0	35	0
Lane Group Flow (vph)	18	1062	0	18	1586	33	18	1	0	37	2	0
Heavy Vehicles (%)	2%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm			Perm			Perm	Prot		Perm		
Protected Phases		2			6		4!	8			8!	
Permitted Phases	2			6		6				8		
Actuated Green, G (s)	123.9	123.9		123.9	123.9	123.9	8.1	8.1		8.1	8.1	
Effective Green, g (s)	123.9	123.9		123.9	123.9	123.9	8.1	8.1		8.1	8.1	
Actuated g/C Ratio	0.88	0.88		0.88	0.88	0.88	0.06	0.06		0.06	0.06	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	241	3100		428	3102	1401	102	92		80	92	
v/s Ratio Prot		0.30			c0.45		0.01	0.00			0.00	
v/s Ratio Perm	0.07			0.04		0.02				c0.03		
v/c Ratio	0.07	0.34		0.04	0.51	0.02	0.18	0.01		0.46	0.02	
Uniform Delay, d1	1.0	1.3		1.0	1.7	0.9	62.8	62.2		63.8	62.2	
Progression Factor	2.79	3.51		0.81	0.75	0.67	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.3		0.0	0.1	0.0	0.8	0.0		4.2	0.1	
Delay (s)	3.3	5.0		0.8	1.4	0.6	63.6	62.2		68.0	62.3	
Level of Service	A	A		A	A	A	E	E		E	E	
Approach Delay (s)		4.9			1.3			62.9			65.2	
Approach LOS		A			A			E			E	

Intersection Summary

HCM Average Control Delay	5.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.6%	ICU Level of Service	B
Analysis Period (min)	15		

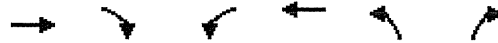
! Phase conflict between lane groups.

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

51: US 6 & Clifton Elem. 2

10/23/2008



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↗
Volume (veh/h)	335	5	0	525	0	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1035	9	0	1622	0	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)	325			1152		
pX, platoon unblocked			0.96		0.83	0.96
vC, conflicting volume			1044		1850	522
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			953		1376	407
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			679		113	567
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	690	354	811	811	9	
Volume Left	0	0	0	0	0	
Volume Right	0	9	0	0	9	
cSH	1700	1700	1700	1700	567	
Volume to Capacity	0.41	0.21	0.48	0.48	0.02	
Queue Length 95th (ft)	0	0	0	0	1	
Control Delay (s)	0.0	0.0	0.0	0.0	11.5	
Lane LOS					B	
Approach Delay (s)	0.0	0.0			11.5	
Approach LOS					B	
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			43.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

19: US 6 & 33 Rd

10/23/2008



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	330	167	139	380	4	430	55	215	7	2	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.88		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)	1752	3505	1568	1752	3497		3400	1624		1752	1572	
Flt Permitted	0.21	1.00	1.00	0.25	1.00		0.10	1.00		0.58	1.00	
Satd. Flow (perm)	390	3505	1568	465	3497		371	1624		1064	1572	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	300%	195%	100%	100%	195%	300%	100%	100%	100%	300%	300%	300%
Adj. Flow (vph)	123	715	186	154	823	13	478	61	239	23	7	457
RTOR Reduction (vph)	0	0	64	0	1	0	0	112	0	0	156	0
Lane Group Flow (vph)	123	715	122	154	835	0	478	188	0	23	308	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	pm+pt		Perm	pm+pt			pm+pt			pm+pt		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6			4			8		
Actuated Green, G (s)	65.0	55.0	55.0	68.0	56.5		58.5	51.1		36.0	33.6	
Effective Green, g (s)	65.0	55.0	55.0	68.0	56.5		58.5	51.1		36.0	33.6	
Actuated g/C Ratio	0.46	0.39	0.39	0.49	0.40		0.42	0.36		0.26	0.24	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	278	1377	616	332	1411		586	593		285	377	
v/s Ratio Prot	0.03	0.20		c0.04	c0.24		c0.12	0.12		0.00	0.20	
v/s Ratio Perm	0.17		0.08	0.19			c0.23			0.02		
v/c Ratio	0.44	0.52	0.20	0.46	0.59		0.82	0.32		0.08	0.82	
Uniform Delay, d1	23.5	32.4	28.0	21.9	32.7		38.7	31.9		39.1	50.3	
Progression Factor	0.45	0.55	0.37	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	1.4	0.7	1.0	0.4		8.6	0.3		0.1	12.9	
Delay (s)	11.8	19.1	11.0	23.0	33.2		47.2	32.2		39.3	63.2	
Level of Service	B	B	B	C	C		D	C		D	E	
Approach Delay (s)		16.8			31.6			41.4			62.0	
Approach LOS		B			C			D			E	

Intersection Summary			
HCM Average Control Delay	33.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

37: US 6 & I-70 B

10/23/2008



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	↔↔	↑↑	↗	↔↔	↑↑	↗	↔↔	↑↑↑	↗	↔↔	↑↑↑	↗
Volume (vph)	162	330	174	225	290	114	179	285	411	159	618	224
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.5	6.0	6.0	4.5	6.0	6.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	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)	3060	3154	1411	3060	3154	1411	3060	4532	1411	3060	4532	1411
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)	3060	3154	1411	3060	3154	1411	3060	4532	1411	3060	4532	1411
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor (vph)	281%	246%	217%	246%	246%	246%	217%	217%	217%	281%	281%	281%
Adj. Flow (vph)	484	864	402	589	759	298	413	658	949	475	1847	670
RTOR Reduction (vph)	0	0	161	0	0	179	0	0	260	0	0	178
Lane Group Flow (vph)	484	864	241	589	759	119	413	658	689	475	1847	492
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
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)	25.3	39.0	39.0	26.0	39.7	39.7	18.5	39.0	39.0	15.5	36.0	36.0
Effective Green, g (s)	25.3	39.0	39.0	26.0	39.7	39.7	18.5	39.0	39.0	15.5	36.0	36.0
Actuated g/C Ratio	0.18	0.28	0.28	0.19	0.28	0.28	0.13	0.28	0.28	0.11	0.26	0.26
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.5	6.0	6.0	4.5	6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0	5.0	4.0	4.0	3.0	0.2	0.2	3.0	0.2	0.2
Lane Grp Cap (vph)	553	879	393	568	894	400	404	1262	393	339	1165	363
v/s Ratio Prot	0.16	c0.27		c0.19	0.24		0.13	0.15		c0.16	0.41	
v/s Ratio Perm			0.17			0.08			c0.49			0.35
v/c Ratio	0.88	0.98	0.61	1.04	0.85	0.30	1.02	0.52	1.75	1.40	1.59	1.35
Uniform Delay, d1	55.8	50.2	43.9	57.0	47.3	39.2	60.8	42.6	50.5	62.2	52.0	52.0
Progression Factor	1.00	1.00	1.00	1.45	0.78	0.65	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.8	26.1	3.2	45.9	6.6	0.5	50.6	1.5	348.8	197.5	267.6	176.7
Delay (s)	70.6	76.2	47.2	128.3	43.7	26.0	111.3	44.2	399.3	259.7	319.6	228.7
Level of Service	E	E	D	F	D	C	F	D	F	F	F	F
Approach Delay (s)		68.0			70.7			224.7			289.7	
Approach LOS		E			E			F			F	

























Intersection Summary

HCM Average Control Delay	185.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.30		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	114.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

4: US 6 & 32 1/2 Rd

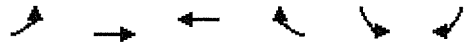
10/23/2008

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	670	175	230	400	42	130	0	285	38	1	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	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	0.85		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	
Satd. Flow (prot)	1752	3505	1568	3400	3505	1568	1770	1583		1770	1585	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.21	1.00		0.28	1.00	
Satd. Flow (perm)	1752	3505	1568	3400	3505	1568	382	1583		514	1585	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor (vph)	170%	246%	170%	170%	246%	170%	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	228	1699	307	403	1014	74	228	0	499	67	2	280
RTOR Reduction (vph)	0	0	87	0	0	30	0	309	0	0	251	0
Lane Group Flow (vph)	228	1699	220	403	1014	44	228	190	0	67	31	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Prot		Perm	Prot		Perm	pm+pt			pm+pt		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	19.1	67.4	67.4	21.4	69.7	69.7	36.2	23.1		22.6	14.5	
Effective Green, g (s)	19.1	67.4	67.4	21.4	69.7	69.7	36.2	23.1		22.6	14.5	
Actuated g/C Ratio	0.14	0.48	0.48	0.15	0.50	0.50	0.26	0.16		0.16	0.10	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	239	1687	755	520	1745	781	264	261		156	164	
v/s Ratio Prot	0.13	c0.48		c0.12	0.29		c0.10	0.12		0.02	0.02	
v/s Ratio Perm			0.14			0.03	c0.12			0.04		
v/c Ratio	0.95	1.01	0.29	0.78	0.58	0.06	0.86	0.73		0.43	0.19	
Uniform Delay, d1	60.0	36.3	21.9	57.0	24.8	18.2	45.5	55.5		51.9	57.4	
Progression Factor	1.01	1.03	1.35	1.17	1.03	1.55	1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.0	8.4	0.1	6.6	1.3	0.1	24.1	9.7		1.9	0.6	
Delay (s)	69.7	45.9	29.7	73.5	26.9	28.3	69.6	65.2		53.8	57.9	
Level of Service	E	D	C	E	C	C	E	E		D	E	
Approach Delay (s)		46.1			39.5			66.6			57.1	
Approach LOS		D			D			E			E	
Intersection Summary												
HCM Average Control Delay			48.0			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			107.0%			ICU Level of Service				G		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

8: US 6 & Access 2

10/23/2008



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↗		↗
Volume (veh/h)	0	1125	725	10	0	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2079	1340	18	0	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		971	506			
pX, platoon unblocked	0.78				0.26	0.78
vC, conflicting volume	1358				2379	670
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	883				0	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	98
cM capacity (veh/h)	591				264	841

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1
Volume Total	1039	1039	670	670	18	18
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	18	18
cSH	1700	1700	1700	1700	1700	841
Volume to Capacity	0.61	0.61	0.39	0.39	0.01	0.02
Queue Length 95th (ft)	0	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	9.4
Lane LOS						A
Approach Delay (s)	0.0		0.0			9.4
Approach LOS						A

Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			56.2%	ICU Level of Service		B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

12: US 6 & Lois St

10/23/2008



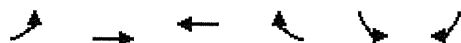
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↶	↶↶	↶↶			↶
Volume (veh/h)	49	730	485	4	0	64
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	92	2230	1482	7	0	120
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		711	547			
pX, platoon unblocked	0.93				0.57	0.93
vC, conflicting volume	1489				2784	745
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1381				2087	583
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	80				100	72
cM capacity (veh/h)	455				21	425
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	92	1115	1115	988	501	120
Volume Left	92	0	0	0	0	0
Volume Right	0	0	0	0	7	120
cSH	455	1700	1700	1700	1700	425
Volume to Capacity	0.20	0.66	0.66	0.58	0.29	0.28
Queue Length 95th (ft)	19	0	0	0	0	28
Control Delay (s)	14.9	0.0	0.0	0.0	0.0	16.7
Lane LOS	B					C
Approach Delay (s)	0.6			0.0		16.7
Approach LOS						C

Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			59.4%	ICU Level of Service		B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

16: US 6 & Holland St

10/23/2008



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↶	↶↶	↶↶			↷
Volume (veh/h)	14	720	475	5	0	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	26	2224	1467	9	0	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		1053	205			
pX, platoon unblocked	0.93				0.58	0.93
vC, conflicting volume	1477				2637	738
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1363				1831	570
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				100	95
cM capacity (veh/h)	460				37	432
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	26	1112	1112	978	499	23
Volume Left	26	0	0	0	0	0
Volume Right	0	0	0	0	9	23
cSH	460	1700	1700	1700	1700	432
Volume to Capacity	0.06	0.65	0.65	0.58	0.29	0.05
Queue Length 95th (ft)	5	0	0	0	0	4
Control Delay (s)	13.3	0.0	0.0	0.0	0.0	13.8
Lane LOS	B					B
Approach Delay (s)	0.2			0.0		13.8
Approach LOS						B

Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			58.7%	ICU Level of Service		B
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

17: US 6 & 5th St

10/23/2008



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖		↖	↖	
Volume (vph)	0	720	4	10	475	0	10	0	10	10	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Flt		1.00		1.00	1.00		1.00	0.85		1.00	0.85	
Flt Protected		1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3503		1752	3505		1770	1583		1770	1583	
Flt Permitted		1.00		0.08	1.00		0.80	1.00		0.80	1.00	
Satd. Flow (perm)		3503		139	3505		1490	1583		1490	1583	
Peak-hour factor, PHF	0.92	0.93	0.93	0.93	0.93	0.92	0.93	0.92	0.93	0.92	0.92	0.92
Growth Factor (vph)	170%	278%	170%	170%	278%	170%	170%	170%	170%	170%	170%	170%
Adj. Flow (vph)	0	2152	7	18	1420	0	18	0	18	18	0	18
RTOR Reduction (vph)	0	0	0	0	0	0	0	17	0	0	17	0
Lane Group Flow (vph)	0	2159	0	18	1420	0	18	1	0	18	1	0
Heavy Vehicles (%)	2%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases	2			6			4			8		
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	127.0			127.0			5.0			5.0		
Effective Green, g (s)	127.0			127.0			5.0			5.0		
Actuated g/C Ratio	0.91			0.91			0.04			0.04		
Clearance Time (s)	4.0			4.0			4.0			4.0		
Vehicle Extension (s)	3.0			3.0			3.0			3.0		
Lane Grp Cap (vph)	3178			126			3180			53		
v/s Ratio Prot	c0.62			0.41			0.00			0.00		
v/s Ratio Perm	0.13			c0.01			0.01			0.01		
v/c Ratio	0.68			0.14			0.45			0.34		
Uniform Delay, d1	1.6			0.7			1.0			65.9		
Progression Factor	4.52			1.15			1.16			1.00		
Incremental Delay, d2	0.5			0.5			0.1			3.8		
Delay (s)	7.6			1.3			1.3			69.7		
Level of Service	A			A			A			E		
Approach Delay (s)	7.6			1.3			67.4			67.4		
Approach LOS	A			A			E			E		
Intersection Summary												
HCM Average Control Delay	6.3			HCM Level of Service			A					
HCM Volume to Capacity ratio	0.67											
Actuated Cycle Length (s)	140.0			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												

HCM Unsignalized Intersection Capacity Analysis

51: US 6 & Clifton Elem. 2

10/23/2008



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Volume (veh/h)	700	0	0	460	0	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	2070	0	0	1360	0	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	325			1152		
pX, platoon unblocked			0.11		0.19	0.11
vC, conflicting volume			2070		2750	1035
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		0	0
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	96
cM capacity (veh/h)			181		199	121

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1380	690	680	680	5
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	5
cSH	1700	1700	1700	1700	121
Volume to Capacity	0.81	0.41	0.40	0.40	0.04
Queue Length 95th (ft)	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	36.0
Lane LOS					E
Approach Delay (s)	0.0		0.0		36.0
Approach LOS					E

Intersection Summary					
Average Delay			0.1		
Intersection Capacity Utilization			63.8%	ICU Level of Service	B
Analysis Period (min)			15		

HCM Signalized Intersection Capacity Analysis
 19: US 6 & 33 Rd

10/23/2008

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	144	425	660	139	327	2	360	76	118	4	8	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.91		1.00	0.86	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	3505	1568	1752	3500		3400	1676		1752	1590	
Flt Permitted	0.26	1.00	1.00	0.30	1.00		0.19	1.00		0.62	1.00	
Satd. Flow (perm)	484	3505	1568	549	3500		682	1676		1150	1590	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	300%	195%	100%	100%	195%	300%	100%	100%	100%	300%	300%	300%
Adj. Flow (vph)	480	921	733	154	708	7	400	84	131	13	27	307
RTOR Reduction (vph)	0	0	174	0	1	0	0	42	0	0	272	0
Lane Group Flow (vph)	480	921	559	154	714	0	400	173	0	13	62	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	pm+pt		Perm	pm+pt			pm+pt			pm+pt		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6			4			8		
Actuated Green, G (s)	92.1	77.5	77.5	71.5	61.9		37.9	31.3		17.6	16.0	
Effective Green, g (s)	92.1	77.5	77.5	71.5	61.9		37.9	31.3		17.6	16.0	
Actuated g/C Ratio	0.66	0.55	0.55	0.51	0.44		0.27	0.22		0.13	0.11	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	547	1940	868	363	1548		513	375		151	182	
v/s Ratio Prot	c0.16	0.26		0.03	0.20		c0.09	0.10		0.00	0.04	
v/s Ratio Perm	c0.42		0.36	0.19			c0.12			0.01		
v/c Ratio	0.88	0.47	0.64	0.42	0.46		0.78	0.46		0.09	0.34	
Uniform Delay, d1	16.1	18.9	21.7	18.4	27.4		61.3	47.1		53.9	57.1	
Progression Factor	1.89	0.63	0.48	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.0	0.7	2.9	0.8	0.1		7.4	0.9		0.2	1.1	
Delay (s)	42.5	12.6	13.4	19.2	27.4		68.7	48.0		54.2	58.3	
Level of Service	D	B	B	B	C		E	D		D	E	
Approach Delay (s)		19.6			26.0			61.5			58.1	
Approach LOS		B			C			E			E	

Intersection Summary			
HCM Average Control Delay	30.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	89.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			