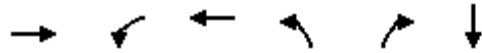


Queues

7: N. Delaware Ave & Shackamaxon Ave

05/18/2007



Lane Group	EBT	WBL	WBT	NBL	NBR	SBT
Lane Group Flow (vph)	2428	124	567	93	365	87
v/c Ratio	0.93	0.25	0.16	0.38	0.37	0.22
Control Delay	29.4	38.1	4.3	39.7	23.7	18.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.4	38.1	4.3	39.7	23.7	18.4
Queue Length 50th (ft)	487	35	34	51	92	20
Queue Length 95th (ft)	#585	62	44	100	134	36
Internal Link Dist (ft)	690		321			1237
Turn Bay Length (ft)		200				
Base Capacity (vph)	2606	493	3579	244	997	399
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.25	0.16	0.38	0.37	0.22

Intersection Summary

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

* 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



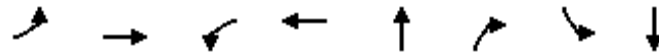
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑		↑↑	↑↑↑		↑		↑↑		↑	
Volume (vph)	0	2094	117	114	499	0	86	0	336	23	0	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	12	13	11	12	12	12	12	12	16	16	16
Total Lost time (s)		4.0		4.0	4.0		4.0		6.0		4.0	
Lane Util. Factor		0.91		0.97	0.91		1.00		0.88		1.00	
Frt		0.99		1.00	1.00		1.00		0.85		0.92	
Flt Protected		1.00		0.95	1.00		0.95		1.00		0.98	
Satd. Flow (prot)		4901		3224	4940		1719		2707		1854	
Flt Permitted		1.00		0.95	1.00		0.70		1.00		0.98	
Satd. Flow (perm)		4901		3224	4940		1260		2707		1854	
Peak-hour factor, PHF	0.91	0.91	0.92	0.92	0.88	0.88	0.92	0.92	0.92	0.61	0.65	0.65
Adj. Flow (vph)	0	2301	127	124	567	0	93	0	365	38	0	49
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	3	0	40	0
Lane Group Flow (vph)	0	2422	0	124	567	0	93	0	362	0	48	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Parking (#/hr)			10			10				10		10
Turn Type				Prot		custom		custom	Perm			
Protected Phases				3	8				2 3		6	
Permitted Phases		4					2			6		
Actuated Green, G (s)		51.0		14.0	70.0		17.0		36.0		17.0	
Effective Green, g (s)		52.0		15.0	71.0		19.0		31.0		19.0	
Actuated g/C Ratio		0.53		0.15	0.72		0.19		0.32		0.19	
Clearance Time (s)		5.0		5.0	5.0		6.0				6.0	
Lane Grp Cap (vph)		2601		493	3579		244		856		359	
v/s Ratio Prot				0.04	0.11				c0.13			
v/s Ratio Perm		c0.49					c0.07				0.03	
v/c Ratio		0.93		0.25	0.16		0.38		0.42		0.13	
Uniform Delay, d1		21.3		36.6	4.2		34.4		26.4		32.7	
Progression Factor		1.00		1.00	1.00		1.00		1.00		1.00	
Incremental Delay, d2		7.5		1.2	0.1		4.5		1.5		0.8	
Delay (s)		28.9		37.8	4.3		38.9		28.0		33.4	
Level of Service		C		D	A		D		C		C	
Approach Delay (s)		28.9			10.3			30.2			33.4	
Approach LOS		C			B			C			C	

Intersection Summary		
HCM Average Control Delay	25.6	HCM Level of Service C
HCM Volume to Capacity ratio	0.73	
Actuated Cycle Length (s)	98.0	Sum of lost time (s) 14.0
Intersection Capacity Utilization	69.8%	ICU Level of Service C
Analysis Period (min)	15	
c Critical Lane Group		

Queues

8: N. Delaware Ave & Frankford Ave

05/18/2007



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	392	2022	46	612	7	59	131	228
v/c Ratio	0.73	0.65	0.57	0.24	0.04	0.16	0.47	0.45
Control Delay	18.9	16.7	48.5	10.6	26.8	21.2	35.7	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	16.7	48.5	10.6	26.8	21.2	35.7	10.3
Queue Length 50th (ft)	146	341	17	57	3	18	67	18
Queue Length 95th (ft)	m160	393	#77	79	14	49	100	47
Internal Link Dist (ft)		1382		690	35			19
Turn Bay Length (ft)	320		100					
Base Capacity (vph)	538	3118	80	2548	191	374	278	504
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.65	0.57	0.24	0.04	0.16	0.47	0.45

Intersection Summary

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

Queue shown is maximum after two cycles.

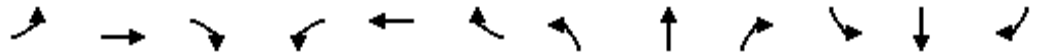
m Volume for 95th percentile queue is metered by upstream signal.

* 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



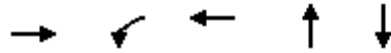
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↑↑↑		↗	↑↑↑			↑	↗	↗	↑	↗
Volume (vph)	341	1775	65	42	481	78	6	0	54	108	19	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	13	12	15
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	5.0	4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00	1.00	0.95	0.95	
Frt	1.00	0.99		1.00	0.98			1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1719	4668		1719	4819			1719	1538	1434	1503	
Flt Permitted	0.36	1.00		0.09	1.00			0.43	1.00	0.75	0.98	
Satd. Flow (perm)	646	4668		154	4819			779	1538	1137	1485	
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)	392	1951	71	46	512	100	7	0	59	146	26	187
RTOR Reduction (vph)	0	4	0	0	32	0	0	0	15	0	141	0
Lane Group Flow (vph)	392	2018	0	46	580	0	0	7	44	131	87	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	Perm		
Protected Phases	7	4			8			2				6
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	58.0	58.0		45.0	45.0			21.0	21.0	20.0	20.0	
Effective Green, g (s)	57.0	60.0		47.0	47.0			22.0	21.0	22.0	22.0	
Actuated g/C Ratio	0.63	0.67		0.52	0.52			0.24	0.23	0.24	0.24	
Clearance Time (s)	3.0	6.0		6.0	6.0			5.0	5.0	6.0	6.0	
Lane Grp Cap (vph)	516	3112		80	2517			190	359	278	363	
v/s Ratio Prot	c0.08	0.43			0.12							
v/s Ratio Perm	c0.40			0.30				0.01	0.03	c0.12	0.06	
v/c Ratio	0.76	0.65		0.57	0.23			0.04	0.12	0.47	0.24	
Uniform Delay, d1	8.7	8.8		14.7	11.7			25.9	27.2	29.0	27.3	
Progression Factor	1.98	1.82		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.6	0.5		26.7	0.2			0.4	0.7	5.6	1.5	
Delay (s)	21.8	16.5		41.4	11.9			26.3	27.9	34.7	28.8	
Level of Service	C	B		D	B			C	C	C	C	
Approach Delay (s)		17.3			14.0			27.7			31.0	
Approach LOS		B			B			C			C	

Intersection Summary		
HCM Average Control Delay	18.3	HCM Level of Service
HCM Volume to Capacity ratio	0.65	B
Actuated Cycle Length (s)	90.0	Sum of lost time (s)
Intersection Capacity Utilization	64.0%	8.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		B

Queues

9: N. Delaware Ave & Columbia Ave

05/18/2007



Lane Group	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	2385	15	782	112	203
v/c Ratio	0.98	0.19	0.32	0.43	0.74
Control Delay	26.7	9.1	4.1	34.1	48.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	26.7	9.1	4.1	34.1	48.8
Queue Length 50th (ft)	570	2	56	50	100
Queue Length 95th (ft)	#868	m7	70	94	#176
Internal Link Dist (ft)	288		577	81	623
Turn Bay Length (ft)		105			
Base Capacity (vph)	2445	80	2445	263	274
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	0.98	0.19	0.32	0.43	0.74

Intersection Summary

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

Queue shown is maximum after two cycles.

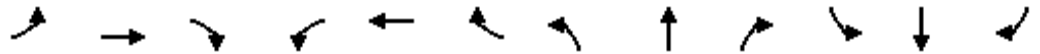
m Volume for 95th percentile queue is metered by upstream signal.

* 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	2214	4	13	680	0	62	0	32	115	8	45
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			1671			1687	
Flt Permitted		1.00		0.06	1.00			0.74			0.74	
Satd. Flow (perm)		3437		113	3438			1269			1296	
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	2381	4	15	782	0	74	0	38	139	10	54
RTOR Reduction (vph)	0	0	0	0	0	0	0	9	0	0	14	0
Lane Group Flow (vph)	0	2385	0	15	782	0	0	103	0	0	189	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)		63.0		63.0	63.0			16.0			16.0	
Effective Green, g (s)		64.0		64.0	64.0			18.0			18.0	
Actuated g/C Ratio		0.71		0.71	0.71			0.20			0.20	
Clearance Time (s)		5.0		5.0	5.0			6.0			6.0	
Lane Grp Cap (vph)		2444		80	2445			254			259	
v/s Ratio Prot		c0.69			0.23							
v/s Ratio Perm				0.13				0.08			c0.15	
v/c Ratio		0.98		0.19	0.32			0.41			0.73	
Uniform Delay, d1		12.3		4.3	4.9			31.3			33.7	
Progression Factor		1.00		0.72	0.76			1.00			1.00	
Incremental Delay, d2		13.4		5.1	0.3			4.8			16.4	
Delay (s)		25.6		8.2	4.0			36.1			50.1	
Level of Service		C		A	A			D			D	
Approach Delay (s)		25.6			4.1			36.1			50.1	
Approach LOS		C			A			D			D	

Intersection Summary

HCM Average Control Delay	22.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
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)	270	1406	461
v/c Ratio	0.64	0.50	0.17
Control Delay	44.8	6.0	2.5
Queue Delay	0.0	0.0	0.0
Total Delay	44.8	6.0	2.5
Queue Length 50th (ft)	75	194	25
Queue Length 95th (ft)	94	m197	33
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	0.64	0.50	0.17

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)	196	7	1378	0	0	392
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	1.00		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)	261	9	1406	0	0	461
RTOR Reduction (vph)	3	0	0	0	0	0
Lane Group Flow (vph)	267	0	1406	0	0	461
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		c0.40			0.13
v/s Ratio Perm						
v/c Ratio	0.64		0.50			0.17
Uniform Delay, d1	37.6		3.3			2.3
Progression Factor	1.00		1.72			1.00
Incremental Delay, d2	7.3		0.2			0.1
Delay (s)	44.9		5.9			2.4
Level of Service	D		A			A
Approach Delay (s)	44.9		5.9			2.4
Approach LOS	D		A			A

Intersection Summary

HCM Average Control Delay	10.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Queues

11: Penn St & N. Delaware Ave

05/18/2007



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	243	2914	32	778
v/c Ratio	0.60	0.89	0.40	0.24
Control Delay	38.3	15.6	24.8	4.4
Queue Delay	0.0	6.6	0.0	0.0
Total Delay	38.3	22.2	24.8	4.4
Queue Length 50th (ft)	123	413	5	44
Queue Length 95th (ft)	86	507	m25	52
Internal Link Dist (ft)	171	483		1382
Turn Bay Length (ft)			95	
Base Capacity (vph)	408	3259	80	3285
Starvation Cap Reductn	0	330	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.60	0.99	0.40	0.24

Intersection Summary

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

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)	84	23	2480	201	29	708
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	4.0
Lane Util. Factor	1.00		0.91		1.00	0.91
Frt	0.97		0.99		1.00	1.00
Flt Protected	0.96		1.00		0.95	1.00
Satd. Flow (prot)	1916		4640		1719	4693
Flt Permitted	0.96		1.00		0.06	1.00
Satd. Flow (perm)	1916		4640		115	4693
Peak-hour factor, PHF	0.44	0.44	0.92	0.92	0.91	0.91
Adj. Flow (vph)	191	52	2696	218	32	778
RTOR Reduction (vph)	4	0	10	0	0	0
Lane Group Flow (vph)	239	0	2904	0	32	778
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	61.0
Effective Green, g (s)	19.0		63.0		63.0	63.0
Actuated g/C Ratio	0.21		0.70		0.70	0.70
Clearance Time (s)	6.0		6.0		6.0	6.0
Lane Grp Cap (vph)	404		3248		81	3285
v/s Ratio Prot	c0.12		c0.63			0.17
v/s Ratio Perm					0.28	
v/c Ratio	0.59		0.89		0.40	0.24
Uniform Delay, d1	32.0		10.8		5.6	4.9
Progression Factor	1.00		1.00		1.16	0.87
Incremental Delay, d2	6.2		4.3		13.5	0.2
Delay (s)	38.2		15.1		20.1	4.4
Level of Service	D		B		C	A
Approach Delay (s)	38.2		15.1			5.0
Approach LOS	D		B			A

Intersection Summary			
HCM Average Control Delay	14.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	90.0	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			

Queues

12: Spring Garden St. & N. Delaware Ave

05/18/2007



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	1028	423	384	1976	976
v/c Ratio	0.82	0.39	0.80	0.71	0.82
Control Delay	32.1	6.8	43.6	16.8	34.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	32.1	6.8	43.6	16.8	34.5
Queue Length 50th (ft)	268	83	201	287	168
Queue Length 95th (ft)	348	131	#338	343	195
Internal Link Dist (ft)				1261	483
Turn Bay Length (ft)	160		215		
Base Capacity (vph)	1285	1109	503	2766	1213
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	0.80	0.38	0.76	0.71	0.80

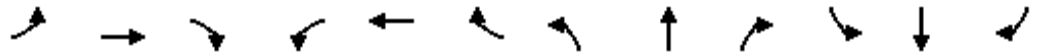
Intersection Summary

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)	966	0	398	0	0	0	357	1838	0	0	528	282
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			4820	
Flt Permitted	0.95		1.00				0.95	1.00			1.00	
Satd. Flow (perm)	3433		1583				1770	5085			4820	
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)	1028	0	423	0	0	0	384	1976	0	0	636	340
RTOR Reduction (vph)	0	0	7	0	0	0	0	0	0	0	107	0
Lane Group Flow (vph)	1028	0	416	0	0	0	384	1976	0	0	869	0
Turn Type	custom		custom				Prot			Prot		
Protected Phases			4 5				5	2		1	6	
Permitted Phases	4											
Actuated Green, G (s)	29.6		57.3				21.7	45.3			17.6	
Effective Green, g (s)	31.6		59.3				23.7	47.3			19.6	
Actuated g/C Ratio	0.36		0.68				0.27	0.54			0.23	
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)	1248		1080				483	2768			1087	
v/s Ratio Prot			0.26				c0.22	0.39			c0.18	
v/s Ratio Perm	c0.30											
v/c Ratio	0.82		0.39				0.80	0.71			0.80	
Uniform Delay, d1	25.1		5.9				29.3	14.8			31.8	
Progression Factor	1.00		1.00				1.00	1.00			1.00	
Incremental Delay, d2	4.5		0.2				8.8	1.6			4.2	
Delay (s)	29.7		6.2				38.1	16.4			36.0	
Level of Service	C		A				D	B			D	
Approach Delay (s)		22.8			0.0			19.9			36.0	
Approach LOS		C			A			B			D	

Intersection Summary

HCM Average Control Delay	24.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	86.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
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)	35	91	2830	990
v/c Ratio	0.15	0.31	0.72	0.25
Control Delay	36.3	11.3	6.3	2.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	36.3	11.3	6.3	2.9
Queue Length 50th (ft)	18	0	227	43
Queue Length 95th (ft)	38	27	271	54
Internal Link Dist (ft)	147		1206	1261
Turn Bay Length (ft)				
Base Capacity (vph)	236	290	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	0.15	0.31	0.72	0.25

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)	26	68	0	2604	921	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)	35	91	0	2830	990	0
RTOR Reduction (vph)	0	79	0	0	0	0
Lane Group Flow (vph)	35	12	0	2830	990	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			c0.56	0.19	
v/s Ratio Perm	0.01					
v/c Ratio	0.15	0.06		0.72	0.25	
Uniform Delay, d1	34.5	34.1		5.0	2.8	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	0.5		1.1	0.2	
Delay (s)	35.8	34.6		6.1	2.9	
Level of Service	D	C		A	A	
Approach Delay (s)	34.9			6.1	2.9	
Approach LOS	C			A	A	

Intersection Summary

HCM Average Control Delay	6.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Queues

14: Race St & Columbus Blvd

05/18/2007



Lane Group	EBL	EBT	EBR	WBT	NBT	SBT
Lane Group Flow (vph)	279	2	186	2	2317	1065
v/c Ratio	0.77	0.01	0.42	0.02	0.67	0.31
Control Delay	48.8	31.0	8.6	42.5	10.2	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.8	31.0	8.6	42.5	10.2	6.5
Queue Length 50th (ft)	138	1	0	1	217	68
Queue Length 95th (ft)	#304	7	58	8	410	136
Internal Link Dist (ft)		497		85	1197	1206
Turn Bay Length (ft)						
Base Capacity (vph)	369	346	445	187	3438	3438
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.01	0.42	0.01	0.67	0.31

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)	257	2	171	2	0	0	0	2132	0	0	980	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		6.0			4.0			4.0	
Lane Util. Factor	1.00	1.00	1.00		1.00			0.91			0.91	
Frt	1.00	1.00	0.85		1.00			1.00			1.00	
Flt Protected	0.95	1.00	1.00		0.95			1.00			1.00	
Satd. Flow (prot)	1770	1863	1583		1770			5085			5085	
Flt Permitted	0.95	1.00	1.00		1.00			1.00			1.00	
Satd. Flow (perm)	1770	1863	1583		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)	279	2	186	2	0	0	0	2317	0	0	1065	0
RTOR Reduction (vph)	0	0	154	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	279	2	32	0	2	0	0	2317	0	0	1065	0
Turn Type	Split		Perm	Perm								
Protected Phases	4	4			8			2			6	
Permitted Phases			4	8								
Actuated Green, G (s)	15.7	15.7	15.7		1.1			56.2			56.2	
Effective Green, g (s)	17.7	15.7	15.7		1.1			58.2			58.2	
Actuated g/C Ratio	0.19	0.17	0.17		0.01			0.64			0.64	
Clearance Time (s)	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	
Lane Grp Cap (vph)	344	321	273		23			3252			3252	
v/s Ratio Prot	c0.16	0.00						c0.46			0.21	
v/s Ratio Perm			0.02		c0.00							
v/c Ratio	0.81	0.01	0.12		0.09			0.71			0.33	
Uniform Delay, d1	35.1	31.2	31.8		44.5			10.9			7.5	
Progression Factor	1.00	1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2	13.5	0.0	0.2		1.6			1.4			0.3	
Delay (s)	48.5	31.2	32.0		46.1			12.2			7.7	
Level of Service	D	C	C		D			B			A	
Approach Delay (s)		41.9			46.1			12.2			7.7	
Approach LOS		D			D			B			A	

Intersection Summary

HCM Average Control Delay	14.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	91.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	62.9%	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)	337	2005	8	1212
v/c Ratio	0.64	0.76	0.07	0.39
Control Delay	26.8	19.3	40.9	8.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	26.8	19.3	40.9	8.5
Queue Length 50th (ft)	120	311	4	110
Queue Length 95th (ft)	158	372	18	136
Internal Link Dist (ft)	281	402		1197
Turn Bay Length (ft)			200	
Base Capacity (vph)	525	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	0.64	0.76	0.07	0.39

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)	48	205	1798	6	7	1127
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		5083		1770	4916
Flt Permitted	0.99		1.00		0.95	1.00
Satd. Flow (perm)	1643		5083		1770	4916
Peak-hour factor, PHF	0.75	0.75	0.90	0.90	0.93	0.93
Adj. Flow (vph)	64	273	1998	7	8	1212
RTOR Reduction (vph)	68	0	0	0	0	0
Lane Group Flow (vph)	269	0	2005	0	8	1212
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		c0.39		0.00	c0.25
v/s Ratio Perm						
v/c Ratio	0.59		0.76		0.07	0.39
Uniform Delay, d1	28.1		17.0		39.4	8.0
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	5.5		2.1		1.1	0.4
Delay (s)	33.6		19.0		40.5	8.4
Level of Service	C		B		D	A
Approach Delay (s)	33.6		19.0			8.6
Approach LOS	C		B			A

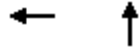
Intersection Summary

HCM Average Control Delay	16.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
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)	2307	428
v/c Ratio	0.51	0.39
Control Delay	10.8	25.3
Queue Delay	0.0	0.0
Total Delay	10.8	25.3
Queue Length 50th (ft)	170	98
Queue Length 95th (ft)	195	134
Internal Link Dist (ft)	309	280
Turn Bay Length (ft)		
Base Capacity (vph)	4515	1093
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.51	0.39

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	2109	36	79	293	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	2268	39	91	337	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	3	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	2304	0	0	424	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					c0.31							
v/s Ratio Perm								0.12				
v/c Ratio					0.51			0.39				
Uniform Delay, d1					10.4			24.3				
Progression Factor					1.00			1.00				
Incremental Delay, d2					0.4			1.0				
Delay (s)					10.8			25.3				
Level of Service					B			C				
Approach Delay (s)		0.0			10.8			25.3			0.0	
Approach LOS		A			B			C			A	

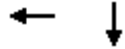
Intersection Summary

HCM Average Control Delay	13.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	42.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Queues
17: 4th St &

05/18/2007

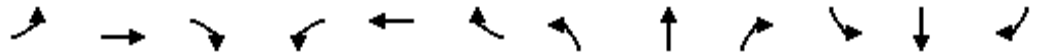


Lane Group	WBT	SBT
Lane Group Flow (vph)	2444	474
v/c Ratio	0.54	0.45
Control Delay	4.7	26.3
Queue Delay	0.0	0.0
Total Delay	4.7	26.3
Queue Length 50th (ft)	55	111
Queue Length 95th (ft)	60	132
Internal Link Dist (ft)	367	1136
Turn Bay Length (ft)		
Base Capacity (vph)	4525	1047
Starvation Cap Reductn	10	0
Spillback Cap Reductn	3	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.54	0.45
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	135	2138	0	0	0	0	0	242	128
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	145	2299	0	0	0	0	0	310	164
RTOR Reduction (vph)	0	0	0	0	13	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	0	0	0	2431	0	0	0	0	0	471	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						0.32						
v/c Ratio						0.54						0.45
Uniform Delay, d1						10.6						24.8
Progression Factor						0.41						1.00
Incremental Delay, d2						0.4						1.4
Delay (s)						4.7						26.2
Level of Service						A						C
Approach Delay (s)		0.0				4.7		0.0				26.2
Approach LOS		A				A		A				C

Intersection Summary

HCM Average Control Delay	8.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.9%	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)	2613	81	904
v/c Ratio	0.59	0.15	0.82
Control Delay	14.2	21.6	36.2
Queue Delay	0.9	0.0	0.0
Total Delay	15.1	21.6	36.2
Queue Length 50th (ft)	320	30	248
Queue Length 95th (ft)	362	65	324
Internal Link Dist (ft)	369		252
Turn Bay Length (ft)			
Base Capacity (vph)	4435	555	1101
Starvation Cap Reductn	1385	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.86	0.15	0.82

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	2067	363	73	814	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)					7375		1770	3539				
Flt Permitted					1.00		0.95	1.00				
Satd. Flow (perm)					7375		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	2223	390	81	904	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	8	0	4	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	2605	0	77	904	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)					4425		551	1101				
v/s Ratio Prot					c0.35			c0.26				
v/s Ratio Perm							0.04					
v/c Ratio					0.59		0.14	0.82				
Uniform Delay, d1					11.1		22.3	28.7				
Progression Factor					1.23		1.00	1.00				
Incremental Delay, d2					0.5		0.5	6.9				
Delay (s)					14.2		22.9	35.6				
Level of Service					B		C	D				
Approach Delay (s)		0.0			14.2			34.5			0.0	
Approach LOS		A			B			C			A	

Intersection Summary

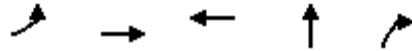
HCM Average Control Delay	19.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		

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)	153	1086	915	1068	328
v/c Ratio	0.68	0.58	0.60	0.92	0.62
Control Delay	27.7	11.0	5.4	33.7	20.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	27.7	11.0	5.4	33.7	20.1
Queue Length 50th (ft)	26	125	54	191	77
Queue Length 95th (ft)	#72	176	83	#308	153
Internal Link Dist (ft)		356	392	1122	
Turn Bay Length (ft)	155				30
Base Capacity (vph)	225	1887	1525	1166	525
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	0.68	0.58	0.60	0.92	0.62

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)	150	1064	0	0	796	91	249	766	312	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			3485			3496	1583			
Flt Permitted	0.18	1.00			1.00			0.99	1.00			
Satd. Flow (perm)	332	3539			3485			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)	153	1086	0	0	821	94	262	806	328	0	0	0
RTOR Reduction (vph)	0	0	0	0	15	0	0	0	50	0	0	0
Lane Group Flow (vph)	153	1086	0	0	900	0	0	1068	278	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)	219	1887			1510			1165	475			
v/s Ratio Prot	0.02	c0.31			0.26			c0.31				
v/s Ratio Perm	c0.34								0.18			
v/c Ratio	0.70	0.58			0.60			0.92	0.58			
Uniform Delay, d1	11.8	9.4			13.0			19.2	17.8			
Progression Factor	1.00	1.00			0.29			1.00	1.00			
Incremental Delay, d2	16.9	1.3			1.6			12.7	5.2			
Delay (s)	28.7	10.7			5.4			31.9	23.0			
Level of Service	C	B			A			C	C			
Approach Delay (s)		12.9			5.4			29.8			0.0	
Approach LOS		B			A			C			A	

Intersection Summary

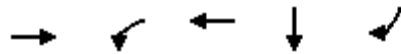
HCM Average Control Delay	17.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		

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)	1625	59	899	280	79
v/c Ratio	0.92	0.31	0.42	0.57	0.19
Control Delay	22.2	10.6	4.2	24.4	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.2	10.6	4.2	24.4	9.8
Queue Length 50th (ft)	196	5	44	87	6
Queue Length 95th (ft)	#405	m14	60	154	35
Internal Link Dist (ft)	392		378	276	
Turn Bay Length (ft)		170			40
Base Capacity (vph)	1763	191	2123	491	413
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	0.92	0.31	0.42	0.57	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	1412	83	54	827	0	0	0	0	55	202	73
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)		3510		1770	3539						1843	1583
Flt Permitted		1.00		0.12	1.00						0.99	1.00
Satd. Flow (perm)		3510		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	1535	90	59	899	0	0	0	0	60	220	79
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	0	0	0	44
Lane Group Flow (vph)	0	1618	0	59	899	0	0	0	0	0	280	35
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)		1755		183	2123						491	369
v/s Ratio Prot		c0.46		0.01	c0.25							
v/s Ratio Perm				0.17							0.15	0.02
v/c Ratio		0.92		0.32	0.42						0.57	0.10
Uniform Delay, d1		13.9		12.2	6.4						19.0	18.0
Progression Factor		0.88		1.37	0.56						1.00	1.00
Incremental Delay, d2		8.5		4.0	0.5						4.7	0.5
Delay (s)		20.8		20.8	4.1						23.8	18.6
Level of Service		C		C	A						C	B
Approach Delay (s)		20.8			5.2			0.0			22.6	
Approach LOS		C			A			A			C	

Intersection Summary

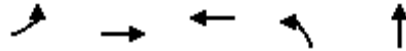
HCM Average Control Delay	15.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues

21: Spring Garden St. & 3rd St.

05/18/2007



Lane Group	EBL	EBT	WBT	NBL	NBT
Lane Group Flow (vph)	161	1313	933	105	417
v/c Ratio	0.67	0.65	0.57	0.20	0.74
Control Delay	20.2	10.3	8.4	16.9	26.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.2	10.3	8.4	16.9	26.7
Queue Length 50th (ft)	26	115	67	28	118
Queue Length 95th (ft)	m26	m116	87	60	#242
Internal Link Dist (ft)		378	448		1140
Turn Bay Length (ft)	126				
Base Capacity (vph)	242	2005	1641	531	562
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	0.67	0.65	0.57	0.20	0.74

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)	148	1208	0	0	774	85	97	241	143	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			0.99		1.00	0.94				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1770	3539			3487		1770	1759				
Flt Permitted	0.18	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	342	3539			3487		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)	161	1313	0	0	841	92	105	262	155	0	0	0
RTOR Reduction (vph)	0	0	0	0	14	0	0	34	0	0	0	0
Lane Group Flow (vph)	161	1313	0	0	919	0	105	383	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)	230	2005			1627		531	528				
v/s Ratio Prot	0.02	c0.37			0.26		0.06	c0.22				
v/s Ratio Perm	0.35											
v/c Ratio	0.70	0.65			0.56		0.20	0.72				
Uniform Delay, d1	11.3	9.0			11.6		15.6	18.8				
Progression Factor	1.50	1.05			0.61		1.00	1.00				
Incremental Delay, d2	6.9	0.7			1.3		0.8	8.4				
Delay (s)	23.8	10.0			8.4		16.5	27.2				
Level of Service	C	B			A		B	C				
Approach Delay (s)		11.5			8.4		25.0				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	0.68		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.7%	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)	1637	82	720	756
v/c Ratio	1.00	0.43	0.36	0.72
Control Delay	34.4	13.4	7.7	21.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	34.4	13.4	7.7	21.7
Queue Length 50th (ft)	272	12	66	116
Queue Length 95th (ft)	#441	27	95	172
Internal Link Dist (ft)	448		1146	338
Turn Bay Length (ft)		67		
Base Capacity (vph)	1645	191	2005	1057
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.00	0.43	0.36	0.72

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	1412	94	75	662	0	0	0	0	157	390	148
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)		3506		1770	3539						3388	
Flt Permitted		1.00		0.13	1.00						0.99	
Satd. Flow (perm)		3506		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	1535	102	82	720	0	0	0	0	171	424	161
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	0	0	41	0
Lane Group Flow (vph)	0	1629	0	82	720	0	0	0	0	0	715	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)		1636		183	2005						1016	
v/s Ratio Prot		c0.46		0.01	c0.20						c0.21	
v/s Ratio Perm				0.22								
v/c Ratio		1.00		0.45	0.36						0.70	
Uniform Delay, d1		15.9		14.1	7.1						18.6	
Progression Factor		0.82		1.00	1.00						1.00	
Incremental Delay, d2		19.0		7.7	0.5						4.1	
Delay (s)		32.1		21.8	7.6						22.7	
Level of Service		C		C	A						C	
Approach Delay (s)		32.1			9.0			0.0			22.7	
Approach LOS		C			A			A			C	

Intersection Summary

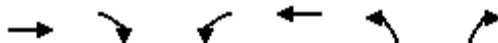
HCM Average Control Delay	24.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		

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)	958	4	2	394	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)	998	8	4	410	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			1006	1420	1002	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1006	1420	1002	
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	89	95	
cM capacity (veh/h)			689	149	294	

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	1006	4	410	32
Volume Left	0	4	0	16
Volume Right	8	0	0	16
cSH	1700	689	1700	198
Volume to Capacity	0.59	0.01	0.24	0.16
Queue Length 95th (ft)	0	0	0	14
Control Delay (s)	0.0	10.3	0.0	26.6
Lane LOS		B		D
Approach Delay (s)	0.0	0.1		26.6
Approach LOS				D

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		60.7%	ICU Level of Service B
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

31: Laurel Ave & Frankford Ave

05/18/2007



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	6	67	0	419	282	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.42	0.85	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	79	0	455	307	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				99		
pX, platoon unblocked	0.90					
vC, conflicting volume	762	153	307			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	677	153	307			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	96	91	100			
cM capacity (veh/h)	341	856	1230			

Direction, Lane #	EB 1	NB 1	SB 1	SB 2
Volume Total	93	455	204	102
Volume Left	14	0	0	0
Volume Right	79	0	0	0
cSH	695	1230	1700	1700
Volume to Capacity	0.13	0.00	0.12	0.06
Queue Length 95th (ft)	12	0	0	0
Control Delay (s)	11.0	0.0	0.0	0.0
Lane LOS	B			
Approach Delay (s)	11.0	0.0	0.0	
Approach LOS	B			

Intersection Summary			
Average Delay		1.2	
Intersection Capacity Utilization		33.2%	ICU Level of Service A
Analysis Period (min)		15	