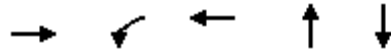


Queues

7: N. Delaware Ave & Shackamaxon Ave

05/18/2007



Lane Group	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	2187	12	486	37	84
v/c Ratio	0.63	0.16	0.14	0.13	0.22
Control Delay	7.3	10.0	4.6	26.6	16.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.3	10.0	4.6	26.6	16.6
Queue Length 50th (ft)	142	2	28	14	17
Queue Length 95th (ft)	142	2	38	29	32
Internal Link Dist (ft)	690		321	214	1237
Turn Bay Length (ft)		80			
Base Capacity (vph)	3455	77	3458	292	387
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.63	0.16	0.14	0.13	0.22

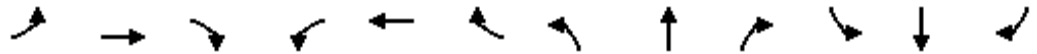
Intersection Summary

* In the Synchro Analysis for this intersection, Delaware Avenue is layed out as an east-west roadway.

HCM Signalized Intersection Capacity Analysis

7: N. Delaware Ave & Shackamaxon Ave

05/18/2007



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑		↑	↑↑↑			↑			↑	
Volume (vph)	0	1983	6	3	428	0	21	0	3	22	0	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	12	13	11	12	12	12	12	12	16	16	16
Total Lost time (s)		4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor		0.91		1.00	0.91			1.00			1.00	
Frt		1.00		1.00	1.00			0.98			0.92	
Flt Protected		1.00		0.95	1.00			0.96			0.98	
Satd. Flow (prot)		4937		1662	4940			1699			1853	
Flt Permitted		1.00		0.06	1.00			0.77			0.87	
Satd. Flow (perm)		4937		111	4940			1360			1654	
Peak-hour factor, PHF	0.91	0.91	0.75	0.25	0.88	0.88	0.67	0.67	0.50	0.61	0.65	0.65
Adj. Flow (vph)	0	2179	8	12	486	0	31	0	6	36	0	48
RTOR Reduction (vph)	0	0	0	0	0	0	0	5	0	0	38	0
Lane Group Flow (vph)	0	2187	0	12	486	0	0	32	0	0	46	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Parking (#/hr)			10			10				10		10
Turn Type				Perm			Perm			Perm		
Protected Phases					8			2			2	
Permitted Phases		4		8			2			2		
Actuated Green, G (s)		62.0		62.0	62.0			17.0			17.0	
Effective Green, g (s)		63.0		63.0	63.0			19.0			19.0	
Actuated g/C Ratio		0.70		0.70	0.70			0.21			0.21	
Clearance Time (s)		5.0		5.0	5.0			6.0			6.0	
Lane Grp Cap (vph)		3456		78	3458			287			349	
v/s Ratio Prot					0.10							
v/s Ratio Perm		c0.44		0.11				0.02			c0.03	
v/c Ratio		0.63		0.15	0.14			0.11			0.13	
Uniform Delay, d1		7.3		4.5	4.5			28.7			28.8	
Progression Factor		0.88		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.8		4.2	0.1			0.8			0.8	
Delay (s)		7.2		8.7	4.6			29.5			29.6	
Level of Service		A		A	A			C			C	
Approach Delay (s)		7.2			4.7			29.5			29.6	
Approach LOS		A			A			C			C	

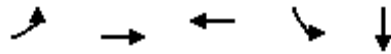
Intersection Summary

HCM Average Control Delay	7.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Queues

8: N. Delaware Ave & Frankford Ave

05/18/2007



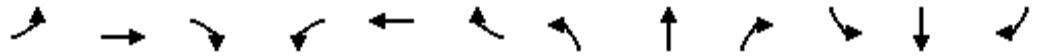
Lane Group	EBL	EBT	WBT	SBL	SBT
Lane Group Flow (vph)	378	1774	507	129	186
v/c Ratio	0.64	0.57	0.20	0.46	0.38
Control Delay	18.1	15.5	8.4	35.4	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	15.5	8.4	35.4	8.2
Queue Length 50th (ft)	129	278	34	66	6
Queue Length 95th (ft)	222	341	48	98	33
Internal Link Dist (ft)		1382	690		19
Turn Bay Length (ft)	320				
Base Capacity (vph)	591	3129	2551	279	486
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.64	0.57	0.20	0.46	0.38

Intersection Summary

* In the Synchro Analysis for this intersection, Delaware Avenue is layed out as an east-west roadway.

HCM Signalized Intersection Capacity Analysis
 8: N. Delaware Ave & Frankford Ave

05/18/2007



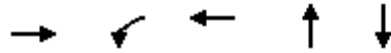
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑↑		↖	↑↑↑			↕		↖	↕	
Volume (vph)	329	1614	0	0	412	54	0	0	0	106	0	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	13	12	15
Total Lost time (s)	4.0	4.0			4.0					4.0	4.0	
Lane Util. Factor	1.00	0.91			0.91					0.95	0.95	
Frt	1.00	1.00			0.98					1.00	0.86	
Flt Protected	0.95	1.00			1.00					0.95	1.00	
Satd. Flow (prot)	1719	4693			4839					1434	1475	
Flt Permitted	0.41	1.00			1.00					0.76	0.98	
Satd. Flow (perm)	739	4693			4839					1143	1456	
Peak-hour factor, PHF	0.87	0.91	0.91	0.92	0.94	0.78	0.92	0.92	0.92	0.74	0.74	0.83
Adj. Flow (vph)	378	1774	0	0	438	69	0	0	0	143	0	172
RTOR Reduction (vph)	0	0	0	0	23	0	0	0	0	0	130	0
Lane Group Flow (vph)	378	1774	0	0	484	0	0	0	0	129	56	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Parking (#/hr)		10								10		10
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	7	4			8			2				6
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	58.0	58.0			45.0					20.0	20.0	
Effective Green, g (s)	57.0	60.0			47.0					22.0	22.0	
Actuated g/C Ratio	0.63	0.67			0.52					0.24	0.24	
Clearance Time (s)	3.0	6.0			6.0					6.0	6.0	
Lane Grp Cap (vph)	566	3129			2527					279	356	
v/s Ratio Prot	c0.07	0.38			0.10							
v/s Ratio Perm	c0.36									c0.11	0.04	
v/c Ratio	0.67	0.57			0.19					0.46	0.16	
Uniform Delay, d1	8.1	8.0			11.4					29.0	26.7	
Progression Factor	2.10	1.84			0.79					1.00	1.00	
Incremental Delay, d2	4.0	0.5			0.2					5.4	0.9	
Delay (s)	21.1	15.3			9.2					34.4	27.7	
Level of Service	C	B			A					C	C	
Approach Delay (s)		16.3			9.2			0.0			30.4	
Approach LOS		B			A			A			C	

Intersection Summary		
HCM Average Control Delay	16.6	HCM Level of Service B
HCM Volume to Capacity ratio	0.58	
Actuated Cycle Length (s)	90.0	Sum of lost time (s) 8.0
Intersection Capacity Utilization	51.8%	ICU Level of Service A
Analysis Period (min)	15	
c Critical Lane Group		

Queues

9: N. Delaware Ave & Columbia Ave

05/18/2007



Lane Group	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	1910	15	571	110	199
v/c Ratio	0.89	0.19	0.27	0.29	0.51
Control Delay	17.1	10.2	4.8	23.3	29.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.1	10.2	4.8	23.3	29.4
Queue Length 50th (ft)	615	2	41	40	84
Queue Length 95th (ft)	693	m6	52	78	137
Internal Link Dist (ft)	288		577	81	623
Turn Bay Length (ft)		105			
Base Capacity (vph)	2139	80	2139	382	389
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.89	0.19	0.27	0.29	0.51

Intersection Summary

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

* In the Synchro Analysis for this intersection, Delaware Avenue is layed out as an east-west roadway.

HCM Signalized Intersection Capacity Analysis

9: N. Delaware Ave & Columbia Ave

05/18/2007



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑			↕			↕	
Volume (vph)	0	1773	4	13	497	0	61	0	31	113	8	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor		0.95		1.00	0.95			1.00			1.00	
Frt		1.00		1.00	1.00			0.95			0.96	
Flt Protected		1.00		0.95	1.00			0.97			0.97	
Satd. Flow (prot)		3437		1719	3438			1672			1687	
Flt Permitted		1.00		0.07	1.00			0.74			0.74	
Satd. Flow (perm)		3437		129	3438			1279			1297	
Peak-hour factor, PHF	0.93	0.93	0.93	0.87	0.87	0.87	0.84	0.84	0.84	0.83	0.83	0.83
Adj. Flow (vph)	0	1906	4	15	571	0	73	0	37	136	10	53
RTOR Reduction (vph)	0	0	0	0	0	0	0	12	0	0	14	0
Lane Group Flow (vph)	0	1910	0	15	571	0	0	98	0	0	185	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type				Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)		55.0		55.0	55.0			24.0			24.0	
Effective Green, g (s)		56.0		56.0	56.0			26.0			26.0	
Actuated g/C Ratio		0.62		0.62	0.62			0.29			0.29	
Clearance Time (s)		5.0		5.0	5.0			6.0			6.0	
Lane Grp Cap (vph)		2139		80	2139			369			375	
v/s Ratio Prot		c0.56			0.17							
v/s Ratio Perm				0.12				0.08			c0.14	
v/c Ratio		0.89		0.19	0.27			0.27			0.49	
Uniform Delay, d1		14.5		7.3	7.7			24.6			26.5	
Progression Factor		0.78		0.58	0.58			1.00			1.00	
Incremental Delay, d2		5.0		5.0	0.3			1.8			4.6	
Delay (s)		16.3		9.2	4.8			26.4			31.1	
Level of Service		B		A	A			C			C	
Approach Delay (s)		16.3			4.9			26.4			31.1	
Approach LOS		B			A			C			C	

Intersection Summary

HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Queues

10: Richmond St & N. Delaware Ave

05/18/2007



Lane Group	WBL	NET	SWT
Lane Group Flow (vph)	265	1728	253
v/c Ratio	0.63	0.62	0.09
Control Delay	44.4	12.1	2.2
Queue Delay	0.0	0.0	0.0
Total Delay	44.4	12.1	2.2
Queue Length 50th (ft)	74	428	13
Queue Length 95th (ft)	93	m492	18
Internal Link Dist (ft)	285	551	107
Turn Bay Length (ft)	180		
Base Capacity (vph)	422	2792	2792
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.63	0.62	0.09

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

10: Richmond St & N. Delaware Ave

05/18/2007



Movement	WBL	WBR	NET	NER	SWL	SWT
Lane Configurations						
Volume (vph)	192	7	1693	0	0	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0			4.0
Lane Util. Factor	0.97		0.95			0.95
Frt	0.99		1.00			1.00
Flt Protected	0.95		1.00			1.00
Satd. Flow (prot)	3430		3539			3539
Flt Permitted	0.95		1.00			1.00
Satd. Flow (perm)	3430		3539			3539
Peak-hour factor, PHF	0.75	0.75	0.98	0.98	0.85	0.85
Adj. Flow (vph)	256	9	1728	0	0	253
RTOR Reduction (vph)	3	0	0	0	0	0
Lane Group Flow (vph)	262	0	1728	0	0	253
Turn Type						
Protected Phases	8		2			6
Permitted Phases						
Actuated Green, G (s)	9.0		70.0			70.0
Effective Green, g (s)	11.0		71.0			71.0
Actuated g/C Ratio	0.12		0.79			0.79
Clearance Time (s)	6.0		5.0			5.0
Lane Grp Cap (vph)	419		2792			2792
v/s Ratio Prot	c0.08		c0.49			0.07
v/s Ratio Perm						
v/c Ratio	0.63		0.62			0.09
Uniform Delay, d1	37.5		3.9			2.2
Progression Factor	1.00		2.85			1.00
Incremental Delay, d2	6.9		0.5			0.1
Delay (s)	44.5		11.7			2.2
Level of Service	D		B			A
Approach Delay (s)	44.5		11.7			2.2
Approach LOS	D		B			A

Intersection Summary

HCM Average Control Delay	14.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Queues

11: Penn St & N. Delaware Ave

05/18/2007



Lane Group	WBL	NBT	SBT
Lane Group Flow (vph)	32	2455	712
v/c Ratio	0.08	0.75	0.22
Control Delay	29.2	10.3	4.2
Queue Delay	0.0	0.7	0.0
Total Delay	29.2	11.1	4.2
Queue Length 50th (ft)	15	275	36
Queue Length 95th (ft)	18	332	47
Internal Link Dist (ft)	171	483	1382
Turn Bay Length (ft)			
Base Capacity (vph)	411	3285	3285
Starvation Cap Reductn	0	451	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.08	0.87	0.22

Intersection Summary

HCM Signalized Intersection Capacity Analysis

11: Penn St & N. Delaware Ave

05/18/2007



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑↑↑		↔	↑↑↑
Volume (vph)	14	0	2259	0	0	648
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	12
Total Lost time (s)	4.0		4.0			4.0
Lane Util. Factor	1.00		0.91			0.91
Frt	1.00		1.00			1.00
Flt Protected	0.95		1.00			1.00
Satd. Flow (prot)	1948		4693			4693
Flt Permitted	0.95		1.00			1.00
Satd. Flow (perm)	1948		4693			4693
Peak-hour factor, PHF	0.44	0.44	0.92	0.92	0.91	0.91
Adj. Flow (vph)	32	0	2455	0	0	712
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	32	0	2455	0	0	712
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Parking (#/hr)		10	10	10		10
Turn Type					Perm	
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	17.0		61.0			61.0
Effective Green, g (s)	19.0		63.0			63.0
Actuated g/C Ratio	0.21		0.70			0.70
Clearance Time (s)	6.0		6.0			6.0
Lane Grp Cap (vph)	411		3285			3285
v/s Ratio Prot	c0.02		c0.52			0.15
v/s Ratio Perm						
v/c Ratio	0.08		0.75			0.22
Uniform Delay, d1	28.5		8.5			4.8
Progression Factor	1.00		1.00			0.84
Incremental Delay, d2	0.4		1.6			0.1
Delay (s)	28.8		10.1			4.2
Level of Service	C		B			A
Approach Delay (s)	28.8		10.1			4.2
Approach LOS	C		B			A
Intersection Summary						
HCM Average Control Delay			9.0		HCM Level of Service	A
HCM Volume to Capacity ratio			0.59			
Actuated Cycle Length (s)			90.0		Sum of lost time (s)	8.0
Intersection Capacity Utilization			53.6%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Queues

12: Spring Garden St. & N. Delaware Ave

05/18/2007



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	907	415	376	1641	820
v/c Ratio	0.75	0.39	0.91	0.59	0.60
Control Delay	27.0	6.2	60.5	13.4	22.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	27.0	6.2	60.5	13.4	22.8
Queue Length 50th (ft)	191	53	183	197	108
Queue Length 95th (ft)	291	128	#385	239	131
Internal Link Dist (ft)				1261	483
Turn Bay Length (ft)	160		215		
Base Capacity (vph)	1284	1069	411	2762	1753
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.71	0.39	0.91	0.59	0.47

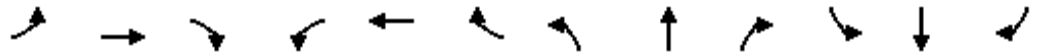
Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

12: Spring Garden St. & N. Delaware Ave

05/18/2007



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗↘		↗				↗	↑↑↑		↗	↑↑↑	
Volume (vph)	853	0	390	0	0	0	350	1526	0	0	459	222
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0				4.0	4.0			4.0	
Lane Util. Factor	0.97		1.00				1.00	0.91			0.91	
Frt	1.00		0.85				1.00	1.00			0.95	
Flt Protected	0.95		1.00				0.95	1.00			1.00	
Satd. Flow (prot)	3433		1583				1770	5085			4837	
Flt Permitted	0.95		1.00				0.95	1.00			1.00	
Satd. Flow (perm)	3433		1583				1770	5085			4837	
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.93	0.93	0.93	0.83	0.83	0.83
Adj. Flow (vph)	907	0	415	0	0	0	376	1641	0	0	553	267
RTOR Reduction (vph)	0	0	44	0	0	0	0	0	0	0	108	0
Lane Group Flow (vph)	907	0	371	0	0	0	376	1641	0	0	712	0
Turn Type	custom		custom				Prot			Prot		
Protected Phases			4 5				5	2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)	25.6		47.7				16.1	40.4			18.3	
Effective Green, g (s)	27.6		49.7				18.1	42.4			20.3	
Actuated g/C Ratio	0.35		0.64				0.23	0.54			0.26	
Clearance Time (s)	6.0						6.0	6.0			6.0	
Vehicle Extension (s)	3.0						3.0	3.0			3.0	
Lane Grp Cap (vph)	1215		1009				411	2764			1259	
v/s Ratio Prot			0.23				c0.21	c0.32			0.15	
v/s Ratio Perm	c0.26											
v/c Ratio	0.75		0.37				0.91	0.59			0.57	
Uniform Delay, d1	22.1		6.7				29.2	12.0			25.0	
Progression Factor	1.00		1.00				1.00	1.00			1.00	
Incremental Delay, d2	2.5		0.2				24.5	0.9			0.6	
Delay (s)	24.7		6.9				53.7	12.9			25.6	
Level of Service	C		A				D	B			C	
Approach Delay (s)		19.1			0.0			20.5			25.6	
Approach LOS		B			A			C			C	

Intersection Summary

HCM Average Control Delay	21.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	78.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Queues

13: Callowhill St. & Columbus Blvd

05/18/2007



Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	33	89	2475	908
v/c Ratio	0.14	0.31	0.63	0.23
Control Delay	36.2	11.3	5.2	2.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	36.2	11.3	5.2	2.9
Queue Length 50th (ft)	17	0	172	39
Queue Length 95th (ft)	36	26	204	50
Internal Link Dist (ft)	147		1206	1261
Turn Bay Length (ft)				
Base Capacity (vph)	236	288	3955	3955
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.14	0.31	0.63	0.23

Intersection Summary

HCM Signalized Intersection Capacity Analysis

13: Callowhill St. & Columbus Blvd

05/18/2007



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	25	67	0	2277	844	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		0.91	0.91	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1770	1583		5085	5085	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	1770	1583		5085	5085	
Peak-hour factor, PHF	0.75	0.75	0.92	0.92	0.93	0.93
Adj. Flow (vph)	33	89	0	2475	908	0
RTOR Reduction (vph)	0	77	0	0	0	0
Lane Group Flow (vph)	33	12	0	2475	908	0
Turn Type	Perm					
Protected Phases	4			2	6	
Permitted Phases	4					
Actuated Green, G (s)	10.0	10.0		68.0	68.0	
Effective Green, g (s)	12.0	12.0		70.0	70.0	
Actuated g/C Ratio	0.13	0.13		0.78	0.78	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)	236	211		3955	3955	
v/s Ratio Prot	c0.02			c0.49		0.18
v/s Ratio Perm	0.01					
v/c Ratio	0.14	0.06		0.63	0.23	
Uniform Delay, d1	34.4	34.1		4.3	2.7	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	0.5		0.8	0.1	
Delay (s)	35.7	34.6		5.1	2.8	
Level of Service	D	C		A	A	
Approach Delay (s)	34.9			5.1		2.8
Approach LOS	C			A		A

Intersection Summary

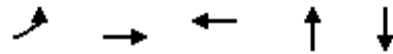
HCM Average Control Delay	5.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Queues

14: Race St & Columbus Blvd

05/18/2007



Lane Group	EBL	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	274	185	2	1973	980
v/c Ratio	0.76	0.42	0.02	0.57	0.28
Control Delay	48.1	8.9	42.5	8.8	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	48.1	8.9	42.5	8.8	6.3
Queue Length 50th (ft)	135	1	1	163	61
Queue Length 95th (ft)	#297	59	8	315	124
Internal Link Dist (ft)		497	85	1197	1206
Turn Bay Length (ft)					
Base Capacity (vph)	369	443	187	3440	3440
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.74	0.42	0.01	0.57	0.28

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

14: Race St & Columbus Blvd

05/18/2007



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	252	2	168	2	0	0	0	1815	0	0	902	0
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			4.0	
Lane Util. Factor	1.00	1.00			1.00			0.91			0.91	
Frt	1.00	0.85			1.00			1.00			1.00	
Flt Protected	0.95	1.00			0.95			1.00			1.00	
Satd. Flow (prot)	1770	1586			1770			5085			5085	
Flt Permitted	0.95	1.00			1.00			1.00			1.00	
Satd. Flow (perm)	1770	1586			1863			5085			5085	
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)	274	2	183	2	0	0	0	1973	0	0	980	0
RTOR Reduction (vph)	0	152	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	274	33	0	0	2	0	0	1973	0	0	980	0
Turn Type	Split			Perm								
Protected Phases	4	4			8			2			6	
Permitted Phases				8								
Actuated Green, G (s)	15.6	15.6			1.2			56.2			56.2	
Effective Green, g (s)	17.6	15.6			1.2			58.2			58.2	
Actuated g/C Ratio	0.19	0.17			0.01			0.64			0.64	
Clearance Time (s)	6.0	6.0			6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	342	272			25			3252			3252	
v/s Ratio Prot	c0.15	0.02						c0.39			0.19	
v/s Ratio Perm					c0.00							
v/c Ratio	0.80	0.12			0.08			0.61			0.30	
Uniform Delay, d1	35.0	31.9			44.4			9.7			7.3	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	12.6	0.2			1.4			0.8			0.2	
Delay (s)	47.7	32.1			45.7			10.5			7.6	
Level of Service	D	C			D			B			A	
Approach Delay (s)		41.4			45.7			10.5			7.6	
Approach LOS		D			D			B			A	

Intersection Summary

HCM Average Control Delay	13.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	91.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Queues

15: Penn's Landing & Columbus Blvd

05/18/2007



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	331	1659	8	1125
v/c Ratio	0.62	0.63	0.07	0.36
Control Delay	25.3	16.6	40.9	8.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.3	16.6	40.9	8.2
Queue Length 50th (ft)	112	231	4	100
Queue Length 95th (ft)	149	279	18	124
Internal Link Dist (ft)	281	402		1197
Turn Bay Length (ft)			200	
Base Capacity (vph)	531	2653	118	3113
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.62	0.63	0.07	0.36

Intersection Summary

HCM Signalized Intersection Capacity Analysis

15: Penn's Landing & Columbus Blvd

05/18/2007



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↵		↑↑↑		↵	↑↑↑
Volume (vph)	47	201	1487	6	7	1046
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0		4.0	4.0
Lane Util. Factor	1.00		0.91		1.00	0.91
Frt	0.89		1.00		1.00	1.00
Flt Protected	0.99		1.00		0.95	1.00
Satd. Flow (prot)	1643		5082		1770	4916
Flt Permitted	0.99		1.00		0.95	1.00
Satd. Flow (perm)	1643		5082		1770	4916
Peak-hour factor, PHF	0.75	0.75	0.90	0.90	0.93	0.93
Adj. Flow (vph)	63	268	1652	7	8	1125
RTOR Reduction (vph)	74	0	0	0	0	0
Lane Group Flow (vph)	257	0	1659	0	8	1125
Parking (#/hr)						0
Turn Type					Prot	
Protected Phases	8		2		1	6
Permitted Phases						
Actuated Green, G (s)	23.0		45.0		4.0	55.0
Effective Green, g (s)	25.0		47.0		6.0	57.0
Actuated g/C Ratio	0.28		0.52		0.07	0.63
Clearance Time (s)	6.0		6.0		6.0	6.0
Lane Grp Cap (vph)	456		2654		118	3113
v/s Ratio Prot	c0.16		c0.33		0.00	c0.23
v/s Ratio Perm						
v/c Ratio	0.56		0.62		0.07	0.36
Uniform Delay, d1	27.8		15.2		39.4	7.8
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	5.0		1.1		1.1	0.3
Delay (s)	32.8		16.4		40.5	8.2
Level of Service	C		B		D	A
Approach Delay (s)	32.8		16.4			8.4
Approach LOS	C		B			A

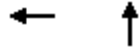
Intersection Summary

HCM Average Control Delay	15.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Queues

16: Callowhill St. & 3rd St.

05/18/2007



Lane Group	WBT	NBT
Lane Group Flow (vph)	2229	419
v/c Ratio	0.49	0.38
Control Delay	10.7	25.1
Queue Delay	0.0	0.0
Total Delay	10.7	25.1
Queue Length 50th (ft)	162	95
Queue Length 95th (ft)	186	131
Internal Link Dist (ft)	309	280
Turn Bay Length (ft)		
Base Capacity (vph)	4515	1094
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.49	0.38

Intersection Summary

HCM Signalized Intersection Capacity Analysis

16: Callowhill St. & 3rd St.

05/18/2007



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑↑			↑↑				
Volume (vph)	0	0	0	0	2038	35	77	287	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0				
Lane Util. Factor					0.81			0.95				
Frt					1.00			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					7525			3502				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					7525			3502				
Peak-hour factor, PHF	0.92	0.92	0.92	0.93	0.93	0.93	0.87	0.87	0.87	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	2191	38	89	330	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	3	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	2226	0	0	414	0	0	0	0
Turn Type								Perm				
Protected Phases					6			8				
Permitted Phases							8					
Actuated Green, G (s)					52.0			26.0				
Effective Green, g (s)					54.0			28.0				
Actuated g/C Ratio					0.60			0.31				
Clearance Time (s)					6.0			6.0				
Lane Grp Cap (vph)					4515			1090				
v/s Ratio Prot					c0.30							
v/s Ratio Perm								0.12				
v/c Ratio					0.49			0.38				
Uniform Delay, d1					10.2			24.2				
Progression Factor					1.00			1.00				
Incremental Delay, d2					0.4			1.0				
Delay (s)					10.6			25.2				
Level of Service					B			C				
Approach Delay (s)		0.0			10.6			25.2			0.0	
Approach LOS		A			B			C			A	

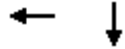
Intersection Summary

HCM Average Control Delay	12.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Queues
17: 4th St &

05/18/2007

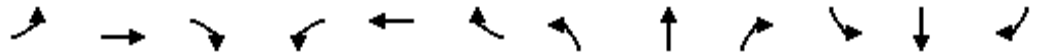


Lane Group	WBT	SBT
Lane Group Flow (vph)	2364	464
v/c Ratio	0.52	0.44
Control Delay	4.7	26.0
Queue Delay	0.0	0.0
Total Delay	4.7	26.0
Queue Length 50th (ft)	54	108
Queue Length 95th (ft)	59	128
Internal Link Dist (ft)	367	1136
Turn Bay Length (ft)		
Base Capacity (vph)	4525	1049
Starvation Cap Reductn	32	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.53	0.44
Intersection Summary		

HCM Signalized Intersection Capacity Analysis

17: 4th St &

05/18/2007



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					←←←←						↑↑	
Volume (vph)	0	0	0	132	2066	0	0	0	0	0	237	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0						4.0	
Lane Util. Factor					0.81						0.95	
Frt					1.00						0.95	
Flt Protected					1.00						1.00	
Satd. Flow (prot)					7522						3356	
Flt Permitted					1.00						1.00	
Satd. Flow (perm)					7522						3356	
Peak-hour factor, PHF	0.92	0.92	0.92	0.93	0.93	0.93	0.92	0.92	0.92	0.78	0.78	0.78
Adj. Flow (vph)	0	0	0	142	2222	0	0	0	0	0	304	160
RTOR Reduction (vph)	0	0	0	0	13	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	0	0	0	2351	0	0	0	0	0	459	0
Turn Type					Perm							
Protected Phases						8						6
Permitted Phases					8							
Actuated Green, G (s)						52.0						26.0
Effective Green, g (s)						54.0						28.0
Actuated g/C Ratio						0.60						0.31
Clearance Time (s)						6.0						6.0
Lane Grp Cap (vph)						4513						1044
v/s Ratio Prot												c0.14
v/s Ratio Perm						0.31						
v/c Ratio						0.52						0.44
Uniform Delay, d1						10.5						24.7
Progression Factor						0.41						1.00
Incremental Delay, d2						0.4						1.3
Delay (s)						4.7						26.1
Level of Service						A						C
Approach Delay (s)		0.0				4.7		0.0				26.1
Approach LOS		A				A		A				C

Intersection Summary

HCM Average Control Delay	8.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	42.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Queues

18: Callowhill St. & 5th St.

05/18/2007



Lane Group	WBT	NBL	NBT
Lane Group Flow (vph)	2529	80	887
v/c Ratio	0.57	0.14	0.81
Control Delay	13.9	21.3	35.3
Queue Delay	0.7	0.0	0.0
Total Delay	14.6	21.3	35.3
Queue Length 50th (ft)	305	30	242
Queue Length 95th (ft)	345	63	316
Internal Link Dist (ft)	369		252
Turn Bay Length (ft)			
Base Capacity (vph)	4441	555	1101
Starvation Cap Reductn	1399	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.83	0.14	0.81

Intersection Summary

HCM Signalized Intersection Capacity Analysis

18: Callowhill St. & 5th St.

05/18/2007



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑↑		↖	↑↑				
Volume (vph)	0	0	0	0	2026	326	72	798	0	0	0	0
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				
Lane Util. Factor					0.81		1.00	0.95				
Flt					0.98		1.00	1.00				
Flt Protected					1.00		0.95	1.00				
Satd. Flow (prot)					7387		1770	3539				
Flt Permitted					1.00		0.95	1.00				
Satd. Flow (perm)					7387		1770	3539				
Peak-hour factor, PHF	0.92	0.92	0.92	0.93	0.93	0.93	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	2178	351	80	887	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	9	0	5	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	2520	0	75	887	0	0	0	0
Turn Type							Perm					
Protected Phases					8			2				
Permitted Phases							2					
Actuated Green, G (s)					52.0		26.0	26.0				
Effective Green, g (s)					54.0		28.0	28.0				
Actuated g/C Ratio					0.60		0.31	0.31				
Clearance Time (s)					6.0		6.0	6.0				
Lane Grp Cap (vph)					4432		551	1101				
v/s Ratio Prot					c0.34			c0.25				
v/s Ratio Perm							0.04					
v/c Ratio					0.57		0.14	0.81				
Uniform Delay, d1					10.9		22.3	28.5				
Progression Factor					1.23		1.00	1.00				
Incremental Delay, d2					0.5		0.5	6.3				
Delay (s)					13.9		22.8	34.8				
Level of Service					B		C	C				
Approach Delay (s)		0.0			13.9			33.8			0.0	
Approach LOS		A			B			C			A	

Intersection Summary

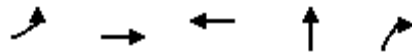
HCM Average Control Delay	19.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Queues

19: Spring Garden St. & 5th St

05/18/2007



Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Group Flow (vph)	150	998	839	1048	291
v/c Ratio	0.59	0.53	0.55	0.90	0.54
Control Delay	20.1	10.4	5.0	31.7	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.1	10.4	5.0	31.7	16.2
Queue Length 50th (ft)	25	111	51	186	57
Queue Length 95th (ft)	#58	157	71	#299	123
Internal Link Dist (ft)		356	392	1122	
Turn Bay Length (ft)	155				30
Base Capacity (vph)	253	1887	1525	1166	539
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.59	0.53	0.55	0.90	0.54

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

19: Spring Garden St. & 5th St

05/18/2007



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	147	978	0	0	725	89	244	751	276	0	0	0
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	6.0			
Lane Util. Factor	1.00	0.95			0.95			0.95	1.00			
Frt	1.00	1.00			0.98			1.00	0.85			
Flt Protected	0.95	1.00			1.00			0.99	1.00			
Satd. Flow (prot)	1770	3539			3481			3496	1583			
Flt Permitted	0.21	1.00			1.00			0.99	1.00			
Satd. Flow (perm)	388	3539			3481			3496	1583			
Peak-hour factor, PHF	0.98	0.98	0.98	0.97	0.97	0.97	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	150	998	0	0	747	92	257	791	291	0	0	0
RTOR Reduction (vph)	0	0	0	0	16	0	0	0	64	0	0	0
Lane Group Flow (vph)	150	998	0	0	823	0	0	1048	227	0	0	0
Turn Type	pm+pt							Split		Perm		
Protected Phases	7	4			8		2	2				
Permitted Phases	4								2			
Actuated Green, G (s)	30.0	30.0			24.0			18.0	18.0			
Effective Green, g (s)	31.0	32.0			26.0			20.0	18.0			
Actuated g/C Ratio	0.52	0.53			0.43			0.33	0.30			
Clearance Time (s)	5.0	6.0			6.0			6.0	6.0			
Lane Grp Cap (vph)	247	1887			1508			1165	475			
v/s Ratio Prot	0.02	c0.28			0.24			c0.30				
v/s Ratio Perm	c0.29								0.14			
v/c Ratio	0.61	0.53			0.55			0.90	0.48			
Uniform Delay, d1	10.9	9.1			12.6			19.0	17.2			
Progression Factor	1.00	1.00			0.29			1.00	1.00			
Incremental Delay, d2	10.6	1.1			1.3			11.1	3.4			
Delay (s)	21.5	10.2			5.0			30.2	20.6			
Level of Service	C	B			A			C	C			
Approach Delay (s)		11.6			5.0			28.1			0.0	
Approach LOS		B			A			C			A	

Intersection Summary

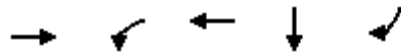
HCM Average Control Delay	16.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues

20: Spring Garden St. & 4th St

05/18/2007



Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	1490	58	822	274	78
v/c Ratio	0.85	0.30	0.39	0.56	0.19
Control Delay	16.6	10.7	4.1	24.1	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	16.6	10.7	4.1	24.1	9.6
Queue Length 50th (ft)	163	5	41	85	6
Queue Length 95th (ft)	#242	m17	54	151	34
Internal Link Dist (ft)	392		378	276	
Turn Bay Length (ft)		170			40
Base Capacity (vph)	1761	191	2123	491	414
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.85	0.30	0.39	0.56	0.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

HCM Signalized Intersection Capacity Analysis

20: Spring Garden St. & 4th St

05/18/2007



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↔	↑↑						↔	↔
Volume (vph)	0	1290	81	53	756	0	0	0	0	54	198	72
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	6.0
Lane Util. Factor		0.95		1.00	0.95						1.00	1.00
Frt		0.99		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						0.99	1.00
Satd. Flow (prot)		3508		1770	3539						1843	1583
Flt Permitted		1.00		0.12	1.00						0.99	1.00
Satd. Flow (perm)		3508		233	3539						1843	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
Adj. Flow (vph)	0	1402	88	58	822	0	0	0	0	59	215	78
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	0	0	0	44
Lane Group Flow (vph)	0	1483	0	58	822	0	0	0	0	0	274	34
Turn Type				pm+pt						Perm		Perm
Protected Phases		4		3	8						6	
Permitted Phases				8						6		6
Actuated Green, G (s)		28.0		34.0	34.0						14.0	14.0
Effective Green, g (s)		30.0		34.0	36.0						16.0	14.0
Actuated g/C Ratio		0.50		0.57	0.60						0.27	0.23
Clearance Time (s)		6.0		4.0	6.0						6.0	6.0
Lane Grp Cap (vph)		1754		183	2123						491	369
v/s Ratio Prot		c0.42		0.01	c0.23							
v/s Ratio Perm				0.17							0.15	0.02
v/c Ratio		0.85		0.32	0.39						0.56	0.09
Uniform Delay, d1		13.0		10.6	6.3						19.0	18.0
Progression Factor		0.85		1.40	0.56						1.00	1.00
Incremental Delay, d2		4.7		4.0	0.5						4.5	0.5
Delay (s)		15.8		18.9	4.0						23.5	18.5
Level of Service		B		B	A						C	B
Approach Delay (s)		15.8			5.0			0.0			22.4	
Approach LOS		B			A			A			C	

Intersection Summary

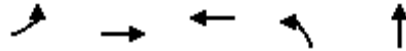
HCM Average Control Delay	13.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues

21: Spring Garden St. & 3rd St.

05/18/2007



Lane Group	EBL	EBT	WBT	NBL	NBT
Lane Group Flow (vph)	158	1185	855	103	409
v/c Ratio	0.58	0.59	0.52	0.19	0.73
Control Delay	16.6	10.7	8.1	16.9	25.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	16.6	10.7	8.1	16.9	25.7
Queue Length 50th (ft)	28	112	62	27	114
Queue Length 95th (ft)	m28	m114	83	59	#234
Internal Link Dist (ft)		378	448		1140
Turn Bay Length (ft)	126				
Base Capacity (vph)	271	2005	1640	531	563
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.58	0.59	0.52	0.19	0.73

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

HCM Signalized Intersection Capacity Analysis

21: Spring Garden St. & 3rd St.

05/18/2007



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗↗			↖↖		↖	↗				
Volume (vph)	145	1090	0	0	704	83	95	236	140	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0				
Lane Util. Factor	1.00	0.95			0.95		1.00	1.00				
Frt	1.00	1.00			0.98		1.00	0.94				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1770	3539			3483		1770	1759				
Flt Permitted	0.21	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	397	3539			3483		1770	1759				
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)	158	1185	0	0	765	90	103	257	152	0	0	0
RTOR Reduction (vph)	0	0	0	0	15	0	0	36	0	0	0	0
Lane Group Flow (vph)	158	1185	0	0	840	0	103	373	0	0	0	0
Turn Type	pm+pt						Split					
Protected Phases	7	4			8		2	2				
Permitted Phases	4											
Actuated Green, G (s)	32.0	32.0			26.0		16.0	16.0				
Effective Green, g (s)	32.0	34.0			28.0		18.0	18.0				
Actuated g/C Ratio	0.53	0.57			0.47		0.30	0.30				
Clearance Time (s)	4.0	6.0			6.0		6.0	6.0				
Lane Grp Cap (vph)	258	2005			1625		531	528				
v/s Ratio Prot	0.02	c0.33			0.24		0.06	c0.21				
v/s Ratio Perm	0.31											
v/c Ratio	0.61	0.59			0.52		0.19	0.71				
Uniform Delay, d1	10.4	8.5			11.2		15.6	18.7				
Progression Factor	1.41	1.15			0.63		1.00	1.00				
Incremental Delay, d2	5.6	0.7			1.1		0.8	7.8				
Delay (s)	20.2	10.4			8.2		16.4	26.4				
Level of Service	C	B			A		B	C				
Approach Delay (s)		11.6			8.2		24.4				0.0	
Approach LOS		B			A		C				A	

Intersection Summary

HCM Average Control Delay	12.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues

22: Spring Garden St. & 2nd St.

05/18/2007



Lane Group	EBT	WBL	WBT	SBT
Lane Group Flow (vph)	1502	80	646	740
v/c Ratio	0.91	0.42	0.32	0.70
Control Delay	21.0	13.0	7.4	21.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.0	13.0	7.4	21.2
Queue Length 50th (ft)	123	12	57	113
Queue Length 95th (ft)	#383	27	85	168
Internal Link Dist (ft)	448		1146	338
Turn Bay Length (ft)		67		
Base Capacity (vph)	1644	191	2005	1058
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.91	0.42	0.32	0.70

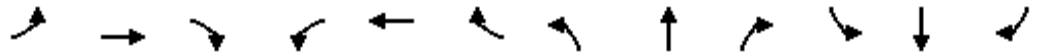
Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

22: Spring Garden St. & 2nd St.

05/18/2007



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑						↑↑	
Volume (vph)	0	1290	92	74	594	0	0	0	0	154	382	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		0.95		1.00	0.95						0.95	
Frt		0.99		1.00	1.00						0.97	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		3504		1770	3539						3388	
Flt Permitted		1.00		0.13	1.00						0.99	
Satd. Flow (perm)		3504		248	3539						3388	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1402	100	80	646	0	0	0	0	167	415	158
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	0	0	41	0
Lane Group Flow (vph)	0	1493	0	80	646	0	0	0	0	0	699	0
Turn Type				pm+pt						Split		
Protected Phases		4		3	8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		26.0		32.0	32.0						16.0	
Effective Green, g (s)		28.0		32.0	34.0						18.0	
Actuated g/C Ratio		0.47		0.53	0.57						0.30	
Clearance Time (s)		6.0		4.0	6.0						6.0	
Lane Grp Cap (vph)		1635		183	2005						1016	
v/s Ratio Prot		c0.43		0.01	c0.18						c0.21	
v/s Ratio Perm				0.22								
v/c Ratio		0.91		0.44	0.32						0.69	
Uniform Delay, d1		14.9		12.4	6.9						18.5	
Progression Factor		0.76		1.00	1.00						1.00	
Incremental Delay, d2		8.2		7.4	0.4						3.8	
Delay (s)		19.5		19.8	7.3						22.3	
Level of Service		B		B	A						C	
Approach Delay (s)		19.5			8.7			0.0			22.3	
Approach LOS		B			A			A			C	

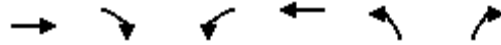
Intersection Summary

HCM Average Control Delay	17.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 23: Richmond St & Schirra Dr

05/18/2007



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻		↻	↻	↻	
Volume (veh/h)	939	4	2	386	11	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.50	0.50	0.96	0.69	0.63
Hourly flow rate (vph)	978	8	4	402	16	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			986		1392	982
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			986		1392	982
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		90	95
cM capacity (veh/h)			701		155	302

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	986	4	402	32
Volume Left	0	4	0	16
Volume Right	8	0	0	16
cSH	1700	701	1700	205
Volume to Capacity	0.58	0.01	0.24	0.16
Queue Length 95th (ft)	0	0	0	13
Control Delay (s)	0.0	10.2	0.0	25.7
Lane LOS		B		D
Approach Delay (s)	0.0	0.1		25.7
Approach LOS				D

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		59.7%	ICU Level of Service B
Analysis Period (min)		15	

