APPENDIX F

CAPACITY ANALYSIS INFORMATION

EXISTING CONDITIONS

FRIDAY PM (4-6 PM)
PEAK HOUR TIME PERIOD

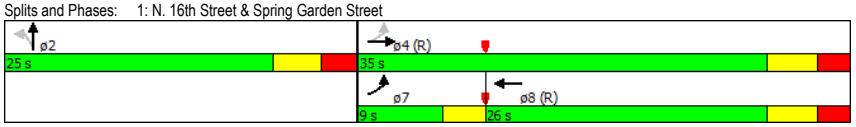
Timings
1: N. 16th Street & Spring Garden Street

Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Volume (vph)	140	660	819	384
Lane Group Flow (vph)	146	688	949	742
Turn Type	pm+pt	NA	NA	NA
Protected Phases	7	4	8	2
Permitted Phases	4			
Minimum Split (s)	9.0	35.0	26.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?				
v/c Ratio	0.56	0.44	0.92	0.76
Control Delay	24.0	16.2	46.1	25.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	24.0	16.2	46.1	25.4
Queue Length 50th (ft)	39	88	186	142
Queue Length 95th (ft)	m43	m93	m#283	204
Internal Link Dist (ft)		350	380	990
Turn Bay Length (ft)	140			
Base Capacity (vph)	263	1550	1027	981
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	0.56	0.44	0.92	0.76

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed
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.

Splits and Phases: 1: N. 16th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
1: N. 16th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	140	660	0	0	819	92	126	384	203	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.89	1.00		0.91			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln	185.3	185.3	0.0	0.0	183.3	187.1	186.2	181.5	186.2			
Lanes	1	2	0	0	2	0	0	2	0			
Cap, veh/h	333	1791	0	0	1010	114	178	558	313			
Arrive On Green	0.20	0.97	0.00	0.00	0.11	0.11	0.32	0.32	0.32			
Sat Flow, veh/h	1765	3706	0	0	3029	341	563	1763	988			
Grp Volume(v), veh/h	146	688	0	0	516	433	416	0	326			
Grp Sat Flow(s),veh/h/ln	1765	1853	0	0	1833	1537	1787	0	1528			
Q Serve(g_s), s	2.8	0.6	0.0	0.0	16.6	16.6	12.4	0.0	11.1			
Cycle Q Clear(g_c), s	2.8	0.6	0.0	0.0	16.6	16.6	12.4	0.0	11.1			
Prop In Lane	1.00		0.00	0.00		0.22	0.32		0.65			
Lane Grp Cap(c), veh/h	333	1791	0	0	611	512	566	0	484			
V/C Ratio(X)	0.44	0.38	0.00	0.00	0.84	0.84	0.73	0.00	0.67			
Avail Cap(c_a), veh/h	333	1791	0	0	611	512	566	0	484			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	11.4	0.5	0.0	0.0	25.2	25.2	18.3	0.0	17.8			
Incr Delay (d2), s/veh	4.2	0.6	0.0	0.0	13.5	15.6	8.2	0.0	7.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln	2.3	0.5	0.0	0.0	13.7	12.1	9.0	0.0	7.2			
Lane Grp Delay (d), s/veh	15.6	1.2	0.0	0.0	38.6	40.8	26.5	0.0	25.1			
Lane Grp LOS	B	A			D	D	C		C			
Approach Vol, veh/h		834			949			742				
Approach Delay, s/veh		3.7			39.6			25.9				
Approach LOS		A			D			C				

Timer

Assigned Phs	7	4			8			2				
Phs Duration (G+Y+Rc), s	9.0	35.0			26.0			25.0				
Change Period (Y+Rc), s	3.0	6.0			6.0			6.0				
Max Green Setting (Gmax), s	6.0	29.0			20.0			19.0				
Max Q Clear Time (g_c+I1), s	0.0	0.0			0.0			0.0				
Green Ext Time (p_c), s	0.0	0.0			0.0			0.0				

Intersection Summary

HCM 2010 Ctrl Delay			23.7									
HCM 2010 LOS			C									

Notes

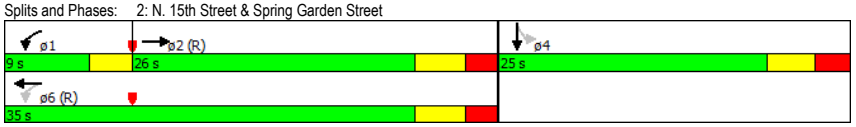
Timings
2: N. 15th Street & Spring Garden Street

Lane Group	EBT	WBL	WBT	SBL	SBT
Lane Configurations					
Volume (vph)	780	121	692	77	306
Lane Group Flow (vph)	887	127	728	81	387
Turn Type	NA	pm+pt	NA	Perm	NA
Protected Phases	2	1	6		4
Permitted Phases		6		4	
Minimum Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (%)	43.3%	15.0%	58.3%	41.7%	41.7%
Yellow Time (s)	3.6	3.0	3.6	3.4	3.4
All-Red Time (s)	2.4	0.0	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	3.0	6.0	6.0	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?					
v/c Ratio	0.85	0.52	0.47	0.20	0.83
Control Delay	23.3	15.6	11.7	16.6	37.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	15.6	11.7	16.6	37.4
Queue Length 50th (ft)	133	21	86	21	128
Queue Length 95th (ft)	#256	#48	126	50	#265
Internal Link Dist (ft)	380		400		290
Turn Bay Length (ft)		115		100	
Base Capacity (vph)	1047	242	1534	405	466
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	0.52	0.47	0.20	0.83

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 15 (25%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: N. 15th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
2: N. 15th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	780	63	121	692	0	0	0	0	77	306	62
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.53	0.90		1.00				1.00		0.85
Parking Bus Adj	1.00	1.00	0.90	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	182.4	189.0	178.2	183.4	0.0				168.0	185.0	189.0
Lanes	0	2	0	1	2	0				1	1	0
Cap, veh/h	0	979	79	361	1773	0				507	458	92
Arrive On Green	0.00	0.67	0.67	0.10	0.48	0.00				0.32	0.32	0.32
Sat Flow, veh/h	0	2938	236	1697	3669	0				1600	1446	292
Grp Volume(v), veh/h	0	509	378	127	728	0				81	0	387
Grp Sat Flow(s),veh/h/ln	0	1824	1350	1697	1834	0				1600	1850	1738
Q Serve(g_s), s	0.0	12.7	12.7	2.6	7.7	0.0				2.2	0.0	11.7
Cycle Q Clear(g_c), s	0.0	12.7	12.7	2.6	7.7	0.0				2.2	0.0	11.7
Prop In Lane	0.00		0.17	1.00		0.00				1.00		0.17
Lane Grp Cap(c), veh/h	0	608	450	361	1773	0				507	0	550
V/C Ratio(X)	0.00	0.84	0.84	0.35	0.41	0.00				0.16	0.00	0.70
Avail Cap(c_a), veh/h	0	608	450	361	1773	0				507	0	550
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	8.8	8.8	11.5	10.0	0.0				14.8	0.0	18.0
Incr Delay (d2), s/veh	0.0	13.0	16.9	2.7	0.7	0.0				0.7	0.0	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	7.2	6.2	2.1	4.9	0.0				1.6	0.0	8.2
Lane Grp Delay (d), s/veh	0.0	21.8	25.7	14.2	10.7	0.0				15.4	0.0	25.4
Lane Grp LOS		C	C	B	B					B		C
Approach Vol, veh/h		887			855						468	
Approach Delay, s/veh		23.4			11.2						23.6	
Approach LOS		C			B						C	

Timer

Assigned Phs		2		1	6						4	
Phs Duration (G+Y+Rc), s		26.0		9.0	35.0						25.0	
Change Period (Y+Rc), s		6.0		3.0	6.0						6.0	
Max Green Setting (Gmax), s		20.0		6.0	29.0						19.0	
Max Q Clear Time (g_c+I1), s		0.0		0.0	0.0						0.0	
Green Ext Time (p_c), s		0.0		0.0	0.0						0.0	

Intersection Summary

HCM 2010 Ctrl Delay			18.8									
HCM 2010 LOS			B									

Notes

Lanes, Volumes, Timings
3: Franklin Town Boulevard & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	198	55	134	37	278	174	26	42	8	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	11	12	12	12	12	12	16	12	12	12	12
Grade (%)		-1%			2%			3%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.953			0.952			0.985				
Flt Protected		0.975			0.996			0.983				
Satd. Flow (prot)	0	1647	0	0	1565	0	0	1748	0	0	0	0
Flt Permitted		0.975			0.996			0.983				
Satd. Flow (perm)	0	1647	0	0	1565	0	0	1748	0	0	0	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		646			325			647			208	
Travel Time (s)		17.6			8.9			17.6			5.7	
Confl. Peds. (#/hr)	35		35	35		35	18		24	24		18
Confl. Bikes (#/hr)			5			8			1			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	13%	2%	2%	2%	2%	4%	2%	25%	2%	2%	2%
Parking (#/hr)					0			0				
Adj. Flow (vph)	213	59	144	40	299	187	28	45	9	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	416	0	0	526	0	0	82	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.05	1.00	1.02	1.17	1.02	1.03	1.00	1.03	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	CBD
Control Type: Unsignalized	
Intersection Capacity Utilization 74.1%	ICU Level of Service D
Analysis Period (min) 15	

HCM 2010 AWSC
3: Franklin Town Boulevard & Callowhill Street

Intersection	
Intersection Delay, s/veh	13.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	198	55	134	37	278	174	26	42	8	0	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	13	2	2	2	2	4	2	25	2	2	2
Mvmt Flow	213	59	144	40	299	187	28	45	9	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	12.9	15.3	10
HCM LOS	B	C	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	34%	51%	8%
Vol Thru, %	55%	14%	57%
Vol Right, %	11%	35%	36%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	76	387	489
LT Vol	42	55	278
Through Vol	8	134	174
RT Vol	26	198	37
Lane Flow Rate	82	416	526
Geometry Grp	1	1	1
Degree of Util (X)	0.135	0.534	0.647
Departure Headway (Hd)	5.948	4.617	4.429
Convergence, Y/N	Yes	Yes	Yes
Cap	597	778	810
Service Time	4.045	2.67	2.476
HCM Lane V/C Ratio	0.137	0.535	0.649
HCM Control Delay	10	12.9	15.3
HCM Lane LOS	A	B	C
HCM 95th-tile Q	0.5	3.2	4.8

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
4: N. 17th Street & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	62	156	331	0	0	0	0	0	226	94
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	11	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			-4%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.865								0.960	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	1429	1693	1659	0	0	0	0	0	1536	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	1429	1693	1659	0	0	0	0	0	1536	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		325			430			230			1070	
Travel Time (s)		8.9			11.7			6.3			29.2	
Confl. Peds. (#/hr)	26		57	57		26	112		60	60		112
Confl. Bikes (#/hr)			1			7						20
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	5	0
Parking (#/hr)			0		0						0	
Adj. Flow (vph)	0	0	70	177	376	0	0	0	0	0	257	107
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	70	177	376	0	0	0	0	0	364	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.15	1.06	1.16	1.01	1.01	1.01	1.01	0.98	1.20	0.98
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization 52.0%		ICU Level of Service A	
Analysis Period (min) 15			

HCM 2010 AWSC
4: N. 17th Street & Callowhill Street

Intersection	
Intersection Delay, s/veh	14.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	62	156	331	0	0	0	0	0	226	94
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	3	2	2	2	2	2	2	2	3	2
Mvmt Flow	0	0	70	177	376	0	0	0	0	0	257	107
Number of Lanes	0	0	1	1	1	0	0	0	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	8.8	14.8	14
HCM LOS	A	B	B

Lane	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	100%	0%	0%
Vol Thru, %	0%	0%	100%	71%
Vol Right, %	100%	0%	0%	29%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	62	156	331	320
LT Vol	0	0	331	226
Through Vol	62	0	0	94
RT Vol	0	156	0	0
Lane Flow Rate	70	177	376	364
Geometry Grp	5	7	7	2
Degree of Util (X)	0.102	0.304	0.592	0.526
Departure Headway (Hd)	5.232	6.175	5.67	5.206
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	688	585	639	684
Service Time	3.242	3.877	3.372	3.305
HCM Lane V/C Ratio	0.102	0.303	0.588	0.532
HCM Control Delay	8.8	11.6	16.3	14
HCM Lane LOS	A	B	C	B
HCM 95th-tile Q	0.3	1.3	3.9	3.1

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Timings
5: N. 16th Street & Callowhill Street

Lane Group	WBT	NBT
Lane Configurations		
Volume (vph)	363	542
Lane Group Flow (vph)	536	671
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Minimum Split (s)	21.0	39.0
Total Split (s)	21.0	39.0
Total Split (%)	35.0%	65.0%
Yellow Time (s)	3.0	3.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
v/c Ratio	0.59	0.35
Control Delay	19.0	7.2
Queue Delay	0.0	0.0
Total Delay	19.0	7.2
Queue Length 50th (ft)	72	56
Queue Length 95th (ft)	117	84
Internal Link Dist (ft)	380	136
Turn Bay Length (ft)		
Base Capacity (vph)	907	1895
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.59	0.35

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 17 (28%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 5: N. 16th Street & Callowhill Street

HCM 2010 Signalized Intersection Summary
5: N. 16th Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	363	136	82	542	0	0	0	0
Number				3	8	18	5	2	12			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.95	1.00		1.00			
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln				0.0	185.3	189.0	187.1	180.1	0.0			
Lanes				0	2	0	0	2	0			
Cap, veh/h				0	678	249	254	1775	0			
Arrive On Green				0.00	0.27	0.27	0.57	0.57	0.00			
Sat Flow, veh/h				0	2543	935	448	3132	0			
Grp Volume(v), veh/h				0	282	254	349	322	0			
Grp Sat Flow(s),veh/h/ln				0	1853	1626	1779	1801	0			
Q Serve(g_s), s				0.0	7.9	8.1	6.4	5.7	0.0			
Cycle Q Clear(g_c), s				0.0	7.9	8.1	6.4	5.7	0.0			
Prop In Lane				0.00		0.58	0.25		0.00			
Lane Grp Cap(c), veh/h				0	494	433	1008	1021	0			
V/C Ratio(X)				0.00	0.57	0.59	0.35	0.32	0.00			
Avail Cap(c_a), veh/h				0	494	433	1008	1021	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	19.0	19.1	7.0	6.9	0.0			
Incr Delay (d2), s/veh				0.0	4.7	5.7	0.9	0.8	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln				0.0	6.1	5.7	4.1	3.9	0.0			
Lane Grp Delay (d), s/veh				0.0	23.8	24.8	8.0	7.7	0.0			
Lane Grp LOS					C	C	A	A				
Approach Vol, veh/h					536			671				
Approach Delay, s/veh					24.3			7.8				
Approach LOS					C			A				

Timer	
Assigned Phs	8	2
Phs Duration (G+Y+Rc), s	21.0	39.0
Change Period (Y+Rc), s	5.0	5.0
Max Green Setting (Gmax), s	16.0	34.0
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	15.1
HCM 2010 LOS	B

Notes

HCM 2010 Signals-Pedestrians
5: N. 16th Street & Callowhill Street

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	23.0	24.0	24.0	24.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	2	2	2
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	0	2	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	25	25	25
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	30.0	30.0	30.0	30.0
Pedestrian Compliance Code	Fair	Fair	Fair	Fair
Pedestrian Crosswalk Score	1.90	1.93	1.98	2.00
Pedestrian Crosswalk LOS	A	A	A	B

HCM 2010 Signals-Bicycles
5: N. 16th Street & Callowhill Street

Approach	EB	WB	NB	SB
Bicycle Flow Rate (bike/h)	0	0	0	0
Total Flow Rate (veh/h)	0	536	671	0
Effct. Green for Bike (s)	0.0	16.0	34.0	0.0
Cross Street Width (ft)	24.0	24.0	24.0	23.0
Through Lanes Number	0	2	2	0
Through Lane Width (ft)	12.0	12.0	12.0	12.0
Bicycle Lane Width (ft)	0.0	0.0	0.0	0.0
Paved Shoulder Width (ft)	0.0	0.0	0.0	0.0
Curb Is Present?	No	No	No	No
On Street Parking?	No	No	No	No
Bicycle Lane Capacity (bike/h)	0	533	1133	0
Bicycle Delay (s/bike)	0.0	16.1	5.6	0.0
Bicycle Compliance		Fair	Good	
Bicycle LOS Score	0.00	2.37	2.48	0.00
Bicycle LOS		B	B	

Lanes, Volumes, Timings
6: N. 15th Street & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	129	342	0	0	0	0	0	512	62
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		0%			0%			0%			-3%	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt											0.985	
Flt Protected					0.987							
Satd. Flow (prot)	0	0	0	0	3301	0	0	0	0	0	1540	0
Flt Permitted					0.987							
Satd. Flow (perm)	0	0	0	0	3301	0	0	0	0	0	1540	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		460			480			146			1070	
Travel Time (s)		12.5			13.1			4.0			29.2	
Confl. Peds. (#/hr)	57		40	40		57	34		23	23		34
Confl. Bikes (#/hr)						1						1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	6%	13%
Parking (#/hr)					0						0	
Adj. Flow (vph)	0	0	0	133	353	0	0	0	0	0	528	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	486	0	0	0	0	0	592	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.08	1.01	1.01	1.01	1.01	0.99	1.18	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization 54.4%		ICU Level of Service A	
Analysis Period (min) 15			

HCM 2010 AWSC
6: N. 15th Street & Callowhill Street

Intersection	
Intersection Delay, s/veh	22.8
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	0	129	342	0	0	0	0	0	512	62
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	6	13
Mvmt Flow	0	0	0	133	353	0	0	0	0	0	528	64
Number of Lanes	0	0	0	0	2	0	0	0	0	0	1	0

Approach	WB	SB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left		WB
Conflicting Lanes Left	0	2
Conflicting Approach Right	SB	
Conflicting Lanes Right	1	0
HCM Control Delay	13.8	30.1
HCM LOS	B	D

Lane	WBLn1	WBLn2	SBLn1
Vol Left, %	53%	0%	0%
Vol Thru, %	47%	100%	89%
Vol Right, %	0%	0%	11%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	243	228	574
LT Vol	114	228	512
Through Vol	0	0	62
RT Vol	129	0	0
Lane Flow Rate	251	235	592
Geometry Grp	7	7	2
Degree of Util (X)	0.451	0.405	0.846
Departure Headway (Hd)	6.476	6.206	5.146
Convergence, Y/N	Yes	Yes	Yes
Cap	559	583	698
Service Time	4.176	3.906	3.244
HCM Lane V/C Ratio	0.449	0.403	0.848
HCM Control Delay	14.4	13.1	30.1
HCM Lane LOS	B	B	D
HCM 95th-tile Q	2.3	2	9.6

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Timings
7: N. Broad Street & Callowhill Street

Lane Group	WBL	WBT	NBT	SBT
Lane Configurations				
Volume (vph)	60	273	768	772
Lane Group Flow (vph)	66	396	844	934
Turn Type	Perm	NA	NA	NA
Protected Phases		8	2	6
Permitted Phases	8			
Minimum Split (s)	33.0	33.0	57.0	57.0
Total Split (s)	33.0	33.0	57.0	57.0
Total Split (%)	36.7%	36.7%	63.3%	63.3%
Yellow Time (s)	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.0	5.0
Lead/Lag				
Lead-Lag Optimize?				
v/c Ratio	0.14	0.41	0.32	0.51
Control Delay	25.2	28.1	18.9	7.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.2	28.1	18.9	7.3
Queue Length 50th (ft)	30	103	164	63
Queue Length 95th (ft)	m65	152	204	75
Internal Link Dist (ft)		525	480	990
Turn Bay Length (ft)				
Base Capacity (vph)	464	958	2640	1846
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	0.41	0.32	0.51

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 49 (54%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: N. Broad Street & Callowhill Street

HCM 2010 Signalized Intersection Summary
7: N. Broad Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	60	273	87	0	768	0	0	772	78
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.94	1.00		1.00	1.00		0.91
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln				182.5	182.5	186.2	0.0	179.8	0.0	0.0	186.2	189.9
Lanes				1	2	0	0	3	0	0	2	0
Cap, veh/h				521	789	245	0	3117	0	0	1901	193
Arrive On Green				0.10	0.10	0.10	0.00	0.19	0.00	0.00	0.77	0.77
Sat Flow, veh/h				1738	2629	818	0	5395	0	0	3291	334
Grp Volume(v), veh/h				66	206	190	0	844	0	0	480	454
Grp Sat Flow(s),veh/h/ln				1738	1825	1622	0	1798	0	0	1862	1762
Q Serve(g_s), s				3.1	9.5	9.9	0.0	12.0	0.0	0.0	8.2	8.2
Cycle Q Clear(g_c), s				3.1	9.5	9.9	0.0	12.0	0.0	0.0	8.2	8.2
Prop In Lane				1.00		0.50	0.00		0.00	0.00		0.19
Lane Grp Cap(c), veh/h				521	548	487	0	3117	0	0	1076	1018
V/C Ratio(X)				0.13	0.38	0.39	0.00	0.27	0.00	0.00	0.45	0.45
Avail Cap(c_a), veh/h				521	548	487	0	3117	0	0	1076	1018
HCM Platoon Ratio				0.33	0.33	0.33	1.00	0.33	1.00	1.00	1.33	1.33
Upstream Filter(I)				1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				29.8	32.7	32.8	0.0	20.2	0.0	0.0	5.3	5.3
Incr Delay (d2), s/veh				0.5	2.0	2.4	0.0	0.2	0.0	0.0	1.3	1.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (85%), veh/ln				2.6	7.3	6.9	0.0	8.4	0.0	0.0	4.8	4.7
Lane Grp Delay (d), s/veh				30.3	34.6	35.2	0.0	20.5	0.0	0.0	6.7	6.8
Lane Grp LOS				C	C	D		C			A	A
Approach Vol, veh/h					462			844			934	
Approach Delay, s/veh					34.2			20.5			6.7	
Approach LOS					C			C			A	

Timer

Assigned Phs					8			2			6	
Phs Duration (G+Y+Rc), s					33.0			57.0			57.0	
Change Period (Y+Rc), s					6.0			5.0			5.0	
Max Green Setting (Gmax), s					27.0			52.0			52.0	
Max Q Clear Time (g_c+I1), s					0.0			0.0			0.0	
Green Ext Time (p_c), s					0.0			0.0			0.0	

Intersection Summary

HCM 2010 Ctrl Delay			17.6									
HCM 2010 LOS			B									

Notes

HCM 2010 Signals-Pedestrians
7: N. Broad Street & Callowhill Street

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	26.4	32.2	70.1	63.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	3	6	5
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	6	2	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	25	25	25
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	45.0	45.0	45.0	45.0
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	1.88	2.08	2.70	2.61
Pedestrian Crosswalk LOS	A	B	B	B

HCM 2010 Signals-Bicycles
7: N. Broad Street & Callowhill Street

Approach	EB	WB	NB	SB
Bicycle Flow Rate (bike/h)	0	0	0	0
Total Flow Rate (veh/h)	0	462	844	934
Effct. Green for Bike (s)	0.0	27.0	52.0	52.0
Cross Street Width (ft)	70.1	63.0	32.2	26.4
Through Lanes Number	0	2	3	2
Through Lane Width (ft)	12.0	11.0	10.0	10.0
Bicycle Lane Width (ft)	0.0	0.0	0.0	0.0
Paved Shoulder Width (ft)	0.0	0.0	0.0	0.0
Curb Is Present?	No	No	No	No
On Street Parking?	No	No	No	No
Bicycle Lane Capacity (bike/h)	0	600	1156	1156
Bicycle Delay (s/bike)	0.0	22.0	8.0	8.0
Bicycle Compliance		Fair	Good	Good
Bicycle LOS Score	0.00	3.12	2.95	3.16
Bicycle LOS		C	C	C

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	734	551	71	589	0	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	11	12	11	12	12	12	12
Grade (%)		0%			0%			-1%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.88	0.91	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor						0.94		0.97				
Frt						0.850						
Flt Protected								0.995				
Satd. Flow (prot)	0	0	0	0	3521	2680	0	4755	0	0	0	0
Flt Permitted								0.995				
Satd. Flow (perm)	0	0	0	0	3521	2528	0	4597	0	0	0	0
Right Turn on Red			Yes			No	Yes		Yes			Yes
Satd. Flow (RTOR)								28				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		430			460			170			344	
Travel Time (s)		11.7			12.5			4.6			9.4	
Confl. Peds. (#/hr)	69		33	33		69	311		16	16		311
Confl. Bikes (#/hr)						3			12			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	4%	5%	2%	2%	2%	2%
Adj. Flow (vph)	0	0	0	0	773	580	75	620	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	773	580	0	695	0	0	0	0
Turn Type					NA	Perm	Perm	NA				
Protected Phases					1			2				
Permitted Phases						1	2					
Minimum Split (s)					51.0	51.0	39.0	39.0				
Total Split (s)					51.0	51.0	39.0	39.0				
Total Split (%)					56.7%	56.7%	43.3%	43.3%				
Yellow Time (s)					3.5	3.5	3.5	3.5				
All-Red Time (s)					1.8	1.8	2.5	2.5				
Lost Time Adjust (s)					0.0	0.0		0.0				
Total Lost Time (s)					5.3	5.3		6.0				
Lead/Lag					Lead	Lead	Lag	Lag				
Lead-Lag Optimize?												
Act Effct Green (s)					45.7	45.7		33.0				
Actuated g/C Ratio					0.51	0.51		0.37				
v/c Ratio					0.43	0.45		0.41				
Control Delay					12.6	13.0		1.6				
Queue Delay					0.0	0.0		0.1				
Total Delay					12.6	13.0		1.7				
LOS					B	B		A				
Approach Delay					12.8			1.7				
Approach LOS					B			A				
Queue Length 50th (ft)					112	91		4				
Queue Length 95th (ft)					m125	m105		3				
Internal Link Dist (ft)		350			380			90			264	
Turn Bay Length (ft)												

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	7
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	1.8	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			

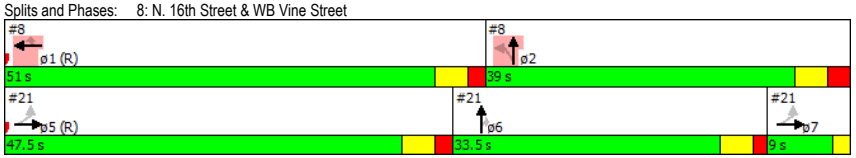
Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)					1787	1283		1703				
Starvation Cap Reductn					0	0		268				
Spillback Cap Reductn					0	0		0				
Storage Cap Reductn					0	0		0				
Reduced v/c Ratio					0.43	0.45		0.48				

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 9.0	Intersection LOS: A
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 8: N. 16th Street & WB Vine Street



Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	77	919	0	0	0	0	0	1191	335
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			2%	
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	0.86	0.86
Ped Bike Factor					1.00						0.99	
Frt											0.967	
Flt Protected					0.996							
Satd. Flow (prot)	0	0	0	0	4846	0	0	0	0	0	5838	0
Flt Permitted					0.996							
Satd. Flow (perm)	0	0	0	0	4846	0	0	0	0	0	5838	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					145						57	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		460			480			170			414	
Travel Time (s)		12.5			13.1			4.6			11.3	
Confl. Peds. (#/hr)	59		2	2		59	34		217	217		34
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Parking (#/hr)					0							
Adj. Flow (vph)	0	0	0	80	957	0	0	0	0	0	1241	349
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1037	0	0	0	0	0	1590	0
Turn Type				Perm	NA						NA	
Protected Phases					1						2	
Permitted Phases				1								
Minimum Split (s)				49.0	49.0						41.0	
Total Split (s)				49.0	49.0						41.0	
Total Split (%)				54.4%	54.4%						45.6%	
Yellow Time (s)				3.5	3.5						3.5	
All-Red Time (s)				1.5	1.5						11.5	
Lost Time Adjust (s)					0.0						0.0	
Total Lost Time (s)					5.0						15.0	
Lead/Lag				Lead	Lead						Lag	
Lead-Lag Optimize?												
Act Effct Green (s)					44.0						26.0	
Actuated g/C Ratio					0.49						0.29	
v/c Ratio					0.42						0.92	
Control Delay					4.4						40.0	
Queue Delay					0.0						0.0	
Total Delay					4.4						40.0	
LOS					A						D	
Approach Delay					4.4						40.0	
Approach LOS					A						D	
Queue Length 50th (ft)					16						245	
Queue Length 95th (ft)					24						#320	
Internal Link Dist (ft)		380			400			90			334	
Turn Bay Length (ft)												
Base Capacity (vph)					2443						1727	

Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	ø5	ø6
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Grade (%)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Peak Hour Factor		
Parking (#/hr)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	5	6
Permitted Phases		
Minimum Split (s)	49.0	41.0
Total Split (s)	49.0	41.0
Total Split (%)	54%	46%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.5	3.5
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lag
Lead-Lag Optimize?		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		

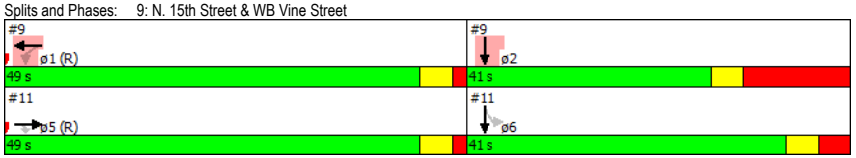
Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					0						1	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.42						0.92	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 26.0	Intersection LOS: C
Intersection Capacity Utilization 77.0%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 9: N. 15th Street & WB Vine Street



Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	ø5	ø6
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	172	865	182	0	648	0	0	645	124
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	11	12	12	10	12	12	10	12
Grade (%)		0%			1%			-1%			1%	
Storage Length (ft)	0		0	0		0	0		0	100		0
Storage Lanes	0		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.86	0.86
Ped Bike Factor				1.00		0.92					0.95	
Frt						0.850					0.976	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	0	1751	3386	1552	0	4686	0	0	5407	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	0	1750	3386	1425	0	4686	0	0	5407	0
Right Turn on Red			Yes			No			Yes			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		480			605			170			560	
Travel Time (s)		13.1			16.5			4.6			15.3	
Confl. Peds. (#/hr)	89		1	1		89	319		150	150		319
Confl. Bikes (#/hr)						39			1			11
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	2%	2%	3%	2%	3%	2%	2%	3%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	2	0	0	5	0
Adj. Flow (vph)	0	0	0	181	911	192	0	682	0	0	679	131
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	181	911	192	0	682	0	0	810	0
Turn Type				Perm	NA	Perm		NA			NA	
Protected Phases					1 3!			2			6!	
Permitted Phases				1 3!		1 3						
Minimum Split (s)								34.0			34.0	
Total Split (s)								34.0			34.0	
Total Split (%)								37.8%			37.8%	
Yellow Time (s)								2.4			3.6	
All-Red Time (s)								3.0			5.4	
Lost Time Adjust (s)								0.0			0.0	
Total Lost Time (s)								5.4			9.0	
Lead/Lag								Lead			Lead	
Lead-Lag Optimize?												
Act Effct Green (s)				46.0	46.0	46.0		28.6			25.0	
Actuated g/C Ratio				0.51	0.51	0.51		0.32			0.28	
v/c Ratio				0.20	0.53	0.26		0.46			0.54	
Control Delay				23.0	26.9	24.1		5.5			15.1	
Queue Delay				0.0	0.0	0.0		1.9			0.1	
Total Delay				23.0	26.9	24.1		7.4			15.2	
LOS				C	C	C		A			B	
Approach Delay					25.9			7.4			15.2	
Approach LOS					C			A			B	

Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø7	ø8
Lane Configurations					
Volume (vph)					
Ideal Flow (vphpl)					
Lane Width (ft)					
Grade (%)					
Storage Length (ft)					
Storage Lanes					
Taper Length (ft)					
Lane Util. Factor					
Ped Bike Factor					
Frt					
Flt Protected					
Satd. Flow (prot)					
Flt Permitted					
Satd. Flow (perm)					
Right Turn on Red					
Satd. Flow (RTOR)					
Link Speed (mph)					
Link Distance (ft)					
Travel Time (s)					
Confl. Peds. (#/hr)					
Confl. Bikes (#/hr)					
Peak Hour Factor					
Heavy Vehicles (%)					
Bus Blockages (#/hr)					
Adj. Flow (vph)					
Shared Lane Traffic (%)					
Lane Group Flow (vph)					
Turn Type					
Protected Phases	1	3	5	7	8
Permitted Phases					
Minimum Split (s)	42.0	14.0	42.0	48.0	14.0
Total Split (s)	42.0	14.0	42.0	48.0	14.0
Total Split (%)	47%	16%	47%	53%	16%
Yellow Time (s)	3.6	2.0	3.6	3.6	3.6
All-Red Time (s)	6.4	0.0	6.4	2.4	2.4
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag		Lag			Lag
Lead-Lag Optimize?		Yes			
Act Effct Green (s)					
Actuated g/C Ratio					
v/c Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

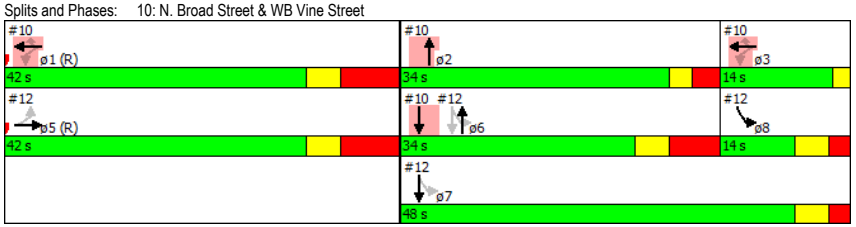
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)				75	213	80		26			88	
Queue Length 95th (ft)				131	276	138		m27			104	
Internal Link Dist (ft)		400			525			90			480	
Turn Bay Length (ft)												
Base Capacity (vph)				894	1730	728		1489			1501	
Starvation Cap Reductn				0	0	0		618			0	
Spillback Cap Reductn				0	0	0		0			124	
Storage Cap Reductn				0	0	0		0			0	
Reduced v/c Ratio				0.20	0.53	0.26		0.78			0.59	

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 18.2	Intersection LOS: B
Intersection Capacity Utilization 82.3%	ICU Level of Service E
Analysis Period (min) 15	

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

! Phase conflict between lane groups.

Splits and Phases: 10: N. Broad Street & WB Vine Street



Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø7	ø8
Queue Length 50th (ft)					
Queue Length 95th (ft)					
Internal Link Dist (ft)					
Turn Bay Length (ft)					
Base Capacity (vph)					
Starvation Cap Reductn					
Spillback Cap Reductn					
Storage Cap Reductn					
Reduced v/c Ratio					

Intersection Summary

Existing Conditions
Traffic Planning and Design, Inc. - BMP

Timing Plan: Friday PM Peak
Synchro 8 - Report

Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1244	232	0	0	0	0	0	0	428	737	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		2%			0%			0%			4%	
Lane Util. Factor	1.00	0.86	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00
Ped Bike Factor			0.98							0.90		
Frt			0.850									
Flt Protected										0.950		
Satd. Flow (prot)	0	6310	2692	0	0	0	0	0	0	1725	4746	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	6310	2627	0	0	0	0	0	0	1544	4746	0
Right Turn on Red			No			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)										30		
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		82			480			430			170	
Travel Time (s)		2.2			13.1			11.7			4.6	
Confl. Peds. (#/hr)	1		19	19		1	19		132	132		19
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	4%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Adj. Flow (vph)	0	1296	242	0	0	0	0	0	0	446	768	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1296	242	0	0	0	0	0	0	446	768	0
Turn Type		NA	Perm							Perm	NA	
Protected Phases		5									6	
Permitted Phases			5							6		
Minimum Split (s)		49.0	49.0							41.0	41.0	
Total Split (s)		49.0	49.0							41.0	41.0	
Total Split (%)		54.4%	54.4%							45.6%	45.6%	
Yellow Time (s)		3.5	3.5							3.5	3.5	
All-Red Time (s)		1.5	1.5							3.5	3.5	
Lost Time Adjust (s)		0.0	0.0							0.0	0.0	
Total Lost Time (s)		5.0	5.0							7.0	7.0	
Lead/Lag		Lead	Lead							Lag	Lag	
Lead-Lag Optimize?												
Act Effct Green (s)		44.0	44.0							34.0	34.0	
Actuated g/C Ratio		0.49	0.49							0.38	0.38	
v/c Ratio		0.42	0.19							0.74	0.43	
Control Delay		11.9	13.5							7.6	2.7	
Queue Delay		0.0	0.0							1.9	1.0	
Total Delay		11.9	13.5							9.4	3.7	
LOS		B	B							A	A	
Approach Delay		12.1									5.8	
Approach LOS		B									A	
Queue Length 50th (ft)		99	43							8	11	
Queue Length 95th (ft)		137	71							m10	m13	
Internal Link Dist (ft)		2			400			350			90	
Turn Bay Length (ft)												

Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

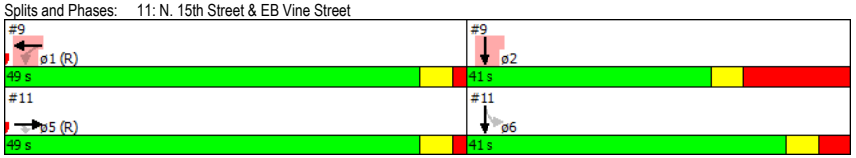
Lane Group	ø1	ø2
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Grade (%)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Heavy Vehicles (%)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	2
Permitted Phases		
Minimum Split (s)	49.0	41.0
Total Split (s)	49.0	41.0
Total Split (%)	54%	46%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.5	11.5
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lag
Lead-Lag Optimize?		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)		3084	1284							601	1792	
Starvation Cap Reductn		0	0							59	713	
Spillback Cap Reductn		0	0							0	0	
Storage Cap Reductn		0	0							0	0	
Reduced v/c Ratio		0.42	0.19							0.82	0.71	

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 9.3	Intersection LOS: A
Intersection Capacity Utilization 77.0%	ICU Level of Service D
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 11: N. 15th Street & EB Vine Street



Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	ø1	ø2
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	88	1455	64	0	0	0	0	565	426	205	679	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	10	12	12	10	12
Grade (%)		2%			0%			2%			2%	
Storage Length (ft)	0		250	0		0	0		0	45		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.81	0.81	0.81	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor		1.00						0.93		0.98		
Frt		0.994						0.936				
Flt Protected		0.997								0.950		
Satd. Flow (prot)	0	7324	0	0	0	0	0	3808	0	1743	4674	0
Flt Permitted		0.997								0.184		
Satd. Flow (perm)	0	7322	0	0	0	0	0	3808	0	332	4674	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		480			163			430			170	
Travel Time (s)		13.1			4.4			11.7			4.6	
Confl. Peds. (#/hr)	6		110	110		6	366		123	123		366
Confl. Bikes (#/hr)			7						16			20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	3%	2%	2%	2%	2%	3%	8%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	30	0	0	0	0
Adj. Flow (vph)	96	1582	70	0	0	0	0	614	463	223	738	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1748	0	0	0	0	0	1077	0	223	738	0
Turn Type	Perm	NA						NA		custom	NA	
Protected Phases		5						6		8	7	
Permitted Phases	5									6 7	6 7	
Minimum Split (s)	42.0	42.0						34.0		14.0	48.0	
Total Split (s)	42.0	42.0						34.0		14.0	48.0	
Total Split (%)	46.7%	46.7%						37.8%		15.6%	53.3%	
Yellow Time (s)	3.6	3.6						3.6		3.6	3.6	
All-Red Time (s)	6.4	6.4						5.4		2.4	2.4	
Lost Time Adjust (s)		0.0						0.0		0.0	0.0	
Total Lost Time (s)		10.0						9.0		6.0	6.0	
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?												
Act Effct Green (s)		32.0						25.0		42.0	42.0	
Actuated g/C Ratio		0.36						0.28		0.47	0.47	
v/c Ratio		0.67						1.45dr		0.80	0.34	
Control Delay		19.7						66.0		40.0	5.5	
Queue Delay		0.0						0.0		66.3	0.4	
Total Delay		19.7						66.0		106.3	5.9	
LOS		B						E		F	A	
Approach Delay		19.7						66.0			29.2	
Approach LOS		B						E			C	

Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Bus Blockages (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	3
Permitted Phases			
Minimum Split (s)	42.0	34.0	14.0
Total Split (s)	42.0	34.0	14.0
Total Split (%)	47%	38%	16%
Yellow Time (s)	3.6	2.4	2.0
All-Red Time (s)	6.4	3.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag		Lead	Lag
Lead-Lag Optimize?			Yes
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

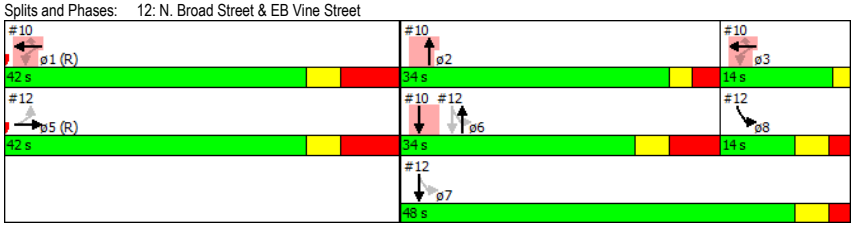
Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		140						~231		77	28	
Queue Length 95th (ft)		155						#327		#189	41	
Internal Link Dist (ft)		400			83			350			90	
Turn Bay Length (ft)										45		
Base Capacity (vph)		2603						1057		280	2181	
Starvation Cap Reductn		0						0		151	889	
Spillback Cap Reductn		0						0		0	0	
Storage Cap Reductn		0						0		0	0	
Reduced v/c Ratio		0.67						1.02		1.73	0.57	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green
Natural Cycle: 90
Control Type: Pretimed
Maximum v/c Ratio: 1.02
Intersection Signal Delay: 35.3 Intersection LOS: D
Intersection Capacity Utilization 82.3% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 12: N. Broad Street & EB Vine Street



Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

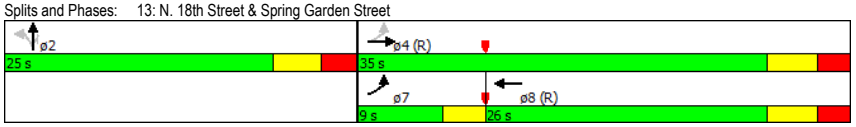
Timings
13: N. 18th Street & Spring Garden Street

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	65	598	851	207	175
Lane Group Flow (vph)	68	629	983	385	184
Turn Type	pm+pt	NA	NA	NA	Perm
Protected Phases	7	4	8	2	
Permitted Phases	4				2
Minimum Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?					
v/c Ratio	0.23	0.40	0.93	0.86	0.37
Control Delay	8.9	10.9	34.1	41.9	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	8.9	10.9	34.1	41.9	9.5
Queue Length 50th (ft)	11	71	210	129	18
Queue Length 95th (ft)	26	106	#309	#272	61
Internal Link Dist (ft)		476	350	810	
Turn Bay Length (ft)	145				150
Base Capacity (vph)	292	1562	1060	446	494
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	0.23	0.40	0.93	0.86	0.37

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 13: N. 18th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
13: N. 18th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	65	598	0	0	851	83	159	207	175	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.86	1.00		0.91			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln	185.3	185.3	0.0	0.0	185.3	189.0	189.0	177.1	177.9			
Lanes	1	2	0	0	2	0	0	1	1			
Cap, veh/h	354	1791	0	0	1090	106	288	258	435			
Arrive On Green	0.10	0.48	0.00	0.00	0.44	0.44	0.32	0.32	0.32			
Sat Flow, veh/h	1765	3706	0	0	3270	317	911	815	1375			
Grp Volume(v), veh/h	68	629	0	0	508	475	316	69	184			
Grp Sat Flow(s),veh/h/ln	1765	1853	0	0	1853	1734	1726	1771	1375			
Q Serve(g_s), s	1.3	6.3	0.0	0.0	14.4	14.4	9.2	0.0	6.3			
Cycle Q Clear(g_c), s	1.3	6.3	0.0	0.0	14.4	14.4	9.2	0.0	6.3			
Prop In Lane	1.00		0.00	0.00		0.18	0.53		1.00			
Lane Grp Cap(c), veh/h	354	1791	0	0	618	578	546	0	435			
V/C Ratio(X)	0.19	0.35	0.00	0.00	0.82	0.82	0.58	0.00	0.42			
Avail Cap(c_a), veh/h	354	1791	0	0	618	578	546	0	435			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	11.4	9.6	0.0	0.0	15.1	15.1	17.2	0.0	16.2			
Incr Delay (d2), s/veh	1.2	0.5	0.0	0.0	11.7	12.5	4.4	0.0	3.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln	1.0	4.3	0.0	0.0	10.1	9.7	6.4	0.0	4.0			
Lane Grp Delay (d), s/veh	12.6	10.2	0.0	0.0	26.9	27.6	21.6	0.0	19.2			
Lane Grp LOS	B	B			C	C	C		B			
Approach Vol, veh/h		697			983			569				
Approach Delay, s/veh		10.4			27.2			18.2				
Approach LOS		B			C			B				

Timer

Assigned Phs	7	4			8			2	
Phs Duration (G+Y+Rc), s	9.0	35.0			26.0			25.0	
Change Period (Y+Rc), s	3.0	6.0			6.0			6.0	
Max Green Setting (Gmax), s	6.0	29.0			20.0			19.0	
Max Q Clear Time (g_c+I1), s	0.0	0.0			0.0			0.0	
Green Ext Time (p_c), s	0.0	0.0			0.0			0.0	

Intersection Summary

HCM 2010 Ctrl Delay			19.7									
HCM 2010 LOS			B									

Notes

Timings
14: N. Broad Street & Spring Garden Street

Lane Group	EBT	WBT	NBT	SBL	SBT	SBR
Lane Configurations						
Volume (vph)	818	741	810	140	808	108
Lane Group Flow (vph)	871	839	877	143	824	110
Turn Type	NA	NA	NA	pm+pt	NA	Perm
Protected Phases	4	8	2	1	6	
Permitted Phases				6		6
Minimum Split (s)	33.0	33.0	35.0	9.0	35.0	35.0
Total Split (s)	40.0	40.0	41.0	9.0	50.0	50.0
Total Split (%)	44.4%	44.4%	45.6%	10.0%	55.6%	55.6%
Yellow Time (s)	3.6	3.6	3.4	3.0	3.4	3.4
All-Red Time (s)	2.4	2.4	2.6	0.0	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	3.0	6.0	6.0
Lead/Lag			Lag	Lead		
Lead-Lag Optimize?						
v/c Ratio	0.72	0.70	0.47	0.49	0.50	0.18
Control Delay	28.2	27.6	22.7	17.4	16.8	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.2	27.6	22.7	17.4	16.8	13.9
Queue Length 50th (ft)	219	208	99	40	158	33
Queue Length 95th (ft)	290	277	147	72	211	65
Internal Link Dist (ft)	400	550	990		290	
Turn Bay Length (ft)				170		
Base Capacity (vph)	1205	1192	1877	293	1655	623
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	0.72	0.70	0.47	0.49	0.50	0.18

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Pretimed

Splits and Phases: 14: N. Broad Street & Spring Garden Street

HCM 2010 Signalized Intersection Summary
14: N. Broad Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	818	35	0	741	81	0	810	49	140	808	108
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.86	1.00		0.92	1.00		0.89	0.98		0.86
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.3	189.0	0.0	185.3	189.0	0.0	185.3	189.0	186.2	184.4	186.2
Lanes	0	2	0	0	2	0	0	3	0	1	2	1
Cap, veh/h	0	1322	57	0	1228	135	0	2002	120	424	1803	668
Arrive On Green	0.00	0.38	0.38	0.00	0.38	0.38	0.00	0.78	0.78	0.07	0.49	0.49
Sat Flow, veh/h	0	3499	151	0	3250	357	0	5148	309	1774	3688	1367
Grp Volume(v), veh/h	0	442	429	0	431	408	0	594	283	143	824	110
Grp Sat Flow(s),veh/h/ln	0	1853	1797	0	1853	1754	0	1853	1751	1774	1844	1367
Q Serve(g_s), s	0.0	17.6	17.6	0.0	17.0	17.0	0.0	4.7	4.8	4.1	13.2	4.0
Cycle Q Clear(g_c), s	0.0	17.6	17.6	0.0	17.0	17.0	0.0	4.7	4.8	4.1	13.2	4.0
Prop In Lane	0.00		0.08	0.00		0.20	0.00		0.18	1.00		1.00
Lane Grp Cap(c), veh/h	0	700	679	0	700	663	0	1441	681	424	1803	668
V/C Ratio(X)	0.00	0.63	0.63	0.00	0.62	0.62	0.00	0.41	0.42	0.34	0.46	0.16
Avail Cap(c_a), veh/h	0	700	679	0	700	663	0	1441	681	424	1803	668
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	22.9	22.9	0.0	22.7	22.7	0.0	6.6	6.6	13.7	15.1	12.8
Incr Delay (d2), s/veh	0.0	4.3	4.4	0.0	4.0	4.3	0.0	0.9	1.9	2.1	0.8	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	11.8	11.5	0.0	11.3	10.9	0.0	3.0	3.2	3.4	8.5	2.5
Lane Grp Delay (d), s/veh	0.0	27.2	27.3	0.0	26.7	27.0	0.0	7.5	8.5	15.8	16.0	13.3
Lane Grp LOS		C	C		C	C		A	A	B	B	B
Approach Vol, veh/h		871			839			877			1077	
Approach Delay, s/veh		27.2			26.8			7.8			15.7	
Approach LOS		C			C			A			B	

Timer

Assigned Phs		4			8			2		1	6	
Phs Duration (G+Y+Rc), s		40.0			40.0			41.0		9.0	50.0	
Change Period (Y+Rc), s		6.0			6.0			6.0		3.0	6.0	
Max Green Setting (Gmax), s		34.0			34.0			35.0		6.0	44.0	
Max Q Clear Time (g_c+I1), s		0.0			0.0			0.0		0.0	0.0	
Green Ext Time (p_c), s		0.0			0.0			0.0		0.0	0.0	

Intersection Summary

HCM 2010 Ctrl Delay			19.1									
HCM 2010 LOS			B									

Notes

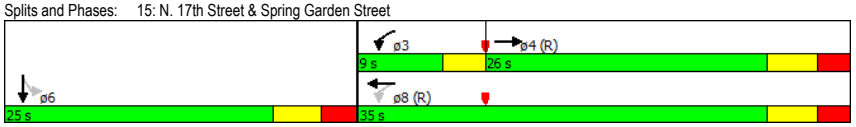
Timings
15: N. 17th Street & Spring Garden Street

Lane Group	EBT	WBL	WBT	SBT
Lane Configurations				
Volume (vph)	930	55	787	88
Lane Group Flow (vph)	1043	59	846	193
Turn Type	NA	pm+pt	NA	NA
Protected Phases	4	3	8	6
Permitted Phases		8		
Minimum Split (s)	26.0	9.0	35.0	25.0
Total Split (s)	26.0	9.0	35.0	25.0
Total Split (%)	43.3%	15.0%	58.3%	41.7%
Yellow Time (s)	3.6	3.0	3.6	3.4
All-Red Time (s)	2.4	0.0	2.4	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	3.0	6.0	6.0
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?				
v/c Ratio	0.98	0.20	0.54	0.39
Control Delay	39.6	11.6	16.0	15.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	39.6	11.6	16.0	15.5
Queue Length 50th (ft)	194	10	113	42
Queue Length 95th (ft)	#323	m12	m131	91
Internal Link Dist (ft)	350		350	290
Turn Bay Length (ft)		165		
Base Capacity (vph)	1066	291	1562	491
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	0.98	0.20	0.54	0.39

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed
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.

Splits and Phases: 15: N. 17th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
15: N. 17th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	930	40	55	787	0	0	0	0	36	88	55
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.82	0.98		1.00				1.00		0.91
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.3	189.0	185.3	185.3	0.0				189.0	184.4	189.0
Lanes	0	2	0	1	2	0				0	1	0
Cap, veh/h	0	1163	50	341	1791	0				168	141	267
Arrive On Green	0.00	0.44	0.44	0.20	0.97	0.00				0.32	0.32	0.32
Sat Flow, veh/h	0	3490	150	1765	3706	0				529	205	842
Grp Volume(v), veh/h	0	531	512	59	846	0				134	0	112
Grp Sat Flow(s),veh/h/ln	0	1853	1787	1765	1853	0				1818	0	1603
Q Serve(g_s), s	0.0	15.5	15.5	1.0	0.8	0.0				2.7	0.0	0.0
Cycle Q Clear(g_c), s	0.0	15.5	15.5	1.0	0.8	0.0				2.7	0.0	0.0
Prop In Lane	0.00		0.08	1.00		0.00				0.29		0.53
Lane Grp Cap(c), veh/h	0	618	596	341	1791	0				576	0	0
V/C Ratio(X)	0.00	0.86	0.86	0.17	0.47	0.00				0.23	0.00	0.00
Avail Cap(c_a), veh/h	0	618	596	341	1791	0				576	0	0
HCM Platoon Ratio	1.00	1.33	1.33	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	15.4	15.4	10.3	0.5	0.0				11.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	14.5	15.0	1.1	0.9	0.0				0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	11.2	10.9	0.8	0.7	0.0				2.2	0.0	0.0
Lane Grp Delay (d), s/veh	0.0	29.9	30.4	11.4	1.4	0.0				12.8	0.0	0.0
Lane Grp LOS		C	C	B	A					B		
Approach Vol, veh/h		1043			905						246	
Approach Delay, s/veh		30.2			2.1						7.0	
Approach LOS		C			A						A	

Timer

Assigned Phs		4		3	8						6	
Phs Duration (G+Y+Rc), s		26.0		9.0	35.0						25.0	
Change Period (Y+Rc), s		6.0		3.0	6.0						6.0	
Max Green Setting (Gmax), s		20.0		6.0	29.0						19.0	
Max Q Clear Time (g_c+I1), s		0.0		0.0	0.0						0.0	
Green Ext Time (p_c), s		0.0		0.0	0.0						0.0	

Intersection Summary

HCM 2010 Ctrl Delay		16.0	
HCM 2010 LOS		B	

Notes

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	192	580	50	0	0	0	0	327	19
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00						1.00	
Frt					0.991						0.993	
Flt Protected					0.988							
Satd. Flow (prot)	0	0	0	0	3261	0	0	0	0	0	1653	0
Flt Permitted					0.988							
Satd. Flow (perm)	0	0	0	0	3260	0	0	0	0	0	1653	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					86						3	
Link Speed (mph)		30			25			30			25	
Link Distance (ft)		975			430			170			647	
Travel Time (s)		22.2			11.7			3.9			17.6	
Confl. Peds. (#/hr)	49		1	1		49	23		142	142		23
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Parking (#/hr)					0						0	
Adj. Flow (vph)	0	0	0	204	617	53	0	0	0	0	348	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	874	0	0	0	0	0	368	0
Turn Type				custom	NA						NA	
Protected Phases					1 3						2	
Permitted Phases				1								
Minimum Split (s)				47.5							33.5	
Total Split (s)				47.5							33.5	
Total Split (%)				52.8%							37.2%	
Yellow Time (s)				3.5							3.5	
All-Red Time (s)				1.8							1.5	
Lost Time Adjust (s)											0.0	
Total Lost Time (s)											5.0	
Lead/Lag				Lead							Lag	
Lead-Lag Optimize?												
Act Effct Green (s)					51.2						28.5	
Actuated g/C Ratio					0.57						0.32	
v/c Ratio					0.46						0.70	
Control Delay					2.9						35.2	
Queue Delay					0.0						3.7	
Total Delay					2.9						38.9	
LOS					A						D	
Approach Delay					2.9						38.9	
Approach LOS					A						D	
Queue Length 50th (ft)					17						181	
Queue Length 95th (ft)					55						283	
Internal Link Dist (ft)		895			350			90			567	
Turn Bay Length (ft)												
Base Capacity (vph)					1891						525	
Starvation Cap Reductn					47						0	
Spillback Cap Reductn					42						88	

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	ø3	ø5	ø6
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	5	6
Permitted Phases			
Minimum Split (s)	9.0	51.0	39.0
Total Split (s)	9.0	51.0	39.0
Total Split (%)	10%	57%	43%
Yellow Time (s)	2.0	3.5	3.5
All-Red Time (s)	0.0	1.8	2.5
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag		Lead	Lag
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			

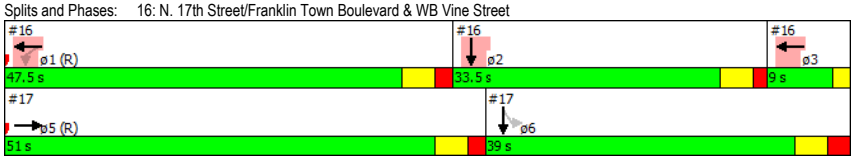
Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.47						0.84	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 13.6	Intersection LOS: B
Intersection Capacity Utilization 67.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 16: N. 17th Street/Franklin Town Boulevard & WB Vine Street



Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	ø3	ø5	ø6
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	494	49	0	0	0	0	0	0	148	440	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor		1.00									0.96	
Frt		0.986										
Flt Protected											0.988	
Satd. Flow (prot)	0	3288	0	0	0	0	0	0	0	0	3478	0
Flt Permitted											0.988	
Satd. Flow (perm)	0	3288	0	0	0	0	0	0	0	0	3332	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)		17									58	
Link Speed (mph)		30			25			30			30	
Link Distance (ft)		975			430			430			170	
Travel Time (s)		22.2			11.7			9.8			3.9	
Confl. Peds. (#/hr)	2		32	32		2	36		155	155		36
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Parking (#/hr)		0										
Adj. Flow (vph)	0	520	52	0	0	0	0	0	0	156	463	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	572	0	0	0	0	0	0	0	0	619	0
Turn Type		NA								Perm	NA	
Protected Phases		5									6	
Permitted Phases										6		
Minimum Split (s)		51.0								39.0	39.0	
Total Split (s)		51.0								39.0	39.0	
Total Split (%)		56.7%								43.3%	43.3%	
Yellow Time (s)		3.5								3.5	3.5	
All-Red Time (s)		1.8								2.5	2.5	
Lost Time Adjust (s)		0.0									0.0	
Total Lost Time (s)		5.3									6.0	
Lead/Lag		Lead								Lag	Lag	
Lead-Lag Optimize?												
Act Effct Green (s)		45.7									33.0	
Actuated g/C Ratio		0.51									0.37	
v/c Ratio		0.34									0.49	
Control Delay		13.5									12.2	
Queue Delay		0.0									6.0	
Total Delay		13.5									18.2	
LOS		B									B	
Approach Delay		13.5									18.2	
Approach LOS		B									B	
Queue Length 50th (ft)		93									67	
Queue Length 95th (ft)		130									100	
Internal Link Dist (ft)		895			350			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		1677									1258	
Starvation Cap Reductn		0									573	
Spillback Cap Reductn		0									0	

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	3
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	1.8	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			

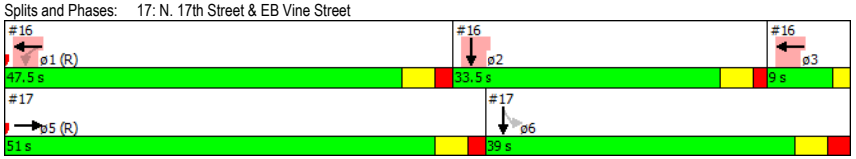
Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.34									0.90	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 15.9	Intersection LOS: B
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: N. 17th Street & EB Vine Street



Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Storage Cap Reductn			
Reduced v/c Ratio			

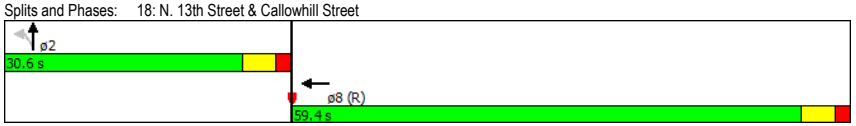
Intersection Summary

Timings
18: N. 13th Street & Callowhill Street

Lane Group	WBT	NBT
Lane Configurations		
Volume (vph)	282	239
Lane Group Flow (vph)	380	292
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Minimum Split (s)	59.4	30.6
Total Split (s)	59.4	30.6
Total Split (%)	66.0%	34.0%
Yellow Time (s)	3.6	3.6
All-Red Time (s)	1.8	1.8
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.4	5.4
Lead/Lag		
Lead-Lag Optimize?		
v/c Ratio	0.21	0.65
Control Delay	7.4	23.8
Queue Delay	0.0	0.0
Total Delay	7.4	23.8
Queue Length 50th (ft)	40	57
Queue Length 95th (ft)	62	134
Internal Link Dist (ft)	195	480
Turn Bay Length (ft)		
Base Capacity (vph)	1811	450
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.21	0.65

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 90
Control Type: Pretimed

Splits and Phases: 18: N. 13th Street & Callowhill Street



HCM 2010 Signalized Intersection Summary
18: N. 13th Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	282	60	23	239	0	0	0	0
Number				3	8	18	5	2	12			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.90	1.00		1.00			
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln				0.0	185.3	189.0	189.0	185.0	0.0			
Lanes				0	2	0	0	1	0			
Cap, veh/h				0	1746	365	46	470	0			
Arrive On Green				0.00	0.60	0.60	0.28	0.28	0.00			
Sat Flow, veh/h				0	2909	608	164	1678	0			
Grp Volume(v), veh/h				0	197	183	292	0	0			
Grp Sat Flow(s),veh/h/ln				0	1853	1664	1842	1850	0			
Q Serve(g_s), s				0.0	4.3	4.5	12.2	0.0	0.0			
Cycle Q Clear(g_c), s				0.0	4.3	4.5	12.2	0.0	0.0			
Prop In Lane				0.00		0.37	0.09		0.00			
Lane Grp Cap(c), veh/h				0	1112	998	516	0	0			
V/C Ratio(X)				0.00	0.18	0.18	0.57	0.00	0.00			
Avail Cap(c_a), veh/h				0	1112	998	516	0	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	8.1	8.1	27.7	0.0	0.0			
Incr Delay (d2), s/veh				0.0	0.3	0.4	4.5	0.0	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln				0.0	3.3	3.1	8.7	0.0	0.0			
Lane Grp Delay (d), s/veh				0.0	8.4	8.5	32.2	0.0	0.0			
Lane Grp LOS					A	A	C					
Approach Vol, veh/h					380			292				
Approach Delay, s/veh					8.4			32.2				
Approach LOS					A			C				

Timer	
Assigned Phs	8	2
Phs Duration (G+Y+Rc), s	59.4	30.6
Change Period (Y+Rc), s	5.4	5.4
Max Green Setting (Gmax), s	54.0	25.2
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	18.8
HCM 2010 LOS	B

Notes

Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	1029	73	119	243	0	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	11	12	11	10	12	12	10	12
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00		0.96					
Frt					0.990							
Flt Protected							0.950					
Satd. Flow (prot)	0	0	0	0	4663	0	1702	1729	0	0	0	0
Flt Permitted							0.950					
Satd. Flow (perm)	0	0	0	0	4663	0	1631	1729	0	0	0	0
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Satd. Flow (RTOR)					18		53					
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		605			275			170			560	
Travel Time (s)		16.5			6.3			3.9			12.7	
Confl. Peds. (#/hr)	36		5	5		36	51		81	81		51
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Parking (#/hr)					0							
Adj. Flow (vph)	0	0	0	0	1131	80	131	267	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1211	0	131	267	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					1			2				
Permitted Phases							2					
Minimum Split (s)					51.0		39.0	39.0				
Total Split (s)					51.0		39.0	39.0				
Total Split (%)					56.7%		43.3%	43.3%				
Yellow Time (s)					3.7		3.5	3.5				
All-Red Time (s)					1.8		2.5	2.5				
Lost Time Adjust (s)					0.0		0.0	0.0				
Total Lost Time (s)					5.5		6.0	6.0				
Lead/Lag					Lead		Lag	Lag				
Lead-Lag Optimize?					Yes		Yes	Yes				
Act Effct Green (s)					45.5		33.0	33.0				
Actuated g/C Ratio					0.51		0.37	0.37				
v/c Ratio					0.51		0.21	0.42				
Control Delay					15.5		2.9	11.1				
Queue Delay					0.0		1.3	2.1				
Total Delay					15.5		4.2	13.1				
LOS					B		A	B				
Approach Delay					15.5			10.2				
Approach LOS					B			B				
Queue Length 50th (ft)					157		2	41				
Queue Length 95th (ft)					196		12	61				
Internal Link Dist (ft)		525			195			90			480	
Turn Bay Length (ft)												
Base Capacity (vph)					2366		631	633				
Starvation Cap Reductn					0		339	234				

Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

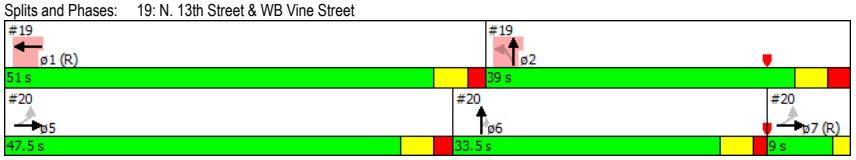
Lane Group	ø5	ø6	ø7
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	7
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	2.0	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.51		0.45	0.67				

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 7:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 110.0%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 19: N. 13th Street & WB Vine Street



Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	74	599	0	0	0	0	0	255	102	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	11	9	12	12	12
Lane Util. Factor	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.92			
Frt									0.850			
Flt Protected		0.995										
Satd. Flow (prot)	0	5033	0	0	0	0	0	1612	1417	0	0	0
Flt Permitted		0.995										
Satd. Flow (perm)	0	5033	0	0	0	0	0	1612	1302	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		40							116			
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		442			275			430			170	
Travel Time (s)		12.1			6.3			9.8			3.9	
Confl. Peds. (#/hr)	2		34	34		2	111		75	75		111
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Parking (#/hr)								0				
Adj. Flow (vph)	84	681	0	0	0	0	0	290	116	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	765	0	0	0	0	0	290	116	0	0	0
Turn Type	Perm	NA						NA	Perm			
Protected Phases		5 7						6				
Permitted Phases	5 7								6			
Minimum Split (s)								33.5	33.5			
Total Split (s)								33.5	33.5			
Total Split (%)								37.2%	37.2%			
Yellow Time (s)								3.5	3.5			
All-Red Time (s)								1.5	1.5			
Lost Time Adjust (s)								0.0	0.0			
Total Lost Time (s)								5.0	5.0			
Lead/Lag								Lag	Lag			
Lead-Lag Optimize?								Yes	Yes			
Act Effct Green (s)		51.0						28.5	28.5			
Actuated g/C Ratio		0.57						0.32	0.32			
v/c Ratio		0.27						0.57	0.24			
Control Delay		5.2						30.9	5.9			
Queue Delay		0.0						0.2	0.0			
Total Delay		5.2						31.1	5.9			
LOS		A						C	A			
Approach Delay		5.2						23.9				
Approach LOS		A						C				
Queue Length 50th (ft)		41						136	0			
Queue Length 95th (ft)		m47						213	35			
Internal Link Dist (ft)		362			195			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		2869						510	491			
Starvation Cap Reductn		0						0	0			

Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

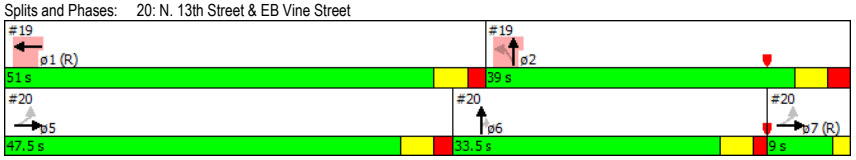
Lane Group	ø1	ø2	ø5	ø7
Lane Configurations				
Volume (vph)				
Ideal Flow (vphpl)				
Lane Width (ft)				
Lane Util. Factor				
Ped Bike Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Confl. Peds. (#/hr)				
Peak Hour Factor				
Parking (#/hr)				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	2	5	7
Permitted Phases				
Minimum Split (s)	51.0	39.0	47.5	9.0
Total Split (s)	51.0	39.0	47.5	9.0
Total Split (%)	57%	43%	53%	10%
Yellow Time (s)	3.7	3.5	3.5	2.0
All-Red Time (s)	1.8	2.5	2.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0						20	0			
Storage Cap Reductn		0						0	0			
Reduced v/c Ratio		0.27						0.59	0.24			

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 7:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 11.7	Intersection LOS: B
Intersection Capacity Utilization 103.5%	ICU Level of Service G
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 20: N. 13th Street & EB Vine Street



Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	651	0	0	0	0	0	643	439	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.97			
Frt									0.850			
Flt Protected		0.998										
Satd. Flow (prot)	0	3514	0	0	0	0	0	5009	1560	0	0	0
Flt Permitted		0.998										
Satd. Flow (perm)	0	3513	0	0	0	0	0	5009	1516	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24							222			
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		430			378			430			170	
Travel Time (s)		11.7			10.3			11.7			4.6	
Confl. Peds. (#/hr)	1		8	8		1	200		10	10		200
Confl. Bikes (#/hr)									10			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	3%	2%	2%	2%
Adj. Flow (vph)	25	678	0	0	0	0	0	670	457	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	703	0	0	0	0	0	670	457	0	0	0
Turn Type	Perm	NA						NA	Perm			
Protected Phases		5 7						6				
Permitted Phases	5 7								6			
Minimum Split (s)								33.5	33.5			
Total Split (s)								33.5	33.5			
Total Split (%)								37.2%	37.2%			
Yellow Time (s)								3.5	3.5			
All-Red Time (s)								1.5	1.5			
Lost Time Adjust (s)								0.0	0.0			
Total Lost Time (s)								5.0	5.0			
Lead/Lag								Lag	Lag			
Lead-Lag Optimize?												
Act Effct Green (s)		51.2						28.5	28.5			
Actuated g/C Ratio		0.57						0.32	0.32			
v/c Ratio		0.35						0.42	0.72			
Control Delay		7.6						25.3	21.2			
Queue Delay		0.0						0.0	0.0			
Total Delay		7.6						25.3	21.2			
LOS		A						C	C			
Approach Delay		7.6						23.6				
Approach LOS		A						C				
Queue Length 50th (ft)		75						109	116			
Queue Length 95th (ft)		87						143	236			
Internal Link Dist (ft)		350			298			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		2008						1586	631			
Starvation Cap Reductn		0						0	0			

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

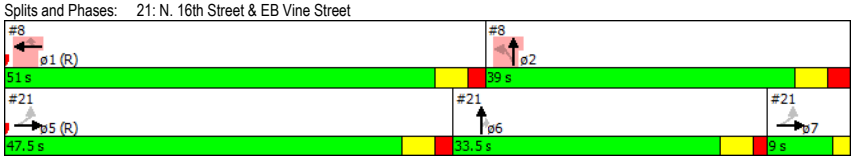
Lane Group	ø1	ø2	ø5	ø7
Lane Configurations				
Volume (vph)				
Ideal Flow (vphpl)				
Lane Util. Factor				
Ped Bike Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Confl. Peds. (#/hr)				
Confl. Bikes (#/hr)				
Peak Hour Factor				
Heavy Vehicles (%)				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	2	5	7
Permitted Phases				
Minimum Split (s)	51.0	39.0	47.5	9.0
Total Split (s)	51.0	39.0	47.5	9.0
Total Split (%)	57%	43%	53%	10%
Yellow Time (s)	3.5	3.5	3.5	2.0
All-Red Time (s)	1.8	2.5	1.8	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lead	
Lead-Lag Optimize?				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0						0	0			
Storage Cap Reductn		0						0	0			
Reduced v/c Ratio		0.35						0.42	0.72			

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 17.5	Intersection LOS: B
Intersection Capacity Utilization 72.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 21: N. 16th Street & EB Vine Street



Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

FRIDAY EVENING (7-10 PM)
PEAK HOUR TIME PERIOD

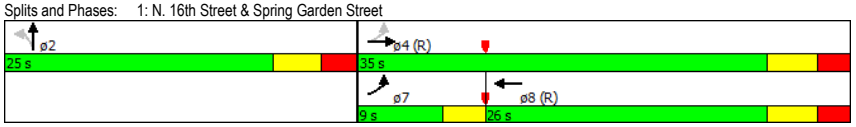
Timings
1: N. 16th Street & Spring Garden Street

Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Volume (vph)	64	460	418	188
Lane Group Flow (vph)	67	484	501	324
Turn Type	pm+pt	NA	NA	NA
Protected Phases	7	4	8	2
Permitted Phases	4			
Minimum Split (s)	9.0	35.0	26.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?				
v/c Ratio	0.17	0.31	0.49	0.32
Control Delay	6.0	9.5	27.8	16.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.0	9.5	27.8	16.5
Queue Length 50th (ft)	6	28	92	52
Queue Length 95th (ft)	m16	73	134	86
Internal Link Dist (ft)		350	380	990
Turn Bay Length (ft)	140			
Base Capacity (vph)	405	1550	1031	1014
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	0.17	0.31	0.49	0.32

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: N. 16th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
1: N. 16th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	64	460	0	0	418	58	51	188	68	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.94	1.00		0.95			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln	185.3	185.3	0.0	0.0	183.4	187.1	186.2	180.5	186.2			
Lanes	1	2	0	0	2	0	0	2	0			
Cap, veh/h	477	1791	0	0	992	136	175	656	247			
Arrive On Green	0.20	0.97	0.00	0.00	0.11	0.11	0.32	0.32	0.32			
Sat Flow, veh/h	1765	3706	0	0	2976	409	552	2071	779			
Grp Volume(v), veh/h	67	484	0	0	270	231	174	0	150			
Grp Sat Flow(s),veh/h/ln	1765	1853	0	0	1834	1550	1778	0	1624			
Q Serve(g_s), s	1.2	0.4	0.0	0.0	8.3	8.4	4.4	0.0	4.2			
Cycle Q Clear(g_c), s	1.2	0.4	0.0	0.0	8.3	8.4	4.4	0.0	4.2			
Prop In Lane	1.00		0.00	0.00		0.26	0.31		0.48			
Lane Grp Cap(c), veh/h	477	1791	0	0	611	517	563	0	514			
V/C Ratio(X)	0.14	0.27	0.00	0.00	0.44	0.45	0.31	0.00	0.29			
Avail Cap(c_a), veh/h	477	1791	0	0	611	517	563	0	514			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	8.7	0.5	0.0	0.0	21.5	21.5	15.5	0.0	15.4			
Incr Delay (d2), s/veh	0.6	0.4	0.0	0.0	2.3	2.8	1.4	0.0	1.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln	0.9	0.4	0.0	0.0	6.6	5.9	3.5	0.0	3.1			
Lane Grp Delay (d), s/veh	9.3	0.9	0.0	0.0	23.8	24.3	16.9	0.0	16.9			
Lane Grp LOS	A	A			C	C	B		B			
Approach Vol, veh/h		551			501			324				
Approach Delay, s/veh		1.9			24.0			16.9				
Approach LOS		A			C			B				

Timer

Assigned Phs	7	4			8			2				
Phs Duration (G+Y+Rc), s	9.0	35.0			26.0			25.0				
Change Period (Y+Rc), s	3.0	6.0			6.0			6.0				
Max Green Setting (Gmax), s	6.0	29.0			20.0			19.0				
Max Q Clear Time (g_c+I1), s	0.0	0.0			0.0			0.0				
Green Ext Time (p_c), s	0.0	0.0			0.0			0.0				

Intersection Summary

HCM 2010 Ctrl Delay			13.5									
HCM 2010 LOS			B									

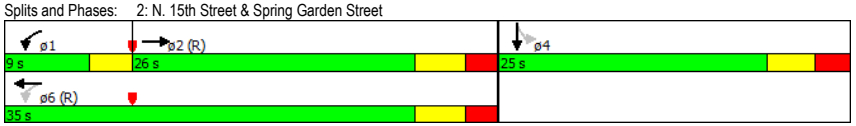
Notes

Timings
2: N. 15th Street & Spring Garden Street

Lane Group	EBT	WBL	WBT	SBL	SBT
Lane Configurations					
Volume (vph)	472	42	443	35	132
Lane Group Flow (vph)	576	47	492	39	237
Turn Type	NA	pm+pt	NA	Perm	NA
Protected Phases	2	1	6		4
Permitted Phases		6		4	
Minimum Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (%)	43.3%	15.0%	58.3%	41.7%	41.7%
Yellow Time (s)	3.6	3.0	3.6	3.4	3.4
All-Red Time (s)	2.4	0.0	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	3.0	6.0	6.0	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?					
v/c Ratio	0.53	0.13	0.32	0.08	0.52
Control Delay	10.5	7.7	10.2	15.0	21.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.5	7.7	10.2	15.0	21.9
Queue Length 50th (ft)	48	7	53	10	69
Queue Length 95th (ft)	99	20	81	28	131
Internal Link Dist (ft)	380		400		290
Turn Bay Length (ft)		115		100	
Base Capacity (vph)	1082	359	1534	489	452
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	0.53	0.13	0.32	0.08	0.52

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 15 (25%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 2: N. 15th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
2: N. 15th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	472	47	42	443	0	0	0	0	35	132	81
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.87	0.96		1.00				1.00		0.94
Parking Bus Adj	1.00	1.00	0.90	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	183.7	189.0	183.4	183.4	0.0				177.9	185.3	189.0
Lanes	0	2	0	1	2	0				1	1	0
Cap, veh/h	0	1027	101	502	1773	0				536	332	203
Arrive On Green	0.00	0.67	0.67	0.10	0.48	0.00				0.32	0.32	0.32
Sat Flow, veh/h	0	3080	304	1747	3669	0				1694	1048	642
Grp Volume(v), veh/h	0	311	265	47	492	0				39	0	237
Grp Sat Flow(s),veh/h/ln	0	1837	1547	1747	1834	0				1694	1853	1690
Q Serve(g_s), s	0.0	5.1	5.2	0.9	4.8	0.0				1.0	0.0	6.7
Cycle Q Clear(g_c), s	0.0	5.1	5.2	0.9	4.8	0.0				1.0	0.0	6.7
Prop In Lane	0.00		0.20	1.00		0.00				1.00		0.38
Lane Grp Cap(c), veh/h	0	612	516	502	1773	0				536	0	535
V/C Ratio(X)	0.00	0.51	0.51	0.09	0.28	0.00				0.07	0.00	0.44
Avail Cap(c_a), veh/h	0	612	516	502	1773	0				536	0	535
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	7.5	7.5	9.2	9.2	0.0				14.3	0.0	16.3
Incr Delay (d2), s/veh	0.0	3.0	3.6	0.4	0.4	0.0				0.3	0.0	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	3.6	3.3	0.7	3.4	0.0				0.7	0.0	4.8
Lane Grp Delay (d), s/veh	0.0	10.5	11.2	9.6	9.6	0.0				14.6	0.0	18.9
Lane Grp LOS		B	B	A	A					B		B
Approach Vol, veh/h		576			539						276	
Approach Delay, s/veh		10.8			9.6						18.3	
Approach LOS		B			A						B	

Timer												
Assigned Phs		2		1	6						4	
Phs Duration (G+Y+Rc), s		26.0		9.0	35.0						25.0	
Change Period (Y+Rc), s		6.0		3.0	6.0						6.0	
Max Green Setting (Gmax), s		20.0		6.0	29.0						19.0	
Max Q Clear Time (g_c+I1), s		0.0		0.0	0.0						0.0	
Green Ext Time (p_c), s		0.0		0.0	0.0						0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	11.8
HCM 2010 LOS	B

Notes

Lanes, Volumes, Timings
3: Franklin Town Boulevard & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	46	108	23	97	53	16	36	6	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	11	12	12	12	12	12	16	12	12	12	12
Grade (%)		-1%			2%			3%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.947			0.959			0.987				
Flt Protected		0.979			0.993			0.986				
Satd. Flow (prot)	0	1669	0	0	1572	0	0	1812	0	0	0	0
Flt Permitted		0.979			0.993			0.986				
Satd. Flow (perm)	0	1669	0	0	1572	0	0	1812	0	0	0	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		646			325			647			208	
Travel Time (s)		17.6			8.9			17.6			5.7	
Confl. Peds. (#/hr)	39		76	76		39	55		64	64		55
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Parking (#/hr)					0			0				
Adj. Flow (vph)	125	48	113	24	101	55	17	38	6	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	285	0	0	180	0	0	61	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.05	1.00	1.02	1.17	1.02	1.03	1.00	1.03	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization 53.4%		ICU Level of Service A	
Analysis Period (min) 15			

HCM 2010 AWSC
3: Franklin Town Boulevard & Callowhill Street

Intersection	
Intersection Delay, s/veh	8.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	120	46	108	23	97	53	16	36	6	0	0	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	125	48	112	24	101	55	17	38	6	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.1	8.3	8.4
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	28%	44%	13%
Vol Thru, %	62%	17%	56%
Vol Right, %	10%	39%	31%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	58	274	173
LT Vol	36	46	97
Through Vol	6	108	53
RT Vol	16	120	23
Lane Flow Rate	60	285	180
Geometry Grp	1	1	1
Degree of Util (X)	0.082	0.319	0.211
Departure Headway (Hd)	4.906	4.129	4.208
Convergence, Y/N	Yes	Yes	Yes
Cap	733	876	856
Service Time	2.916	2.129	2.215
HCM Lane V/C Ratio	0.082	0.325	0.21
HCM Control Delay	8.4	9.1	8.3
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.3	1.4	0.8

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
4: N. 17th Street & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	43	56	110	0	0	0	0	0	125	30
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	11	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			-4%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.865								0.974	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	1443	1693	1659	0	0	0	0	0	1570	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	1443	1693	1659	0	0	0	0	0	1570	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		325			430			230			1070	
Travel Time (s)		8.9			11.7			6.3			29.2	
Confl. Peds. (#/hr)	24		54	54		24	41		6	6		41
Confl. Bikes (#/hr)			3			1						7
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	5	0
Parking (#/hr)			0		0						0	
Adj. Flow (vph)	0	0	49	64	125	0	0	0	0	0	142	34
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	49	64	125	0	0	0	0	0	176	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.15	1.06	1.16	1.01	1.01	1.01	1.01	0.98	1.20	0.98
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	CBD
Control Type: Unsignalized	
Intersection Capacity Utilization 50.0%	ICU Level of Service A
Analysis Period (min) 15	

HCM 2010 AWSC
4: N. 17th Street & Callowhill Street

Intersection	
Intersection Delay, s/veh	8.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	43	56	110	0	0	0	0	0	125	30
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	49	64	125	0	0	0	0	0	142	34
Number of Lanes	0	0	1	1	1	0	0	0	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.3	8.7	8.6
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	100%	0%	0%
Vol Thru, %	0%	0%	100%	81%
Vol Right, %	100%	0%	0%	19%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	43	56	110	155
LT Vol	0	0	110	125
Through Vol	43	0	0	30
RT Vol	0	56	0	0
Lane Flow Rate	49	64	125	176
Geometry Grp	5	7	7	2
Degree of Util (X)	0.055	0.097	0.173	0.215
Departure Headway (Hd)	4.066	5.481	4.979	4.39
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	881	655	723	821
Service Time	2.09	3.201	2.699	2.403
HCM Lane V/C Ratio	0.056	0.098	0.173	0.214
HCM Control Delay	7.3	8.8	8.7	8.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.3	0.6	0.8

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Timings
5: N. 16th Street & Callowhill Street

Lane Group	WBT	NBT
Lane Configurations		
Volume (vph)	131	269
Lane Group Flow (vph)	210	379
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Minimum Split (s)	21.0	39.0
Total Split (s)	21.0	39.0
Total Split (%)	35.0%	65.0%
Yellow Time (s)	3.0	3.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
v/c Ratio	0.24	0.20
Control Delay	13.8	5.8
Queue Delay	0.0	0.0
Total Delay	13.8	5.8
Queue Length 50th (ft)	23	26
Queue Length 95th (ft)	41	39
Internal Link Dist (ft)	380	136
Turn Bay Length (ft)		
Base Capacity (vph)	887	1924
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.24	0.20

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 17 (28%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 5: N. 16th Street & Callowhill Street

HCM 2010 Signalized Intersection Summary
5: N. 16th Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	131	41	42	269	0	0	0	0
Number				3	8	18	5	2	12			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.97	1.00		1.00			
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln				0.0	185.3	189.0	187.1	180.4	0.0			
Lanes				0	2	0	0	2	0			
Cap, veh/h				0	724	217	260	1771	0			
Arrive On Green				0.00	0.27	0.27	0.57	0.57	0.00			
Sat Flow, veh/h				0	2715	815	459	3125	0			
Grp Volume(v), veh/h				0	107	103	198	181	0			
Grp Sat Flow(s),veh/h/ln				0	1853	1677	1781	1804	0			
Q Serve(g_s), s				0.0	2.7	2.9	3.2	2.9	0.0			
Cycle Q Clear(g_c), s				0.0	2.7	2.9	3.2	2.9	0.0			
Prop In Lane				0.00		0.49	0.26		0.00			
Lane Grp Cap(c), veh/h				0	494	447	1009	1022	0			
V/C Ratio(X)				0.00	0.22	0.23	0.20	0.18	0.00			
Avail Cap(c_a), veh/h				0	494	447	1009	1022	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	17.1	17.2	6.3	6.3	0.0			
Incr Delay (d2), s/veh				0.0	1.0	1.2	0.4	0.4	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln				0.0	2.3	2.3	2.3	2.1	0.0			
Lane Grp Delay (d), s/veh				0.0	18.1	18.4	6.8	6.6	0.0			
Lane Grp LOS					B	B	A	A				
Approach Vol, veh/h					210			379				
Approach Delay, s/veh					18.3			6.7				
Approach LOS					B			A				

Timer	
Assigned Phs	8	2
Phs Duration (G+Y+Rc), s	21.0	39.0
Change Period (Y+Rc), s	5.0	5.0
Max Green Setting (Gmax), s	16.0	34.0
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	10.8
HCM 2010 LOS	B

Notes

HCM 2010 Signals-Pedestrians
5: N. 16th Street & Callowhill Street

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	23.0	24.0	24.0	24.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	2	2	2
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	0	2	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	25	25	25
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	30.0	30.0	30.0	30.0
Pedestrian Compliance Code	Fair	Fair	Fair	Fair
Pedestrian Crosswalk Score	1.79	1.79	1.86	1.86
Pedestrian Crosswalk LOS	A	A	A	A

HCM 2010 Signals-Bicycles
5: N. 16th Street & Callowhill Street

Approach	EB	WB	NB	SB
Bicycle Flow Rate (bike/h)	0	0	0	0
Total Flow Rate (veh/h)	0	210	379	0
Effct. Green for Bike (s)	0.0	16.0	34.0	0.0
Cross Street Width (ft)	24.0	24.0	24.0	23.0
Through Lanes Number	0	2	2	0
Through Lane Width (ft)	12.0	12.0	12.0	12.0
Bicycle Lane Width (ft)	0.0	0.0	0.0	0.0
Paved Shoulder Width (ft)	0.0	0.0	0.0	0.0
Curb Is Present?	No	No	No	No
On Street Parking?	No	No	No	No
Bicycle Lane Capacity (bike/h)	0	533	1133	0
Bicycle Delay (s/bike)	0.0	16.1	5.6	0.0
Bicycle Compliance		Fair	Good	
Bicycle LOS Score	0.00	2.10	2.24	0.00
Bicycle LOS		B	B	

Lanes, Volumes, Timings
6: N. 15th Street & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	82	135	0	0	0	0	0	229	16
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		0%			0%			0%			-3%	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt											0.991	
Flt Protected					0.982							
Satd. Flow (prot)	0	0	0	0	3225	0	0	0	0	0	1622	0
Flt Permitted					0.982							
Satd. Flow (perm)	0	0	0	0	3225	0	0	0	0	0	1622	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		460			480			146			1070	
Travel Time (s)		12.5			13.1			4.0			29.2	
Confl. Peds. (#/hr)	10		41	41		10	15		19	19		15
Confl. Bikes (#/hr)												5
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	2%	2%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Parking (#/hr)					0						0	
Adj. Flow (vph)	0	0	0	101	167	0	0	0	0	0	283	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	268	0	0	0	0	0	303	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.08	1.01	1.01	1.01	1.01	0.99	1.18	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization 31.7%		ICU Level of Service A	
Analysis Period (min) 15			

HCM 2010 AWSC
6: N. 15th Street & Callowhill Street

Intersection	
Intersection Delay, s/veh	10.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	0	82	135	0	0	0	0	0	229	16
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	2	2	2	2	5	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	101	167	0	0	0	0	0	283	20
Number of Lanes	0	0	0	0	2	0	0	0	0	0	1	0

Approach	WB	SB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left		WB
Conflicting Lanes Left	0	2
Conflicting Approach Right	SB	
Conflicting Lanes Right	1	0
HCM Control Delay	9.7	10.5
HCM LOS	A	B

Lane	WBLn1	WBLn2	SBLn1
Vol Left, %	65%	0%	0%
Vol Thru, %	35%	100%	93%
Vol Right, %	0%	0%	7%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	127	90	245
LT Vol	45	90	229
Through Vol	0	0	16
RT Vol	82	0	0
Lane Flow Rate	157	111	302
Geometry Grp	7	7	2
Degree of Util (X)	0.243	0.164	0.385
Departure Headway (Hd)	5.579	5.305	4.585
Convergence, Y/N	Yes	Yes	Yes
Cap	643	676	786
Service Time	3.32	3.046	2.607
HCM Lane V/C Ratio	0.244	0.164	0.384
HCM Control Delay	10.1	9.1	10.5
HCM Lane LOS	B	A	B
HCM 95th-tile Q	0.9	0.6	1.8

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Timings
7: N. Broad Street & Callowhill Street

Lane Group	WBL	WBT	NBT	SBT
Lane Configurations				
Volume (vph)	30	122	551	761
Lane Group Flow (vph)	33	179	605	925
Turn Type	Perm	NA	NA	NA
Protected Phases		8	2	6
Permitted Phases	8			
Minimum Split (s)	29.0	29.0	61.0	61.0
Total Split (s)	29.0	29.0	61.0	61.0
Total Split (%)	32.2%	32.2%	67.8%	67.8%
Yellow Time (s)	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.0	5.0
Lead/Lag				
Lead-Lag Optimize?				
v/c Ratio	0.08	0.22	0.30	0.46
Control Delay	26.3	27.4	19.3	6.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	26.3	27.4	19.3	6.6
Queue Length 50th (ft)	15	45	165	67
Queue Length 95th (ft)	m40	75	221	79
Internal Link Dist (ft)		525	250	990
Turn Bay Length (ft)				
Base Capacity (vph)	407	811	1995	1994
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	0.08	0.22	0.30	0.46

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 47 (52%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: N. Broad Street & Callowhill Street

HCM 2010 Signalized Intersection Summary
7: N. Broad Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	30	122	41	0	551	0	0	761	81
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.97	1.00		1.00	1.00		0.96
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln				182.5	181.2	186.2	0.0	181.6	0.0	0.0	185.9	189.9
Lanes				1	2	0	0	2	0	0	2	0
Cap, veh/h				444	666	213	0	2260	0	0	2046	218
Arrive On Green				0.08	0.08	0.08	0.00	0.62	0.00	0.00	0.62	0.62
Sat Flow, veh/h				1738	2608	835	0	3632	0	0	3288	350
Grp Volume(v), veh/h				33	91	88	0	605	0	0	473	452
Grp Sat Flow(s),veh/h/ln				1738	1812	1631	0	1816	0	0	1859	1780
Q Serve(g_s), s				1.6	4.2	4.5	0.0	6.8	0.0	0.0	11.6	11.6
Cycle Q Clear(g_c), s				1.6	4.2	4.5	0.0	6.8	0.0	0.0	11.6	11.6
Prop In Lane				1.00		0.51	0.00		0.00	0.00		0.20
Lane Grp Cap(c), veh/h				444	463	417	0	2260	0	0	1157	1107
V/C Ratio(X)				0.07	0.20	0.21	0.00	0.27	0.00	0.00	0.41	0.41
Avail Cap(c_a), veh/h				444	463	417	0	2260	0	0	1157	1107
HCM Platoon Ratio				0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				31.4	32.6	32.7	0.0	7.7	0.0	0.0	8.6	8.6
Incr Delay (d2), s/veh				0.3	1.0	1.1	0.0	0.3	0.0	0.0	1.1	1.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (85%), veh/ln				1.3	3.6	3.5	0.0	4.5	0.0	0.0	7.4	7.2
Lane Grp Delay (d), s/veh				31.7	33.6	33.9	0.0	8.0	0.0	0.0	9.7	9.7
Lane Grp LOS				C	C	C		A			A	A
Approach Vol, veh/h					212			605			925	
Approach Delay, s/veh					33.4			8.0			9.7	
Approach LOS					C			A			A	

Timer

Assigned Phs	8	2	6
Phs Duration (G+Y+Rc), s	29.0	61.0	61.0
Change Period (Y+Rc), s	6.0	5.0	5.0
Max Green Setting (Gmax), s	23.0	56.0	56.0
Max Q Clear Time (g_c+I1), s	0.0	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	12.0
HCM 2010 LOS	B

Notes

HCM 2010 Signals-Pedestrians
7: N. Broad Street & Callowhill Street

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	24.4	32.0	44.8	42.4
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	3	4	4
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	6	2	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	25	25	25
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	45.0	45.0	45.0	45.0
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	1.82	2.01	2.44	2.46
Pedestrian Crosswalk LOS	A	B	B	B

HCM 2010 Signals-Bicycles
7: N. Broad Street & Callowhill Street

Approach	EB	WB	NB	SB
Bicycle Flow Rate (bike/h)	0	0	0	0
Total Flow Rate (veh/h)	0	212	605	925
Effct. Green for Bike (s)	0.0	23.0	56.0	56.0
Cross Street Width (ft)	44.8	42.4	32.0	24.4
Through Lanes Number	0	2	2	2
Through Lane Width (ft)	12.0	11.0	10.0	10.0
Bicycle Lane Width (ft)	0.0	0.0	0.0	0.0
Paved Shoulder Width (ft)	0.0	0.0	0.0	0.0
Curb Is Present?	No	No	No	No
On Street Parking?	No	No	No	No
Bicycle Lane Capacity (bike/h)	0	511	1244	1244
Bicycle Delay (s/bike)	0.0	24.9	6.4	6.4
Bicycle Compliance		Fair	Good	Good
Bicycle LOS Score	0.00	2.60	2.98	3.12
Bicycle LOS		B	C	C

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	252	419	47	408	0	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	11	12	11	12	12	12	12
Grade (%)		0%			0%			-1%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.88	0.91	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor						0.98		1.00				
Frt						0.850						
Flt Protected								0.995				
Satd. Flow (prot)	0	0	0	0	3521	2680	0	4847	0	0	0	0
Flt Permitted								0.995				
Satd. Flow (perm)	0	0	0	0	3521	2622	0	4840	0	0	0	0
Right Turn on Red			Yes			No	Yes		Yes			Yes
Satd. Flow (RTOR)								28				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		430			460			170			344	
Travel Time (s)		11.7			12.5			4.6			9.4	
Confl. Peds. (#/hr)	15		7	7		15	14		1	1		14
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%
Adj. Flow (vph)	0	0	0	0	262	436	49	425	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	262	436	0	474	0	0	0	0
Turn Type					NA	Perm	Perm	NA				
Protected Phases					1			2				
Permitted Phases						1	2					
Minimum Split (s)					51.0	51.0	39.0	39.0				
Total Split (s)					51.0	51.0	39.0	39.0				
Total Split (%)					56.7%	56.7%	43.3%	43.3%				
Yellow Time (s)					3.5	3.5	3.5	3.5				
All-Red Time (s)					1.8	1.8	2.5	2.5				
Lost Time Adjust (s)					0.0	0.0		0.0				
Total Lost Time (s)					5.3	5.3		6.0				
Lead/Lag					Lead	Lead	Lag	Lag				
Lead-Lag Optimize?												
Act Effct Green (s)					45.7	45.7		33.0				
Actuated g/C Ratio					0.51	0.51		0.37				
v/c Ratio					0.15	0.33		0.26				
Control Delay					15.8	18.0		1.3				
Queue Delay					0.0	0.0		0.3				
Total Delay					15.8	18.0		1.6				
LOS					B	B		A				
Approach Delay					17.2			1.6				
Approach LOS					B			A				
Queue Length 50th (ft)					53	97		2				
Queue Length 95th (ft)					m66	m114		4				
Internal Link Dist (ft)		350			380			90			264	
Turn Bay Length (ft)												
Base Capacity (vph)					1787	1331		1792				

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	7
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	1.8	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening P
Synchro 8 - Report

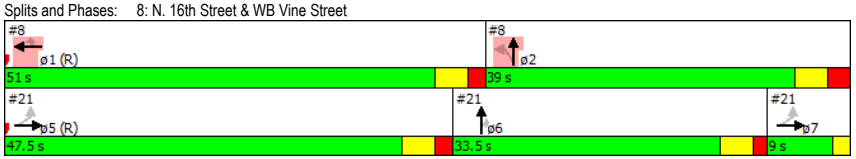
Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn					0	0		706				
Spillback Cap Reductn					0	0		0				
Storage Cap Reductn					0	0		0				
Reduced v/c Ratio					0.15	0.33		0.44				

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 10.9	Intersection LOS: B
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 8: N. 16th Street & WB Vine Street



Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening P
Synchro 8 - Report

Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	35	464	0	0	0	0	0	1011	262
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			2%	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.86	0.86
Ped Bike Factor					1.00						0.99	
Frt											0.969	
Flt Protected					0.996							
Satd. Flow (prot)	0	0	0	0	3315	0	0	0	0	0	5875	0
Flt Permitted					0.996							
Satd. Flow (perm)	0	0	0	0	3314	0	0	0	0	0	5875	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					145						73	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		460			480			170			414	
Travel Time (s)		12.5			13.1			4.6			11.3	
Confl. Peds. (#/hr)	18		1	1		18	17		56	56		17
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Parking (#/hr)					0							
Adj. Flow (vph)	0	0	0	39	516	0	0	0	0	0	1123	291
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	555	0	0	0	0	0	1414	0
Turn Type				Perm	NA						NA	
Protected Phases					1						2	
Permitted Phases				1								
Minimum Split (s)				49.0	49.0						41.0	
Total Split (s)				49.0	49.0						41.0	
Total Split (%)				54.4%	54.4%						45.6%	
Yellow Time (s)				3.5	3.5						3.5	
All-Red Time (s)				1.5	1.5						11.5	
Lost Time Adjust (s)					0.0						0.0	
Total Lost Time (s)					5.0						15.0	
Lead/Lag				Lead	Lead						Lag	
Lead-Lag Optimize?												
Act Effct Green (s)					44.0						26.0	
Actuated g/C Ratio					0.49						0.29	
v/c Ratio					0.33						0.81	
Control Delay					6.3						32.5	
Queue Delay					0.0						0.0	
Total Delay					6.3						32.5	
LOS					A						C	
Approach Delay					6.3						32.5	
Approach LOS					A						C	
Queue Length 50th (ft)					16						205	
Queue Length 95th (ft)					36						250	
Internal Link Dist (ft)		380			400			90			334	
Turn Bay Length (ft)												
Base Capacity (vph)					1694						1749	

Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	ø5	ø6
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Grade (%)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Peak Hour Factor		
Parking (#/hr)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	5	6
Permitted Phases		
Minimum Split (s)	49.0	41.0
Total Split (s)	49.0	41.0
Total Split (%)	54%	46%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.5	3.5
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lag
Lead-Lag Optimize?		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		

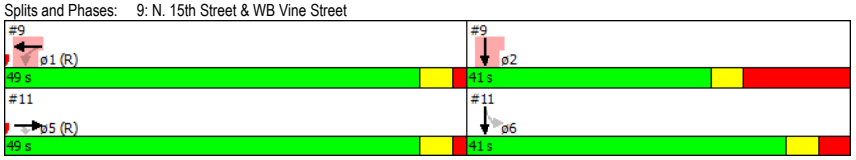
Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening P
Synchro 8 - Report

Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					0						0	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.33						0.81	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green			
Natural Cycle: 90			
Control Type: Pretimed			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 25.1		Intersection LOS: C	
Intersection Capacity Utilization 75.0%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 9: N. 15th Street & WB Vine Street



Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	ø5	ø6
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening P
Synchro 8 - Report

Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	104	410	107	0	518	0	0	593	88
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	11	12	12	10	12	12	10	12
Grade (%)		0%			1%			-1%			1%	
Storage Length (ft)	0		0	0		0	0		0	100		100
Storage Lanes	0		0	1		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.86	0.86
Ped Bike Factor				1.00		0.96					0.96	
Frt						0.850					0.981	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	0	1751	3386	1567	0	4732	0	0	5572	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	0	1750	3386	1507	0	4732	0	0	5572	0
Right Turn on Red			Yes			No			Yes			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		480			605			170			230	
Travel Time (s)		13.1			16.5			4.6			6.3	
Confl. Peds. (#/hr)	43		1	1		43	244		68	68		244
Confl. Bikes (#/hr)						1			13			10
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Bus Blockages (#/hr)	0	0	0	0	0	0	0	2	0	0	5	0
Adj. Flow (vph)	0	0	0	111	436	114	0	551	0	0	631	94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	111	436	114	0	551	0	0	725	0
Turn Type				Perm	NA	Perm		NA			NA	
Protected Phases					1 3!			2			6!	
Permitted Phases				1 3!		1 3						
Minimum Split (s)								34.0			34.0	
Total Split (s)								34.0			34.0	
Total Split (%)								37.8%			37.8%	
Yellow Time (s)								2.4			3.6	
All-Red Time (s)								3.0			5.4	
Lost Time Adjust (s)								0.0			0.0	
Total Lost Time (s)								5.4			9.0	
Lead/Lag								Lead			Lead	
Lead-Lag Optimize?												
Act Effct Green (s)				46.0	46.0	46.0		28.6			25.0	
Actuated g/C Ratio				0.51	0.51	0.51		0.32			0.28	
v/c Ratio				0.12	0.25	0.15		0.37			0.47	
Control Delay				14.3	14.4	14.6		9.6			14.3	
Queue Delay				0.0	0.0	0.0		0.5			0.1	
Total Delay				14.3	14.4	14.6		10.1			14.4	
LOS				B	B	B		B			B	
Approach Delay					14.5			10.1			14.4	
Approach LOS					B			B			B	
Queue Length 50th (ft)				29	61	30		41			69	

Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø7	ø8
Lane Configurations					
Volume (vph)					
Ideal Flow (vphpl)					
Lane Width (ft)					
Grade (%)					
Storage Length (ft)					
Storage Lanes					
Taper Length (ft)					
Lane Util. Factor					
Ped Bike Factor					
Frt					
Flt Protected					
Satd. Flow (prot)					
Flt Permitted					
Satd. Flow (perm)					
Right Turn on Red					
Satd. Flow (RTOR)					
Link Speed (mph)					
Link Distance (ft)					
Travel Time (s)					
Confl. Peds. (#/hr)					
Confl. Bikes (#/hr)					
Peak Hour Factor					
Bus Blockages (#/hr)					
Adj. Flow (vph)					
Shared Lane Traffic (%)					
Lane Group Flow (vph)					
Turn Type					
Protected Phases	1	3	5	7	8
Permitted Phases					
Minimum Split (s)	42.0	14.0	42.0	48.0	14.0
Total Split (s)	42.0	14.0	42.0	48.0	14.0
Total Split (%)	47%	16%	47%	53%	16%
Yellow Time (s)	3.6	2.0	3.6	3.6	3.6
All-Red Time (s)	6.4	0.0	6.4	2.4	2.4
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag		Lag			Lag
Lead-Lag Optimize?		Yes			
Act Effct Green (s)					
Actuated g/C Ratio					
v/c Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Queue Length 50th (ft)					

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening P
Synchro 8 - Report

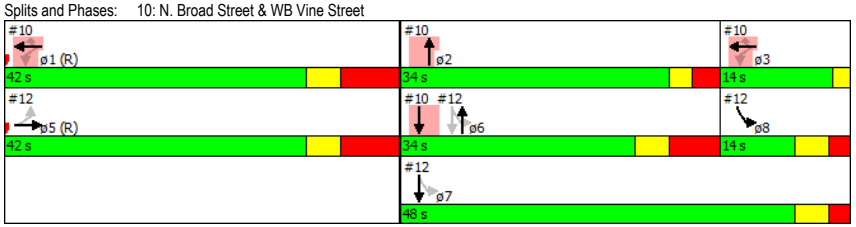
Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)				68	108	70		53			84	
Internal Link Dist (ft)		400			525			90			150	
Turn Bay Length (ft)												
Base Capacity (vph)				894	1730	770		1503			1547	
Starvation Cap Reductn				0	0	0		519			0	
Spillback Cap Reductn				0	0	0		0			98	
Storage Cap Reductn				0	0	0		0			0	
Reduced v/c Ratio				0.12	0.25	0.15		0.56			0.50	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green
Natural Cycle: 90
Control Type: Pretimed
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 13.2 Intersection LOS: B
Intersection Capacity Utilization 83.1% ICU Level of Service E
Analysis Period (min) 15
! Phase conflict between lane groups.

Splits and Phases: 10: N. Broad Street & WB Vine Street



Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø7	ø8
Queue Length 95th (ft)					
Internal Link Dist (ft)					
Turn Bay Length (ft)					
Base Capacity (vph)					
Starvation Cap Reductn					
Spillback Cap Reductn					
Storage Cap Reductn					
Reduced v/c Ratio					

Intersection Summary

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening P
Synchro 8 - Report

Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1095	325	0	0	0	0	0	0	266	787	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		2%			0%			0%			4%	
Lane Util. Factor	1.00	0.86	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00
Ped Bike Factor			0.98							0.94		
Frt			0.850									
Flt Protected										0.950		
Satd. Flow (prot)	0	6310	2744	0	0	0	0	0	0	1725	4792	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	6310	2692	0	0	0	0	0	0	1628	4792	0
Right Turn on Red			No			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)										41		
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		82			480			430			170	
Travel Time (s)		2.2			13.1			11.7			4.6	
Confl. Peds. (#/hr)			12	12			21		71	71		21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1190	353	0	0	0	0	0	0	289	855	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1190	353	0	0	0	0	0	0	289	855	0
Turn Type		NA	Perm							Perm	NA	
Protected Phases		5									6	
Permitted Phases			5							6		
Minimum Split (s)		49.0	49.0							41.0	41.0	
Total Split (s)		49.0	49.0							41.0	41.0	
Total Split (%)		54.4%	54.4%							45.6%	45.6%	
Yellow Time (s)		3.5	3.5							3.5	3.5	
All-Red Time (s)		1.5	1.5							3.5	3.5	
Lost Time Adjust (s)		0.0	0.0							0.0	0.0	
Total Lost Time (s)		5.0	5.0							7.0	7.0	
Lead/Lag		Lead	Lead							Lag	Lag	
Lead-Lag Optimize?												
Act Effct Green (s)		44.0	44.0							34.0	34.0	
Actuated g/C Ratio		0.49	0.49							0.38	0.38	
v/c Ratio		0.39	0.27							0.45	0.47	
Control Delay		12.1	14.2							1.5	2.2	
Queue Delay		0.0	0.0							1.1	0.6	
Total Delay		12.1	14.2							2.6	2.8	
LOS		B	B							A	A	
Approach Delay		12.6									2.7	
Approach LOS		B									A	
Queue Length 50th (ft)		84	63							1	9	
Queue Length 95th (ft)		113	93							m1	11	
Internal Link Dist (ft)		2			400			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		3084	1316							640	1810	
Starvation Cap Reductn		0	0							166	522	

Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

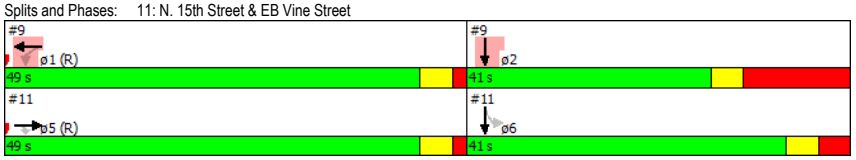
Lane Group	ø1	ø2
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Grade (%)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	2
Permitted Phases		
Minimum Split (s)	49.0	41.0
Total Split (s)	49.0	41.0
Total Split (%)	54%	46%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.5	11.5
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lag
Lead-Lag Optimize?		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening P
Synchro 8 - Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0	0							0	0	
Storage Cap Reductn		0	0							0	0	
Reduced v/c Ratio		0.39	0.27							0.61	0.66	

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 8.4	Intersection LOS: A
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 11: N. 15th Street & EB Vine Street



Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	ø1	ø2
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening P
Synchro 8 - Report

Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	167	1311	102	0	0	0	0	361	207	266	480	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	10	12	12	10	12
Grade (%)		2%			0%			2%			2%	
Storage Length (ft)	0		250	0		0	0		100	45		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.81	0.81	0.81	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor		1.00						0.97		0.98		
Frt		0.990						0.945				
Flt Protected		0.995								0.950		
Satd. Flow (prot)	0	7273	0	0	0	0	0	4063	0	1743	4674	0
Flt Permitted		0.995								0.418		
Satd. Flow (perm)	0	7273	0	0	0	0	0	4063	0	751	4674	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		480			163			240			170	
Travel Time (s)		13.1			4.4			6.5			4.6	
Confl. Peds. (#/hr)			41	41			151		73	73		151
Confl. Bikes (#/hr)			1						9			8
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	7%	2%	2%	2%	2%	2%	4%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	30	0	0	0	0
Adj. Flow (vph)	174	1366	106	0	0	0	0	376	216	277	500	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1646	0	0	0	0	0	592	0	277	500	0
Turn Type	Perm	NA						NA		custom	NA	
Protected Phases		5						6		8	7	
Permitted Phases	5									6 7	6 7	
Minimum Split (s)	42.0	42.0						34.0		14.0	48.0	
Total Split (s)	42.0	42.0						34.0		14.0	48.0	
Total Split (%)	46.7%	46.7%						37.8%		15.6%	53.3%	
Yellow Time (s)	3.6	3.6						3.6		3.6	3.6	
All-Red Time (s)	6.4	6.4						5.4		2.4	2.4	
Lost Time Adjust (s)		0.0						0.0		0.0	0.0	
Total Lost Time (s)		10.0						9.0		6.0	6.0	
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?												
Act Effct Green (s)		32.0						25.0		42.0	42.0	
Actuated g/C Ratio		0.36						0.28		0.47	0.47	
v/c Ratio		0.64						0.52		0.63	0.23	
Control Delay		19.6						29.5		15.7	2.3	
Queue Delay		0.0						0.0		56.5	0.3	
Total Delay		19.6						29.5		72.1	2.6	
LOS		B						C		E	A	
Approach Delay		19.6						29.5			27.4	
Approach LOS		B						C			C	

Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Bus Blockages (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	3
Permitted Phases			
Minimum Split (s)	42.0	34.0	14.0
Total Split (s)	42.0	34.0	14.0
Total Split (%)	47%	38%	16%
Yellow Time (s)	3.6	2.4	2.0
All-Red Time (s)	6.4	3.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag		Lead	Lag
Lead-Lag Optimize?			Yes
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			

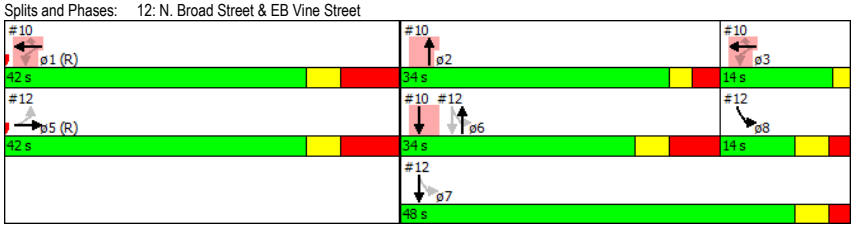
Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening P
Synchro 8 - Report

Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		127						104		73	11	
Queue Length 95th (ft)		138						140		126	17	
Internal Link Dist (ft)		400			83			160			90	
Turn Bay Length (ft)										45		
Base Capacity (vph)		2585						1128		438	2181	
Starvation Cap Reductn		0						0		184	1053	
Spillback Cap Reductn		0						0		0	0	
Storage Cap Reductn		0						0		0	0	
Reduced v/c Ratio		0.64						0.52		1.09	0.44	

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 23.5	Intersection LOS: C
Intersection Capacity Utilization 83.1%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 12: N. Broad Street & EB Vine Street



Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Existing Conditions
Traffic Planning and Design, Inc. - BMP

Timing Plan: Friday Evening P
Synchro 8 - Report

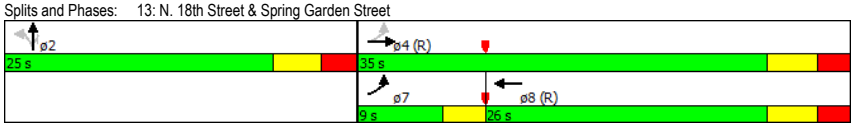
Timings
13: N. 18th Street & Spring Garden Street

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	52	452	445	75	58
Lane Group Flow (vph)	56	486	509	115	62
Turn Type	pm+pt	NA	NA	NA	Perm
Protected Phases	7	4	8	2	
Permitted Phases	4				2
Minimum Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?					
v/c Ratio	0.13	0.31	0.48	0.25	0.12
Control Delay	7.5	10.1	23.8	17.1	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.5	10.1	23.8	17.1	1.9
Queue Length 50th (ft)	9	52	77	30	0
Queue Length 95th (ft)	23	80	81	65	9
Internal Link Dist (ft)		476	350	810	
Turn Bay Length (ft)	145				150
Base Capacity (vph)	439	1562	1068	459	500
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	0.13	0.31	0.48	0.25	0.12

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 13: N. 18th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
13: N. 18th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	52	452	0	0	445	29	32	75	58	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.97		1.00	1.00		0.90	1.00		0.93			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln	185.3	185.3	0.0	0.0	185.3	189.0	189.0	177.9	176.2			
Lanes	1	2	0	0	2	0	0	1	1			
Cap, veh/h	541	1791	0	0	1139	74	198	355	441			
Arrive On Green	0.10	0.48	0.00	0.00	0.67	0.67	0.32	0.32	0.32			
Sat Flow, veh/h	1765	3706	0	0	3416	221	625	1122	1393			
Grp Volume(v), veh/h	56	486	0	0	258	251	95	20	62			
Grp Sat Flow(s),veh/h/ln	1765	1853	0	0	1853	1784	1748	1779	1393			
Q Serve(g_s), s	1.0	4.7	0.0	0.0	3.9	3.9	2.4	0.0	1.9			
Cycle Q Clear(g_c), s	1.0	4.7	0.0	0.0	3.9	3.9	2.4	0.0	1.9			
Prop In Lane	1.00		0.00	0.00		0.12	0.36		1.00			
Lane Grp Cap(c), veh/h	541	1791	0	0	618	595	553	0	441			
V/C Ratio(X)	0.10	0.27	0.00	0.00	0.42	0.42	0.17	0.00	0.14			
Avail Cap(c_a), veh/h	541	1791	0	0	618	595	553	0	441			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	9.1	9.2	0.0	0.0	7.3	7.3	14.8	0.0	14.7			
Incr Delay (d2), s/veh	0.4	0.4	0.0	0.0	2.1	2.2	0.7	0.0	0.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln	0.8	3.4	0.0	0.0	2.9	2.8	1.8	0.0	1.2			
Lane Grp Delay (d), s/veh	9.5	9.6	0.0	0.0	9.4	9.5	15.5	0.0	15.3			
Lane Grp LOS	A	A			A	A	B		B			
Approach Vol, veh/h		542			509			177				
Approach Delay, s/veh		9.6			9.4			13.7				
Approach LOS		A			A			B				

Timer

Assigned Phs	7	4			8			2				
Phs Duration (G+Y+Rc), s	9.0	35.0			26.0			25.0				
Change Period (Y+Rc), s	3.0	6.0			6.0			6.0				
Max Green Setting (Gmax), s	6.0	29.0			20.0			19.0				
Max Q Clear Time (g_c+I1), s	0.0	0.0			0.0			0.0				
Green Ext Time (p_c), s	0.0	0.0			0.0			0.0				

Intersection Summary

HCM 2010 Ctrl Delay			10.1									
HCM 2010 LOS			B									

Notes

Timings
14: N. Broad Street & Spring Garden Street

Lane Group	EBT	WBT	NBT	NBR	SBL	SBT	SBR
Lane Configurations							
Volume (vph)	480	390	543	56	75	794	101
Lane Group Flow (vph)	578	474	584	60	81	854	109
Turn Type	NA	NA	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	8	2		1	6	
Permitted Phases				2	6		6
Minimum Split (s)	33.0	33.0	35.0	35.0	9.0	35.0	35.0
Total Split (s)	40.0	40.0	41.0	41.0	9.0	50.0	50.0
Total Split (%)	44.4%	44.4%	45.6%	45.6%	10.0%	55.6%	55.6%
Yellow Time (s)	3.6	3.6	3.4	3.4	3.0	3.4	3.4
All-Red Time (s)	2.4	2.4	2.6	2.6	0.0	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Lead/Lag			Lag	Lag	Lead		
Lead-Lag Optimize?							
v/c Ratio	0.48	0.40	0.44	0.10	0.22	0.51	0.17
Control Delay	23.0	21.7	9.3	2.6	12.4	17.0	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.0	21.7	9.3	2.6	12.4	17.0	13.7
Queue Length 50th (ft)	129	102	34	0	22	166	33
Queue Length 95th (ft)	178	144	94	1	45	218	64
Internal Link Dist (ft)	400	550	990			290	
Turn Bay Length (ft)				100	170		100
Base Capacity (vph)	1193	1195	1323	603	369	1672	657
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.40	0.44	0.10	0.22	0.51	0.17

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Pretimed

Splits and Phases: 14: N. Broad Street & Spring Garden Street

HCM 2010 Signalized Intersection Summary
14: N. Broad Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	480	58	0	390	51	0	543	56	75	794	101
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	1.00		0.93	0.98		0.90
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.3	189.0	0.0	185.3	189.0	0.0	185.3	185.3	186.2	186.2	186.2
Lanes	0	2	0	0	2	0	0	2	1	1	2	1
Cap, veh/h	0	1221	146	0	1209	157	0	1441	567	477	1821	694
Arrive On Green	0.00	0.38	0.38	0.00	0.38	0.38	0.00	0.78	0.78	0.07	0.49	0.49
Sat Flow, veh/h	0	3231	386	0	3199	417	0	3706	1458	1774	3724	1420
Grp Volume(v), veh/h	0	295	283	0	241	233	0	584	60	81	854	109
Grp Sat Flow(s),veh/h/ln	0	1853	1764	0	1853	1763	0	1853	1458	1774	1862	1420
Q Serve(g_s), s	0.0	10.6	10.7	0.0	8.4	8.5	0.0	4.6	0.9	2.2	13.7	3.8
Cycle Q Clear(g_c), s	0.0	10.6	10.7	0.0	8.4	8.5	0.0	4.6	0.9	2.2	13.7	3.8
Prop In Lane	0.00		0.22	0.00		0.24	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	700	667	0	700	666	0	1441	567	477	1821	694
V/C Ratio(X)	0.00	0.42	0.42	0.00	0.34	0.35	0.00	0.41	0.11	0.17	0.47	0.16
Avail Cap(c_a), veh/h	0	700	667	0	700	666	0	1441	567	477	1821	694
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	20.7	20.8	0.0	20.0	20.1	0.0	6.6	6.2	13.1	15.3	12.7
Incr Delay (d2), s/veh	0.0	1.9	2.0	0.0	1.3	1.4	0.0	0.8	0.4	0.8	0.9	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	7.5	7.2	0.0	6.1	5.9	0.0	3.0	0.6	1.8	8.7	2.5
Lane Grp Delay (d), s/veh	0.0	22.6	22.7	0.0	21.4	21.5	0.0	7.5	6.6	13.9	16.1	13.2
Lane Grp LOS		C	C		C	C		A	A	B	B	B
Approach Vol, veh/h		578			474			644			1044	
Approach Delay, s/veh		22.7			21.4			7.4			15.6	
Approach LOS		C			C			A			B	

Timer

Assigned Phs		4			8			2		1	6	
Phs Duration (G+Y+Rc), s		40.0			40.0			41.0		9.0	50.0	
Change Period (Y+Rc), s		6.0			6.0			6.0		3.0	6.0	
Max Green Setting (Gmax), s		34.0			34.0			35.0		6.0	44.0	
Max Q Clear Time (g_c+I1), s		0.0			0.0			0.0		0.0	0.0	
Green Ext Time (p_c), s		0.0			0.0			0.0		0.0	0.0	

Intersection Summary

HCM 2010 Ctrl Delay			16.2									
HCM 2010 LOS			B									

Notes

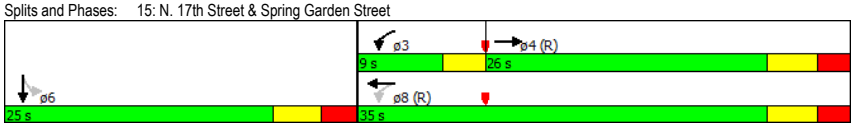
Timings
15: N. 17th Street & Spring Garden Street

Lane Group	EBT	WBL	WBT	SBT
Lane Configurations				
Volume (vph)	438	58	412	68
Lane Group Flow (vph)	577	69	490	169
Turn Type	NA	pm+pt	NA	NA
Protected Phases	4	3	8	6
Permitted Phases		8		
Minimum Split (s)	26.0	9.0	35.0	25.0
Total Split (s)	26.0	9.0	35.0	25.0
Total Split (%)	43.3%	15.0%	58.3%	41.7%
Yellow Time (s)	3.6	3.0	3.6	3.4
All-Red Time (s)	2.4	0.0	2.4	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	3.0	6.0	6.0
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?				
v/c Ratio	0.54	0.17	0.31	0.35
Control Delay	10.1	5.4	8.3	15.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.1	5.4	8.3	15.1
Queue Length 50th (ft)	30	7	27	37
Queue Length 95th (ft)	41	m17	67	73
Internal Link Dist (ft)	350		350	290
Turn Bay Length (ft)		165		
Base Capacity (vph)	1063	409	1562	489
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	0.54	0.17	0.31	0.35

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: N. 17th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
15: N. 17th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	438	47	58	412	0	0	0	0	36	68	38
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.90	0.98		1.00				1.00		0.92
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.3	189.0	185.3	185.3	0.0				189.0	184.8	189.0
Lanes	0	2	0	1	2	0				0	1	0
Cap, veh/h	0	1084	116	517	1791	0				199	155	221
Arrive On Green	0.00	0.67	0.67	0.20	0.97	0.00				0.32	0.32	0.32
Sat Flow, veh/h	0	3253	348	1765	3706	0				630	294	697
Grp Volume(v), veh/h	0	296	281	69	490	0				124	0	107
Grp Sat Flow(s),veh/h/ln	0	1853	1748	1765	1853	0				1817	0	1653
Q Serve(g_s), s	0.0	4.7	4.8	1.2	0.4	0.0				2.6	0.0	0.0
Cycle Q Clear(g_c), s	0.0	4.7	4.8	1.2	0.4	0.0				2.6	0.0	0.0
Prop In Lane	0.00		0.20	1.00		0.00				0.35		0.42
Lane Grp Cap(c), veh/h	0	618	583	517	1791	0				575	0	0
V/C Ratio(X)	0.00	0.48	0.48	0.13	0.27	0.00				0.22	0.00	0.00
Avail Cap(c_a), veh/h	0	618	583	517	1791	0				575	0	0
HCM Platoon Ratio	1.00	2.00	2.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	7.4	7.5	8.2	0.5	0.0				12.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	2.6	2.9	0.5	0.4	0.0				0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	3.3	3.2	0.9	0.4	0.0				2.1	0.0	0.0
Lane Grp Delay (d), s/veh	0.0	10.1	10.3	8.8	0.9	0.0				13.2	0.0	0.0
Lane Grp LOS		B	B	A	A					B		
Approach Vol, veh/h		577			559						231	
Approach Delay, s/veh		10.2			1.9						7.1	
Approach LOS		B			A						A	

Timer

Assigned Phs		4		3	8						6	
Phs Duration (G+Y+Rc), s		26.0		9.0	35.0						25.0	
Change Period (Y+Rc), s		6.0		3.0	6.0						6.0	
Max Green Setting (Gmax), s		20.0		6.0	29.0						19.0	
Max Q Clear Time (g_c+I1), s		0.0		0.0	0.0						0.0	
Green Ext Time (p_c), s		0.0		0.0	0.0						0.0	

Intersection Summary

HCM 2010 Ctrl Delay			6.3									
HCM 2010 LOS			A									

Notes

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	73	219	28	0	0	0	0	268	10
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00						1.00	
Frt					0.987						0.995	
Flt Protected					0.989							
Satd. Flow (prot)	0	0	0	0	3252	0	0	0	0	0	1658	0
Flt Permitted					0.989							
Satd. Flow (perm)	0	0	0	0	3251	0	0	0	0	0	1658	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					89						2	
Link Speed (mph)		30			25			30			25	
Link Distance (ft)		975			430			170			647	
Travel Time (s)		22.2			11.7			3.9			17.6	
Confl. Peds. (#/hr)	24		2	2		24	18		104	104		18
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Parking (#/hr)					0						0	
Adj. Flow (vph)	0	0	0	89	267	34	0	0	0	0	327	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	390	0	0	0	0	0	339	0
Turn Type				custom	NA						NA	
Protected Phases					1 3						2	
Permitted Phases				1								
Minimum Split (s)				47.5							33.5	
Total Split (s)				47.5							33.5	
Total Split (%)				52.8%							37.2%	
Yellow Time (s)				3.5							3.5	
All-Red Time (s)				1.8							1.5	
Lost Time Adjust (s)											0.0	
Total Lost Time (s)											5.0	
Lead/Lag				Lead							Lag	
Lead-Lag Optimize?												
Act Effct Green (s)					51.2						28.5	
Actuated g/C Ratio					0.57						0.32	
v/c Ratio					0.21						0.64	
Control Delay					2.1						33.0	
Queue Delay					0.0						0.0	
Total Delay					2.1						33.0	
LOS					A						C	
Approach Delay					2.1						33.0	
Approach LOS					A						C	
Queue Length 50th (ft)					13						163	
Queue Length 95th (ft)					19						226	
Internal Link Dist (ft)		895			350			90			567	
Turn Bay Length (ft)												
Base Capacity (vph)					1887						526	
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					0						0	

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

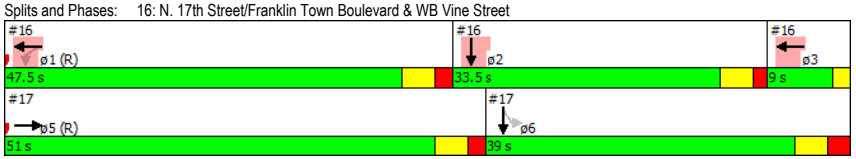
Lane Group	ø3	ø5	ø6
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	5	6
Permitted Phases			
Minimum Split (s)	9.0	51.0	39.0
Total Split (s)	9.0	51.0	39.0
Total Split (%)	10%	57%	43%
Yellow Time (s)	2.0	3.5	3.5
All-Red Time (s)	0.0	1.8	2.5
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag		Lead	Lag
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening P
Synchro 8 - Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.21						0.64	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green			
Natural Cycle: 90			
Control Type: Pretimed			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 16.5		Intersection LOS: B	
Intersection Capacity Utilization 67.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 16: N. 17th Street/Franklin Town Boulevard & WB Vine Street



Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	ø3	ø5	ø6
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening P
Synchro 8 - Report

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	310	26	0	0	0	0	0	0	119	236	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor		1.00									0.96	
Frt		0.989										
Flt Protected											0.983	
Satd. Flow (prot)	0	3302	0	0	0	0	0	0	0	0	3461	0
Flt Permitted											0.983	
Satd. Flow (perm)	0	3302	0	0	0	0	0	0	0	0	3315	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)		14									111	
Link Speed (mph)		30			25			30			30	
Link Distance (ft)		975			430			430			170	
Travel Time (s)		22.2			11.7			9.8			3.9	
Confl. Peds. (#/hr)			18	18			14		116	116		14
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Parking (#/hr)		0										
Adj. Flow (vph)	0	388	32	0	0	0	0	0	0	149	295	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	420	0	0	0	0	0	0	0	0	444	0
Turn Type		NA								Perm	NA	
Protected Phases		5									6	
Permitted Phases										6		
Minimum Split (s)		51.0								39.0	39.0	
Total Split (s)		51.0								39.0	39.0	
Total Split (%)		56.7%								43.3%	43.3%	
Yellow Time (s)		3.5								3.5	3.5	
All-Red Time (s)		1.8								2.5	2.5	
Lost Time Adjust (s)		0.0									0.0	
Total Lost Time (s)		5.3									6.0	
Lead/Lag		Lead								Lag	Lag	
Lead-Lag Optimize?												
Act Effct Green (s)		45.7									33.0	
Actuated g/C Ratio		0.51									0.37	
v/c Ratio		0.25									0.35	
Control Delay		12.5									3.6	
Queue Delay		0.0									1.0	
Total Delay		12.5									4.7	
LOS		B									A	
Approach Delay		12.5									4.7	
Approach LOS		B									A	
Queue Length 50th (ft)		64									3	
Queue Length 95th (ft)		81									11	
Internal Link Dist (ft)		895			350			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		1683									1285	
Starvation Cap Reductn		0									575	
Spillback Cap Reductn		0									0	

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	3
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	1.8	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			

Existing Conditions
Traffic Planning and Design, Inc. - BMP
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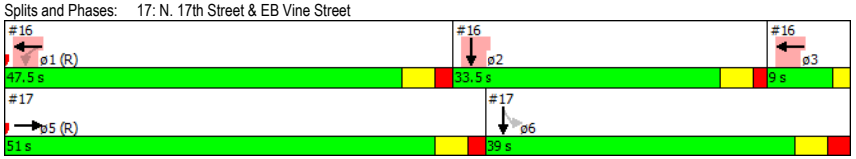
Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.25									0.63	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 8.5	Intersection LOS: A
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: N. 17th Street & EB Vine Street



Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Storage Cap Reductn			
Reduced v/c Ratio			

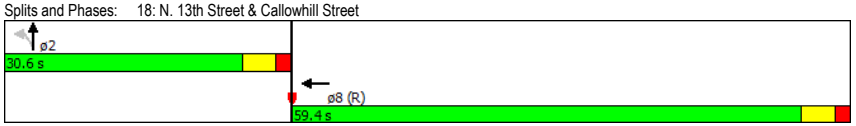
Intersection Summary

Timings
18: N. 13th Street & Callowhill Street

Lane Group	WBT	NBT
Lane Configurations		
Volume (vph)	127	162
Lane Group Flow (vph)	160	197
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Minimum Split (s)	59.4	30.6
Total Split (s)	59.4	30.6
Total Split (%)	66.0%	34.0%
Yellow Time (s)	3.6	3.6
All-Red Time (s)	1.8	1.8
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.4	5.4
Lead/Lag		
Lead-Lag Optimize?		
v/c Ratio	0.09	0.43
Control Delay	6.8	12.8
Queue Delay	0.0	0.0
Total Delay	6.8	12.8
Queue Length 50th (ft)	16	29
Queue Length 95th (ft)	28	53
Internal Link Dist (ft)	195	480
Turn Bay Length (ft)		
Base Capacity (vph)	1835	453
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.09	0.43

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 90
Control Type: Pretimed

Splits and Phases: 18: N. 13th Street & Callowhill Street



HCM 2010 Signalized Intersection Summary
18: N. 13th Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	127	18	17	162	0	0	0	0
Number				3	8	18	5	2	12			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.96	1.00		1.00			
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln				0.0	185.3	189.0	189.0	185.3	0.0			
Lanes				0	2	0	0	1	0			
Cap, veh/h				0	1898	265	50	467	0			
Arrive On Green				0.00	0.60	0.60	0.28	0.28	0.00			
Sat Flow, veh/h				0	3163	442	178	1666	0			
Grp Volume(v), veh/h				0	81	79	197	0	0			
Grp Sat Flow(s),veh/h/ln				0	1853	1752	1844	1853	0			
Q Serve(g_s), s				0.0	1.6	1.7	7.8	0.0	0.0			
Cycle Q Clear(g_c), s				0.0	1.6	1.7	7.8	0.0	0.0			
Prop In Lane				0.00		0.25	0.10		0.00			
Lane Grp Cap(c), veh/h				0	1112	1051	516	0	0			
V/C Ratio(X)				0.00	0.07	0.08	0.38	0.00	0.00			
Avail Cap(c_a), veh/h				0	1112	1051	516	0	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh				0.0	7.5	7.5	26.1	0.0	0.0			
Incr Delay (d2), s/veh				0.0	0.1	0.1	2.1	0.0	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln				0.0	1.3	1.3	5.8	0.0	0.0			
Lane Grp Delay (d), s/veh				0.0	7.7	7.7	28.3	0.0	0.0			
Lane Grp LOS					A	A	C					
Approach Vol, veh/h					160			197				
Approach Delay, s/veh					7.7			28.3				
Approach LOS					A			C				

Timer	
Assigned Phs	8	2
Phs Duration (G+Y+Rc), s	59.4	30.6
Change Period (Y+Rc), s	5.4	5.4
Max Green Setting (Gmax), s	54.0	25.2
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	19.0
HCM 2010 LOS	B

Notes

Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	542	40	67	129	0	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	11	12	11	10	12	12	10	12
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00		0.94					
Frt					0.990							
Flt Protected							0.950					
Satd. Flow (prot)	0	0	0	0	4656	0	1702	1729	0	0	0	0
Flt Permitted							0.950					
Satd. Flow (perm)	0	0	0	0	4656	0	1604	1729	0	0	0	0
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Satd. Flow (RTOR)					18		73					
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		605			275			170			560	
Travel Time (s)		16.5			6.3			3.9			12.7	
Confl. Peds. (#/hr)	55					55	70		58	58		70
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Parking (#/hr)					0							
Adj. Flow (vph)	0	0	0	0	589	43	73	140	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	632	0	73	140	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					1			2				
Permitted Phases							2					
Minimum Split (s)					51.0		39.0	39.0				
Total Split (s)					51.0		39.0	39.0				
Total Split (%)					56.7%		43.3%	43.3%				
Yellow Time (s)					3.7		3.5	3.5				
All-Red Time (s)					1.8		2.5	2.5				
Lost Time Adjust (s)					0.0		0.0	0.0				
Total Lost Time (s)					5.5		6.0	6.0				
Lead/Lag					Lead		Lag	Lag				
Lead-Lag Optimize?					Yes		Yes	Yes				
Act Effct Green (s)					45.5		33.0	33.0				
Actuated g/C Ratio					0.51		0.37	0.37				
v/c Ratio					0.27		0.12	0.22				
Control Delay					12.7		1.3	12.8				
Queue Delay					0.0		0.9	2.0				
Total Delay					12.7		2.2	14.8				
LOS					B		A	B				
Approach Delay					12.7			10.5				
Approach LOS					B			B				
Queue Length 50th (ft)					69		0	29				
Queue Length 95th (ft)					93		4	49				
Internal Link Dist (ft)		525			195			90			480	
Turn Bay Length (ft)												
Base Capacity (vph)					2362		634	633				
Starvation Cap Reductn					0		394	367				

Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	7
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	2.0	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			

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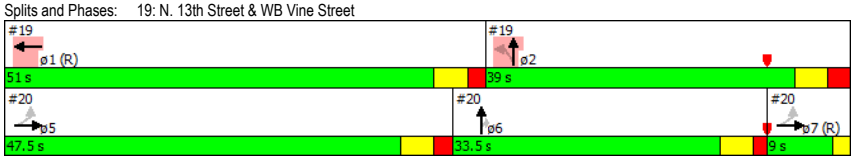
Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.27		0.30	0.53				

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 7:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.27	
Intersection Signal Delay: 12.1	Intersection LOS: B
Intersection Capacity Utilization 110.0%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 19: N. 13th Street & WB Vine Street



Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	64	484	0	0	0	0	0	132	65	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	11	9	12	12	12
Lane Util. Factor	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.93			
Frt									0.850			
Flt Protected		0.994										
Satd. Flow (prot)	0	5028	0	0	0	0	0	1612	1417	0	0	0
Flt Permitted		0.994										
Satd. Flow (perm)	0	5027	0	0	0	0	0	1612	1320	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		44							103			
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		442			275			430			170	
Travel Time (s)		12.1			6.3			9.8			3.9	
Confl. Peds. (#/hr)	4		32	32		4	64		61	61		64
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Parking (#/hr)								0				
Adj. Flow (vph)	67	504	0	0	0	0	0	138	68	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	571	0	0	0	0	0	138	68	0	0	0
Turn Type	Perm	NA						NA	Perm			
Protected Phases		5 7						6				
Permitted Phases	5 7								6			
Minimum Split (s)								33.5	33.5			
Total Split (s)								33.5	33.5			
Total Split (%)								37.2%	37.2%			
Yellow Time (s)								3.5	3.5			
All-Red Time (s)								1.5	1.5			
Lost Time Adjust (s)								0.0	0.0			
Total Lost Time (s)								5.0	5.0			
Lead/Lag								Lag	Lag			
Lead-Lag Optimize?								Yes	Yes			
Act Effct Green (s)		51.0						28.5	28.5			
Actuated g/C Ratio		0.57						0.32	0.32			
v/c Ratio		0.20						0.27	0.14			
Control Delay		4.8						24.8	2.6			
Queue Delay		0.0						0.0	0.0			
Total Delay		4.8						24.8	2.6			
LOS		A						C	A			
Approach Delay		4.8						17.5				
Approach LOS		A						B				
Queue Length 50th (ft)		28						58	0			
Queue Length 95th (ft)		31						106	14			
Internal Link Dist (ft)		362			195			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		2867						510	488			
Starvation Cap Reductn		0						0	0			

Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Lane Configurations				
Volume (vph)				
Ideal Flow (vphpl)				
Lane Width (ft)				
Lane Util. Factor				
Ped Bike Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Confl. Peds. (#/hr)				
Peak Hour Factor				
Parking (#/hr)				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	2	5	7
Permitted Phases				
Minimum Split (s)	51.0	39.0	47.5	9.0
Total Split (s)	51.0	39.0	47.5	9.0
Total Split (%)	57%	43%	53%	10%
Yellow Time (s)	3.7	3.5	3.5	2.0
All-Red Time (s)	1.8	2.5	2.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				

Existing Conditions
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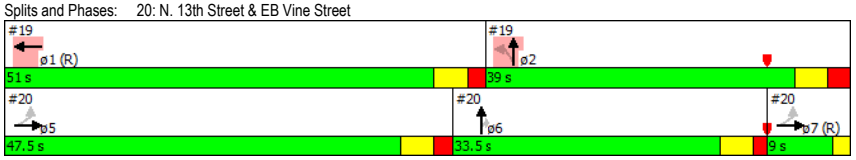
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0						6	0			
Storage Cap Reductn		0						0	0			
Reduced v/c Ratio		0.20						0.27	0.14			

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 7:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.27	
Intersection Signal Delay: 8.2	Intersection LOS: A
Intersection Capacity Utilization 103.5%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 20: N. 13th Street & EB Vine Street



Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening P
Synchro 8 - Report

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	359	0	0	0	0	0	407	388	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.99			
Frt									0.850			
Flt Protected		0.998										
Satd. Flow (prot)	0	3457	0	0	0	0	0	4961	1575	0	0	0
Flt Permitted		0.998										
Satd. Flow (perm)	0	3456	0	0	0	0	0	4961	1552	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24							417			
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		430			378			430			170	
Travel Time (s)		11.7			10.3			11.7			4.6	
Confl. Peds. (#/hr)	3		10	10		3	57		3	3		57
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	20%	3%	2%	2%	2%	2%	2%	4%	2%	2%	2%	2%
Adj. Flow (vph)	16	386	0	0	0	0	0	438	417	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	402	0	0	0	0	0	438	417	0	0	0
Turn Type	Perm	NA						NA	Perm			
Protected Phases		5 7						6				
Permitted Phases	5 7								6			
Minimum Split (s)								33.5	33.5			
Total Split (s)								33.5	33.5			
Total Split (%)								37.2%	37.2%			
Yellow Time (s)								3.5	3.5			
All-Red Time (s)								1.5	1.5			
Lost Time Adjust (s)								0.0	0.0			
Total Lost Time (s)								5.0	5.0			
Lead/Lag								Lag	Lag			
Lead-Lag Optimize?												
Act Effct Green (s)		51.2						28.5	28.5			
Actuated g/C Ratio		0.57						0.32	0.32			
v/c Ratio		0.20						0.28	0.54			
Control Delay		6.7						23.6	5.3			
Queue Delay		0.0						0.0	0.0			
Total Delay		6.7						23.6	5.3			
LOS		A						C	A			
Approach Delay		6.7						14.7				
Approach LOS		A						B				
Queue Length 50th (ft)		41						67	0			
Queue Length 95th (ft)		51						94	64			
Internal Link Dist (ft)		350			298			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		1976						1570	776			
Starvation Cap Reductn		0						0	0			
Spillback Cap Reductn		0						0	0			

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

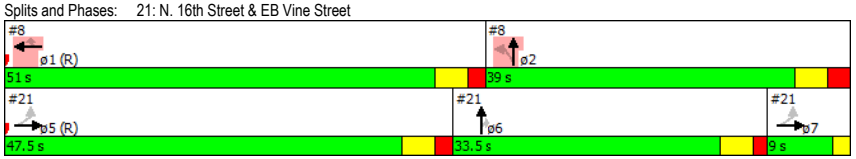
Lane Group	ø1	ø2	ø5	ø7
Lane Configurations				
Volume (vph)				
Ideal Flow (vphpl)				
Lane Util. Factor				
Ped Bike Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Confl. Peds. (#/hr)				
Peak Hour Factor				
Heavy Vehicles (%)				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	2	5	7
Permitted Phases				
Minimum Split (s)	51.0	39.0	47.5	9.0
Total Split (s)	51.0	39.0	47.5	9.0
Total Split (%)	57%	43%	53%	10%
Yellow Time (s)	3.5	3.5	3.5	2.0
All-Red Time (s)	1.8	2.5	1.8	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lead	
Lead-Lag Optimize?				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening P
Synchro 8 - Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn		0						0	0			
Reduced v/c Ratio		0.20						0.28	0.54			

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 12.2	Intersection LOS: B
Intersection Capacity Utilization 68.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 21: N. 16th Street & EB Vine Street



Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening P
Synchro 8 - Report

SATURDAY EVENING (6-9 PM)
PEAK HOUR TIME PERIOD

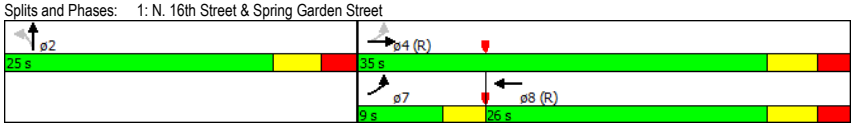
Timings
1: N. 16th Street & Spring Garden Street

Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Volume (vph)	56	398	379	161
Lane Group Flow (vph)	62	437	453	266
Turn Type	pm+pt	NA	NA	NA
Protected Phases	7	4	8	2
Permitted Phases	4			
Minimum Split (s)	9.0	35.0	26.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?				
v/c Ratio	0.15	0.28	0.44	0.26
Control Delay	4.9	7.5	26.9	14.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	4.9	7.5	26.9	14.5
Queue Length 50th (ft)	5	24	79	41
Queue Length 95th (ft)	m12	53	123	70
Internal Link Dist (ft)		350	380	990
Turn Bay Length (ft)	140			
Base Capacity (vph)	426	1550	1040	1038
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	0.28	0.44	0.26

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: N. 16th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
1: N. 16th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	56	398	0	0	379	34	36	161	45	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.98		1.00	1.00		0.94	1.00		0.96			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln	185.3	185.3	0.0	0.0	183.4	187.1	186.2	182.5	186.2			
Lanes	1	2	0	0	2	0	0	2	0			
Cap, veh/h	499	1791	0	0	1047	92	161	731	209			
Arrive On Green	0.20	0.97	0.00	0.00	0.11	0.11	0.32	0.32	0.32			
Sat Flow, veh/h	1765	3706	0	0	3140	277	509	2309	661			
Grp Volume(v), veh/h	62	437	0	0	242	211	142	0	124			
Grp Sat Flow(s),veh/h/ln	1765	1853	0	0	1834	1583	1800	0	1678			
Q Serve(g_s), s	1.1	0.3	0.0	0.0	7.4	7.5	3.5	0.0	3.3			
Cycle Q Clear(g_c), s	1.1	0.3	0.0	0.0	7.4	7.5	3.5	0.0	3.3			
Prop In Lane	1.00		0.00	0.00		0.18	0.28		0.39			
Lane Grp Cap(c), veh/h	499	1791	0	0	611	528	570	0	531			
V/C Ratio(X)	0.12	0.24	0.00	0.00	0.40	0.40	0.25	0.00	0.23			
Avail Cap(c_a), veh/h	499	1791	0	0	611	528	570	0	531			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	8.5	0.5	0.0	0.0	21.1	21.1	15.2	0.0	15.1			
Incr Delay (d2), s/veh	0.5	0.3	0.0	0.0	1.9	2.3	1.0	0.0	1.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln	0.8	0.3	0.0	0.0	6.0	5.4	2.8	0.0	2.5			
Lane Grp Delay (d), s/veh	9.1	0.8	0.0	0.0	23.0	23.4	16.2	0.0	16.2			
Lane Grp LOS	A	A			C	C	B		B			
Approach Vol, veh/h		499			453			266				
Approach Delay, s/veh		1.9			23.2			16.2				
Approach LOS		A			C			B				

Timer

Assigned Phs	7	4			8			2				
Phs Duration (G+Y+Rc), s	9.0	35.0			26.0			25.0				
Change Period (Y+Rc), s	3.0	6.0			6.0			6.0				
Max Green Setting (Gmax), s	6.0	29.0			20.0			19.0				
Max Q Clear Time (g_c+I1), s	0.0	0.0			0.0			0.0				
Green Ext Time (p_c), s	0.0	0.0			0.0			0.0				

Intersection Summary

HCM 2010 Ctrl Delay			12.9									
HCM 2010 LOS			B									

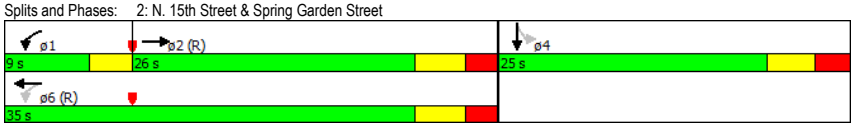
Notes

Timings
2: N. 15th Street & Spring Garden Street

Lane Group	EBT	WBL	WBT	SBL	SBT
Lane Configurations					
Volume (vph)	414	51	373	27	127
Lane Group Flow (vph)	462	53	389	28	176
Turn Type	NA	pm+pt	NA	Perm	NA
Protected Phases	2	1	6		4
Permitted Phases		6		4	
Minimum Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (%)	43.3%	15.0%	58.3%	41.7%	41.7%
Yellow Time (s)	3.6	3.0	3.6	3.4	3.4
All-Red Time (s)	2.4	0.0	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	3.0	6.0	6.0	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?					
v/c Ratio	0.42	0.13	0.25	0.06	0.38
Control Delay	8.0	7.6	9.7	14.8	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	8.0	7.6	9.7	14.8	18.8
Queue Length 50th (ft)	36	8	40	7	49
Queue Length 95th (ft)	68	22	64	22	96
Internal Link Dist (ft)	380		400		290
Turn Bay Length (ft)		115		100	
Base Capacity (vph)	1107	416	1534	494	468
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	0.42	0.13	0.25	0.06	0.38

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 15 (25%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 2: N. 15th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
2: N. 15th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	414	30	51	373	0	0	0	0	27	127	42
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	0.98		1.00				1.00		0.97
Parking Bus Adj	1.00	1.00	0.90	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.2	189.0	183.4	183.4	0.0				177.9	185.3	189.0
Lanes	0	2	0	1	2	0				1	1	0
Cap, veh/h	0	1077	77	553	1773	0				536	418	139
Arrive On Green	0.00	0.67	0.67	0.10	0.48	0.00				0.32	0.32	0.32
Sat Flow, veh/h	0	3231	231	1747	3669	0				1694	1321	440
Grp Volume(v), veh/h	0	246	216	53	389	0				28	0	176
Grp Sat Flow(s),veh/h/ln	0	1852	1610	1747	1834	0				1694	1853	1761
Q Serve(g_s), s	0.0	3.6	3.7	1.0	3.7	0.0				0.7	0.0	4.6
Cycle Q Clear(g_c), s	0.0	3.6	3.7	1.0	3.7	0.0				0.7	0.0	4.6
Prop In Lane	0.00		0.14	1.00		0.00				1.00		0.25
Lane Grp Cap(c), veh/h	0	617	537	553	1773	0				536	0	558
V/C Ratio(X)	0.00	0.40	0.40	0.10	0.22	0.00				0.05	0.00	0.32
Avail Cap(c_a), veh/h	0	617	537	553	1773	0				536	0	558
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	7.3	7.3	9.1	9.0	0.0				14.2	0.0	15.6
Incr Delay (d2), s/veh	0.0	1.9	2.2	0.3	0.3	0.0				0.2	0.0	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	2.7	2.5	0.7	2.7	0.0				0.5	0.0	3.5
Lane Grp Delay (d), s/veh	0.0	9.2	9.5	9.4	9.2	0.0				14.4	0.0	17.0
Lane Grp LOS		A	A	A	A					B		B
Approach Vol, veh/h		462			442						204	
Approach Delay, s/veh		9.3			9.3						16.7	
Approach LOS		A			A						B	

Timer												
Assigned Phs		2		1	6						4	
Phs Duration (G+Y+Rc), s		26.0		9.0	35.0						25.0	
Change Period (Y+Rc), s		6.0		3.0	6.0						6.0	
Max Green Setting (Gmax), s		20.0		6.0	29.0						19.0	
Max Q Clear Time (g_c+I1), s		0.0		0.0	0.0						0.0	
Green Ext Time (p_c), s		0.0		0.0	0.0						0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	10.7
HCM 2010 LOS	B

Notes

Lanes, Volumes, Timings
3: Franklin Town Boulevard & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	106	33	80	25	85	28	11	19	8	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	11	12	12	12	12	12	16	12	12	12	12
Grade (%)		-1%			2%			3%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.951			0.972			0.971				
Flt Protected		0.976			0.991			0.986				
Satd. Flow (prot)	0	1671	0	0	1590	0	0	1782	0	0	0	0
Flt Permitted		0.976			0.991			0.986				
Satd. Flow (perm)	0	1671	0	0	1590	0	0	1782	0	0	0	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		646			325			647			208	
Travel Time (s)		17.6			8.9			17.6			5.7	
Confl. Peds. (#/hr)	17		65	65		17	49		41	41		49
Confl. Bikes (#/hr)			7			4						
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Parking (#/hr)					0			0				
Adj. Flow (vph)	128	40	96	30	102	34	13	23	10	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	264	0	0	166	0	0	46	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.05	1.00	1.02	1.17	1.02	1.03	1.00	1.03	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	40.0%	ICU Level of Service A	
Analysis Period (min)	15		

HCM 2010 AWSC
3: Franklin Town Boulevard & Callowhill Street

Intersection	
Intersection Delay, s/veh	8.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	106	33	80	25	85	28	11	19	8	0	0	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	128	40	96	30	102	34	13	23	10	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.8	8.2	8.1
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	29%	48%	18%
Vol Thru, %	50%	15%	62%
Vol Right, %	21%	37%	20%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	38	219	138
LT Vol	19	33	85
Through Vol	8	80	28
RT Vol	11	106	25
Lane Flow Rate	46	264	166
Geometry Grp	1	1	1
Degree of Util (X)	0.061	0.294	0.191
Departure Headway (Hd)	4.774	4.018	4.129
Convergence, Y/N	Yes	Yes	Yes
Cap	755	884	855
Service Time	2.774	2.096	2.221
HCM Lane V/C Ratio	0.061	0.299	0.194
HCM Control Delay	8.1	8.8	8.2
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.2	1.2	0.7

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
4: N. 17th Street & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	29	33	111	0	0	0	0	0	90	23
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	11	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			-4%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.865								0.972	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	1443	1693	1659	0	0	0	0	0	1566	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	1443	1693	1659	0	0	0	0	0	1566	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		325			430			230			1070	
Travel Time (s)		8.9			11.7			6.3			29.2	
Confl. Peds. (#/hr)	15		24	24		15	5		5	5		5
Confl. Bikes (#/hr)			4									1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	5	0
Parking (#/hr)			0		0						0	
Adj. Flow (vph)	0	0	32	37	123	0	0	0	0	0	100	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	32	37	123	0	0	0	0	0	126	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.15	1.06	1.16	1.01	1.01	1.01	1.01	0.98	1.20	0.98
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization 50.0%		ICU Level of Service A	
Analysis Period (min) 15			

HCM 2010 AWSC
4: N. 17th Street & Callowhill Street

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	29	33	111	0	0	0	0	0	90	23
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	32	37	123	0	0	0	0	0	100	26
Number of Lanes	0	0	1	1	1	0	0	0	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.1	8.5	8
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	100%	0%	0%
Vol Thru, %	0%	0%	100%	80%
Vol Right, %	100%	0%	0%	20%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	29	33	111	113
LT Vol	0	0	111	90
Through Vol	29	0	0	23
RT Vol	0	33	0	0
Lane Flow Rate	32	37	123	126
Geometry Grp	5	7	7	2
Degree of Util (X)	0.035	0.054	0.164	0.149
Departure Headway (Hd)	3.903	5.275	4.774	4.276
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	921	673	744	844
Service Time	1.913	3.054	2.552	2.278
HCM Lane V/C Ratio	0.035	0.055	0.165	0.149
HCM Control Delay	7.1	8.4	8.5	8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.2	0.6	0.5

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Timings
5: N. 16th Street & Callowhill Street

Lane Group	WBT	NBT
Lane Configurations		
Volume (vph)	106	254
Lane Group Flow (vph)	134	332
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Minimum Split (s)	21.0	39.0
Total Split (s)	21.0	39.0
Total Split (%)	35.0%	65.0%
Yellow Time (s)	3.0	3.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
v/c Ratio	0.15	0.17
Control Delay	15.3	5.5
Queue Delay	0.0	0.0
Total Delay	15.3	5.5
Queue Length 50th (ft)	16	22
Queue Length 95th (ft)	35	38
Internal Link Dist (ft)	380	136
Turn Bay Length (ft)		
Base Capacity (vph)	884	1958
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.15	0.17

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 17 (28%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 5: N. 16th Street & Callowhill Street

HCM 2010 Signalized Intersection Summary
5: N. 16th Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	106	14	45	254	0	0	0	0
Number				3	8	18	5	2	12			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.98	1.00		1.00			
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln				0.0	185.3	189.0	187.1	183.4	0.0			
Lanes				0	2	0	0	2	0			
Cap, veh/h				0	852	113	296	1768	0			
Arrive On Green				0.00	0.27	0.27	0.57	0.57	0.00			
Sat Flow, veh/h				0	3195	424	522	3121	0			
Grp Volume(v), veh/h				0	67	67	173	159	0			
Grp Sat Flow(s),veh/h/ln				0	1853	1766	1808	1834	0			
Q Serve(g_s), s				0.0	1.7	1.7	2.8	2.5	0.0			
Cycle Q Clear(g_c), s				0.0	1.7	1.7	2.8	2.5	0.0			
Prop In Lane				0.00		0.24	0.29		0.00			
Lane Grp Cap(c), veh/h				0	494	471	1025	1040	0			
V/C Ratio(X)				0.00	0.14	0.14	0.17	0.15	0.00			
Avail Cap(c_a), veh/h				0	494	471	1025	1040	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	16.7	16.8	6.2	6.2	0.0			
Incr Delay (d2), s/veh				0.0	0.6	0.6	0.4	0.3	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln				0.0	1.4	1.4	2.0	1.8	0.0			
Lane Grp Delay (d), s/veh				0.0	17.3	17.4	6.6	6.5	0.0			
Lane Grp LOS					B	B	A	A				
Approach Vol, veh/h					134			332				
Approach Delay, s/veh					17.4			6.5				
Approach LOS					B			A				

Timer	
Assigned Phs	8	2
Phs Duration (G+Y+Rc), s	21.0	39.0
Change Period (Y+Rc), s	5.0	5.0
Max Green Setting (Gmax), s	16.0	34.0
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	9.6
HCM 2010 LOS	A

Notes

HCM 2010 Signals-Pedestrians
5: N. 16th Street & Callowhill Street

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	23.0	24.0	24.0	24.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	2	2	2
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	0	2	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	25	25	25
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	30.0	30.0	30.0	30.0
Pedestrian Compliance Code	Fair	Fair	Fair	Fair
Pedestrian Crosswalk Score	1.78	1.76	1.84	1.83
Pedestrian Crosswalk LOS	A	A	A	A

HCM 2010 Signals-Bicycles
5: N. 16th Street & Callowhill Street

Approach	EB	WB	NB	SB
Bicycle Flow Rate (bike/h)	0	0	0	0
Total Flow Rate (veh/h)	0	134	332	0
Effct. Green for Bike (s)	0.0	16.0	34.0	0.0
Cross Street Width (ft)	24.0	24.0	24.0	23.0
Through Lanes Number	0	2	2	0
Through Lane Width (ft)	12.0	12.0	12.0	12.0
Bicycle Lane Width (ft)	0.0	0.0	0.0	0.0
Paved Shoulder Width (ft)	0.0	0.0	0.0	0.0
Curb Is Present?	No	No	No	No
On Street Parking?	No	No	No	No
Bicycle Lane Capacity (bike/h)	0	533	1133	0
Bicycle Delay (s/bike)	0.0	16.1	5.6	0.0
Bicycle Compliance		Fair	Good	
Bicycle LOS Score	0.00	2.04	2.20	0.00
Bicycle LOS		B	B	

Lanes, Volumes, Timings
6: N. 15th Street & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	47	91	0	0	0	0	0	194	13
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		0%			0%			0%			-3%	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt											0.992	
Flt Protected					0.983							
Satd. Flow (prot)	0	0	0	0	3288	0	0	0	0	0	1623	0
Flt Permitted					0.983							
Satd. Flow (perm)	0	0	0	0	3288	0	0	0	0	0	1623	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		460			480			146			1070	
Travel Time (s)		12.5			13.1			4.0			29.2	
Confl. Peds. (#/hr)	12		26	26		12	3		14	14		3
Confl. Bikes (#/hr)						2						9
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Parking (#/hr)					0						0	
Adj. Flow (vph)	0	0	0	51	98	0	0	0	0	0	209	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	149	0	0	0	0	0	223	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.08	1.01	1.01	1.01	1.01	0.99	1.18	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	28.6%	ICU Level of Service A	
Analysis Period (min) 15			

HCM 2010 AWSC
6: N. 15th Street & Callowhill Street

Intersection	
Intersection Delay, s/veh	8.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	0	47	91	0	0	0	0	0	194	13
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	51	98	0	0	0	0	0	209	14
Number of Lanes	0	0	0	0	2	0	0	0	0	0	1	0

Approach	WB	SB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left		WB
Conflicting Lanes Left	0	2
Conflicting Approach Right	SB	
Conflicting Lanes Right	1	0
HCM Control Delay	8.6	8.8
HCM LOS	A	A

Lane	WBLn1	WBLn2	SBLn1
Vol Left, %	61%	0%	0%
Vol Thru, %	39%	100%	94%
Vol Right, %	0%	0%	6%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	77	61	207
LT Vol	30	61	194
Through Vol	0	0	13
RT Vol	47	0	0
Lane Flow Rate	83	65	223
Geometry Grp	7	7	2
Degree of Util (X)	0.123	0.091	0.265
Departure Headway (Hd)	5.345	5.04	4.283
Convergence, Y/N	Yes	Yes	Yes
Cap	673	713	844
Service Time	3.063	2.758	2.29
HCM Lane V/C Ratio	0.123	0.091	0.264
HCM Control Delay	8.8	8.3	8.8
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.4	0.3	1.1

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Timings
7: N. Broad Street & Callowhill Street

Lane Group	WBL	WBT	NBT	SBT
Lane Configurations				
Volume (vph)	46	96	602	661
Lane Group Flow (vph)	47	128	621	719
Turn Type	Perm	NA	NA	NA
Protected Phases		8	2	6
Permitted Phases	8			
Minimum Split (s)	29.0	29.0	61.0	61.0
Total Split (s)	29.0	29.0	61.0	61.0
Total Split (%)	32.2%	32.2%	67.8%	67.8%
Yellow Time (s)	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.0	5.0
Lead/Lag				
Lead-Lag Optimize?				
v/c Ratio	0.12	0.16	0.31	0.36
Control Delay	25.6	25.4	20.4	6.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.6	25.4	20.4	6.0
Queue Length 50th (ft)	22	32	168	54
Queue Length 95th (ft)	52	57	226	64
Internal Link Dist (ft)		525	200	990
Turn Bay Length (ft)				
Base Capacity (vph)	407	824	1995	2012
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	0.12	0.16	0.31	0.36

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 47 (52%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Pretimed

Splits and Phases: 7: N. Broad Street & Callowhill Street

HCM 2010 Signalized Intersection Summary
7: N. Broad Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	46	96	28	0	602	0	0	661	37
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.97	1.00		1.00	1.00		0.95
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln				182.5	182.5	186.2	0.0	181.6	0.0	0.0	186.2	189.9
Lanes				1	2	0	0	2	0	0	2	0
Cap, veh/h				444	697	195	0	2260	0	0	2168	121
Arrive On Green				0.26	0.26	0.26	0.00	0.62	0.00	0.00	0.83	0.83
Sat Flow, veh/h				1738	2726	763	0	3632	0	0	3485	194
Grp Volume(v), veh/h				47	65	63	0	621	0	0	364	355
Grp Sat Flow(s),veh/h/ln				1738	1825	1664	0	1816	0	0	1862	1817
Q Serve(g_s), s				1.9	2.5	2.6	0.0	7.0	0.0	0.0	4.1	4.1
Cycle Q Clear(g_c), s				1.9	2.5	2.6	0.0	7.0	0.0	0.0	4.1	4.1
Prop In Lane				1.00		0.46	0.00		0.00	0.00		0.11
Lane Grp Cap(c), veh/h				444	466	425	0	2260	0	0	1159	1130
V/C Ratio(X)				0.11	0.14	0.15	0.00	0.27	0.00	0.00	0.31	0.31
Avail Cap(c_a), veh/h				444	466	425	0	2260	0	0	1159	1130
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33
Upstream Filter(I)				1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				25.6	25.9	25.9	0.0	7.7	0.0	0.0	3.3	3.3
Incr Delay (d2), s/veh				0.5	0.6	0.7	0.0	0.3	0.0	0.0	0.7	0.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (85%), veh/ln				1.5	2.2	2.1	0.0	4.6	0.0	0.0	2.8	2.8
Lane Grp Delay (d), s/veh				26.1	26.5	26.7	0.0	8.0	0.0	0.0	4.0	4.0
Lane Grp LOS				C	C	C		A			A	A
Approach Vol, veh/h					175			621			719	
Approach Delay, s/veh					26.4			8.0			4.0	
Approach LOS					C			A			A	

Timer

Assigned Phs					8			2			6	
Phs Duration (G+Y+Rc), s					29.0			61.0			61.0	
Change Period (Y+Rc), s					6.0			5.0			5.0	
Max Green Setting (Gmax), s					23.0			56.0			56.0	
Max Q Clear Time (g_c+I1), s					0.0			0.0			0.0	
Green Ext Time (p_c), s					0.0			0.0			0.0	

Intersection Summary

HCM 2010 Ctrl Delay			8.3									
HCM 2010 LOS			A									

Notes

HCM 2010 Signals-Pedestrians
7: N. Broad Street & Callowhill Street

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	24.4	32.0	45.0	42.4
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	3	4	4
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	6	2	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	25	25	25
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	45.0	45.0	45.0	45.0
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	1.78	2.00	2.42	2.42
Pedestrian Crosswalk LOS	A	A	B	B

HCM 2010 Signals-Bicycles
7: N. Broad Street & Callowhill Street

Approach	EB	WB	NB	SB
Bicycle Flow Rate (bike/h)	0	0	0	0
Total Flow Rate (veh/h)	0	175	621	719
Effct. Green for Bike (s)	0.0	23.0	56.0	56.0
Cross Street Width (ft)	45.0	42.4	32.0	24.4
Through Lanes Number	0	2	2	2
Through Lane Width (ft)	12.0	11.0	10.0	10.0
Bicycle Lane Width (ft)	0.0	0.0	0.0	0.0
Paved Shoulder Width (ft)	0.0	0.0	0.0	0.0
Curb Is Present?	No	No	No	No
On Street Parking?	No	No	No	No
Bicycle Lane Capacity (bike/h)	0	511	1244	1244
Bicycle Delay (s/bike)	0.0	24.9	6.4	6.4
Bicycle Compliance		Fair	Good	Good
Bicycle LOS Score	0.00	2.57	2.99	2.95
Bicycle LOS		B	C	C

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	510	465	21	281	0	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	11	12	11	12	12	12	12
Grade (%)		0%			0%			-1%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.88	0.91	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor						0.97		0.99				
Frt						0.850						
Flt Protected								0.997				
Satd. Flow (prot)	0	0	0	0	3521	2680	0	4900	0	0	0	0
Flt Permitted								0.997				
Satd. Flow (perm)	0	0	0	0	3521	2599	0	4875	0	0	0	0
Right Turn on Red			Yes			No	Yes		Yes			Yes
Satd. Flow (RTOR)								28				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		430			460			170			344	
Travel Time (s)		11.7			12.5			4.6			9.4	
Confl. Peds. (#/hr)	29		14	14		29	68		4	4		68
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	0	0	0	0	607	554	25	335	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	607	554	0	360	0	0	0	0
Turn Type					NA	Perm	Perm	NA				
Protected Phases					1			2				
Permitted Phases						1	2					
Minimum Split (s)					51.0	51.0	39.0	39.0				
Total Split (s)					51.0	51.0	39.0	39.0				
Total Split (%)					56.7%	56.7%	43.3%	43.3%				
Yellow Time (s)					3.5	3.5	3.5	3.5				
All-Red Time (s)					1.8	1.8	2.5	2.5				
Lost Time Adjust (s)					0.0	0.0		0.0				
Total Lost Time (s)					5.3	5.3		6.0				
Lead/Lag					Lead	Lead	Lag	Lag				
Lead-Lag Optimize?												
Act Effct Green (s)					45.7	45.7		33.0				
Actuated g/C Ratio					0.51	0.51		0.37				
v/c Ratio					0.34	0.42		0.20				
Control Delay					16.4	17.5		1.4				
Queue Delay					0.0	0.0		0.3				
Total Delay					16.4	17.5		1.7				
LOS					B	B		A				
Approach Delay					16.9			1.7				
Approach LOS					B			A				
Queue Length 50th (ft)					116	115		2				
Queue Length 95th (ft)					m128	m128		3				
Internal Link Dist (ft)		350			380			90			264	
Turn Bay Length (ft)												
Base Capacity (vph)					1787	1319		1805				
Starvation Cap Reductn					0	0		898				

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	7
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	1.8	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			

Existing Conditions
Traffic Planning and Design, Inc. - BMP
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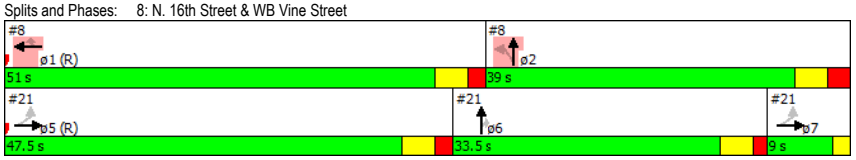
Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn					0	0		0				
Storage Cap Reductn					0	0		0				
Reduced v/c Ratio					0.34	0.42		0.40				

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.43	
Intersection Signal Delay: 13.3	Intersection LOS: B
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 8: N. 16th Street & WB Vine Street



Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	42	594	0	0	0	0	0	981	348
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			2%	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.86	0.86
Ped Bike Factor					1.00						0.99	
Frt											0.961	
Flt Protected					0.997							
Satd. Flow (prot)	0	0	0	0	3318	0	0	0	0	0	5829	0
Flt Permitted					0.997							
Satd. Flow (perm)	0	0	0	0	3317	0	0	0	0	0	5829	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					145						100	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		460			480			170			414	
Travel Time (s)		12.5			13.1			4.6			11.3	
Confl. Peds. (#/hr)	27		3	3		27	8		56	56		8
Confl. Bikes (#/hr)						3						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Parking (#/hr)					0							
Adj. Flow (vph)	0	0	0	47	660	0	0	0	0	0	1090	387
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	707	0	0	0	0	0	1477	0
Turn Type				Perm	NA						NA	
Protected Phases					1						2	
Permitted Phases				1								
Minimum Split (s)				49.0	49.0						41.0	
Total Split (s)				49.0	49.0						41.0	
Total Split (%)				54.4%	54.4%						45.6%	
Yellow Time (s)				3.5	3.5						3.5	
All-Red Time (s)				1.5	1.5						11.5	
Lost Time Adjust (s)					0.0						0.0	
Total Lost Time (s)					5.0						15.0	
Lead/Lag				Lead	Lead						Lag	
Lead-Lag Optimize?												
Act Effct Green (s)					44.0						26.0	
Actuated g/C Ratio					0.49						0.29	
v/c Ratio					0.42						0.84	
Control Delay					4.8						33.3	
Queue Delay					0.0						0.0	
Total Delay					4.8						33.3	
LOS					A						C	
Approach Delay					4.8						33.3	
Approach LOS					A						C	
Queue Length 50th (ft)					12						214	
Queue Length 95th (ft)					20						260	
Internal Link Dist (ft)		380			400			90			334	
Turn Bay Length (ft)												

Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	ø5	ø6
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Grade (%)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Parking (#/hr)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	5	6
Permitted Phases		
Minimum Split (s)	49.0	41.0
Total Split (s)	49.0	41.0
Total Split (%)	54%	46%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.5	3.5
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lag
Lead-Lag Optimize?		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		

Existing Conditions
Traffic Planning and Design, Inc. - BMP
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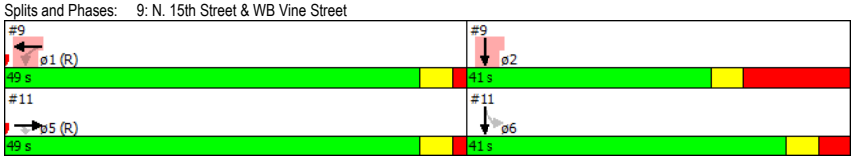
Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)					1695						1755	
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					0						0	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.42						0.84	

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 24.1	Intersection LOS: C
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 9: N. 15th Street & WB Vine Street



Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	ø5	ø6
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Existing Conditions
Traffic Planning and Design, Inc. - BMP

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Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	129	577	113	0	528	0	0	603	70
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	11	12	12	10	12	12	10	12
Grade (%)		0%			1%			-1%			1%	
Storage Length (ft)	0		0	0		0	0		0	100		100
Storage Lanes	0		0	1		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.86	0.86
Ped Bike Factor						0.97					0.98	
Frt						0.850					0.984	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	0	1751	3386	1567	0	4732	0	0	5696	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	0	1751	3386	1521	0	4732	0	0	5696	0
Right Turn on Red			Yes			No			Yes			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		480			605			170			280	
Travel Time (s)		13.1			16.5			4.6			7.6	
Confl. Peds. (#/hr)	26					26	135		70	70		135
Confl. Bikes (#/hr)						4			11			16
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Bus Blockages (#/hr)	0	0	0	0	0	0	0	2	0	0	5	0
Adj. Flow (vph)	0	0	0	142	634	124	0	580	0	0	663	77
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	142	634	124	0	580	0	0	740	0
Turn Type				Perm	NA	Perm		NA			NA	
Protected Phases					1 3!			2			6!	
Permitted Phases				1 3!		1 3						
Minimum Split (s)								34.0			34.0	
Total Split (s)								34.0			34.0	
Total Split (%)								37.8%			37.8%	
Yellow Time (s)								2.4			3.6	
All-Red Time (s)								3.0			5.4	
Lost Time Adjust (s)								0.0			0.0	
Total Lost Time (s)								5.4			9.0	
Lead/Lag								Lead			Lead	
Lead-Lag Optimize?												
Act Effct Green (s)				46.0	46.0	46.0		28.6			25.0	
Actuated g/C Ratio				0.51	0.51	0.51		0.32			0.28	
v/c Ratio				0.16	0.37	0.16		0.39			0.47	
Control Delay				17.2	18.2	17.4		13.4			17.1	
Queue Delay				0.0	0.0	0.0		0.8			0.0	
Total Delay				17.2	18.2	17.4		14.2			17.1	
LOS				B	B	B		B			B	
Approach Delay					18.0			14.2			17.1	
Approach LOS					B			B			B	
Queue Length 50th (ft)				46	112	40		57			97	

Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø7	ø8
Lane Configurations					
Volume (vph)					
Ideal Flow (vphpl)					
Lane Width (ft)					
Grade (%)					
Storage Length (ft)					
Storage Lanes					
Taper Length (ft)					
Lane Util. Factor					
Ped Bike Factor					
Frt					
Flt Protected					
Satd. Flow (prot)					
Flt Permitted					
Satd. Flow (perm)					
Right Turn on Red					
Satd. Flow (RTOR)					
Link Speed (mph)					
Link Distance (ft)					
Travel Time (s)					
Confl. Peds. (#/hr)					
Confl. Bikes (#/hr)					
Peak Hour Factor					
Bus Blockages (#/hr)					
Adj. Flow (vph)					
Shared Lane Traffic (%)					
Lane Group Flow (vph)					
Turn Type					
Protected Phases	1	3	5	7	8
Permitted Phases					
Minimum Split (s)	42.0	14.0	42.0	48.0	14.0
Total Split (s)	42.0	14.0	42.0	48.0	14.0
Total Split (%)	47%	16%	47%	53%	16%
Yellow Time (s)	3.6	2.0	3.6	3.6	3.6
All-Red Time (s)	6.4	0.0	6.4	2.4	2.4
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag		Lag			Lag
Lead-Lag Optimize?		Yes			
Act Effct Green (s)					
Actuated g/C Ratio					
v/c Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Queue Length 50th (ft)					

Existing Conditions
Traffic Planning and Design, Inc. - BMP
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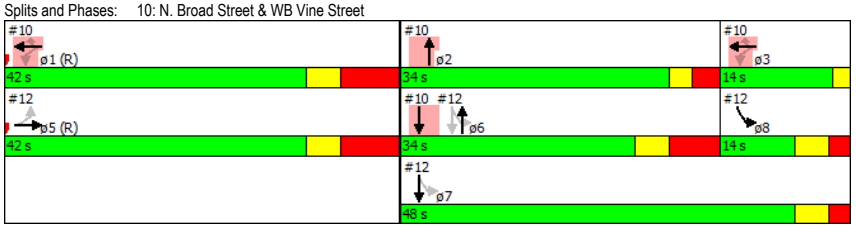
Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)				91	170	82		74			112	
Internal Link Dist (ft)		400			525			90			200	
Turn Bay Length (ft)												
Base Capacity (vph)				894	1730	777		1503			1582	
Starvation Cap Reductn				0	0	0		592			0	
Spillback Cap Reductn				0	0	0		0			37	
Storage Cap Reductn				0	0	0		0			0	
Reduced v/c Ratio				0.16	0.37	0.16		0.64			0.48	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green
Natural Cycle: 90
Control Type: Pretimed
Maximum v/c Ratio: 0.48
Intersection Signal Delay: 16.7 — Intersection LOS: B
Intersection Capacity Utilization 80.6% — ICU Level of Service D
Analysis Period (min) 15
! Phase conflict between lane groups.

Splits and Phases: 10: N. Broad Street & WB Vine Street



Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø7	ø8
Queue Length 95th (ft)					
Internal Link Dist (ft)					
Turn Bay Length (ft)					
Base Capacity (vph)					
Starvation Cap Reductn					
Spillback Cap Reductn					
Storage Cap Reductn					
Reduced v/c Ratio					

Intersection Summary

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
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Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1070	511	0	0	0	0	0	0	228	792	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		2%			0%			0%			4%	
Lane Util. Factor	1.00	0.86	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00
Ped Bike Factor			0.98							0.95		
Frt			0.850									
Flt Protected										0.950		
Satd. Flow (prot)	0	6310	2744	0	0	0	0	0	0	1725	4792	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	6310	2685	0	0	0	0	0	0	1643	4792	0
Right Turn on Red			No			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)										55		
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		82			480			430			170	
Travel Time (s)		2.2			13.1			11.7			4.6	
Confl. Peds. (#/hr)			16	16			8		60	60		8
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	1092	521	0	0	0	0	0	0	233	808	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1092	521	0	0	0	0	0	0	233	808	0
Turn Type		NA	Perm							Perm	NA	
Protected Phases		5									6	
Permitted Phases			5							6		
Minimum Split (s)		49.0	49.0							41.0	41.0	
Total Split (s)		49.0	49.0							41.0	41.0	
Total Split (%)		54.4%	54.4%							45.6%	45.6%	
Yellow Time (s)		3.5	3.5							3.5	3.5	
All-Red Time (s)		1.5	1.5							3.5	3.5	
Lost Time Adjust (s)		0.0	0.0							0.0	0.0	
Total Lost Time (s)		5.0	5.0							7.0	7.0	
Lead/Lag		Lead	Lead							Lag	Lag	
Lead-Lag Optimize?												
Act Effct Green (s)		44.0	44.0							34.0	34.0	
Actuated g/C Ratio		0.49	0.49							0.38	0.38	
v/c Ratio		0.35	0.40							0.36	0.45	
Control Delay		13.1	16.0							0.9	2.7	
Queue Delay		0.0	0.0							1.3	0.7	
Total Delay		13.1	16.0							2.2	3.4	
LOS		B	B							A	A	
Approach Delay		14.0									3.1	
Approach LOS		B									A	
Queue Length 50th (ft)		92	110							0	12	
Queue Length 95th (ft)		145	171							m0	m13	
Internal Link Dist (ft)		2			400			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		3084	1312							654	1810	
Starvation Cap Reductn		0	0							248	619	

Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	ø1	ø2
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Grade (%)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	2
Permitted Phases		
Minimum Split (s)	49.0	41.0
Total Split (s)	49.0	41.0
Total Split (%)	54%	46%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.5	11.5
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lag
Lead-Lag Optimize?		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		

Existing Conditions
Traffic Planning and Design, Inc. - BMP
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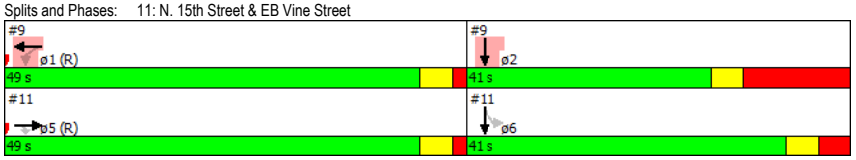
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0	0							0	0	
Storage Cap Reductn		0	0							0	0	
Reduced v/c Ratio		0.35	0.40							0.57	0.68	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 9.8	Intersection LOS: A
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 11: N. 15th Street & EB Vine Street



Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	ø1	ø2
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 - Report

Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	197	878	86	0	0	0	0	299	147	221	484	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	10	12	12	10	12
Grade (%)		2%			0%			2%			2%	
Storage Length (ft)	0		250	0		0	0		100	45		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.81	0.81	0.81	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor		1.00						0.97		0.98		
Frt		0.989						0.951				
Flt Protected		0.992								0.950		
Satd. Flow (prot)	0	7258	0	0	0	0	0	3925	0	1743	4674	0
Flt Permitted		0.992								0.476		
Satd. Flow (perm)	0	7258	0	0	0	0	0	3925	0	858	4674	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		480			163			240			170	
Travel Time (s)		13.1			4.4			6.5			4.6	
Confl. Peds. (#/hr)			29	29			222		53	53		222
Confl. Bikes (#/hr)			2						14			15
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	4%	2%	2%	2%	3%	11%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	30	0	0	0	0
Adj. Flow (vph)	205	915	90	0	0	0	0	311	153	230	504	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1210	0	0	0	0	0	464	0	230	504	0
Turn Type	Perm	NA						NA		custom	NA	
Protected Phases		5						6		8	7	
Permitted Phases	5									6 7	6 7	
Minimum Split (s)	42.0	42.0						34.0		14.0	48.0	
Total Split (s)	42.0	42.0						34.0		14.0	48.0	
Total Split (%)	46.7%	46.7%						37.8%		15.6%	53.3%	
Yellow Time (s)	3.6	3.6						3.6		3.6	3.6	
All-Red Time (s)	6.4	6.4						5.4		2.4	2.4	
Lost Time Adjust (s)		0.0						0.0		0.0	0.0	
Total Lost Time (s)		10.0						9.0		6.0	6.0	
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?												
Act Effct Green (s)		32.0						25.0		42.0	42.0	
Actuated g/C Ratio		0.36						0.28		0.47	0.47	
v/c Ratio		0.47						0.43		0.48	0.23	
Control Delay		16.8						28.1		9.7	2.7	
Queue Delay		0.0						0.0		5.7	0.3	
Total Delay		16.8						28.1		15.5	3.0	
LOS		B						C		B	A	
Approach Delay		16.8						28.1			6.9	
Approach LOS		B						C			A	

Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Bus Blockages (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	3
Permitted Phases			
Minimum Split (s)	42.0	34.0	14.0
Total Split (s)	42.0	34.0	14.0
Total Split (%)	47%	38%	16%
Yellow Time (s)	3.6	2.4	2.0
All-Red Time (s)	6.4	3.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag		Lead	Lag
Lead-Lag Optimize?			Yes
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			

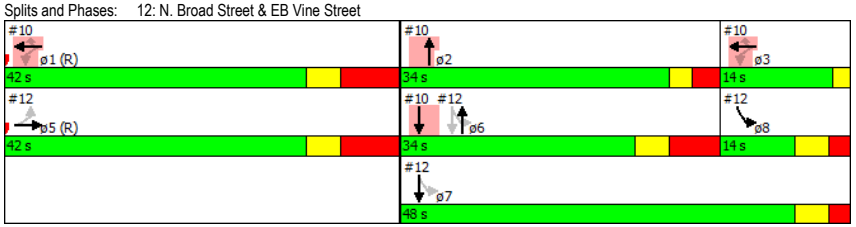
Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 - Report

Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		82						79		29	10	
Queue Length 95th (ft)		92						110		86	19	
Internal Link Dist (ft)		400			83			160			90	
Turn Bay Length (ft)										45		
Base Capacity (vph)		2580						1090		479	2181	
Starvation Cap Reductn		0						0		190	1044	
Spillback Cap Reductn		0						23		0	0	
Storage Cap Reductn		0						0		0	0	
Reduced v/c Ratio		0.47						0.43		0.80	0.44	

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 16.0	Intersection LOS: B
Intersection Capacity Utilization 80.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 12: N. Broad Street & EB Vine Street



Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 - Report

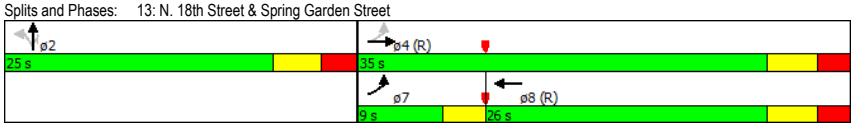
Timings
13: N. 18th Street & Spring Garden Street

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	43	372	375	57	49
Lane Group Flow (vph)	44	384	412	88	51
Turn Type	pm+pt	NA	NA	NA	Perm
Protected Phases	7	4	8	2	
Permitted Phases	4				2
Minimum Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?					
v/c Ratio	0.09	0.25	0.39	0.19	0.10
Control Delay	7.2	9.6	25.5	16.3	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.2	9.6	25.5	16.3	1.1
Queue Length 50th (ft)	7	40	66	23	0
Queue Length 95th (ft)	19	63	80	52	5
Internal Link Dist (ft)		476	350	810	
Turn Bay Length (ft)	145				150
Base Capacity (vph)	479	1562	1068	459	507
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	0.09	0.25	0.39	0.19	0.10

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 13: N. 18th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
13: N. 18th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	43	372	0	0	375	24	28	57	49	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.96		1.00	1.00		0.90	1.00		0.96			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln	185.3	185.3	0.0	0.0	185.3	189.0	189.0	177.9	177.9			
Lanes	1	2	0	0	2	0	0	1	1			
Cap, veh/h	576	1791	0	0	1139	73	220	333	458			
Arrive On Green	0.10	0.48	0.00	0.00	0.67	0.67	0.32	0.32	0.32			
Sat Flow, veh/h	1765	3706	0	0	3418	219	694	1051	1446			
Grp Volume(v), veh/h	44	384	0	0	209	203	73	15	51			
Grp Sat Flow(s),veh/h/ln	1765	1853	0	0	1853	1784	1744	1779	1446			
Q Serve(g_s), s	0.8	3.6	0.0	0.0	2.9	3.0	1.8	0.0	1.5			
Cycle Q Clear(g_c), s	0.8	3.6	0.0	0.0	2.9	3.0	1.8	0.0	1.5			
Prop In Lane	1.00		0.00	0.00		0.12	0.40		1.00			
Lane Grp Cap(c), veh/h	576	1791	0	0	618	595	552	0	458			
V/C Ratio(X)	0.08	0.21	0.00	0.00	0.34	0.34	0.13	0.00	0.11			
Avail Cap(c_a), veh/h	576	1791	0	0	618	595	552	0	458			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	9.0	8.9	0.0	0.0	7.2	7.2	14.6	0.0	14.5			
Incr Delay (d2), s/veh	0.3	0.3	0.0	0.0	1.5	1.6	0.5	0.0	0.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln	0.6	2.6	0.0	0.0	2.2	2.2	1.4	0.0	1.0			
Lane Grp Delay (d), s/veh	9.2	9.2	0.0	0.0	8.6	8.7	15.1	0.0	15.0			
Lane Grp LOS	A	A			A	A	B		B			
Approach Vol, veh/h		428			412			139				
Approach Delay, s/veh		9.2			8.7			13.4				
Approach LOS		A			A			B				

Timer

Assigned Phs	7	4			8			2				
Phs Duration (G+Y+Rc), s	9.0	35.0			26.0			25.0				
Change Period (Y+Rc), s	3.0	6.0			6.0			6.0				
Max Green Setting (Gmax), s	6.0	29.0			20.0			19.0				
Max Q Clear Time (g_c+I1), s	0.0	0.0			0.0			0.0				
Green Ext Time (p_c), s	0.0	0.0			0.0			0.0				

Intersection Summary

HCM 2010 Ctrl Delay			9.6									
HCM 2010 LOS			A									

Notes

Timings
14: N. Broad Street & Spring Garden Street

Lane Group	EBT	WBT	NBT	NBR	SBL	SBT	SBR
Lane Configurations							
Volume (vph)	375	353	566	43	69	654	69
Lane Group Flow (vph)	442	441	590	45	72	681	72
Turn Type	NA	NA	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	8	2		1	6	
Permitted Phases				2	6		6
Minimum Split (s)	33.0	33.0	35.0	35.0	9.0	35.0	35.0
Total Split (s)	40.0	40.0	41.0	41.0	9.0	50.0	50.0
Total Split (%)	44.4%	44.4%	45.6%	45.6%	10.0%	55.6%	55.6%
Yellow Time (s)	3.6	3.6	3.4	3.4	3.0	3.4	3.4
All-Red Time (s)	2.4	2.4	2.6	2.6	0.0	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Lead/Lag			Lag	Lag	Lead		
Lead-Lag Optimize?							
v/c Ratio	0.37	0.37	0.45	0.07	0.19	0.41	0.10
Control Delay	21.4	21.4	10.3	2.3	12.1	15.6	12.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.4	21.4	10.3	2.3	12.1	15.6	12.9
Queue Length 50th (ft)	93	93	35	0	19	124	21
Queue Length 95th (ft)	133	133	95	3	41	167	44
Internal Link Dist (ft)	400	550	990			290	
Turn Bay Length (ft)				100	170		100
Base Capacity (vph)	1194	1185	1323	625	371	1672	715
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.37	0.45	0.07	0.19	0.41	0.10

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Pretimed

Splits and Phases: 14: N. Broad Street & Spring Garden Street

HCM 2010 Signalized Intersection Summary
14: N. Broad Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	375	49	0	353	70	0	566	43	69	654	69
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	1.00		0.95	0.99		0.95
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.3	189.0	0.0	185.3	189.0	0.0	185.3	185.3	186.2	186.2	186.2
Lanes	0	2	0	0	2	0	0	2	1	1	2	1
Cap, veh/h	0	1209	156	0	1132	222	0	1441	584	482	1821	731
Arrive On Green	0.00	0.38	0.38	0.00	0.38	0.38	0.00	0.78	0.78	0.07	0.49	0.49
Sat Flow, veh/h	0	3201	414	0	2996	587	0	3706	1502	1774	3724	1496
Grp Volume(v), veh/h	0	225	217	0	226	215	0	590	45	72	681	72
Grp Sat Flow(s),veh/h/ln	0	1853	1762	0	1853	1731	0	1853	1502	1774	1862	1496
Q Serve(g_s), s	0.0	7.7	7.9	0.0	7.8	8.0	0.0	4.7	0.6	2.0	10.3	2.3
Cycle Q Clear(g_c), s	0.0	7.7	7.9	0.0	7.8	8.0	0.0	4.7	0.6	2.0	10.3	2.3
Prop In Lane	0.00		0.23	0.00		0.34	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	700	666	0	700	654	0	1441	584	482	1821	731
V/C Ratio(X)	0.00	0.32	0.33	0.00	0.32	0.33	0.00	0.41	0.08	0.15	0.37	0.10
Avail Cap(c_a), veh/h	0	700	666	0	700	654	0	1441	584	482	1821	731
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	19.8	19.9	0.0	19.8	19.9	0.0	6.6	6.2	13.1	14.4	12.3
Incr Delay (d2), s/veh	0.0	1.2	1.3	0.0	1.2	1.3	0.0	0.9	0.3	0.7	0.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	5.7	5.5	0.0	5.7	5.5	0.0	3.0	0.5	1.6	6.8	1.5
Lane Grp Delay (d), s/veh	0.0	21.0	21.2	0.0	21.1	21.2	0.0	7.5	6.4	13.7	15.0	12.6
Lane Grp LOS		C	C		C	C		A	A	B	B	B
Approach Vol, veh/h		442			441			635			825	
Approach Delay, s/veh		21.1			21.1			7.4			14.7	
Approach LOS		C			C			A			B	

Timer

Assigned Phs		4			8			2		1	6	
Phs Duration (G+Y+Rc), s		40.0			40.0			41.0		9.0	50.0	
Change Period (Y+Rc), s		6.0			6.0			6.0		3.0	6.0	
Max Green Setting (Gmax), s		34.0			34.0			35.0		6.0	44.0	
Max Q Clear Time (g_c+I1), s		0.0			0.0			0.0		0.0	0.0	
Green Ext Time (p_c), s		0.0			0.0			0.0		0.0	0.0	

Intersection Summary

HCM 2010 Ctrl Delay			15.1									
HCM 2010 LOS			B									

Notes

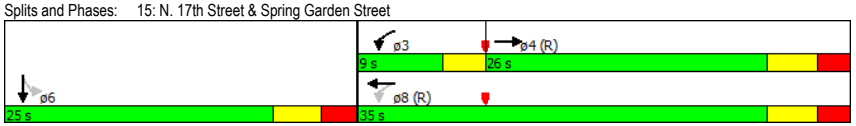
Timings
15: N. 17th Street & Spring Garden Street

Lane Group	EBT	WBL	WBT	SBT
Lane Configurations				
Volume (vph)	387	33	383	53
Lane Group Flow (vph)	464	37	426	121
Turn Type	NA	pm+pt	NA	NA
Protected Phases	4	3	8	6
Permitted Phases		8		
Minimum Split (s)	26.0	9.0	35.0	25.0
Total Split (s)	26.0	9.0	35.0	25.0
Total Split (%)	43.3%	15.0%	58.3%	41.7%
Yellow Time (s)	3.6	3.0	3.6	3.4
All-Red Time (s)	2.4	0.0	2.4	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	3.0	6.0	6.0
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?				
v/c Ratio	0.43	0.08	0.27	0.24
Control Delay	9.2	4.0	7.2	13.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	9.2	4.0	7.2	13.3
Queue Length 50th (ft)	25	4	23	24
Queue Length 95th (ft)	37	m7	54	58
Internal Link Dist (ft)	350		350	290
Turn Bay Length (ft)		165		
Base Capacity (vph)	1068	463	1562	496
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	0.43	0.08	0.27	0.24

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: N. 17th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
15: N. 17th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	387	31	33	383	0	0	0	0	28	53	28
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91	0.97		1.00				1.00		0.96
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.3	189.0	185.3	185.3	0.0				189.0	183.5	189.0
Lanes	0	2	0	1	2	0				0	1	0
Cap, veh/h	0	1122	88	558	1791	0				197	166	209
Arrive On Green	0.00	0.67	0.67	0.20	0.97	0.00				0.32	0.32	0.32
Sat Flow, veh/h	0	3366	264	1765	3706	0				621	378	658
Grp Volume(v), veh/h	0	236	228	37	426	0				90	0	80
Grp Sat Flow(s),veh/h/ln	0	1853	1777	1765	1853	0				1804	0	1689
Q Serve(g_s), s	0.0	3.4	3.5	0.6	0.3	0.0				1.8	0.0	0.0
Cycle Q Clear(g_c), s	0.0	3.4	3.5	0.6	0.3	0.0				1.8	0.0	0.0
Prop In Lane	0.00		0.15	1.00		0.00				0.34		0.39
Lane Grp Cap(c), veh/h	0	618	592	558	1791	0				571	0	0
V/C Ratio(X)	0.00	0.38	0.39	0.07	0.24	0.00				0.16	0.00	0.00
Avail Cap(c_a), veh/h	0	618	592	558	1791	0				571	0	0
HCM Platoon Ratio	1.00	2.00	2.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	7.2	7.2	8.0	0.5	0.0				12.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.8	1.9	0.2	0.3	0.0				0.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	2.6	2.6	0.5	0.3	0.0				1.5	0.0	0.0
Lane Grp Delay (d), s/veh	0.0	9.0	9.1	8.2	0.8	0.0				12.9	0.0	0.0
Lane Grp LOS		A	A	A	A					B		
Approach Vol, veh/h		464			463						170	
Approach Delay, s/veh		9.1			1.4						6.8	
Approach LOS		A			A						A	

Timer

Assigned Phs		4		3	8						6	
Phs Duration (G+Y+Rc), s		26.0		9.0	35.0						25.0	
Change Period (Y+Rc), s		6.0		3.0	6.0						6.0	
Max Green Setting (Gmax), s		20.0		6.0	29.0						19.0	
Max Q Clear Time (g_c+I1), s		0.0		0.0	0.0						0.0	
Green Ext Time (p_c), s		0.0		0.0	0.0						0.0	

Intersection Summary

HCM 2010 Ctrl Delay			5.5									
HCM 2010 LOS			A									

Notes

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	98	281	32	0	0	0	0	155	7
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00						1.00	
Frt					0.988						0.994	
Flt Protected					0.988							
Satd. Flow (prot)	0	0	0	0	3254	0	0	0	0	0	1656	0
Flt Permitted					0.988							
Satd. Flow (perm)	0	0	0	0	3254	0	0	0	0	0	1656	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					93						3	
Link Speed (mph)		30			25			30			25	
Link Distance (ft)		975			430			170			647	
Travel Time (s)		22.2			11.7			3.9			17.6	
Confl. Peds. (#/hr)	17		1	1		17	10		100	100		10
Confl. Bikes (#/hr)						5						2
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Parking (#/hr)					0						0	
Adj. Flow (vph)	0	0	0	113	323	37	0	0	0	0	178	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	473	0	0	0	0	0	186	0
Turn Type				custom	NA						NA	
Protected Phases					1 3						2	
Permitted Phases				1								
Minimum Split (s)				47.5							33.5	
Total Split (s)				47.5							33.5	
Total Split (%)				52.8%							37.2%	
Yellow Time (s)				3.5							3.5	
All-Red Time (s)				1.8							1.5	
Lost Time Adjust (s)											0.0	
Total Lost Time (s)											5.0	
Lead/Lag				Lead							Lag	
Lead-Lag Optimize?												
Act Effct Green (s)					51.2						28.5	
Actuated g/C Ratio					0.57						0.32	
v/c Ratio					0.25						0.35	
Control Delay					0.5						25.7	
Queue Delay					0.0						0.0	
Total Delay					0.5						25.7	
LOS					A						C	
Approach Delay					0.5						25.7	
Approach LOS					A						C	
Queue Length 50th (ft)					0						79	
Queue Length 95th (ft)					1						131	
Internal Link Dist (ft)		895			350			90			567	
Turn Bay Length (ft)												
Base Capacity (vph)					1891						526	
Starvation Cap Reductn					0						0	

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

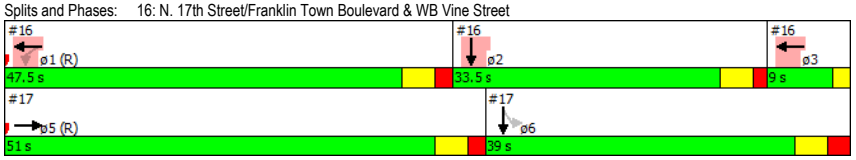
Lane Group	ø3	ø5	ø6
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	5	6
Permitted Phases			
Minimum Split (s)	9.0	51.0	39.0
Total Split (s)	9.0	51.0	39.0
Total Split (%)	10%	57%	43%
Yellow Time (s)	2.0	3.5	3.5
All-Red Time (s)	0.0	1.8	2.5
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag		Lead	Lag
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 - Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn					0						0	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.25						0.35	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.35	
Intersection Signal Delay: 7.6	Intersection LOS: A
Intersection Capacity Utilization 67.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 16: N. 17th Street/Franklin Town Boulevard & WB Vine Street



Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	ø3	ø5	ø6
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 - Report

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	197	29	0	0	0	0	0	0	58	200	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor		1.00									0.98	
Frt		0.981										
Flt Protected											0.989	
Satd. Flow (prot)	0	3271	0	0	0	0	0	0	0	0	3482	0
Flt Permitted											0.989	
Satd. Flow (perm)	0	3271	0	0	0	0	0	0	0	0	3408	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)		27									47	
Link Speed (mph)		30			25			30			30	
Link Distance (ft)		975			430			430			170	
Travel Time (s)		22.2			11.7			9.8			3.9	
Confl. Peds. (#/hr)	1		16	16		1	9		87	87		9
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Parking (#/hr)		0										
Adj. Flow (vph)	0	235	35	0	0	0	0	0	0	69	238	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	270	0	0	0	0	0	0	0	0	307	0
Turn Type		NA								Perm	NA	
Protected Phases		5									6	
Permitted Phases										6		
Minimum Split (s)		51.0								39.0	39.0	
Total Split (s)		51.0								39.0	39.0	
Total Split (%)		56.7%								43.3%	43.3%	
Yellow Time (s)		3.5								3.5	3.5	
All-Red Time (s)		1.8								2.5	2.5	
Lost Time Adjust (s)		0.0									0.0	
Total Lost Time (s)		5.3									6.0	
Lead/Lag		Lead								Lag	Lag	
Lead-Lag Optimize?												
Act Effct Green (s)		45.7									33.0	
Actuated g/C Ratio		0.51									0.37	
v/c Ratio		0.16									0.24	
Control Delay		10.9									8.7	
Queue Delay		0.0									1.1	
Total Delay		10.9									9.8	
LOS		B									A	
Approach Delay		10.9									9.8	
Approach LOS		B									A	
Queue Length 50th (ft)		36									28	
Queue Length 95th (ft)		53									40	
Internal Link Dist (ft)		895			350			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		1674									1279	
Starvation Cap Reductn		0									729	

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	3
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	1.8	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			

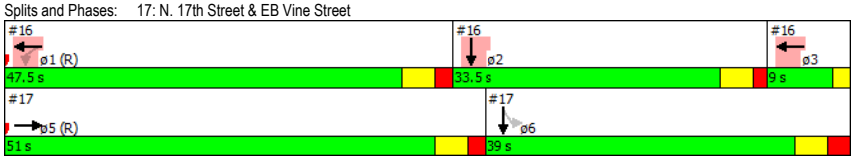
Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 - Report

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0									0	
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.16									0.56	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.35	
Intersection Signal Delay: 10.3	Intersection LOS: B
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: N. 17th Street & EB Vine Street



Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

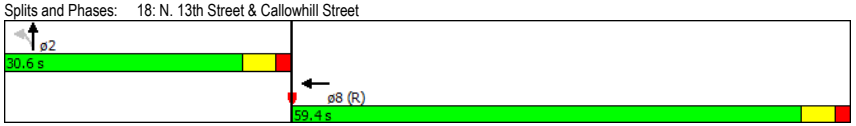
Timings
18: N. 13th Street & Callowhill Street

Lane Group	WBT	NBT
Lane Configurations		
Volume (vph)	153	141
Lane Group Flow (vph)	183	163
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Minimum Split (s)	59.4	30.6
Total Split (s)	59.4	30.6
Total Split (%)	66.0%	34.0%
Yellow Time (s)	3.6	3.6
All-Red Time (s)	1.8	1.8
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.4	5.4
Lead/Lag		
Lead-Lag Optimize?		
v/c Ratio	0.10	0.36
Control Delay	6.9	10.3
Queue Delay	0.0	0.0
Total Delay	6.9	10.3
Queue Length 50th (ft)	18	21
Queue Length 95th (ft)	32	41
Internal Link Dist (ft)	195	480
Turn Bay Length (ft)		
Base Capacity (vph)	1841	454
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.10	0.36

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 90
Control Type: Pretimed

Splits and Phases: 18: N. 13th Street & Callowhill Street



HCM 2010 Signalized Intersection Summary
18: N. 13th Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	153	21	14	141	0	0	0	0
Number				3	8	18	5	2	12			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.97	1.00		1.00			
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln				0.0	185.3	189.0	189.0	185.3	0.0			
Lanes				0	2	0	0	1	0			
Cap, veh/h				0	1913	257	48	469	0			
Arrive On Green				0.00	0.60	0.60	0.28	0.28	0.00			
Sat Flow, veh/h				0	3189	428	170	1675	0			
Grp Volume(v), veh/h				0	92	91	163	0	0			
Grp Sat Flow(s),veh/h/ln				0	1853	1763	1844	1853	0			
Q Serve(g_s), s				0.0	1.9	2.0	6.3	0.0	0.0			
Cycle Q Clear(g_c), s				0.0	1.9	2.0	6.3	0.0	0.0			
Prop In Lane				0.00		0.24	0.09		0.00			
Lane Grp Cap(c), veh/h				0	1112	1058	516	0	0			
V/C Ratio(X)				0.00	0.08	0.09	0.32	0.00	0.00			
Avail Cap(c_a), veh/h				0	1112	1058	516	0	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	7.6	7.6	25.6	0.0	0.0			
Incr Delay (d2), s/veh				0.0	0.1	0.2	1.6	0.0	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln				0.0	1.5	1.4	4.9	0.0	0.0			
Lane Grp Delay (d), s/veh				0.0	7.7	7.8	27.2	0.0	0.0			
Lane Grp LOS					A	A	C					
Approach Vol, veh/h					183			163				
Approach Delay, s/veh					7.7			27.2				
Approach LOS					A			C				

Timer

Assigned Phs	8	2
Phs Duration (G+Y+Rc), s	59.4	30.6
Change Period (Y+Rc), s	5.4	5.4
Max Green Setting (Gmax), s	54.0	25.2
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	16.9
HCM 2010 LOS	B

Notes

Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	704	43	73	129	0	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	11	12	11	10	12	12	10	12
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00		0.96					
Frt					0.991							
Flt Protected							0.950					
Satd. Flow (prot)	0	0	0	0	4673	0	1702	1729	0	0	0	0
Flt Permitted							0.950					
Satd. Flow (perm)	0	0	0	0	4673	0	1628	1729	0	0	0	0
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Satd. Flow (RTOR)					15		76					
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		605			275			170			560	
Travel Time (s)		16.5			6.3			3.9			12.7	
Confl. Peds. (#/hr)	24		3	3		24	53		40	40		53
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Parking (#/hr)					0							
Adj. Flow (vph)	0	0	0	0	733	45	76	134	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	778	0	76	134	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					1			2				
Permitted Phases							2					
Minimum Split (s)					51.0		39.0	39.0				
Total Split (s)					51.0		39.0	39.0				
Total Split (%)					56.7%		43.3%	43.3%				
Yellow Time (s)					3.7		3.5	3.5				
All-Red Time (s)					1.8		2.5	2.5				
Lost Time Adjust (s)					0.0		0.0	0.0				
Total Lost Time (s)					5.5		6.0	6.0				
Lead/Lag					Lead		Lag	Lag				
Lead-Lag Optimize?					Yes		Yes	Yes				
Act Effct Green (s)					45.5		33.0	33.0				
Actuated g/C Ratio					0.51		0.37	0.37				
v/c Ratio					0.33		0.12	0.21				
Control Delay					13.4		1.1	11.7				
Queue Delay					0.0		0.8	1.7				
Total Delay					13.4		1.9	13.4				
LOS					B		A	B				
Approach Delay					13.4			9.3				
Approach LOS					B			A				
Queue Length 50th (ft)					89		1	25				
Queue Length 95th (ft)					116		3	43				
Internal Link Dist (ft)		525			195			90			480	
Turn Bay Length (ft)												
Base Capacity (vph)					2369		645	633				
Starvation Cap Reductn					0		395	364				

Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

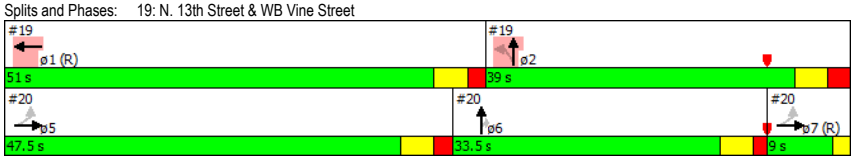
Lane Group	ø5	ø6	ø7
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	7
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	2.0	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 - Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.33		0.30	0.50				

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 7:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.33	
Intersection Signal Delay: 12.5	Intersection LOS: B
Intersection Capacity Utilization 110.0%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 19: N. 13th Street & WB Vine Street



Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 - Report

Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	62	469	0	0	0	0	0	140	43	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	11	9	12	12	12
Lane Util. Factor	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor									0.95			
Frt									0.850			
Flt Protected		0.994										
Satd. Flow (prot)	0	5028	0	0	0	0	0	1612	1417	0	0	0
Flt Permitted		0.994										
Satd. Flow (perm)	0	5028	0	0	0	0	0	1612	1349	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		43							103			
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		442			275			430			170	
Travel Time (s)		12.1			6.3			9.8			3.9	
Confl. Peds. (#/hr)			11	11			49		36	36		49
Confl. Bikes (#/hr)			2						4			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Parking (#/hr)								0				
Adj. Flow (vph)	68	515	0	0	0	0	0	154	47	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	583	0	0	0	0	0	154	47	0	0	0
Turn Type	Perm	NA						NA	Perm			
Protected Phases		5 7						6				
Permitted Phases	5 7								6			
Minimum Split (s)								33.5	33.5			
Total Split (s)								33.5	33.5			
Total Split (%)								37.2%	37.2%			
Yellow Time (s)								3.5	3.5			
All-Red Time (s)								1.5	1.5			
Lost Time Adjust (s)								0.0	0.0			
Total Lost Time (s)								5.0	5.0			
Lead/Lag								Lag	Lag			
Lead-Lag Optimize?								Yes	Yes			
Act Effct Green (s)		51.0						28.5	28.5			
Actuated g/C Ratio		0.57						0.32	0.32			
v/c Ratio		0.20						0.30	0.09			
Control Delay		5.9						25.3	0.4			
Queue Delay		0.0						0.0	0.0			
Total Delay		5.9						25.3	0.4			
LOS		A						C	A			
Approach Delay		5.9						19.5				
Approach LOS		A						B				
Queue Length 50th (ft)		31						66	0			
Queue Length 95th (ft)		41						117	1			
Internal Link Dist (ft)		362			195			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		2867						510	497			

Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Lane Configurations				
Volume (vph)				
Ideal Flow (vphpl)				
Lane Width (ft)				
Lane Util. Factor				
Ped Bike Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Confl. Peds. (#/hr)				
Confl. Bikes (#/hr)				
Peak Hour Factor				
Parking (#/hr)				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	2	5	7
Permitted Phases				
Minimum Split (s)	51.0	39.0	47.5	9.0
Total Split (s)	51.0	39.0	47.5	9.0
Total Split (%)	57%	43%	53%	10%
Yellow Time (s)	3.7	3.5	3.5	2.0
All-Red Time (s)	1.8	2.5	2.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				

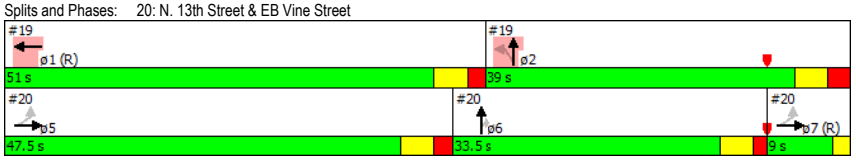
Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 - Report

Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0						0	0			
Spillback Cap Reductn		0						3	0			
Storage Cap Reductn		0						0	0			
Reduced v/c Ratio		0.20						0.30	0.09			

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 7:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.33	
Intersection Signal Delay: 9.4	Intersection LOS: A
Intersection Capacity Utilization 103.5%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 20: N. 13th Street & EB Vine Street



Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 - Report

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	16	243	0	0	0	0	0	305	276	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.98			
Frt									0.850			
Flt Protected		0.997										
Satd. Flow (prot)	0	3502	0	0	0	0	0	5009	1575	0	0	0
Flt Permitted		0.997										
Satd. Flow (perm)	0	3501	0	0	0	0	0	5009	1546	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24							297			
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		430			378			430			170	
Travel Time (s)		11.7			10.3			11.7			4.6	
Confl. Peds. (#/hr)	2		13	13		2	35		7	7		35
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	6%	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%
Adj. Flow (vph)	17	261	0	0	0	0	0	328	297	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	278	0	0	0	0	0	328	297	0	0	0
Turn Type	Perm	NA						NA	Perm			
Protected Phases		5 7						6				
Permitted Phases	5 7								6			
Minimum Split (s)								33.5	33.5			
Total Split (s)								33.5	33.5			
Total Split (%)								37.2%	37.2%			
Yellow Time (s)								3.5	3.5			
All-Red Time (s)								1.5	1.5			
Lost Time Adjust (s)								0.0	0.0			
Total Lost Time (s)								5.0	5.0			
Lead/Lag								Lag	Lag			
Lead-Lag Optimize?												
Act Effct Green (s)		51.2						28.5	28.5			
Actuated g/C Ratio		0.57						0.32	0.32			
v/c Ratio		0.14						0.21	0.43			
Control Delay		6.9						22.9	5.0			
Queue Delay		0.0						0.0	0.0			
Total Delay		6.9						22.9	5.0			
LOS		A						C	A			
Approach Delay		6.9						14.4				
Approach LOS		A						B				
Queue Length 50th (ft)		27						49	0			
Queue Length 95th (ft)		41						72	55			
Internal Link Dist (ft)		350			298			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		2002						1586	692			
Starvation Cap Reductn		0						0	0			
Spillback Cap Reductn		0						0	0			

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

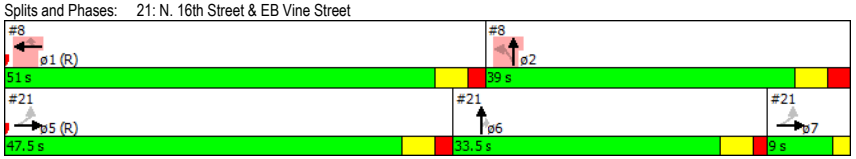
Lane Group	ø1	ø2	ø5	ø7
Lane Configurations				
Volume (vph)				
Ideal Flow (vphpl)				
Lane Util. Factor				
Ped Bike Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Confl. Peds. (#/hr)				
Peak Hour Factor				
Heavy Vehicles (%)				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	2	5	7
Permitted Phases				
Minimum Split (s)	51.0	39.0	47.5	9.0
Total Split (s)	51.0	39.0	47.5	9.0
Total Split (%)	57%	43%	53%	10%
Yellow Time (s)	3.5	3.5	3.5	2.0
All-Red Time (s)	1.8	2.5	1.8	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lead	
Lead-Lag Optimize?				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 - Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn		0						0	0			
Reduced v/c Ratio		0.14						0.21	0.43			

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.43	
Intersection Signal Delay: 12.1	Intersection LOS: B
Intersection Capacity Utilization 67.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 21: N. 16th Street & EB Vine Street



Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

Existing Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 - Report

BASE (NO-BUILD) CONDITIONS

FRIDAY PM (4-6 PM)
PEAK HOUR TIME PERIOD

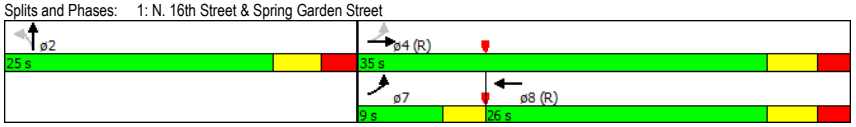
Timings
1: N. 16th Street & Spring Garden Street

Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Volume (vph)	140	661	824	384
Lane Group Flow (vph)	146	689	955	742
Turn Type	pm+pt	NA	NA	NA
Protected Phases	7	4	8	2
Permitted Phases	4			
Minimum Split (s)	9.0	35.0	26.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?				
v/c Ratio	0.56	0.44	0.93	0.76
Control Delay	23.8	16.3	46.9	25.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.8	16.3	46.9	25.5
Queue Length 50th (ft)	39	88	187	142
Queue Length 95th (ft)	m42	m92	m#286	204
Internal Link Dist (ft)		350	380	990
Turn Bay Length (ft)	140			
Base Capacity (vph)	263	1550	1027	981
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	0.56	0.44	0.93	0.76

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed
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.

Splits and Phases: 1: N. 16th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
1: N. 16th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	140	661	0	0	824	93	126	384	203	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.89	1.00		0.91			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln	185.3	185.3	0.0	0.0	183.3	187.1	186.2	181.5	186.2			
Lanes	1	2	0	0	2	0	0	2	0			
Cap, veh/h	331	1791	0	0	1009	114	178	558	313			
Arrive On Green	0.20	0.97	0.00	0.00	0.11	0.11	0.32	0.32	0.32			
Sat Flow, veh/h	1765	3706	0	0	3027	342	563	1763	988			
Grp Volume(v), veh/h	146	689	0	0	519	436	416	0	326			
Grp Sat Flow(s),veh/h/ln	1765	1853	0	0	1833	1537	1787	0	1528			
Q Serve(g_s), s	2.8	0.6	0.0	0.0	16.7	16.7	12.4	0.0	11.1			
Cycle Q Clear(g_c), s	2.8	0.6	0.0	0.0	16.7	16.7	12.4	0.0	11.1			
Prop In Lane	1.00		0.00	0.00		0.22	0.32		0.65			
Lane Grp Cap(c), veh/h	331	1791	0	0	611	512	566	0	484			
V/C Ratio(X)	0.44	0.38	0.00	0.00	0.85	0.85	0.73	0.00	0.67			
Avail Cap(c_a), veh/h	331	1791	0	0	611	512	566	0	484			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	11.4	0.5	0.0	0.0	25.2	25.2	18.3	0.0	17.8			
Incr Delay (d2), s/veh	4.2	0.6	0.0	0.0	13.9	16.1	8.2	0.0	7.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln	2.3	0.5	0.0	0.0	13.8	12.2	9.0	0.0	7.2			
Lane Grp Delay (d), s/veh	15.6	1.2	0.0	0.0	39.1	41.3	26.5	0.0	25.1			
Lane Grp LOS	B	A			D	D	C		C			
Approach Vol, veh/h		835			955			742				
Approach Delay, s/veh		3.7			40.1			25.9				
Approach LOS		A			D			C				

Timer

Assigned Phs	7	4			8			2				
Phs Duration (G+Y+Rc), s	9.0	35.0			26.0			25.0				
Change Period (Y+Rc), s	3.0	6.0			6.0			6.0				
Max Green Setting (Gmax), s	6.0	29.0			20.0			19.0				
Max Q Clear Time (g_c+I1), s	0.0	0.0			0.0			0.0				
Green Ext Time (p_c), s	0.0	0.0			0.0			0.0				

Intersection Summary

HCM 2010 Ctrl Delay			23.9									
HCM 2010 LOS			C									

Notes

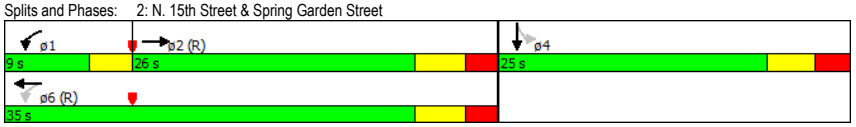
Timings
2: N. 15th Street & Spring Garden Street

Lane Group	EBT	WBL	WBT	SBL	SBT
Lane Configurations					
Volume (vph)	781	121	698	78	306
Lane Group Flow (vph)	888	127	735	82	387
Turn Type	NA	pm+pt	NA	Perm	NA
Protected Phases	2	1	6		4
Permitted Phases		6		4	
Minimum Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (%)	43.3%	15.0%	58.3%	41.7%	41.7%
Yellow Time (s)	3.6	3.0	3.6	3.4	3.4
All-Red Time (s)	2.4	0.0	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	3.0	6.0	6.0	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?					
v/c Ratio	0.85	0.52	0.48	0.20	0.83
Control Delay	23.3	15.6	11.7	16.7	37.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	15.6	11.7	16.7	37.4
Queue Length 50th (ft)	134	21	87	21	128
Queue Length 95th (ft)	#257	#48	127	50	#265
Internal Link Dist (ft)	380		400		290
Turn Bay Length (ft)		115		100	
Base Capacity (vph)	1047	242	1534	405	466
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	0.52	0.48	0.20	0.83

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 15 (25%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: N. 15th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
2: N. 15th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	781	63	121	698	0	0	0	0	78	306	62
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.53	0.90		1.00				1.00		0.85
Parking Bus Adj	1.00	1.00	0.90	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	182.4	189.0	178.2	183.4	0.0				168.0	185.0	189.0
Lanes	0	2	0	1	2	0				1	1	0
Cap, veh/h	0	979	79	361	1773	0				507	458	92
Arrive On Green	0.00	0.67	0.67	0.10	0.48	0.00				0.32	0.32	0.32
Sat Flow, veh/h	0	2937	236	1697	3669	0				1600	1446	292
Grp Volume(v), veh/h	0	510	378	127	735	0				82	0	387
Grp Sat Flow(s),veh/h/ln	0	1824	1349	1697	1834	0				1600	1850	1738
Q Serve(g_s), s	0.0	12.7	12.7	2.6	7.8	0.0				2.2	0.0	11.7
Cycle Q Clear(g_c), s	0.0	12.7	12.7	2.6	7.8	0.0				2.2	0.0	11.7
Prop In Lane	0.00		0.17	1.00		0.00				1.00		0.17
Lane Grp Cap(c), veh/h	0	608	450	361	1773	0				507	0	550
V/C Ratio(X)	0.00	0.84	0.84	0.35	0.41	0.00				0.16	0.00	0.70
Avail Cap(c_a), veh/h	0	608	450	361	1773	0				507	0	550
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	8.8	8.8	11.5	10.0	0.0				14.8	0.0	18.0
Incr Delay (d2), s/veh	0.0	13.1	17.0	2.7	0.7	0.0				0.7	0.0	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	7.2	6.2	2.1	5.1	0.0				1.6	0.0	8.2
Lane Grp Delay (d), s/veh	0.0	21.9	25.8	14.2	10.7	0.0				15.4	0.0	25.4
Lane Grp LOS		C	C	B	B					B		C
Approach Vol, veh/h		888			862						469	
Approach Delay, s/veh		23.5			11.2						23.6	
Approach LOS		C			B						C	

Timer

Assigned Phs		2		1	6						4	
Phs Duration (G+Y+Rc), s		26.0		9.0	35.0						25.0	
Change Period (Y+Rc), s		6.0		3.0	6.0						6.0	
Max Green Setting (Gmax), s		20.0		6.0	29.0						19.0	
Max Q Clear Time (g_c+I1), s		0.0		0.0	0.0						0.0	
Green Ext Time (p_c), s		0.0		0.0	0.0						0.0	

Intersection Summary

HCM 2010 Ctrl Delay			18.8									
HCM 2010 LOS			B									

Notes

Lanes, Volumes, Timings
3: Franklin Town Boulevard & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	198	55	137	37	280	174	38	42	8	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	11	12	12	12	12	12	16	12	12	12	12
Grade (%)		-1%			2%			3%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.953			0.952			0.987				
Flt Protected		0.975			0.996			0.979				
Satd. Flow (prot)	0	1648	0	0	1565	0	0	1747	0	0	0	0
Flt Permitted		0.975			0.996			0.979				
Satd. Flow (perm)	0	1648	0	0	1565	0	0	1747	0	0	0	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		646			325			647			208	
Travel Time (s)		17.6			8.9			17.6			5.7	
Confl. Peds. (#/hr)	35		35	35		35	28		24	24		28
Confl. Bikes (#/hr)			5			8			1			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	13%	2%	2%	2%	2%	4%	2%	25%	2%	2%	2%
Parking (#/hr)					0			0				
Adj. Flow (vph)	213	59	147	40	301	187	41	45	9	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	419	0	0	528	0	0	95	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.05	1.00	1.02	1.17	1.02	1.03	1.00	1.03	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	CBD
Control Type: Unsignalized	
Intersection Capacity Utilization 74.6%	ICU Level of Service D
Analysis Period (min) 15	

HCM 2010 AWSC
3: Franklin Town Boulevard & Callowhill Street

Intersection	
Intersection Delay, s/veh	14.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	198	55	137	37	280	174	38	42	8	0	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	13	2	2	2	2	4	2	25	2	2	2
Mvmt Flow	213	59	147	40	301	187	41	45	9	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	13.2	15.8	10.3
HCM LOS	B	C	B

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	43%	51%	8%
Vol Thru, %	48%	14%	57%
Vol Right, %	9%	35%	35%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	88	390	491
LT Vol	42	55	280
Through Vol	8	137	174
RT Vol	38	198	37
Lane Flow Rate	95	419	528
Geometry Grp	1	1	1
Degree of Util (X)	0.16	0.543	0.657
Departure Headway (Hd)	6.101	4.665	4.479
Convergence, Y/N	Yes	Yes	Yes
Cap	591	767	802
Service Time	4.101	2.731	2.54
HCM Lane V/C Ratio	0.161	0.546	0.658
HCM Control Delay	10.3	13.2	15.8
HCM Lane LOS	B	B	C
HCM 95th-tile Q	0.6	3.3	5

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
4: N. 17th Street & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	62	156	333	0	0	0	0	0	231	94
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	11	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			-4%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.865								0.961	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	1429	1693	1659	0	0	0	0	0	1538	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	1429	1693	1659	0	0	0	0	0	1538	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		325			430			230			1070	
Travel Time (s)		8.9			11.7			6.3			29.2	
Confl. Peds. (#/hr)	26		57	57		26	112		60	60		112
Confl. Bikes (#/hr)			1			7						20
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	5	0
Parking (#/hr)			0		0						0	
Adj. Flow (vph)	0	0	70	177	378	0	0	0	0	0	263	107
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	70	177	378	0	0	0	0	0	369	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.15	1.06	1.16	1.01	1.01	1.01	1.01	0.98	1.20	0.98
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	CBD
Control Type: Unsignalized	
Intersection Capacity Utilization 52.0%	ICU Level of Service A
Analysis Period (min) 15	

HCM 2010 AWSC
4: N. 17th Street & Callowhill Street

Intersection	
Intersection Delay, s/veh	14.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	62	156	333	0	0	0	0	0	231	94
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	3	2	2	2	2	2	2	2	3	2
Mvmt Flow	0	0	70	177	378	0	0	0	0	0	262	107
Number of Lanes	0	0	1	1	1	0	0	0	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	8.9	14.9	14.3
HCM LOS	A	B	B

Lane	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	100%	0%	0%
Vol Thru, %	0%	0%	100%	71%
Vol Right, %	100%	0%	0%	29%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	62	156	333	325
LT Vol	0	0	333	231
Through Vol	62	0	0	94
RT Vol	0	156	0	0
Lane Flow Rate	70	177	378	369
Geometry Grp	5	7	7	2
Degree of Util (X)	0.103	0.305	0.598	0.535
Departure Headway (Hd)	5.256	6.194	5.688	5.318
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	685	583	640	683
Service Time	3.267	3.897	3.391	3.318
HCM Lane V/C Ratio	0.102	0.304	0.591	0.54
HCM Control Delay	8.9	11.6	16.5	14.3
HCM Lane LOS	A	B	C	B
HCM 95th-tile Q	0.3	1.3	4	3.2

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Timings
5: N. 16th Street & Callowhill Street

Lane Group	WBT	NBT
Lane Configurations		
Volume (vph)	365	542
Lane Group Flow (vph)	538	671
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Minimum Split (s)	21.0	39.0
Total Split (s)	21.0	39.0
Total Split (%)	35.0%	65.0%
Yellow Time (s)	3.0	3.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
v/c Ratio	0.59	0.35
Control Delay	19.1	7.2
Queue Delay	0.0	0.0
Total Delay	19.1	7.2
Queue Length 50th (ft)	73	56
Queue Length 95th (ft)	118	84
Internal Link Dist (ft)	380	136
Turn Bay Length (ft)		
Base Capacity (vph)	906	1895
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.59	0.35

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 17 (28%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 5: N. 16th Street & Callowhill Street

HCM 2010 Signalized Intersection Summary
5: N. 16th Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	365	136	82	542	0	0	0	0
Number				3	8	18	5	2	12			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.95	1.00		1.00			
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln				0.0	185.3	189.0	187.1	180.1	0.0			
Lanes				0	2	0	0	2	0			
Cap, veh/h				0	679	249	254	1775	0			
Arrive On Green				0.00	0.27	0.27	0.57	0.57	0.00			
Sat Flow, veh/h				0	2547	932	448	3132	0			
Grp Volume(v), veh/h				0	283	255	349	322	0			
Grp Sat Flow(s),veh/h/ln				0	1853	1626	1779	1801	0			
Q Serve(g_s), s				0.0	7.9	8.2	6.4	5.7	0.0			
Cycle Q Clear(g_c), s				0.0	7.9	8.2	6.4	5.7	0.0			
Prop In Lane				0.00		0.57	0.25		0.00			
Lane Grp Cap(c), veh/h				0	494	434	1008	1021	0			
V/C Ratio(X)				0.00	0.57	0.59	0.35	0.32	0.00			
Avail Cap(c_a), veh/h				0	494	434	1008	1021	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	19.0	19.1	7.0	6.9	0.0			
Incr Delay (d2), s/veh				0.0	4.8	5.7	0.9	0.8	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln				0.0	6.1	5.7	4.1	3.9	0.0			
Lane Grp Delay (d), s/veh				0.0	23.8	24.9	8.0	7.7	0.0			
Lane Grp LOS					C	C	A	A				
Approach Vol, veh/h					538			671				
Approach Delay, s/veh					24.3			7.8				
Approach LOS					C			A				

Timer	
Assigned Phs	8	2
Phs Duration (G+Y+Rc), s	21.0	39.0
Change Period (Y+Rc), s	5.0	5.0
Max Green Setting (Gmax), s	16.0	34.0
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	15.2
HCM 2010 LOS	B

Notes

HCM 2010 Signals-Pedestrians
5: N. 16th Street & Callowhill Street

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	23.0	24.0	24.0	24.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	2	2	2
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	0	2	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	25	25	25
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	30.0	30.0	30.0	30.0
Pedestrian Compliance Code	Fair	Fair	Fair	Fair
Pedestrian Crosswalk Score	1.90	1.93	1.98	2.00
Pedestrian Crosswalk LOS	A	A	A	B

HCM 2010 Signals-Bicycles
5: N. 16th Street & Callowhill Street

Approach	EB	WB	NB	SB
Bicycle Flow Rate (bike/h)	0	0	0	0
Total Flow Rate (veh/h)	0	538	671	0
Effct. Green for Bike (s)	0.0	16.0	34.0	0.0
Cross Street Width (ft)	24.0	24.0	24.0	23.0
Through Lanes Number	0	2	2	0
Through Lane Width (ft)	12.0	12.0	12.0	12.0
Bicycle Lane Width (ft)	0.0	0.0	0.0	0.0
Paved Shoulder Width (ft)	0.0	0.0	0.0	0.0
Curb Is Present?	No	No	No	No
On Street Parking?	No	No	No	No
Bicycle Lane Capacity (bike/h)	0	533	1133	0
Bicycle Delay (s/bike)	0.0	16.1	5.6	0.0
Bicycle Compliance		Fair	Good	
Bicycle LOS Score	0.00	2.37	2.48	0.00
Bicycle LOS		B	B	

Lanes, Volumes, Timings
6: N. 15th Street & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	129	344	0	0	0	0	0	512	62
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		0%			0%			0%			-3%	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt											0.985	
Flt Protected					0.987							
Satd. Flow (prot)	0	0	0	0	3301	0	0	0	0	0	1540	0
Flt Permitted					0.987							
Satd. Flow (perm)	0	0	0	0	3301	0	0	0	0	0	1540	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		460			480			146			1070	
Travel Time (s)		12.5			13.1			4.0			29.2	
Confl. Peds. (#/hr)	57		40	40		57	34		31	31		34
Confl. Bikes (#/hr)						1						1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	6%	13%
Parking (#/hr)					0						0	
Adj. Flow (vph)	0	0	0	133	355	0	0	0	0	0	528	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	488	0	0	0	0	0	592	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.08	1.01	1.01	1.01	1.01	0.99	1.18	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization 54.5%		ICU Level of Service A	
Analysis Period (min) 15			

HCM 2010 AWSC
6: N. 15th Street & Callowhill Street

Intersection	
Intersection Delay, s/veh	22.8
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	0	129	344	0	0	0	0	0	512	62
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	6	13
Mvmt Flow	0	0	0	133	355	0	0	0	0	0	528	64
Number of Lanes	0	0	0	0	2	0	0	0	0	0	1	0

Approach	WB	SB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left		WB
Conflicting Lanes Left	0	2
Conflicting Approach Right	SB	
Conflicting Lanes Right	1	0
HCM Control Delay	13.8	30.3
HCM LOS	B	D

Lane	WBLn1	WBLn2	SBLn1
Vol Left, %	53%	0%	0%
Vol Thru, %	47%	100%	89%
Vol Right, %	0%	0%	11%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	244	229	574
LT Vol	115	229	512
Through Vol	0	0	62
RT Vol	129	0	0
Lane Flow Rate	251	236	592
Geometry Grp	7	7	2
Degree of Util (X)	0.452	0.408	0.847
Departure Headway (Hd)	6.477	6.208	5.15
Convergence, Y/N	Yes	Yes	Yes
Cap	560	584	692
Service Time	4.177	3.908	3.249
HCM Lane V/C Ratio	0.448	0.404	0.855
HCM Control Delay	14.4	13.1	30.3
HCM Lane LOS	B	B	D
HCM 95th-tile Q	2.3	2	9.6

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Timings
7: N. Broad Street & Callowhill Street

Lane Group	WBL	WBT	NBT	SBT
Lane Configurations				
Volume (vph)	60	274	792	788
Lane Group Flow (vph)	66	398	870	953
Turn Type	Perm	NA	NA	NA
Protected Phases		8	2	6
Permitted Phases	8			
Minimum Split (s)	33.0	33.0	57.0	57.0
Total Split (s)	33.0	33.0	57.0	57.0
Total Split (%)	36.7%	36.7%	63.3%	63.3%
Yellow Time (s)	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.0	5.0
Lead/Lag				
Lead-Lag Optimize?				
v/c Ratio	0.14	0.42	0.33	0.52
Control Delay	25.2	28.2	19.5	7.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.2	28.2	19.5	7.5
Queue Length 50th (ft)	30	104	172	66
Queue Length 95th (ft)	m66	152	211	78
Internal Link Dist (ft)		525	480	990
Turn Bay Length (ft)				
Base Capacity (vph)	464	957	2640	1845
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	0.42	0.33	0.52

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 49 (54%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: N. Broad Street & Callowhill Street

HCM 2010 Signalized Intersection Summary
7: N. Broad Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	60	274	88	0	792	0	0	788	79
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.94	1.00		1.00	1.00		0.90
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln				182.5	182.5	186.2	0.0	179.8	0.0	0.0	186.2	189.9
Lanes				1	2	0	0	3	0	0	2	0
Cap, veh/h				521	787	247	0	3117	0	0	1902	191
Arrive On Green				0.10	0.10	0.10	0.00	0.19	0.00	0.00	0.77	0.77
Sat Flow, veh/h				1738	2624	822	0	5395	0	0	3293	331
Grp Volume(v), veh/h				66	207	191	0	870	0	0	490	463
Grp Sat Flow(s),veh/h/ln				1738	1825	1621	0	1798	0	0	1862	1761
Q Serve(g_s), s				3.1	9.5	10.0	0.0	12.4	0.0	0.0	8.4	8.4
Cycle Q Clear(g_c), s				3.1	9.5	10.0	0.0	12.4	0.0	0.0	8.4	8.4
Prop In Lane				1.00		0.51	0.00		0.00	0.00		0.19
Lane Grp Cap(c), veh/h				521	548	486	0	3117	0	0	1076	1018
V/C Ratio(X)				0.13	0.38	0.39	0.00	0.28	0.00	0.00	0.46	0.46
Avail Cap(c_a), veh/h				521	548	486	0	3117	0	0	1076	1018
HCM Platoon Ratio				0.33	0.33	0.33	1.00	0.33	1.00	1.00	1.33	1.33
Upstream Filter(I)				1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				29.8	32.7	32.9	0.0	20.4	0.0	0.0	5.4	5.4
Incr Delay (d2), s/veh				0.5	2.0	2.4	0.0	0.2	0.0	0.0	1.4	1.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (85%), veh/ln				2.6	7.3	6.9	0.0	8.6	0.0	0.0	4.9	4.7
Lane Grp Delay (d), s/veh				30.3	34.7	35.2	0.0	20.6	0.0	0.0	6.8	6.8
Lane Grp LOS				C	C	D		C			A	A
Approach Vol, veh/h					464			870			953	
Approach Delay, s/veh					34.3			20.6			6.8	
Approach LOS					C			C			A	

Timer

Assigned Phs	8	2	6
Phs Duration (G+Y+Rc), s	33.0	57.0	57.0
Change Period (Y+Rc), s	6.0	5.0	5.0
Max Green Setting (Gmax), s	27.0	52.0	52.0
Max Q Clear Time (g_c+I1), s	0.0	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	17.6
HCM 2010 LOS	B

Notes

HCM 2010 Signals-Pedestrians
7: N. Broad Street & Callowhill Street

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	26.4	32.2	70.1	63.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	3	6	5
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	6	2	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	25	25	25
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	45.0	45.0	45.0	45.0
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	1.88	2.08	2.71	2.62
Pedestrian Crosswalk LOS	A	B	B	B

HCM 2010 Signals-Bicycles
7: N. Broad Street & Callowhill Street

Approach	EB	WB	NB	SB
Bicycle Flow Rate (bike/h)	0	0	0	0
Total Flow Rate (veh/h)	0	464	870	953
Effct. Green for Bike (s)	0.0	27.0	52.0	52.0
Cross Street Width (ft)	70.1	63.0	32.2	26.4
Through Lanes Number	0	2	3	2
Through Lane Width (ft)	12.0	11.0	10.0	10.0
Bicycle Lane Width (ft)	0.0	0.0	0.0	0.0
Paved Shoulder Width (ft)	0.0	0.0	0.0	0.0
Curb Is Present?	No	No	No	No
On Street Parking?	No	No	No	No
Bicycle Lane Capacity (bike/h)	0	600	1156	1156
Bicycle Delay (s/bike)	0.0	22.0	8.0	8.0
Bicycle Compliance		Fair	Good	Good
Bicycle LOS Score	0.00	3.12	2.96	3.18
Bicycle LOS		C	C	C

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	749	557	83	589	0	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	11	12	11	12	12	12	12
Grade (%)		0%			0%			-1%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.88	0.91	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor						0.94		0.96				
Frt						0.850						
Flt Protected								0.994				
Satd. Flow (prot)	0	0	0	0	3521	2680	0	4751	0	0	0	0
Flt Permitted								0.994				
Satd. Flow (perm)	0	0	0	0	3521	2528	0	4571	0	0	0	0
Right Turn on Red			Yes			No	Yes		Yes			Yes
Satd. Flow (RTOR)								32				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		430			460			170			344	
Travel Time (s)		11.7			12.5			4.6			9.4	
Confl. Peds. (#/hr)	69		33	33		69	311		16	16		311
Confl. Bikes (#/hr)						3			12			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	4%	5%	2%	2%	2%	2%
Adj. Flow (vph)	0	0	0	0	788	586	87	620	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	788	586	0	707	0	0	0	0
Turn Type					NA	Perm	Perm	NA				
Protected Phases					1			2				
Permitted Phases						1	2					
Minimum Split (s)					51.0	51.0	39.0	39.0				
Total Split (s)					51.0	51.0	39.0	39.0				
Total Split (%)					56.7%	56.7%	43.3%	43.3%				
Yellow Time (s)					3.5	3.5	3.5	3.5				
All-Red Time (s)					1.8	1.8	2.5	2.5				
Lost Time Adjust (s)					0.0	0.0		0.0				
Total Lost Time (s)					5.3	5.3		6.0				
Lead/Lag					Lead	Lead	Lag	Lag				
Lead-Lag Optimize?												
Act Effct Green (s)					45.7	45.7		33.0				
Actuated g/C Ratio					0.51	0.51		0.37				
v/c Ratio					0.44	0.46		0.42				
Control Delay					12.6	13.0		1.6				
Queue Delay					0.0	0.0		0.1				
Total Delay					12.6	13.0		1.8				
LOS					B	B		A				
Approach Delay					12.8			1.8				
Approach LOS					B			A				
Queue Length 50th (ft)					115	92		4				
Queue Length 95th (ft)					m127	m105		4				
Internal Link Dist (ft)		350			380			90			264	
Turn Bay Length (ft)												

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	7
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	1.8	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			

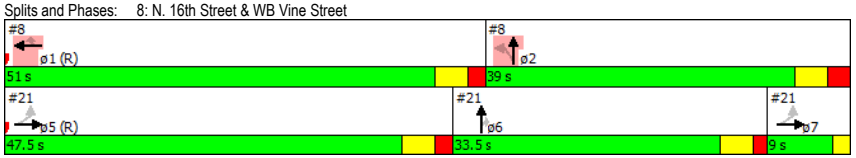
Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)					1787	1283		1696				
Starvation Cap Reductn					0	0		244				
Spillback Cap Reductn					0	0		0				
Storage Cap Reductn					0	0		0				
Reduced v/c Ratio					0.44	0.46		0.49				

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 9.0	Intersection LOS: A
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 8: N. 16th Street & WB Vine Street



Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	77	930	0	0	0	0	0	1200	345
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			2%	
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	0.86	0.86
Ped Bike Factor					1.00						0.99	
Frt											0.967	
Flt Protected					0.996							
Satd. Flow (prot)	0	0	0	0	4846	0	0	0	0	0	5837	0
Flt Permitted					0.996							
Satd. Flow (perm)	0	0	0	0	4846	0	0	0	0	0	5837	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					145						55	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		460			480			170			414	
Travel Time (s)		12.5			13.1			4.6			11.3	
Confl. Peds. (#/hr)	59		2	2		59	34		225	225		34
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Parking (#/hr)					0							
Adj. Flow (vph)	0	0	0	80	969	0	0	0	0	0	1250	359
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1049	0	0	0	0	0	1609	0
Turn Type				Perm	NA						NA	
Protected Phases					1						2	
Permitted Phases				1								
Minimum Split (s)				49.0	49.0						41.0	
Total Split (s)				49.0	49.0						41.0	
Total Split (%)				54.4%	54.4%						45.6%	
Yellow Time (s)				3.5	3.5						3.5	
All-Red Time (s)				1.5	1.5						11.5	
Lost Time Adjust (s)					0.0						0.0	
Total Lost Time (s)					5.0						15.0	
Lead/Lag				Lead	Lead						Lag	
Lead-Lag Optimize?												
Act Effct Green (s)					44.0						26.0	
Actuated g/C Ratio					0.49						0.29	
v/c Ratio					0.43						0.93	
Control Delay					4.6						41.4	
Queue Delay					0.0						0.1	
Total Delay					4.6						41.5	
LOS					A						D	
Approach Delay					4.6						41.5	
Approach LOS					A						D	
Queue Length 50th (ft)					17						250	
Queue Length 95th (ft)					33						#327	
Internal Link Dist (ft)		380			400			90			334	
Turn Bay Length (ft)												
Base Capacity (vph)					2443						1725	

Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	ø5	ø6
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Grade (%)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Peak Hour Factor		
Parking (#/hr)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	5	6
Permitted Phases		
Minimum Split (s)	49.0	41.0
Total Split (s)	49.0	41.0
Total Split (%)	54%	46%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.5	3.5
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lag
Lead-Lag Optimize?		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		

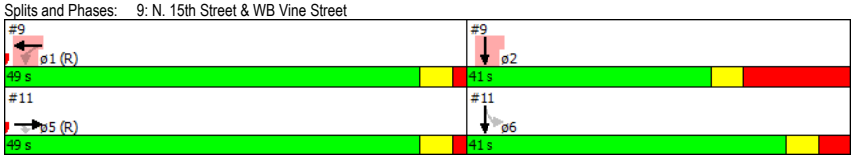
Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					1						4	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.43						0.93	

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 27.0	Intersection LOS: C
Intersection Capacity Utilization 77.3%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 9: N. 15th Street & WB Vine Street



Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	ø5	ø6
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	172	869	184	0	670	0	0	654	131
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	11	12	12	10	12	12	10	12
Grade (%)		0%			1%			-1%			1%	
Storage Length (ft)	0		0	0		0	0		0	100		0
Storage Lanes	0		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.86	0.86
Ped Bike Factor				1.00		0.92					0.95	
Frt						0.850					0.975	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	0	1751	3386	1552	0	4686	0	0	5391	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	0	1750	3386	1425	0	4686	0	0	5391	0
Right Turn on Red			Yes			No			Yes			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		480			605			170			560	
Travel Time (s)		13.1			16.5			4.6			15.3	
Confl. Peds. (#/hr)	89		1	1		89	328		150	150		328
Confl. Bikes (#/hr)						39			1			11
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	2%	2%	3%	2%	3%	2%	2%	3%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	2	0	0	5	0
Adj. Flow (vph)	0	0	0	181	915	194	0	705	0	0	688	138
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	181	915	194	0	705	0	0	826	0
Turn Type				Perm	NA	Perm		NA			NA	
Protected Phases					1 3!			2			6!	
Permitted Phases				1 3!		1 3						
Minimum Split (s)								34.0			34.0	
Total Split (s)								34.0			34.0	
Total Split (%)								37.8%			37.8%	
Yellow Time (s)								2.4			3.6	
All-Red Time (s)								3.0			5.4	
Lost Time Adjust (s)								0.0			0.0	
Total Lost Time (s)								5.4			9.0	
Lead/Lag								Lead			Lead	
Lead-Lag Optimize?												
Act Effct Green (s)				46.0	46.0	46.0		28.6			25.0	
Actuated g/C Ratio				0.51	0.51	0.51		0.32			0.28	
v/c Ratio				0.20	0.53	0.27		0.47			0.55	
Control Delay				23.0	27.0	24.2		6.1			15.3	
Queue Delay				0.0	0.0	0.0		2.2			0.2	
Total Delay				23.0	27.0	24.2		8.3			15.5	
LOS				C	C	C		A			B	
Approach Delay					26.0			8.3			15.5	
Approach LOS					C			A			B	

Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø7	ø8
Lane Configurations					
Volume (vph)					
Ideal Flow (vphpl)					
Lane Width (ft)					
Grade (%)					
Storage Length (ft)					
Storage Lanes					
Taper Length (ft)					
Lane Util. Factor					
Ped Bike Factor					
Frt					
Flt Protected					
Satd. Flow (prot)					
Flt Permitted					
Satd. Flow (perm)					
Right Turn on Red					
Satd. Flow (RTOR)					
Link Speed (mph)					
Link Distance (ft)					
Travel Time (s)					
Confl. Peds. (#/hr)					
Confl. Bikes (#/hr)					
Peak Hour Factor					
Heavy Vehicles (%)					
Bus Blockages (#/hr)					
Adj. Flow (vph)					
Shared Lane Traffic (%)					
Lane Group Flow (vph)					
Turn Type					
Protected Phases	1	3	5	7	8
Permitted Phases					
Minimum Split (s)	42.0	14.0	42.0	48.0	14.0
Total Split (s)	42.0	14.0	42.0	48.0	14.0
Total Split (%)	47%	16%	47%	53%	16%
Yellow Time (s)	3.6	2.0	3.6	3.6	3.6
All-Red Time (s)	6.4	0.0	6.4	2.4	2.4
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag		Lag			Lag
Lead-Lag Optimize?		Yes			
Act Effct Green (s)					
Actuated g/C Ratio					
v/c Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

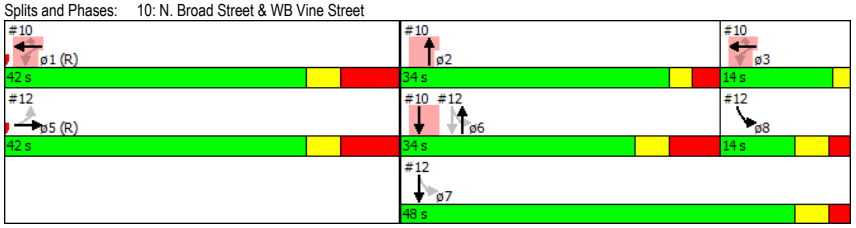
Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)				74	214	81		31			91	
Queue Length 95th (ft)				131	277	140		m31			109	
Internal Link Dist (ft)		400			525			90			480	
Turn Bay Length (ft)												
Base Capacity (vph)				894	1730	728		1489			1497	
Starvation Cap Reductn				0	0	0		617			0	
Spillback Cap Reductn				0	0	0		0			129	
Storage Cap Reductn				0	0	0		0			0	
Reduced v/c Ratio				0.20	0.53	0.27		0.81			0.60	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green
Natural Cycle: 90
Control Type: Pretimed
Maximum v/c Ratio: 1.02
Intersection Signal Delay: 18.5 Intersection LOS: B
Intersection Capacity Utilization 82.7% ICU Level of Service E
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.
! Phase conflict between lane groups.

Splits and Phases: 10: N. Broad Street & WB Vine Street



Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø7	ø8
Queue Length 50th (ft)					
Queue Length 95th (ft)					
Internal Link Dist (ft)					
Turn Bay Length (ft)					
Base Capacity (vph)					
Starvation Cap Reductn					
Spillback Cap Reductn					
Storage Cap Reductn					
Reduced v/c Ratio					

Intersection Summary

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1263	242	0	0	0	0	0	0	437	737	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		2%			0%			0%			4%	
Lane Util. Factor	1.00	0.86	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00
Ped Bike Factor			0.98							0.89		
Frt			0.850									
Flt Protected										0.950		
Satd. Flow (prot)	0	6310	2692	0	0	0	0	0	0	1725	4746	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	6310	2627	0	0	0	0	0	0	1533	4746	0
Right Turn on Red			No			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)										28		
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		82			480			430			170	
Travel Time (s)		2.2			13.1			11.7			4.6	
Confl. Peds. (#/hr)	1		19	19		1	19		140	140		19
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	4%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Adj. Flow (vph)	0	1316	252	0	0	0	0	0	0	455	768	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1316	252	0	0	0	0	0	0	455	768	0
Turn Type		NA	Perm							Perm	NA	
Protected Phases		5									6	
Permitted Phases			5							6		
Minimum Split (s)		49.0	49.0							41.0	41.0	
Total Split (s)		49.0	49.0							41.0	41.0	
Total Split (%)		54.4%	54.4%							45.6%	45.6%	
Yellow Time (s)		3.5	3.5							3.5	3.5	
All-Red Time (s)		1.5	1.5							3.5	3.5	
Lost Time Adjust (s)		0.0	0.0							0.0	0.0	
Total Lost Time (s)		5.0	5.0							7.0	7.0	
Lead/Lag		Lead	Lead							Lag	Lag	
Lead-Lag Optimize?												
Act Effct Green (s)		44.0	44.0							34.0	34.0	
Actuated g/C Ratio		0.49	0.49							0.38	0.38	
v/c Ratio		0.43	0.20							0.76	0.43	
Control Delay		11.9	13.6							8.3	2.6	
Queue Delay		0.0	0.0							2.3	1.0	
Total Delay		11.9	13.6							10.6	3.7	
LOS		B	B							B	A	
Approach Delay		12.2									6.2	
Approach LOS		B									A	
Queue Length 50th (ft)		100	45							8	11	
Queue Length 95th (ft)		141	73							m10	m12	
Internal Link Dist (ft)		2			400			350			90	
Turn Bay Length (ft)												

Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	ø1	ø2
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Grade (%)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Heavy Vehicles (%)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	2
Permitted Phases		
Minimum Split (s)	49.0	41.0
Total Split (s)	49.0	41.0
Total Split (%)	54%	46%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.5	11.5
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lag
Lead-Lag Optimize?		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		

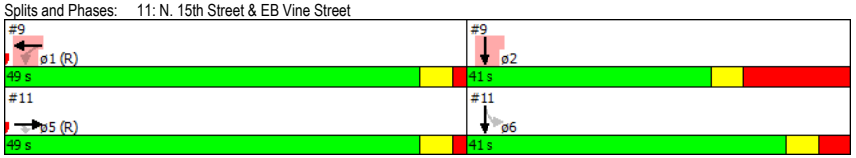
Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)		3084	1284							596	1792	
Starvation Cap Reductn		0	0							58	721	
Spillback Cap Reductn		0	0							0	0	
Storage Cap Reductn		0	0							0	0	
Reduced v/c Ratio		0.43	0.20							0.85	0.72	

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 9.6	Intersection LOS: A
Intersection Capacity Utilization 77.3%	ICU Level of Service D
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 11: N. 15th Street & EB Vine Street



Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	ø1	ø2
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	108	1463	64	0	0	0	0	567	426	211	682	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	10	12	12	10	12
Grade (%)		2%			0%			2%			2%	
Storage Length (ft)	0		250	0		0	0		0	45		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.81	0.81	0.81	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor		1.00						0.93		0.98		
Frt		0.994						0.936				
Flt Protected		0.997								0.950		
Satd. Flow (prot)	0	7324	0	0	0	0	0	3808	0	1743	4674	0
Flt Permitted		0.997								0.184		
Satd. Flow (perm)	0	7322	0	0	0	0	0	3808	0	332	4674	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		480			163			430			170	
Travel Time (s)		13.1			4.4			11.7			4.6	
Confl. Peds. (#/hr)	6		110	110		6	375		123	123		375
Confl. Bikes (#/hr)			7						16			20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	3%	2%	2%	2%	2%	3%	8%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	30	0	0	0	0
Adj. Flow (vph)	117	1590	70	0	0	0	0	616	463	229	741	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1777	0	0	0	0	0	1079	0	229	741	0
Turn Type	Perm	NA						NA		custom	NA	
Protected Phases		5						6		8	7	
Permitted Phases	5									6 7	6 7	
Minimum Split (s)	42.0	42.0						34.0		14.0	48.0	
Total Split (s)	42.0	42.0						34.0		14.0	48.0	
Total Split (%)	46.7%	46.7%						37.8%		15.6%	53.3%	
Yellow Time (s)	3.6	3.6						3.6		3.6	3.6	
All-Red Time (s)	6.4	6.4						5.4		2.4	2.4	
Lost Time Adjust (s)		0.0						0.0		0.0	0.0	
Total Lost Time (s)		10.0						9.0		6.0	6.0	
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?												
Act Effct Green (s)		32.0						25.0		42.0	42.0	
Actuated g/C Ratio		0.36						0.28		0.47	0.47	
v/c Ratio		0.68						1.45dr		0.82	0.34	
Control Delay		19.6						66.5		42.3	5.6	
Queue Delay		0.0						0.0		65.4	0.5	
Total Delay		19.6						66.5		107.7	6.0	
LOS		B						E		F	A	
Approach Delay		19.6						66.5			30.0	
Approach LOS		B						E			C	

Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Bus Blockages (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	3
Permitted Phases			
Minimum Split (s)	42.0	34.0	14.0
Total Split (s)	42.0	34.0	14.0
Total Split (%)	47%	38%	16%
Yellow Time (s)	3.6	2.4	2.0
All-Red Time (s)	6.4	3.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag		Lead	Lag
Lead-Lag Optimize?			Yes
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

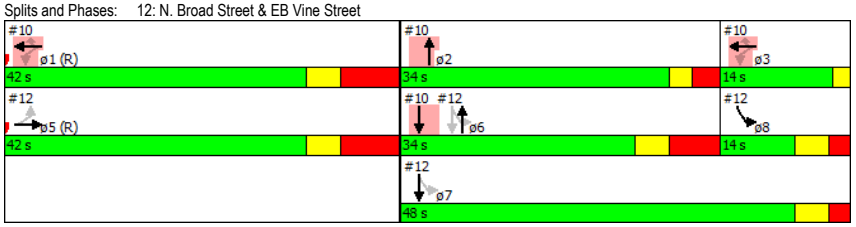
Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		142						~232		81	28	
Queue Length 95th (ft)		157						#328		#197	41	
Internal Link Dist (ft)		400			83			350			90	
Turn Bay Length (ft)										45		
Base Capacity (vph)		2603						1057		280	2181	
Starvation Cap Reductn		0						0		151	901	
Spillback Cap Reductn		0						0		0	0	
Storage Cap Reductn		0						0		0	0	
Reduced v/c Ratio		0.68						1.02		1.78	0.58	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green
Natural Cycle: 90
Control Type: Pretimed
Maximum v/c Ratio: 1.02
Intersection Signal Delay: 35.5 Intersection LOS: D
Intersection Capacity Utilization 82.7% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 12: N. Broad Street & EB Vine Street



Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

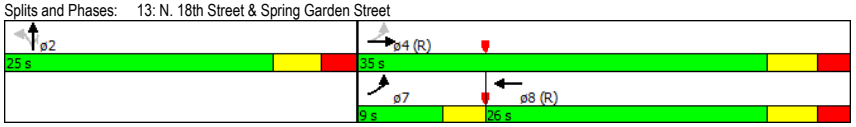
Timings
13: N. 18th Street & Spring Garden Street

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	65	604	856	207	175
Lane Group Flow (vph)	68	636	988	385	184
Turn Type	pm+pt	NA	NA	NA	Perm
Protected Phases	7	4	8	2	
Permitted Phases	4				2
Minimum Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?					
v/c Ratio	0.23	0.41	0.93	0.86	0.37
Control Delay	8.9	11.0	34.6	41.9	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	8.9	11.0	34.6	41.9	9.8
Queue Length 50th (ft)	11	72	211	129	19
Queue Length 95th (ft)	26	107	#310	#272	62
Internal Link Dist (ft)		476	350	810	
Turn Bay Length (ft)	145				150
Base Capacity (vph)	292	1562	1060	446	491
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	0.23	0.41	0.93	0.86	0.37

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 13: N. 18th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
13: N. 18th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	65	604	0	0	856	83	159	207	175	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.86	1.00		0.91			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln	185.3	185.3	0.0	0.0	185.3	189.0	189.0	177.1	177.9			
Lanes	1	2	0	0	2	0	0	1	1			
Cap, veh/h	353	1791	0	0	1091	105	288	258	435			
Arrive On Green	0.10	0.48	0.00	0.00	0.44	0.44	0.32	0.32	0.32			
Sat Flow, veh/h	1765	3706	0	0	3272	316	911	815	1375			
Grp Volume(v), veh/h	68	636	0	0	510	478	316	69	184			
Grp Sat Flow(s),veh/h/ln	1765	1853	0	0	1853	1735	1726	1771	1375			
Q Serve(g_s), s	1.3	6.4	0.0	0.0	14.5	14.5	9.2	0.0	6.3			
Cycle Q Clear(g_c), s	1.3	6.4	0.0	0.0	14.5	14.5	9.2	0.0	6.3			
Prop In Lane	1.00		0.00	0.00		0.18	0.53		1.00			
Lane Grp Cap(c), veh/h	353	1791	0	0	618	578	546	0	435			
V/C Ratio(X)	0.19	0.36	0.00	0.00	0.83	0.83	0.58	0.00	0.42			
Avail Cap(c_a), veh/h	353	1791	0	0	618	578	546	0	435			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	11.4	9.7	0.0	0.0	15.2	15.2	17.2	0.0	16.2			
Incr Delay (d2), s/veh	1.2	0.6	0.0	0.0	12.0	12.7	4.4	0.0	3.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln	1.0	4.3	0.0	0.0	10.2	9.8	6.4	0.0	4.0			
Lane Grp Delay (d), s/veh	12.6	10.2	0.0	0.0	27.2	27.9	21.6	0.0	19.2			
Lane Grp LOS	B	B			C	C	C		B			
Approach Vol, veh/h		704			988			569				
Approach Delay, s/veh		10.5			27.5			18.2				
Approach LOS		B			C			B				

Timer

Assigned Phs	7	4			8			2	
Phs Duration (G+Y+Rc), s	9.0	35.0			26.0			25.0	
Change Period (Y+Rc), s	3.0	6.0			6.0			6.0	
Max Green Setting (Gmax), s	6.0	29.0			20.0			19.0	
Max Q Clear Time (g_c+I1), s	0.0	0.0			0.0			0.0	
Green Ext Time (p_c), s	0.0	0.0			0.0			0.0	

Intersection Summary

HCM 2010 Ctrl Delay			19.9
HCM 2010 LOS			B

Notes

Timings
14: N. Broad Street & Spring Garden Street

Lane Group	EBT	WBT	NBT	SBL	SBT	SBR
Lane Configurations						
Volume (vph)	818	743	810	140	810	110
Lane Group Flow (vph)	871	841	877	143	827	112
Turn Type	NA	NA	NA	pm+pt	NA	Perm
Protected Phases	4	8	2	1	6	
Permitted Phases				6		6
Minimum Split (s)	33.0	33.0	35.0	9.0	35.0	35.0
Total Split (s)	40.0	40.0	41.0	9.0	50.0	50.0
Total Split (%)	44.4%	44.4%	45.6%	10.0%	55.6%	55.6%
Yellow Time (s)	3.6	3.6	3.4	3.0	3.4	3.4
All-Red Time (s)	2.4	2.4	2.6	0.0	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	3.0	6.0	6.0
Lead/Lag			Lag	Lead		
Lead-Lag Optimize?						
v/c Ratio	0.72	0.71	0.47	0.49	0.50	0.18
Control Delay	28.2	27.7	23.5	17.4	16.9	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.2	27.7	23.5	17.4	16.9	13.9
Queue Length 50th (ft)	219	209	102	40	160	34
Queue Length 95th (ft)	290	278	149	72	211	66
Internal Link Dist (ft)	400	550	990		290	
Turn Bay Length (ft)				170		
Base Capacity (vph)	1205	1192	1877	293	1655	621
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	0.72	0.71	0.47	0.49	0.50	0.18

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Pretimed

Splits and Phases: 14: N. Broad Street & Spring Garden Street

HCM 2010 Signalized Intersection Summary
14: N. Broad Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	818	35	0	743	81	0	810	49	140	810	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.86	1.00		0.92	1.00		0.89	0.98		0.86
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.3	189.0	0.0	185.3	189.0	0.0	185.3	189.0	186.2	184.4	186.2
Lanes	0	2	0	0	2	0	0	3	0	1	2	1
Cap, veh/h	0	1322	57	0	1228	134	0	2002	120	424	1803	667
Arrive On Green	0.00	0.38	0.38	0.00	0.38	0.38	0.00	0.78	0.78	0.07	0.49	0.49
Sat Flow, veh/h	0	3499	151	0	3251	356	0	5148	309	1774	3688	1364
Grp Volume(v), veh/h	0	442	429	0	432	409	0	594	283	143	827	112
Grp Sat Flow(s),veh/h/ln	0	1853	1797	0	1853	1754	0	1853	1751	1774	1844	1364
Q Serve(g_s), s	0.0	17.6	17.6	0.0	17.0	17.0	0.0	4.7	4.8	4.1	13.3	4.1
Cycle Q Clear(g_c), s	0.0	17.6	17.6	0.0	17.0	17.0	0.0	4.7	4.8	4.1	13.3	4.1
Prop In Lane	0.00		0.08	0.00		0.20	0.00		0.18	1.00		1.00
Lane Grp Cap(c), veh/h	0	700	679	0	700	663	0	1441	681	424	1803	667
V/C Ratio(X)	0.00	0.63	0.63	0.00	0.62	0.62	0.00	0.41	0.42	0.34	0.46	0.17
Avail Cap(c_a), veh/h	0	700	679	0	700	663	0	1441	681	424	1803	667
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	22.9	22.9	0.0	22.7	22.7	0.0	6.6	6.6	13.7	15.2	12.8
Incr Delay (d2), s/veh	0.0	4.3	4.4	0.0	4.0	4.3	0.0	0.9	1.9	2.1	0.8	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	11.8	11.5	0.0	11.3	10.9	0.0	3.0	3.2	3.4	8.5	2.5
Lane Grp Delay (d), s/veh	0.0	27.2	27.3	0.0	26.8	27.0	0.0	7.5	8.5	15.8	16.0	13.4
Lane Grp LOS		C	C		C	C		A	A	B	B	B
Approach Vol, veh/h		871			841			877			1082	
Approach Delay, s/veh		27.2			26.9			7.8			15.7	
Approach LOS		C			C			A			B	

Timer

Assigned Phs		4			8			2		1	6	
Phs Duration (G+Y+Rc), s		40.0			40.0			41.0		9.0	50.0	
Change Period (Y+Rc), s		6.0			6.0			6.0		3.0	6.0	
Max Green Setting (Gmax), s		34.0			34.0			35.0		6.0	44.0	
Max Q Clear Time (g_c+I1), s		0.0			0.0			0.0		0.0	0.0	
Green Ext Time (p_c), s		0.0			0.0			0.0		0.0	0.0	

Intersection Summary

HCM 2010 Ctrl Delay			19.1									
HCM 2010 LOS			B									

Notes

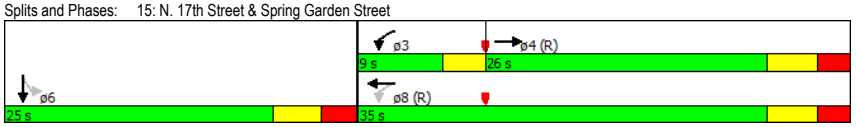
Timings
15: N. 17th Street & Spring Garden Street

Lane Group	EBT	WBL	WBT	SBT
Lane Configurations				
Volume (vph)	931	55	792	88
Lane Group Flow (vph)	1049	59	852	193
Turn Type	NA	pm+pt	NA	NA
Protected Phases	4	3	8	6
Permitted Phases		8		
Minimum Split (s)	26.0	9.0	35.0	25.0
Total Split (s)	26.0	9.0	35.0	25.0
Total Split (%)	43.3%	15.0%	58.3%	41.7%
Yellow Time (s)	3.6	3.0	3.6	3.4
All-Red Time (s)	2.4	0.0	2.4	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	3.0	6.0	6.0
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?				
v/c Ratio	0.98	0.20	0.55	0.39
Control Delay	41.0	11.6	16.1	15.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	41.0	11.6	16.1	15.5
Queue Length 50th (ft)	196	10	114	42
Queue Length 95th (ft)	#325	m12	m131	91
Internal Link Dist (ft)	350		350	290
Turn Bay Length (ft)		165		
Base Capacity (vph)	1065	291	1562	491
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	0.98	0.20	0.55	0.39

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed
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.

Splits and Phases: 15: N. 17th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
15: N. 17th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	931	45	55	792	0	0	0	0	36	88	55
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.81	0.98		1.00				1.00		0.91
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.3	189.0	185.3	185.3	0.0				189.0	184.4	189.0
Lanes	0	2	0	1	2	0				0	1	0
Cap, veh/h	0	1155	55	338	1791	0				168	141	267
Arrive On Green	0.00	0.44	0.44	0.20	0.97	0.00				0.32	0.32	0.32
Sat Flow, veh/h	0	3465	166	1765	3706	0				529	205	842
Grp Volume(v), veh/h	0	535	514	59	852	0				134	0	112
Grp Sat Flow(s),veh/h/ln	0	1853	1779	1765	1853	0				1818	0	1603
Q Serve(g_s), s	0.0	15.7	15.7	1.0	0.9	0.0				2.7	0.0	0.0
Cycle Q Clear(g_c), s	0.0	15.7	15.7	1.0	0.9	0.0				2.7	0.0	0.0
Prop In Lane	0.00		0.09	1.00		0.00				0.29		0.53
Lane Grp Cap(c), veh/h	0	618	593	338	1791	0				576	0	0
V/C Ratio(X)	0.00	0.87	0.87	0.17	0.48	0.00				0.23	0.00	0.00
Avail Cap(c_a), veh/h	0	618	593	338	1791	0				576	0	0
HCM Platoon Ratio	1.00	1.33	1.33	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	15.5	15.5	10.4	0.5	0.0				11.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	15.1	15.7	1.1	0.9	0.0				0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	11.4	11.1	0.8	0.7	0.0				2.2	0.0	0.0
Lane Grp Delay (d), s/veh	0.0	30.6	31.1	11.5	1.4	0.0				12.8	0.0	0.0
Lane Grp LOS		C	C	B	A					B		
Approach Vol, veh/h		1049			911						246	
Approach Delay, s/veh		30.9			2.1						7.0	
Approach LOS		C			A						A	

Timer

Assigned Phs		4		3	8						6	
Phs Duration (G+Y+Rc), s		26.0		9.0	35.0						25.0	
Change Period (Y+Rc), s		6.0		3.0	6.0						6.0	
Max Green Setting (Gmax), s		20.0		6.0	29.0						19.0	
Max Q Clear Time (g_c+I1), s		0.0		0.0	0.0						0.0	
Green Ext Time (p_c), s		0.0		0.0	0.0						0.0	

Intersection Summary

HCM 2010 Ctrl Delay		16.3	
HCM 2010 LOS		B	

Notes

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	192	581	76	0	0	0	0	335	29
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					0.99						1.00	
Frt					0.987						0.989	
Flt Protected					0.989							
Satd. Flow (prot)	0	0	0	0	3244	0	0	0	0	0	1644	0
Flt Permitted					0.989							
Satd. Flow (perm)	0	0	0	0	3243	0	0	0	0	0	1644	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					89						5	
Link Speed (mph)		30			25			30			25	
Link Distance (ft)		975			430			170			647	
Travel Time (s)		22.2			11.7			3.9			17.6	
Confl. Peds. (#/hr)	49		1	1		49	33		142	142		33
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Parking (#/hr)					0						0	
Adj. Flow (vph)	0	0	0	204	618	81	0	0	0	0	356	31
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	903	0	0	0	0	0	387	0
Turn Type				custom	NA						NA	
Protected Phases					1 3						2	
Permitted Phases				1								
Minimum Split (s)				47.5							33.5	
Total Split (s)				47.5							33.5	
Total Split (%)				52.8%							37.2%	
Yellow Time (s)				3.5							3.5	
All-Red Time (s)				1.8							1.5	
Lost Time Adjust (s)											0.0	
Total Lost Time (s)											5.0	
Lead/Lag				Lead							Lag	
Lead-Lag Optimize?												
Act Effct Green (s)					51.2						28.5	
Actuated g/C Ratio					0.57						0.32	
v/c Ratio					0.48						0.74	
Control Delay					3.1						37.1	
Queue Delay					0.0						5.1	
Total Delay					3.1						42.2	
LOS					A						D	
Approach Delay					3.1						42.2	
Approach LOS					A						D	
Queue Length 50th (ft)					21						192	
Queue Length 95th (ft)					59						#309	
Internal Link Dist (ft)		895			350			90			567	
Turn Bay Length (ft)												
Base Capacity (vph)					1883						524	
Starvation Cap Reductn					29						0	
Spillback Cap Reductn					39						85	

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	ø3	ø5	ø6
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	5	6
Permitted Phases			
Minimum Split (s)	9.0	51.0	39.0
Total Split (s)	9.0	51.0	39.0
Total Split (%)	10%	57%	43%
Yellow Time (s)	2.0	3.5	3.5
All-Red Time (s)	0.0	1.8	2.5
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag		Lead	Lag
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			

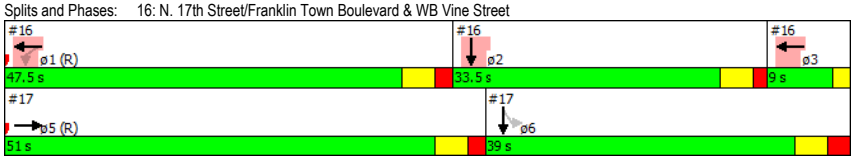
Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.49						0.88	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 14.9	Intersection LOS: B
Intersection Capacity Utilization 67.5%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 16: N. 17th Street/Franklin Town Boulevard & WB Vine Street



Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	ø3	ø5	ø6
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	497	49	0	0	0	0	0	0	156	440	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor		1.00									0.96	
Frt		0.986										
Flt Protected											0.987	
Satd. Flow (prot)	0	3288	0	0	0	0	0	0	0	0	3475	0
Flt Permitted											0.987	
Satd. Flow (perm)	0	3288	0	0	0	0	0	0	0	0	3323	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)		17									62	
Link Speed (mph)		30			25			30			30	
Link Distance (ft)		975			430			430			170	
Travel Time (s)		22.2			11.7			9.8			3.9	
Confl. Peds. (#/hr)	2		32	32		2	46		155	155		46
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Parking (#/hr)		0										
Adj. Flow (vph)	0	523	52	0	0	0	0	0	0	164	463	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	575	0	0	0	0	0	0	0	0	627	0
Turn Type		NA								Perm	NA	
Protected Phases		5									6	
Permitted Phases										6		
Minimum Split (s)		51.0								39.0	39.0	
Total Split (s)		51.0								39.0	39.0	
Total Split (%)		56.7%								43.3%	43.3%	
Yellow Time (s)		3.5								3.5	3.5	
All-Red Time (s)		1.8								2.5	2.5	
Lost Time Adjust (s)		0.0									0.0	
Total Lost Time (s)		5.3									6.0	
Lead/Lag		Lead								Lag	Lag	
Lead-Lag Optimize?												
Act Effct Green (s)		45.7									33.0	
Actuated g/C Ratio		0.51									0.37	
v/c Ratio		0.34									0.50	
Control Delay		13.5									12.0	
Queue Delay		0.0									7.9	
Total Delay		13.5									19.9	
LOS		B									B	
Approach Delay		13.5									19.9	
Approach LOS		B									B	
Queue Length 50th (ft)		94									66	
Queue Length 95th (ft)		131									99	
Internal Link Dist (ft)		895			350			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		1677									1257	
Starvation Cap Reductn		0									582	
Spillback Cap Reductn		0									0	

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	3
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	1.8	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			

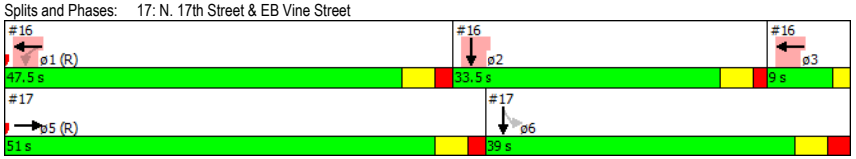
Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.34									0.93	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 16.8	Intersection LOS: B
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: N. 17th Street & EB Vine Street



Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

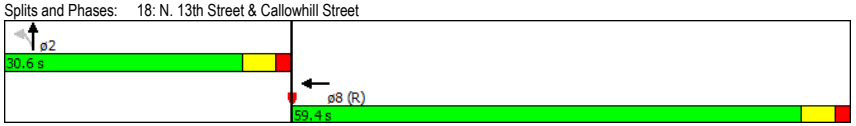
Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Timings
18: N. 13th Street & Callowhill Street

Lane Group	WBT	NBT
Lane Configurations		
Volume (vph)	284	239
Lane Group Flow (vph)	383	292
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Minimum Split (s)	59.4	30.6
Total Split (s)	59.4	30.6
Total Split (%)	66.0%	34.0%
Yellow Time (s)	3.6	3.6
All-Red Time (s)	1.8	1.8
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.4	5.4
Lead/Lag		
Lead-Lag Optimize?		
v/c Ratio	0.21	0.65
Control Delay	7.4	23.8
Queue Delay	0.0	0.0
Total Delay	7.4	23.8
Queue Length 50th (ft)	41	57
Queue Length 95th (ft)	62	134
Internal Link Dist (ft)	195	480
Turn Bay Length (ft)		
Base Capacity (vph)	1811	450
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.21	0.65

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 90
Control Type: Pretimed

Splits and Phases: 18: N. 13th Street & Callowhill Street



HCM 2010 Signalized Intersection Summary
18: N. 13th Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	284	60	23	239	0	0	0	0
Number				3	8	18	5	2	12			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.90	1.00		1.00			
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln				0.0	185.3	189.0	189.0	185.0	0.0			
Lanes				0	2	0	0	1	0			
Cap, veh/h				0	1749	362	46	470	0			
Arrive On Green				0.00	0.60	0.60	0.28	0.28	0.00			
Sat Flow, veh/h				0	2915	603	164	1678	0			
Grp Volume(v), veh/h				0	198	185	292	0	0			
Grp Sat Flow(s),veh/h/ln				0	1853	1665	1842	1850	0			
Q Serve(g_s), s				0.0	4.3	4.5	12.2	0.0	0.0			
Cycle Q Clear(g_c), s				0.0	4.3	4.5	12.2	0.0	0.0			
Prop In Lane				0.00		0.36	0.09		0.00			
Lane Grp Cap(c), veh/h				0	1112	999	516	0	0			
V/C Ratio(X)				0.00	0.18	0.19	0.57	0.00	0.00			
Avail Cap(c_a), veh/h				0	1112	999	516	0	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	8.1	8.1	27.7	0.0	0.0			
Incr Delay (d2), s/veh				0.0	0.4	0.4	4.5	0.0	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln				0.0	3.3	3.1	8.7	0.0	0.0			
Lane Grp Delay (d), s/veh				0.0	8.4	8.5	32.2	0.0	0.0			
Lane Grp LOS					A	A	C					
Approach Vol, veh/h					383			292				
Approach Delay, s/veh					8.5			32.2				
Approach LOS					A			C				

Timer	
Assigned Phs	8	2
Phs Duration (G+Y+Rc), s	59.4	30.6
Change Period (Y+Rc), s	5.4	5.4
Max Green Setting (Gmax), s	54.0	25.2
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	18.7
HCM 2010 LOS	B

Notes

Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	1035	73	119	243	0	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	11	12	11	10	12	12	10	12
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00		0.96					
Frt					0.990							
Flt Protected							0.950					
Satd. Flow (prot)	0	0	0	0	4663	0	1702	1729	0	0	0	0
Flt Permitted							0.950					
Satd. Flow (perm)	0	0	0	0	4663	0	1631	1729	0	0	0	0
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Satd. Flow (RTOR)					18		52					
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		605			275			170			560	
Travel Time (s)		16.5			6.3			3.9			12.7	
Confl. Peds. (#/hr)	36		5	5		36	51		81	81		51
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Parking (#/hr)					0							
Adj. Flow (vph)	0	0	0	0	1137	80	131	267	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1217	0	131	267	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					1			2				
Permitted Phases							2					
Minimum Split (s)					51.0		39.0	39.0				
Total Split (s)					51.0		39.0	39.0				
Total Split (%)					56.7%		43.3%	43.3%				
Yellow Time (s)					3.7		3.5	3.5				
All-Red Time (s)					1.8		2.5	2.5				
Lost Time Adjust (s)					0.0		0.0	0.0				
Total Lost Time (s)					5.5		6.0	6.0				
Lead/Lag					Lead		Lag	Lag				
Lead-Lag Optimize?					Yes		Yes	Yes				
Act Effct Green (s)					45.5		33.0	33.0				
Actuated g/C Ratio					0.51		0.37	0.37				
v/c Ratio					0.51		0.21	0.42				
Control Delay					15.6		3.0	11.1				
Queue Delay					0.0		1.3	2.1				
Total Delay					15.6		4.3	13.1				
LOS					B		A	B				
Approach Delay					15.6			10.2				
Approach LOS					B			B				
Queue Length 50th (ft)					158		2	41				
Queue Length 95th (ft)					197		12	60				
Internal Link Dist (ft)		525			195			90			480	
Turn Bay Length (ft)												
Base Capacity (vph)					2366		630	633				
Starvation Cap Reductn					0		339	234				

Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

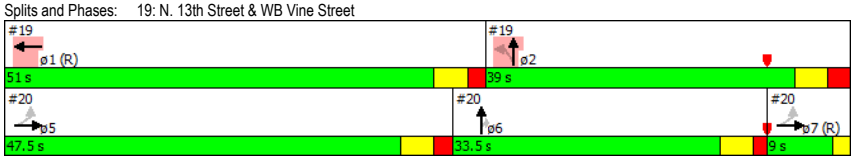
Lane Group	ø5	ø6	ø7
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	7
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	2.0	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.51		0.45	0.67				

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 7:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 14.3	Intersection LOS: B
Intersection Capacity Utilization 110.0%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 19: N. 13th Street & WB Vine Street



Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	74	600	0	0	0	0	0	255	102	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	11	9	12	12	12
Lane Util. Factor	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.92			
Frt									0.850			
Flt Protected		0.995										
Satd. Flow (prot)	0	5033	0	0	0	0	0	1612	1417	0	0	0
Flt Permitted		0.995										
Satd. Flow (perm)	0	5033	0	0	0	0	0	1612	1302	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		39							116			
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		442			275			430			170	
Travel Time (s)		12.1			6.3			9.8			3.9	
Confl. Peds. (#/hr)	2		34	34		2	111		75	75		111
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Parking (#/hr)								0				
Adj. Flow (vph)	84	682	0	0	0	0	0	290	116	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	766	0	0	0	0	0	290	116	0	0	0
Turn Type	Perm	NA						NA	Perm			
Protected Phases		5 7						6				
Permitted Phases	5 7								6			
Minimum Split (s)								33.5	33.5			
Total Split (s)								33.5	33.5			
Total Split (%)								37.2%	37.2%			
Yellow Time (s)								3.5	3.5			
All-Red Time (s)								1.5	1.5			
Lost Time Adjust (s)								0.0	0.0			
Total Lost Time (s)								5.0	5.0			
Lead/Lag								Lag	Lag			
Lead-Lag Optimize?								Yes	Yes			
Act Effct Green (s)		51.0						28.5	28.5			
Actuated g/C Ratio		0.57						0.32	0.32			
v/c Ratio		0.27						0.57	0.24			
Control Delay		5.2						30.9	5.9			
Queue Delay		0.0						0.2	0.0			
Total Delay		5.2						31.1	5.9			
LOS		A						C	A			
Approach Delay		5.2						23.9				
Approach LOS		A						C				
Queue Length 50th (ft)		41						136	0			
Queue Length 95th (ft)		m47						213	35			
Internal Link Dist (ft)		362			195			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		2868						510	491			
Starvation Cap Reductn		0						0	0			

Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

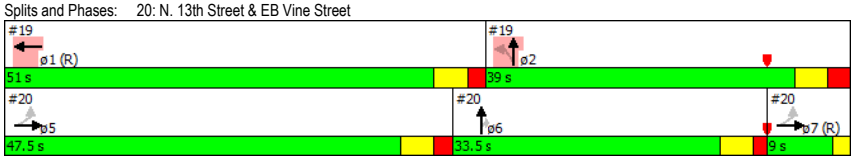
Lane Group	ø1	ø2	ø5	ø7
Lane Configurations				
Volume (vph)				
Ideal Flow (vphpl)				
Lane Width (ft)				
Lane Util. Factor				
Ped Bike Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Confl. Peds. (#/hr)				
Peak Hour Factor				
Parking (#/hr)				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	2	5	7
Permitted Phases				
Minimum Split (s)	51.0	39.0	47.5	9.0
Total Split (s)	51.0	39.0	47.5	9.0
Total Split (%)	57%	43%	53%	10%
Yellow Time (s)	3.7	3.5	3.5	2.0
All-Red Time (s)	1.8	2.5	2.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0						20	0			
Storage Cap Reductn		0						0	0			
Reduced v/c Ratio		0.27						0.59	0.24			

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 7:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 11.7	Intersection LOS: B
Intersection Capacity Utilization 103.5%	ICU Level of Service G
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 20: N. 13th Street & EB Vine Street



Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	660	0	0	0	0	0	653	440	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.97			
Frt									0.850			
Flt Protected		0.998										
Satd. Flow (prot)	0	3514	0	0	0	0	0	5009	1560	0	0	0
Flt Permitted		0.998										
Satd. Flow (perm)	0	3513	0	0	0	0	0	5009	1516	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24							216			
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		430			378			430			170	
Travel Time (s)		11.7			10.3			11.7			4.6	
Confl. Peds. (#/hr)	1		8	8		1	200		10	10		200
Confl. Bikes (#/hr)									10			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	3%	2%	2%	2%
Adj. Flow (vph)	27	688	0	0	0	0	0	680	458	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	715	0	0	0	0	0	680	458	0	0	0
Turn Type	Perm	NA						NA	Perm			
Protected Phases		5 7						6				
Permitted Phases	5 7								6			
Minimum Split (s)								33.5	33.5			
Total Split (s)								33.5	33.5			
Total Split (%)								37.2%	37.2%			
Yellow Time (s)								3.5	3.5			
All-Red Time (s)								1.5	1.5			
Lost Time Adjust (s)								0.0	0.0			
Total Lost Time (s)								5.0	5.0			
Lead/Lag								Lag	Lag			
Lead-Lag Optimize?												
Act Effct Green (s)		51.2						28.5	28.5			
Actuated g/C Ratio		0.57						0.32	0.32			
v/c Ratio		0.36						0.43	0.73			
Control Delay		7.6						25.3	22.0			
Queue Delay		0.0						0.0	0.0			
Total Delay		7.6						25.3	22.0			
LOS		A						C	C			
Approach Delay		7.6						24.0				
Approach LOS		A						C				
Queue Length 50th (ft)		77						110	121			
Queue Length 95th (ft)		90						145	242			
Internal Link Dist (ft)		350			298			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		2008						1586	627			
Starvation Cap Reductn		0						0	0			

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

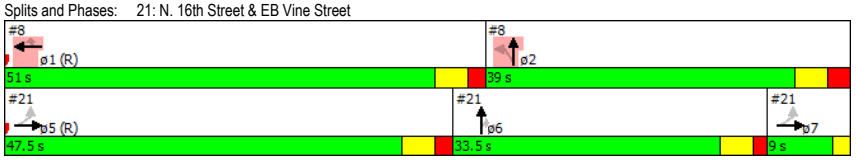
Lane Group	ø1	ø2	ø5	ø7
Lane Configurations				
Volume (vph)				
Ideal Flow (vphpl)				
Lane Util. Factor				
Ped Bike Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Confl. Peds. (#/hr)				
Confl. Bikes (#/hr)				
Peak Hour Factor				
Heavy Vehicles (%)				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	2	5	7
Permitted Phases				
Minimum Split (s)	51.0	39.0	47.5	9.0
Total Split (s)	51.0	39.0	47.5	9.0
Total Split (%)	57%	43%	53%	10%
Yellow Time (s)	3.5	3.5	3.5	2.0
All-Red Time (s)	1.8	2.5	1.8	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lead	
Lead-Lag Optimize?				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0						0	0			
Storage Cap Reductn		0						0	0			
Reduced v/c Ratio		0.36						0.43	0.73			

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 17.7	Intersection LOS: B
Intersection Capacity Utilization 72.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 21: N. 16th Street & EB Vine Street



Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 - Report

FRIDAY EVENING (7-10 PM)
PEAK HOUR TIME PERIOD

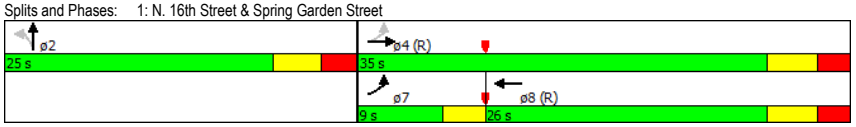
Timings
1: N. 16th Street & Spring Garden Street

Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Volume (vph)	64	461	421	188
Lane Group Flow (vph)	67	485	505	324
Turn Type	pm+pt	NA	NA	NA
Protected Phases	7	4	8	2
Permitted Phases	4			
Minimum Split (s)	9.0	35.0	26.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?				
v/c Ratio	0.17	0.31	0.49	0.32
Control Delay	6.0	9.6	28.0	16.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.0	9.6	28.0	16.5
Queue Length 50th (ft)	6	29	93	52
Queue Length 95th (ft)	m16	74	135	86
Internal Link Dist (ft)		350	380	990
Turn Bay Length (ft)	140			
Base Capacity (vph)	403	1550	1031	1014
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	0.17	0.31	0.49	0.32

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: N. 16th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
1: N. 16th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	64	461	0	0	421	59	51	188	68	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.94	1.00		0.95			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln	185.3	185.3	0.0	0.0	183.4	187.1	186.2	180.5	186.2			
Lanes	1	2	0	0	2	0	0	2	0			
Cap, veh/h	476	1791	0	0	991	137	175	656	247			
Arrive On Green	0.20	0.97	0.00	0.00	0.11	0.11	0.32	0.32	0.32			
Sat Flow, veh/h	1765	3706	0	0	2972	412	552	2071	779			
Grp Volume(v), veh/h	67	485	0	0	272	233	174	0	150			
Grp Sat Flow(s),veh/h/ln	1765	1853	0	0	1834	1549	1778	0	1624			
Q Serve(g_s), s	1.2	0.4	0.0	0.0	8.3	8.5	4.4	0.0	4.2			
Cycle Q Clear(g_c), s	1.2	0.4	0.0	0.0	8.3	8.5	4.4	0.0	4.2			
Prop In Lane	1.00		0.00	0.00		0.27	0.31		0.48			
Lane Grp Cap(c), veh/h	476	1791	0	0	611	516	563	0	514			
V/C Ratio(X)	0.14	0.27	0.00	0.00	0.44	0.45	0.31	0.00	0.29			
Avail Cap(c_a), veh/h	476	1791	0	0	611	516	563	0	514			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	8.7	0.5	0.0	0.0	21.5	21.6	15.5	0.0	15.4			
Incr Delay (d2), s/veh	0.6	0.4	0.0	0.0	2.3	2.8	1.4	0.0	1.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln	0.9	0.4	0.0	0.0	6.6	5.9	3.5	0.0	3.1			
Lane Grp Delay (d), s/veh	9.3	0.9	0.0	0.0	23.8	24.4	16.9	0.0	16.9			
Lane Grp LOS	A	A			C	C	B		B			
Approach Vol, veh/h		552			505			324				
Approach Delay, s/veh		1.9			24.1			16.9				
Approach LOS		A			C			B				

Timer

Assigned Phs	7	4			8			2				
Phs Duration (G+Y+Rc), s	9.0	35.0			26.0			25.0				
Change Period (Y+Rc), s	3.0	6.0			6.0			6.0				
Max Green Setting (Gmax), s	6.0	29.0			20.0			19.0				
Max Q Clear Time (g_c+I1), s	0.0	0.0			0.0			0.0				
Green Ext Time (p_c), s	0.0	0.0			0.0			0.0				

Intersection Summary

HCM 2010 Ctrl Delay			13.5									
HCM 2010 LOS			B									

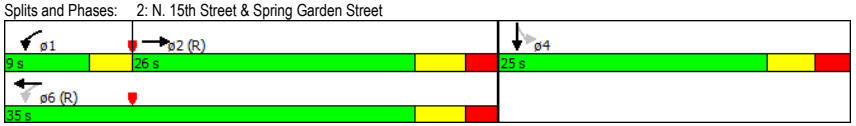
Notes

Timings
2: N. 15th Street & Spring Garden Street

Lane Group	EBT	WBL	WBT	SBL	SBT
Lane Configurations					
Volume (vph)	473	42	447	36	132
Lane Group Flow (vph)	578	47	497	40	237
Turn Type	NA	pm+pt	NA	Perm	NA
Protected Phases	2	1	6		4
Permitted Phases		6		4	
Minimum Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (%)	43.3%	15.0%	58.3%	41.7%	41.7%
Yellow Time (s)	3.6	3.0	3.6	3.4	3.4
All-Red Time (s)	2.4	0.0	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	3.0	6.0	6.0	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?					
v/c Ratio	0.53	0.13	0.32	0.08	0.52
Control Delay	10.6	7.7	10.2	15.1	21.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.6	7.7	10.2	15.1	21.9
Queue Length 50th (ft)	50	7	53	10	69
Queue Length 95th (ft)	99	20	82	29	131
Internal Link Dist (ft)	380		400		290
Turn Bay Length (ft)		115		100	
Base Capacity (vph)	1082	357	1534	489	452
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	0.53	0.13	0.32	0.08	0.52

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 15 (25%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 2: N. 15th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
2: N. 15th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	473	47	42	447	0	0	0	0	36	132	81
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.87	0.95		1.00				1.00		0.94
Parking Bus Adj	1.00	1.00	0.90	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	183.7	189.0	183.4	183.4	0.0				177.9	185.3	189.0
Lanes	0	2	0	1	2	0				1	1	0
Cap, veh/h	0	1026	101	501	1773	0				536	332	203
Arrive On Green	0.00	0.67	0.67	0.10	0.48	0.00				0.32	0.32	0.32
Sat Flow, veh/h	0	3078	302	1747	3669	0				1694	1048	642
Grp Volume(v), veh/h	0	312	266	47	497	0				40	0	237
Grp Sat Flow(s),veh/h/ln	0	1837	1544	1747	1834	0				1694	1853	1690
Q Serve(g_s), s	0.0	5.2	5.2	0.9	4.9	0.0				1.0	0.0	6.7
Cycle Q Clear(g_c), s	0.0	5.2	5.2	0.9	4.9	0.0				1.0	0.0	6.7
Prop In Lane	0.00		0.20	1.00		0.00				1.00		0.38
Lane Grp Cap(c), veh/h	0	612	515	501	1773	0				536	0	535
V/C Ratio(X)	0.00	0.51	0.52	0.09	0.28	0.00				0.07	0.00	0.44
Avail Cap(c_a), veh/h	0	612	515	501	1773	0				536	0	535
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	7.5	7.5	9.2	9.3	0.0				14.3	0.0	16.3
Incr Delay (d2), s/veh	0.0	3.0	3.7	0.4	0.4	0.0				0.3	0.0	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	3.6	3.3	0.7	3.4	0.0				0.8	0.0	4.8
Lane Grp Delay (d), s/veh	0.0	10.5	11.2	9.6	9.7	0.0				14.6	0.0	18.9
Lane Grp LOS		B	B	A	A					B		B
Approach Vol, veh/h		578			544						277	
Approach Delay, s/veh		10.9			9.7						18.3	
Approach LOS		B			A						B	

Timer												
Assigned Phs		2		1	6						4	
Phs Duration (G+Y+Rc), s		26.0		9.0	35.0						25.0	
Change Period (Y+Rc), s		6.0		3.0	6.0						6.0	
Max Green Setting (Gmax), s		20.0		6.0	29.0						19.0	
Max Q Clear Time (g_c+I1), s		0.0		0.0	0.0						0.0	
Green Ext Time (p_c), s		0.0		0.0	0.0						0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	11.9
HCM 2010 LOS	B

Notes

Lanes, Volumes, Timings
3: Franklin Town Boulevard & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	46	108	23	97	53	16	36	6	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	11	12	12	12	12	12	16	12	12	12	12
Grade (%)		-1%			2%			3%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.947			0.959			0.987				
Flt Protected		0.979			0.993			0.986				
Satd. Flow (prot)	0	1669	0	0	1572	0	0	1812	0	0	0	0
Flt Permitted		0.979			0.993			0.986				
Satd. Flow (perm)	0	1669	0	0	1572	0	0	1812	0	0	0	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		646			325			647			208	
Travel Time (s)		17.6			8.9			17.6			5.7	
Confl. Peds. (#/hr)	39		76	76		39	74		64	64		74
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Parking (#/hr)					0			0				
Adj. Flow (vph)	125	48	113	24	101	55	17	38	6	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	285	0	0	180	0	0	61	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.05	1.00	1.02	1.17	1.02	1.03	1.00	1.03	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization 53.4%		ICU Level of Service A	
Analysis Period (min) 15			

HCM 2010 AWSC
3: Franklin Town Boulevard & Callowhill Street

Intersection	
Intersection Delay, s/veh	8.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	120	46	108	23	97	53	16	36	6	0	0	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	125	48	112	24	101	55	17	38	6	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.1	8.3	8.4
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	28%	44%	13%
Vol Thru, %	62%	17%	56%
Vol Right, %	10%	39%	31%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	58	274	173
LT Vol	36	46	97
Through Vol	6	108	53
RT Vol	16	120	23
Lane Flow Rate	60	285	180
Geometry Grp	1	1	1
Degree of Util (X)	0.082	0.319	0.211
Departure Headway (Hd)	4.906	4.129	4.208
Convergence, Y/N	Yes	Yes	Yes
Cap	733	876	856
Service Time	2.916	2.129	2.215
HCM Lane V/C Ratio	0.082	0.325	0.21
HCM Control Delay	8.4	9.1	8.3
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.3	1.4	0.8

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
4: N. 17th Street & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	43	56	110	0	0	0	0	0	129	30
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	11	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			-4%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.865								0.975	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	1443	1693	1659	0	0	0	0	0	1571	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	1443	1693	1659	0	0	0	0	0	1571	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		325			430			230			1070	
Travel Time (s)		8.9			11.7			6.3			29.2	
Confl. Peds. (#/hr)	24		54	54		24	41		6	6		41
Confl. Bikes (#/hr)			3			1						7
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	5	0
Parking (#/hr)			0		0						0	
Adj. Flow (vph)	0	0	49	64	125	0	0	0	0	0	147	34
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	49	64	125	0	0	0	0	0	181	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.15	1.06	1.16	1.01	1.01	1.01	1.01	0.98	1.20	0.98
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	CBD
Control Type: Unsignalized	
Intersection Capacity Utilization 50.0%	ICU Level of Service A
Analysis Period (min) 15	

HCM 2010 AWSC
4: N. 17th Street & Callowhill Street

Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	43	56	110	0	0	0	0	0	129	30
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	49	64	125	0	0	0	0	0	147	34
Number of Lanes	0	0	1	1	1	0	0	0	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.3	8.8	8.7
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	100%	0%	0%
Vol Thru, %	0%	0%	100%	81%
Vol Right, %	100%	0%	0%	19%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	43	56	110	159
LT Vol	0	0	110	129
Through Vol	43	0	0	30
RT Vol	0	56	0	0
Lane Flow Rate	49	64	125	181
Geometry Grp	5	7	7	2
Degree of Util (X)	0.055	0.097	0.173	0.221
Departure Headway (Hd)	4.077	5.492	4.989	4.394
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	879	654	720	820
Service Time	2.102	3.213	2.711	2.406
HCM Lane V/C Ratio	0.056	0.098	0.174	0.221
HCM Control Delay	7.3	8.8	8.8	8.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.3	0.6	0.8

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Timings
5: N. 16th Street & Callowhill Street

Lane Group	WBT	NBT
Lane Configurations		
Volume (vph)	131	269
Lane Group Flow (vph)	210	379
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Minimum Split (s)	21.0	39.0
Total Split (s)	21.0	39.0
Total Split (%)	35.0%	65.0%
Yellow Time (s)	3.0	3.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
v/c Ratio	0.24	0.20
Control Delay	13.8	5.8
Queue Delay	0.0	0.0
Total Delay	13.8	5.8
Queue Length 50th (ft)	23	26
Queue Length 95th (ft)	41	39
Internal Link Dist (ft)	380	136
Turn Bay Length (ft)		
Base Capacity (vph)	887	1924
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.24	0.20

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 17 (28%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 5: N. 16th Street & Callowhill Street

HCM 2010 Signalized Intersection Summary
5: N. 16th Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	131	41	42	269	0	0	0	0
Number				3	8	18	5	2	12			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.97	1.00		1.00			
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln				0.0	185.3	189.0	187.1	180.4	0.0			
Lanes				0	2	0	0	2	0			
Cap, veh/h				0	724	217	260	1771	0			
Arrive On Green				0.00	0.27	0.27	0.57	0.57	0.00			
Sat Flow, veh/h				0	2715	815	459	3125	0			
Grp Volume(v), veh/h				0	107	103	198	181	0			
Grp Sat Flow(s),veh/h/ln				0	1853	1677	1781	1804	0			
Q Serve(g_s), s				0.0	2.7	2.9	3.2	2.9	0.0			
Cycle Q Clear(g_c), s				0.0	2.7	2.9	3.2	2.9	0.0			
Prop In Lane				0.00		0.49	0.26		0.00			
Lane Grp Cap(c), veh/h				0	494	447	1009	1022	0			
V/C Ratio(X)				0.00	0.22	0.23	0.20	0.18	0.00			
Avail Cap(c_a), veh/h				0	494	447	1009	1022	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	17.1	17.2	6.3	6.3	0.0			
Incr Delay (d2), s/veh				0.0	1.0	1.2	0.4	0.4	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln				0.0	2.3	2.3	2.3	2.1	0.0			
Lane Grp Delay (d), s/veh				0.0	18.1	18.4	6.8	6.6	0.0			
Lane Grp LOS					B	B	A	A				
Approach Vol, veh/h					210			379				
Approach Delay, s/veh					18.3			6.7				
Approach LOS					B			A				

Timer	
Assigned Phs	8	2
Phs Duration (G+Y+Rc), s	21.0	39.0
Change Period (Y+Rc), s	5.0	5.0
Max Green Setting (Gmax), s	16.0	34.0
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	10.8
HCM 2010 LOS	B

Notes

HCM 2010 Signals-Pedestrians
5: N. 16th Street & Callowhill Street

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	23.0	24.0	24.0	24.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	2	2	2
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	0	2	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	25	25	25
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	30.0	30.0	30.0	30.0
Pedestrian Compliance Code	Fair	Fair	Fair	Fair
Pedestrian Crosswalk Score	1.79	1.79	1.86	1.86
Pedestrian Crosswalk LOS	A	A	A	A

HCM 2010 Signals-Bicycles
5: N. 16th Street & Callowhill Street

Approach	EB	WB	NB	SB
Bicycle Flow Rate (bike/h)	0	0	0	0
Total Flow Rate (veh/h)	0	210	379	0
Effct. Green for Bike (s)	0.0	16.0	34.0	0.0
Cross Street Width (ft)	24.0	24.0	24.0	23.0
Through Lanes Number	0	2	2	0
Through Lane Width (ft)	12.0	12.0	12.0	12.0
Bicycle Lane Width (ft)	0.0	0.0	0.0	0.0
Paved Shoulder Width (ft)	0.0	0.0	0.0	0.0
Curb Is Present?	No	No	No	No
On Street Parking?	No	No	No	No
Bicycle Lane Capacity (bike/h)	0	533	1133	0
Bicycle Delay (s/bike)	0.0	16.1	5.6	0.0
Bicycle Compliance		Fair	Good	
Bicycle LOS Score	0.00	2.10	2.24	0.00
Bicycle LOS		B	B	

Lanes, Volumes, Timings
6: N. 15th Street & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	82	135	0	0	0	0	0	229	16
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		0%			0%			0%			-3%	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt											0.991	
Flt Protected					0.982							
Satd. Flow (prot)	0	0	0	0	3225	0	0	0	0	0	1622	0
Flt Permitted					0.982							
Satd. Flow (perm)	0	0	0	0	3225	0	0	0	0	0	1622	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		460			480			146			1070	
Travel Time (s)		12.5			13.1			4.0			29.2	
Confl. Peds. (#/hr)	10		41	41		10	15		37	37		15
Confl. Bikes (#/hr)												5
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	2%	2%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Parking (#/hr)					0						0	
Adj. Flow (vph)	0	0	0	101	167	0	0	0	0	0	283	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	268	0	0	0	0	0	303	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.08	1.01	1.01	1.01	1.01	0.99	1.18	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization 31.7%		ICU Level of Service A	
Analysis Period (min) 15			

HCM 2010 AWSC
6: N. 15th Street & Callowhill Street

Intersection	
Intersection Delay, s/veh	10.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	0	82	135	0	0	0	0	0	229	16
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	2	2	2	2	5	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	101	167	0	0	0	0	0	283	20
Number of Lanes	0	0	0	0	2	0	0	0	0	0	1	0

Approach	WB	SB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left		WB
Conflicting Lanes Left	0	2
Conflicting Approach Right	SB	
Conflicting Lanes Right	1	0
HCM Control Delay	9.7	10.5
HCM LOS	A	B

Lane	WBLn1	WBLn2	SBLn1
Vol Left, %	65%	0%	0%
Vol Thru, %	35%	100%	93%
Vol Right, %	0%	0%	7%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	127	90	245
LT Vol	45	90	229
Through Vol	0	0	16
RT Vol	82	0	0
Lane Flow Rate	157	111	302
Geometry Grp	7	7	2
Degree of Util (X)	0.243	0.164	0.385
Departure Headway (Hd)	5.579	5.305	4.585
Convergence, Y/N	Yes	Yes	Yes
Cap	643	676	786
Service Time	3.32	3.046	2.607
HCM Lane V/C Ratio	0.244	0.164	0.384
HCM Control Delay	10.1	9.1	10.5
HCM Lane LOS	B	A	B
HCM 95th-tile Q	0.9	0.6	1.8

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Timings
7: N. Broad Street & Callowhill Street

Lane Group	WBL	WBT	NBT	SBT
Lane Configurations				
Volume (vph)	30	122	563	769
Lane Group Flow (vph)	33	179	619	934
Turn Type	Perm	NA	NA	NA
Protected Phases		8	2	6
Permitted Phases	8			
Minimum Split (s)	29.0	29.0	61.0	61.0
Total Split (s)	29.0	29.0	61.0	61.0
Total Split (%)	32.2%	32.2%	67.8%	67.8%
Yellow Time (s)	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.0	5.0
Lead/Lag				
Lead-Lag Optimize?				
v/c Ratio	0.08	0.22	0.31	0.47
Control Delay	26.3	27.4	19.6	6.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	26.3	27.4	19.6	6.6
Queue Length 50th (ft)	15	45	170	69
Queue Length 95th (ft)	m40	75	228	80
Internal Link Dist (ft)		525	220	990
Turn Bay Length (ft)				
Base Capacity (vph)	407	811	1995	1992
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	0.08	0.22	0.31	0.47

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 47 (52%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: N. Broad Street & Callowhill Street

HCM 2010 Signalized Intersection Summary
7: N. Broad Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	30	122	41	0	563	0	0	769	81
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.97	1.00		1.00	1.00		0.95
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln				182.5	181.2	186.2	0.0	181.6	0.0	0.0	185.9	189.9
Lanes				1	2	0	0	2	0	0	2	0
Cap, veh/h				444	666	213	0	2260	0	0	2047	216
Arrive On Green				0.08	0.08	0.08	0.00	0.62	0.00	0.00	0.62	0.62
Sat Flow, veh/h				1738	2608	835	0	3632	0	0	3289	346
Grp Volume(v), veh/h				33	91	88	0	619	0	0	477	457
Grp Sat Flow(s),veh/h/ln				1738	1812	1631	0	1816	0	0	1859	1777
Q Serve(g_s), s				1.6	4.2	4.5	0.0	7.0	0.0	0.0	11.8	11.8
Cycle Q Clear(g_c), s				1.6	4.2	4.5	0.0	7.0	0.0	0.0	11.8	11.8
Prop In Lane				1.00		0.51	0.00		0.00	0.00		0.19
Lane Grp Cap(c), veh/h				444	463	417	0	2260	0	0	1157	1106
V/C Ratio(X)				0.07	0.20	0.21	0.00	0.27	0.00	0.00	0.41	0.41
Avail Cap(c_a), veh/h				444	463	417	0	2260	0	0	1157	1106
HCM Platoon Ratio				0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				31.4	32.6	32.7	0.0	7.7	0.0	0.0	8.6	8.6
Incr Delay (d2), s/veh				0.3	1.0	1.1	0.0	0.3	0.0	0.0	1.1	1.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (85%), veh/ln				1.3	3.6	3.5	0.0	4.6	0.0	0.0	7.5	7.2
Lane Grp Delay (d), s/veh				31.7	33.6	33.9	0.0	8.0	0.0	0.0	9.7	9.8
Lane Grp LOS				C	C	C		A			A	A
Approach Vol, veh/h					212			619			934	
Approach Delay, s/veh					33.4			8.0			9.8	
Approach LOS					C			A			A	

Timer

Assigned Phs	8	2	6
Phs Duration (G+Y+Rc), s	29.0	61.0	61.0
Change Period (Y+Rc), s	6.0	5.0	5.0
Max Green Setting (Gmax), s	23.0	56.0	56.0
Max Q Clear Time (g_c+I1), s	0.0	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	12.0
HCM 2010 LOS	B

Notes

HCM 2010 Signals-Pedestrians
7: N. Broad Street & Callowhill Street

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	24.4	32.0	45.0	42.4
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	3	4	4
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	6	2	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	25	25	25
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	45.0	45.0	45.0	45.0
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	1.82	2.01	2.45	2.47
Pedestrian Crosswalk LOS	A	B	B	B

HCM 2010 Signals-Bicycles
7: N. Broad Street & Callowhill Street

Approach	EB	WB	NB	SB
Bicycle Flow Rate (bike/h)	0	0	0	0
Total Flow Rate (veh/h)	0	212	619	934
Effct. Green for Bike (s)	0.0	23.0	56.0	56.0
Cross Street Width (ft)	45.0	42.4	32.0	24.4
Through Lanes Number	0	2	2	2
Through Lane Width (ft)	12.0	11.0	10.0	10.0
Bicycle Lane Width (ft)	0.0	0.0	0.0	0.0
Paved Shoulder Width (ft)	0.0	0.0	0.0	0.0
Curb Is Present?	No	No	No	No
On Street Parking?	No	No	No	No
Bicycle Lane Capacity (bike/h)	0	511	1244	1244
Bicycle Delay (s/bike)	0.0	24.9	6.4	6.4
Bicycle Compliance		Fair	Good	Good
Bicycle LOS Score	0.00	2.60	2.99	3.13
Bicycle LOS		B	C	C

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	264	422	59	408	0	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	11	12	11	12	12	12	12
Grade (%)		0%			0%			-1%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.88	0.91	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor						0.98		1.00				
Frt						0.850						
Flt Protected								0.994				
Satd. Flow (prot)	0	0	0	0	3521	2680	0	4843	0	0	0	0
Flt Permitted								0.994				
Satd. Flow (perm)	0	0	0	0	3521	2622	0	4834	0	0	0	0
Right Turn on Red			Yes			No	Yes		Yes			Yes
Satd. Flow (RTOR)								33				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		430			460			170			344	
Travel Time (s)		11.7			12.5			4.6			9.4	
Confl. Peds. (#/hr)	15		7	7		15	14		1	1		14
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%
Adj. Flow (vph)	0	0	0	0	275	440	61	425	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	275	440	0	486	0	0	0	0
Turn Type					NA	Perm	Perm	NA				
Protected Phases					1			2				
Permitted Phases						1	2					
Minimum Split (s)					51.0	51.0	39.0	39.0				
Total Split (s)					51.0	51.0	39.0	39.0				
Total Split (%)					56.7%	56.7%	43.3%	43.3%				
Yellow Time (s)					3.5	3.5	3.5	3.5				
All-Red Time (s)					1.8	1.8	2.5	2.5				
Lost Time Adjust (s)					0.0	0.0		0.0				
Total Lost Time (s)					5.3	5.3		6.0				
Lead/Lag					Lead	Lead	Lag	Lag				
Lead-Lag Optimize?												
Act Effct Green (s)					45.7	45.7		33.0				
Actuated g/C Ratio					0.51	0.51		0.37				
v/c Ratio					0.15	0.33		0.27				
Control Delay					15.8	17.9		1.3				
Queue Delay					0.0	0.0		0.3				
Total Delay					15.8	17.9		1.6				
LOS					B	B		A				
Approach Delay					17.1			1.6				
Approach LOS					B			A				
Queue Length 50th (ft)					55	98		2				
Queue Length 95th (ft)					m69	m114		4				
Internal Link Dist (ft)		350			380			90			264	
Turn Bay Length (ft)												
Base Capacity (vph)					1787	1331		1793				

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	7
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	1.8	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening
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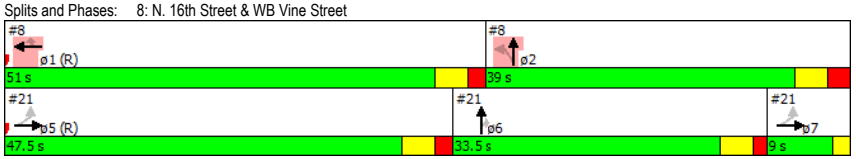
Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn					0	0		689				
Spillback Cap Reductn					0	0		0				
Storage Cap Reductn					0	0		0				
Reduced v/c Ratio					0.15	0.33		0.44				

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 10.8	Intersection LOS: B
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 8: N. 16th Street & WB Vine Street



Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	35	471	0	0	0	0	0	1016	270
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			2%	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.86	0.86
Ped Bike Factor					1.00						0.99	
Frt											0.969	
Flt Protected					0.997							
Satd. Flow (prot)	0	0	0	0	3318	0	0	0	0	0	5875	0
Flt Permitted					0.997							
Satd. Flow (perm)	0	0	0	0	3318	0	0	0	0	0	5875	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					145						75	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		460			480			170			414	
Travel Time (s)		12.5			13.1			4.6			11.3	
Confl. Peds. (#/hr)	18		1	1		18	17		74	74		17
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Parking (#/hr)					0							
Adj. Flow (vph)	0	0	0	39	523	0	0	0	0	0	1129	300
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	562	0	0	0	0	0	1429	0
Turn Type				Perm	NA						NA	
Protected Phases					1						2	
Permitted Phases				1								
Minimum Split (s)				49.0	49.0						41.0	
Total Split (s)				49.0	49.0						41.0	
Total Split (%)				54.4%	54.4%						45.6%	
Yellow Time (s)				3.5	3.5						3.5	
All-Red Time (s)				1.5	1.5						11.5	
Lost Time Adjust (s)					0.0						0.0	
Total Lost Time (s)					5.0						15.0	
Lead/Lag				Lead	Lead						Lag	
Lead-Lag Optimize?												
Act Effct Green (s)					44.0						26.0	
Actuated g/C Ratio					0.49						0.29	
v/c Ratio					0.33						0.82	
Control Delay					6.5						32.7	
Queue Delay					0.0						0.0	
Total Delay					6.5						32.7	
LOS					A						C	
Approach Delay					6.5						32.7	
Approach LOS					A						C	
Queue Length 50th (ft)					18						208	
Queue Length 95th (ft)					40						252	
Internal Link Dist (ft)		380			400			90			334	
Turn Bay Length (ft)												
Base Capacity (vph)					1696						1750	

Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	ø5	ø6
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Grade (%)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Peak Hour Factor		
Parking (#/hr)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	5	6
Permitted Phases		
Minimum Split (s)	49.0	41.0
Total Split (s)	49.0	41.0
Total Split (%)	54%	46%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.5	3.5
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lag
Lead-Lag Optimize?		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		

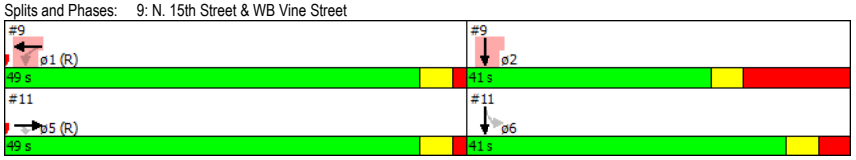
Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening
Synchro 8 - Report

Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					0						0	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.33						0.82	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green			
Natural Cycle: 90			
Control Type: Pretimed			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 25.3		Intersection LOS: C	
Intersection Capacity Utilization 75.0%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 9: N. 15th Street & WB Vine Street



Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	ø5	ø6
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	104	413	108	0	529	0	0	597	92
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	11	12	12	10	12	12	10	12
Grade (%)		0%			1%			-1%			1%	
Storage Length (ft)	0		0	0		0	0		0	100		100
Storage Lanes	0		0	1		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.86	0.86
Ped Bike Factor				1.00		0.96					0.96	
Frt						0.850					0.980	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	0	1751	3386	1567	0	4732	0	0	5546	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	0	1750	3386	1507	0	4732	0	0	5546	0
Right Turn on Red			Yes			No			Yes			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		480			605			170			260	
Travel Time (s)		13.1			16.5			4.6			7.1	
Confl. Peds. (#/hr)	43		1	1		43	262		68	68		262
Confl. Bikes (#/hr)						1			13			10
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Bus Blockages (#/hr)	0	0	0	0	0	0	0	2	0	0	5	0
Adj. Flow (vph)	0	0	0	111	439	115	0	563	0	0	635	98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	111	439	115	0	563	0	0	733	0
Turn Type				Perm	NA	Perm		NA			NA	
Protected Phases					1 3!			2			6!	
Permitted Phases				1 3!		1 3						
Minimum Split (s)								34.0			34.0	
Total Split (s)								34.0			34.0	
Total Split (%)								37.8%			37.8%	
Yellow Time (s)								2.4			3.6	
All-Red Time (s)								3.0			5.4	
Lost Time Adjust (s)								0.0			0.0	
Total Lost Time (s)								5.4			9.0	
Lead/Lag								Lead			Lead	
Lead-Lag Optimize?												
Act Effct Green (s)				46.0	46.0	46.0		28.6			25.0	
Actuated g/C Ratio				0.51	0.51	0.51		0.32			0.28	
v/c Ratio				0.12	0.25	0.15		0.37			0.48	
Control Delay				14.4	14.6	14.7		10.0			14.5	
Queue Delay				0.0	0.0	0.0		0.5			0.1	
Total Delay				14.4	14.6	14.7		10.5			14.5	
LOS				B	B	B		B			B	
Approach Delay					14.6			10.5			14.5	
Approach LOS					B			B			B	
Queue Length 50th (ft)				30	62	31		43			71	

Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø7	ø8
Lane Configurations					
Volume (vph)					
Ideal Flow (vphpl)					
Lane Width (ft)					
Grade (%)					
Storage Length (ft)					
Storage Lanes					
Taper Length (ft)					
Lane Util. Factor					
Ped Bike Factor					
Frt					
Flt Protected					
Satd. Flow (prot)					
Flt Permitted					
Satd. Flow (perm)					
Right Turn on Red					
Satd. Flow (RTOR)					
Link Speed (mph)					
Link Distance (ft)					
Travel Time (s)					
Confl. Peds. (#/hr)					
Confl. Bikes (#/hr)					
Peak Hour Factor					
Bus Blockages (#/hr)					
Adj. Flow (vph)					
Shared Lane Traffic (%)					
Lane Group Flow (vph)					
Turn Type					
Protected Phases	1	3	5	7	8
Permitted Phases					
Minimum Split (s)	42.0	14.0	42.0	48.0	14.0
Total Split (s)	42.0	14.0	42.0	48.0	14.0
Total Split (%)	47%	16%	47%	53%	16%
Yellow Time (s)	3.6	2.0	3.6	3.6	3.6
All-Red Time (s)	6.4	0.0	6.4	2.4	2.4
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag		Lag			Lag
Lead-Lag Optimize?		Yes			
Act Effct Green (s)					
Actuated g/C Ratio					
v/c Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Queue Length 50th (ft)					

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening
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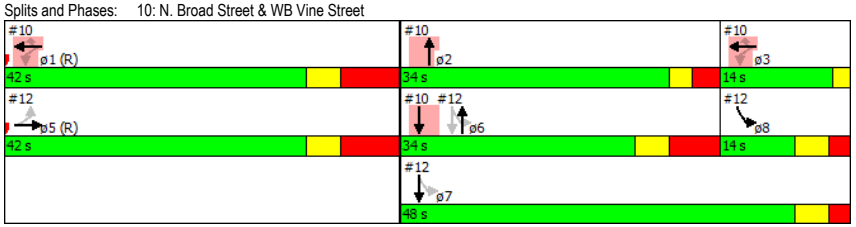
Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)				68	110	71		56			86	
Internal Link Dist (ft)		400			525			90			180	
Turn Bay Length (ft)												
Base Capacity (vph)				894	1730	770		1503			1540	
Starvation Cap Reductn				0	0	0		518			0	
Spillback Cap Reductn				0	0	0		0			106	
Storage Cap Reductn				0	0	0		0			0	
Reduced v/c Ratio				0.12	0.25	0.15		0.57			0.51	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green
Natural Cycle: 90
Control Type: Pretimed
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 13.4 — Intersection LOS: B
Intersection Capacity Utilization 83.3% — ICU Level of Service E
Analysis Period (min) 15
! Phase conflict between lane groups.

Splits and Phases: 10: N. Broad Street & WB Vine Street



Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø7	ø8
Queue Length 95th (ft)					
Internal Link Dist (ft)					
Turn Bay Length (ft)					
Base Capacity (vph)					
Starvation Cap Reductn					
Spillback Cap Reductn					
Storage Cap Reductn					
Reduced v/c Ratio					

Intersection Summary

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening
Synchro 8 - Report

Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1108	333	0	0	0	0	0	0	271	787	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		2%			0%			0%			4%	
Lane Util. Factor	1.00	0.86	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00
Ped Bike Factor			0.98							0.93		
Frt			0.850									
Flt Protected										0.950		
Satd. Flow (prot)	0	6310	2744	0	0	0	0	0	0	1725	4792	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	6310	2692	0	0	0	0	0	0	1603	4792	0
Right Turn on Red			No			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)										40		
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		82			480			430			170	
Travel Time (s)		2.2			13.1			11.7			4.6	
Confl. Peds. (#/hr)			12	12			21		89	89		21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1204	362	0	0	0	0	0	0	295	855	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1204	362	0	0	0	0	0	0	295	855	0
Turn Type		NA	Perm							Perm	NA	
Protected Phases		5									6	
Permitted Phases			5							6		
Minimum Split (s)		49.0	49.0							41.0	41.0	
Total Split (s)		49.0	49.0							41.0	41.0	
Total Split (%)		54.4%	54.4%							45.6%	45.6%	
Yellow Time (s)		3.5	3.5							3.5	3.5	
All-Red Time (s)		1.5	1.5							3.5	3.5	
Lost Time Adjust (s)		0.0	0.0							0.0	0.0	
Total Lost Time (s)		5.0	5.0							7.0	7.0	
Lead/Lag		Lead	Lead							Lag	Lag	
Lead-Lag Optimize?												
Act Effct Green (s)		44.0	44.0							34.0	34.0	
Actuated g/C Ratio		0.49	0.49							0.38	0.38	
v/c Ratio		0.39	0.28							0.47	0.47	
Control Delay		12.1	14.3							1.6	2.2	
Queue Delay		0.0	0.0							1.1	0.6	
Total Delay		12.1	14.3							2.7	2.8	
LOS		B	B							A	A	
Approach Delay		12.6									2.8	
Approach LOS		B									A	
Queue Length 50th (ft)		84	65							1	9	
Queue Length 95th (ft)		114	96							m1	11	
Internal Link Dist (ft)		2			400			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		3084	1316							630	1810	
Starvation Cap Reductn		0	0							155	531	

Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

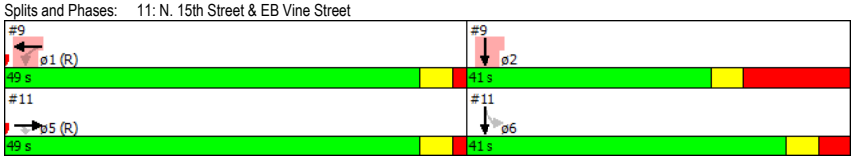
Lane Group	ø1	ø2
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Grade (%)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	2
Permitted Phases		
Minimum Split (s)	49.0	41.0
Total Split (s)	49.0	41.0
Total Split (%)	54%	46%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.5	11.5
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lag
Lead-Lag Optimize?		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening
Synchro 8 - Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0	0							0	0	
Storage Cap Reductn		0	0							0	0	
Reduced v/c Ratio		0.39	0.28							0.62	0.67	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 8.5	Intersection LOS: A
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 11: N. 15th Street & EB Vine Street



Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	ø1	ø2
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening
Synchro 8 - Report

Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	177	1319	102	0	0	0	0	362	207	269	481	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	10	12	12	10	12
Grade (%)		2%			0%			2%			2%	
Storage Length (ft)	0		250	0		0	0		100	45		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.81	0.81	0.81	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor		1.00						0.97		0.98		
Frt		0.990						0.945				
Flt Protected		0.995								0.950		
Satd. Flow (prot)	0	7274	0	0	0	0	0	4064	0	1743	4674	0
Flt Permitted		0.995								0.417		
Satd. Flow (perm)	0	7274	0	0	0	0	0	4064	0	749	4674	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		480			163			270			170	
Travel Time (s)		13.1			4.4			7.4			4.6	
Confl. Peds. (#/hr)			41	41			169		73	73		169
Confl. Bikes (#/hr)			1						9			8
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	7%	2%	2%	2%	2%	2%	4%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	30	0	0	0	0
Adj. Flow (vph)	184	1374	106	0	0	0	0	377	216	280	501	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1664	0	0	0	0	0	593	0	280	501	0
Turn Type	Perm	NA						NA		custom	NA	
Protected Phases		5						6		8	7	
Permitted Phases	5									6 7	6 7	
Minimum Split (s)	42.0	42.0						34.0		14.0	48.0	
Total Split (s)	42.0	42.0						34.0		14.0	48.0	
Total Split (%)	46.7%	46.7%						37.8%		15.6%	53.3%	
Yellow Time (s)	3.6	3.6						3.6		3.6	3.6	
All-Red Time (s)	6.4	6.4						5.4		2.4	2.4	
Lost Time Adjust (s)		0.0						0.0		0.0	0.0	
Total Lost Time (s)		10.0						9.0		6.0	6.0	
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?												
Act Effct Green (s)		32.0						25.0		42.0	42.0	
Actuated g/C Ratio		0.36						0.28		0.47	0.47	
v/c Ratio		0.64						0.53		0.64	0.23	
Control Delay		19.6						29.5		16.0	2.3	
Queue Delay		0.0						0.0		59.9	0.3	
Total Delay		19.6						29.5		75.8	2.6	
LOS		B						C		E	A	
Approach Delay		19.6						29.5			28.8	
Approach LOS		B						C			C	

Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Bus Blockages (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	3
Permitted Phases			
Minimum Split (s)	42.0	34.0	14.0
Total Split (s)	42.0	34.0	14.0
Total Split (%)	47%	38%	16%
Yellow Time (s)	3.6	2.4	2.0
All-Red Time (s)	6.4	3.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag		Lead	Lag
Lead-Lag Optimize?			Yes
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			

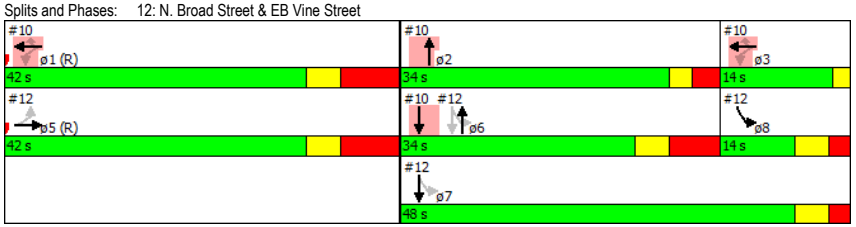
Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening
Synchro 8 - Report

Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		128						104		74	11	
Queue Length 95th (ft)		139						140		129	17	
Internal Link Dist (ft)		400			83			190			90	
Turn Bay Length (ft)										45		
Base Capacity (vph)		2586						1128		437	2181	
Starvation Cap Reductn		0						0		184	1051	
Spillback Cap Reductn		0						0		0	0	
Storage Cap Reductn		0						0		0	0	
Reduced v/c Ratio		0.64						0.53		1.11	0.44	

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 23.9	Intersection LOS: C
Intersection Capacity Utilization 83.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 12: N. Broad Street & EB Vine Street



Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening
Synchro 8 - Report

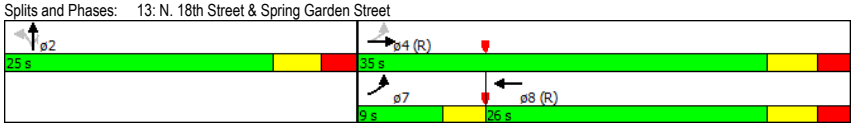
Timings
13: N. 18th Street & Spring Garden Street

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	52	454	446	75	58
Lane Group Flow (vph)	56	488	511	115	62
Turn Type	pm+pt	NA	NA	NA	Perm
Protected Phases	7	4	8	2	
Permitted Phases	4				2
Minimum Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?					
v/c Ratio	0.13	0.31	0.48	0.25	0.12
Control Delay	7.5	10.1	23.7	17.1	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.5	10.1	23.7	17.1	1.9
Queue Length 50th (ft)	9	52	78	30	0
Queue Length 95th (ft)	23	80	81	65	9
Internal Link Dist (ft)		476	350	810	
Turn Bay Length (ft)	145				150
Base Capacity (vph)	437	1562	1068	459	500
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	0.13	0.31	0.48	0.25	0.12

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 13: N. 18th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
13: N. 18th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	52	454	0	0	446	29	32	75	58	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.97		1.00	1.00		0.90	1.00		0.93			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln	185.3	185.3	0.0	0.0	185.3	189.0	189.0	177.9	176.2			
Lanes	1	2	0	0	2	0	0	1	1			
Cap, veh/h	540	1791	0	0	1139	73	198	355	441			
Arrive On Green	0.10	0.48	0.00	0.00	0.67	0.67	0.32	0.32	0.32			
Sat Flow, veh/h	1765	3706	0	0	3418	220	625	1122	1393			
Grp Volume(v), veh/h	56	488	0	0	259	252	95	20	62			
Grp Sat Flow(s),veh/h/ln	1765	1853	0	0	1853	1784	1748	1779	1393			
Q Serve(g_s), s	1.0	4.7	0.0	0.0	3.9	3.9	2.4	0.0	1.9			
Cycle Q Clear(g_c), s	1.0	4.7	0.0	0.0	3.9	3.9	2.4	0.0	1.9			
Prop In Lane	1.00		0.00	0.00		0.12	0.36		1.00			
Lane Grp Cap(c), veh/h	540	1791	0	0	618	595	553	0	441			
V/C Ratio(X)	0.10	0.27	0.00	0.00	0.42	0.42	0.17	0.00	0.14			
Avail Cap(c_a), veh/h	540	1791	0	0	618	595	553	0	441			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	9.1	9.2	0.0	0.0	7.3	7.3	14.8	0.0	14.7			
Incr Delay (d2), s/veh	0.4	0.4	0.0	0.0	2.1	2.2	0.7	0.0	0.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln	0.8	3.4	0.0	0.0	2.9	2.9	1.8	0.0	1.2			
Lane Grp Delay (d), s/veh	9.5	9.6	0.0	0.0	9.4	9.5	15.5	0.0	15.3			
Lane Grp LOS	A	A			A	A	B		B			
Approach Vol, veh/h		544			511			177				
Approach Delay, s/veh		9.6			9.5			13.7				
Approach LOS		A			A			B				

Timer

Assigned Phs	7	4			8			2	
Phs Duration (G+Y+Rc), s	9.0	35.0			26.0			25.0	
Change Period (Y+Rc), s	3.0	6.0			6.0			6.0	
Max Green Setting (Gmax), s	6.0	29.0			20.0			19.0	
Max Q Clear Time (g_c+I1), s	0.0	0.0			0.0			0.0	
Green Ext Time (p_c), s	0.0	0.0			0.0			0.0	

Intersection Summary

HCM 2010 Ctrl Delay			10.1									
HCM 2010 LOS			B									

Notes

Timings
14: N. Broad Street & Spring Garden Street

Lane Group	EBT	WBT	NBT	NBR	SBL	SBT	SBR
Lane Configurations							
Volume (vph)	480	391	543	56	75	795	102
Lane Group Flow (vph)	578	475	584	60	81	855	110
Turn Type	NA	NA	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	8	2		1	6	
Permitted Phases				2	6		6
Minimum Split (s)	33.0	33.0	35.0	35.0	9.0	35.0	35.0
Total Split (s)	40.0	40.0	41.0	41.0	9.0	50.0	50.0
Total Split (%)	44.4%	44.4%	45.6%	45.6%	10.0%	55.6%	55.6%
Yellow Time (s)	3.6	3.6	3.4	3.4	3.0	3.4	3.4
All-Red Time (s)	2.4	2.4	2.6	2.6	0.0	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Lead/Lag			Lag	Lag	Lead		
Lead-Lag Optimize?							
v/c Ratio	0.48	0.40	0.44	0.10	0.22	0.51	0.17
Control Delay	23.0	21.8	9.9	2.9	12.4	17.0	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.0	21.8	9.9	2.9	12.4	17.0	13.7
Queue Length 50th (ft)	129	102	37	0	22	166	33
Queue Length 95th (ft)	178	144	97	3	45	219	64
Internal Link Dist (ft)	400	550	990			290	
Turn Bay Length (ft)				100	170		100
Base Capacity (vph)	1193	1195	1323	603	369	1672	654
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.40	0.44	0.10	0.22	0.51	0.17

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Pretimed

Splits and Phases: 14: N. Broad Street & Spring Garden Street

HCM 2010 Signalized Intersection Summary
14: N. Broad Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	480	58	0	391	51	0	543	56	75	795	102
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	1.00		0.93	0.98		0.89
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.3	189.0	0.0	185.3	189.0	0.0	185.3	185.3	186.2	186.2	186.2
Lanes	0	2	0	0	2	0	0	2	1	1	2	1
Cap, veh/h	0	1221	146	0	1209	157	0	1441	567	477	1821	692
Arrive On Green	0.00	0.38	0.38	0.00	0.38	0.38	0.00	0.78	0.78	0.07	0.49	0.49
Sat Flow, veh/h	0	3231	386	0	3200	416	0	3706	1458	1774	3724	1415
Grp Volume(v), veh/h	0	295	283	0	242	233	0	584	60	81	855	110
Grp Sat Flow(s),veh/h/ln	0	1853	1764	0	1853	1763	0	1853	1458	1774	1862	1415
Q Serve(g_s), s	0.0	10.6	10.7	0.0	8.4	8.5	0.0	4.6	0.9	2.2	13.7	3.9
Cycle Q Clear(g_c), s	0.0	10.6	10.7	0.0	8.4	8.5	0.0	4.6	0.9	2.2	13.7	3.9
Prop In Lane	0.00		0.22	0.00		0.24	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	700	667	0	700	666	0	1441	567	477	1821	692
V/C Ratio(X)	0.00	0.42	0.42	0.00	0.35	0.35	0.00	0.41	0.11	0.17	0.47	0.16
Avail Cap(c_a), veh/h	0	700	667	0	700	666	0	1441	567	477	1821	692
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	20.7	20.8	0.0	20.0	20.1	0.0	6.6	6.2	13.1	15.3	12.7
Incr Delay (d2), s/veh	0.0	1.9	2.0	0.0	1.4	1.4	0.0	0.8	0.4	0.8	0.9	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	7.5	7.2	0.0	6.1	5.9	0.0	3.0	0.6	1.8	8.7	2.5
Lane Grp Delay (d), s/veh	0.0	22.6	22.7	0.0	21.4	21.5	0.0	7.5	6.6	13.9	16.1	13.2
Lane Grp LOS		C	C		C	C		A	A	B	B	B
Approach Vol, veh/h		578			475			644			1046	
Approach Delay, s/veh		22.7			21.5			7.4			15.7	
Approach LOS		C			C			A			B	

Timer

Assigned Phs		4			8			2		1	6	
Phs Duration (G+Y+Rc), s		40.0			40.0			41.0		9.0	50.0	
Change Period (Y+Rc), s		6.0			6.0			6.0		3.0	6.0	
Max Green Setting (Gmax), s		34.0			34.0			35.0		6.0	44.0	
Max Q Clear Time (g_c+I1), s		0.0			0.0			0.0		0.0	0.0	
Green Ext Time (p_c), s		0.0			0.0			0.0		0.0	0.0	

Intersection Summary

HCM 2010 Ctrl Delay			16.2									
HCM 2010 LOS			B									

Notes

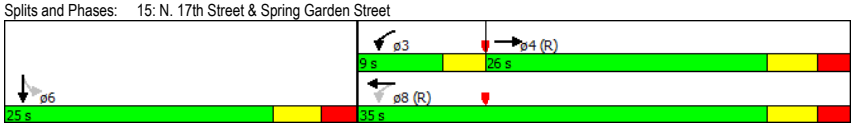
Timings
15: N. 17th Street & Spring Garden Street

Lane Group	EBT	WBL	WBT	SBT
Lane Configurations				
Volume (vph)	439	60	413	69
Lane Group Flow (vph)	580	71	492	170
Turn Type	NA	pm+pt	NA	NA
Protected Phases	4	3	8	6
Permitted Phases		8		
Minimum Split (s)	26.0	9.0	35.0	25.0
Total Split (s)	26.0	9.0	35.0	25.0
Total Split (%)	43.3%	15.0%	58.3%	41.7%
Yellow Time (s)	3.6	3.0	3.6	3.4
All-Red Time (s)	2.4	0.0	2.4	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	3.0	6.0	6.0
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?				
v/c Ratio	0.55	0.17	0.31	0.35
Control Delay	10.1	5.5	8.4	15.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.1	5.5	8.4	15.1
Queue Length 50th (ft)	30	7	27	37
Queue Length 95th (ft)	42	m18	67	73
Internal Link Dist (ft)	350		350	290
Turn Bay Length (ft)		165		
Base Capacity (vph)	1062	406	1562	490
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	0.55	0.17	0.31	0.35

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: N. 17th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
15: N. 17th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	439	48	60	413	0	0	0	0	36	69	38
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.90	0.97		1.00				1.00		0.92
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.3	189.0	185.3	185.3	0.0				189.0	184.8	189.0
Lanes	0	2	0	1	2	0				0	1	0
Cap, veh/h	0	1081	117	515	1791	0				198	158	219
Arrive On Green	0.00	0.67	0.67	0.20	0.97	0.00				0.32	0.32	0.32
Sat Flow, veh/h	0	3244	352	1765	3706	0				625	306	692
Grp Volume(v), veh/h	0	297	283	71	492	0				125	0	108
Grp Sat Flow(s),veh/h/ln	0	1853	1743	1765	1853	0				1817	0	1654
Q Serve(g_s), s	0.0	4.7	4.8	1.2	0.4	0.0				2.6	0.0	0.0
Cycle Q Clear(g_c), s	0.0	4.7	4.8	1.2	0.4	0.0				2.6	0.0	0.0
Prop In Lane	0.00		0.20	1.00		0.00				0.34		0.42
Lane Grp Cap(c), veh/h	0	618	581	515	1791	0				575	0	0
V/C Ratio(X)	0.00	0.48	0.49	0.14	0.27	0.00				0.22	0.00	0.00
Avail Cap(c_a), veh/h	0	618	581	515	1791	0				575	0	0
HCM Platoon Ratio	1.00	2.00	2.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	7.5	7.5	8.2	0.5	0.0				12.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	2.7	2.9	0.6	0.4	0.0				0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	3.3	3.3	0.9	0.4	0.0				2.1	0.0	0.0
Lane Grp Delay (d), s/veh	0.0	10.1	10.4	8.8	0.9	0.0				13.3	0.0	0.0
Lane Grp LOS		B	B	A	A					B		
Approach Vol, veh/h		580			563						233	
Approach Delay, s/veh		10.2			1.9						7.1	
Approach LOS		B			A						A	

Timer

Assigned Phs		4		3	8						6	
Phs Duration (G+Y+Rc), s		26.0		9.0	35.0						25.0	
Change Period (Y+Rc), s		6.0		3.0	6.0						6.0	
Max Green Setting (Gmax), s		20.0		6.0	29.0						19.0	
Max Q Clear Time (g_c+I1), s		0.0		0.0	0.0						0.0	
Green Ext Time (p_c), s		0.0		0.0	0.0						0.0	

Intersection Summary

HCM 2010 Ctrl Delay			6.3									
HCM 2010 LOS			A									

Notes

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	73	220	51	0	0	0	0	278	23
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					0.99						1.00	
Frt					0.978						0.990	
Flt Protected					0.989							
Satd. Flow (prot)	0	0	0	0	3213	0	0	0	0	0	1645	0
Flt Permitted					0.989							
Satd. Flow (perm)	0	0	0	0	3213	0	0	0	0	0	1645	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					99						5	
Link Speed (mph)		30			25			30			25	
Link Distance (ft)		975			430			170			647	
Travel Time (s)		22.2			11.7			3.9			17.6	
Confl. Peds. (#/hr)	24		2	2		24	37		104	104		37
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Parking (#/hr)					0						0	
Adj. Flow (vph)	0	0	0	89	268	62	0	0	0	0	339	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	419	0	0	0	0	0	367	0
Turn Type				custom	NA						NA	
Protected Phases					1 3						2	
Permitted Phases				1								
Minimum Split (s)				47.5							33.5	
Total Split (s)				47.5							33.5	
Total Split (%)				52.8%							37.2%	
Yellow Time (s)				3.5							3.5	
All-Red Time (s)				1.8							1.5	
Lost Time Adjust (s)											0.0	
Total Lost Time (s)											5.0	
Lead/Lag				Lead							Lag	
Lead-Lag Optimize?												
Act Effct Green (s)					51.2						28.5	
Actuated g/C Ratio					0.57						0.32	
v/c Ratio					0.22						0.70	
Control Delay					2.3						35.0	
Queue Delay					0.0						0.0	
Total Delay					2.3						35.0	
LOS					A						D	
Approach Delay					2.3						35.0	
Approach LOS					A						D	
Queue Length 50th (ft)					15						180	
Queue Length 95th (ft)					22						247	
Internal Link Dist (ft)		895			350			90			567	
Turn Bay Length (ft)												
Base Capacity (vph)					1870						524	
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					0						0	

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	ø3	ø5	ø6
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	5	6
Permitted Phases			
Minimum Split (s)	9.0	51.0	39.0
Total Split (s)	9.0	51.0	39.0
Total Split (%)	10%	57%	43%
Yellow Time (s)	2.0	3.5	3.5
All-Red Time (s)	0.0	1.8	2.5
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag		Lead	Lag
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			

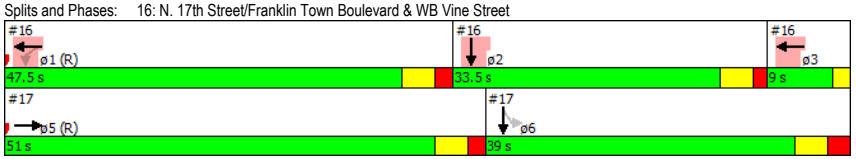
Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening
Synchro 8 - Report

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.22						0.70	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 17.6	Intersection LOS: B
Intersection Capacity Utilization 67.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 16: N. 17th Street/Franklin Town Boulevard & WB Vine Street



Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	ø3	ø5	ø6
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	312	26	0	0	0	0	0	0	127	238	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor		1.00									0.96	
Frt		0.989										
Flt Protected											0.983	
Satd. Flow (prot)	0	3302	0	0	0	0	0	0	0	0	3461	0
Flt Permitted											0.983	
Satd. Flow (perm)	0	3302	0	0	0	0	0	0	0	0	3310	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)		14									122	
Link Speed (mph)		30			25			30			30	
Link Distance (ft)		975			430			430			170	
Travel Time (s)		22.2			11.7			9.8			3.9	
Confl. Peds. (#/hr)			18	18			33		116	116		33
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Parking (#/hr)		0										
Adj. Flow (vph)	0	390	32	0	0	0	0	0	0	159	298	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	422	0	0	0	0	0	0	0	0	457	0
Turn Type		NA								Perm	NA	
Protected Phases		5									6	
Permitted Phases										6		
Minimum Split (s)		51.0								39.0	39.0	
Total Split (s)		51.0								39.0	39.0	
Total Split (%)		56.7%								43.3%	43.3%	
Yellow Time (s)		3.5								3.5	3.5	
All-Red Time (s)		1.8								2.5	2.5	
Lost Time Adjust (s)		0.0									0.0	
Total Lost Time (s)		5.3									6.0	
Lead/Lag		Lead								Lag	Lag	
Lead-Lag Optimize?												
Act Effct Green (s)		45.7									33.0	
Actuated g/C Ratio		0.51									0.37	
v/c Ratio		0.25									0.35	
Control Delay		12.5									3.3	
Queue Delay		0.0									1.2	
Total Delay		12.5									4.5	
LOS		B									A	
Approach Delay		12.5									4.5	
Approach LOS		B									A	
Queue Length 50th (ft)		65									3	
Queue Length 95th (ft)		81									10	
Internal Link Dist (ft)		895			350			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		1683									1290	
Starvation Cap Reductn		0									592	
Spillback Cap Reductn		0									0	

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	3
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	1.8	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			

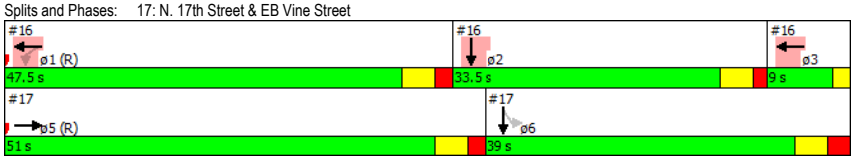
Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening
Synchro 8 - Report

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.25									0.65	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 8.4	Intersection LOS: A
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: N. 17th Street & EB Vine Street



Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

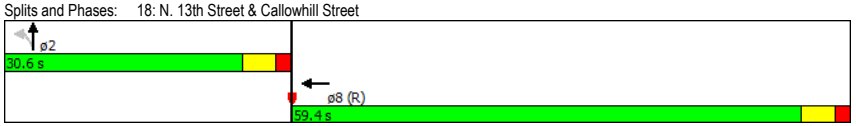
Timings
18: N. 13th Street & Callowhill Street

Lane Group	WBT	NBT
Lane Configurations		
Volume (vph)	127	162
Lane Group Flow (vph)	160	197
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Minimum Split (s)	59.4	30.6
Total Split (s)	59.4	30.6
Total Split (%)	66.0%	34.0%
Yellow Time (s)	3.6	3.6
All-Red Time (s)	1.8	1.8
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.4	5.4
Lead/Lag		
Lead-Lag Optimize?		
v/c Ratio	0.09	0.43
Control Delay	6.8	12.8
Queue Delay	0.0	0.0
Total Delay	6.8	12.8
Queue Length 50th (ft)	16	29
Queue Length 95th (ft)	28	53
Internal Link Dist (ft)	195	480
Turn Bay Length (ft)		
Base Capacity (vph)	1835	453
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.09	0.43

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 90
Control Type: Pretimed

Splits and Phases: 18: N. 13th Street & Callowhill Street



HCM 2010 Signalized Intersection Summary
18: N. 13th Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	127	18	17	162	0	0	0	0
Number				3	8	18	5	2	12			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.96	1.00		1.00			
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln				0.0	185.3	189.0	189.0	185.3	0.0			
Lanes				0	2	0	0	1	0			
Cap, veh/h				0	1898	265	50	467	0			
Arrive On Green				0.00	0.60	0.60	0.28	0.28	0.00			
Sat Flow, veh/h				0	3163	442	178	1666	0			
Grp Volume(v), veh/h				0	81	79	197	0	0			
Grp Sat Flow(s),veh/h/ln				0	1853	1752	1844	1853	0			
Q Serve(g_s), s				0.0	1.6	1.7	7.8	0.0	0.0			
Cycle Q Clear(g_c), s				0.0	1.6	1.7	7.8	0.0	0.0			
Prop In Lane				0.00		0.25	0.10		0.00			
Lane Grp Cap(c), veh/h				0	1112	1051	516	0	0			
V/C Ratio(X)				0.00	0.07	0.08	0.38	0.00	0.00			
Avail Cap(c_a), veh/h				0	1112	1051	516	0	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh				0.0	7.5	7.5	26.1	0.0	0.0			
Incr Delay (d2), s/veh				0.0	0.1	0.1	2.1	0.0	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln				0.0	1.3	1.3	5.8	0.0	0.0			
Lane Grp Delay (d), s/veh				0.0	7.7	7.7	28.3	0.0	0.0			
Lane Grp LOS					A	A	C					
Approach Vol, veh/h					160			197				
Approach Delay, s/veh					7.7			28.3				
Approach LOS					A			C				

Timer

Assigned Phs	8	2
Phs Duration (G+Y+Rc), s	59.4	30.6
Change Period (Y+Rc), s	5.4	5.4
Max Green Setting (Gmax), s	54.0	25.2
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	19.0
HCM 2010 LOS	B

Notes

Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	546	40	67	129	0	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	11	12	11	10	12	12	10	12
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00		0.94					
Frt					0.990							
Flt Protected							0.950					
Satd. Flow (prot)	0	0	0	0	4656	0	1702	1729	0	0	0	0
Flt Permitted							0.950					
Satd. Flow (perm)	0	0	0	0	4656	0	1604	1729	0	0	0	0
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Satd. Flow (RTOR)					18		73					
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		605			275			170			560	
Travel Time (s)		16.5			6.3			3.9			12.7	
Confl. Peds. (#/hr)	55					55	70		58	58		70
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Parking (#/hr)					0							
Adj. Flow (vph)	0	0	0	0	593	43	73	140	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	636	0	73	140	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					1			2				
Permitted Phases							2					
Minimum Split (s)					51.0		39.0	39.0				
Total Split (s)					51.0		39.0	39.0				
Total Split (%)					56.7%		43.3%	43.3%				
Yellow Time (s)					3.7		3.5	3.5				
All-Red Time (s)					1.8		2.5	2.5				
Lost Time Adjust (s)					0.0		0.0	0.0				
Total Lost Time (s)					5.5		6.0	6.0				
Lead/Lag					Lead		Lag	Lag				
Lead-Lag Optimize?					Yes		Yes	Yes				
Act Effct Green (s)					45.5		33.0	33.0				
Actuated g/C Ratio					0.51		0.37	0.37				
v/c Ratio					0.27		0.12	0.22				
Control Delay					12.7		1.3	12.8				
Queue Delay					0.0		0.9	2.0				
Total Delay					12.7		2.2	14.8				
LOS					B		A	B				
Approach Delay					12.7			10.5				
Approach LOS					B			B				
Queue Length 50th (ft)					69		0	29				
Queue Length 95th (ft)					93		5	49				
Internal Link Dist (ft)		525			195			90			480	
Turn Bay Length (ft)												
Base Capacity (vph)					2362		634	633				
Starvation Cap Reductn					0		394	367				

Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	7
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	2.0	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			

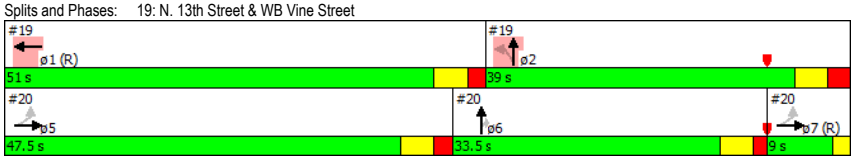
Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening
Synchro 8 - Report

Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.27		0.30	0.53				

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 7:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.27	
Intersection Signal Delay: 12.1	Intersection LOS: B
Intersection Capacity Utilization 110.0%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 19: N. 13th Street & WB Vine Street



Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening
Synchro 8 - Report

Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	64	485	0	0	0	0	0	132	65	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	11	9	12	12	12
Lane Util. Factor	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.93			
Frt									0.850			
Flt Protected		0.994										
Satd. Flow (prot)	0	5028	0	0	0	0	0	1612	1417	0	0	0
Flt Permitted		0.994										
Satd. Flow (perm)	0	5027	0	0	0	0	0	1612	1320	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		43							103			
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		442			275			430			170	
Travel Time (s)		12.1			6.3			9.8			3.9	
Confl. Peds. (#/hr)	4		32	32		4	64		61	61		64
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Parking (#/hr)								0				
Adj. Flow (vph)	67	505	0	0	0	0	0	138	68	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	572	0	0	0	0	0	138	68	0	0	0
Turn Type	Perm	NA						NA	Perm			
Protected Phases		5 7						6				
Permitted Phases	5 7								6			
Minimum Split (s)								33.5	33.5			
Total Split (s)								33.5	33.5			
Total Split (%)								37.2%	37.2%			
Yellow Time (s)								3.5	3.5			
All-Red Time (s)								1.5	1.5			
Lost Time Adjust (s)								0.0	0.0			
Total Lost Time (s)								5.0	5.0			
Lead/Lag								Lag	Lag			
Lead-Lag Optimize?								Yes	Yes			
Act Effct Green (s)		51.0						28.5	28.5			
Actuated g/C Ratio		0.57						0.32	0.32			
v/c Ratio		0.20						0.27	0.14			
Control Delay		4.8						24.8	2.6			
Queue Delay		0.0						0.0	0.0			
Total Delay		4.8						24.8	2.6			
LOS		A						C	A			
Approach Delay		4.8						17.5				
Approach LOS		A						B				
Queue Length 50th (ft)		28						58	0			
Queue Length 95th (ft)		31						106	14			
Internal Link Dist (ft)		362			195			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		2867						510	488			
Starvation Cap Reductn		0						0	0			

Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

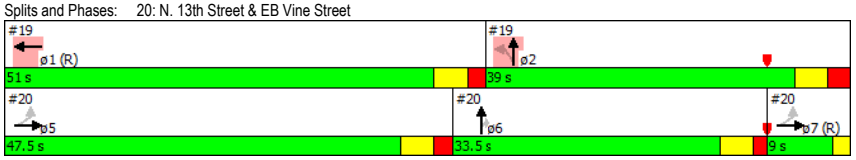
Lane Group	ø1	ø2	ø5	ø7
Lane Configurations				
Volume (vph)				
Ideal Flow (vphpl)				
Lane Width (ft)				
Lane Util. Factor				
Ped Bike Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Confl. Peds. (#/hr)				
Peak Hour Factor				
Parking (#/hr)				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	2	5	7
Permitted Phases				
Minimum Split (s)	51.0	39.0	47.5	9.0
Total Split (s)	51.0	39.0	47.5	9.0
Total Split (%)	57%	43%	53%	10%
Yellow Time (s)	3.7	3.5	3.5	2.0
All-Red Time (s)	1.8	2.5	2.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening
Synchro 8 - Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0						7	0			
Storage Cap Reductn		0						0	0			
Reduced v/c Ratio		0.20						0.27	0.14			

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 7:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.27	
Intersection Signal Delay: 8.1	Intersection LOS: A
Intersection Capacity Utilization 103.5%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 20: N. 13th Street & EB Vine Street



Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening
Synchro 8 - Report

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	367	0	0	0	0	0	417	388	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.99			
Frt									0.850			
Flt Protected		0.998										
Satd. Flow (prot)	0	3455	0	0	0	0	0	4961	1575	0	0	0
Flt Permitted		0.998										
Satd. Flow (perm)	0	3454	0	0	0	0	0	4961	1552	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24							417			
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		430			378			430			170	
Travel Time (s)		11.7			10.3			11.7			4.6	
Confl. Peds. (#/hr)	3		10	10		3	57		3	3		57
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	20%	3%	2%	2%	2%	2%	2%	4%	2%	2%	2%	2%
Adj. Flow (vph)	18	395	0	0	0	0	0	448	417	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	413	0	0	0	0	0	448	417	0	0	0
Turn Type	Perm	NA						NA	Perm			
Protected Phases		5 7						6				
Permitted Phases	5 7								6			
Minimum Split (s)								33.5	33.5			
Total Split (s)								33.5	33.5			
Total Split (%)								37.2%	37.2%			
Yellow Time (s)								3.5	3.5			
All-Red Time (s)								1.5	1.5			
Lost Time Adjust (s)								0.0	0.0			
Total Lost Time (s)								5.0	5.0			
Lead/Lag								Lag	Lag			
Lead-Lag Optimize?												
Act Effct Green (s)		51.2						28.5	28.5			
Actuated g/C Ratio		0.57						0.32	0.32			
v/c Ratio		0.21						0.29	0.54			
Control Delay		6.7						23.7	5.3			
Queue Delay		0.0						0.0	0.0			
Total Delay		6.7						23.7	5.3			
LOS		A						C	A			
Approach Delay		6.7						14.9				
Approach LOS		A						B				
Queue Length 50th (ft)		41						69	0			
Queue Length 95th (ft)		51						96	64			
Internal Link Dist (ft)		350			298			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		1975						1570	776			
Starvation Cap Reductn		0						0	0			
Spillback Cap Reductn		0						0	0			

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Lane Configurations				
Volume (vph)				
Ideal Flow (vphpl)				
Lane Util. Factor				
Ped Bike Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Confl. Peds. (#/hr)				
Peak Hour Factor				
Heavy Vehicles (%)				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	2	5	7
Permitted Phases				
Minimum Split (s)	51.0	39.0	47.5	9.0
Total Split (s)	51.0	39.0	47.5	9.0
Total Split (%)	57%	43%	53%	10%
Yellow Time (s)	3.5	3.5	3.5	2.0
All-Red Time (s)	1.8	2.5	1.8	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lead	
Lead-Lag Optimize?				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				

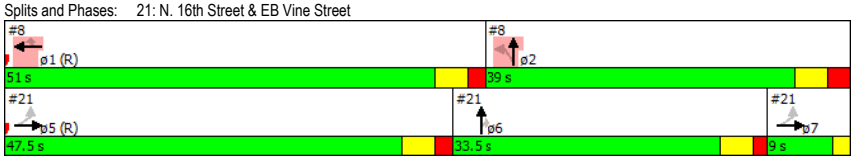
Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening
Synchro 8 - Report

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn		0						0	0			
Reduced v/c Ratio		0.21						0.29	0.54			

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 12.2	Intersection LOS: B
Intersection Capacity Utilization 68.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 21: N. 16th Street & EB Vine Street



Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

SATURDAY EVENING (6-9 PM)
PEAK HOUR TIME PERIOD

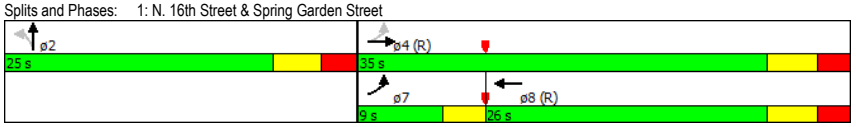
Timings
1: N. 16th Street & Spring Garden Street

Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Volume (vph)	56	399	394	161
Lane Group Flow (vph)	62	438	471	266
Turn Type	pm+pt	NA	NA	NA
Protected Phases	7	4	8	2
Permitted Phases	4			
Minimum Split (s)	9.0	35.0	26.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?				
v/c Ratio	0.15	0.28	0.45	0.26
Control Delay	4.9	7.6	27.5	14.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	4.9	7.6	27.5	14.5
Queue Length 50th (ft)	5	25	83	41
Queue Length 95th (ft)	m12	54	127	70
Internal Link Dist (ft)		350	380	990
Turn Bay Length (ft)	140			
Base Capacity (vph)	417	1550	1040	1038
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	0.28	0.45	0.26

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: N. 16th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
1: N. 16th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	56	399	0	0	394	35	36	161	45	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.98		1.00	1.00		0.94	1.00		0.96			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln	185.3	185.3	0.0	0.0	183.4	187.1	186.2	182.5	186.2			
Lanes	1	2	0	0	2	0	0	2	0			
Cap, veh/h	492	1791	0	0	1048	91	161	731	209			
Arrive On Green	0.20	0.97	0.00	0.00	0.11	0.11	0.32	0.32	0.32			
Sat Flow, veh/h	1765	3706	0	0	3144	274	509	2309	661			
Grp Volume(v), veh/h	62	438	0	0	252	219	142	0	124			
Grp Sat Flow(s),veh/h/ln	1765	1853	0	0	1834	1583	1800	0	1678			
Q Serve(g_s), s	1.1	0.3	0.0	0.0	7.7	7.8	3.5	0.0	3.3			
Cycle Q Clear(g_c), s	1.1	0.3	0.0	0.0	7.7	7.8	3.5	0.0	3.3			
Prop In Lane	1.00		0.00	0.00		0.17	0.28		0.39			
Lane Grp Cap(c), veh/h	492	1791	0	0	611	528	570	0	531			
V/C Ratio(X)	0.13	0.24	0.00	0.00	0.41	0.42	0.25	0.00	0.23			
Avail Cap(c_a), veh/h	492	1791	0	0	611	528	570	0	531			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	8.6	0.5	0.0	0.0	21.2	21.3	15.2	0.0	15.1			
Incr Delay (d2), s/veh	0.5	0.3	0.0	0.0	2.0	2.4	1.0	0.0	1.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln	0.8	0.3	0.0	0.0	6.2	5.6	2.8	0.0	2.5			
Lane Grp Delay (d), s/veh	9.1	0.8	0.0	0.0	23.3	23.7	16.2	0.0	16.2			
Lane Grp LOS	A	A			C	C	B		B			
Approach Vol, veh/h		500			471			266				
Approach Delay, s/veh		1.9			23.4			16.2				
Approach LOS		A			C			B				

Timer

Assigned Phs	7	4			8			2				
Phs Duration (G+Y+Rc), s	9.0	35.0			26.0			25.0				
Change Period (Y+Rc), s	3.0	6.0			6.0			6.0				
Max Green Setting (Gmax), s	6.0	29.0			20.0			19.0				
Max Q Clear Time (g_c+I1), s	0.0	0.0			0.0			0.0				
Green Ext Time (p_c), s	0.0	0.0			0.0			0.0				

Intersection Summary

HCM 2010 Ctrl Delay			13.2									
HCM 2010 LOS			B									

Notes

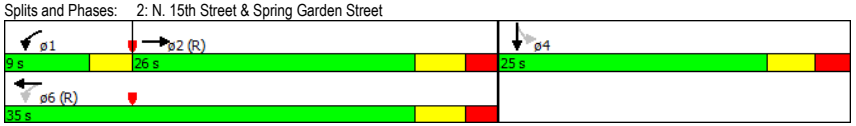
Timings
2: N. 15th Street & Spring Garden Street

Lane Group	EBT	WBL	WBT	SBL	SBT
Lane Configurations					
Volume (vph)	415	51	389	28	127
Lane Group Flow (vph)	463	53	405	29	176
Turn Type	NA	pm+pt	NA	Perm	NA
Protected Phases	2	1	6		4
Permitted Phases		6		4	
Minimum Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (%)	43.3%	15.0%	58.3%	41.7%	41.7%
Yellow Time (s)	3.6	3.0	3.6	3.4	3.4
All-Red Time (s)	2.4	0.0	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	3.0	6.0	6.0	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?					
v/c Ratio	0.42	0.13	0.26	0.06	0.38
Control Delay	8.1	7.6	9.8	14.8	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	8.1	7.6	9.8	14.8	18.8
Queue Length 50th (ft)	36	8	42	7	49
Queue Length 95th (ft)	69	22	66	23	96
Internal Link Dist (ft)	380		400		290
Turn Bay Length (ft)		115		100	
Base Capacity (vph)	1106	414	1534	494	468
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	0.42	0.13	0.26	0.06	0.38

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 15 (25%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 2: N. 15th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
2: N. 15th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	415	30	51	389	0	0	0	0	28	127	42
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	0.97		1.00				1.00		0.97
Parking Bus Adj	1.00	1.00	0.90	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.2	189.0	183.4	183.4	0.0				177.9	185.3	189.0
Lanes	0	2	0	1	2	0				1	1	0
Cap, veh/h	0	1076	77	551	1773	0				536	418	139
Arrive On Green	0.00	0.67	0.67	0.10	0.48	0.00				0.32	0.32	0.32
Sat Flow, veh/h	0	3229	230	1747	3669	0				1694	1321	440
Grp Volume(v), veh/h	0	247	216	53	405	0				29	0	176
Grp Sat Flow(s),veh/h/ln	0	1852	1608	1747	1834	0				1694	1853	1761
Q Serve(g_s), s	0.0	3.6	3.7	1.0	3.8	0.0				0.7	0.0	4.6
Cycle Q Clear(g_c), s	0.0	3.6	3.7	1.0	3.8	0.0				0.7	0.0	4.6
Prop In Lane	0.00		0.14	1.00		0.00				1.00		0.25
Lane Grp Cap(c), veh/h	0	617	536	551	1773	0				536	0	558
V/C Ratio(X)	0.00	0.40	0.40	0.10	0.23	0.00				0.05	0.00	0.32
Avail Cap(c_a), veh/h	0	617	536	551	1773	0				536	0	558
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	7.3	7.3	9.1	9.0	0.0				14.3	0.0	15.6
Incr Delay (d2), s/veh	0.0	1.9	2.3	0.3	0.3	0.0				0.2	0.0	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	2.8	2.5	0.7	2.8	0.0				0.5	0.0	3.5
Lane Grp Delay (d), s/veh	0.0	9.2	9.5	9.4	9.3	0.0				14.4	0.0	17.0
Lane Grp LOS		A	A	A	A					B		B
Approach Vol, veh/h		463			458						205	
Approach Delay, s/veh		9.4			9.3						16.7	
Approach LOS		A			A						B	

Timer

Assigned Phs		2		1	6						4	
Phs Duration (G+Y+Rc), s		26.0		9.0	35.0						25.0	
Change Period (Y+Rc), s		6.0		3.0	6.0						6.0	
Max Green Setting (Gmax), s		20.0		6.0	29.0						19.0	
Max Q Clear Time (g_c+I1), s		0.0		0.0	0.0						0.0	
Green Ext Time (p_c), s		0.0		0.0	0.0						0.0	

Intersection Summary

HCM 2010 Ctrl Delay			10.7									
HCM 2010 LOS			B									

Notes

Lanes, Volumes, Timings
3: Franklin Town Boulevard & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	106	33	80	25	85	28	11	19	8	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	11	12	12	12	12	12	16	12	12	12	12
Grade (%)		-1%			2%			3%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.951			0.972			0.971				
Flt Protected		0.976			0.991			0.986				
Satd. Flow (prot)	0	1671	0	0	1590	0	0	1782	0	0	0	0
Flt Permitted		0.976			0.991			0.986				
Satd. Flow (perm)	0	1671	0	0	1590	0	0	1782	0	0	0	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		646			325			647			208	
Travel Time (s)		17.6			8.9			17.6			5.7	
Confl. Peds. (#/hr)	17		65	65		17	71		41	41		71
Confl. Bikes (#/hr)			7			4						
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Parking (#/hr)					0			0				
Adj. Flow (vph)	128	40	96	30	102	34	13	23	10	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	264	0	0	166	0	0	46	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.05	1.00	1.02	1.17	1.02	1.03	1.00	1.03	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	40.0%	ICU Level of Service A	
Analysis Period (min)	15		

HCM 2010 AWSC
3: Franklin Town Boulevard & Callowhill Street

Intersection	
Intersection Delay, s/veh	8.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	106	33	80	25	85	28	11	19	8	0	0	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	128	40	96	30	102	34	13	23	10	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.8	8.2	8.1
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	29%	48%	18%
Vol Thru, %	50%	15%	62%
Vol Right, %	21%	37%	20%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	38	219	138
LT Vol	19	33	85
Through Vol	8	80	28
RT Vol	11	106	25
Lane Flow Rate	46	264	166
Geometry Grp	1	1	1
Degree of Util (X)	0.061	0.294	0.191
Departure Headway (Hd)	4.774	4.018	4.129
Convergence, Y/N	Yes	Yes	Yes
Cap	755	884	855
Service Time	2.774	2.096	2.221
HCM Lane V/C Ratio	0.061	0.299	0.194
HCM Control Delay	8.1	8.8	8.2
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.2	1.2	0.7

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
4: N. 17th Street & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	29	33	111	0	0	0	0	0	119	23
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	11	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			-4%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.865								0.978	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	1443	1693	1659	0	0	0	0	0	1576	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	1443	1693	1659	0	0	0	0	0	1576	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		325			430			230			1070	
Travel Time (s)		8.9			11.7			6.3			29.2	
Confl. Peds. (#/hr)	15		24	24		15	5		5	5		5
Confl. Bikes (#/hr)			4									1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	5	0
Parking (#/hr)			0		0						0	
Adj. Flow (vph)	0	0	32	37	123	0	0	0	0	0	132	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	32	37	123	0	0	0	0	0	158	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.15	1.06	1.16	1.01	1.01	1.01	1.01	0.98	1.20	0.98
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	CBD
Control Type: Unsignalized	
Intersection Capacity Utilization 50.0%	ICU Level of Service A
Analysis Period (min) 15	

HCM 2010 AWSC
4: N. 17th Street & Callowhill Street

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	29	33	111	0	0	0	0	0	119	23
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	32	37	123	0	0	0	0	0	132	26
Number of Lanes	0	0	1	1	1	0	0	0	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.1	8.6	8.3
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	100%	0%	0%
Vol Thru, %	0%	0%	100%	84%
Vol Right, %	100%	0%	0%	16%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	29	33	111	142
LT Vol	0	0	111	119
Through Vol	29	0	0	23
RT Vol	0	33	0	0
Lane Flow Rate	32	37	123	158
Geometry Grp	5	7	7	2
Degree of Util (X)	0.036	0.054	0.165	0.189
Departure Headway (Hd)	3.982	5.435	4.933	4.303
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	901	663	731	838
Service Time	1.996	3.135	2.633	2.306
HCM Lane V/C Ratio	0.036	0.056	0.168	0.189
HCM Control Delay	7.1	8.4	8.6	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.2	0.6	0.7

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Timings
5: N. 16th Street & Callowhill Street

Lane Group	WBT	NBT
Lane Configurations		
Volume (vph)	106	254
Lane Group Flow (vph)	134	332
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Minimum Split (s)	21.0	39.0
Total Split (s)	21.0	39.0
Total Split (%)	35.0%	65.0%
Yellow Time (s)	3.0	3.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
v/c Ratio	0.15	0.17
Control Delay	15.3	5.5
Queue Delay	0.0	0.0
Total Delay	15.3	5.5
Queue Length 50th (ft)	16	22
Queue Length 95th (ft)	35	38
Internal Link Dist (ft)	380	136
Turn Bay Length (ft)		
Base Capacity (vph)	884	1958
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.15	0.17

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 17 (28%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 5: N. 16th Street & Callowhill Street

HCM 2010 Signalized Intersection Summary
5: N. 16th Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	106	14	45	254	0	0	0	0
Number				3	8	18	5	2	12			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.98	1.00		1.00			
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln				0.0	185.3	189.0	187.1	183.4	0.0			
Lanes				0	2	0	0	2	0			
Cap, veh/h				0	852	113	296	1768	0			
Arrive On Green				0.00	0.27	0.27	0.57	0.57	0.00			
Sat Flow, veh/h				0	3195	424	522	3121	0			
Grp Volume(v), veh/h				0	67	67	173	159	0			
Grp Sat Flow(s),veh/h/ln				0	1853	1766	1808	1834	0			
Q Serve(g_s), s				0.0	1.7	1.7	2.8	2.5	0.0			
Cycle Q Clear(g_c), s				0.0	1.7	1.7	2.8	2.5	0.0			
Prop In Lane				0.00		0.24	0.29		0.00			
Lane Grp Cap(c), veh/h				0	494	471	1025	1040	0			
V/C Ratio(X)				0.00	0.14	0.14	0.17	0.15	0.00			
Avail Cap(c_a), veh/h				0	494	471	1025	1040	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	16.7	16.8	6.2	6.2	0.0			
Incr Delay (d2), s/veh				0.0	0.6	0.6	0.4	0.3	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln				0.0	1.4	1.4	2.0	1.8	0.0			
Lane Grp Delay (d), s/veh				0.0	17.3	17.4	6.6	6.5	0.0			
Lane Grp LOS					B	B	A	A				
Approach Vol, veh/h					134			332				
Approach Delay, s/veh					17.4			6.5				
Approach LOS					B			A				

Timer	
Assigned Phs	8	2
Phs Duration (G+Y+Rc), s	21.0	39.0
Change Period (Y+Rc), s	5.0	5.0
Max Green Setting (Gmax), s	16.0	34.0
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	9.6
HCM 2010 LOS	A

Notes

HCM 2010 Signals-Pedestrians
5: N. 16th Street & Callowhill Street

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	23.0	24.0	24.0	24.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	2	2	2
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	0	2	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	25	25	25
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	30.0	30.0	30.0	30.0
Pedestrian Compliance Code	Fair	Fair	Fair	Fair
Pedestrian Crosswalk Score	1.78	1.76	1.84	1.83
Pedestrian Crosswalk LOS	A	A	A	A

HCM 2010 Signals-Bicycles
5: N. 16th Street & Callowhill Street

Approach	EB	WB	NB	SB
Bicycle Flow Rate (bike/h)	0	0	0	0
Total Flow Rate (veh/h)	0	134	332	0
Effct. Green for Bike (s)	0.0	16.0	34.0	0.0
Cross Street Width (ft)	24.0	24.0	24.0	23.0
Through Lanes Number	0	2	2	0
Through Lane Width (ft)	12.0	12.0	12.0	12.0
Bicycle Lane Width (ft)	0.0	0.0	0.0	0.0
Paved Shoulder Width (ft)	0.0	0.0	0.0	0.0
Curb Is Present?	No	No	No	No
On Street Parking?	No	No	No	No
Bicycle Lane Capacity (bike/h)	0	533	1133	0
Bicycle Delay (s/bike)	0.0	16.1	5.6	0.0
Bicycle Compliance		Fair	Good	
Bicycle LOS Score	0.00	2.04	2.20	0.00
Bicycle LOS		B	B	

Lanes, Volumes, Timings
6: N. 15th Street & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	47	91	0	0	0	0	0	194	13
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		0%			0%			0%			-3%	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt											0.992	
Flt Protected					0.983							
Satd. Flow (prot)	0	0	0	0	3288	0	0	0	0	0	1623	0
Flt Permitted					0.983							
Satd. Flow (perm)	0	0	0	0	3288	0	0	0	0	0	1623	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		460			480			146			1070	
Travel Time (s)		12.5			13.1			4.0			29.2	
Confl. Peds. (#/hr)	12		26	26		12	3		35	35		3
Confl. Bikes (#/hr)						2						9
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Parking (#/hr)					0						0	
Adj. Flow (vph)	0	0	0	51	98	0	0	0	0	0	209	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	149	0	0	0	0	0	223	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.08	1.01	1.01	1.01	1.01	0.99	1.18	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization	28.6%	ICU Level of Service A	
Analysis Period (min)	15		

HCM 2010 AWSC
6: N. 15th Street & Callowhill Street

Intersection	
Intersection Delay, s/veh	8.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	0	47	91	0	0	0	0	0	194	13
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	51	98	0	0	0	0	0	209	14
Number of Lanes	0	0	0	0	2	0	0	0	0	0	1	0

Approach	WB	SB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left		WB
Conflicting Lanes Left	0	2
Conflicting Approach Right	SB	
Conflicting Lanes Right	1	0
HCM Control Delay	8.6	8.8
HCM LOS	A	A

Lane	WBLn1	WBLn2	SBLn1
Vol Left, %	61%	0%	0%
Vol Thru, %	39%	100%	94%
Vol Right, %	0%	0%	6%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	77	61	207
LT Vol	30	61	194
Through Vol	0	0	13
RT Vol	47	0	0
Lane Flow Rate	83	65	223
Geometry Grp	7	7	2
Degree of Util (X)	0.123	0.091	0.265
Departure Headway (Hd)	5.345	5.04	4.283
Convergence, Y/N	Yes	Yes	Yes
Cap	673	713	844
Service Time	3.063	2.758	2.29
HCM Lane V/C Ratio	0.123	0.091	0.264
HCM Control Delay	8.8	8.3	8.8
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.4	0.3	1.1

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Timings
7: N. Broad Street & Callowhill Street

Lane Group	WBL	WBT	NBT	SBT
Lane Configurations				
Volume (vph)	46	96	615	671
Lane Group Flow (vph)	47	129	634	730
Turn Type	Perm	NA	NA	NA
Protected Phases		8	2	6
Permitted Phases	8			
Minimum Split (s)	29.0	29.0	61.0	61.0
Total Split (s)	29.0	29.0	61.0	61.0
Total Split (%)	32.2%	32.2%	67.8%	67.8%
Yellow Time (s)	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.0	5.0
Lead/Lag				
Lead-Lag Optimize?				
v/c Ratio	0.12	0.16	0.32	0.36
Control Delay	25.6	25.3	20.6	6.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.6	25.3	20.6	6.1
Queue Length 50th (ft)	22	32	173	54
Queue Length 95th (ft)	53	57	232	65
Internal Link Dist (ft)		525	180	990
Turn Bay Length (ft)				
Base Capacity (vph)	407	823	1995	2011
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	0.12	0.16	0.32	0.36

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 47 (52%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Pretimed

Splits and Phases: 7: N. Broad Street & Callowhill Street

HCM 2010 Signalized Intersection Summary
7: N. Broad Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	46	96	29	0	615	0	0	671	37
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.97	1.00		1.00	1.00		0.94
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln				182.5	182.5	186.2	0.0	181.6	0.0	0.0	186.2	189.9
Lanes				1	2	0	0	2	0	0	2	0
Cap, veh/h				444	691	200	0	2260	0	0	2169	119
Arrive On Green				0.26	0.26	0.26	0.00	0.62	0.00	0.00	0.83	0.83
Sat Flow, veh/h				1738	2704	782	0	3632	0	0	3486	191
Grp Volume(v), veh/h				47	65	64	0	634	0	0	369	361
Grp Sat Flow(s),veh/h/ln				1738	1825	1660	0	1816	0	0	1862	1815
Q Serve(g_s), s				1.9	2.5	2.7	0.0	7.2	0.0	0.0	4.2	4.2
Cycle Q Clear(g_c), s				1.9	2.5	2.7	0.0	7.2	0.0	0.0	4.2	4.2
Prop In Lane				1.00		0.47	0.00		0.00	0.00		0.11
Lane Grp Cap(c), veh/h				444	466	424	0	2260	0	0	1159	1129
V/C Ratio(X)				0.11	0.14	0.15	0.00	0.28	0.00	0.00	0.32	0.32
Avail Cap(c_a), veh/h				444	466	424	0	2260	0	0	1159	1129
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33
Upstream Filter(I)				1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				25.6	25.9	25.9	0.0	7.8	0.0	0.0	3.3	3.3
Incr Delay (d2), s/veh				0.5	0.6	0.7	0.0	0.3	0.0	0.0	0.7	0.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (85%), veh/ln				1.5	2.2	2.1	0.0	4.7	0.0	0.0	2.9	2.8
Lane Grp Delay (d), s/veh				26.1	26.5	26.7	0.0	8.1	0.0	0.0	4.0	4.0
Lane Grp LOS				C	C	C		A			A	A
Approach Vol, veh/h					176			634			730	
Approach Delay, s/veh					26.5			8.1			4.0	
Approach LOS					C			A			A	

Timer												
Assigned Phs					8			2			6	
Phs Duration (G+Y+Rc), s					29.0			61.0			61.0	
Change Period (Y+Rc), s					6.0			5.0			5.0	
Max Green Setting (Gmax), s					23.0			56.0			56.0	
Max Q Clear Time (g_c+I1), s					0.0			0.0			0.0	
Green Ext Time (p_c), s					0.0			0.0			0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	8.3
HCM 2010 LOS	A

Notes

HCM 2010 Signals-Pedestrians
7: N. Broad Street & Callowhill Street

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	24.4	32.0	45.0	42.4
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	3	4	4
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	6	2	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	25	25	25
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	45.0	45.0	45.0	45.0
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	1.78	2.00	2.42	2.42
Pedestrian Crosswalk LOS	A	A	B	B

HCM 2010 Signals-Bicycles
7: N. Broad Street & Callowhill Street

Approach	EB	WB	NB	SB
Bicycle Flow Rate (bike/h)	0	0	0	0
Total Flow Rate (veh/h)	0	176	634	730
Effct. Green for Bike (s)	0.0	23.0	56.0	56.0
Cross Street Width (ft)	45.0	42.4	32.0	24.4
Through Lanes Number	0	2	2	2
Through Lane Width (ft)	12.0	11.0	10.0	10.0
Bicycle Lane Width (ft)	0.0	0.0	0.0	0.0
Paved Shoulder Width (ft)	0.0	0.0	0.0	0.0
Curb Is Present?	No	No	No	No
On Street Parking?	No	No	No	No
Bicycle Lane Capacity (bike/h)	0	511	1244	1244
Bicycle Delay (s/bike)	0.0	24.9	6.4	6.4
Bicycle Compliance		Fair	Good	Good
Bicycle LOS Score	0.00	2.57	3.00	2.96
Bicycle LOS		B	C	C

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	563	469	73	281	0	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	11	12	11	12	12	12	12
Grade (%)		0%			0%			-1%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.88	0.91	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor						0.97		0.98				
Frt						0.850						
Flt Protected								0.990				
Satd. Flow (prot)	0	0	0	0	3521	2680	0	4865	0	0	0	0
Flt Permitted								0.990				
Satd. Flow (perm)	0	0	0	0	3521	2599	0	4792	0	0	0	0
Right Turn on Red			Yes			No	Yes		Yes			Yes
Satd. Flow (RTOR)								81				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		430			460			170			344	
Travel Time (s)		11.7			12.5			4.6			9.4	
Confl. Peds. (#/hr)	29		14	14		29	68		4	4		68
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	0	0	0	0	670	558	87	335	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	670	558	0	422	0	0	0	0
Turn Type					NA	Perm	Perm	NA				
Protected Phases					1			2				
Permitted Phases						1	2					
Minimum Split (s)					51.0	51.0	39.0	39.0				
Total Split (s)					51.0	51.0	39.0	39.0				
Total Split (%)					56.7%	56.7%	43.3%	43.3%				
Yellow Time (s)					3.5	3.5	3.5	3.5				
All-Red Time (s)					1.8	1.8	2.5	2.5				
Lost Time Adjust (s)					0.0	0.0		0.0				
Total Lost Time (s)					5.3	5.3		6.0				
Lead/Lag					Lead	Lead	Lag	Lag				
Lead-Lag Optimize?												
Act Effct Green (s)					45.7	45.7		33.0				
Actuated g/C Ratio					0.51	0.51		0.37				
v/c Ratio					0.37	0.42		0.23				
Control Delay					16.7	17.5		0.7				
Queue Delay					0.0	0.0		0.3				
Total Delay					16.7	17.5		0.9				
LOS					B	B		A				
Approach Delay					17.1			0.9				
Approach LOS					B			A				
Queue Length 50th (ft)					130	118		0				
Queue Length 95th (ft)					m141	m130		0				
Internal Link Dist (ft)		350			380			90			264	
Turn Bay Length (ft)												
Base Capacity (vph)					1787	1319		1808				
Starvation Cap Reductn					0	0		790				

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	7
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	1.8	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			

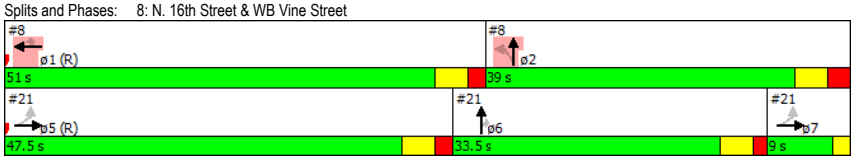
Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 - Report

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn					0	0		0				
Storage Cap Reductn					0	0		0				
Reduced v/c Ratio					0.37	0.42		0.41				

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.43	
Intersection Signal Delay: 12.9	Intersection LOS: B
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 8: N. 16th Street & WB Vine Street



Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 - Report

Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	42	611	0	0	0	0	0	986	388
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			2%	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.86	0.86
Ped Bike Factor					1.00						0.99	
Frt											0.958	
Flt Protected					0.997							
Satd. Flow (prot)	0	0	0	0	3318	0	0	0	0	0	5808	0
Flt Permitted					0.997							
Satd. Flow (perm)	0	0	0	0	3317	0	0	0	0	0	5808	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					145						111	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		460			480			170			414	
Travel Time (s)		12.5			13.1			4.6			11.3	
Confl. Peds. (#/hr)	27		3	3		27	8		77	77		8
Confl. Bikes (#/hr)						3						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Parking (#/hr)					0							
Adj. Flow (vph)	0	0	0	47	679	0	0	0	0	0	1096	431
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	726	0	0	0	0	0	1527	0
Turn Type				Perm	NA						NA	
Protected Phases					1						2	
Permitted Phases				1								
Minimum Split (s)				49.0	49.0						41.0	
Total Split (s)				49.0	49.0						41.0	
Total Split (%)				54.4%	54.4%						45.6%	
Yellow Time (s)				3.5	3.5						3.5	
All-Red Time (s)				1.5	1.5						11.5	
Lost Time Adjust (s)					0.0						0.0	
Total Lost Time (s)					5.0						15.0	
Lead/Lag				Lead	Lead						Lag	
Lead-Lag Optimize?												
Act Effct Green (s)					44.0						26.0	
Actuated g/C Ratio					0.49						0.29	
v/c Ratio					0.43						0.87	
Control Delay					5.1						34.7	
Queue Delay					0.0						0.0	
Total Delay					5.1						34.7	
LOS					A						C	
Approach Delay					5.1						34.7	
Approach LOS					A						C	
Queue Length 50th (ft)					14						223	
Queue Length 95th (ft)					21						270	
Internal Link Dist (ft)		380			400			90			334	
Turn Bay Length (ft)												

Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	ø5	ø6
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Grade (%)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Parking (#/hr)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	5	6
Permitted Phases		
Minimum Split (s)	49.0	41.0
Total Split (s)	49.0	41.0
Total Split (%)	54%	46%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.5	3.5
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lag
Lead-Lag Optimize?		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
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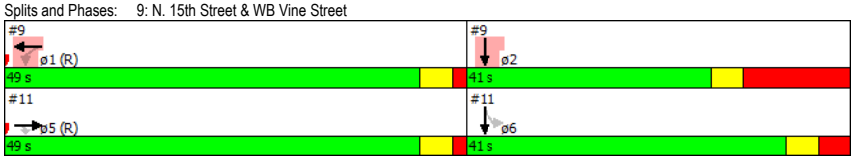
Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)					1695						1756	
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					0						0	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.43						0.87	

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 25.2	Intersection LOS: C
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 9: N. 15th Street & WB Vine Street



Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	ø5	ø6
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP

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Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	129	589	114	0	540	0	0	608	75
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	11	12	12	10	12	12	10	12
Grade (%)		0%			1%			-1%			1%	
Storage Length (ft)	0		0	0		0	0		0	100		100
Storage Lanes	0		0	1		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.86	0.86
Ped Bike Factor						0.97					0.98	
Frt						0.850					0.984	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	0	1751	3386	1567	0	4732	0	0	5677	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	0	1751	3386	1521	0	4732	0	0	5677	0
Right Turn on Red			Yes			No			Yes			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		480			605			170			300	
Travel Time (s)		13.1			16.5			4.6			8.2	
Confl. Peds. (#/hr)	26					26	157		70	70		157
Confl. Bikes (#/hr)						4			11			16
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Bus Blockages (#/hr)	0	0	0	0	0	0	0	2	0	0	5	0
Adj. Flow (vph)	0	0	0	142	647	125	0	593	0	0	668	82
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	142	647	125	0	593	0	0	750	0
Turn Type				Perm	NA	Perm		NA			NA	
Protected Phases					1 3!			2			6!	
Permitted Phases				1 3!		1 3						
Minimum Split (s)								34.0			34.0	
Total Split (s)								34.0			34.0	
Total Split (%)								37.8%			37.8%	
Yellow Time (s)								2.4			3.6	
All-Red Time (s)								3.0			5.4	
Lost Time Adjust (s)								0.0			0.0	
Total Lost Time (s)								5.4			9.0	
Lead/Lag								Lead			Lead	
Lead-Lag Optimize?												
Act Effct Green (s)				46.0	46.0	46.0		28.6			25.0	
Actuated g/C Ratio				0.51	0.51	0.51		0.32			0.28	
v/c Ratio				0.16	0.37	0.16		0.39			0.48	
Control Delay				17.5	18.6	17.7		13.7			17.0	
Queue Delay				0.0	0.0	0.0		0.9			0.0	
Total Delay				17.5	18.6	17.7		14.6			17.1	
LOS				B	B	B		B			B	
Approach Delay					18.3			14.6			17.1	
Approach LOS					B			B			B	
Queue Length 50th (ft)				46	116	41		60			96	

Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø7	ø8
Lane Configurations					
Volume (vph)					
Ideal Flow (vphpl)					
Lane Width (ft)					
Grade (%)					
Storage Length (ft)					
Storage Lanes					
Taper Length (ft)					
Lane Util. Factor					
Ped Bike Factor					
Frt					
Flt Protected					
Satd. Flow (prot)					
Flt Permitted					
Satd. Flow (perm)					
Right Turn on Red					
Satd. Flow (RTOR)					
Link Speed (mph)					
Link Distance (ft)					
Travel Time (s)					
Confl. Peds. (#/hr)					
Confl. Bikes (#/hr)					
Peak Hour Factor					
Bus Blockages (#/hr)					
Adj. Flow (vph)					
Shared Lane Traffic (%)					
Lane Group Flow (vph)					
Turn Type					
Protected Phases	1	3	5	7	8
Permitted Phases					
Minimum Split (s)	42.0	14.0	42.0	48.0	14.0
Total Split (s)	42.0	14.0	42.0	48.0	14.0
Total Split (%)	47%	16%	47%	53%	16%
Yellow Time (s)	3.6	2.0	3.6	3.6	3.6
All-Red Time (s)	6.4	0.0	6.4	2.4	2.4
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag		Lag			Lag
Lead-Lag Optimize?		Yes			
Act Effct Green (s)					
Actuated g/C Ratio					
v/c Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Queue Length 50th (ft)					

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
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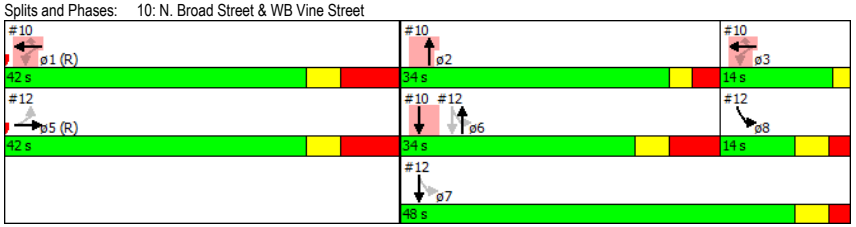
Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)				92	175	84		77			112	
Internal Link Dist (ft)		400			525			90			220	
Turn Bay Length (ft)												
Base Capacity (vph)				894	1730	777		1503			1576	
Starvation Cap Reductn				0	0	0		591			0	
Spillback Cap Reductn				0	0	0		0			38	
Storage Cap Reductn				0	0	0		0			0	
Reduced v/c Ratio				0.16	0.37	0.16		0.65			0.49	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green
Natural Cycle: 90
Control Type: Pretimed
Maximum v/c Ratio: 0.49
Intersection Signal Delay: 16.9 — Intersection LOS: B
Intersection Capacity Utilization 80.9% — ICU Level of Service D
Analysis Period (min) 15
! Phase conflict between lane groups.

Splits and Phases: 10: N. Broad Street & WB Vine Street



Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø7	ø8
Queue Length 95th (ft)					
Internal Link Dist (ft)					
Turn Bay Length (ft)					
Base Capacity (vph)					
Starvation Cap Reductn					
Spillback Cap Reductn					
Storage Cap Reductn					
Reduced v/c Ratio					

Intersection Summary

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
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Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1098	551	0	0	0	0	0	0	233	792	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		2%			0%			0%			4%	
Lane Util. Factor	1.00	0.86	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00
Ped Bike Factor			0.98							0.94		
Frt			0.850									
Flt Protected										0.950		
Satd. Flow (prot)	0	6310	2744	0	0	0	0	0	0	1725	4792	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	6310	2685	0	0	0	0	0	0	1614	4792	0
Right Turn on Red			No			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)										50		
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		82			480			430			170	
Travel Time (s)		2.2			13.1			11.7			4.6	
Confl. Peds. (#/hr)			16	16			8		81	81		8
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	1120	562	0	0	0	0	0	0	238	808	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1120	562	0	0	0	0	0	0	238	808	0
Turn Type		NA	Perm							Perm	NA	
Protected Phases		5									6	
Permitted Phases			5							6		
Minimum Split (s)		49.0	49.0							41.0	41.0	
Total Split (s)		49.0	49.0							41.0	41.0	
Total Split (%)		54.4%	54.4%							45.6%	45.6%	
Yellow Time (s)		3.5	3.5							3.5	3.5	
All-Red Time (s)		1.5	1.5							3.5	3.5	
Lost Time Adjust (s)		0.0	0.0							0.0	0.0	
Total Lost Time (s)		5.0	5.0							7.0	7.0	
Lead/Lag		Lead	Lead							Lag	Lag	
Lead-Lag Optimize?												
Act Effct Green (s)		44.0	44.0							34.0	34.0	
Actuated g/C Ratio		0.49	0.49							0.38	0.38	
v/c Ratio		0.36	0.43							0.37	0.45	
Control Delay		13.0	16.4							0.9	2.7	
Queue Delay		0.0	0.0							1.5	0.8	
Total Delay		13.0	16.4							2.4	3.5	
LOS		B	B							A	A	
Approach Delay		14.1									3.3	
Approach LOS		B									A	
Queue Length 50th (ft)		93	121							1	12	
Queue Length 95th (ft)		147	188							m1	m13	
Internal Link Dist (ft)		2			400			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		3084	1312							640	1810	
Starvation Cap Reductn		0	0							241	648	

Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	ø1	ø2
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Grade (%)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	2
Permitted Phases		
Minimum Split (s)	49.0	41.0
Total Split (s)	49.0	41.0
Total Split (%)	54%	46%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.5	11.5
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lag
Lead-Lag Optimize?		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
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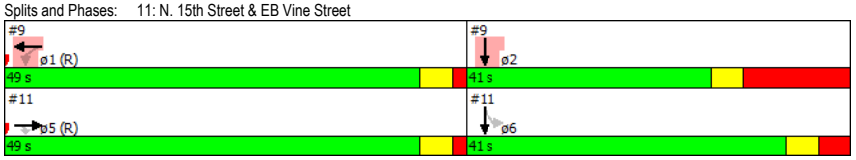
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0	0							0	0	
Storage Cap Reductn		0	0							0	0	
Reduced v/c Ratio		0.36	0.43							0.60	0.70	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 10.0	Intersection LOS: A
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 11: N. 15th Street & EB Vine Street



Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	ø1	ø2
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
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Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	208	900	86	0	0	0	0	300	147	225	485	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	10	12	12	10	12
Grade (%)		2%			0%			2%			2%	
Storage Length (ft)	0		250	0		0	0		100	45		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.81	0.81	0.81	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor		1.00						0.97		0.98		
Frt		0.989						0.951				
Flt Protected		0.991								0.950		
Satd. Flow (prot)	0	7252	0	0	0	0	0	3925	0	1743	4674	0
Flt Permitted		0.991								0.475		
Satd. Flow (perm)	0	7252	0	0	0	0	0	3925	0	856	4674	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		480			163			250			170	
Travel Time (s)		13.1			4.4			6.8			4.6	
Confl. Peds. (#/hr)			29	29			244		53	53		244
Confl. Bikes (#/hr)			2						14			15
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	4%	2%	2%	2%	3%	11%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	30	0	0	0	0
Adj. Flow (vph)	217	938	90	0	0	0	0	312	153	234	505	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1245	0	0	0	0	0	465	0	234	505	0
Turn Type	Perm	NA						NA		custom	NA	
Protected Phases		5						6		8	7	
Permitted Phases	5									6 7	6 7	
Minimum Split (s)	42.0	42.0						34.0		14.0	48.0	
Total Split (s)	42.0	42.0						34.0		14.0	48.0	
Total Split (%)	46.7%	46.7%						37.8%		15.6%	53.3%	
Yellow Time (s)	3.6	3.6						3.6		3.6	3.6	
All-Red Time (s)	6.4	6.4						5.4		2.4	2.4	
Lost Time Adjust (s)		0.0						0.0		0.0	0.0	
Total Lost Time (s)		10.0						9.0		6.0	6.0	
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?												
Act Effct Green (s)		32.0						25.0		42.0	42.0	
Actuated g/C Ratio		0.36						0.28		0.47	0.47	
v/c Ratio		0.48						0.43		0.49	0.23	
Control Delay		16.8						28.1		10.0	2.7	
Queue Delay		0.0						0.0		6.5	0.3	
Total Delay		16.8						28.1		16.5	3.0	
LOS		B						C		B	A	
Approach Delay		16.8						28.1			7.3	
Approach LOS		B						C			A	

Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Bus Blockages (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	3
Permitted Phases			
Minimum Split (s)	42.0	34.0	14.0
Total Split (s)	42.0	34.0	14.0
Total Split (%)	47%	38%	16%
Yellow Time (s)	3.6	2.4	2.0
All-Red Time (s)	6.4	3.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag		Lead	Lag
Lead-Lag Optimize?			Yes
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
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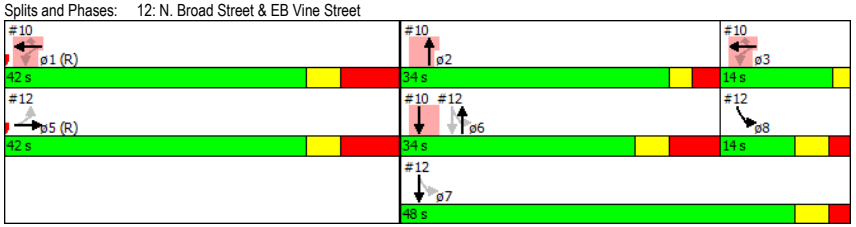
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		84						79		31	10	
Queue Length 95th (ft)		93						110		89	19	
Internal Link Dist (ft)		400			83			170			90	
Turn Bay Length (ft)										45		
Base Capacity (vph)		2578						1090		478	2181	
Starvation Cap Reductn		0						0		191	1041	
Spillback Cap Reductn		0						30		0	0	
Storage Cap Reductn		0						0		0	0	
Reduced v/c Ratio		0.48						0.44		0.82	0.44	

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 16.0	Intersection LOS: B
Intersection Capacity Utilization 80.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 12: N. Broad Street & EB Vine Street



Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 - Report

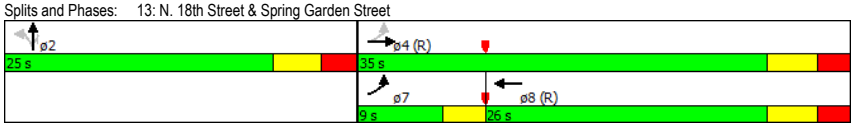
Timings
13: N. 18th Street & Spring Garden Street

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	43	378	376	57	49
Lane Group Flow (vph)	44	390	413	88	51
Turn Type	pm+pt	NA	NA	NA	Perm
Protected Phases	7	4	8	2	
Permitted Phases	4				2
Minimum Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?					
v/c Ratio	0.09	0.25	0.39	0.19	0.10
Control Delay	7.3	9.6	25.1	16.3	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.3	9.6	25.1	16.3	1.1
Queue Length 50th (ft)	7	40	66	23	0
Queue Length 95th (ft)	19	64	77	52	5
Internal Link Dist (ft)		476	350	810	
Turn Bay Length (ft)	145				150
Base Capacity (vph)	478	1562	1068	459	507
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	0.09	0.25	0.39	0.19	0.10

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 13: N. 18th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
13: N. 18th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	43	378	0	0	376	24	28	57	49	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.96		1.00	1.00		0.90	1.00		0.96			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln	185.3	185.3	0.0	0.0	185.3	189.0	189.0	177.9	177.9			
Lanes	1	2	0	0	2	0	0	1	1			
Cap, veh/h	575	1791	0	0	1139	73	220	333	458			
Arrive On Green	0.10	0.48	0.00	0.00	0.67	0.67	0.32	0.32	0.32			
Sat Flow, veh/h	1765	3706	0	0	3418	219	694	1051	1446			
Grp Volume(v), veh/h	44	390	0	0	209	204	73	15	51			
Grp Sat Flow(s),veh/h/ln	1765	1853	0	0	1853	1784	1744	1779	1446			
Q Serve(g_s), s	0.8	3.6	0.0	0.0	2.9	3.0	1.8	0.0	1.5			
Cycle Q Clear(g_c), s	0.8	3.6	0.0	0.0	2.9	3.0	1.8	0.0	1.5			
Prop In Lane	1.00		0.00	0.00		0.12	0.40		1.00			
Lane Grp Cap(c), veh/h	575	1791	0	0	618	595	552	0	458			
V/C Ratio(X)	0.08	0.22	0.00	0.00	0.34	0.34	0.13	0.00	0.11			
Avail Cap(c_a), veh/h	575	1791	0	0	618	595	552	0	458			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	9.0	9.0	0.0	0.0	7.2	7.2	14.6	0.0	14.5			
Incr Delay (d2), s/veh	0.3	0.3	0.0	0.0	1.5	1.6	0.5	0.0	0.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln	0.6	2.7	0.0	0.0	2.2	2.2	1.4	0.0	1.0			
Lane Grp Delay (d), s/veh	9.2	9.2	0.0	0.0	8.6	8.7	15.1	0.0	15.0			
Lane Grp LOS	A	A			A	A	B		B			
Approach Vol, veh/h		434			413			139				
Approach Delay, s/veh		9.2			8.7			13.4				
Approach LOS		A			A			B				

Timer

Assigned Phs	7	4			8			2	
Phs Duration (G+Y+Rc), s	9.0	35.0			26.0			25.0	
Change Period (Y+Rc), s	3.0	6.0			6.0			6.0	
Max Green Setting (Gmax), s	6.0	29.0			20.0			19.0	
Max Q Clear Time (g_c+I1), s	0.0	0.0			0.0			0.0	
Green Ext Time (p_c), s	0.0	0.0			0.0			0.0	

Intersection Summary

HCM 2010 Ctrl Delay			9.6
HCM 2010 LOS			A

Notes

Timings
14: N. Broad Street & Spring Garden Street

Lane Group	EBT	WBT	NBT	NBR	SBL	SBT	SBR
Lane Configurations							
Volume (vph)	375	360	566	43	69	655	76
Lane Group Flow (vph)	442	448	590	45	72	682	79
Turn Type	NA	NA	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	8	2		1	6	
Permitted Phases				2	6		6
Minimum Split (s)	33.0	33.0	35.0	35.0	9.0	35.0	35.0
Total Split (s)	40.0	40.0	41.0	41.0	9.0	50.0	50.0
Total Split (%)	44.4%	44.4%	45.6%	45.6%	10.0%	55.6%	55.6%
Yellow Time (s)	3.6	3.6	3.4	3.4	3.0	3.4	3.4
All-Red Time (s)	2.4	2.4	2.6	2.6	0.0	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Lead/Lag			Lag	Lag	Lead		
Lead-Lag Optimize?							
v/c Ratio	0.37	0.38	0.45	0.07	0.19	0.41	0.11
Control Delay	21.4	21.5	10.8	2.6	12.1	15.6	13.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.4	21.5	10.8	2.6	12.1	15.6	13.0
Queue Length 50th (ft)	93	95	38	0	19	124	23
Queue Length 95th (ft)	133	135	98	4	41	167	48
Internal Link Dist (ft)	400	550	990			290	
Turn Bay Length (ft)				100	170		100
Base Capacity (vph)	1194	1186	1323	625	371	1672	712
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.38	0.45	0.07	0.19	0.41	0.11

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Pretimed

Splits and Phases: 14: N. Broad Street & Spring Garden Street

HCM 2010 Signalized Intersection Summary
14: N. Broad Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	375	49	0	360	70	0	566	43	69	655	76
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	1.00		0.95	0.99		0.94
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.3	189.0	0.0	185.3	189.0	0.0	185.3	185.3	186.2	186.2	186.2
Lanes	0	2	0	0	2	0	0	2	1	1	2	1
Cap, veh/h	0	1209	156	0	1136	219	0	1441	584	482	1821	729
Arrive On Green	0.00	0.38	0.38	0.00	0.38	0.38	0.00	0.78	0.78	0.07	0.49	0.49
Sat Flow, veh/h	0	3201	414	0	3007	579	0	3706	1502	1774	3724	1491
Grp Volume(v), veh/h	0	225	217	0	229	219	0	590	45	72	682	79
Grp Sat Flow(s),veh/h/ln	0	1853	1762	0	1853	1732	0	1853	1502	1774	1862	1491
Q Serve(g_s), s	0.0	7.7	7.9	0.0	7.9	8.1	0.0	4.7	0.6	2.0	10.3	2.6
Cycle Q Clear(g_c), s	0.0	7.7	7.9	0.0	7.9	8.1	0.0	4.7	0.6	2.0	10.3	2.6
Prop In Lane	0.00		0.23	0.00		0.33	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	700	666	0	700	654	0	1441	584	482	1821	729
V/C Ratio(X)	0.00	0.32	0.33	0.00	0.33	0.33	0.00	0.41	0.08	0.15	0.37	0.11
Avail Cap(c_a), veh/h	0	700	666	0	700	654	0	1441	584	482	1821	729
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	19.8	19.9	0.0	19.9	19.9	0.0	6.6	6.2	13.1	14.4	12.4
Incr Delay (d2), s/veh	0.0	1.2	1.3	0.0	1.2	1.4	0.0	0.9	0.3	0.7	0.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	5.7	5.5	0.0	5.8	5.6	0.0	3.0	0.5	1.6	6.8	1.7
Lane Grp Delay (d), s/veh	0.0	21.0	21.2	0.0	21.1	21.3	0.0	7.5	6.4	13.7	15.0	12.7
Lane Grp LOS		C	C		C	C		A	A	B	B	B
Approach Vol, veh/h		442			448			635			833	
Approach Delay, s/veh		21.1			21.2			7.4			14.7	
Approach LOS		C			C			A			B	

Timer

Assigned Phs		4			8			2		1	6	
Phs Duration (G+Y+Rc), s		40.0			40.0			41.0		9.0	50.0	
Change Period (Y+Rc), s		6.0			6.0			6.0		3.0	6.0	
Max Green Setting (Gmax), s		34.0			34.0			35.0		6.0	44.0	
Max Q Clear Time (g_c+I1), s		0.0			0.0			0.0		0.0	0.0	
Green Ext Time (p_c), s		0.0			0.0			0.0		0.0	0.0	

Intersection Summary

HCM 2010 Ctrl Delay			15.2									
HCM 2010 LOS			B									

Notes

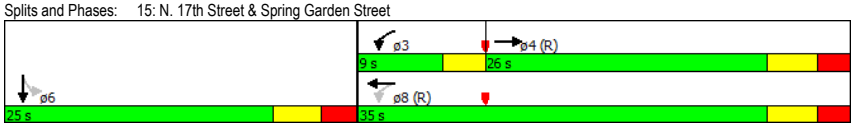
Timings
15: N. 17th Street & Spring Garden Street

Lane Group	EBT	WBL	WBT	SBT
Lane Configurations				
Volume (vph)	388	47	384	63
Lane Group Flow (vph)	471	52	427	132
Turn Type	NA	pm+pt	NA	NA
Protected Phases	4	3	8	6
Permitted Phases		8		
Minimum Split (s)	26.0	9.0	35.0	25.0
Total Split (s)	26.0	9.0	35.0	25.0
Total Split (%)	43.3%	15.0%	58.3%	41.7%
Yellow Time (s)	3.6	3.0	3.6	3.4
All-Red Time (s)	2.4	0.0	2.4	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	3.0	6.0	6.0
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?				
v/c Ratio	0.44	0.11	0.27	0.27
Control Delay	9.3	4.4	7.6	14.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	9.3	4.4	7.6	14.0
Queue Length 50th (ft)	25	5	22	27
Queue Length 95th (ft)	37	m10	57	64
Internal Link Dist (ft)	350		350	290
Turn Bay Length (ft)		165		
Base Capacity (vph)	1065	458	1562	496
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	0.44	0.11	0.27	0.27

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: N. 17th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
15: N. 17th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	388	36	47	384	0	0	0	0	28	63	28
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91	0.97		1.00				1.00		0.96
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.3	189.0	185.3	185.3	0.0				189.0	183.4	189.0
Lanes	0	2	0	1	2	0				0	1	0
Cap, veh/h	0	1103	102	555	1791	0				176	209	187
Arrive On Green	0.00	0.67	0.67	0.20	0.97	0.00				0.32	0.32	0.32
Sat Flow, veh/h	0	3310	305	1765	3706	0				554	530	591
Grp Volume(v), veh/h	0	240	231	52	427	0				101	0	89
Grp Sat Flow(s),veh/h/ln	0	1853	1762	1765	1853	0				1806	0	1703
Q Serve(g_s), s	0.0	3.5	3.6	0.9	0.3	0.0				2.1	0.0	0.0
Cycle Q Clear(g_c), s	0.0	3.5	3.6	0.9	0.3	0.0				2.1	0.0	0.0
Prop In Lane	0.00		0.17	1.00		0.00				0.31		0.35
Lane Grp Cap(c), veh/h	0	618	587	555	1791	0				572	0	0
V/C Ratio(X)	0.00	0.39	0.39	0.09	0.24	0.00				0.18	0.00	0.00
Avail Cap(c_a), veh/h	0	618	587	555	1791	0				572	0	0
HCM Platoon Ratio	1.00	2.00	2.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	7.2	7.3	8.0	0.5	0.0				12.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.8	2.0	0.3	0.3	0.0				0.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	2.7	2.6	0.6	0.3	0.0				1.7	0.0	0.0
Lane Grp Delay (d), s/veh	0.0	9.1	9.2	8.4	0.8	0.0				13.3	0.0	0.0
Lane Grp LOS		A	A	A	A					B		
Approach Vol, veh/h		471			479						190	
Approach Delay, s/veh		9.2			1.7						7.1	
Approach LOS		A			A						A	

Timer

Assigned Phs		4		3	8						6	
Phs Duration (G+Y+Rc), s		26.0		9.0	35.0						25.0	
Change Period (Y+Rc), s		6.0		3.0	6.0						6.0	
Max Green Setting (Gmax), s		20.0		6.0	29.0						19.0	
Max Q Clear Time (g_c+I1), s		0.0		0.0	0.0						0.0	
Green Ext Time (p_c), s		0.0		0.0	0.0						0.0	

Intersection Summary

HCM 2010 Ctrl Delay			5.7									
HCM 2010 LOS			A									

Notes

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	98	282	136	0	0	0	0	180	37
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					0.99						0.99	
Frt					0.961						0.977	
Flt Protected					0.991							
Satd. Flow (prot)	0	0	0	0	3151	0	0	0	0	0	1617	0
Flt Permitted					0.991							
Satd. Flow (perm)	0	0	0	0	3150	0	0	0	0	0	1617	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					146						12	
Link Speed (mph)		30			25			30			25	
Link Distance (ft)		975			430			170			647	
Travel Time (s)		22.2			11.7			3.9			17.6	
Confl. Peds. (#/hr)	17		1	1		17	32		100	100		32
Confl. Bikes (#/hr)						5						2
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Parking (#/hr)					0						0	
Adj. Flow (vph)	0	0	0	113	324	156	0	0	0	0	207	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	593	0	0	0	0	0	250	0
Turn Type				custom	NA						NA	
Protected Phases					1 3						2	
Permitted Phases				1								
Minimum Split (s)				47.5							33.5	
Total Split (s)				47.5							33.5	
Total Split (%)				52.8%							37.2%	
Yellow Time (s)				3.5							3.5	
All-Red Time (s)				1.8							1.5	
Lost Time Adjust (s)											0.0	
Total Lost Time (s)											5.0	
Lead/Lag				Lead							Lag	
Lead-Lag Optimize?												
Act Effct Green (s)					51.2						28.5	
Actuated g/C Ratio					0.57						0.32	
v/c Ratio					0.32						0.48	
Control Delay					1.2						27.3	
Queue Delay					0.0						0.0	
Total Delay					1.2						27.3	
LOS					A						C	
Approach Delay					1.2						27.3	
Approach LOS					A						C	
Queue Length 50th (ft)					0						108	
Queue Length 95th (ft)					3						172	
Internal Link Dist (ft)		895			350			90			567	
Turn Bay Length (ft)												
Base Capacity (vph)					1854						520	
Starvation Cap Reductn					0						0	

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

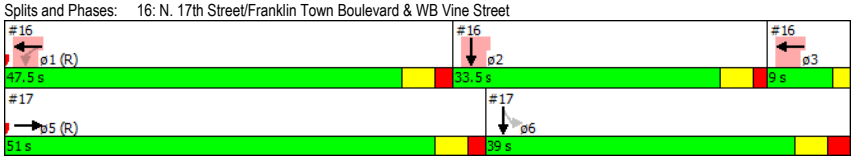
Lane Group	ø3	ø5	ø6
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	5	6
Permitted Phases			
Minimum Split (s)	9.0	51.0	39.0
Total Split (s)	9.0	51.0	39.0
Total Split (%)	10%	57%	43%
Yellow Time (s)	2.0	3.5	3.5
All-Red Time (s)	0.0	1.8	2.5
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag		Lead	Lag
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 - Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn					0						0	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.32						0.48	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 9.0	Intersection LOS: A
Intersection Capacity Utilization 67.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 16: N. 17th Street/Franklin Town Boulevard & WB Vine Street



Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	ø3	ø5	ø6
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 - Report

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	203	29	0	0	0	0	0	0	80	203	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor		1.00									0.97	
Frt		0.981										
Flt Protected											0.986	
Satd. Flow (prot)	0	3271	0	0	0	0	0	0	0	0	3471	0
Flt Permitted											0.986	
Satd. Flow (perm)	0	3271	0	0	0	0	0	0	0	0	3379	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)		26									73	
Link Speed (mph)		30			25			30			30	
Link Distance (ft)		975			430			430			170	
Travel Time (s)		22.2			11.7			9.8			3.9	
Confl. Peds. (#/hr)	1		16	16		1	31		87	87		31
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Parking (#/hr)		0										
Adj. Flow (vph)	0	242	35	0	0	0	0	0	0	95	242	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	277	0	0	0	0	0	0	0	0	337	0
Turn Type		NA								Perm	NA	
Protected Phases		5									6	
Permitted Phases										6		
Minimum Split (s)		51.0								39.0	39.0	
Total Split (s)		51.0								39.0	39.0	
Total Split (%)		56.7%								43.3%	43.3%	
Yellow Time (s)		3.5								3.5	3.5	
All-Red Time (s)		1.8								2.5	2.5	
Lost Time Adjust (s)		0.0									0.0	
Total Lost Time (s)		5.3									6.0	
Lead/Lag		Lead								Lag	Lag	
Lead-Lag Optimize?												
Act Effct Green (s)		45.7									33.0	
Actuated g/C Ratio		0.51									0.37	
v/c Ratio		0.17									0.26	
Control Delay		11.0									7.0	
Queue Delay		0.0									0.9	
Total Delay		11.0									7.9	
LOS		B									A	
Approach Delay		11.0									7.9	
Approach LOS		B									A	
Queue Length 50th (ft)		37									24	
Queue Length 95th (ft)		55									32	
Internal Link Dist (ft)		895			350			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		1673									1285	
Starvation Cap Reductn		0									671	

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	3
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	1.8	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			

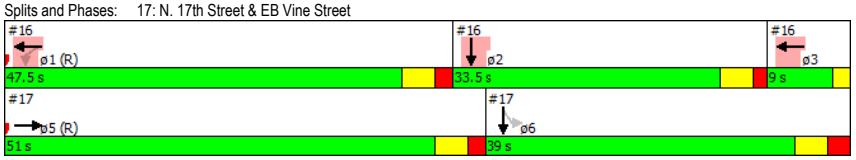
Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 - Report

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0									0	
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.17									0.55	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 9.3	Intersection LOS: A
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: N. 17th Street & EB Vine Street



Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

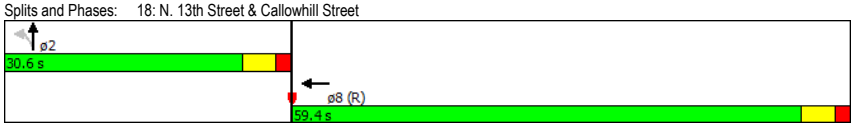
Timings
18: N. 13th Street & Callowhill Street

Lane Group	WBT	NBT
Lane Configurations		
Volume (vph)	154	141
Lane Group Flow (vph)	184	163
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Minimum Split (s)	59.4	30.6
Total Split (s)	59.4	30.6
Total Split (%)	66.0%	34.0%
Yellow Time (s)	3.6	3.6
All-Red Time (s)	1.8	1.8
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.4	5.4
Lead/Lag		
Lead-Lag Optimize?		
v/c Ratio	0.10	0.36
Control Delay	6.9	10.3
Queue Delay	0.0	0.0
Total Delay	6.9	10.3
Queue Length 50th (ft)	18	21
Queue Length 95th (ft)	32	41
Internal Link Dist (ft)	195	480
Turn Bay Length (ft)		
Base Capacity (vph)	1841	454
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.10	0.36

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 90
Control Type: Pretimed

Splits and Phases: 18: N. 13th Street & Callowhill Street



HCM 2010 Signalized Intersection Summary
18: N. 13th Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	154	21	14	141	0	0	0	0
Number				3	8	18	5	2	12			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.97	1.00		1.00			
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln				0.0	185.3	189.0	189.0	185.3	0.0			
Lanes				0	2	0	0	1	0			
Cap, veh/h				0	1915	255	48	469	0			
Arrive On Green				0.00	0.60	0.60	0.28	0.28	0.00			
Sat Flow, veh/h				0	3191	425	170	1675	0			
Grp Volume(v), veh/h				0	93	91	163	0	0			
Grp Sat Flow(s),veh/h/ln				0	1853	1764	1844	1853	0			
Q Serve(g_s), s				0.0	1.9	2.0	6.3	0.0	0.0			
Cycle Q Clear(g_c), s				0.0	1.9	2.0	6.3	0.0	0.0			
Prop In Lane				0.00		0.24	0.09		0.00			
Lane Grp Cap(c), veh/h				0	1112	1058	516	0	0			
V/C Ratio(X)				0.00	0.08	0.09	0.32	0.00	0.00			
Avail Cap(c_a), veh/h				0	1112	1058	516	0	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	7.6	7.6	25.6	0.0	0.0			
Incr Delay (d2), s/veh				0.0	0.1	0.2	1.6	0.0	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln				0.0	1.5	1.5	4.9	0.0	0.0			
Lane Grp Delay (d), s/veh				0.0	7.7	7.8	27.2	0.0	0.0			
Lane Grp LOS					A	A	C					
Approach Vol, veh/h					184			163				
Approach Delay, s/veh					7.7			27.2				
Approach LOS					A			C				

Timer

Assigned Phs	8	2
Phs Duration (G+Y+Rc), s	59.4	30.6
Change Period (Y+Rc), s	5.4	5.4
Max Green Setting (Gmax), s	54.0	25.2
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	16.9
HCM 2010 LOS	B

Notes

Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	717	43	73	129	0	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	11	12	11	10	12	12	10	12
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00		0.96					
Frt					0.991							
Flt Protected							0.950					
Satd. Flow (prot)	0	0	0	0	4673	0	1702	1729	0	0	0	0
Flt Permitted							0.950					
Satd. Flow (perm)	0	0	0	0	4673	0	1628	1729	0	0	0	0
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Satd. Flow (RTOR)					15		76					
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		605			275			170			560	
Travel Time (s)		16.5			6.3			3.9			12.7	
Confl. Peds. (#/hr)	24		3	3		24	53		40	40		53
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Parking (#/hr)					0							
Adj. Flow (vph)	0	0	0	0	747	45	76	134	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	792	0	76	134	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					1			2				
Permitted Phases							2					
Minimum Split (s)					51.0		39.0	39.0				
Total Split (s)					51.0		39.0	39.0				
Total Split (%)					56.7%		43.3%	43.3%				
Yellow Time (s)					3.7		3.5	3.5				
All-Red Time (s)					1.8		2.5	2.5				
Lost Time Adjust (s)					0.0		0.0	0.0				
Total Lost Time (s)					5.5		6.0	6.0				
Lead/Lag					Lead		Lag	Lag				
Lead-Lag Optimize?					Yes		Yes	Yes				
Act Effct Green (s)					45.5		33.0	33.0				
Actuated g/C Ratio					0.51		0.37	0.37				
v/c Ratio					0.33		0.12	0.21				
Control Delay					13.5		1.1	11.7				
Queue Delay					0.0		0.8	1.7				
Total Delay					13.5		1.9	13.4				
LOS					B		A	B				
Approach Delay					13.5			9.3				
Approach LOS					B			A				
Queue Length 50th (ft)					91		1	25				
Queue Length 95th (ft)					118		3	43				
Internal Link Dist (ft)		525			195			90			480	
Turn Bay Length (ft)												
Base Capacity (vph)					2369		645	633				
Starvation Cap Reductn					0		395	364				

Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

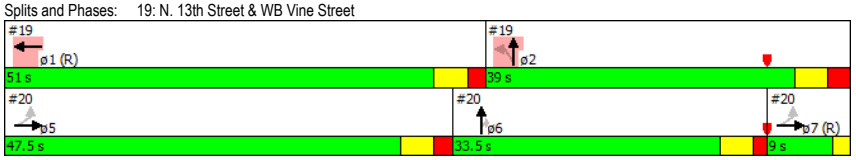
Lane Group	ø5	ø6	ø7
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	7
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	2.0	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 - Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.33		0.30	0.50				

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 7:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.33	
Intersection Signal Delay: 12.6	Intersection LOS: B
Intersection Capacity Utilization 110.0%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 19: N. 13th Street & WB Vine Street



Lane Group	ø5	ø6	ø7
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	62	474	0	0	0	0	0	140	43	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	11	9	12	12	12
Lane Util. Factor	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor									0.95			
Frt									0.850			
Flt Protected		0.994										
Satd. Flow (prot)	0	5028	0	0	0	0	0	1612	1417	0	0	0
Flt Permitted		0.994										
Satd. Flow (perm)	0	5028	0	0	0	0	0	1612	1349	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		42							103			
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		442			275			430			170	
Travel Time (s)		12.1			6.3			9.8			3.9	
Confl. Peds. (#/hr)			11	11			49		36	36		49
Confl. Bikes (#/hr)			2						4			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Parking (#/hr)								0				
Adj. Flow (vph)	68	521	0	0	0	0	0	154	47	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	589	0	0	0	0	0	154	47	0	0	0
Turn Type	Perm	NA						NA	Perm			
Protected Phases		5 7						6				
Permitted Phases	5 7								6			
Minimum Split (s)								33.5	33.5			
Total Split (s)								33.5	33.5			
Total Split (%)								37.2%	37.2%			
Yellow Time (s)								3.5	3.5			
All-Red Time (s)								1.5	1.5			
Lost Time Adjust (s)								0.0	0.0			
Total Lost Time (s)								5.0	5.0			
Lead/Lag								Lag	Lag			
Lead-Lag Optimize?								Yes	Yes			
Act Effct Green (s)		51.0						28.5	28.5			
Actuated g/C Ratio		0.57						0.32	0.32			
v/c Ratio		0.21						0.30	0.09			
Control Delay		5.8						25.3	0.4			
Queue Delay		0.0						0.0	0.0			
Total Delay		5.8						25.3	0.4			
LOS		A						C	A			
Approach Delay		5.8						19.5				
Approach LOS		A						B				
Queue Length 50th (ft)		31						66	0			
Queue Length 95th (ft)		41						117	1			
Internal Link Dist (ft)		362			195			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		2867						510	497			

Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Lane Configurations				
Volume (vph)				
Ideal Flow (vphpl)				
Lane Width (ft)				
Lane Util. Factor				
Ped Bike Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Confl. Peds. (#/hr)				
Confl. Bikes (#/hr)				
Peak Hour Factor				
Parking (#/hr)				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	2	5	7
Permitted Phases				
Minimum Split (s)	51.0	39.0	47.5	9.0
Total Split (s)	51.0	39.0	47.5	9.0
Total Split (%)	57%	43%	53%	10%
Yellow Time (s)	3.7	3.5	3.5	2.0
All-Red Time (s)	1.8	2.5	2.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				

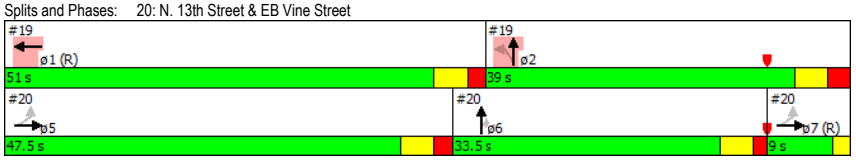
Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 - Report

Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0						0	0			
Spillback Cap Reductn		0						3	0			
Storage Cap Reductn		0						0	0			
Reduced v/c Ratio		0.21						0.30	0.09			

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 7:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.33	
Intersection Signal Delay: 9.3	Intersection LOS: A
Intersection Capacity Utilization 103.5%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 20: N. 13th Street & EB Vine Street



Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 - Report

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	21	266	0	0	0	0	0	352	276	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.98			
Frt									0.850			
Flt Protected		0.996										
Satd. Flow (prot)	0	3496	0	0	0	0	0	5009	1575	0	0	0
Flt Permitted		0.996										
Satd. Flow (perm)	0	3496	0	0	0	0	0	5009	1546	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24							297			
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		430			378			430			170	
Travel Time (s)		11.7			10.3			11.7			4.6	
Confl. Peds. (#/hr)	2		13	13		2	35		7	7		35
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	6%	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%
Adj. Flow (vph)	23	286	0	0	0	0	0	378	297	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	309	0	0	0	0	0	378	297	0	0	0
Turn Type	Perm	NA						NA	Perm			
Protected Phases		5 7						6				
Permitted Phases	5 7								6			
Minimum Split (s)								33.5	33.5			
Total Split (s)								33.5	33.5			
Total Split (%)								37.2%	37.2%			
Yellow Time (s)								3.5	3.5			
All-Red Time (s)								1.5	1.5			
Lost Time Adjust (s)								0.0	0.0			
Total Lost Time (s)								5.0	5.0			
Lead/Lag								Lag	Lag			
Lead-Lag Optimize?												
Act Effct Green (s)		51.2						28.5	28.5			
Actuated g/C Ratio		0.57						0.32	0.32			
v/c Ratio		0.15						0.24	0.43			
Control Delay		7.2						23.2	5.0			
Queue Delay		0.0						0.0	0.0			
Total Delay		7.2						23.2	5.0			
LOS		A						C	A			
Approach Delay		7.2						15.2				
Approach LOS		A						B				
Queue Length 50th (ft)		33						57	0			
Queue Length 95th (ft)		47						82	55			
Internal Link Dist (ft)		350			298			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		1999						1586	692			
Starvation Cap Reductn		0						0	0			
Spillback Cap Reductn		0						0	0			

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Lane Configurations				
Volume (vph)				
Ideal Flow (vphpl)				
Lane Util. Factor				
Ped Bike Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Confl. Peds. (#/hr)				
Peak Hour Factor				
Heavy Vehicles (%)				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	2	5	7
Permitted Phases				
Minimum Split (s)	51.0	39.0	47.5	9.0
Total Split (s)	51.0	39.0	47.5	9.0
Total Split (%)	57%	43%	53%	10%
Yellow Time (s)	3.5	3.5	3.5	2.0
All-Red Time (s)	1.8	2.5	1.8	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lead	
Lead-Lag Optimize?				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				

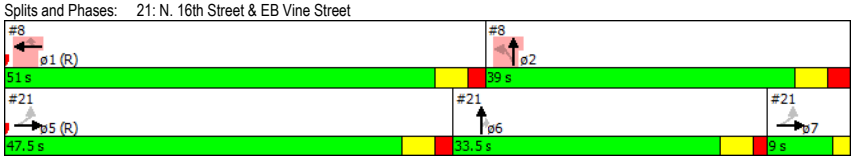
Base (No-Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 - Report

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn		0						0	0			
Reduced v/c Ratio		0.15						0.24	0.43			

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.43	
Intersection Signal Delay: 12.7	Intersection LOS: B
Intersection Capacity Utilization 67.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 21: N. 16th Street & EB Vine Street



Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

PROJECTED (BUILD) CONDITIONS

FRIDAY PM (4-6 PM)
PEAK HOUR TIME PERIOD

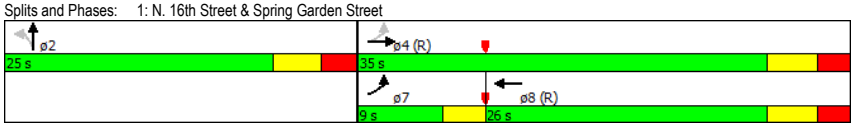
Timings
1: N. 16th Street & Spring Garden Street

Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Volume (vph)	140	667	824	438
Lane Group Flow (vph)	146	695	955	873
Turn Type	pm+pt	NA	NA	NA
Protected Phases	7	4	8	2
Permitted Phases	4			
Minimum Split (s)	9.0	35.0	26.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?				
v/c Ratio	0.56	0.45	0.93	0.93
Control Delay	23.3	16.4	46.9	37.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.3	16.4	46.9	37.4
Queue Length 50th (ft)	39	90	187	178
Queue Length 95th (ft)	m40	m90	m#285	m#276
Internal Link Dist (ft)		350	380	990
Turn Bay Length (ft)	140			
Base Capacity (vph)	263	1550	1027	935
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	0.56	0.45	0.93	0.93

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 65
Control Type: Pretimed
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.

Splits and Phases: 1: N. 16th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
1: N. 16th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	140	667	0	0	824	93	160	438	240	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.89	1.00		0.80			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln	185.3	185.3	0.0	0.0	183.3	187.1	186.2	181.5	186.2			
Lanes	1	2	0	0	2	0	0	2	0			
Cap, veh/h	331	1791	0	0	1009	114	183	512	301			
Arrive On Green	0.20	0.97	0.00	0.00	0.11	0.11	0.32	0.32	0.32			
Sat Flow, veh/h	1765	3706	0	0	3027	342	579	1617	950			
Grp Volume(v), veh/h	146	695	0	0	519	436	515	0	358			
Grp Sat Flow(s),veh/h/ln	1765	1853	0	0	1833	1537	1786	0	1360			
Q Serve(g_s), s	2.8	0.6	0.0	0.0	16.7	16.7	16.6	0.0	14.6			
Cycle Q Clear(g_c), s	2.8	0.6	0.0	0.0	16.7	16.7	16.6	0.0	14.6			
Prop In Lane	1.00		0.00	0.00		0.22	0.32		0.70			
Lane Grp Cap(c), veh/h	331	1791	0	0	611	512	566	0	431			
V/C Ratio(X)	0.44	0.39	0.00	0.00	0.85	0.85	0.91	0.00	0.83			
Avail Cap(c_a), veh/h	331	1791	0	0	611	512	566	0	431			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	11.4	0.5	0.0	0.0	25.2	25.2	19.7	0.0	19.0			
Incr Delay (d2), s/veh	4.2	0.6	0.0	0.0	13.9	16.1	21.3	0.0	16.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln	2.3	0.6	0.0	0.0	13.8	12.2	13.4	0.0	9.3			
Lane Grp Delay (d), s/veh	15.6	1.2	0.0	0.0	39.1	41.3	40.9	0.0	35.8			
Lane Grp LOS	B	A			D	D	D		D			
Approach Vol, veh/h		841			955			873				
Approach Delay, s/veh		3.7			40.1			38.8				
Approach LOS		A			D			D				

Timer

Assigned Phs	7	4			8			2				
Phs Duration (G+Y+Rc), s	9.0	35.0			26.0			25.0				
Change Period (Y+Rc), s	3.0	6.0			6.0			6.0				
Max Green Setting (Gmax), s	6.0	29.0			20.0			19.0				
Max Q Clear Time (g_c+I1), s	0.0	0.0			0.0			0.0				
Green Ext Time (p_c), s	0.0	0.0			0.0			0.0				

Intersection Summary

HCM 2010 Ctrl Delay			28.2									
HCM 2010 LOS			C									

Notes

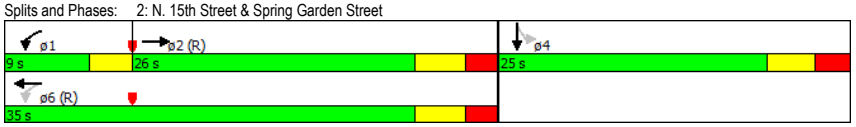
Timings
2: N. 15th Street & Spring Garden Street

Lane Group	EBT	WBL	WBT	SBL	SBT
Lane Configurations					
Volume (vph)	818	150	698	82	325
Lane Group Flow (vph)	934	158	735	86	407
Turn Type	NA	pm+pt	NA	Perm	NA
Protected Phases	2	1	6		4
Permitted Phases		6		4	
Minimum Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (%)	43.3%	15.0%	58.3%	41.7%	41.7%
Yellow Time (s)	3.6	3.0	3.6	3.4	3.4
All-Red Time (s)	2.4	0.0	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	3.0	6.0	6.0	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?					
v/c Ratio	0.90	0.65	0.48	0.22	0.87
Control Delay	27.4	22.9	11.7	17.0	42.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	27.4	22.9	11.7	17.0	42.4
Queue Length 50th (ft)	144	27	87	23	137
Queue Length 95th (ft)	m#259	#86	127	53	#284
Internal Link Dist (ft)	380		400		290
Turn Bay Length (ft)		115		100	
Base Capacity (vph)	1043	244	1534	390	466
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	0.90	0.65	0.48	0.22	0.87

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 15 (25%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed
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.

Splits and Phases: 2: N. 15th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
2: N. 15th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	818	69	150	698	0	0	0	0	82	325	62
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.53	0.91		1.00				1.00		0.83
Parking Bus Adj	1.00	1.00	0.90	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	182.2	189.0	178.2	183.4	0.0				168.0	185.0	189.0
Lanes	0	2	0	1	2	0				1	1	0
Cap, veh/h	0	970	82	342	1773	0				507	461	88
Arrive On Green	0.00	0.67	0.67	0.10	0.48	0.00				0.32	0.32	0.32
Sat Flow, veh/h	0	2910	247	1697	3669	0				1600	1456	277
Grp Volume(v), veh/h	0	539	395	158	735	0				86	0	407
Grp Sat Flow(s),veh/h/ln	0	1822	1334	1697	1834	0				1600	1850	1732
Q Serve(g_s), s	0.0	14.5	14.5	3.3	7.8	0.0				2.3	0.0	12.6
Cycle Q Clear(g_c), s	0.0	14.5	14.5	3.3	7.8	0.0				2.3	0.0	12.6
Prop In Lane	0.00		0.18	1.00		0.00				1.00		0.16
Lane Grp Cap(c), veh/h	0	607	445	342	1773	0				507	0	549
V/C Ratio(X)	0.00	0.89	0.89	0.46	0.41	0.00				0.17	0.00	0.74
Avail Cap(c_a), veh/h	0	607	445	342	1773	0				507	0	549
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	9.1	9.1	12.5	10.0	0.0				14.8	0.0	18.3
Incr Delay (d2), s/veh	0.0	17.4	22.2	4.4	0.7	0.0				0.7	0.0	8.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	8.3	7.1	2.8	5.1	0.0				1.7	0.0	8.9
Lane Grp Delay (d), s/veh	0.0	26.5	31.3	17.0	10.7	0.0				15.5	0.0	27.1
Lane Grp LOS		C	C	B	B					B		C
Approach Vol, veh/h		934			893						493	
Approach Delay, s/veh		28.5			11.8						25.1	
Approach LOS		C			B						C	

Timer

Assigned Phs		2		1	6						4	
Phs Duration (G+Y+Rc), s		26.0		9.0	35.0						25.0	
Change Period (Y+Rc), s		6.0		3.0	6.0						6.0	
Max Green Setting (Gmax), s		20.0		6.0	29.0						19.0	
Max Q Clear Time (g_c+I1), s		0.0		0.0	0.0						0.0	
Green Ext Time (p_c), s		0.0		0.0	0.0						0.0	

Intersection Summary

HCM 2010 Ctrl Delay		21.4	
HCM 2010 LOS		C	

Notes

Lanes, Volumes, Timings
3: Franklin Town Boulevard & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	198	55	137	37	333	188	38	42	8	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	11	12	12	12	12	12	16	12	12	12	12
Grade (%)		-1%			2%			3%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.953			0.955			0.987				
Flt Protected		0.975			0.997			0.979				
Satd. Flow (prot)	0	1648	0	0	1572	0	0	1747	0	0	0	0
Flt Permitted		0.975			0.997			0.979				
Satd. Flow (perm)	0	1648	0	0	1572	0	0	1747	0	0	0	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		646			325			647			208	
Travel Time (s)		17.6			8.9			17.6			5.7	
Confl. Peds. (#/hr)	56		53	53		56	28		24	24		28
Confl. Bikes (#/hr)			5			8			1			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	13%	2%	2%	2%	2%	4%	2%	25%	2%	2%	2%
Parking (#/hr)					0			0				
Adj. Flow (vph)	213	59	147	40	358	202	41	45	9	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	419	0	0	600	0	0	95	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.05	1.00	1.02	1.17	1.02	1.03	1.00	1.03	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	CBD
Control Type: Unsignalized	
Intersection Capacity Utilization 79.0%	ICU Level of Service D
Analysis Period (min) 15	

HCM 2010 AWSC
3: Franklin Town Boulevard & Callowhill Street

Intersection	
Intersection Delay, s/veh	16.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	198	55	137	37	333	188	38	42	8	0	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	13	2	2	2	2	4	2	25	2	2	2
Mvmt Flow	213	59	147	40	358	202	41	45	9	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	13.6	19.9	10.5
HCM LOS	B	C	B

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	43%	51%	7%
Vol Thru, %	48%	14%	60%
Vol Right, %	9%	35%	34%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	88	390	558
LT Vol	42	55	333
Through Vol	8	137	188
RT Vol	38	198	37
Lane Flow Rate	95	419	600
Geometry Grp	1	1	1
Degree of Util (X)	0.165	0.553	0.75
Departure Headway (Hd)	6.263	4.748	4.501
Convergence, Y/N	Yes	Yes	Yes
Cap	576	751	798
Service Time	4.263	2.826	2.568
HCM Lane V/C Ratio	0.165	0.558	0.752
HCM Control Delay	10.5	13.6	19.9
HCM Lane LOS	B	B	C
HCM 95th-tile Q	0.6	3.4	7

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
4: N. 17th Street & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	62	195	350	0	0	0	0	0	285	144
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	11	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			-4%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.865								0.955	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	1429	1693	1659	0	0	0	0	0	1529	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	1429	1693	1659	0	0	0	0	0	1529	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		325			430			230			1070	
Travel Time (s)		8.9			11.7			6.3			29.2	
Confl. Peds. (#/hr)	47		75	75		47	112		60	60		112
Confl. Bikes (#/hr)			1			7						20
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	5	0
Parking (#/hr)			0		0						0	
Adj. Flow (vph)	0	0	70	222	398	0	0	0	0	0	324	164
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	70	222	398	0	0	0	0	0	488	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.15	1.06	1.16	1.01	1.01	1.01	1.01	0.98	1.20	0.98
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization 59.9%		ICU Level of Service B	
Analysis Period (min) 15			

HCM 2010 AWSC
4: N. 17th Street & Callowhill Street

Intersection	
Intersection Delay, s/veh	19.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	62	195	350	0	0	0	0	0	285	144
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	3	2	2	2	2	2	2	2	3	2
Mvmt Flow	0	0	70	222	398	0	0	0	0	0	324	164
Number of Lanes	0	0	1	1	1	0	0	0	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	9.6	18	22.1
HCM LOS	A	C	C

Lane	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	100%	0%	0%
Vol Thru, %	0%	0%	100%	66%
Vol Right, %	100%	0%	0%	34%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	62	195	350	429
LT Vol	0	0	350	285
Through Vol	62	0	0	144
RT Vol	0	195	0	0
Lane Flow Rate	70	222	398	488
Geometry Grp	5	7	7	2
Degree of Util (X)	0.113	0.406	0.672	0.735
Departure Headway (Hd)	5.773	6.588	6.081	5.427
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	619	547	597	668
Service Time	3.823	4.322	3.814	3.461
HCM Lane V/C Ratio	0.113	0.406	0.667	0.731
HCM Control Delay	9.6	13.8	20.4	22.1
HCM Lane LOS	A	B	C	C
HCM 95th-tile Q	0.4	2	5.1	6.4

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Timings
5: N. 16th Street & Callowhill Street

Lane Group	WBT	NBT
Lane Configurations		
Volume (vph)	421	853
Lane Group Flow (vph)	708	1005
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Minimum Split (s)	21.0	39.0
Total Split (s)	21.0	39.0
Total Split (%)	35.0%	65.0%
Yellow Time (s)	3.0	3.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
v/c Ratio	0.85	0.54
Control Delay	30.1	9.1
Queue Delay	0.0	0.0
Total Delay	30.1	9.1
Queue Length 50th (ft)	107	101
Queue Length 95th (ft)	#200	145
Internal Link Dist (ft)	380	136
Turn Bay Length (ft)		
Base Capacity (vph)	829	1878
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.85	0.54

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 17 (28%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: N. 16th Street & Callowhill Street

HCM 2010 Signalized Intersection Summary
5: N. 16th Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	421	237	82	853	0	0	0	0
Number				3	8	18	5	2	12			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.68	1.00		1.00			
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln				0.0	185.3	189.0	187.1	180.1	0.0			
Lanes				0	2	0	0	2	0			
Cap, veh/h				0	510	278	170	1862	0			
Arrive On Green				0.00	0.27	0.27	0.57	0.57	0.00			
Sat Flow, veh/h				0	1911	1044	300	3286	0			
Grp Volume(v), veh/h				0	439	269	524	481	0			
Grp Sat Flow(s),veh/h/ln				0	1853	1102	1786	1801	0			
Q Serve(g_s), s				0.0	13.7	14.2	10.8	9.5	0.0			
Cycle Q Clear(g_c), s				0.0	13.7	14.2	10.8	9.5	0.0			
Prop In Lane				0.00		0.95	0.17		0.00			
Lane Grp Cap(c), veh/h				0	494	294	1012	1020	0			
V/C Ratio(X)				0.00	0.89	0.92	0.52	0.47	0.00			
Avail Cap(c_a), veh/h				0	494	294	1012	1020	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	21.1	21.3	8.0	7.7	0.0			
Incr Delay (d2), s/veh				0.0	20.5	34.7	1.9	1.6	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln				0.0	11.7	9.1	6.5	5.8	0.0			
Lane Grp Delay (d), s/veh				0.0	41.7	56.1	9.9	9.2	0.0			
Lane Grp LOS					D	E	A	A				
Approach Vol, veh/h					708			1005				
Approach Delay, s/veh					47.2			9.6				
Approach LOS					D			A				

Timer

Assigned Phs	8	2
Phs Duration (G+Y+Rc), s	21.0	39.0
Change Period (Y+Rc), s	5.0	5.0
Max Green Setting (Gmax), s	16.0	34.0
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	25.1
HCM 2010 LOS	C

Notes

HCM 2010 Signals-Pedestrians
5: N. 16th Street & Callowhill Street

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	23.0	24.0	24.0	24.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	2	2	2
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	0	2	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	25	25	25
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	30.0	30.0	30.0	30.0
Pedestrian Compliance Code	Fair	Fair	Fair	Fair
Pedestrian Crosswalk Score	1.93	2.00	2.12	2.18
Pedestrian Crosswalk LOS	A	A	B	B

HCM 2010 Signals-Bicycles
5: N. 16th Street & Callowhill Street

Approach	EB	WB	NB	SB
Bicycle Flow Rate (bike/h)	0	0	0	0
Total Flow Rate (veh/h)	0	708	1005	0
Effct. Green for Bike (s)	0.0	16.0	34.0	0.0
Cross Street Width (ft)	24.0	24.0	24.0	23.0
Through Lanes Number	0	2	2	0
Through Lane Width (ft)	12.0	12.0	12.0	12.0
Bicycle Lane Width (ft)	0.0	0.0	0.0	0.0
Paved Shoulder Width (ft)	0.0	0.0	0.0	0.0
Curb Is Present?	No	No	No	No
On Street Parking?	No	No	No	No
Bicycle Lane Capacity (bike/h)	0	533	1133	0
Bicycle Delay (s/bike)	0.0	16.1	5.6	0.0
Bicycle Compliance		Fair	Good	
Bicycle LOS Score	0.00	2.51	2.76	0.00
Bicycle LOS		B	C	

Lanes, Volumes, Timings
6: N. 15th Street & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	163	496	0	0	0	0	0	700	126
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		0%			0%			0%			-3%	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt											0.979	
Flt Protected					0.988							
Satd. Flow (prot)	0	0	0	0	3304	0	0	0	0	0	1526	0
Flt Permitted					0.988							
Satd. Flow (perm)	0	0	0	0	3304	0	0	0	0	0	1526	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		460			480			146			1070	
Travel Time (s)		12.5			13.1			4.0			29.2	
Confl. Peds. (#/hr)	57		40	40		57	34		324	324		34
Confl. Bikes (#/hr)						1						1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	6%	13%
Parking (#/hr)					0						0	
Adj. Flow (vph)	0	0	0	168	511	0	0	0	0	0	722	130
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	679	0	0	0	0	0	852	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.08	1.01	1.01	1.01	1.01	0.99	1.18	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	CBD
Control Type: Unsignalized	
Intersection Capacity Utilization 73.7%	ICU Level of Service D
Analysis Period (min) 15	

HCM 2010 AWSC
6: N. 15th Street & Callowhill Street

Intersection	
Intersection Delay, s/veh	41.1
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	0	163	496	0	0	0	0	0	700	126
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	6	13
Mvmt Flow	0	0	0	168	511	0	0	0	0	0	722	130
Number of Lanes	0	0	0	0	2	0	0	0	0	0	1	0

Approach	WB	SB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left		WB
Conflicting Lanes Left	0	2
Conflicting Approach Right	SB	
Conflicting Lanes Right	1	0
HCM Control Delay	19.2	58.6
HCM LOS	C	F

Lane	WBLn1	WBLn2	SBLn1
Vol Left, %	50%	0%	0%
Vol Thru, %	50%	100%	85%
Vol Right, %	0%	0%	15%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	328	331	826
LT Vol	165	331	700
Through Vol	0	0	126
RT Vol	163	0	0
Lane Flow Rate	338	341	852
Geometry Grp	7	7	2
Degree of Util (X)	0.627	0.608	1
Departure Headway (Hd)	6.668	6.42	5.511
Convergence, Y/N	Yes	Yes	Yes
Cap	545	566	656
Service Time	4.368	4.12	3.568
HCM Lane V/C Ratio	0.62	0.602	1.299
HCM Control Delay	19.9	18.6	58.6
HCM Lane LOS	C	C	F
HCM 95th-tile Q	4.3	4.1	15.6

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Timings
7: N. Broad Street & Callowhill Street

Lane Group	WBL	WBT	NBL	NBT	SBT
Lane Configurations					
Volume (vph)	60	316	145	780	790
Lane Group Flow (vph)	66	444	159	857	1005
Turn Type	Perm	NA	Perm	NA	NA
Protected Phases		8		2	6
Permitted Phases	8		2		
Minimum Split (s)	33.0	33.0	57.0	57.0	57.0
Total Split (s)	33.0	33.0	57.0	57.0	57.0
Total Split (%)	36.7%	36.7%	63.3%	63.3%	63.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.0	5.0	5.0
Lead/Lag					
Lead-Lag Optimize?					
v/c Ratio	0.17	0.47	0.71	0.32	0.57
Control Delay	26.4	29.7	47.8	20.4	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	26.4	29.7	47.8	20.4	8.1
Queue Length 50th (ft)	31	118	95	169	73
Queue Length 95th (ft)	m66	171	#185	209	85
Internal Link Dist (ft)		525		480	990
Turn Bay Length (ft)			300		
Base Capacity (vph)	390	944	223	2640	1774
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	0.17	0.47	0.71	0.32	0.57

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 49 (54%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Pretimed
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.

Splits and Phases: 7: N. Broad Street & Callowhill Street

HCM 2010 Signalized Intersection Summary
7: N. Broad Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	60	316	88	145	780	0	0	790	125
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.79	0.93		1.00	1.00		0.70
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln				182.5	182.5	186.2	181.6	179.8	0.0	0.0	186.2	189.9
Lanes				1	2	0	1	3	0	0	2	0
Cap, veh/h				521	783	211	342	3117	0	0	1699	268
Arrive On Green				0.10	0.10	0.10	0.19	0.19	0.00	0.00	0.77	0.77
Sat Flow, veh/h				1738	2611	702	563	5395	0	0	2941	464
Grp Volume(v), veh/h				66	238	206	159	857	0	0	550	455
Grp Sat Flow(s),veh/h/ln				1738	1825	1488	563	1798	0	0	1862	1543
Q Serve(g_s), s				3.1	11.1	11.7	23.7	12.2	0.0	0.0	10.1	10.1
Cycle Q Clear(g_c), s				3.1	11.1	11.7	33.8	12.2	0.0	0.0	10.1	10.1
Prop In Lane				1.00		0.47	1.00		0.00	0.00		0.30
Lane Grp Cap(c), veh/h				521	548	446	342	3117	0	0	1076	892
V/C Ratio(X)				0.13	0.44	0.46	0.46	0.27	0.00	0.00	0.51	0.51
Avail Cap(c_a), veh/h				521	548	446	342	3117	0	0	1076	892
HCM Platoon Ratio				0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.33	1.33
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				29.8	33.4	33.7	33.8	20.3	0.0	0.0	5.6	5.6
Incr Delay (d2), s/veh				0.5	2.5	3.4	4.5	0.2	0.0	0.0	1.7	2.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (85%), veh/ln				2.6	8.3	7.5	6.1	8.5	0.0	0.0	5.5	4.8
Lane Grp Delay (d), s/veh				30.3	35.9	37.1	38.3	20.5	0.0	0.0	7.3	7.7
Lane Grp LOS				C	D	D	D	C			A	A
Approach Vol, veh/h					510			1016			1005	
Approach Delay, s/veh					35.6			23.3			7.5	
Approach LOS					D			C			A	

Timer

Assigned Phs					8			2			6	
Phs Duration (G+Y+Rc), s					33.0			57.0			57.0	
Change Period (Y+Rc), s					6.0			5.0			5.0	
Max Green Setting (Gmax), s					27.0			52.0			52.0	
Max Q Clear Time (g_c+I1), s					0.0			0.0			0.0	
Green Ext Time (p_c), s					0.0			0.0			0.0	

Intersection Summary

HCM 2010 Ctrl Delay			19.5									
HCM 2010 LOS			B									

Notes

HCM 2010 Signals-Pedestrians
7: N. Broad Street & Callowhill Street

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	26.3	32.2	72.1	65.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	3	7	5
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	6	2	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	25	25	25
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	45.0	45.0	45.0	45.0
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	1.99	2.09	2.83	2.63
Pedestrian Crosswalk LOS	A	B	C	B

HCM 2010 Signals-Bicycles
7: N. Broad Street & Callowhill Street

Approach	EB	WB	NB	SB
Bicycle Flow Rate (bike/h)	0	0	0	0
Total Flow Rate (veh/h)	0	510	1016	1005
Effct. Green for Bike (s)	0.0	27.0	52.0	52.0
Cross Street Width (ft)	72.1	65.0	32.2	26.3
Through Lanes Number	0	2	3	2
Through Lane Width (ft)	12.0	11.0	10.0	10.0
Bicycle Lane Width (ft)	0.0	0.0	0.0	0.0
Paved Shoulder Width (ft)	0.0	0.0	0.0	0.0
Curb Is Present?	No	No	No	No
On Street Parking?	No	No	No	No
Bicycle Lane Capacity (bike/h)	0	600	1156	1156
Bicycle Delay (s/bike)	0.0	22.0	8.0	8.0
Bicycle Compliance		Fair	Good	Good
Bicycle LOS Score	0.00	3.19	3.04	3.22
Bicycle LOS		C	C	C

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	749	807	83	737	0	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	11	12	11	12	12	12	12
Grade (%)		0%			0%			-1%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.88	0.91	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor						0.94		0.96				
Frt						0.850						
Flt Protected								0.995				
Satd. Flow (prot)	0	0	0	0	3521	2680	0	4755	0	0	0	0
Flt Permitted								0.995				
Satd. Flow (perm)	0	0	0	0	3521	2528	0	4577	0	0	0	0
Right Turn on Red			Yes			No	Yes		Yes			Yes
Satd. Flow (RTOR)								28				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		430			460			170			344	
Travel Time (s)		11.7			12.5			4.6			9.4	
Confl. Peds. (#/hr)	69		33	33		69	604		16	16		604
Confl. Bikes (#/hr)						3			12			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	4%	5%	2%	2%	2%	2%
Adj. Flow (vph)	0	0	0	0	788	849	87	776	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	788	849	0	863	0	0	0	0
Turn Type					NA	Perm	Perm	NA				
Protected Phases					1			2				
Permitted Phases						1	2					
Minimum Split (s)					51.0	51.0	39.0	39.0				
Total Split (s)					51.0	51.0	39.0	39.0				
Total Split (%)					56.7%	56.7%	43.3%	43.3%				
Yellow Time (s)					3.5	3.5	3.5	3.5				
All-Red Time (s)					1.8	1.8	2.5	2.5				
Lost Time Adjust (s)					0.0	0.0		0.0				
Total Lost Time (s)					5.3	5.3		6.0				
Lead/Lag					Lead	Lead	Lag	Lag				
Lead-Lag Optimize?												
Act Effct Green (s)					45.7	45.7		33.0				
Actuated g/C Ratio					0.51	0.51		0.37				
v/c Ratio					0.44	0.66		0.51				
Control Delay					13.8	18.1		3.0				
Queue Delay					0.0	0.0		0.1				
Total Delay					13.8	18.1		3.1				
LOS					B	B		A				
Approach Delay					16.1			3.1				
Approach LOS					B			A				
Queue Length 50th (ft)					136	160		8				
Queue Length 95th (ft)					m140	m164		10				
Internal Link Dist (ft)		350			380			90			264	
Turn Bay Length (ft)												

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	7
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	1.8	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			

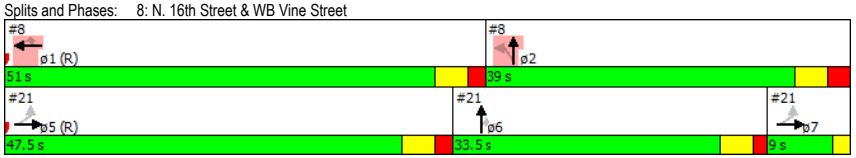
Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 Report

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)					1787	1283		1695				
Starvation Cap Reductn					0	0		174				
Spillback Cap Reductn					0	0		0				
Storage Cap Reductn					0	0		0				
Reduced v/c Ratio					0.44	0.66		0.57				

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 11.6	Intersection LOS: B
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 8: N. 16th Street & WB Vine Street



Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	77	939	0	0	0	0	0	1357	586
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			2%	
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	0.86	0.86
Ped Bike Factor					1.00						0.99	
Frt											0.955	
Flt Protected					0.996							
Satd. Flow (prot)	0	0	0	0	4846	0	0	0	0	0	5744	0
Flt Permitted					0.996							
Satd. Flow (perm)	0	0	0	0	4846	0	0	0	0	0	5744	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					145						54	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		460			480			170			414	
Travel Time (s)		12.5			13.1			4.6			11.3	
Confl. Peds. (#/hr)	59		2	2		59	34		518	518		34
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Parking (#/hr)					0							
Adj. Flow (vph)	0	0	0	80	978	0	0	0	0	0	1414	610
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1058	0	0	0	0	0	2024	0
Turn Type				Perm	NA						NA	
Protected Phases					1						2	
Permitted Phases				1								
Minimum Split (s)				49.0	49.0						41.0	
Total Split (s)				49.0	49.0						41.0	
Total Split (%)				54.4%	54.4%						45.6%	
Yellow Time (s)				3.5	3.5						3.5	
All-Red Time (s)				1.5	1.5						11.5	
Lost Time Adjust (s)					0.0						0.0	
Total Lost Time (s)					5.0						15.0	
Lead/Lag				Lead	Lead						Lag	
Lead-Lag Optimize?												
Act Effct Green (s)					44.0						26.0	
Actuated g/C Ratio					0.49						0.29	
v/c Ratio					0.43						1.28dr	
Control Delay					4.6						122.8	
Queue Delay					0.1						0.2	
Total Delay					4.6						123.0	
LOS					A						F	
Approach Delay					4.6						123.0	
Approach LOS					A						F	
Queue Length 50th (ft)					18						~403	
Queue Length 95th (ft)					31						#481	
Internal Link Dist (ft)		380			400			90			334	
Turn Bay Length (ft)												
Base Capacity (vph)					2443						1697	

Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	ø5	ø6
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Grade (%)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Peak Hour Factor		
Parking (#/hr)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	5	6
Permitted Phases		
Minimum Split (s)	49.0	41.0
Total Split (s)	49.0	41.0
Total Split (%)	54%	46%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.5	3.5
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lag
Lead-Lag Optimize?		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		

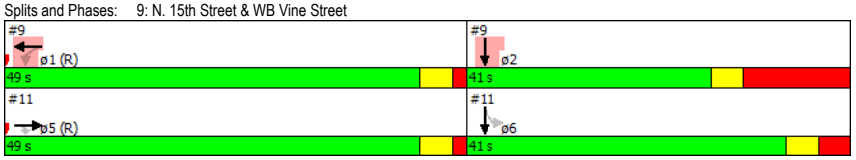
Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					236						121	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.48						1.28	

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 100	
Control Type: Pretimed	
Maximum v/c Ratio: 1.24	
Intersection Signal Delay: 82.4	Intersection LOS: F
Intersection Capacity Utilization 83.9%	ICU Level of Service E
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 9: N. 15th Street & WB Vine Street



Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	ø5	ø6
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 Report

Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	172	878	198	0	790	0	0	656	131
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	11	12	12	10	12	12	10	12
Grade (%)		0%			1%			-1%			1%	
Storage Length (ft)	0		0	0		0	0		0	100		0
Storage Lanes	0		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.86	0.86
Ped Bike Factor				1.00		0.91					0.94	
Frt						0.850					0.975	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	0	1751	3386	1552	0	4686	0	0	5345	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	0	1750	3386	1409	0	4686	0	0	5345	0
Right Turn on Red			Yes			No			Yes			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		480			605			170			560	
Travel Time (s)		13.1			16.5			4.6			15.3	
Confl. Peds. (#/hr)	107		1	1		107	564		239	239		564
Confl. Bikes (#/hr)						39			1			11
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	2%	2%	3%	2%	3%	2%	2%	3%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	2	0	0	5	0
Adj. Flow (vph)	0	0	0	181	924	208	0	832	0	0	691	138
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	181	924	208	0	832	0	0	829	0
Turn Type				Perm	NA	Perm		NA			NA	
Protected Phases					1 3!			2			6!	
Permitted Phases				1 3!		1 3						
Minimum Split (s)								34.0			34.0	
Total Split (s)								34.0			34.0	
Total Split (%)								37.8%			37.8%	
Yellow Time (s)								2.4			3.6	
All-Red Time (s)								3.0			5.4	
Lost Time Adjust (s)								0.0			0.0	
Total Lost Time (s)								5.4			9.0	
Lead/Lag								Lead			Lead	
Lead-Lag Optimize?												
Act Effct Green (s)				46.0	46.0	46.0		28.6			25.0	
Actuated g/C Ratio				0.51	0.51	0.51		0.32			0.28	
v/c Ratio				0.20	0.53	0.29		0.56			0.56	
Control Delay				23.3	27.4	24.8		8.2			15.2	
Queue Delay				0.0	0.0	0.0		9.2			0.2	
Total Delay				23.3	27.4	24.8		17.4			15.4	
LOS				C	C	C		B			B	
Approach Delay					26.4			17.4			15.4	
Approach LOS					C			B			B	

Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø7	ø8
Lane Configurations					
Volume (vph)					
Ideal Flow (vphpl)					
Lane Width (ft)					
Grade (%)					
Storage Length (ft)					
Storage Lanes					
Taper Length (ft)					
Lane Util. Factor					
Ped Bike Factor					
Frt					
Flt Protected					
Satd. Flow (prot)					
Flt Permitted					
Satd. Flow (perm)					
Right Turn on Red					
Satd. Flow (RTOR)					
Link Speed (mph)					
Link Distance (ft)					
Travel Time (s)					
Confl. Peds. (#/hr)					
Confl. Bikes (#/hr)					
Peak Hour Factor					
Heavy Vehicles (%)					
Bus Blockages (#/hr)					
Adj. Flow (vph)					
Shared Lane Traffic (%)					
Lane Group Flow (vph)					
Turn Type					
Protected Phases	1	3	5	7	8
Permitted Phases					
Minimum Split (s)	42.0	14.0	42.0	48.0	14.0
Total Split (s)	42.0	14.0	42.0	48.0	14.0
Total Split (%)	47%	16%	47%	53%	16%
Yellow Time (s)	3.6	2.0	3.6	3.6	3.6
All-Red Time (s)	6.4	0.0	6.4	2.4	2.4
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag		Lag			Lag
Lead-Lag Optimize?		Yes			
Act Effct Green (s)					
Actuated g/C Ratio					
v/c Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 Report

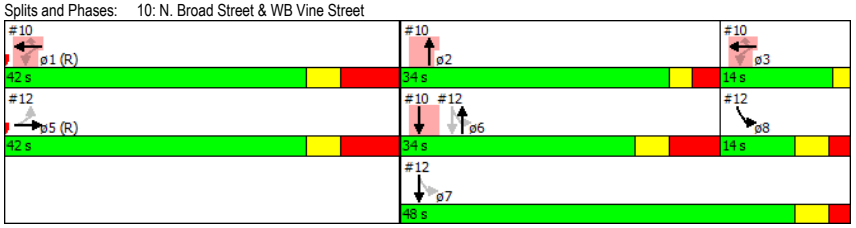
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)				76	218	88		53			88	
Queue Length 95th (ft)				131	282	150		m53			105	
Internal Link Dist (ft)		400			525			90			480	
Turn Bay Length (ft)												
Base Capacity (vph)				894	1730	720		1489			1484	
Starvation Cap Reductn				0	0	0		622			0	
Spillback Cap Reductn				0	0	0		0			143	
Storage Cap Reductn				0	0	0		0			0	
Reduced v/c Ratio				0.20	0.53	0.29		0.96			0.62	

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 20.8	Intersection LOS: C
Intersection Capacity Utilization 84.4%	ICU Level of Service E
Analysis Period (min) 15	

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

! Phase conflict between lane groups.

Splits and Phases: 10: N. Broad Street & WB Vine Street



Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø7	ø8
Queue Length 50th (ft)					
Queue Length 95th (ft)					
Internal Link Dist (ft)					
Turn Bay Length (ft)					
Base Capacity (vph)					
Starvation Cap Reductn					
Spillback Cap Reductn					
Storage Cap Reductn					
Reduced v/c Ratio					

Intersection Summary

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 Report

Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1380	349	0	0	0	0	0	0	554	777	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		2%			0%			0%			4%	
Lane Util. Factor	1.00	0.86	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00
Ped Bike Factor			0.98							0.69		
Frt			0.850									
Flt Protected										0.950		
Satd. Flow (prot)	0	6310	2692	0	0	0	0	0	0	1725	4746	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	6310	2627	0	0	0	0	0	0	1192	4746	0
Right Turn on Red			No			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)										24		
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		82			480			430			170	
Travel Time (s)		2.2			13.1			11.7			4.6	
Confl. Peds. (#/hr)	1		19	19		1	19		433	433		19
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	4%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Adj. Flow (vph)	0	1438	364	0	0	0	0	0	0	577	809	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1438	364	0	0	0	0	0	0	577	809	0
Turn Type		NA	Perm							Perm	NA	
Protected Phases		5									6	
Permitted Phases			5							6		
Minimum Split (s)		49.0	49.0							41.0	41.0	
Total Split (s)		49.0	49.0							41.0	41.0	
Total Split (%)		54.4%	54.4%							45.6%	45.6%	
Yellow Time (s)		3.5	3.5							3.5	3.5	
All-Red Time (s)		1.5	1.5							3.5	3.5	
Lost Time Adjust (s)		0.0	0.0							0.0	0.0	
Total Lost Time (s)		5.0	5.0							7.0	7.0	
Lead/Lag		Lead	Lead							Lag	Lag	
Lead-Lag Optimize?												
Act Effct Green (s)		44.0	44.0							34.0	34.0	
Actuated g/C Ratio		0.49	0.49							0.38	0.38	
v/c Ratio		0.47	0.28							1.24	0.45	
Control Delay		12.1	14.4							126.0	2.2	
Queue Delay		0.0	0.0							0.9	2.8	
Total Delay		12.1	14.4							126.9	5.0	
LOS		B	B							F	A	
Approach Delay		12.6									55.8	
Approach LOS		B									E	
Queue Length 50th (ft)		107	67							~414	10	
Queue Length 95th (ft)		146	100							m#95	m9	
Internal Link Dist (ft)		2			400			350			90	
Turn Bay Length (ft)												

Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	ø1	ø2
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Grade (%)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Heavy Vehicles (%)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	2
Permitted Phases		
Minimum Split (s)	49.0	41.0
Total Split (s)	49.0	41.0
Total Split (%)	54%	46%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.5	11.5
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lag
Lead-Lag Optimize?		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 Report

Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)		3084	1284							465	1792	
Starvation Cap Reductn		0	0							44	840	
Spillback Cap Reductn		0	0							0	0	
Storage Cap Reductn		0	0							0	0	
Reduced v/c Ratio		0.47	0.28							1.37	0.85	

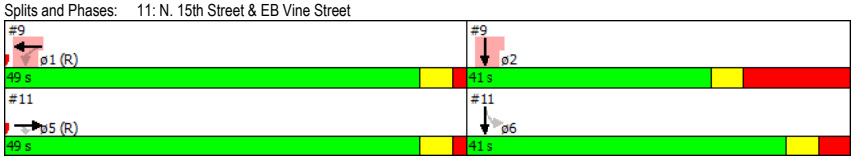
Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 100	
Control Type: Pretimed	
Maximum v/c Ratio: 1.24	
Intersection Signal Delay: 31.4	Intersection LOS: C
Intersection Capacity Utilization 83.9%	ICU Level of Service E
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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.

Splits and Phases: 11: N. 15th Street & EB Vine Street



Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	ø1	ø2
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 Report

Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	198	1608	64	0	0	0	0	597	426	225	670	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	10	12	12	10	12
Grade (%)		2%			0%			2%			2%	
Storage Length (ft)	0		250	0		0	0		0	45		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.81	0.81	0.81	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor		1.00						0.91		0.98		
Frt		0.995						0.938				
Flt Protected		0.995								0.950		
Satd. Flow (prot)	0	7314	0	0	0	0	0	3707	0	1743	4674	0
Flt Permitted		0.995								0.172		
Satd. Flow (perm)	0	7310	0	0	0	0	0	3707	0	308	4674	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		480			163			430			170	
Travel Time (s)		13.1			4.4			11.7			4.6	
Confl. Peds. (#/hr)	6		131	131		6	611		191	191		611
Confl. Bikes (#/hr)			7						16			20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	3%	2%	2%	2%	2%	3%	8%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	30	0	0	0	0
Adj. Flow (vph)	215	1748	70	0	0	0	0	649	463	245	728	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2033	0	0	0	0	0	1112	0	245	728	0
Turn Type	Perm	NA						NA		custom	NA	
Protected Phases		5						6		8	7	
Permitted Phases	5									6 7	6 7	
Minimum Split (s)	42.0	42.0						34.0		14.0	48.0	
Total Split (s)	42.0	42.0						34.0		14.0	48.0	
Total Split (%)	46.7%	46.7%						37.8%		15.6%	53.3%	
Yellow Time (s)	3.6	3.6						3.6		3.6	3.6	
All-Red Time (s)	6.4	6.4						5.4		2.4	2.4	
Lost Time Adjust (s)		0.0						0.0		0.0	0.0	
Total Lost Time (s)		10.0						9.0		6.0	6.0	
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?												
Act Effct Green (s)		32.0						25.0		42.0	42.0	
Actuated g/C Ratio		0.36						0.28		0.47	0.47	
v/c Ratio		0.78						1.49dr		0.90	0.33	
Control Delay		20.0						85.1		56.2	5.5	
Queue Delay		0.0						1.7		56.6	0.5	
Total Delay		20.0						86.8		112.8	6.0	
LOS		B						F		F	A	
Approach Delay		20.0						86.8			32.9	
Approach LOS		B						F			C	

Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Bus Blockages (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	3
Permitted Phases			
Minimum Split (s)	42.0	34.0	14.0
Total Split (s)	42.0	34.0	14.0
Total Split (%)	47%	38%	16%
Yellow Time (s)	3.6	2.4	2.0
All-Red Time (s)	6.4	3.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag		Lead	Lag
Lead-Lag Optimize?			Yes
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		165						~261		93	28	
Queue Length 95th (ft)		m167						#349		#226	40	
Internal Link Dist (ft)		400			83			350			90	
Turn Bay Length (ft)										45		
Base Capacity (vph)		2599						1029		271	2181	
Starvation Cap Reductn		0						0		124	926	
Spillback Cap Reductn		0						4		0	0	
Storage Cap Reductn		0						0		0	0	
Reduced v/c Ratio		0.78						1.08		1.67	0.58	

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 41.1	Intersection LOS: D
Intersection Capacity Utilization 84.4%	ICU Level of Service E
Analysis Period (min) 15	

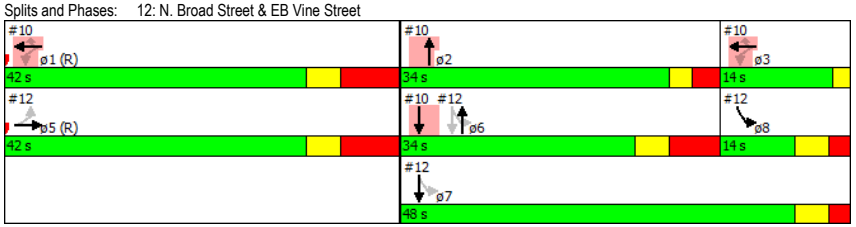
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 12: N. Broad Street & EB Vine Street



Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 Report

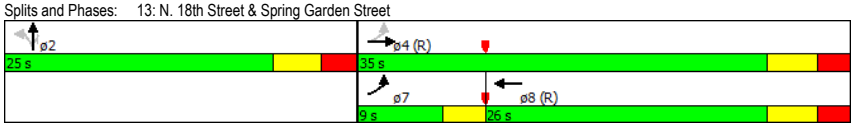
Timings
13: N. 18th Street & Spring Garden Street

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	65	627	879	207	175
Lane Group Flow (vph)	68	660	1012	400	184
Turn Type	pm+pt	NA	NA	NA	Perm
Protected Phases	7	4	8	2	
Permitted Phases	4				2
Minimum Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?					
v/c Ratio	0.23	0.42	0.96	0.90	0.37
Control Delay	8.9	11.1	38.0	47.3	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	8.9	11.1	38.0	47.3	9.8
Queue Length 50th (ft)	11	75	217	136	19
Queue Length 95th (ft)	26	112	#315	#286	62
Internal Link Dist (ft)		476	350	810	
Turn Bay Length (ft)	145				150
Base Capacity (vph)	292	1562	1057	444	491
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	0.23	0.42	0.96	0.90	0.37

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 65
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 13: N. 18th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
13: N. 18th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	65	627	0	0	879	83	173	207	175	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.98		1.00	1.00		0.83	1.00		0.91			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln	185.3	185.3	0.0	0.0	185.3	189.0	189.0	177.1	177.9			
Lanes	1	2	0	0	2	0	0	1	1			
Cap, veh/h	345	1791	0	0	1090	103	306	239	435			
Arrive On Green	0.10	0.48	0.00	0.00	0.44	0.44	0.32	0.32	0.32			
Sat Flow, veh/h	1765	3706	0	0	3270	308	967	756	1375			
Grp Volume(v), veh/h	68	660	0	0	524	488	324	76	184			
Grp Sat Flow(s),veh/h/ln	1765	1853	0	0	1853	1725	1723	1771	1375			
Q Serve(g_s), s	1.3	6.7	0.0	0.0	15.1	15.1	9.5	0.0	6.3			
Cycle Q Clear(g_c), s	1.3	6.7	0.0	0.0	15.1	15.1	9.5	0.0	6.3			
Prop In Lane	1.00		0.00	0.00		0.18	0.56		1.00			
Lane Grp Cap(c), veh/h	345	1791	0	0	618	575	545	0	435			
V/C Ratio(X)	0.20	0.37	0.00	0.00	0.85	0.85	0.59	0.00	0.42			
Avail Cap(c_a), veh/h	345	1791	0	0	618	575	545	0	435			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	11.6	9.7	0.0	0.0	15.3	15.3	17.3	0.0	16.2			
Incr Delay (d2), s/veh	1.3	0.6	0.0	0.0	13.6	14.5	4.7	0.0	3.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln	1.0	4.5	0.0	0.0	10.7	10.2	6.6	0.0	4.0			
Lane Grp Delay (d), s/veh	12.9	10.3	0.0	0.0	29.0	29.8	22.0	0.0	19.2			
Lane Grp LOS	B	B			C	C	C		B			
Approach Vol, veh/h		728			1012			584				
Approach Delay, s/veh		10.6			29.4			18.2				
Approach LOS		B			C			B				

Timer

Assigned Phs	7	4			8			2	
Phs Duration (G+Y+Rc), s	9.0	35.0			26.0			25.0	
Change Period (Y+Rc), s	3.0	6.0			6.0			6.0	
Max Green Setting (Gmax), s	6.0	29.0			20.0			19.0	
Max Q Clear Time (g_c+I1), s	0.0	0.0			0.0			0.0	
Green Ext Time (p_c), s	0.0	0.0			0.0			0.0	

Intersection Summary

HCM 2010 Ctrl Delay			20.7
HCM 2010 LOS			C

Notes

Timings
14: N. Broad Street & Spring Garden Street

Lane Group	EBT	WBT	NBT	SBL	SBT	SBR
Lane Configurations						
Volume (vph)	841	772	798	140	839	110
Lane Group Flow (vph)	912	871	864	143	856	112
Turn Type	NA	NA	NA	pm+pt	NA	Perm
Protected Phases	4	8	2	1	6	
Permitted Phases				6		6
Minimum Split (s)	33.0	33.0	35.0	9.0	35.0	35.0
Total Split (s)	40.0	40.0	41.0	9.0	50.0	50.0
Total Split (%)	44.4%	44.4%	45.6%	10.0%	55.6%	55.6%
Yellow Time (s)	3.6	3.6	3.4	3.0	3.4	3.4
All-Red Time (s)	2.4	2.4	2.6	0.0	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	3.0	6.0	6.0
Lead/Lag			Lag	Lead		
Lead-Lag Optimize?						
v/c Ratio	0.76	0.73	0.46	0.48	0.52	0.20
Control Delay	29.6	28.5	23.2	17.2	17.1	14.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.6	28.5	23.2	17.2	17.1	14.2
Queue Length 50th (ft)	234	220	97	40	167	34
Queue Length 95th (ft)	309	292	143	72	220	67
Internal Link Dist (ft)	400	550	990		290	
Turn Bay Length (ft)				170		
Base Capacity (vph)	1196	1191	1877	296	1655	573
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	0.73	0.46	0.48	0.52	0.20

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Pretimed

Splits and Phases: 14: N. Broad Street & Spring Garden Street

HCM 2010 Signalized Intersection Summary
14: N. Broad Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	841	53	0	772	81	0	798	49	140	839	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.84	1.00		0.91	1.00		0.89	0.97		0.82
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.3	189.0	0.0	185.3	189.0	0.0	185.3	189.0	186.2	184.4	186.2
Lanes	0	2	0	0	2	0	0	3	0	1	2	1
Cap, veh/h	0	1286	81	0	1232	130	0	2000	122	428	1803	636
Arrive On Green	0.00	0.38	0.38	0.00	0.38	0.38	0.00	0.78	0.78	0.07	0.49	0.49
Sat Flow, veh/h	0	3404	214	0	3261	343	0	5142	314	1774	3688	1301
Grp Volume(v), veh/h	0	467	445	0	448	423	0	585	279	143	856	112
Grp Sat Flow(s),veh/h/ln	0	1853	1765	0	1853	1751	0	1853	1750	1774	1844	1301
Q Serve(g_s), s	0.0	18.9	18.9	0.0	17.8	17.9	0.0	4.6	4.7	4.1	13.9	4.3
Cycle Q Clear(g_c), s	0.0	18.9	18.9	0.0	17.8	17.9	0.0	4.6	4.7	4.1	13.9	4.3
Prop In Lane	0.00		0.12	0.00		0.20	0.00		0.18	1.00		1.00
Lane Grp Cap(c), veh/h	0	700	667	0	700	662	0	1441	680	428	1803	636
V/C Ratio(X)	0.00	0.67	0.67	0.00	0.64	0.64	0.00	0.41	0.41	0.33	0.47	0.18
Avail Cap(c_a), veh/h	0	700	667	0	700	662	0	1441	680	428	1803	636
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	23.3	23.3	0.0	23.0	23.0	0.0	6.6	6.6	13.7	15.3	12.9
Incr Delay (d2), s/veh	0.0	5.0	5.2	0.0	4.4	4.7	0.0	0.9	1.8	2.1	0.9	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	12.6	12.1	0.0	11.9	11.4	0.0	3.0	3.1	3.4	8.8	2.5
Lane Grp Delay (d), s/veh	0.0	28.3	28.5	0.0	27.4	27.7	0.0	7.5	8.5	15.8	16.2	13.5
Lane Grp LOS		C	C		C	C		A	A	B	B	B
Approach Vol, veh/h		912			871			864			1111	
Approach Delay, s/veh		28.4			27.5			7.8			15.9	
Approach LOS		C			C			A			B	

Timer

Assigned Phs		4			8			2		1	6	
Phs Duration (G+Y+Rc), s		40.0			40.0			41.0		9.0	50.0	
Change Period (Y+Rc), s		6.0			6.0			6.0		3.0	6.0	
Max Green Setting (Gmax), s		34.0			34.0			35.0		6.0	44.0	
Max Q Clear Time (g_c+I1), s		0.0			0.0			0.0		0.0	0.0	
Green Ext Time (p_c), s		0.0			0.0			0.0		0.0	0.0	

Intersection Summary

HCM 2010 Ctrl Delay		19.8	
HCM 2010 LOS		B	

Notes

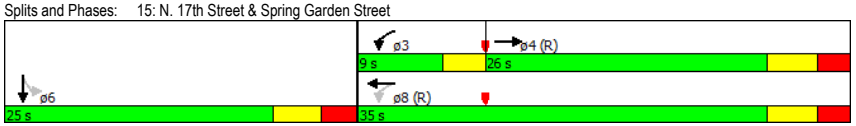
Timings
15: N. 17th Street & Spring Garden Street

Lane Group	EBT	WBL	WBT	SBT
Lane Configurations				
Volume (vph)	937	66	815	88
Lane Group Flow (vph)	1075	71	876	193
Turn Type	NA	pm+pt	NA	NA
Protected Phases	4	3	8	6
Permitted Phases		8		
Minimum Split (s)	26.0	9.0	35.0	25.0
Total Split (s)	26.0	9.0	35.0	25.0
Total Split (%)	43.3%	15.0%	58.3%	41.7%
Yellow Time (s)	3.6	3.0	3.6	3.4
All-Red Time (s)	2.4	0.0	2.4	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	3.0	6.0	6.0
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?				
v/c Ratio	1.02	0.24	0.56	0.39
Control Delay	48.8	12.1	15.9	15.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	48.8	12.1	15.9	15.5
Queue Length 50th (ft)	~210	12	120	42
Queue Length 95th (ft)	#338	m14	m134	91
Internal Link Dist (ft)	350		350	290
Turn Bay Length (ft)		165		
Base Capacity (vph)	1058	290	1562	491
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	1.02	0.24	0.56	0.39

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
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.

Splits and Phases: 15: N. 17th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
15: N. 17th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	937	62	66	815	0	0	0	0	36	88	55
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.78	0.98		1.00				1.00		0.91
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.3	189.0	185.3	185.3	0.0				189.0	184.4	189.0
Lanes	0	2	0	1	2	0				0	1	0
Cap, veh/h	0	1123	75	328	1791	0				168	141	267
Arrive On Green	0.00	0.44	0.44	0.20	0.97	0.00				0.32	0.32	0.32
Sat Flow, veh/h	0	3369	224	1765	3706	0				529	205	842
Grp Volume(v), veh/h	0	554	521	71	876	0				134	0	112
Grp Sat Flow(s),veh/h/ln	0	1853	1740	1765	1853	0				1818	0	1603
Q Serve(g_s), s	0.0	16.6	16.6	1.2	0.9	0.0				2.7	0.0	0.0
Cycle Q Clear(g_c), s	0.0	16.6	16.6	1.2	0.9	0.0				2.7	0.0	0.0
Prop In Lane	0.00		0.13	1.00		0.00				0.29		0.53
Lane Grp Cap(c), veh/h	0	618	580	328	1791	0				576	0	0
V/C Ratio(X)	0.00	0.90	0.90	0.22	0.49	0.00				0.23	0.00	0.00
Avail Cap(c_a), veh/h	0	618	580	328	1791	0				576	0	0
HCM Platoon Ratio	1.00	1.33	1.33	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	15.8	15.8	10.8	0.5	0.0				11.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	18.2	19.2	1.5	1.0	0.0				0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	12.2	11.8	1.0	0.8	0.0				2.2	0.0	0.0
Lane Grp Delay (d), s/veh	0.0	34.0	35.0	12.3	1.5	0.0				12.8	0.0	0.0
Lane Grp LOS		C	C	B	A					B		
Approach Vol, veh/h		1075			947						246	
Approach Delay, s/veh		34.5			2.3						7.0	
Approach LOS		C			A						A	

Timer

Assigned Phs		4		3	8						6	
Phs Duration (G+Y+Rc), s		26.0		9.0	35.0						25.0	
Change Period (Y+Rc), s		6.0		3.0	6.0						6.0	
Max Green Setting (Gmax), s		20.0		6.0	29.0						19.0	
Max Q Clear Time (g_c+I1), s		0.0		0.0	0.0						0.0	
Green Ext Time (p_c), s		0.0		0.0	0.0						0.0	

Intersection Summary

HCM 2010 Ctrl Delay		18.1	
HCM 2010 LOS		B	

Notes

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	192	581	76	0	0	0	0	405	52
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					0.99						1.00	
Frt					0.987						0.985	
Flt Protected					0.989							
Satd. Flow (prot)	0	0	0	0	3244	0	0	0	0	0	1635	0
Flt Permitted					0.989							
Satd. Flow (perm)	0	0	0	0	3243	0	0	0	0	0	1635	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					72						7	
Link Speed (mph)		30			25			30			25	
Link Distance (ft)		975			430			170			647	
Travel Time (s)		22.2			11.7			3.9			17.6	
Confl. Peds. (#/hr)	49		1	1		49	33		142	142		33
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Parking (#/hr)					0						0	
Adj. Flow (vph)	0	0	0	204	618	81	0	0	0	0	431	55
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	903	0	0	0	0	0	486	0
Turn Type				custom	NA						NA	
Protected Phases					1 3						2	
Permitted Phases				1								
Minimum Split (s)				47.5							33.5	
Total Split (s)				47.5							33.5	
Total Split (%)				52.8%							37.2%	
Yellow Time (s)				3.5							3.5	
All-Red Time (s)				1.8							1.5	
Lost Time Adjust (s)											0.0	
Total Lost Time (s)											5.0	
Lead/Lag				Lead							Lag	
Lead-Lag Optimize?												
Act Effct Green (s)					51.2						28.5	
Actuated g/C Ratio					0.57						0.32	
v/c Ratio					0.48						0.93	
Control Delay					3.2						56.7	
Queue Delay					0.0						12.4	
Total Delay					3.2						69.1	
LOS					A						E	
Approach Delay					3.2						69.1	
Approach LOS					A						E	
Queue Length 50th (ft)					22						262	
Queue Length 95th (ft)					52						#458	
Internal Link Dist (ft)		895			350			90			567	
Turn Bay Length (ft)												
Base Capacity (vph)					1875						522	
Starvation Cap Reductn					29						0	
Spillback Cap Reductn					26						37	

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	ø3	ø5	ø6
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	5	6
Permitted Phases			
Minimum Split (s)	9.0	51.0	39.0
Total Split (s)	9.0	51.0	39.0
Total Split (%)	10%	57%	43%
Yellow Time (s)	2.0	3.5	3.5
All-Red Time (s)	0.0	1.8	2.5
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag		Lead	Lag
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			

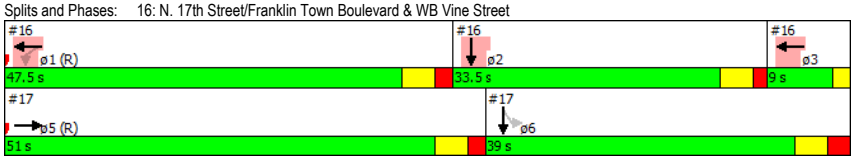
Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 Report

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.49						1.00	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 26.3	Intersection LOS: C
Intersection Capacity Utilization 68.7%	ICU Level of Service C
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 16: N. 17th Street/Franklin Town Boulevard & WB Vine Street



Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	ø3	ø5	ø6
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	520	49	0	0	0	0	0	0	205	461	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor		1.00									0.95	
Frt		0.987										
Flt Protected											0.985	
Satd. Flow (prot)	0	3291	0	0	0	0	0	0	0	0	3468	0
Flt Permitted											0.985	
Satd. Flow (perm)	0	3291	0	0	0	0	0	0	0	0	3289	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)		16									89	
Link Speed (mph)		30			25			30			30	
Link Distance (ft)		975			430			430			170	
Travel Time (s)		22.2			11.7			9.8			3.9	
Confl. Peds. (#/hr)	2		32	32		2	46		155	155		46
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Parking (#/hr)		0										
Adj. Flow (vph)	0	547	52	0	0	0	0	0	0	216	485	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	599	0	0	0	0	0	0	0	0	701	0
Turn Type		NA								Perm	NA	
Protected Phases		5									6	
Permitted Phases										6		
Minimum Split (s)		51.0								39.0	39.0	
Total Split (s)		51.0								39.0	39.0	
Total Split (%)		56.7%								43.3%	43.3%	
Yellow Time (s)		3.5								3.5	3.5	
All-Red Time (s)		1.8								2.5	2.5	
Lost Time Adjust (s)		0.0									0.0	
Total Lost Time (s)		5.3									6.0	
Lead/Lag		Lead								Lag	Lag	
Lead-Lag Optimize?												
Act Effct Green (s)		45.7									33.0	
Actuated g/C Ratio		0.51									0.37	
v/c Ratio		0.36									0.56	
Control Delay		13.7									10.3	
Queue Delay		0.0									28.3	
Total Delay		13.7									38.6	
LOS		B									D	
Approach Delay		13.7									38.6	
Approach LOS		B									D	
Queue Length 50th (ft)		99									61	
Queue Length 95th (ft)		137									m73	
Internal Link Dist (ft)		895			350			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		1678									1262	
Starvation Cap Reductn		0									585	
Spillback Cap Reductn		0									0	

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	3
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	1.8	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 Report

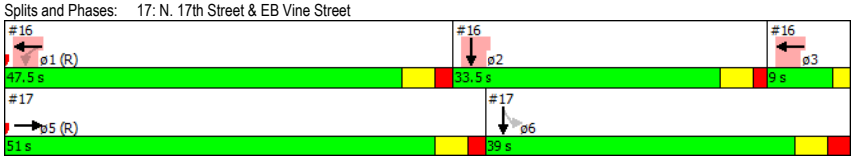
Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.36									1.04	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 27.1	Intersection LOS: C
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 17: N. 17th Street & EB Vine Street



Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

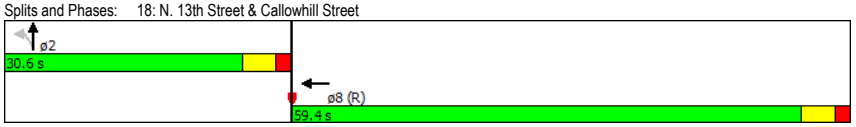
Timings
18: N. 13th Street & Callowhill Street

Lane Group	WBT	NBT
Lane Configurations		
Volume (vph)	307	239
Lane Group Flow (vph)	408	313
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Minimum Split (s)	59.4	30.6
Total Split (s)	59.4	30.6
Total Split (%)	66.0%	34.0%
Yellow Time (s)	3.6	3.6
All-Red Time (s)	1.8	1.8
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.4	5.4
Lead/Lag		
Lead-Lag Optimize?		
v/c Ratio	0.23	0.70
Control Delay	7.7	26.8
Queue Delay	0.0	0.0
Total Delay	7.7	26.8
Queue Length 50th (ft)	45	67
Queue Length 95th (ft)	67	#150
Internal Link Dist (ft)	195	480
Turn Bay Length (ft)		
Base Capacity (vph)	1813	446
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.23	0.70

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 90
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 18: N. 13th Street & Callowhill Street



HCM 2010 Signalized Intersection Summary
18: N. 13th Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	307	60	42	239	0	0	0	0
Number				3	8	18	5	2	12			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.90	1.00		1.00			
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln				0.0	185.3	189.0	189.0	184.8	0.0			
Lanes				0	2	0	0	1	0			
Cap, veh/h				0	1775	342	77	436	0			
Arrive On Green				0.00	0.60	0.60	0.28	0.28	0.00			
Sat Flow, veh/h				0	2959	570	275	1558	0			
Grp Volume(v), veh/h				0	211	197	313	0	0			
Grp Sat Flow(s),veh/h/ln				0	1853	1676	1834	1848	0			
Q Serve(g_s), s				0.0	4.6	4.8	13.3	0.0	0.0			
Cycle Q Clear(g_c), s				0.0	4.6	4.8	13.3	0.0	0.0			
Prop In Lane				0.00		0.34	0.15		0.00			
Lane Grp Cap(c), veh/h				0	1112	1005	513	0	0			
V/C Ratio(X)				0.00	0.19	0.20	0.61	0.00	0.00			
Avail Cap(c_a), veh/h				0	1112	1005	513	0	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	8.1	8.2	28.1	0.0	0.0			
Incr Delay (d2), s/veh				0.0	0.4	0.4	5.3	0.0	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln				0.0	3.5	3.3	9.5	0.0	0.0			
Lane Grp Delay (d), s/veh				0.0	8.5	8.6	33.4	0.0	0.0			
Lane Grp LOS					A	A	C					
Approach Vol, veh/h					408			313				
Approach Delay, s/veh					8.5			33.4				
Approach LOS					A			C				

Timer

Assigned Phs	8	2
Phs Duration (G+Y+Rc), s	59.4	30.6
Change Period (Y+Rc), s	5.4	5.4
Max Green Setting (Gmax), s	54.0	25.2
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	19.4
HCM 2010 LOS	B

Notes

Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	1057	80	119	255	0	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	11	12	11	10	12	12	10	12
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					0.99		0.96					
Frt					0.989							
Flt Protected							0.950					
Satd. Flow (prot)	0	0	0	0	4651	0	1702	1729	0	0	0	0
Flt Permitted							0.950					
Satd. Flow (perm)	0	0	0	0	4651	0	1631	1729	0	0	0	0
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Satd. Flow (RTOR)					19		49					
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		605			275			170			560	
Travel Time (s)		16.5			6.3			3.9			12.7	
Confl. Peds. (#/hr)	54		5	5		54	51		81	81		51
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Parking (#/hr)					0							
Adj. Flow (vph)	0	0	0	0	1162	88	131	280	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1250	0	131	280	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					1			2				
Permitted Phases							2					
Minimum Split (s)					51.0		39.0	39.0				
Total Split (s)					51.0		39.0	39.0				
Total Split (%)					56.7%		43.3%	43.3%				
Yellow Time (s)					3.7		3.5	3.5				
All-Red Time (s)					1.8		2.5	2.5				
Lost Time Adjust (s)					0.0		0.0	0.0				
Total Lost Time (s)					5.5		6.0	6.0				
Lead/Lag					Lead		Lag	Lag				
Lead-Lag Optimize?					Yes		Yes	Yes				
Act Effct Green (s)					45.5		33.0	33.0				
Actuated g/C Ratio					0.51		0.37	0.37				
v/c Ratio					0.53		0.21	0.44				
Control Delay					15.8		2.9	10.8				
Queue Delay					0.0		1.4	2.3				
Total Delay					15.8		4.3	13.1				
LOS					B		A	B				
Approach Delay					15.8			10.3				
Approach LOS					B			B				
Queue Length 50th (ft)					164		2	41				
Queue Length 95th (ft)					204		m14	61				
Internal Link Dist (ft)		525			195			90			480	
Turn Bay Length (ft)												
Base Capacity (vph)					2360		629	633				
Starvation Cap Reductn					0		343	230				

Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

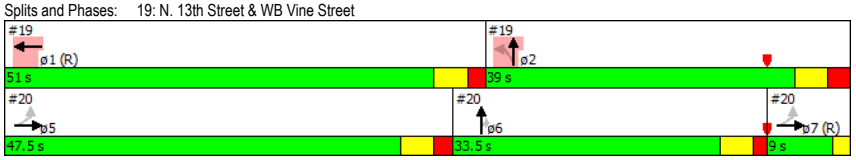
Lane Group	ø5	ø6	ø7
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	7
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	2.0	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.53		0.46	0.69				

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 7:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 14.4	Intersection LOS: B
Intersection Capacity Utilization 110.0%	ICU Level of Service H
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 19: N. 13th Street & WB Vine Street



Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 Report

Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	74	619	0	0	0	0	0	267	102	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	11	9	12	12	12
Lane Util. Factor	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.92			
Frt									0.850			
Flt Protected		0.995										
Satd. Flow (prot)	0	5033	0	0	0	0	0	1612	1417	0	0	0
Flt Permitted		0.995										
Satd. Flow (perm)	0	5033	0	0	0	0	0	1612	1302	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		38							116			
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		442			275			430			170	
Travel Time (s)		12.1			6.3			9.8			3.9	
Confl. Peds. (#/hr)	2		45	45		2	111		75	75		111
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Parking (#/hr)								0				
Adj. Flow (vph)	84	703	0	0	0	0	0	303	116	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	787	0	0	0	0	0	303	116	0	0	0
Turn Type	Perm	NA						NA	Perm			
Protected Phases		5 7						6				
Permitted Phases	5 7								6			
Minimum Split (s)								33.5	33.5			
Total Split (s)								33.5	33.5			
Total Split (%)								37.2%	37.2%			
Yellow Time (s)								3.5	3.5			
All-Red Time (s)								1.5	1.5			
Lost Time Adjust (s)								0.0	0.0			
Total Lost Time (s)								5.0	5.0			
Lead/Lag								Lag	Lag			
Lead-Lag Optimize?								Yes	Yes			
Act Effct Green (s)		51.0						28.5	28.5			
Actuated g/C Ratio		0.57						0.32	0.32			
v/c Ratio		0.27						0.59	0.24			
Control Delay		4.8						31.6	5.9			
Queue Delay		0.0						0.2	0.0			
Total Delay		4.8						31.9	5.9			
LOS		A						C	A			
Approach Delay		4.8						24.7				
Approach LOS		A						C				
Queue Length 50th (ft)		39						144	0			
Queue Length 95th (ft)		m44						223	35			
Internal Link Dist (ft)		362			195			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		2868						510	491			
Starvation Cap Reductn		0						0	0			

Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

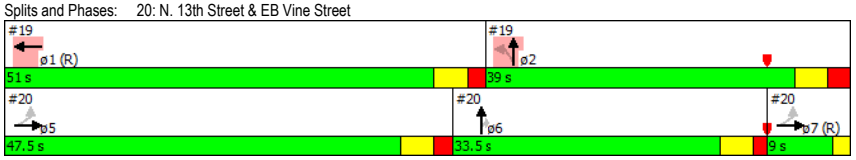
Lane Group	ø1	ø2	ø5	ø7
Lane Configurations				
Volume (vph)				
Ideal Flow (vphpl)				
Lane Width (ft)				
Lane Util. Factor				
Ped Bike Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Confl. Peds. (#/hr)				
Peak Hour Factor				
Parking (#/hr)				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	2	5	7
Permitted Phases				
Minimum Split (s)	51.0	39.0	47.5	9.0
Total Split (s)	51.0	39.0	47.5	9.0
Total Split (%)	57%	43%	53%	10%
Yellow Time (s)	3.7	3.5	3.5	2.0
All-Red Time (s)	1.8	2.5	2.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0						21	0			
Storage Cap Reductn		0						0	0			
Reduced v/c Ratio		0.27						0.62	0.24			

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 7:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 11.7	Intersection LOS: B
Intersection Capacity Utilization 103.5%	ICU Level of Service G
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 20: N. 13th Street & EB Vine Street



Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 Report

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	49	709	0	0	0	0	0	778	440	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.97			
Frt									0.850			
Flt Protected		0.997										
Satd. Flow (prot)	0	3510	0	0	0	0	0	5009	1560	0	0	0
Flt Permitted		0.997										
Satd. Flow (perm)	0	3510	0	0	0	0	0	5009	1516	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24							192			
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		430			378			430			170	
Travel Time (s)		11.7			10.3			11.7			4.6	
Confl. Peds. (#/hr)	1		8	8		1	493		10	10		493
Confl. Bikes (#/hr)									10			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	3%	2%	2%	2%
Adj. Flow (vph)	51	739	0	0	0	0	0	810	458	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	790	0	0	0	0	0	810	458	0	0	0
Turn Type	Perm	NA						NA	Perm			
Protected Phases		5 7						6				
Permitted Phases	5 7								6			
Minimum Split (s)								33.5	33.5			
Total Split (s)								33.5	33.5			
Total Split (%)								37.2%	37.2%			
Yellow Time (s)								3.5	3.5			
All-Red Time (s)								1.5	1.5			
Lost Time Adjust (s)								0.0	0.0			
Total Lost Time (s)								5.0	5.0			
Lead/Lag								Lag	Lag			
Lead-Lag Optimize?												
Act Effct Green (s)		51.2						28.5	28.5			
Actuated g/C Ratio		0.57						0.32	0.32			
v/c Ratio		0.39						0.51	0.75			
Control Delay		7.9						26.4	24.6			
Queue Delay		0.0						0.0	0.0			
Total Delay		7.9						26.4	24.6			
LOS		A						C	C			
Approach Delay		7.9						25.8				
Approach LOS		A						C				
Queue Length 50th (ft)		85						136	135			
Queue Length 95th (ft)		107						175	#261			
Internal Link Dist (ft)		350			298			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		2007						1586	611			
Starvation Cap Reductn		0						0	0			

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Lane Configurations				
Volume (vph)				
Ideal Flow (vphpl)				
Lane Util. Factor				
Ped Bike Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Confl. Peds. (#/hr)				
Confl. Bikes (#/hr)				
Peak Hour Factor				
Heavy Vehicles (%)				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	2	5	7
Permitted Phases				
Minimum Split (s)	51.0	39.0	47.5	9.0
Total Split (s)	51.0	39.0	47.5	9.0
Total Split (%)	57%	43%	53%	10%
Yellow Time (s)	3.5	3.5	3.5	2.0
All-Red Time (s)	1.8	2.5	1.8	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lead	
Lead-Lag Optimize?				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				

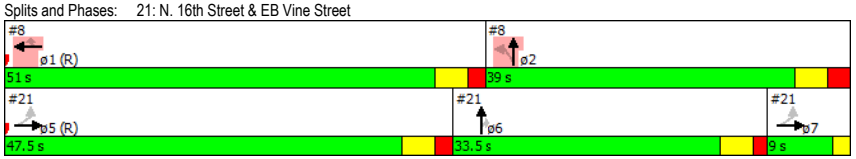
Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 Report

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0						0	0			
Storage Cap Reductn		0						0	0			
Reduced v/c Ratio		0.39						0.51	0.75			

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 18.9	Intersection LOS: B
Intersection Capacity Utilization 72.2%	ICU Level of Service C
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 21: N. 16th Street & EB Vine Street



Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 Report

FRIDAY EVENING (7-10 PM)
PEAK HOUR TIME PERIOD

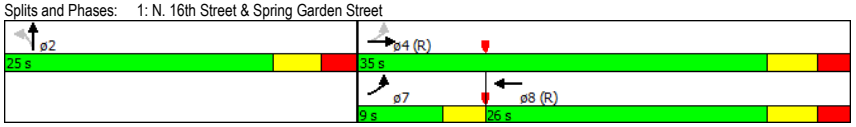
Timings
1: N. 16th Street & Spring Garden Street

Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Volume (vph)	64	468	421	250
Lane Group Flow (vph)	67	493	505	476
Turn Type	pm+pt	NA	NA	NA
Protected Phases	7	4	8	2
Permitted Phases	4			
Minimum Split (s)	9.0	35.0	26.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?				
v/c Ratio	0.17	0.32	0.49	0.49
Control Delay	6.5	10.3	27.9	18.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.5	10.3	27.9	18.1
Queue Length 50th (ft)	6	34	92	82
Queue Length 95th (ft)	m17	79	134	127
Internal Link Dist (ft)		350	380	990
Turn Bay Length (ft)	140			
Base Capacity (vph)	403	1550	1031	962
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	0.17	0.32	0.49	0.49

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: N. 16th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
1: N. 16th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	64	468	0	0	421	59	90	250	112	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.94	1.00		0.83			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln	185.3	185.3	0.0	0.0	183.4	187.1	186.2	180.2	186.2			
Lanes	1	2	0	0	2	0	0	2	0			
Cap, veh/h	476	1791	0	0	991	137	200	563	261			
Arrive On Green	0.20	0.97	0.00	0.00	0.11	0.11	0.32	0.32	0.32			
Sat Flow, veh/h	1765	3706	0	0	2972	412	632	1779	824			
Grp Volume(v), veh/h	67	493	0	0	272	233	266	0	210			
Grp Sat Flow(s),veh/h/ln	1765	1853	0	0	1834	1549	1771	0	1463			
Q Serve(g_s), s	1.2	0.4	0.0	0.0	8.3	8.5	7.3	0.0	6.9			
Cycle Q Clear(g_c), s	1.2	0.4	0.0	0.0	8.3	8.5	7.3	0.0	6.9			
Prop In Lane	1.00		0.00	0.00		0.27	0.36		0.56			
Lane Grp Cap(c), veh/h	476	1791	0	0	611	516	561	0	463			
V/C Ratio(X)	0.14	0.28	0.00	0.00	0.44	0.45	0.48	0.00	0.45			
Avail Cap(c_a), veh/h	476	1791	0	0	611	516	561	0	463			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	8.7	0.5	0.0	0.0	21.5	21.6	16.5	0.0	16.4			
Incr Delay (d2), s/veh	0.6	0.4	0.0	0.0	2.3	2.8	2.9	0.0	3.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln	0.9	0.4	0.0	0.0	6.6	5.9	5.3	0.0	4.4			
Lane Grp Delay (d), s/veh	9.3	0.9	0.0	0.0	23.8	24.4	19.4	0.0	19.5			
Lane Grp LOS	A	A			C	C	B		B			
Approach Vol, veh/h		560			505			476				
Approach Delay, s/veh		1.9			24.1			19.4				
Approach LOS		A			C			B				

Timer

Assigned Phs	7	4			8			2				
Phs Duration (G+Y+Rc), s	9.0	35.0			26.0			25.0				
Change Period (Y+Rc), s	3.0	6.0			6.0			6.0				
Max Green Setting (Gmax), s	6.0	29.0			20.0			19.0				
Max Q Clear Time (g_c+I1), s	0.0	0.0			0.0			0.0				
Green Ext Time (p_c), s	0.0	0.0			0.0			0.0				

Intersection Summary

HCM 2010 Ctrl Delay			14.6									
HCM 2010 LOS			B									

Notes

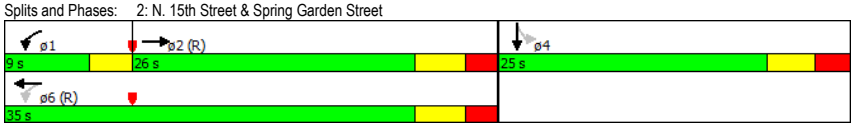
Timings
2: N. 15th Street & Spring Garden Street

Lane Group	EBT	WBL	WBT	SBL	SBT
Lane Configurations					
Volume (vph)	517	78	447	41	155
Lane Group Flow (vph)	634	87	497	46	262
Turn Type	NA	pm+pt	NA	Perm	NA
Protected Phases	2	1	6		4
Permitted Phases		6		4	
Minimum Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (%)	43.3%	15.0%	58.3%	41.7%	41.7%
Yellow Time (s)	3.6	3.0	3.6	3.4	3.4
All-Red Time (s)	2.4	0.0	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	3.0	6.0	6.0	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?					
v/c Ratio	0.59	0.26	0.32	0.10	0.58
Control Delay	13.2	9.0	10.2	15.2	23.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.2	9.0	10.2	15.2	23.2
Queue Length 50th (ft)	65	14	53	12	78
Queue Length 95th (ft)	118	32	82	31	145
Internal Link Dist (ft)	380		400		290
Turn Bay Length (ft)		115		100	
Base Capacity (vph)	1080	336	1534	472	454
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	0.26	0.32	0.10	0.58

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 15 (25%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 2: N. 15th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
2: N. 15th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	517	54	78	447	0	0	0	0	41	155	81
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.87	0.96		1.00				1.00		0.93
Parking Bus Adj	1.00	1.00	0.90	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	183.7	189.0	183.4	183.4	0.0				177.9	185.3	189.0
Lanes	0	2	0	1	2	0				1	1	0
Cap, veh/h	0	1019	106	481	1773	0				536	353	185
Arrive On Green	0.00	0.67	0.67	0.10	0.48	0.00				0.32	0.32	0.32
Sat Flow, veh/h	0	3057	318	1747	3669	0				1694	1114	583
Grp Volume(v), veh/h	0	344	290	87	497	0				46	0	262
Grp Sat Flow(s),veh/h/ln	0	1837	1538	1747	1834	0				1694	1853	1697
Q Serve(g_s), s	0.0	6.0	6.1	1.7	4.9	0.0				1.1	0.0	7.5
Cycle Q Clear(g_c), s	0.0	6.0	6.1	1.7	4.9	0.0				1.1	0.0	7.5
Prop In Lane	0.00		0.21	1.00		0.00				1.00		0.34
Lane Grp Cap(c), veh/h	0	612	513	481	1773	0				536	0	537
V/C Ratio(X)	0.00	0.56	0.57	0.18	0.28	0.00				0.09	0.00	0.49
Avail Cap(c_a), veh/h	0	612	513	481	1773	0				536	0	537
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	7.7	7.7	9.6	9.3	0.0				14.4	0.0	16.6
Incr Delay (d2), s/veh	0.0	3.7	4.5	0.8	0.4	0.0				0.3	0.0	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	3.9	3.6	1.3	3.4	0.0				0.9	0.0	5.3
Lane Grp Delay (d), s/veh	0.0	11.4	12.2	10.4	9.7	0.0				14.7	0.0	19.7
Lane Grp LOS		B	B	B	A					B		B
Approach Vol, veh/h		634			584						308	
Approach Delay, s/veh		11.7			9.8						19.0	
Approach LOS		B			A						B	

Timer

Assigned Phs		2		1	6						4	
Phs Duration (G+Y+Rc), s		26.0		9.0	35.0						25.0	
Change Period (Y+Rc), s		6.0		3.0	6.0						6.0	
Max Green Setting (Gmax), s		20.0		6.0	29.0						19.0	
Max Q Clear Time (g_c+I1), s		0.0		0.0	0.0						0.0	
Green Ext Time (p_c), s		0.0		0.0	0.0						0.0	

Intersection Summary

HCM 2010 Ctrl Delay			12.4									
HCM 2010 LOS			B									

Notes

Lanes, Volumes, Timings
3: Franklin Town Boulevard & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	46	108	23	161	69	16	36	6	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	11	12	12	12	12	12	16	12	12	12	12
Grade (%)		-1%			2%			3%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.947			0.963			0.987				
Flt Protected		0.979			0.995			0.986				
Satd. Flow (prot)	0	1669	0	0	1582	0	0	1812	0	0	0	0
Flt Permitted		0.979			0.995			0.986				
Satd. Flow (perm)	0	1669	0	0	1582	0	0	1812	0	0	0	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		646			325			647			208	
Travel Time (s)		17.6			8.9			17.6			5.7	
Confl. Peds. (#/hr)	61		94	94		61	74		64	64		74
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Parking (#/hr)					0			0				
Adj. Flow (vph)	125	48	113	24	168	72	17	38	6	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	285	0	0	264	0	0	61	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.05	1.00	1.02	1.17	1.02	1.03	1.00	1.03	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization 56.3%		ICU Level of Service B	
Analysis Period (min) 15			

HCM 2010 AWSC
3: Franklin Town Boulevard & Callowhill Street

Intersection	
Intersection Delay, s/veh	9.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	120	46	108	23	161	69	16	36	6	0	0	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	125	48	112	24	168	72	17	38	6	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.3	9.1	8.6
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	28%	44%	9%
Vol Thru, %	62%	17%	64%
Vol Right, %	10%	39%	27%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	58	274	253
LT Vol	36	46	161
Through Vol	6	108	69
RT Vol	16	120	23
Lane Flow Rate	60	285	264
Geometry Grp	1	1	1
Degree of Util (X)	0.085	0.333	0.31
Departure Headway (Hd)	5.081	4.205	4.229
Convergence, Y/N	Yes	Yes	Yes
Cap	705	856	851
Service Time	3.113	2.221	2.245
HCM Lane V/C Ratio	0.085	0.333	0.31
HCM Control Delay	8.6	9.3	9.1
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.3	1.5	1.3

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
4: N. 17th Street & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	43	102	131	0	0	0	0	0	194	89
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	11	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			-4%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.865								0.958	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	1443	1693	1659	0	0	0	0	0	1544	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	1443	1693	1659	0	0	0	0	0	1544	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		325			430			230			1070	
Travel Time (s)		8.9			11.7			6.3			29.2	
Confl. Peds. (#/hr)	46		72	72		46	41		6	6		41
Confl. Bikes (#/hr)			3			1						7
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	5	0
Parking (#/hr)			0		0						0	
Adj. Flow (vph)	0	0	49	116	149	0	0	0	0	0	220	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	49	116	149	0	0	0	0	0	321	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.15	1.06	1.16	1.01	1.01	1.01	1.01	0.98	1.20	0.98
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	CBD
Control Type: Unsignalized	
Intersection Capacity Utilization 51.2%	ICU Level of Service A
Analysis Period (min) 15	

HCM 2010 AWSC
4: N. 17th Street & Callowhill Street

Intersection	
Intersection Delay, s/veh	10
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	43	102	131	0	0	0	0	0	194	89
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	49	116	149	0	0	0	0	0	220	101
Number of Lanes	0	0	1	1	1	0	0	0	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.9	9.7	10.6
HCM LOS	A	A	B

Lane	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	100%	0%	0%
Vol Thru, %	0%	0%	100%	69%
Vol Right, %	100%	0%	0%	31%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	43	102	131	283
LT Vol	0	0	131	194
Through Vol	43	0	0	89
RT Vol	0	102	0	0
Lane Flow Rate	49	116	149	322
Geometry Grp	5	7	7	2
Degree of Util (X)	0.062	0.188	0.221	0.404
Departure Headway (Hd)	4.534	5.838	5.334	4.526
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	784	613	670	794
Service Time	2.598	3.591	3.087	2.558
HCM Lane V/C Ratio	0.063	0.189	0.222	0.406
HCM Control Delay	7.9	9.9	9.6	10.6
HCM Lane LOS	A	A	A	B
HCM 95th-tile Q	0.2	0.7	0.8	2

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Timings
5: N. 16th Street & Callowhill Street

Lane Group	WBT	NBT
Lane Configurations		
Volume (vph)	197	648
Lane Group Flow (vph)	435	841
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Minimum Split (s)	21.0	39.0
Total Split (s)	21.0	39.0
Total Split (%)	35.0%	65.0%
Yellow Time (s)	3.0	3.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
v/c Ratio	0.52	0.44
Control Delay	13.9	8.0
Queue Delay	0.0	0.0
Total Delay	13.9	8.0
Queue Length 50th (ft)	41	77
Queue Length 95th (ft)	67	98
Internal Link Dist (ft)	380	136
Turn Bay Length (ft)		
Base Capacity (vph)	835	1907
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.52	0.44

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 17 (28%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 5: N. 16th Street & Callowhill Street

HCM 2010 Signalized Intersection Summary
5: N. 16th Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	197	160	42	648	0	0	0	0
Number				3	8	18	5	2	12			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.69	1.00		1.00			
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln				0.0	185.3	189.0	187.1	180.1	0.0			
Lanes				0	2	0	0	2	0			
Cap, veh/h				0	494	290	118	1918	0			
Arrive On Green				0.00	0.27	0.27	0.57	0.57	0.00			
Sat Flow, veh/h				0	1853	1086	208	3384	0			
Grp Volume(v), veh/h				0	240	195	439	402	0			
Grp Sat Flow(s),veh/h/ln				0	1853	1086	1791	1801	0			
Q Serve(g_s), s				0.0	6.5	9.6	8.4	7.5	0.0			
Cycle Q Clear(g_c), s				0.0	6.5	9.6	8.4	7.5	0.0			
Prop In Lane				0.00		1.00	0.12		0.00			
Lane Grp Cap(c), veh/h				0	494	290	1015	1021	0			
V/C Ratio(X)				0.00	0.49	0.67	0.43	0.39	0.00			
Avail Cap(c_a), veh/h				0	494	290	1015	1021	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	18.5	19.7	7.5	7.3	0.0			
Incr Delay (d2), s/veh				0.0	3.4	11.9	1.3	1.1	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln				0.0	5.1	5.3	5.4	4.8	0.0			
Lane Grp Delay (d), s/veh				0.0	21.9	31.5	8.8	8.4	0.0			
Lane Grp LOS					C	C	A	A				
Approach Vol, veh/h					435			841				
Approach Delay, s/veh					26.2			8.6				
Approach LOS					C			A				

Timer	
Assigned Phs	8	2
Phs Duration (G+Y+Rc), s	21.0	39.0
Change Period (Y+Rc), s	5.0	5.0
Max Green Setting (Gmax), s	16.0	34.0
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	14.6
HCM 2010 LOS	B

Notes

HCM 2010 Signals-Pedestrians
5: N. 16th Street & Callowhill Street

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	23.0	24.0	24.0	24.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	2	2	2
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	0	2	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	25	25	25
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	30.0	30.0	30.0	30.0
Pedestrian Compliance Code	Fair	Fair	Fair	Fair
Pedestrian Crosswalk Score	1.83	1.89	2.05	2.11
Pedestrian Crosswalk LOS	A	A	B	B

HCM 2010 Signals-Bicycles
5: N. 16th Street & Callowhill Street

Approach	EB	WB	NB	SB
Bicycle Flow Rate (bike/h)	0	0	0	0
Total Flow Rate (veh/h)	0	435	841	0
Effct. Green for Bike (s)	0.0	16.0	34.0	0.0
Cross Street Width (ft)	24.0	24.0	24.0	23.0
Through Lanes Number	0	2	2	0
Through Lane Width (ft)	12.0	12.0	12.0	12.0
Bicycle Lane Width (ft)	0.0	0.0	0.0	0.0
Paved Shoulder Width (ft)	0.0	0.0	0.0	0.0
Curb Is Present?	No	No	No	No
On Street Parking?	No	No	No	No
Bicycle Lane Capacity (bike/h)	0	533	1133	0
Bicycle Delay (s/bike)	0.0	16.1	5.6	0.0
Bicycle Compliance		Fair	Good	
Bicycle LOS Score	0.00	2.29	2.62	0.00
Bicycle LOS		B	B	

Lanes, Volumes, Timings
6: N. 15th Street & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	123	313	0	0	0	0	0	447	91
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		0%			0%			0%			-3%	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt											0.977	
Flt Protected					0.986							
Satd. Flow (prot)	0	0	0	0	3230	0	0	0	0	0	1599	0
Flt Permitted					0.986							
Satd. Flow (perm)	0	0	0	0	3230	0	0	0	0	0	1599	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		460			480			146			1070	
Travel Time (s)		12.5			13.1			4.0			29.2	
Confl. Peds. (#/hr)	10		41	41		10	15		346	346		15
Confl. Bikes (#/hr)												5
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	2%	2%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Parking (#/hr)					0						0	
Adj. Flow (vph)	0	0	0	152	386	0	0	0	0	0	552	112
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	538	0	0	0	0	0	664	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.08	1.01	1.01	1.01	1.01	0.99	1.18	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	CBD
Control Type: Unsignalized	
Intersection Capacity Utilization 51.7%	ICU Level of Service A
Analysis Period (min) 15	

HCM 2010 AWSC
6: N. 15th Street & Callowhill Street

Intersection	
Intersection Delay, s/veh	32.6
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	0	123	313	0	0	0	0	0	447	91
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	2	2	2	2	5	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	152	386	0	0	0	0	0	552	112
Number of Lanes	0	0	0	0	2	0	0	0	0	0	1	0

Approach	WB	SB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left		WB
Conflicting Lanes Left	0	2
Conflicting Approach Right	SB	
Conflicting Lanes Right	1	0
HCM Control Delay	15.6	46.4
HCM LOS	C	E

Lane	WBLn1	WBLn2	SBLn1
Vol Left, %	54%	0%	0%
Vol Thru, %	46%	100%	83%
Vol Right, %	0%	0%	17%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	227	209	538
LT Vol	104	209	447
Through Vol	0	0	91
RT Vol	123	0	0
Lane Flow Rate	281	258	664
Geometry Grp	7	7	2
Degree of Util (X)	0.522	0.463	0.953
Departure Headway (Hd)	6.693	6.47	5.274
Convergence, Y/N	Yes	Yes	Yes
Cap	542	559	691
Service Time	4.393	4.17	3.274
HCM Lane V/C Ratio	0.518	0.462	0.961
HCM Control Delay	16.5	14.6	46.4
HCM Lane LOS	C	B	E
HCM 95th-tile Q	3	2.4	13.7

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Timings
7: N. Broad Street & Callowhill Street

Lane Group	WBL	WBT	NBL	NBT	SBT
Lane Configurations					
Volume (vph)	30	173	169	551	773
Lane Group Flow (vph)	33	235	186	605	996
Turn Type	Perm	NA	Perm	NA	NA
Protected Phases		8		2	6
Permitted Phases	8		2		
Minimum Split (s)	29.0	29.0	61.0	61.0	61.0
Total Split (s)	29.0	29.0	61.0	61.0	61.0
Total Split (%)	32.2%	32.2%	67.8%	67.8%	67.8%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.0	5.0	5.0
Lead/Lag					
Lead-Lag Optimize?					
v/c Ratio	0.10	0.29	0.72	0.30	0.52
Control Delay	28.9	30.2	46.2	19.8	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	28.9	30.2	46.2	19.8	7.2
Queue Length 50th (ft)	16	62	108	168	76
Queue Length 95th (ft)	m40	97	#200	224	87
Internal Link Dist (ft)		525		210	990
Turn Bay Length (ft)			300		
Base Capacity (vph)	329	803	260	1995	1910
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	0.10	0.29	0.72	0.30	0.52

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 47 (52%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Pretimed
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.

Splits and Phases: 7: N. Broad Street & Callowhill Street

HCM 2010 Signalized Intersection Summary
7: N. Broad Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	30	173	41	169	551	0	0	773	134
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.79	0.95		1.00	1.00		0.75
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln				182.5	181.1	186.2	181.6	181.6	0.0	0.0	185.7	189.9
Lanes				1	2	0	1	2	0	0	2	0
Cap, veh/h				444	695	154	349	2260	0	0	1818	315
Arrive On Green				0.08	0.08	0.08	0.62	0.62	0.00	0.00	0.62	0.62
Sat Flow, veh/h				1738	2719	603	576	3632	0	0	2921	506
Grp Volume(v), veh/h				33	122	113	186	605	0	0	540	456
Grp Sat Flow(s),veh/h/ln				1738	1811	1511	576	1816	0	0	1857	1570
Q Serve(g_s), s				1.6	5.7	6.3	22.9	6.8	0.0	0.0	13.9	13.9
Cycle Q Clear(g_c), s				1.6	5.7	6.3	36.8	6.8	0.0	0.0	13.9	13.9
Prop In Lane				1.00		0.40	1.00		0.00	0.00		0.32
Lane Grp Cap(c), veh/h				444	463	386	349	2260	0	0	1155	977
V/C Ratio(X)				0.07	0.26	0.29	0.53	0.27	0.00	0.00	0.47	0.47
Avail Cap(c_a), veh/h				444	463	386	349	2260	0	0	1155	977
HCM Platoon Ratio				0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				31.4	33.3	33.6	18.9	7.7	0.0	0.0	9.1	9.1
Incr Delay (d2), s/veh				0.3	1.4	1.9	5.7	0.3	0.0	0.0	1.4	1.6
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (85%), veh/ln				1.3	4.7	4.5	5.6	4.5	0.0	0.0	8.7	7.6
Lane Grp Delay (d), s/veh				31.7	34.7	35.5	24.6	8.0	0.0	0.0	10.4	10.7
Lane Grp LOS				C	C	D	C	A			B	B
Approach Vol, veh/h					268			791			996	
Approach Delay, s/veh					34.6			11.9			10.5	
Approach LOS					C			B			B	

Timer

Assigned Phs					8			2			6	
Phs Duration (G+Y+Rc), s					29.0			61.0			61.0	
Change Period (Y+Rc), s					6.0			5.0			5.0	
Max Green Setting (Gmax), s					23.0			56.0			56.0	
Max Q Clear Time (g_c+I1), s					0.0			0.0			0.0	
Green Ext Time (p_c), s					0.0			0.0			0.0	

Intersection Summary

HCM 2010 Ctrl Delay			14.2									
HCM 2010 LOS			B									

Notes

HCM 2010 Signals-Pedestrians
7: N. Broad Street & Callowhill Street

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	24.5	32.2	56.2	54.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	3	5	4
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	6	2	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	25	25	25
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	45.0	45.0	45.0	45.0
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	1.94	2.02	2.58	2.48
Pedestrian Crosswalk LOS	A	B	B	B

HCM 2010 Signals-Bicycles
7: N. Broad Street & Callowhill Street

Approach	EB	WB	NB	SB
Bicycle Flow Rate (bike/h)	0	0	0	0
Total Flow Rate (veh/h)	0	268	791	996
Effct. Green for Bike (s)	0.0	23.0	56.0	56.0
Cross Street Width (ft)	56.2	54.0	32.2	24.5
Through Lanes Number	0	2	2	2
Through Lane Width (ft)	12.0	11.0	10.0	10.0
Bicycle Lane Width (ft)	0.0	0.0	0.0	0.0
Paved Shoulder Width (ft)	0.0	0.0	0.0	0.0
Curb Is Present?	No	No	No	No
On Street Parking?	No	No	No	No
Bicycle Lane Capacity (bike/h)	0	511	1244	1244
Bicycle Delay (s/bike)	0.0	24.9	6.4	6.4
Bicycle Compliance		Fair	Good	Good
Bicycle LOS Score	0.00	2.82	3.13	3.18
Bicycle LOS		C	C	C

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	264	722	59	590	0	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	11	12	11	12	12	12	12
Grade (%)		0%			0%			-1%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.88	0.91	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor						0.98		0.97				
Frt						0.850						
Flt Protected								0.996				
Satd. Flow (prot)	0	0	0	0	3521	2680	0	4851	0	0	0	0
Flt Permitted								0.996				
Satd. Flow (perm)	0	0	0	0	3521	2622	0	4716	0	0	0	0
Right Turn on Red			Yes			No	Yes		Yes			Yes
Satd. Flow (RTOR)								28				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		430			460			170			344	
Travel Time (s)		11.7			12.5			4.6			9.4	
Confl. Peds. (#/hr)	15		7	7		15	323		1	1		323
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%
Adj. Flow (vph)	0	0	0	0	275	752	61	615	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	275	752	0	676	0	0	0	0
Turn Type					NA	Perm	Perm	NA				
Protected Phases					1			2				
Permitted Phases						1	2					
Minimum Split (s)					51.0	51.0	39.0	39.0				
Total Split (s)					51.0	51.0	39.0	39.0				
Total Split (%)					56.7%	56.7%	43.3%	43.3%				
Yellow Time (s)					3.5	3.5	3.5	3.5				
All-Red Time (s)					1.8	1.8	2.5	2.5				
Lost Time Adjust (s)					0.0	0.0		0.0				
Total Lost Time (s)					5.3	5.3		6.0				
Lead/Lag					Lead	Lead	Lag	Lag				
Lead-Lag Optimize?												
Act Effct Green (s)					45.7	45.7		33.0				
Actuated g/C Ratio					0.51	0.51		0.37				
v/c Ratio					0.15	0.56		0.39				
Control Delay					15.8	23.3		3.0				
Queue Delay					0.0	0.0		0.2				
Total Delay					15.8	23.3		3.2				
LOS					B	C		A				
Approach Delay					21.3			3.2				
Approach LOS					C			A				
Queue Length 50th (ft)					63	200		8				
Queue Length 95th (ft)					m68	m190		12				
Internal Link Dist (ft)		350			380			90			264	
Turn Bay Length (ft)												
Base Capacity (vph)					1787	1331		1746				

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	7
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	1.8	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
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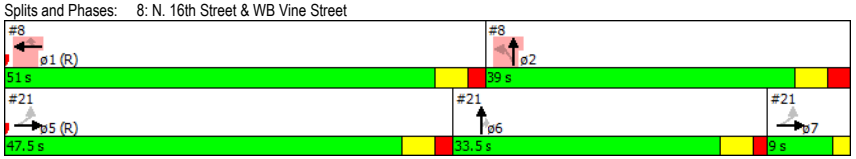
Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn					0	0		389				
Spillback Cap Reductn					0	0		0				
Storage Cap Reductn					0	0		0				
Reduced v/c Ratio					0.15	0.56		0.50				

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 14.1	Intersection LOS: B
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 8: N. 16th Street & WB Vine Street



Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	35	482	0	0	0	0	0	1199	559
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			2%	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.86	0.86
Ped Bike Factor					1.00						0.99	
Frt											0.952	
Flt Protected					0.997							
Satd. Flow (prot)	0	0	0	0	3318	0	0	0	0	0	5753	0
Flt Permitted					0.997							
Satd. Flow (perm)	0	0	0	0	3318	0	0	0	0	0	5753	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					145						131	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		460			480			170			414	
Travel Time (s)		12.5			13.1			4.6			11.3	
Confl. Peds. (#/hr)	18		1	1		18	17		383	383		17
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Parking (#/hr)					0							
Adj. Flow (vph)	0	0	0	39	536	0	0	0	0	0	1332	621
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	575	0	0	0	0	0	1953	0
Turn Type				Perm	NA						NA	
Protected Phases					1						2	
Permitted Phases				1								
Minimum Split (s)				49.0	49.0						41.0	
Total Split (s)				49.0	49.0						41.0	
Total Split (%)				54.4%	54.4%						45.6%	
Yellow Time (s)				3.5	3.5						3.5	
All-Red Time (s)				1.5	1.5						11.5	
Lost Time Adjust (s)					0.0						0.0	
Total Lost Time (s)					5.0						15.0	
Lead/Lag				Lead	Lead						Lag	
Lead-Lag Optimize?												
Act Effct Green (s)					44.0						26.0	
Actuated g/C Ratio					0.49						0.29	
v/c Ratio					0.34						1.17dr	
Control Delay					6.6						89.0	
Queue Delay					0.0						0.1	
Total Delay					6.6						89.1	
LOS					A						F	
Approach Delay					6.6						89.1	
Approach LOS					A						F	
Queue Length 50th (ft)					24						~358	
Queue Length 95th (ft)					37						#436	
Internal Link Dist (ft)		380			400			90			334	
Turn Bay Length (ft)												
Base Capacity (vph)					1696						1755	

Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	ø5	ø6
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Grade (%)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Peak Hour Factor		
Parking (#/hr)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	5	6
Permitted Phases		
Minimum Split (s)	49.0	41.0
Total Split (s)	49.0	41.0
Total Split (%)	54%	46%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.5	3.5
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lag
Lead-Lag Optimize?		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
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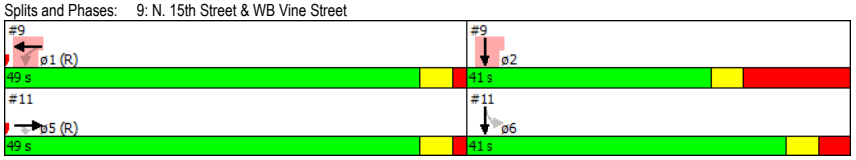
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					65						40	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.35						1.14	

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 1.11	
Intersection Signal Delay: 70.3	Intersection LOS: E
Intersection Capacity Utilization 80.8%	ICU Level of Service D
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 9: N. 15th Street & WB Vine Street



Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	ø5	ø6
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Projected (Build) Conditions
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Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	104	424	124	0	670	0	0	601	92
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	11	12	12	10	12	12	10	12
Grade (%)		0%			1%			-1%			1%	
Storage Length (ft)	0		0	0		0	0		0	100		100
Storage Lanes	0		0	1		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.86	0.86
Ped Bike Factor				1.00		0.95					0.95	
Frt						0.850					0.980	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	0	1751	3386	1567	0	4732	0	0	5496	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	0	1750	3386	1490	0	4732	0	0	5496	0
Right Turn on Red			Yes			No			Yes			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		480			605			170			270	
Travel Time (s)		13.1			16.5			4.6			7.4	
Confl. Peds. (#/hr)	61		1	1		61	513		161	161		513
Confl. Bikes (#/hr)						1			13			10
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Bus Blockages (#/hr)	0	0	0	0	0	0	0	2	0	0	5	0
Adj. Flow (vph)	0	0	0	111	451	132	0	713	0	0	639	98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	111	451	132	0	713	0	0	737	0
Turn Type				Perm	NA	Perm		NA			NA	
Protected Phases					1 3!			2			6!	
Permitted Phases				1 3!		1 3						
Minimum Split (s)								34.0			34.0	
Total Split (s)								34.0			34.0	
Total Split (%)								37.8%			37.8%	
Yellow Time (s)								2.4			3.6	
All-Red Time (s)								3.0			5.4	
Lost Time Adjust (s)								0.0			0.0	
Total Lost Time (s)								5.4			9.0	
Lead/Lag								Lead			Lead	
Lead-Lag Optimize?												
Act Effct Green (s)				46.0	46.0	46.0		28.6			25.0	
Actuated g/C Ratio				0.51	0.51	0.51		0.32			0.28	
v/c Ratio				0.12	0.26	0.17		0.47			0.48	
Control Delay				15.3	15.4	15.7		12.8			14.4	
Queue Delay				0.0	0.0	0.0		1.1			0.1	
Total Delay				15.3	15.4	15.7		13.9			14.5	
LOS				B	B	B		B			B	
Approach Delay					15.5			13.9			14.5	
Approach LOS					B			B			B	
Queue Length 50th (ft)				32	68	38		69			70	

Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø7	ø8
Lane Configurations					
Volume (vph)					
Ideal Flow (vphpl)					
Lane Width (ft)					
Grade (%)					
Storage Length (ft)					
Storage Lanes					
Taper Length (ft)					
Lane Util. Factor					
Ped Bike Factor					
Frt					
Flt Protected					
Satd. Flow (prot)					
Flt Permitted					
Satd. Flow (perm)					
Right Turn on Red					
Satd. Flow (RTOR)					
Link Speed (mph)					
Link Distance (ft)					
Travel Time (s)					
Confl. Peds. (#/hr)					
Confl. Bikes (#/hr)					
Peak Hour Factor					
Bus Blockages (#/hr)					
Adj. Flow (vph)					
Shared Lane Traffic (%)					
Lane Group Flow (vph)					
Turn Type					
Protected Phases	1	3	5	7	8
Permitted Phases					
Minimum Split (s)	42.0	14.0	42.0	48.0	14.0
Total Split (s)	42.0	14.0	42.0	48.0	14.0
Total Split (%)	47%	16%	47%	53%	16%
Yellow Time (s)	3.6	2.0	3.6	3.6	3.6
All-Red Time (s)	6.4	0.0	6.4	2.4	2.4
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag		Lag			Lag
Lead-Lag Optimize?		Yes			
Act Effct Green (s)					
Actuated g/C Ratio					
v/c Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Queue Length 50th (ft)					

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
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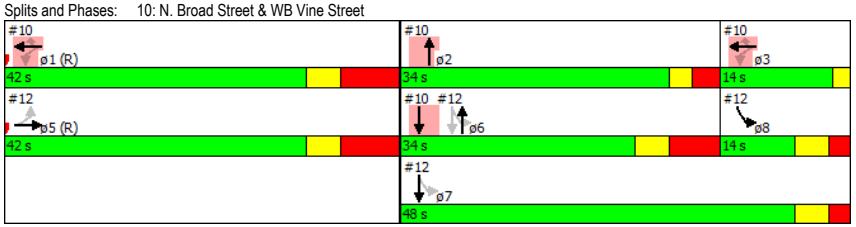
Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)				71	116	82		86			85	
Internal Link Dist (ft)		400			525			90			190	
Turn Bay Length (ft)												
Base Capacity (vph)				894	1730	761		1503			1526	
Starvation Cap Reductn				0	0	0		514			0	
Spillback Cap Reductn				0	0	0		0			117	
Storage Cap Reductn				0	0	0		0			0	
Reduced v/c Ratio				0.12	0.26	0.17		0.72			0.52	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green
Natural Cycle: 90
Control Type: Pretimed
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 14.6 Intersection LOS: B
Intersection Capacity Utilization 119.0% ICU Level of Service H
Analysis Period (min) 15
! Phase conflict between lane groups.

Splits and Phases: 10: N. Broad Street & WB Vine Street



Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø7	ø8
Queue Length 95th (ft)					
Internal Link Dist (ft)					
Turn Bay Length (ft)					
Base Capacity (vph)					
Starvation Cap Reductn					
Spillback Cap Reductn					
Storage Cap Reductn					
Reduced v/c Ratio					

Intersection Summary

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
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Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1246	466	0	0	0	0	0	0	411	830	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		2%			0%			0%			4%	
Lane Util. Factor	1.00	0.86	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00
Ped Bike Factor			0.98							0.70		
Frt			0.850									
Flt Protected										0.950		
Satd. Flow (prot)	0	6310	2744	0	0	0	0	0	0	1725	4792	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	6310	2692	0	0	0	0	0	0	1202	4792	0
Right Turn on Red			No			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)										25		
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		82			480			430			170	
Travel Time (s)		2.2			13.1			11.7			4.6	
Confl. Peds. (#/hr)			12	12			21		398	398		21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1354	507	0	0	0	0	0	0	447	902	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1354	507	0	0	0	0	0	0	447	902	0
Turn Type		NA	Perm							Perm	NA	
Protected Phases		5									6	
Permitted Phases			5							6		
Minimum Split (s)		49.0	49.0							41.0	41.0	
Total Split (s)		49.0	49.0							41.0	41.0	
Total Split (%)		54.4%	54.4%							45.6%	45.6%	
Yellow Time (s)		3.5	3.5							3.5	3.5	
All-Red Time (s)		1.5	1.5							3.5	3.5	
Lost Time Adjust (s)		0.0	0.0							0.0	0.0	
Total Lost Time (s)		5.0	5.0							7.0	7.0	
Lead/Lag		Lead	Lead							Lag	Lag	
Lead-Lag Optimize?												
Act Effct Green (s)		44.0	44.0							34.0	34.0	
Actuated g/C Ratio		0.49	0.49							0.38	0.38	
v/c Ratio		0.44	0.39							0.95	0.50	
Control Delay		12.6	15.5							16.1	2.1	
Queue Delay		0.0	0.0							24.7	2.4	
Total Delay		12.6	15.5							40.8	4.5	
LOS		B	B							D	A	
Approach Delay		13.4									16.6	
Approach LOS		B									B	
Queue Length 50th (ft)		98	94							39	12	
Queue Length 95th (ft)		123	128							m15	m11	
Internal Link Dist (ft)		2			400			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		3084	1316							469	1810	
Starvation Cap Reductn		0	0							44	745	

Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	ø1	ø2
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Grade (%)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	2
Permitted Phases		
Minimum Split (s)	49.0	41.0
Total Split (s)	49.0	41.0
Total Split (%)	54%	46%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.5	11.5
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lag
Lead-Lag Optimize?		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
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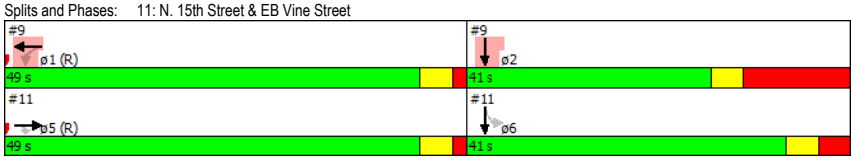
Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0	0							0	0	
Storage Cap Reductn		0	0							0	0	
Reduced v/c Ratio		0.44	0.39							1.05	0.85	

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 1.11	
Intersection Signal Delay: 14.7	Intersection LOS: B
Intersection Capacity Utilization 80.8%	ICU Level of Service D
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 11: N. 15th Street & EB Vine Street



Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	ø1	ø2
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
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Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	283	1489	102	0	0	0	0	397	207	285	469	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	10	12	12	10	12
Grade (%)		2%			0%			2%			2%	
Storage Length (ft)	0		250	0		0	0		100	45		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.81	0.81	0.81	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor		1.00						0.94		0.96		
Frt		0.992						0.949				
Flt Protected		0.993								0.950		
Satd. Flow (prot)	0	7273	0	0	0	0	0	3984	0	1743	4674	0
Flt Permitted		0.993								0.395		
Satd. Flow (perm)	0	7273	0	0	0	0	0	3984	0	697	4674	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		480			163			250			170	
Travel Time (s)		13.1			4.4			6.8			4.6	
Confl. Peds. (#/hr)			63	63			420		144	144		420
Confl. Bikes (#/hr)			1						9			8
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	7%	2%	2%	2%	2%	2%	4%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	30	0	0	0	0
Adj. Flow (vph)	295	1551	106	0	0	0	0	414	216	297	489	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1952	0	0	0	0	0	630	0	297	489	0
Turn Type	Perm	NA						NA		custom	NA	
Protected Phases		5						6		8	7	
Permitted Phases	5									6 7	6 7	
Minimum Split (s)	42.0	42.0						34.0		14.0	48.0	
Total Split (s)	42.0	42.0						34.0		14.0	48.0	
Total Split (%)	46.7%	46.7%						37.8%		15.6%	53.3%	
Yellow Time (s)	3.6	3.6						3.6		3.6	3.6	
All-Red Time (s)	6.4	6.4						5.4		2.4	2.4	
Lost Time Adjust (s)		0.0						0.0		0.0	0.0	
Total Lost Time (s)		10.0						9.0		6.0	6.0	
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?												
Act Effct Green (s)		32.0						25.0		42.0	42.0	
Actuated g/C Ratio		0.36						0.28		0.47	0.47	
v/c Ratio		0.76						0.57		0.71	0.22	
Control Delay		20.0						30.3		20.4	2.3	
Queue Delay		0.0						0.1		59.8	0.3	
Total Delay		20.0						30.4		80.3	2.6	
LOS		B						C		F	A	
Approach Delay		20.0						30.4			32.0	
Approach LOS		B						C			C	

Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Bus Blockages (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	3
Permitted Phases			
Minimum Split (s)	42.0	34.0	14.0
Total Split (s)	42.0	34.0	14.0
Total Split (%)	47%	38%	16%
Yellow Time (s)	3.6	2.4	2.0
All-Red Time (s)	6.4	3.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag		Lead	Lag
Lead-Lag Optimize?			Yes
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			

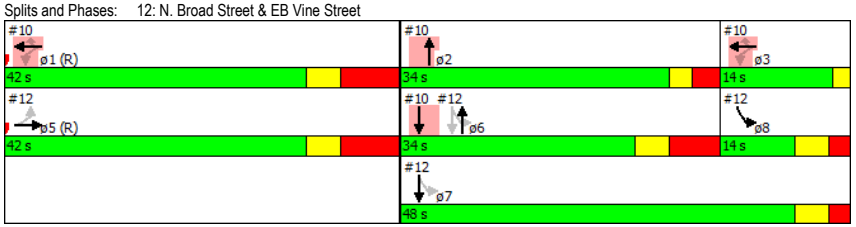
Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening
Synchro 8 Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		156						112		81	10	
Queue Length 95th (ft)		m166						150		#140	17	
Internal Link Dist (ft)		400			83			170			90	
Turn Bay Length (ft)										45		
Base Capacity (vph)		2585						1106		418	2181	
Starvation Cap Reductn		0						0		181	1068	
Spillback Cap Reductn		24						37		0	0	
Storage Cap Reductn		0						0		0	0	
Reduced v/c Ratio		0.76						0.59		1.25	0.44	

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 24.7	Intersection LOS: C
Intersection Capacity Utilization 119.0%	ICU Level of Service H
Analysis Period (min) 15	

\# 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.

Splits and Phases: 12: N. Broad Street & EB Vine Street



Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening
Synchro 8 Report

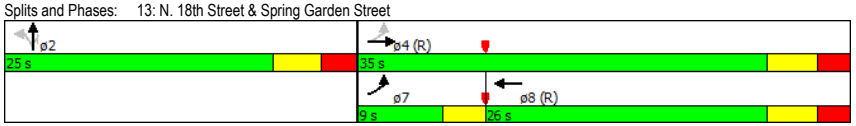
Timings
13: N. 18th Street & Spring Garden Street

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	52	482	472	75	58
Lane Group Flow (vph)	56	518	539	133	62
Turn Type	pm+pt	NA	NA	NA	Perm
Protected Phases	7	4	8	2	
Permitted Phases	4				2
Minimum Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?					
v/c Ratio	0.13	0.33	0.51	0.29	0.12
Control Delay	7.6	10.3	22.6	17.7	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.6	10.3	22.6	17.7	1.9
Queue Length 50th (ft)	9	56	77	36	0
Queue Length 95th (ft)	23	85	80	74	9
Internal Link Dist (ft)		476	350	810	
Turn Bay Length (ft)	145				150
Base Capacity (vph)	420	1562	1065	455	500
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	0.13	0.33	0.51	0.29	0.12

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 13: N. 18th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
13: N. 18th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	52	482	0	0	472	29	48	75	58	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.96		1.00	1.00		0.87	1.00		0.93			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln	185.3	185.3	0.0	0.0	185.3	189.0	189.0	177.9	176.2			
Lanes	1	2	0	0	2	0	0	1	1			
Cap, veh/h	527	1791	0	0	1142	69	272	277	441			
Arrive On Green	0.10	0.48	0.00	0.00	0.67	0.67	0.32	0.32	0.32			
Sat Flow, veh/h	1765	3706	0	0	3425	208	860	876	1393			
Grp Volume(v), veh/h	56	518	0	0	274	265	105	28	62			
Grp Sat Flow(s),veh/h/ln	1765	1853	0	0	1853	1780	1736	1779	1393			
Q Serve(g_s), s	1.0	5.0	0.0	0.0	4.2	4.2	2.6	0.0	1.9			
Cycle Q Clear(g_c), s	1.0	5.0	0.0	0.0	4.2	4.2	2.6	0.0	1.9			
Prop In Lane	1.00		0.00	0.00		0.12	0.50		1.00			
Lane Grp Cap(c), veh/h	527	1791	0	0	618	593	550	0	441			
V/C Ratio(X)	0.11	0.29	0.00	0.00	0.44	0.45	0.19	0.00	0.14			
Avail Cap(c_a), veh/h	527	1791	0	0	618	593	550	0	441			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	9.2	9.3	0.0	0.0	7.4	7.4	14.9	0.0	14.7			
Incr Delay (d2), s/veh	0.4	0.4	0.0	0.0	2.3	2.4	0.8	0.0	0.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln	0.8	3.5	0.0	0.0	3.1	3.0	2.1	0.0	1.2			
Lane Grp Delay (d), s/veh	9.6	9.7	0.0	0.0	9.7	9.8	15.7	0.0	15.3			
Lane Grp LOS	A	A			A	A	B		B			
Approach Vol, veh/h		574			539			195				
Approach Delay, s/veh		9.7			9.7			13.3				
Approach LOS		A			A			B				

Timer

Assigned Phs	7	4			8			2	
Phs Duration (G+Y+Rc), s	9.0	35.0			26.0			25.0	
Change Period (Y+Rc), s	3.0	6.0			6.0			6.0	
Max Green Setting (Gmax), s	6.0	29.0			20.0			19.0	
Max Q Clear Time (g_c+I1), s	0.0	0.0			0.0			0.0	
Green Ext Time (p_c), s	0.0	0.0			0.0			0.0	

Intersection Summary

HCM 2010 Ctrl Delay			10.3									
HCM 2010 LOS			B									

Notes

Timings
14: N. Broad Street & Spring Garden Street

Lane Group	EBT	WBT	NBT	NBR	SBL	SBT	SBR
Lane Configurations							
Volume (vph)	508	427	531	56	75	831	102
Lane Group Flow (vph)	631	514	571	60	81	894	110
Turn Type	NA	NA	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	8	2		1	6	
Permitted Phases				2	6		6
Minimum Split (s)	33.0	33.0	35.0	35.0	9.0	35.0	35.0
Total Split (s)	40.0	40.0	41.0	41.0	9.0	50.0	50.0
Total Split (%)	44.4%	44.4%	45.6%	45.6%	10.0%	55.6%	55.6%
Yellow Time (s)	3.6	3.6	3.4	3.4	3.0	3.4	3.4
All-Red Time (s)	2.4	2.4	2.6	2.6	0.0	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Lead/Lag			Lag	Lag	Lead		
Lead-Lag Optimize?							
v/c Ratio	0.53	0.43	0.43	0.10	0.22	0.53	0.18
Control Delay	23.9	22.2	9.4	2.7	12.3	17.4	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.9	22.2	9.4	2.7	12.3	17.4	13.9
Queue Length 50th (ft)	144	112	32	0	22	176	34
Queue Length 95th (ft)	197	156	93	2	45	232	65
Internal Link Dist (ft)	400	550	990			290	
Turn Bay Length (ft)				100	170		100
Base Capacity (vph)	1182	1194	1323	603	375	1672	604
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.43	0.43	0.10	0.22	0.53	0.18

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Pretimed

Splits and Phases: 14: N. Broad Street & Spring Garden Street

HCM 2010 Signalized Intersection Summary
14: N. Broad Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	508	79	0	427	51	0	531	56	75	831	102
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	1.00		0.95	1.00		0.93	0.98		0.85
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.3	189.0	0.0	185.3	189.0	0.0	185.3	185.3	186.2	186.2	186.2
Lanes	0	2	0	0	2	0	0	2	1	1	2	1
Cap, veh/h	0	1171	181	0	1221	145	0	1441	567	481	1821	659
Arrive On Green	0.00	0.38	0.38	0.00	0.38	0.38	0.00	0.78	0.78	0.07	0.49	0.49
Sat Flow, veh/h	0	3101	480	0	3231	385	0	3706	1458	1774	3724	1347
Grp Volume(v), veh/h	0	325	306	0	262	252	0	571	60	81	894	110
Grp Sat Flow(s),veh/h/ln	0	1853	1728	0	1853	1763	0	1853	1458	1774	1862	1347
Q Serve(g_s), s	0.0	11.9	12.0	0.0	9.2	9.3	0.0	4.5	0.9	2.2	14.5	4.1
Cycle Q Clear(g_c), s	0.0	11.9	12.0	0.0	9.2	9.3	0.0	4.5	0.9	2.2	14.5	4.1
Prop In Lane	0.00		0.28	0.00		0.22	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	700	653	0	700	666	0	1441	567	481	1821	659
V/C Ratio(X)	0.00	0.46	0.47	0.00	0.37	0.38	0.00	0.40	0.11	0.17	0.49	0.17
Avail Cap(c_a), veh/h	0	700	653	0	700	666	0	1441	567	481	1821	659
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	21.1	21.2	0.0	20.3	20.3	0.0	6.6	6.2	13.1	15.5	12.8
Incr Delay (d2), s/veh	0.0	2.2	2.4	0.0	1.5	1.6	0.0	0.8	0.4	0.8	0.9	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	8.3	7.9	0.0	6.6	6.4	0.0	2.9	0.6	1.8	9.2	2.5
Lane Grp Delay (d), s/veh	0.0	23.3	23.6	0.0	21.8	22.0	0.0	7.4	6.6	13.9	16.4	13.3
Lane Grp LOS		C	C		C	C		A	A	B	B	B
Approach Vol, veh/h		631			514			631			1085	
Approach Delay, s/veh		23.5			21.9			7.3			15.9	
Approach LOS		C			C			A			B	

Timer

Assigned Phs		4			8			2		1	6	
Phs Duration (G+Y+Rc), s		40.0			40.0			41.0		9.0	50.0	
Change Period (Y+Rc), s		6.0			6.0			6.0		3.0	6.0	
Max Green Setting (Gmax), s		34.0			34.0			35.0		6.0	44.0	
Max Q Clear Time (g_c+I1), s		0.0			0.0			0.0		0.0	0.0	
Green Ext Time (p_c), s		0.0			0.0			0.0		0.0	0.0	

Intersection Summary

HCM 2010 Ctrl Delay			16.8									
HCM 2010 LOS			B									

Notes

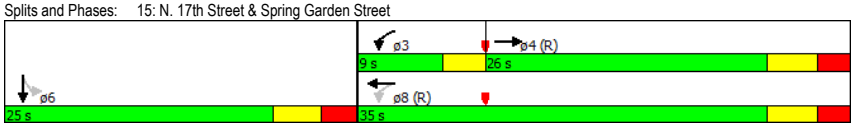
Timings
15: N. 17th Street & Spring Garden Street

Lane Group	EBT	WBL	WBT	SBT
Lane Configurations				
Volume (vph)	446	73	439	69
Lane Group Flow (vph)	613	87	523	170
Turn Type	NA	pm+pt	NA	NA
Protected Phases	4	3	8	6
Permitted Phases		8		
Minimum Split (s)	26.0	9.0	35.0	25.0
Total Split (s)	26.0	9.0	35.0	25.0
Total Split (%)	43.3%	15.0%	58.3%	41.7%
Yellow Time (s)	3.6	3.0	3.6	3.4
All-Red Time (s)	2.4	0.0	2.4	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	3.0	6.0	6.0
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?				
v/c Ratio	0.58	0.22	0.33	0.35
Control Delay	10.3	6.9	8.6	15.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.3	6.9	8.6	15.1
Queue Length 50th (ft)	31	10	35	37
Queue Length 95th (ft)	42	24	76	73
Internal Link Dist (ft)	350		350	290
Turn Bay Length (ft)		165		
Base Capacity (vph)	1053	388	1562	490
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	0.58	0.22	0.33	0.35

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 15: N. 17th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
15: N. 17th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	446	69	73	439	0	0	0	0	36	69	38
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.86	0.96		1.00				1.00		0.92
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.3	189.0	185.3	185.3	0.0				189.0	184.8	189.0
Lanes	0	2	0	1	2	0				0	1	0
Cap, veh/h	0	1022	157	499	1791	0				198	158	219
Arrive On Green	0.00	0.67	0.67	0.20	0.97	0.00				0.32	0.32	0.32
Sat Flow, veh/h	0	3066	470	1765	3706	0				625	306	692
Grp Volume(v), veh/h	0	319	294	87	523	0				125	0	108
Grp Sat Flow(s),veh/h/ln	0	1853	1683	1765	1853	0				1817	0	1654
Q Serve(g_s), s	0.0	5.3	5.4	1.6	0.4	0.0				2.6	0.0	0.0
Cycle Q Clear(g_c), s	0.0	5.3	5.4	1.6	0.4	0.0				2.6	0.0	0.0
Prop In Lane	0.00		0.28	1.00		0.00				0.34		0.42
Lane Grp Cap(c), veh/h	0	618	561	499	1791	0				575	0	0
V/C Ratio(X)	0.00	0.52	0.52	0.17	0.29	0.00				0.22	0.00	0.00
Avail Cap(c_a), veh/h	0	618	561	499	1791	0				575	0	0
HCM Platoon Ratio	1.00	2.00	2.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	7.5	7.6	8.4	0.5	0.0				12.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	3.1	3.5	0.8	0.4	0.0				0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	3.6	3.5	1.2	0.4	0.0				2.1	0.0	0.0
Lane Grp Delay (d), s/veh	0.0	10.6	11.0	9.2	0.9	0.0				13.3	0.0	0.0
Lane Grp LOS		B	B	A	A					B		
Approach Vol, veh/h		613			610						233	
Approach Delay, s/veh		10.8			2.1						7.1	
Approach LOS		B			A						A	

Timer

Assigned Phs		4		3	8						6	
Phs Duration (G+Y+Rc), s		26.0		9.0	35.0						25.0	
Change Period (Y+Rc), s		6.0		3.0	6.0						6.0	
Max Green Setting (Gmax), s		20.0		6.0	29.0						19.0	
Max Q Clear Time (g_c+I1), s		0.0		0.0	0.0						0.0	
Green Ext Time (p_c), s		0.0		0.0	0.0						0.0	

Intersection Summary

HCM 2010 Ctrl Delay			6.6									
HCM 2010 LOS			A									

Notes

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	73	220	51	0	0	0	0	361	51
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					0.99						0.99	
Frt					0.978						0.983	
Flt Protected					0.989							
Satd. Flow (prot)	0	0	0	0	3213	0	0	0	0	0	1630	0
Flt Permitted					0.989							
Satd. Flow (perm)	0	0	0	0	3213	0	0	0	0	0	1630	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					99						8	
Link Speed (mph)		30			25			30			25	
Link Distance (ft)		975			430			170			647	
Travel Time (s)		22.2			11.7			3.9			17.6	
Confl. Peds. (#/hr)	24		2	2		24	37		104	104		37
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Parking (#/hr)					0						0	
Adj. Flow (vph)	0	0	0	89	268	62	0	0	0	0	440	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	419	0	0	0	0	0	502	0
Turn Type				custom	NA						NA	
Protected Phases					1 3						2	
Permitted Phases				1								
Minimum Split (s)				47.5							33.5	
Total Split (s)				47.5							33.5	
Total Split (%)				52.8%							37.2%	
Yellow Time (s)				3.5							3.5	
All-Red Time (s)				1.8							1.5	
Lost Time Adjust (s)											0.0	
Total Lost Time (s)											5.0	
Lead/Lag				Lead							Lag	
Lead-Lag Optimize?												
Act Effct Green (s)					51.2						28.5	
Actuated g/C Ratio					0.57						0.32	
v/c Ratio					0.22						0.96	
Control Delay					2.2						63.0	
Queue Delay					0.0						0.0	
Total Delay					2.2						63.0	
LOS					A						E	
Approach Delay					2.2						63.0	
Approach LOS					A						E	
Queue Length 50th (ft)					16						275	
Queue Length 95th (ft)					23						#408	
Internal Link Dist (ft)		895			350			90			567	
Turn Bay Length (ft)												
Base Capacity (vph)					1870						521	
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					0						0	

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	ø3	ø5	ø6
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	5	6
Permitted Phases			
Minimum Split (s)	9.0	51.0	39.0
Total Split (s)	9.0	51.0	39.0
Total Split (%)	10%	57%	43%
Yellow Time (s)	2.0	3.5	3.5
All-Red Time (s)	0.0	1.8	2.5
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag		Lead	Lag
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			

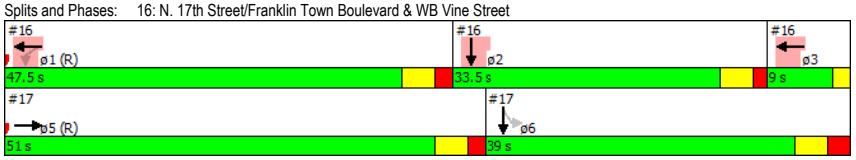
Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening
Synchro 8 Report

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.22						0.96	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 35.4	Intersection LOS: D
Intersection Capacity Utilization 67.5%	ICU Level of Service C
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 16: N. 17th Street/Franklin Town Boulevard & WB Vine Street



Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	ø3	ø5	ø6
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	340	26	0	0	0	0	0	0	185	262	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor		1.00									0.95	
Frt		0.989										
Flt Protected											0.980	
Satd. Flow (prot)	0	3302	0	0	0	0	0	0	0	0	3450	0
Flt Permitted											0.980	
Satd. Flow (perm)	0	3302	0	0	0	0	0	0	0	0	3272	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)		12									224	
Link Speed (mph)		30			25			30			30	
Link Distance (ft)		975			430			430			170	
Travel Time (s)		22.2			11.7			9.8			3.9	
Confl. Peds. (#/hr)			18	18			33		116	116		33
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Parking (#/hr)		0										
Adj. Flow (vph)	0	425	32	0	0	0	0	0	0	231	328	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	457	0	0	0	0	0	0	0	0	559	0
Turn Type		NA								Perm	NA	
Protected Phases		5									6	
Permitted Phases										6		
Minimum Split (s)		51.0								39.0	39.0	
Total Split (s)		51.0								39.0	39.0	
Total Split (%)		56.7%								43.3%	43.3%	
Yellow Time (s)		3.5								3.5	3.5	
All-Red Time (s)		1.8								2.5	2.5	
Lost Time Adjust (s)		0.0									0.0	
Total Lost Time (s)		5.3									6.0	
Lead/Lag		Lead								Lag	Lag	
Lead-Lag Optimize?												
Act Effct Green (s)		45.7									33.0	
Actuated g/C Ratio		0.51									0.37	
v/c Ratio		0.27									0.42	
Control Delay		12.8									1.4	
Queue Delay		0.0									2.0	
Total Delay		12.8									3.4	
LOS		B									A	
Approach Delay		12.8									3.4	
Approach LOS		B									A	
Queue Length 50th (ft)		72									0	
Queue Length 95th (ft)		88									m1	
Internal Link Dist (ft)		895			350			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		1682									1341	
Starvation Cap Reductn		0									605	
Spillback Cap Reductn		0									0	

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	3
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	1.8	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening
Synchro 8 Report

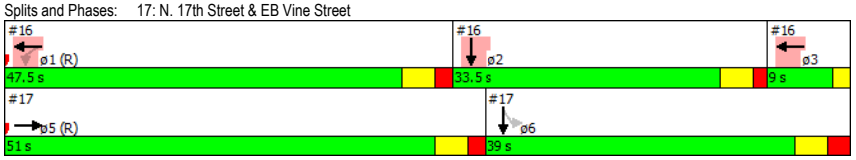
Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.27									0.76	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green			
Natural Cycle: 90			
Control Type: Pretimed			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 7.6		Intersection LOS: A	
Intersection Capacity Utilization 75.0%		ICU Level of Service D	
Analysis Period (min) 15			

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

Splits and Phases: 17: N. 17th Street & EB Vine Street



Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Storage Cap Reductn			
Reduced v/c Ratio			

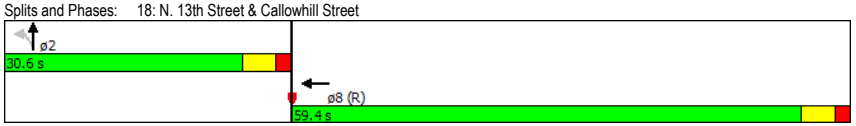
Intersection Summary

Timings
18: N. 13th Street & Callowhill Street

Lane Group	WBT	NBT
Lane Configurations		
Volume (vph)	155	162
Lane Group Flow (vph)	190	222
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Minimum Split (s)	59.4	30.6
Total Split (s)	59.4	30.6
Total Split (%)	66.0%	34.0%
Yellow Time (s)	3.6	3.6
All-Red Time (s)	1.8	1.8
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.4	5.4
Lead/Lag		
Lead-Lag Optimize?		
v/c Ratio	0.10	0.49
Control Delay	7.0	14.9
Queue Delay	0.0	0.0
Total Delay	7.0	14.9
Queue Length 50th (ft)	19	36
Queue Length 95th (ft)	33	66
Internal Link Dist (ft)	195	480
Turn Bay Length (ft)		
Base Capacity (vph)	1842	450
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.10	0.49

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 90
Control Type: Pretimed

Splits and Phases: 18: N. 13th Street & Callowhill Street



HCM 2010 Signalized Intersection Summary
18: N. 13th Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	155	18	40	162	0	0	0	0
Number				3	8	18	5	2	12			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.96	1.00		1.00			
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln				0.0	185.3	189.0	189.0	185.3	0.0			
Lanes				0	2	0	0	1	0			
Cap, veh/h				0	1947	225	102	412	0			
Arrive On Green				0.00	0.60	0.60	0.28	0.28	0.00			
Sat Flow, veh/h				0	3245	375	364	1471	0			
Grp Volume(v), veh/h				0	96	94	222	0	0			
Grp Sat Flow(s),veh/h/ln				0	1853	1768	1835	1853	0			
Q Serve(g_s), s				0.0	2.0	2.0	8.9	0.0	0.0			
Cycle Q Clear(g_c), s				0.0	2.0	2.0	8.9	0.0	0.0			
Prop In Lane				0.00		0.21	0.20		0.00			
Lane Grp Cap(c), veh/h				0	1112	1061	514	0	0			
V/C Ratio(X)				0.00	0.09	0.09	0.43	0.00	0.00			
Avail Cap(c_a), veh/h				0	1112	1061	514	0	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	7.6	7.6	26.5	0.0	0.0			
Incr Delay (d2), s/veh				0.0	0.2	0.2	2.6	0.0	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln				0.0	1.5	1.5	6.6	0.0	0.0			
Lane Grp Delay (d), s/veh				0.0	7.7	7.8	29.2	0.0	0.0			
Lane Grp LOS					A	A	C					
Approach Vol, veh/h					190			222				
Approach Delay, s/veh					7.8			29.2				
Approach LOS					A			C				

Timer	
Assigned Phs	8	2
Phs Duration (G+Y+Rc), s	59.4	30.6
Change Period (Y+Rc), s	5.4	5.4
Max Green Setting (Gmax), s	54.0	25.2
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	19.3
HCM 2010 LOS	B

Notes

Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	572	49	67	144	0	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	11	12	11	10	12	12	10	12
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					0.99		0.94					
Frt					0.988							
Flt Protected							0.950					
Satd. Flow (prot)	0	0	0	0	4637	0	1702	1729	0	0	0	0
Flt Permitted							0.950					
Satd. Flow (perm)	0	0	0	0	4637	0	1604	1729	0	0	0	0
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Satd. Flow (RTOR)					22		73					
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		605			275			170			560	
Travel Time (s)		16.5			6.3			3.9			12.7	
Confl. Peds. (#/hr)	73					73	70		58	58		70
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Parking (#/hr)					0							
Adj. Flow (vph)	0	0	0	0	622	53	73	157	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	675	0	73	157	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					1			2				
Permitted Phases							2					
Minimum Split (s)					51.0		39.0	39.0				
Total Split (s)					51.0		39.0	39.0				
Total Split (%)					56.7%		43.3%	43.3%				
Yellow Time (s)					3.7		3.5	3.5				
All-Red Time (s)					1.8		2.5	2.5				
Lost Time Adjust (s)					0.0		0.0	0.0				
Total Lost Time (s)					5.5		6.0	6.0				
Lead/Lag					Lead		Lag	Lag				
Lead-Lag Optimize?					Yes		Yes	Yes				
Act Effct Green (s)					45.5		33.0	33.0				
Actuated g/C Ratio					0.51		0.37	0.37				
v/c Ratio					0.29		0.12	0.25				
Control Delay					12.8		1.0	12.1				
Queue Delay					0.0		0.8	1.9				
Total Delay					12.8		1.9	14.0				
LOS					B		A	B				
Approach Delay					12.8			10.2				
Approach LOS					B			B				
Queue Length 50th (ft)					74		0	30				
Queue Length 95th (ft)					99		5	50				
Internal Link Dist (ft)		525			195			90			480	
Turn Bay Length (ft)												
Base Capacity (vph)					2355		634	633				
Starvation Cap Reductn					0		391	345				

Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	7
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	2.0	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			

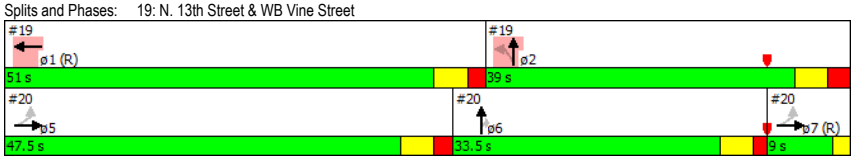
Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening
Synchro 8 Report

Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.29		0.30	0.55				

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 7:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.30	
Intersection Signal Delay: 12.1	Intersection LOS: B
Intersection Capacity Utilization 110.0%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 19: N. 13th Street & WB Vine Street



Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	64	507	0	0	0	0	0	147	65	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	11	9	12	12	12
Lane Util. Factor	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.93			
Frt									0.850			
Flt Protected		0.994										
Satd. Flow (prot)	0	5028	0	0	0	0	0	1612	1417	0	0	0
Flt Permitted		0.994										
Satd. Flow (perm)	0	5027	0	0	0	0	0	1612	1320	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		41							103			
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		442			275			430			170	
Travel Time (s)		12.1			6.3			9.8			3.9	
Confl. Peds. (#/hr)	4		43	43		4	64		61	61		64
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Parking (#/hr)								0				
Adj. Flow (vph)	67	528	0	0	0	0	0	153	68	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	595	0	0	0	0	0	153	68	0	0	0
Turn Type	Perm	NA						NA	Perm			
Protected Phases		5 7						6				
Permitted Phases	5 7								6			
Minimum Split (s)								33.5	33.5			
Total Split (s)								33.5	33.5			
Total Split (%)								37.2%	37.2%			
Yellow Time (s)								3.5	3.5			
All-Red Time (s)								1.5	1.5			
Lost Time Adjust (s)								0.0	0.0			
Total Lost Time (s)								5.0	5.0			
Lead/Lag								Lag	Lag			
Lead-Lag Optimize?								Yes	Yes			
Act Effct Green (s)		51.0						28.5	28.5			
Actuated g/C Ratio		0.57						0.32	0.32			
v/c Ratio		0.21						0.30	0.14			
Control Delay		4.2						25.2	2.6			
Queue Delay		0.0						0.0	0.0			
Total Delay		4.2						25.3	2.6			
LOS		A						C	A			
Approach Delay		4.2						18.3				
Approach LOS		A						B				
Queue Length 50th (ft)		25						65	0			
Queue Length 95th (ft)		29						116	14			
Internal Link Dist (ft)		362			195			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		2866						510	488			
Starvation Cap Reductn		0						0	0			

Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Lane Configurations				
Volume (vph)				
Ideal Flow (vphpl)				
Lane Width (ft)				
Lane Util. Factor				
Ped Bike Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Confl. Peds. (#/hr)				
Peak Hour Factor				
Parking (#/hr)				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	2	5	7
Permitted Phases				
Minimum Split (s)	51.0	39.0	47.5	9.0
Total Split (s)	51.0	39.0	47.5	9.0
Total Split (%)	57%	43%	53%	10%
Yellow Time (s)	3.7	3.5	3.5	2.0
All-Red Time (s)	1.8	2.5	2.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				

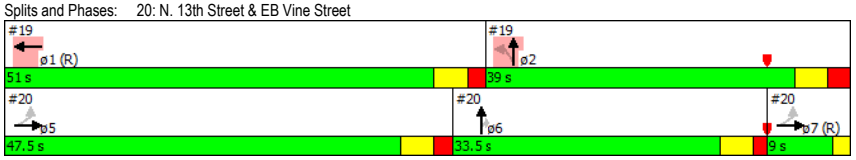
Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening
Synchro 8 Report

Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0						8	0			
Storage Cap Reductn		0						0	0			
Reduced v/c Ratio		0.21						0.30	0.14			

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 7:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.30	
Intersection Signal Delay: 8.1	Intersection LOS: A
Intersection Capacity Utilization 103.5%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 20: N. 13th Street & EB Vine Street



Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening
Synchro 8 Report

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	425	0	0	0	0	0	571	388	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.99			
Frt									0.850			
Flt Protected		0.995										
Satd. Flow (prot)	0	3415	0	0	0	0	0	4961	1575	0	0	0
Flt Permitted		0.995										
Satd. Flow (perm)	0	3415	0	0	0	0	0	4961	1552	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24							368			
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		430			378			430			170	
Travel Time (s)		11.7			10.3			11.7			4.6	
Confl. Peds. (#/hr)	3		10	10		3	366		3	3		366
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	20%	3%	2%	2%	2%	2%	2%	4%	2%	2%	2%	2%
Adj. Flow (vph)	48	457	0	0	0	0	0	614	417	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	505	0	0	0	0	0	614	417	0	0	0
Turn Type	Perm	NA						NA	Perm			
Protected Phases		5 7						6				
Permitted Phases	5 7								6			
Minimum Split (s)								33.5	33.5			
Total Split (s)								33.5	33.5			
Total Split (%)								37.2%	37.2%			
Yellow Time (s)								3.5	3.5			
All-Red Time (s)								1.5	1.5			
Lost Time Adjust (s)								0.0	0.0			
Total Lost Time (s)								5.0	5.0			
Lead/Lag								Lag	Lag			
Lead-Lag Optimize?												
Act Effct Green (s)		51.2						28.5	28.5			
Actuated g/C Ratio		0.57						0.32	0.32			
v/c Ratio		0.26						0.39	0.56			
Control Delay		6.7						24.9	7.5			
Queue Delay		0.0						0.0	0.0			
Total Delay		6.7						24.9	7.5			
LOS		A						C	A			
Approach Delay		6.7						17.9				
Approach LOS		A						B				
Queue Length 50th (ft)		46						98	20			
Queue Length 95th (ft)		64						131	96			
Internal Link Dist (ft)		350			298			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		1953						1570	742			
Starvation Cap Reductn		0						0	0			
Spillback Cap Reductn		0						0	0			

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Lane Configurations				
Volume (vph)				
Ideal Flow (vphpl)				
Lane Util. Factor				
Ped Bike Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Confl. Peds. (#/hr)				
Peak Hour Factor				
Heavy Vehicles (%)				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	2	5	7
Permitted Phases				
Minimum Split (s)	51.0	39.0	47.5	9.0
Total Split (s)	51.0	39.0	47.5	9.0
Total Split (%)	57%	43%	53%	10%
Yellow Time (s)	3.5	3.5	3.5	2.0
All-Red Time (s)	1.8	2.5	1.8	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lead	
Lead-Lag Optimize?				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				

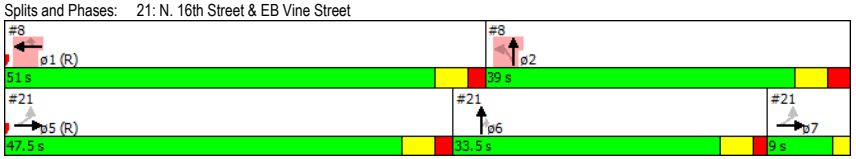
Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening
Synchro 8 Report

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn		0						0	0			
Reduced v/c Ratio		0.26						0.39	0.56			

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 68.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 21: N. 16th Street & EB Vine Street



Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

SATURDAY EVENING (6-9 PM)
PEAK HOUR TIME PERIOD

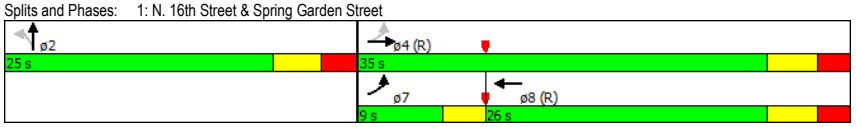
Timings
1: N. 16th Street & Spring Garden Street

Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Volume (vph)	56	406	394	230
Lane Group Flow (vph)	62	446	471	447
Turn Type	pm+pt	NA	NA	NA
Protected Phases	7	4	8	2
Permitted Phases	4			
Minimum Split (s)	9.0	35.0	26.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?				
v/c Ratio	0.15	0.29	0.45	0.46
Control Delay	5.1	8.2	27.4	17.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.1	8.2	27.4	17.2
Queue Length 50th (ft)	6	25	83	76
Queue Length 95th (ft)	m12	60	127	118
Internal Link Dist (ft)		350	380	990
Turn Bay Length (ft)	140			
Base Capacity (vph)	417	1550	1040	980
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	0.29	0.45	0.46

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: N. 16th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
1: N. 16th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	56	406	0	0	394	35	81	230	96	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.98		1.00	1.00		0.94	1.00		0.84			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln	185.3	185.3	0.0	0.0	183.4	187.1	186.2	182.5	186.2			
Lanes	1	2	0	0	2	0	0	2	0			
Cap, veh/h	492	1791	0	0	1048	91	204	589	252			
Arrive On Green	0.20	0.97	0.00	0.00	0.11	0.11	0.32	0.32	0.32			
Sat Flow, veh/h	1765	3706	0	0	3144	274	643	1859	794			
Grp Volume(v), veh/h	62	446	0	0	252	219	248	0	199			
Grp Sat Flow(s),veh/h/ln	1765	1853	0	0	1834	1583	1793	0	1504			
Q Serve(g_s), s	1.1	0.3	0.0	0.0	7.7	7.8	6.6	0.0	6.2			
Cycle Q Clear(g_c), s	1.1	0.3	0.0	0.0	7.7	7.8	6.6	0.0	6.2			
Prop In Lane	1.00		0.00	0.00		0.17	0.36		0.53			
Lane Grp Cap(c), veh/h	492	1791	0	0	611	528	568	0	476			
V/C Ratio(X)	0.13	0.25	0.00	0.00	0.41	0.42	0.44	0.00	0.42			
Avail Cap(c_a), veh/h	492	1791	0	0	611	528	568	0	476			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	8.6	0.5	0.0	0.0	21.2	21.3	16.3	0.0	16.1			
Incr Delay (d2), s/veh	0.5	0.3	0.0	0.0	2.0	2.4	2.4	0.0	2.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln	0.8	0.3	0.0	0.0	6.2	5.6	4.9	0.0	4.2			
Lane Grp Delay (d), s/veh	9.1	0.9	0.0	0.0	23.3	23.7	18.7	0.0	18.8			
Lane Grp LOS	A	A			C	C	B		B			
Approach Vol, veh/h		508			471			447				
Approach Delay, s/veh		1.9			23.4			18.8				
Approach LOS		A			C			B				

Timer

Assigned Phs	7	4			8			2				
Phs Duration (G+Y+Rc), s	9.0	35.0			26.0			25.0				
Change Period (Y+Rc), s	3.0	6.0			6.0			6.0				
Max Green Setting (Gmax), s	6.0	29.0			20.0			19.0				
Max Q Clear Time (g_c+I1), s	0.0	0.0			0.0			0.0				
Green Ext Time (p_c), s	0.0	0.0			0.0			0.0				

Intersection Summary

HCM 2010 Ctrl Delay			14.3									
HCM 2010 LOS			B									

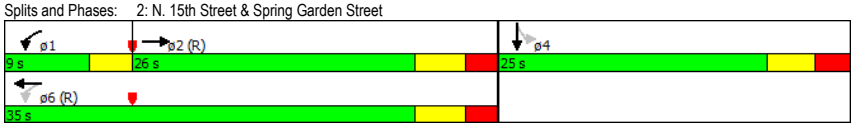
Notes

Timings
2: N. 15th Street & Spring Garden Street

Lane Group	EBT	WBL	WBT	SBL	SBT
Lane Configurations					
Volume (vph)	466	87	389	33	150
Lane Group Flow (vph)	524	91	405	34	200
Turn Type	NA	pm+pt	NA	Perm	NA
Protected Phases	2	1	6		4
Permitted Phases		6		4	
Minimum Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (%)	43.3%	15.0%	58.3%	41.7%	41.7%
Yellow Time (s)	3.6	3.0	3.6	3.4	3.4
All-Red Time (s)	2.4	0.0	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	3.0	6.0	6.0	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?					
v/c Ratio	0.47	0.24	0.26	0.07	0.43
Control Delay	11.4	8.6	9.8	14.9	19.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.4	8.6	9.8	14.9	19.7
Queue Length 50th (ft)	49	15	42	8	56
Queue Length 95th (ft)	90	34	66	25	108
Internal Link Dist (ft)	380		400		290
Turn Bay Length (ft)		115		100	
Base Capacity (vph)	1104	387	1534	476	470
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	0.47	0.24	0.26	0.07	0.43

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 15 (25%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 2: N. 15th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
2: N. 15th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	466	37	87	389	0	0	0	0	33	150	42
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	0.98		1.00				1.00		0.96
Parking Bus Adj	1.00	1.00	0.90	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.2	189.0	183.4	183.4	0.0				177.9	185.3	189.0
Lanes	0	2	0	1	2	0				1	1	0
Cap, veh/h	0	1066	85	529	1773	0				536	436	123
Arrive On Green	0.00	0.67	0.67	0.10	0.48	0.00				0.32	0.32	0.32
Sat Flow, veh/h	0	3197	256	1747	3669	0				1694	1376	388
Grp Volume(v), veh/h	0	280	244	91	405	0				34	0	200
Grp Sat Flow(s),veh/h/ln	0	1852	1602	1747	1834	0				1694	1853	1765
Q Serve(g_s), s	0.0	4.3	4.4	1.8	3.8	0.0				0.8	0.0	5.2
Cycle Q Clear(g_c), s	0.0	4.3	4.4	1.8	3.8	0.0				0.8	0.0	5.2
Prop In Lane	0.00		0.16	1.00		0.00				1.00		0.22
Lane Grp Cap(c), veh/h	0	617	534	529	1773	0				536	0	559
V/C Ratio(X)	0.00	0.45	0.46	0.17	0.23	0.00				0.06	0.00	0.36
Avail Cap(c_a), veh/h	0	617	534	529	1773	0				536	0	559
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	7.4	7.4	9.4	9.0	0.0				14.3	0.0	15.8
Incr Delay (d2), s/veh	0.0	2.4	2.8	0.7	0.3	0.0				0.2	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	3.2	2.9	1.3	2.8	0.0				0.6	0.0	4.0
Lane Grp Delay (d), s/veh	0.0	9.8	10.2	10.1	9.3	0.0				14.5	0.0	17.6
Lane Grp LOS		A	B	B	A					B		B
Approach Vol, veh/h		524			496						234	
Approach Delay, s/veh		10.0			9.4						17.1	
Approach LOS		A			A						B	

Timer												
Assigned Phs		2		1	6						4	
Phs Duration (G+Y+Rc), s		26.0		9.0	35.0						25.0	
Change Period (Y+Rc), s		6.0		3.0	6.0						6.0	
Max Green Setting (Gmax), s		20.0		6.0	29.0						19.0	
Max Q Clear Time (g_c+I1), s		0.0		0.0	0.0						0.0	
Green Ext Time (p_c), s		0.0		0.0	0.0						0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	11.1
HCM 2010 LOS	B

Notes

Lanes, Volumes, Timings
3: Franklin Town Boulevard & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	106	33	80	25	158	47	11	19	8	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	11	12	12	12	12	12	16	12	12	12	12
Grade (%)		-1%			2%			3%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.951			0.972			0.971				
Flt Protected		0.976			0.995			0.986				
Satd. Flow (prot)	0	1671	0	0	1597	0	0	1782	0	0	0	0
Flt Permitted		0.976			0.995			0.986				
Satd. Flow (perm)	0	1671	0	0	1597	0	0	1782	0	0	0	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		646			325			647			208	
Travel Time (s)		17.6			8.9			17.6			5.7	
Confl. Peds. (#/hr)	41		85	85		41	71		41	41		71
Confl. Bikes (#/hr)			7			4						
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Parking (#/hr)					0			0				
Adj. Flow (vph)	128	40	96	30	190	57	13	23	10	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	264	0	0	277	0	0	46	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.05	1.00	1.02	1.17	1.02	1.03	1.00	1.03	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization 50.3%		ICU Level of Service A	
Analysis Period (min) 15			

HCM 2010 AWSC
3: Franklin Town Boulevard & Callowhill Street

Intersection	
Intersection Delay, s/veh	9.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	106	33	80	25	158	47	11	19	8	0	0	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	128	40	96	30	190	57	13	23	10	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.1	9.2	8.4
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	29%	48%	11%
Vol Thru, %	50%	15%	69%
Vol Right, %	21%	37%	20%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	38	219	230
LT Vol	19	33	158
Through Vol	8	80	47
RT Vol	11	106	25
Lane Flow Rate	46	264	277
Geometry Grp	1	1	1
Degree of Util (X)	0.064	0.308	0.317
Departure Headway (Hd)	5.007	4.204	4.224
Convergence, Y/N	Yes	Yes	Yes
Cap	718	860	856
Service Time	3.019	2.21	2.224
HCM Lane V/C Ratio	0.064	0.307	0.324
HCM Control Delay	8.4	9.1	9.2
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.2	1.3	1.4

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
4: N. 17th Street & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	29	86	135	0	0	0	0	0	194	91
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	11	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			-4%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.865								0.957	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	1443	1693	1659	0	0	0	0	0	1542	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	1443	1693	1659	0	0	0	0	0	1542	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		325			430			230			1070	
Travel Time (s)		8.9			11.7			6.3			29.2	
Confl. Peds. (#/hr)	39		44	44		39	5		5	5		5
Confl. Bikes (#/hr)			4									1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	5	0
Parking (#/hr)			0		0						0	
Adj. Flow (vph)	0	0	32	96	150	0	0	0	0	0	216	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	32	96	150	0	0	0	0	0	317	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.15	1.06	1.16	1.01	1.01	1.01	1.01	0.98	1.20	0.98
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	CBD
Control Type: Unsignalized	
Intersection Capacity Utilization 50.0%	ICU Level of Service A
Analysis Period (min) 15	

HCM 2010 AWSC
4: N. 17th Street & Callowhill Street

Intersection	
Intersection Delay, s/veh	9.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	29	86	135	0	0	0	0	0	194	91
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	32	96	150	0	0	0	0	0	216	101
Number of Lanes	0	0	1	1	1	0	0	0	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.7	9.6	10.3
HCM LOS	A	A	B

Lane	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	100%	0%	0%
Vol Thru, %	0%	0%	100%	68%
Vol Right, %	100%	0%	0%	32%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	29	86	135	285
LT Vol	0	0	135	194
Through Vol	29	0	0	91
RT Vol	0	86	0	0
Lane Flow Rate	32	96	150	317
Geometry Grp	5	7	7	2
Degree of Util (X)	0.04	0.154	0.221	0.391
Departure Headway (Hd)	4.487	5.8	5.296	4.442
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	793	617	677	811
Service Time	2.544	3.547	3.043	2.468
HCM Lane V/C Ratio	0.04	0.156	0.222	0.391
HCM Control Delay	7.7	9.6	9.6	10.3
HCM Lane LOS	A	A	A	B
HCM 95th-tile Q	0.1	0.5	0.8	1.9

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Timings
5: N. 16th Street & Callowhill Street

Lane Group	WBT	NBT
Lane Configurations		
Volume (vph)	183	636
Lane Group Flow (vph)	354	757
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Minimum Split (s)	21.0	39.0
Total Split (s)	21.0	39.0
Total Split (%)	35.0%	65.0%
Yellow Time (s)	3.0	3.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
v/c Ratio	0.43	0.39
Control Delay	12.0	7.6
Queue Delay	0.0	0.0
Total Delay	12.0	7.6
Queue Length 50th (ft)	30	66
Queue Length 95th (ft)	62	98
Internal Link Dist (ft)	380	136
Turn Bay Length (ft)		
Base Capacity (vph)	831	1938
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.43	0.39

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 17 (28%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 5: N. 16th Street & Callowhill Street

HCM 2010 Signalized Intersection Summary
5: N. 16th Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	183	136	45	636	0	0	0	0
Number				3	8	18	5	2	12			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.69	1.00		1.00			
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln				0.0	185.3	189.0	187.1	183.4	0.0			
Lanes				0	2	0	0	2	0			
Cap, veh/h				0	494	288	131	1942	0			
Arrive On Green				0.00	0.27	0.27	0.57	0.57	0.00			
Sat Flow, veh/h				0	1853	1080	231	3427	0			
Grp Volume(v), veh/h				0	203	151	395	362	0			
Grp Sat Flow(s),veh/h/ln				0	1853	1080	1823	1834	0			
Q Serve(g_s), s				0.0	5.4	7.2	7.2	6.4	0.0			
Cycle Q Clear(g_c), s				0.0	5.4	7.2	7.2	6.4	0.0			
Prop In Lane				0.00		1.00	0.13		0.00			
Lane Grp Cap(c), veh/h				0	494	288	1033	1040	0			
V/C Ratio(X)				0.00	0.41	0.52	0.38	0.35	0.00			
Avail Cap(c_a), veh/h				0	494	288	1033	1040	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	18.1	18.8	7.2	7.0	0.0			
Incr Delay (d2), s/veh				0.0	2.5	6.7	1.1	0.9	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln				0.0	4.4	3.9	4.7	4.2	0.0			
Lane Grp Delay (d), s/veh				0.0	20.6	25.4	8.3	7.9	0.0			
Lane Grp LOS					C	C	A	A				
Approach Vol, veh/h					354			757				
Approach Delay, s/veh					22.7			8.1				
Approach LOS					C			A				

Timer	
Assigned Phs	8	2
Phs Duration (G+Y+Rc), s	21.0	39.0
Change Period (Y+Rc), s	5.0	5.0
Max Green Setting (Gmax), s	16.0	34.0
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	12.8
HCM 2010 LOS	B

Notes

HCM 2010 Signals-Pedestrians
5: N. 16th Street & Callowhill Street

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	23.0	24.0	24.0	24.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	2	2	2
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	0	2	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	25	25	25
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	30.0	30.0	30.0	30.0
Pedestrian Compliance Code	Fair	Fair	Fair	Fair
Pedestrian Crosswalk Score	1.81	1.85	2.02	2.06
Pedestrian Crosswalk LOS	A	A	B	B

HCM 2010 Signals-Bicycles
5: N. 16th Street & Callowhill Street

Approach	EB	WB	NB	SB
Bicycle Flow Rate (bike/h)	0	0	0	0
Total Flow Rate (veh/h)	0	354	757	0
Effct. Green for Bike (s)	0.0	16.0	34.0	0.0
Cross Street Width (ft)	24.0	24.0	24.0	23.0
Through Lanes Number	0	2	2	0
Through Lane Width (ft)	12.0	12.0	12.0	12.0
Bicycle Lane Width (ft)	0.0	0.0	0.0	0.0
Paved Shoulder Width (ft)	0.0	0.0	0.0	0.0
Curb Is Present?	No	No	No	No
On Street Parking?	No	No	No	No
Bicycle Lane Capacity (bike/h)	0	533	1133	0
Bicycle Delay (s/bike)	0.0	16.1	5.6	0.0
Bicycle Compliance		Fair	Good	
Bicycle LOS Score	0.00	2.22	2.55	0.00
Bicycle LOS		B	B	

Lanes, Volumes, Timings
6: N. 15th Street & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	95	279	0	0	0	0	0	444	89
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		0%			0%			0%			-3%	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt											0.977	
Flt Protected					0.987							
Satd. Flow (prot)	0	0	0	0	3301	0	0	0	0	0	1599	0
Flt Permitted					0.987							
Satd. Flow (perm)	0	0	0	0	3301	0	0	0	0	0	1599	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		460			480			146			1070	
Travel Time (s)		12.5			13.1			4.0			29.2	
Confl. Peds. (#/hr)	12		26	26		12	3		372	372		3
Confl. Bikes (#/hr)						2						9
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Parking (#/hr)					0						0	
Adj. Flow (vph)	0	0	0	102	300	0	0	0	0	0	477	96
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	402	0	0	0	0	0	573	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.08	1.01	1.01	1.01	1.01	0.99	1.18	0.99
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization 49.5%		ICU Level of Service A	
Analysis Period (min) 15			

HCM 2010 AWSC
6: N. 15th Street & Callowhill Street

Intersection	
Intersection Delay, s/veh	18.4
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	0	95	279	0	0	0	0	0	444	89
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	102	300	0	0	0	0	0	477	96
Number of Lanes	0	0	0	0	2	0	0	0	0	0	1	0

Approach	WB	SB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left		WB
Conflicting Lanes Left	0	2
Conflicting Approach Right	SB	
Conflicting Lanes Right	1	0
HCM Control Delay	12.2	22.8
HCM LOS	B	C

Lane	WBLn1	WBLn2	SBLn1
Vol Left, %	51%	0%	0%
Vol Thru, %	49%	100%	83%
Vol Right, %	0%	0%	17%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	188	186	533
LT Vol	93	186	444
Through Vol	0	0	89
RT Vol	95	0	0
Lane Flow Rate	202	200	573
Geometry Grp	7	7	2
Degree of Util (X)	0.355	0.337	0.775
Departure Headway (Hd)	6.322	6.066	4.868
Convergence, Y/N	Yes	Yes	Yes
Cap	572	596	739
Service Time	4.022	3.766	2.944
HCM Lane V/C Ratio	0.353	0.336	0.775
HCM Control Delay	12.5	11.8	22.8
HCM Lane LOS	B	B	C
HCM 95th-tile Q	1.6	1.5	7.5

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Timings
7: N. Broad Street & Callowhill Street

Lane Group	WBL	WBT	NBL	NBT	SBT
Lane Configurations					
Volume (vph)	46	148	172	603	678
Lane Group Flow (vph)	47	183	177	622	792
Turn Type	Perm	NA	Perm	NA	NA
Protected Phases		8		2	6
Permitted Phases	8		2		
Minimum Split (s)	29.0	29.0	61.0	61.0	61.0
Total Split (s)	29.0	29.0	61.0	61.0	61.0
Total Split (%)	32.2%	32.2%	67.8%	67.8%	67.8%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.0	5.0	5.0
Lead/Lag					
Lead-Lag Optimize?					
v/c Ratio	0.15	0.22	0.53	0.31	0.41
Control Delay	28.8	28.5	32.5	20.3	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	28.8	28.5	32.5	20.3	6.5
Queue Length 50th (ft)	23	48	104	172	63
Queue Length 95th (ft)	55	79	170	229	73
Internal Link Dist (ft)		525		190	990
Turn Bay Length (ft)			300		
Base Capacity (vph)	322	817	334	1995	1933
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	0.15	0.22	0.53	0.31	0.41

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 47 (52%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Pretimed

Splits and Phases: 7: N. Broad Street & Callowhill Street

HCM 2010 Signalized Intersection Summary
7: N. Broad Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	46	148	29	172	603	0	0	678	90
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.77	0.92		1.00	1.00		0.72
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln				182.5	182.5	186.2	181.6	181.6	0.0	0.0	186.2	189.9
Lanes				1	2	0	1	2	0	0	2	0
Cap, veh/h				444	729	134	455	2260	0	0	1907	253
Arrive On Green				0.08	0.08	0.08	0.62	0.62	0.00	0.00	0.83	0.83
Sat Flow, veh/h				1738	2852	524	663	3632	0	0	3065	407
Grp Volume(v), veh/h				47	94	89	177	622	0	0	424	368
Grp Sat Flow(s),veh/h/ln				1738	1825	1550	663	1816	0	0	1862	1609
Q Serve(g_s), s				2.2	4.3	4.8	14.2	7.0	0.0	0.0	5.1	5.1
Cycle Q Clear(g_c), s				2.2	4.3	4.8	19.3	7.0	0.0	0.0	5.1	5.1
Prop In Lane				1.00		0.34	1.00		0.00	0.00		0.25
Lane Grp Cap(c), veh/h				444	466	396	455	2260	0	0	1159	1001
V/C Ratio(X)				0.11	0.20	0.22	0.39	0.28	0.00	0.00	0.37	0.37
Avail Cap(c_a), veh/h				444	466	396	455	2260	0	0	1159	1001
HCM Platoon Ratio				0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.33	1.33
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				31.7	32.7	32.9	11.6	7.7	0.0	0.0	3.4	3.4
Incr Delay (d2), s/veh				0.5	1.0	1.3	2.5	0.3	0.0	0.0	0.9	1.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (85%), veh/ln				1.9	3.7	3.6	4.2	4.6	0.0	0.0	3.3	3.0
Lane Grp Delay (d), s/veh				32.2	33.6	34.2	14.1	8.1	0.0	0.0	4.3	4.4
Lane Grp LOS				C	C	C	B	A			A	A
Approach Vol, veh/h					230			799			792	
Approach Delay, s/veh					33.5			9.4			4.3	
Approach LOS					C			A			A	

Timer

Assigned Phs					8			2			6	
Phs Duration (G+Y+Rc), s					29.0			61.0			61.0	
Change Period (Y+Rc), s					6.0			5.0			5.0	
Max Green Setting (Gmax), s					23.0			56.0			56.0	
Max Q Clear Time (g_c+I1), s					0.0			0.0			0.0	
Green Ext Time (p_c), s					0.0			0.0			0.0	

Intersection Summary

HCM 2010 Ctrl Delay			10.2									
HCM 2010 LOS			B									

Notes

HCM 2010 Signals-Pedestrians
7: N. Broad Street & Callowhill Street

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	24.5	32.2	56.2	54.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	3	5	4
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	6	2	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	25	25	25
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	45.0	45.0	45.0	45.0
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	1.90	2.01	2.56	2.43
Pedestrian Crosswalk LOS	A	B	B	B

HCM 2010 Signals-Bicycles
7: N. Broad Street & Callowhill Street

Approach	EB	WB	NB	SB
Bicycle Flow Rate (bike/h)	0	0	0	0
Total Flow Rate (veh/h)	0	230	799	792
Effct. Green for Bike (s)	0.0	23.0	56.0	56.0
Cross Street Width (ft)	56.2	54.0	32.2	24.5
Through Lanes Number	0	2	2	2
Through Lane Width (ft)	12.0	11.0	10.0	10.0
Bicycle Lane Width (ft)	0.0	0.0	0.0	0.0
Paved Shoulder Width (ft)	0.0	0.0	0.0	0.0
Curb Is Present?	No	No	No	No
On Street Parking?	No	No	No	No
Bicycle Lane Capacity (bike/h)	0	511	1244	1244
Bicycle Delay (s/bike)	0.0	24.9	6.4	6.4
Bicycle Compliance		Fair	Good	Good
Bicycle LOS Score	0.00	2.79	3.14	3.02
Bicycle LOS		C	C	C

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	563	787	73	466	0	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	11	12	11	12	12	12	12
Grade (%)		0%			0%			-1%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.88	0.91	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor						0.97		0.96				
Frt						0.850						
Flt Protected								0.993				
Satd. Flow (prot)	0	0	0	0	3521	2680	0	4880	0	0	0	0
Flt Permitted								0.993				
Satd. Flow (perm)	0	0	0	0	3521	2599	0	4663	0	0	0	0
Right Turn on Red			Yes			No	Yes		Yes			Yes
Satd. Flow (RTOR)								37				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		430			460			170			344	
Travel Time (s)		11.7			12.5			4.6			9.4	
Confl. Peds. (#/hr)	29		14	14		29	405		4	4		405
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	0	0	0	0	670	937	87	555	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	670	937	0	642	0	0	0	0
Turn Type					NA	Perm	Perm	NA				
Protected Phases					1			2				
Permitted Phases						1	2					
Minimum Split (s)					51.0	51.0	39.0	39.0				
Total Split (s)					51.0	51.0	39.0	39.0				
Total Split (%)					56.7%	56.7%	43.3%	43.3%				
Yellow Time (s)					3.5	3.5	3.5	3.5				
All-Red Time (s)					1.8	1.8	2.5	2.5				
Lost Time Adjust (s)					0.0	0.0		0.0				
Total Lost Time (s)					5.3	5.3		6.0				
Lead/Lag					Lead	Lead	Lag	Lag				
Lead-Lag Optimize?												
Act Effct Green (s)					45.7	45.7		33.0				
Actuated g/C Ratio					0.51	0.51		0.37				
v/c Ratio					0.37	0.71		0.37				
Control Delay					17.2	25.0		4.3				
Queue Delay					0.0	0.2		0.3				
Total Delay					17.2	25.2		4.5				
LOS					B	C		A				
Approach Delay					21.9			4.5				
Approach LOS					C			A				
Queue Length 50th (ft)					146	318		12				
Queue Length 95th (ft)					m140	m242		16				
Internal Link Dist (ft)		350			380			90			264	
Turn Bay Length (ft)												
Base Capacity (vph)					1787	1319		1733				
Starvation Cap Reductn					0	41		475				

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	7
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	1.8	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
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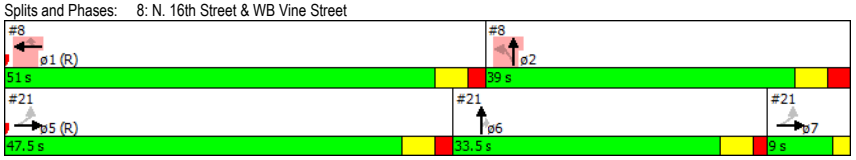
Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn					0	0		0				
Storage Cap Reductn					0	0		0				
Reduced v/c Ratio					0.37	0.73		0.51				

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 16.9	Intersection LOS: B
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 8: N. 16th Street & WB Vine Street



Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	42	622	0	0	0	0	0	1191	695
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			2%	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.86	0.86
Ped Bike Factor					1.00						0.99	
Frt											0.945	
Flt Protected					0.997							
Satd. Flow (prot)	0	0	0	0	3318	0	0	0	0	0	5719	0
Flt Permitted					0.997							
Satd. Flow (perm)	0	0	0	0	3317	0	0	0	0	0	5719	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					145						147	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		460			480			170			414	
Travel Time (s)		12.5			13.1			4.6			11.3	
Confl. Peds. (#/hr)	27		3	3		27	8		414	414		8
Confl. Bikes (#/hr)						3						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Parking (#/hr)					0							
Adj. Flow (vph)	0	0	0	47	691	0	0	0	0	0	1323	772
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	738	0	0	0	0	0	2095	0
Turn Type				Perm	NA						NA	
Protected Phases					1						2	
Permitted Phases				1								
Minimum Split (s)				49.0	49.0						41.0	
Total Split (s)				49.0	49.0						41.0	
Total Split (%)				54.4%	54.4%						45.6%	
Yellow Time (s)				3.5	3.5						3.5	
All-Red Time (s)				1.5	1.5						11.5	
Lost Time Adjust (s)					0.0						0.0	
Total Lost Time (s)					5.0						15.0	
Lead/Lag				Lead	Lead						Lag	
Lead-Lag Optimize?												
Act Effct Green (s)					44.0						26.0	
Actuated g/C Ratio					0.49						0.29	
v/c Ratio					0.44						1.42dr	
Control Delay					5.2						121.6	
Queue Delay					0.0						0.0	
Total Delay					5.2						121.6	
LOS					A						F	
Approach Delay					5.2						121.6	
Approach LOS					A						F	
Queue Length 50th (ft)					14						~406	
Queue Length 95th (ft)					22						#484	
Internal Link Dist (ft)		380			400			90			334	
Turn Bay Length (ft)												

Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	ø5	ø6
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Grade (%)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor		
Parking (#/hr)		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	5	6
Permitted Phases		
Minimum Split (s)	49.0	41.0
Total Split (s)	49.0	41.0
Total Split (%)	54%	46%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.5	3.5
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lag
Lead-Lag Optimize?		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
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Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)					1695						1756	
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					74						27	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.46						1.21	

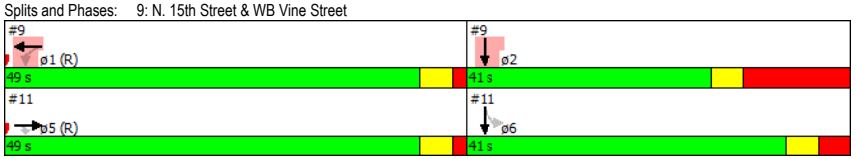
Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 1.19	
Intersection Signal Delay: 91.3	Intersection LOS: F
Intersection Capacity Utilization 82.7%	ICU Level of Service E
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 9: N. 15th Street & WB Vine Street



Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	ø5	ø6
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 Report

Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	129	600	130	0	684	0	0	615	75
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	11	12	12	10	12	12	10	12
Grade (%)		0%			1%			-1%			1%	
Storage Length (ft)	0		0	0		0	0		0	100		100
Storage Lanes	0		0	1		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.86	0.86
Ped Bike Factor						0.96					0.96	
Frt						0.850					0.984	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	0	1751	3386	1567	0	4732	0	0	5580	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	0	1751	3386	1502	0	4732	0	0	5580	0
Right Turn on Red			Yes			No			Yes			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		480			605			170			290	
Travel Time (s)		13.1			16.5			4.6			7.9	
Confl. Peds. (#/hr)	46					46	429		171	171		429
Confl. Bikes (#/hr)						4			11			16
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Bus Blockages (#/hr)	0	0	0	0	0	0	0	2	0	0	5	0
Adj. Flow (vph)	0	0	0	142	659	143	0	752	0	0	676	82
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	142	659	143	0	752	0	0	758	0
Turn Type				Perm	NA	Perm		NA			NA	
Protected Phases					1 3!			2			6!	
Permitted Phases				1 3!		1 3						
Minimum Split (s)								34.0			34.0	
Total Split (s)								34.0			34.0	
Total Split (%)								37.8%			37.8%	
Yellow Time (s)								2.4			3.6	
All-Red Time (s)								3.0			5.4	
Lost Time Adjust (s)								0.0			0.0	
Total Lost Time (s)								5.4			9.0	
Lead/Lag								Lead			Lead	
Lead-Lag Optimize?												
Act Effct Green (s)				46.0	46.0	46.0		28.6			25.0	
Actuated g/C Ratio				0.51	0.51	0.51		0.32			0.28	
v/c Ratio				0.16	0.38	0.19		0.50			0.49	
Control Delay				18.1	19.3	18.5		16.6			17.4	
Queue Delay				0.0	0.0	0.0		1.5			0.0	
Total Delay				18.1	19.3	18.5		18.1			17.4	
LOS				B	B	B		B			B	
Approach Delay					19.0			18.1			17.4	
Approach LOS					B			B			B	
Queue Length 50th (ft)				48	123	48		87			93	

Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø7	ø8
Lane Configurations					
Volume (vph)					
Ideal Flow (vphpl)					
Lane Width (ft)					
Grade (%)					
Storage Length (ft)					
Storage Lanes					
Taper Length (ft)					
Lane Util. Factor					
Ped Bike Factor					
Frt					
Flt Protected					
Satd. Flow (prot)					
Flt Permitted					
Satd. Flow (perm)					
Right Turn on Red					
Satd. Flow (RTOR)					
Link Speed (mph)					
Link Distance (ft)					
Travel Time (s)					
Confl. Peds. (#/hr)					
Confl. Bikes (#/hr)					
Peak Hour Factor					
Bus Blockages (#/hr)					
Adj. Flow (vph)					
Shared Lane Traffic (%)					
Lane Group Flow (vph)					
Turn Type					
Protected Phases	1	3	5	7	8
Permitted Phases					
Minimum Split (s)	42.0	14.0	42.0	48.0	14.0
Total Split (s)	42.0	14.0	42.0	48.0	14.0
Total Split (%)	47%	16%	47%	53%	16%
Yellow Time (s)	3.6	2.0	3.6	3.6	3.6
All-Red Time (s)	6.4	0.0	6.4	2.4	2.4
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag		Lag			Lag
Lead-Lag Optimize?		Yes			
Act Effct Green (s)					
Actuated g/C Ratio					
v/c Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Queue Length 50th (ft)					

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
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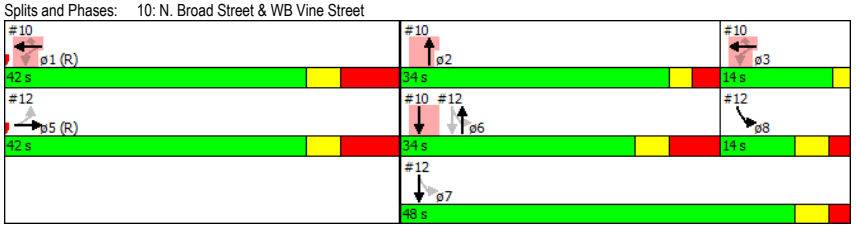
Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)				93	180	95		109			109	
Internal Link Dist (ft)		400			525			90			210	
Turn Bay Length (ft)												
Base Capacity (vph)				894	1730	767		1503			1550	
Starvation Cap Reductn				0	0	0		526			0	
Spillback Cap Reductn				0	0	0		0			44	
Storage Cap Reductn				0	0	0		0			0	
Reduced v/c Ratio				0.16	0.38	0.19		0.77			0.50	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green
Natural Cycle: 90
Control Type: Pretimed
Maximum v/c Ratio: 0.61
Intersection Signal Delay: 18.2 — Intersection LOS: B
Intersection Capacity Utilization 119.0% — ICU Level of Service H
Analysis Period (min) 15
! Phase conflict between lane groups.

Splits and Phases: 10: N. Broad Street & WB Vine Street



Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø7	ø8
Queue Length 95th (ft)					
Internal Link Dist (ft)					
Turn Bay Length (ft)					
Base Capacity (vph)					
Starvation Cap Reductn					
Spillback Cap Reductn					
Storage Cap Reductn					
Reduced v/c Ratio					

Intersection Summary

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
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Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1246	685	0	0	0	0	0	0	390	840	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		2%			0%			0%			4%	
Lane Util. Factor	1.00	0.86	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00
Ped Bike Factor			0.98							0.69		
Frt			0.850									
Flt Protected										0.950		
Satd. Flow (prot)	0	6310	2744	0	0	0	0	0	0	1725	4792	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	6310	2685	0	0	0	0	0	0	1197	4792	0
Right Turn on Red			No			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)										32		
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		82			480			430			170	
Travel Time (s)		2.2			13.1			11.7			4.6	
Confl. Peds. (#/hr)			16	16			8		418	418		8
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	1271	699	0	0	0	0	0	0	398	857	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1271	699	0	0	0	0	0	0	398	857	0
Turn Type		NA	Perm							Perm	NA	
Protected Phases		5									6	
Permitted Phases			5							6		
Minimum Split (s)		49.0	49.0							41.0	41.0	
Total Split (s)		49.0	49.0							41.0	41.0	
Total Split (%)		54.4%	54.4%							45.6%	45.6%	
Yellow Time (s)		3.5	3.5							3.5	3.5	
All-Red Time (s)		1.5	1.5							3.5	3.5	
Lost Time Adjust (s)		0.0	0.0							0.0	0.0	
Total Lost Time (s)		5.0	5.0							7.0	7.0	
Lead/Lag		Lead	Lead							Lag	Lag	
Lead-Lag Optimize?												
Act Effct Green (s)		44.0	44.0							34.0	34.0	
Actuated g/C Ratio		0.49	0.49							0.38	0.38	
v/c Ratio		0.41	0.53							0.84	0.47	
Control Delay		13.1	18.0							8.8	2.4	
Queue Delay		0.0	0.0							15.5	3.3	
Total Delay		13.1	18.0							24.4	5.8	
LOS		B	B							C	A	
Approach Delay		14.9									11.7	
Approach LOS		B									B	
Queue Length 50th (ft)		102	156							8	13	
Queue Length 95th (ft)		152	227							m3	m12	
Internal Link Dist (ft)		2			400			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		3084	1312							472	1810	
Starvation Cap Reductn		0	0							68	830	

Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	ø1	ø2
Lane Configurations		
Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Grade (%)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	2
Permitted Phases		
Minimum Split (s)	49.0	41.0
Total Split (s)	49.0	41.0
Total Split (%)	54%	46%
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.5	11.5
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lag
Lead-Lag Optimize?		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)		
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
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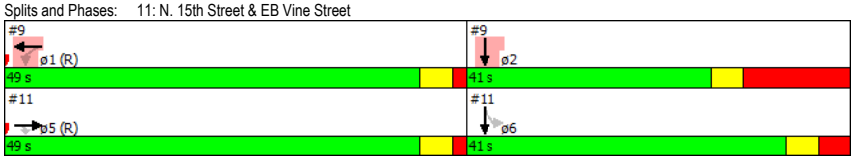
Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0	0							0	0	
Storage Cap Reductn		0	0							0	0	
Reduced v/c Ratio		0.41	0.53							0.99	0.87	

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 1.19	
Intersection Signal Delay: 13.6	Intersection LOS: B
Intersection Capacity Utilization 82.7%	ICU Level of Service E
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 11: N. 15th Street & EB Vine Street



Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	ø1	ø2
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		

Intersection Summary

Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	316	1097	86	0	0	0	0	336	147	244	473	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	10	12	12	10	12
Grade (%)		2%			0%			2%			2%	
Storage Length (ft)	0		250	0		0	0		100	45		0
Storage Lanes	0		1	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.81	0.81	0.81	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor		1.00						0.95		0.96		
Frt		0.991						0.954				
Flt Protected		0.990								0.950		
Satd. Flow (prot)	0	7257	0	0	0	0	0	3839	0	1743	4674	0
Flt Permitted		0.990								0.457		
Satd. Flow (perm)	0	7257	0	0	0	0	0	3839	0	803	4674	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		480			163			260			170	
Travel Time (s)		13.1			4.4			7.1			4.6	
Confl. Peds. (#/hr)			53	53			516		130	130		516
Confl. Bikes (#/hr)			2						14			15
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	4%	2%	2%	2%	3%	11%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	30	0	0	0	0
Adj. Flow (vph)	329	1143	90	0	0	0	0	350	153	254	493	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1562	0	0	0	0	0	503	0	254	493	0
Turn Type	Perm	NA						NA		custom	NA	
Protected Phases		5						6		8	7	
Permitted Phases	5									6 7	6 7	
Minimum Split (s)	42.0	42.0						34.0		14.0	48.0	
Total Split (s)	42.0	42.0						34.0		14.0	48.0	
Total Split (%)	46.7%	46.7%						37.8%		15.6%	53.3%	
Yellow Time (s)	3.6	3.6						3.6		3.6	3.6	
All-Red Time (s)	6.4	6.4						5.4		2.4	2.4	
Lost Time Adjust (s)		0.0						0.0		0.0	0.0	
Total Lost Time (s)		10.0						9.0		6.0	6.0	
Lead/Lag								Lead		Lag		
Lead-Lag Optimize?												
Act Effct Green (s)		32.0						25.0		42.0	42.0	
Actuated g/C Ratio		0.36						0.28		0.47	0.47	
v/c Ratio		0.61						0.47		0.55	0.23	
Control Delay		17.0						28.8		12.5	2.7	
Queue Delay		0.1						0.1		16.7	0.3	
Total Delay		17.1						28.9		29.1	3.0	
LOS		B						C		C	A	
Approach Delay		17.1						28.9			11.9	
Approach LOS		B						C			B	

Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Bus Blockages (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	3
Permitted Phases			
Minimum Split (s)	42.0	34.0	14.0
Total Split (s)	42.0	34.0	14.0
Total Split (%)	47%	38%	16%
Yellow Time (s)	3.6	2.4	2.0
All-Red Time (s)	6.4	3.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag		Lead	Lag
Lead-Lag Optimize?			Yes
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
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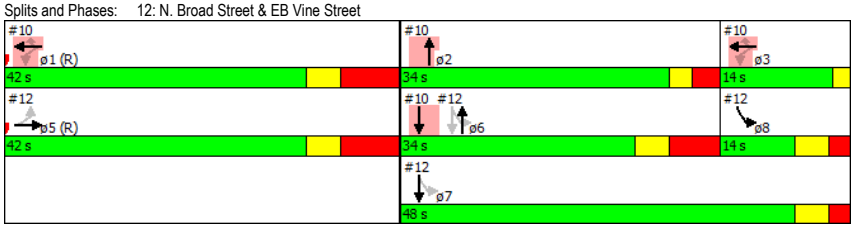
Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		114						86		47	10	
Queue Length 95th (ft)		123						120		112	18	
Internal Link Dist (ft)		400			83			180			90	
Turn Bay Length (ft)										45		
Base Capacity (vph)		2580						1066		458	2181	
Starvation Cap Reductn		0						0		187	1057	
Spillback Cap Reductn		108						93		0	0	
Storage Cap Reductn		0						0		0	0	
Reduced v/c Ratio		0.63						0.52		0.94	0.44	

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 17.8	Intersection LOS: B
Intersection Capacity Utilization 119.0%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 12: N. Broad Street & EB Vine Street



Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP

Timing Plan: Saturday Evening
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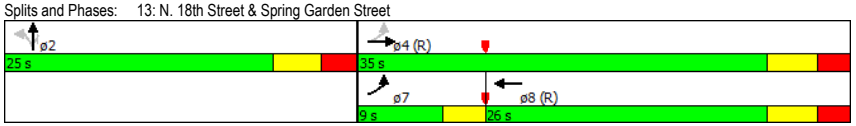
Timings
13: N. 18th Street & Spring Garden Street

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	43	406	406	57	49
Lane Group Flow (vph)	44	419	444	107	51
Turn Type	pm+pt	NA	NA	NA	Perm
Protected Phases	7	4	8	2	
Permitted Phases	4				2
Minimum Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?					
v/c Ratio	0.09	0.27	0.42	0.24	0.10
Control Delay	7.3	9.8	23.3	16.9	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.3	9.8	23.3	16.9	1.1
Queue Length 50th (ft)	7	44	66	28	0
Queue Length 95th (ft)	19	68	75	62	5
Internal Link Dist (ft)		476	350	810	
Turn Bay Length (ft)	145				150
Base Capacity (vph)	464	1562	1066	454	507
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	0.09	0.27	0.42	0.24	0.10

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 13: N. 18th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
13: N. 18th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	43	406	0	0	406	24	47	57	49	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.95		1.00	1.00		0.87	1.00		0.96			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln	185.3	185.3	0.0	0.0	185.3	189.0	189.0	177.9	177.9			
Lanes	1	2	0	0	2	0	0	1	1			
Cap, veh/h	560	1791	0	0	1143	68	316	232	458			
Arrive On Green	0.10	0.48	0.00	0.00	0.67	0.67	0.32	0.32	0.32			
Sat Flow, veh/h	1765	3706	0	0	3430	203	998	731	1446			
Grp Volume(v), veh/h	44	419	0	0	225	219	83	24	51			
Grp Sat Flow(s),veh/h/ln	1765	1853	0	0	1853	1780	1729	1779	1446			
Q Serve(g_s), s	0.8	4.0	0.0	0.0	3.2	3.3	2.1	0.0	1.5			
Cycle Q Clear(g_c), s	0.8	4.0	0.0	0.0	3.2	3.3	2.1	0.0	1.5			
Prop In Lane	1.00		0.00	0.00		0.11	0.58		1.00			
Lane Grp Cap(c), veh/h	560	1791	0	0	618	593	547	0	458			
V/C Ratio(X)	0.08	0.23	0.00	0.00	0.36	0.37	0.15	0.00	0.11			
Avail Cap(c_a), veh/h	560	1791	0	0	618	593	547	0	458			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	9.0	9.0	0.0	0.0	7.2	7.2	14.7	0.0	14.5			
Incr Delay (d2), s/veh	0.3	0.3	0.0	0.0	1.7	1.8	0.6	0.0	0.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln	0.6	3.0	0.0	0.0	2.5	2.4	1.6	0.0	1.0			
Lane Grp Delay (d), s/veh	9.3	9.3	0.0	0.0	8.9	9.0	15.3	0.0	15.0			
Lane Grp LOS	A	A			A	A	B		B			
Approach Vol, veh/h		463			444			158				
Approach Delay, s/veh		9.3			8.9			12.9				
Approach LOS		A			A			B				

Timer

Assigned Phs	7	4			8			2				
Phs Duration (G+Y+Rc), s	9.0	35.0			26.0			25.0				
Change Period (Y+Rc), s	3.0	6.0			6.0			6.0				
Max Green Setting (Gmax), s	6.0	29.0			20.0			19.0				
Max Q Clear Time (g_c+I1), s	0.0	0.0			0.0			0.0				
Green Ext Time (p_c), s	0.0	0.0			0.0			0.0				

Intersection Summary

HCM 2010 Ctrl Delay			9.7									
HCM 2010 LOS			A									

Notes

Timings
14: N. Broad Street & Spring Garden Street

Lane Group	EBT	WBT	NBT	NBR	SBL	SBT	SBR
Lane Configurations							
Volume (vph)	407	396	554	43	69	691	76
Lane Group Flow (vph)	500	485	577	45	72	720	79
Turn Type	NA	NA	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	8	2		1	6	
Permitted Phases				2	6		6
Minimum Split (s)	33.0	33.0	35.0	35.0	9.0	35.0	35.0
Total Split (s)	40.0	40.0	41.0	41.0	9.0	50.0	50.0
Total Split (%)	44.4%	44.4%	45.6%	45.6%	10.0%	55.6%	55.6%
Yellow Time (s)	3.6	3.6	3.4	3.4	3.0	3.4	3.4
All-Red Time (s)	2.4	2.4	2.6	2.6	0.0	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Lead/Lag			Lag	Lag	Lead		
Lead-Lag Optimize?							
v/c Ratio	0.42	0.41	0.44	0.07	0.19	0.43	0.12
Control Delay	22.1	21.9	10.3	2.4	12.1	15.9	13.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.1	21.9	10.3	2.4	12.1	15.9	13.2
Queue Length 50th (ft)	108	104	35	0	19	133	23
Queue Length 95th (ft)	153	147	94	3	41	178	48
Internal Link Dist (ft)	400	550	990			290	
Turn Bay Length (ft)				100	170		100
Base Capacity (vph)	1180	1184	1323	625	376	1672	658
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.41	0.44	0.07	0.19	0.43	0.12

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Pretimed

Splits and Phases: 14: N. Broad Street & Spring Garden Street

HCM 2010 Signalized Intersection Summary
14: N. Broad Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	407	73	0	396	70	0	554	43	69	691	76
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	1.00		0.96	1.00		0.95	0.99		0.90
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.3	189.0	0.0	185.3	189.0	0.0	185.3	185.3	186.2	186.2	186.2
Lanes	0	2	0	0	2	0	0	2	1	1	2	1
Cap, veh/h	0	1146	203	0	1152	202	0	1441	584	486	1821	693
Arrive On Green	0.00	0.38	0.38	0.00	0.38	0.38	0.00	0.78	0.78	0.07	0.49	0.49
Sat Flow, veh/h	0	3032	538	0	3049	535	0	3706	1502	1774	3724	1418
Grp Volume(v), veh/h	0	257	243	0	249	236	0	577	45	72	720	79
Grp Sat Flow(s),veh/h/ln	0	1853	1717	0	1853	1731	0	1853	1502	1774	1862	1418
Q Serve(g_s), s	0.0	9.0	9.2	0.0	8.7	8.9	0.0	4.5	0.6	2.0	11.0	2.7
Cycle Q Clear(g_c), s	0.0	9.0	9.2	0.0	8.7	8.9	0.0	4.5	0.6	2.0	11.0	2.7
Prop In Lane	0.00		0.31	0.00		0.31	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	700	649	0	700	654	0	1441	584	486	1821	693
V/C Ratio(X)	0.00	0.37	0.37	0.00	0.36	0.36	0.00	0.40	0.08	0.15	0.40	0.11
Avail Cap(c_a), veh/h	0	700	649	0	700	654	0	1441	584	486	1821	693
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	20.2	20.3	0.0	20.1	20.2	0.0	6.6	6.2	13.0	14.6	12.4
Incr Delay (d2), s/veh	0.0	1.5	1.6	0.0	1.4	1.5	0.0	0.8	0.3	0.6	0.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	6.4	6.3	0.0	6.3	6.0	0.0	2.9	0.5	1.6	7.3	1.7
Lane Grp Delay (d), s/veh	0.0	21.7	21.9	0.0	21.5	21.7	0.0	7.4	6.4	13.7	15.2	12.8
Lane Grp LOS		C	C		C	C		A	A	B	B	B
Approach Vol, veh/h		500			485			622			871	
Approach Delay, s/veh		21.8			21.6			7.4			14.9	
Approach LOS		C			C			A			B	

Timer

Assigned Phs		4			8			2		1	6	
Phs Duration (G+Y+Rc), s		40.0			40.0			41.0		9.0	50.0	
Change Period (Y+Rc), s		6.0			6.0			6.0		3.0	6.0	
Max Green Setting (Gmax), s		34.0			34.0			35.0		6.0	44.0	
Max Q Clear Time (g_c+I1), s		0.0			0.0			0.0		0.0	0.0	
Green Ext Time (p_c), s		0.0			0.0			0.0		0.0	0.0	

Intersection Summary

HCM 2010 Ctrl Delay			15.7									
HCM 2010 LOS			B									

Notes

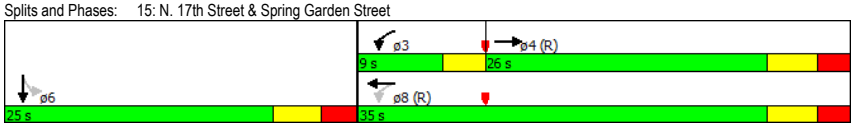
Timings
15: N. 17th Street & Spring Garden Street

Lane Group	EBT	WBL	WBT	SBT
Lane Configurations				
Volume (vph)	395	61	414	63
Lane Group Flow (vph)	502	68	460	132
Turn Type	NA	pm+pt	NA	NA
Protected Phases	4	3	8	6
Permitted Phases		8		
Minimum Split (s)	26.0	9.0	35.0	25.0
Total Split (s)	26.0	9.0	35.0	25.0
Total Split (%)	43.3%	15.0%	58.3%	41.7%
Yellow Time (s)	3.6	3.0	3.6	3.4
All-Red Time (s)	2.4	0.0	2.4	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	3.0	6.0	6.0
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?				
v/c Ratio	0.48	0.16	0.29	0.27
Control Delay	9.2	4.9	7.9	14.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	9.2	4.9	7.9	14.0
Queue Length 50th (ft)	25	8	31	27
Queue Length 95th (ft)	38	m15	68	64
Internal Link Dist (ft)	350		350	290
Turn Bay Length (ft)		165		
Base Capacity (vph)	1055	438	1562	496
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	0.48	0.16	0.29	0.27

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: N. 17th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
15: N. 17th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	395	57	61	414	0	0	0	0	28	63	28
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.87	0.96		1.00				1.00		0.96
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.3	189.0	185.3	185.3	0.0				189.0	183.4	189.0
Lanes	0	2	0	1	2	0				0	1	0
Cap, veh/h	0	1037	147	538	1791	0				176	209	187
Arrive On Green	0.00	0.67	0.67	0.20	0.97	0.00				0.32	0.32	0.32
Sat Flow, veh/h	0	3110	441	1765	3706	0				554	530	591
Grp Volume(v), veh/h	0	259	243	68	460	0				101	0	89
Grp Sat Flow(s),veh/h/ln	0	1853	1699	1765	1853	0				1806	0	1703
Q Serve(g_s), s	0.0	3.9	4.0	1.2	0.3	0.0				2.1	0.0	0.0
Cycle Q Clear(g_c), s	0.0	3.9	4.0	1.2	0.3	0.0				2.1	0.0	0.0
Prop In Lane	0.00		0.26	1.00		0.00				0.31		0.35
Lane Grp Cap(c), veh/h	0	618	566	538	1791	0				572	0	0
V/C Ratio(X)	0.00	0.42	0.43	0.13	0.26	0.00				0.18	0.00	0.00
Avail Cap(c_a), veh/h	0	618	566	538	1791	0				572	0	0
HCM Platoon Ratio	1.00	2.00	2.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	7.3	7.3	8.2	0.5	0.0				12.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	2.1	2.4	0.5	0.3	0.0				0.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	2.9	2.8	0.9	0.3	0.0				1.7	0.0	0.0
Lane Grp Delay (d), s/veh	0.0	9.4	9.7	8.6	0.9	0.0				13.3	0.0	0.0
Lane Grp LOS		A	A	A	A					B		
Approach Vol, veh/h		502			528						190	
Approach Delay, s/veh		9.5			1.9						7.1	
Approach LOS		A			A						A	

Timer

Assigned Phs		4		3	8						6	
Phs Duration (G+Y+Rc), s		26.0		9.0	35.0						25.0	
Change Period (Y+Rc), s		6.0		3.0	6.0						6.0	
Max Green Setting (Gmax), s		20.0		6.0	29.0						19.0	
Max Q Clear Time (g_c+I1), s		0.0		0.0	0.0						0.0	
Green Ext Time (p_c), s		0.0		0.0	0.0						0.0	

Intersection Summary

HCM 2010 Ctrl Delay			5.8									
HCM 2010 LOS			A									

Notes

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	98	282	136	0	0	0	0	276	69
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					0.99						0.99	
Frt					0.961						0.973	
Flt Protected					0.991							
Satd. Flow (prot)	0	0	0	0	3151	0	0	0	0	0	1609	0
Flt Permitted					0.991							
Satd. Flow (perm)	0	0	0	0	3150	0	0	0	0	0	1609	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					146						15	
Link Speed (mph)		30			25			30			25	
Link Distance (ft)		975			430			170			647	
Travel Time (s)		22.2			11.7			3.9			17.6	
Confl. Peds. (#/hr)	17		1	1		17	32		100	100		32
Confl. Bikes (#/hr)						5						2
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Parking (#/hr)					0						0	
Adj. Flow (vph)	0	0	0	113	324	156	0	0	0	0	317	79
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	593	0	0	0	0	0	396	0
Turn Type				custom	NA						NA	
Protected Phases					1 3						2	
Permitted Phases				1								
Minimum Split (s)				47.5							33.5	
Total Split (s)				47.5							33.5	
Total Split (%)				52.8%							37.2%	
Yellow Time (s)				3.5							3.5	
All-Red Time (s)				1.8							1.5	
Lost Time Adjust (s)											0.0	
Total Lost Time (s)											5.0	
Lead/Lag				Lead							Lag	
Lead-Lag Optimize?												
Act Effct Green (s)					51.2						28.5	
Actuated g/C Ratio					0.57						0.32	
v/c Ratio					0.32						0.76	
Control Delay					1.2						37.9	
Queue Delay					0.0						0.0	
Total Delay					1.2						37.9	
LOS					A						D	
Approach Delay					1.2						37.9	
Approach LOS					A						D	
Queue Length 50th (ft)					3						194	
Queue Length 95th (ft)					9						#296	
Internal Link Dist (ft)		895			350			90			567	
Turn Bay Length (ft)												
Base Capacity (vph)					1854						519	
Starvation Cap Reductn					0						0	

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

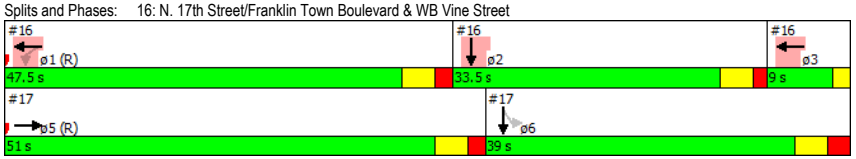
Lane Group	ø3	ø5	ø6
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	5	6
Permitted Phases			
Minimum Split (s)	9.0	51.0	39.0
Total Split (s)	9.0	51.0	39.0
Total Split (%)	10%	57%	43%
Yellow Time (s)	2.0	3.5	3.5
All-Red Time (s)	0.0	1.8	2.5
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag		Lead	Lag
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn					0						0	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.32						0.76	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 15.9	Intersection LOS: B
Intersection Capacity Utilization 67.5%	ICU Level of Service C
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 16: N. 17th Street/Franklin Town Boulevard & WB Vine Street



Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	ø3	ø5	ø6
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 Report

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	231	29	0	0	0	0	0	0	147	232	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor		1.00									0.96	
Frt		0.983										
Flt Protected											0.981	
Satd. Flow (prot)	0	3279	0	0	0	0	0	0	0	0	3454	0
Flt Permitted											0.981	
Satd. Flow (perm)	0	3279	0	0	0	0	0	0	0	0	3328	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)		22									175	
Link Speed (mph)		30			25			30			30	
Link Distance (ft)		975			430			430			170	
Travel Time (s)		22.2			11.7			9.8			3.9	
Confl. Peds. (#/hr)	1		16	16		1	31		87	87		31
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Parking (#/hr)		0										
Adj. Flow (vph)	0	275	35	0	0	0	0	0	0	175	276	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	310	0	0	0	0	0	0	0	0	451	0
Turn Type		NA								Perm	NA	
Protected Phases		5									6	
Permitted Phases										6		
Minimum Split (s)		51.0								39.0	39.0	
Total Split (s)		51.0								39.0	39.0	
Total Split (%)		56.7%								43.3%	43.3%	
Yellow Time (s)		3.5								3.5	3.5	
All-Red Time (s)		1.8								2.5	2.5	
Lost Time Adjust (s)		0.0									0.0	
Total Lost Time (s)		5.3									6.0	
Lead/Lag		Lead								Lag	Lag	
Lead-Lag Optimize?												
Act Effct Green (s)		45.7									33.0	
Actuated g/C Ratio		0.51									0.37	
v/c Ratio		0.19									0.34	
Control Delay		11.5									3.6	
Queue Delay		0.0									1.4	
Total Delay		11.5									5.0	
LOS		B									A	
Approach Delay		11.5									5.0	
Approach LOS		B									A	
Queue Length 50th (ft)		44									8	
Queue Length 95th (ft)		62									21	
Internal Link Dist (ft)		895			350			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		1675									1331	
Starvation Cap Reductn		0									656	

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	3
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	1.8	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
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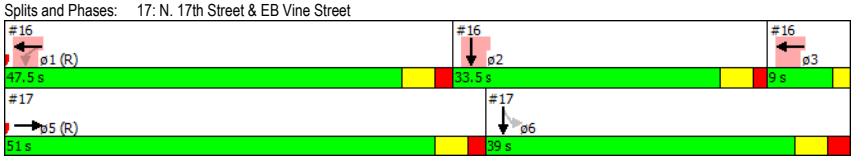
Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0									0	
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.19									0.67	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 7.6	Intersection LOS: A
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: N. 17th Street & EB Vine Street



Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

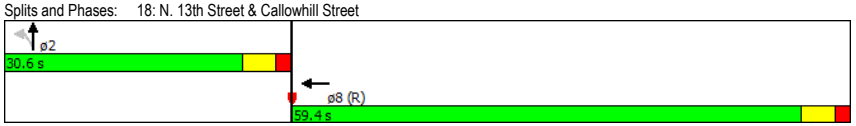
Timings
18: N. 13th Street & Callowhill Street

Lane Group	WBT	NBT
Lane Configurations		
Volume (vph)	182	141
Lane Group Flow (vph)	214	187
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Minimum Split (s)	59.4	30.6
Total Split (s)	59.4	30.6
Total Split (%)	66.0%	34.0%
Yellow Time (s)	3.6	3.6
All-Red Time (s)	1.8	1.8
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.4	5.4
Lead/Lag		
Lead-Lag Optimize?		
v/c Ratio	0.12	0.41
Control Delay	7.1	12.5
Queue Delay	0.0	0.0
Total Delay	7.1	12.5
Queue Length 50th (ft)	22	27
Queue Length 95th (ft)	37	57
Internal Link Dist (ft)	195	480
Turn Bay Length (ft)		
Base Capacity (vph)	1848	451
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.12	0.41

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 90
Control Type: Pretimed

Splits and Phases: 18: N. 13th Street & Callowhill Street



HCM 2010 Signalized Intersection Summary
18: N. 13th Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	182	21	37	141	0	0	0	0
Number				3	8	18	5	2	12			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.97	1.00		1.00			
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln				0.0	185.3	189.0	189.0	185.3	0.0			
Lanes				0	2	0	0	1	0			
Cap, veh/h				0	1956	221	107	406	0			
Arrive On Green				0.00	0.60	0.60	0.28	0.28	0.00			
Sat Flow, veh/h				0	3261	368	382	1451	0			
Grp Volume(v), veh/h				0	108	106	187	0	0			
Grp Sat Flow(s),veh/h/ln				0	1853	1776	1834	1853	0			
Q Serve(g_s), s				0.0	2.2	2.3	7.4	0.0	0.0			
Cycle Q Clear(g_c), s				0.0	2.2	2.3	7.4	0.0	0.0			
Prop In Lane				0.00		0.21	0.21		0.00			
Lane Grp Cap(c), veh/h				0	1112	1066	513	0	0			
V/C Ratio(X)				0.00	0.10	0.10	0.36	0.00	0.00			
Avail Cap(c_a), veh/h				0	1112	1066	513	0	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh				0.0	7.6	7.7	26.0	0.0	0.0			
Incr Delay (d2), s/veh				0.0	0.2	0.2	2.0	0.0	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln				0.0	1.7	1.7	5.6	0.0	0.0			
Lane Grp Delay (d), s/veh				0.0	7.8	7.8	28.0	0.0	0.0			
Lane Grp LOS					A	A	C					
Approach Vol, veh/h					214			187				
Approach Delay, s/veh					7.8			28.0				
Approach LOS					A			C				

Timer

Assigned Phs	8	2
Phs Duration (G+Y+Rc), s	59.4	30.6
Change Period (Y+Rc), s	5.4	5.4
Max Green Setting (Gmax), s	54.0	25.2
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	17.2
HCM 2010 LOS	B

Notes

Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	743	52	73	144	0	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	11	12	11	10	12	12	10	12
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00		0.96					
Frt					0.990							
Flt Protected							0.950					
Satd. Flow (prot)	0	0	0	0	4661	0	1702	1729	0	0	0	0
Flt Permitted							0.950					
Satd. Flow (perm)	0	0	0	0	4661	0	1628	1729	0	0	0	0
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Satd. Flow (RTOR)					18		76					
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		605			275			170			560	
Travel Time (s)		16.5			6.3			3.9			12.7	
Confl. Peds. (#/hr)	44		3	3		44	53		40	40		53
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Parking (#/hr)					0							
Adj. Flow (vph)	0	0	0	0	774	54	76	150	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	828	0	76	150	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					1			2				
Permitted Phases							2					
Minimum Split (s)					51.0		39.0	39.0				
Total Split (s)					51.0		39.0	39.0				
Total Split (%)					56.7%		43.3%	43.3%				
Yellow Time (s)					3.7		3.5	3.5				
All-Red Time (s)					1.8		2.5	2.5				
Lost Time Adjust (s)					0.0		0.0	0.0				
Total Lost Time (s)					5.5		6.0	6.0				
Lead/Lag					Lead		Lag	Lag				
Lead-Lag Optimize?					Yes		Yes	Yes				
Act Effct Green (s)					45.5		33.0	33.0				
Actuated g/C Ratio					0.51		0.37	0.37				
v/c Ratio					0.35		0.12	0.24				
Control Delay					13.6		0.8	10.9				
Queue Delay					0.0		0.8	1.7				
Total Delay					13.6		1.6	12.6				
LOS					B		A	B				
Approach Delay					13.6			8.9				
Approach LOS					B			A				
Queue Length 50th (ft)					96		0	26				
Queue Length 95th (ft)					124		2	44				
Internal Link Dist (ft)		525			195			90			480	
Turn Bay Length (ft)												
Base Capacity (vph)					2365		645	633				
Starvation Cap Reductn					0		391	341				

Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	7
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	2.0	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			

Projected (Build) Conditions
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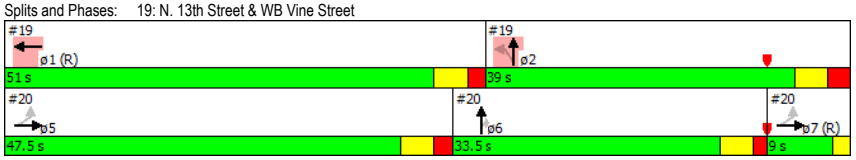
Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.35		0.30	0.51				

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 7:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.35	
Intersection Signal Delay: 12.6	Intersection LOS: B
Intersection Capacity Utilization 110.0%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 19: N. 13th Street & WB Vine Street



Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Projected (Build) Conditions
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Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	62	499	0	0	0	0	0	155	43	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	11	9	12	12	12
Lane Util. Factor	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor									0.95			
Frt									0.850			
Flt Protected		0.995										
Satd. Flow (prot)	0	5033	0	0	0	0	0	1612	1417	0	0	0
Flt Permitted		0.995										
Satd. Flow (perm)	0	5033	0	0	0	0	0	1612	1349	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		40							103			
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		442			275			430			170	
Travel Time (s)		12.1			6.3			9.8			3.9	
Confl. Peds. (#/hr)			23	23			49		36	36		49
Confl. Bikes (#/hr)			2						4			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Parking (#/hr)								0				
Adj. Flow (vph)	68	548	0	0	0	0	0	170	47	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	616	0	0	0	0	0	170	47	0	0	0
Turn Type	Perm	NA						NA	Perm			
Protected Phases		5 7						6				
Permitted Phases	5 7								6			
Minimum Split (s)								33.5	33.5			
Total Split (s)								33.5	33.5			
Total Split (%)								37.2%	37.2%			
Yellow Time (s)								3.5	3.5			
All-Red Time (s)								1.5	1.5			
Lost Time Adjust (s)								0.0	0.0			
Total Lost Time (s)								5.0	5.0			
Lead/Lag								Lag	Lag			
Lead-Lag Optimize?								Yes	Yes			
Act Effct Green (s)		51.0						28.5	28.5			
Actuated g/C Ratio		0.57						0.32	0.32			
v/c Ratio		0.21						0.33	0.09			
Control Delay		5.0						25.8	0.4			
Queue Delay		0.0						0.0	0.0			
Total Delay		5.0						25.8	0.4			
LOS		A						C	A			
Approach Delay		5.0						20.3				
Approach LOS		A						C				
Queue Length 50th (ft)		30						73	0			
Queue Length 95th (ft)		35						128	1			
Internal Link Dist (ft)		362			195			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		2869						510	497			

Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Lane Configurations				
Volume (vph)				
Ideal Flow (vphpl)				
Lane Width (ft)				
Lane Util. Factor				
Ped Bike Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Confl. Peds. (#/hr)				
Confl. Bikes (#/hr)				
Peak Hour Factor				
Parking (#/hr)				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	2	5	7
Permitted Phases				
Minimum Split (s)	51.0	39.0	47.5	9.0
Total Split (s)	51.0	39.0	47.5	9.0
Total Split (%)	57%	43%	53%	10%
Yellow Time (s)	3.7	3.5	3.5	2.0
All-Red Time (s)	1.8	2.5	2.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				

Projected (Build) Conditions
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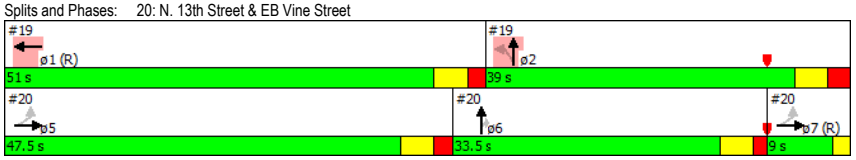
Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0						0	0			
Spillback Cap Reductn		0						4	0			
Storage Cap Reductn		0						0	0			
Reduced v/c Ratio		0.21						0.34	0.09			

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 7:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.35	
Intersection Signal Delay: 9.0	Intersection LOS: A
Intersection Capacity Utilization 103.5%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 20: N. 13th Street & EB Vine Street



Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
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Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	49	333	0	0	0	0	0	507	276	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.98			
Frt									0.850			
Flt Protected		0.994										
Satd. Flow (prot)	0	3482	0	0	0	0	0	5009	1575	0	0	0
Flt Permitted		0.994										
Satd. Flow (perm)	0	3481	0	0	0	0	0	5009	1546	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24							297			
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		430			378			430			170	
Travel Time (s)		11.7			10.3			11.7			4.6	
Confl. Peds. (#/hr)	2		13	13		2	372		7	7		372
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	6%	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%
Adj. Flow (vph)	53	358	0	0	0	0	0	545	297	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	411	0	0	0	0	0	545	297	0	0	0
Turn Type	Perm	NA						NA	Perm			
Protected Phases		5 7						6				
Permitted Phases	5 7								6			
Minimum Split (s)								33.5	33.5			
Total Split (s)								33.5	33.5			
Total Split (%)								37.2%	37.2%			
Yellow Time (s)								3.5	3.5			
All-Red Time (s)								1.5	1.5			
Lost Time Adjust (s)								0.0	0.0			
Total Lost Time (s)								5.0	5.0			
Lead/Lag								Lag	Lag			
Lead-Lag Optimize?												
Act Effct Green (s)		51.2						28.5	28.5			
Actuated g/C Ratio		0.57						0.32	0.32			
v/c Ratio		0.21						0.34	0.43			
Control Delay		7.5						24.3	5.0			
Queue Delay		0.0						0.0	0.0			
Total Delay		7.5						24.3	5.0			
LOS		A						C	A			
Approach Delay		7.5						17.5				
Approach LOS		A						B				
Queue Length 50th (ft)		48						86	0			
Queue Length 95th (ft)		60						116	55			
Internal Link Dist (ft)		350			298			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		1990						1586	692			
Starvation Cap Reductn		0						0	0			
Spillback Cap Reductn		0						14	0			

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Lane Configurations				
Volume (vph)				
Ideal Flow (vphpl)				
Lane Util. Factor				
Ped Bike Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Confl. Peds. (#/hr)				
Peak Hour Factor				
Heavy Vehicles (%)				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	2	5	7
Permitted Phases				
Minimum Split (s)	51.0	39.0	47.5	9.0
Total Split (s)	51.0	39.0	47.5	9.0
Total Split (%)	57%	43%	53%	10%
Yellow Time (s)	3.5	3.5	3.5	2.0
All-Red Time (s)	1.8	2.5	1.8	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lead	
Lead-Lag Optimize?				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				

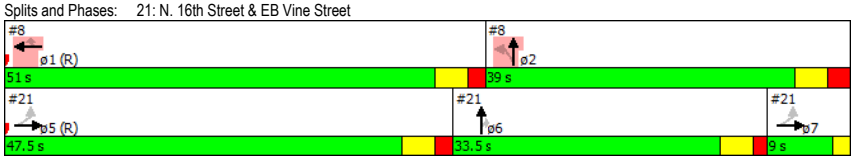
Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 Report

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn		0						0	0			
Reduced v/c Ratio		0.21						0.35	0.43			

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 67.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 21: N. 16th Street & EB Vine Street



Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

Projected (Build) Conditions
Traffic Planning and Design, Inc. - BMP

Timing Plan: Saturday Evening
Synchro 8 Report

PROJECTED (BUILD) CONDITIONS – WITH ANTICIPATED ROADWAY IMPROVEMENTS

FRIDAY PM (4-6 PM)
PEAK HOUR TIME PERIOD

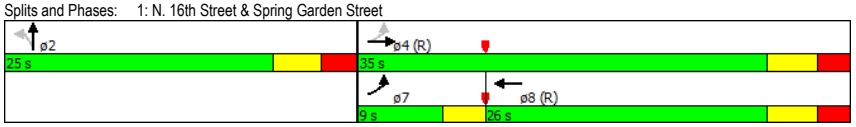
Timings
1: N. 16th Street & Spring Garden Street

Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Volume (vph)	140	667	824	438
Lane Group Flow (vph)	146	695	955	873
Turn Type	pm+pt	NA	NA	NA
Protected Phases	7	4	8	2
Permitted Phases	4			
Minimum Split (s)	9.0	35.0	26.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?				
v/c Ratio	0.56	0.45	0.93	0.93
Control Delay	23.3	16.4	46.9	34.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.3	16.4	46.9	34.1
Queue Length 50th (ft)	39	90	187	179
Queue Length 95th (ft)	m40	m90	m#285	#286
Internal Link Dist (ft)		350	380	990
Turn Bay Length (ft)	140			
Base Capacity (vph)	263	1550	1027	935
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	0.56	0.45	0.93	0.93

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 65
Control Type: Pretimed
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.

Splits and Phases: 1: N. 16th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
1: N. 16th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	140	667	0	0	824	93	160	438	240	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.89	1.00		0.80			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln	185.3	185.3	0.0	0.0	183.3	187.1	186.2	181.5	186.2			
Lanes	1	2	0	0	2	0	0	2	0			
Cap, veh/h	331	1791	0	0	1009	114	183	512	301			
Arrive On Green	0.20	0.97	0.00	0.00	0.11	0.11	0.32	0.32	0.32			
Sat Flow, veh/h	1765	3706	0	0	3027	342	579	1617	950			
Grp Volume(v), veh/h	146	695	0	0	519	436	515	0	358			
Grp Sat Flow(s),veh/h/ln	1765	1853	0	0	1833	1537	1786	0	1360			
Q Serve(g_s), s	2.8	0.6	0.0	0.0	16.7	16.7	16.6	0.0	14.6			
Cycle Q Clear(g_c), s	2.8	0.6	0.0	0.0	16.7	16.7	16.6	0.0	14.6			
Prop In Lane	1.00		0.00	0.00		0.22	0.32		0.70			
Lane Grp Cap(c), veh/h	331	1791	0	0	611	512	566	0	431			
V/C Ratio(X)	0.44	0.39	0.00	0.00	0.85	0.85	0.91	0.00	0.83			
Avail Cap(c_a), veh/h	331	1791	0	0	611	512	566	0	431			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	11.4	0.5	0.0	0.0	25.2	25.2	19.7	0.0	19.0			
Incr Delay (d2), s/veh	4.2	0.6	0.0	0.0	13.9	16.1	21.3	0.0	16.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln	2.3	0.6	0.0	0.0	13.8	12.2	13.4	0.0	9.3			
Lane Grp Delay (d), s/veh	15.6	1.2	0.0	0.0	39.1	41.3	40.9	0.0	35.8			
Lane Grp LOS	B	A			D	D	D		D			
Approach Vol, veh/h		841			955			873				
Approach Delay, s/veh		3.7			40.1			38.8				
Approach LOS		A			D			D				

Timer

Assigned Phs	7	4			8			2				
Phs Duration (G+Y+Rc), s	9.0	35.0			26.0			25.0				
Change Period (Y+Rc), s	3.0	6.0			6.0			6.0				
Max Green Setting (Gmax), s	6.0	29.0			20.0			19.0				
Max Q Clear Time (g_c+I1), s	0.0	0.0			0.0			0.0				
Green Ext Time (p_c), s	0.0	0.0			0.0			0.0				

Intersection Summary

HCM 2010 Ctrl Delay			28.2									
HCM 2010 LOS			C									

Notes

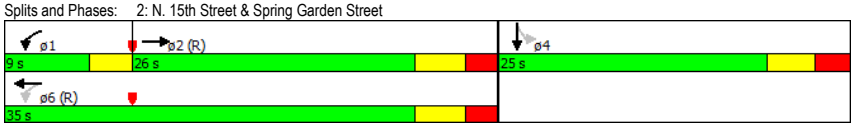
Timings
2: N. 15th Street & Spring Garden Street

Lane Group	EBT	WBL	WBT	SBL	SBT
Lane Configurations					
Volume (vph)	818	150	698	82	325
Lane Group Flow (vph)	934	158	735	86	407
Turn Type	NA	pm+pt	NA	Perm	NA
Protected Phases	2	1	6		4
Permitted Phases		6		4	
Minimum Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (%)	43.3%	15.0%	58.3%	41.7%	41.7%
Yellow Time (s)	3.6	3.0	3.6	3.4	3.4
All-Red Time (s)	2.4	0.0	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	3.0	6.0	6.0	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?					
v/c Ratio	0.90	0.65	0.48	0.22	0.87
Control Delay	27.4	22.9	11.7	17.0	42.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	27.4	22.9	11.7	17.0	42.4
Queue Length 50th (ft)	144	27	87	23	137
Queue Length 95th (ft)	m#259	#86	127	53	#284
Internal Link Dist (ft)	380		400		290
Turn Bay Length (ft)		115		100	
Base Capacity (vph)	1043	244	1534	390	466
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	0.90	0.65	0.48	0.22	0.87

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 15 (25%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed
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.

Splits and Phases: 2: N. 15th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
2: N. 15th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	818	69	150	698	0	0	0	0	82	325	62
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.53	0.91		1.00				1.00		0.83
Parking Bus Adj	1.00	1.00	0.90	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	182.2	189.0	178.2	183.4	0.0				168.0	185.0	189.0
Lanes	0	2	0	1	2	0				1	1	0
Cap, veh/h	0	970	82	342	1773	0				507	461	88
Arrive On Green	0.00	0.67	0.67	0.10	0.48	0.00				0.32	0.32	0.32
Sat Flow, veh/h	0	2910	247	1697	3669	0				1600	1456	277
Grp Volume(v), veh/h	0	539	395	158	735	0				86	0	407
Grp Sat Flow(s),veh/h/ln	0	1822	1334	1697	1834	0				1600	1850	1732
Q Serve(g_s), s	0.0	14.5	14.5	3.3	7.8	0.0				2.3	0.0	12.6
Cycle Q Clear(g_c), s	0.0	14.5	14.5	3.3	7.8	0.0				2.3	0.0	12.6
Prop In Lane	0.00		0.18	1.00		0.00				1.00		0.16
Lane Grp Cap(c), veh/h	0	607	445	342	1773	0				507	0	549
V/C Ratio(X)	0.00	0.89	0.89	0.46	0.41	0.00				0.17	0.00	0.74
Avail Cap(c_a), veh/h	0	607	445	342	1773	0				507	0	549
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	9.1	9.1	12.5	10.0	0.0				14.8	0.0	18.3
Incr Delay (d2), s/veh	0.0	17.4	22.2	4.4	0.7	0.0				0.7	0.0	8.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	8.3	7.1	2.8	5.1	0.0				1.7	0.0	8.9
Lane Grp Delay (d), s/veh	0.0	26.5	31.3	17.0	10.7	0.0				15.5	0.0	27.1
Lane Grp LOS		C	C	B	B					B		C
Approach Vol, veh/h		934			893						493	
Approach Delay, s/veh		28.5			11.8						25.1	
Approach LOS		C			B						C	

Timer

Assigned Phs		2		1	6						4	
Phs Duration (G+Y+Rc), s		26.0		9.0	35.0						25.0	
Change Period (Y+Rc), s		6.0		3.0	6.0						6.0	
Max Green Setting (Gmax), s		20.0		6.0	29.0						19.0	
Max Q Clear Time (g_c+I1), s		0.0		0.0	0.0						0.0	
Green Ext Time (p_c), s		0.0		0.0	0.0						0.0	

Intersection Summary

HCM 2010 Ctrl Delay		21.4	
HCM 2010 LOS		C	

Notes

Lanes, Volumes, Timings
3: Franklin Town Boulevard & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	198	55	137	37	333	188	38	42	8	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	11	12	12	12	12	12	16	12	12	12	12
Grade (%)		-1%			2%			3%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.953			0.955			0.987				
Flt Protected		0.975			0.997			0.979				
Satd. Flow (prot)	0	1648	0	0	1572	0	0	1747	0	0	0	0
Flt Permitted		0.975			0.997			0.979				
Satd. Flow (perm)	0	1648	0	0	1572	0	0	1747	0	0	0	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		646			325			647			208	
Travel Time (s)		17.6			8.9			17.6			5.7	
Confl. Peds. (#/hr)	56		53	53		56	28		24	24		28
Confl. Bikes (#/hr)			5			8			1			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	13%	2%	2%	2%	2%	4%	2%	25%	2%	2%	2%
Parking (#/hr)					0			0				
Adj. Flow (vph)	213	59	147	40	358	202	41	45	9	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	419	0	0	600	0	0	95	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.05	1.00	1.02	1.17	1.02	1.03	1.00	1.03	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	CBD
Control Type: Unsignalized	
Intersection Capacity Utilization 79.0%	ICU Level of Service D
Analysis Period (min) 15	

HCM 2010 AWSC
3: Franklin Town Boulevard & Callowhill Street

Intersection	
Intersection Delay, s/veh	16.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	198	55	137	37	333	188	38	42	8	0	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	13	2	2	2	2	4	2	25	2	2	2
Mvmt Flow	213	59	147	40	358	202	41	45	9	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	13.6	19.9	10.5
HCM LOS	B	C	B

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	43%	51%	7%
Vol Thru, %	48%	14%	60%
Vol Right, %	9%	35%	34%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	88	390	558
LT Vol	42	55	333
Through Vol	8	137	188
RT Vol	38	198	37
Lane Flow Rate	95	419	600
Geometry Grp	1	1	1
Degree of Util (X)	0.165	0.553	0.75
Departure Headway (Hd)	6.263	4.748	4.501
Convergence, Y/N	Yes	Yes	Yes
Cap	576	751	798
Service Time	4.263	2.826	2.568
HCM Lane V/C Ratio	0.165	0.558	0.752
HCM Control Delay	10.5	13.6	19.9
HCM Lane LOS	B	B	C
HCM 95th-tile Q	0.6	3.4	7

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
4: N. 17th Street & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	62	195	350	0	0	0	0	0	285	144
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	11	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			-4%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.865								0.955	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	1429	1693	1659	0	0	0	0	0	1529	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	1429	1693	1659	0	0	0	0	0	1529	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		325			430			230			1070	
Travel Time (s)		8.9			11.7			6.3			29.2	
Confl. Peds. (#/hr)	47		75	75		47	112		60	60		112
Confl. Bikes (#/hr)			1			7						20
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	5	0
Parking (#/hr)			0		0						0	
Adj. Flow (vph)	0	0	70	222	398	0	0	0	0	0	324	164
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	70	222	398	0	0	0	0	0	488	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.15	1.06	1.16	1.01	1.01	1.01	1.01	0.98	1.20	0.98
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	CBD
Control Type: Unsignalized	
Intersection Capacity Utilization 59.9%	ICU Level of Service B
Analysis Period (min) 15	

HCM 2010 AWSC
4: N. 17th Street & Callowhill Street

Intersection	
Intersection Delay, s/veh	19.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	62	195	350	0	0	0	0	0	285	144
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	3	2	2	2	2	2	2	2	3	2
Mvmt Flow	0	0	70	222	398	0	0	0	0	0	324	164
Number of Lanes	0	0	1	1	1	0	0	0	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	9.6	18	22.1
HCM LOS	A	C	C

Lane	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	100%	0%	0%
Vol Thru, %	0%	0%	100%	66%
Vol Right, %	100%	0%	0%	34%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	62	195	350	429
LT Vol	0	0	350	285
Through Vol	62	0	0	144
RT Vol	0	195	0	0
Lane Flow Rate	70	222	398	488
Geometry Grp	5	7	7	2
Degree of Util (X)	0.113	0.406	0.672	0.735
Departure Headway (Hd)	5.773	6.588	6.081	5.427
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	619	547	597	668
Service Time	3.823	4.322	3.814	3.461
HCM Lane V/C Ratio	0.113	0.406	0.667	0.731
HCM Control Delay	9.6	13.8	20.4	22.1
HCM Lane LOS	A	B	C	C
HCM 95th-tile Q	0.4	2	5.1	6.4

Notes

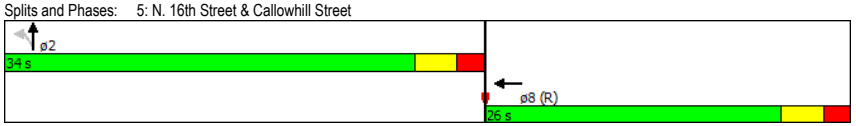
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Timings
5: N. 16th Street & Callowhill Street

Lane Group	WBT	NBT
Lane Configurations		
Volume (vph)	421	853
Lane Group Flow (vph)	708	1005
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Minimum Split (s)	26.0	34.0
Total Split (s)	26.0	34.0
Total Split (%)	43.3%	56.7%
Yellow Time (s)	3.0	3.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
v/c Ratio	0.68	0.63
Control Delay	14.1	13.2
Queue Delay	0.0	0.0
Total Delay	14.1	13.2
Queue Length 50th (ft)	44	126
Queue Length 95th (ft)	101	182
Internal Link Dist (ft)	380	136
Turn Bay Length (ft)		
Base Capacity (vph)	1048	1605
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.68	0.63

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 17 (28%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 5: N. 16th Street & Callowhill Street



HCM 2010 Signalized Intersection Summary
5: N. 16th Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	421	237	82	853	0	0	0	0
Number				3	8	18	5	2	12			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.73	1.00		1.00			
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln				0.0	185.3	189.0	187.1	180.1	0.0			
Lanes				0	2	0	0	2	0			
Cap, veh/h				0	689	378	145	1588	0			
Arrive On Green				0.00	0.12	0.12	0.48	0.48	0.00			
Sat Flow, veh/h				0	1969	1081	300	3286	0			
Grp Volume(v), veh/h				0	426	282	524	481	0			
Grp Sat Flow(s),veh/h/ln				0	1853	1197	1786	1801	0			
Q Serve(g_s), s				0.0	13.2	13.6	12.9	11.3	0.0			
Cycle Q Clear(g_c), s				0.0	13.2	13.6	12.9	11.3	0.0			
Prop In Lane				0.00		0.90	0.17		0.00			
Lane Grp Cap(c), veh/h				0	649	419	863	870	0			
V/C Ratio(X)				0.00	0.66	0.67	0.61	0.55	0.00			
Avail Cap(c_a), veh/h				0	649	419	863	870	0			
HCM Platoon Ratio				1.00	0.33	0.33	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	23.1	23.3	11.3	10.9	0.0			
Incr Delay (d2), s/veh				0.0	5.1	8.4	3.2	2.5	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln				0.0	10.2	7.7	8.0	7.2	0.0			
Lane Grp Delay (d), s/veh				0.0	28.2	31.7	14.5	13.4	0.0			
Lane Grp LOS					C	C	B	B				
Approach Vol, veh/h					708			1005				
Approach Delay, s/veh					29.6			14.0				
Approach LOS					C			B				

Timer	
Assigned Phs	8	2
Phs Duration (G+Y+Rc), s	26.0	34.0
Change Period (Y+Rc), s	5.0	5.0
Max Green Setting (Gmax), s	21.0	29.0
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	20.4
HCM 2010 LOS	C

Notes

HCM 2010 Signals-Pedestrians
5: N. 16th Street & Callowhill Street

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	23.0	24.0	24.0	24.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	2	2	2
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	0	2	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	25	25	25
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	30.0	30.0	30.0	30.0
Pedestrian Compliance Code	Fair	Fair	Fair	Fair
Pedestrian Crosswalk Score	1.93	2.00	2.12	2.18
Pedestrian Crosswalk LOS	A	A	B	B

HCM 2010 Signals-Bicycles
5: N. 16th Street & Callowhill Street

Approach	EB	WB	NB	SB
Bicycle Flow Rate (bike/h)	0	0	0	0
Total Flow Rate (veh/h)	0	708	1005	0
Effct. Green for Bike (s)	0.0	21.0	29.0	0.0
Cross Street Width (ft)	24.0	24.0	24.0	23.0
Through Lanes Number	0	2	2	0
Through Lane Width (ft)	12.0	12.0	12.0	12.0
Bicycle Lane Width (ft)	0.0	0.0	0.0	0.0
Paved Shoulder Width (ft)	0.0	0.0	0.0	0.0
Curb Is Present?	No	No	No	No
On Street Parking?	No	No	No	No
Bicycle Lane Capacity (bike/h)	0	700	967	0
Bicycle Delay (s/bike)	0.0	12.7	8.0	0.0
Bicycle Compliance		Fair	Good	
Bicycle LOS Score	0.00	2.51	2.76	0.00
Bicycle LOS		B	C	

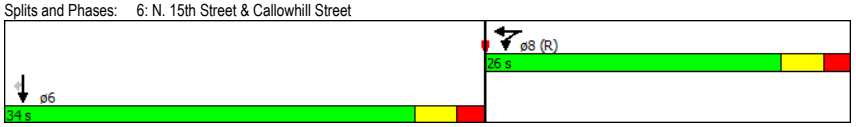
Timings
6: N. 15th Street & Callowhill Street

Lane Group	WBT	SBT	SBR
Lane Configurations			
Volume (vph)	496	700	126
Lane Group Flow (vph)	679	722	130
Turn Type	NA	NA	Perm
Protected Phases	8	6	
Permitted Phases			6
Minimum Split (s)	26.0	34.0	34.0
Total Split (s)	26.0	34.0	34.0
Total Split (%)	43.3%	56.7%	56.7%
Yellow Time (s)	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0
Lead/Lag			
Lead-Lag Optimize?			
v/c Ratio	0.58	0.95	0.18
Control Delay	17.3	43.7	7.5
Queue Delay	0.0	0.0	0.0
Total Delay	17.3	43.7	7.5
Queue Length 50th (ft)	96	270	9
Queue Length 95th (ft)	144	m#414	m20
Internal Link Dist (ft)	400	990	
Turn Bay Length (ft)			100
Base Capacity (vph)	1179	760	726
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.58	0.95	0.18

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 16 (27%), Referenced to phase 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed
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.

Splits and Phases: 6: N. 15th Street & Callowhill Street



HCM 2010 Signalized Intersection Summary
6: N. 15th Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	163	496	0	0	0	0	0	700	126
Number				3	8	18				1	6	16
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.97
Parking Bus Adj				1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln				189.0	185.3	0.0				0.0	181.0	169.8
Lanes				0	2	0				0	1	1
Cap, veh/h				302	980	0				0	875	674
Arrive On Green				0.35	0.35	0.00				0.00	0.16	0.16
Sat Flow, veh/h				864	2799	0				0	1810	1395
Grp Volume(v), veh/h				352	327	0				0	722	130
Grp Sat Flow(s),veh/h/ln				1810	1853	0				0	1810	1395
Q Serve(g_s), s				9.4	8.4	0.0				0.0	23.2	4.8
Cycle Q Clear(g_c), s				9.4	8.4	0.0				0.0	23.2	4.8
Prop In Lane				0.48		0.00				0.00		1.00
Lane Grp Cap(c), veh/h				633	649	0				0	875	674
V/C Ratio(X)				0.56	0.50	0.00				0.00	0.83	0.19
Avail Cap(c_a), veh/h				633	649	0				0	875	674
HCM Platoon Ratio				1.00	1.00	1.00				1.00	0.33	0.33
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				15.7	15.4	0.0				0.0	22.8	15.1
Incr Delay (d2), s/veh				3.5	2.8	0.0				0.0	8.8	0.6
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (85%), veh/ln				6.6	6.0	0.0				0.0	17.0	3.1
Lane Grp Delay (d), s/veh				19.2	18.2	0.0				0.0	31.5	15.7
Lane Grp LOS				B	B						C	B
Approach Vol, veh/h					679						852	
Approach Delay, s/veh					18.7						29.1	
Approach LOS					B						C	

Timer

Assigned Phs					8						6	
Phs Duration (G+Y+Rc), s					26.0						34.0	
Change Period (Y+Rc), s					5.0						5.0	
Max Green Setting (Gmax), s					21.0						29.0	
Max Q Clear Time (g_c+I1), s					0.0						0.0	
Green Ext Time (p_c), s					0.0						0.0	

Intersection Summary

HCM 2010 Ctrl Delay			24.5									
HCM 2010 LOS			C									

Notes

HCM 2010 Signals-Pedestrians
6: N. 15th Street & Callowhill Street

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	24.0	24.0	24.0	23.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	2	2	2
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	6	0	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	25	25	25
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	30.0	30.0	30.0	30.0
Pedestrian Compliance Code	Fair	Fair	Fair	Fair
Pedestrian Crosswalk Score	1.97	1.98	2.07	2.05
Pedestrian Crosswalk LOS	A	A	B	B

HCM 2010 Signals-Bicycles
6: N. 15th Street & Callowhill Street

Approach	EB	WB	NB	SB
Bicycle Flow Rate (bike/h)	0	0	0	0
Total Flow Rate (veh/h)	0	679	0	852
Effct. Green for Bike (s)	0.0	21.0	0.0	29.0
Cross Street Width (ft)	24.0	23.0	24.0	24.0
Through Lanes Number	0	2	0	1
Through Lane Width (ft)	12.0	12.0	12.0	11.0
Bicycle Lane Width (ft)	0.0	0.0	0.0	0.0
Paved Shoulder Width (ft)	0.0	0.0	0.0	0.0
Curb Is Present?	No	No	No	No
On Street Parking?	No	No	No	No
Bicycle Lane Capacity (bike/h)	0	700	0	967
Bicycle Delay (s/bike)	0.0	12.7	0.0	8.0
Bicycle Compliance		Fair		Good
Bicycle LOS Score	0.00	2.47	0.00	3.55
Bicycle LOS		B		D

Timings
7: N. Broad Street & Callowhill Street

Lane Group	WBL	WBT	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	60	316	145	780	790	125
Lane Group Flow (vph)	66	444	159	857	868	137
Turn Type	Perm	NA	pm+pt	NA	NA	Perm
Protected Phases		8	5	2	6	
Permitted Phases	8		2			6
Minimum Split (s)	33.0	33.0	9.0	57.0	37.0	37.0
Total Split (s)	33.0	33.0	9.0	57.0	48.0	48.0
Total Split (%)	36.7%	36.7%	10.0%	63.3%	53.3%	53.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	0.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	3.0	5.0	5.0	5.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
v/c Ratio	0.17	0.47	0.50	0.32	0.56	0.27
Control Delay	26.4	29.7	26.7	22.8	9.5	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.4	29.7	26.7	22.8	9.5	9.0
Queue Length 50th (ft)	31	118	80	169	68	20
Queue Length 95th (ft)	m66	171	132	209	82	m33
Internal Link Dist (ft)		525		480	990	
Turn Bay Length (ft)			125			100
Base Capacity (vph)	390	944	320	2640	1561	513
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	0.17	0.47	0.50	0.32	0.56	0.27

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 49 (54%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: N. Broad Street & Callowhill Street

HCM 2010 Signalized Intersection Summary
7: N. Broad Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	60	316	88	145	780	0	0	790	125
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.79	0.93		1.00	1.00		0.68
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln				182.5	182.5	186.2	181.6	179.8	0.0	0.0	186.2	186.2
Lanes				1	2	0	1	3	0	0	2	1
Cap, veh/h				521	783	211	451	3117	0	0	1779	513
Arrive On Green				0.10	0.10	0.10	0.02	0.19	0.00	0.00	0.96	0.96
Sat Flow, veh/h				1738	2611	702	1729	5395	0	0	3724	1074
Grp Volume(v), veh/h				66	238	206	159	857	0	0	868	137
Grp Sat Flow(s),veh/h/ln				1738	1825	1488	1729	1798	0	0	1862	1074
Q Serve(g_s), s				3.1	11.1	11.7	3.9	12.2	0.0	0.0	1.7	0.7
Cycle Q Clear(g_c), s				3.1	11.1	11.7	3.9	12.2	0.0	0.0	1.7	0.7
Prop In Lane				1.00		0.47	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				521	548	446	451	3117	0	0	1779	513
V/C Ratio(X)				0.13	0.44	0.46	0.35	0.27	0.00	0.00	0.49	0.27
Avail Cap(c_a), veh/h				521	548	446	451	3117	0	0	1779	513
HCM Platoon Ratio				0.33	0.33	0.33	0.33	0.33	1.00	1.00	2.00	2.00
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				29.8	33.4	33.7	9.9	20.3	0.0	0.0	1.1	1.1
Incr Delay (d2), s/veh				0.5	2.5	3.4	2.2	0.2	0.0	0.0	1.0	1.3
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (85%), veh/ln				2.6	8.3	7.5	3.3	8.5	0.0	0.0	1.2	0.6
Lane Grp Delay (d), s/veh				30.3	35.9	37.1	12.0	20.5	0.0	0.0	2.0	2.3
Lane Grp LOS				C	D	D	B	C			A	A
Approach Vol, veh/h					510			1016			1005	
Approach Delay, s/veh					35.6			19.2			2.1	
Approach LOS					D			B			A	

Timer

Assigned Phs					8		5	2			6	
Phs Duration (G+Y+Rc), s					33.0		9.0	57.0			48.0	
Change Period (Y+Rc), s					6.0		3.0	5.0			5.0	
Max Green Setting (Gmax), s					27.0		6.0	52.0			43.0	
Max Q Clear Time (g_c+I1), s					0.0		0.0	0.0			0.0	
Green Ext Time (p_c), s					0.0		0.0	0.0			0.0	

Intersection Summary

HCM 2010 Ctrl Delay		15.7
HCM 2010 LOS		B

Notes

HCM 2010 Signals-Pedestrians
7: N. Broad Street & Callowhill Street

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	23.9	32.2	72.1	77.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	3	7	6
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	6	2	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	25	25	25
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	45.0	45.0	45.0	45.0
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	1.99	2.09	2.83	2.73
Pedestrian Crosswalk LOS	A	B	C	B

HCM 2010 Signals-Bicycles
7: N. Broad Street & Callowhill Street

Approach	EB	WB	NB	SB
Bicycle Flow Rate (bike/h)	0	0	0	0
Total Flow Rate (veh/h)	0	510	1016	1005
Effct. Green for Bike (s)	0.0	27.0	52.0	43.0
Cross Street Width (ft)	72.1	77.0	32.2	23.9
Through Lanes Number	0	2	3	2
Through Lane Width (ft)	12.0	11.0	10.0	10.0
Bicycle Lane Width (ft)	0.0	0.0	0.0	0.0
Paved Shoulder Width (ft)	0.0	0.0	0.0	0.0
Curb Is Present?	No	No	No	No
On Street Parking?	No	No	No	No
Bicycle Lane Capacity (bike/h)	0	600	1156	956
Bicycle Delay (s/bike)	0.0	22.0	8.0	12.3
Bicycle Compliance		Fair	Good	Fair
Bicycle LOS Score	0.00	3.37	3.04	3.18
Bicycle LOS		C	C	C

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	749	807	83	737	0	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	11	12	11	12	12	12	12
Grade (%)		0%			0%			-1%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.88	0.91	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor						0.94		0.96				
Frt						0.850						
Flt Protected								0.995				
Satd. Flow (prot)	0	0	0	0	3521	2680	0	4755	0	0	0	0
Flt Permitted								0.995				
Satd. Flow (perm)	0	0	0	0	3521	2528	0	4577	0	0	0	0
Right Turn on Red			Yes			No	Yes		Yes			Yes
Satd. Flow (RTOR)								28				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		430			460			170			344	
Travel Time (s)		11.7			12.5			4.6			9.4	
Confl. Peds. (#/hr)	69		33	33		69	604		16	16		604
Confl. Bikes (#/hr)						3			12			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	4%	5%	2%	2%	2%	2%
Adj. Flow (vph)	0	0	0	0	788	849	87	776	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	788	849	0	863	0	0	0	0
Turn Type					NA	Perm	Perm	NA				
Protected Phases					1			2				
Permitted Phases						1	2					
Minimum Split (s)					51.0	51.0	39.0	39.0				
Total Split (s)					51.0	51.0	39.0	39.0				
Total Split (%)					56.7%	56.7%	43.3%	43.3%				
Yellow Time (s)					3.5	3.5	3.5	3.5				
All-Red Time (s)					1.8	1.8	2.5	2.5				
Lost Time Adjust (s)					0.0	0.0		0.0				
Total Lost Time (s)					5.3	5.3		6.0				
Lead/Lag					Lead	Lead	Lag	Lag				
Lead-Lag Optimize?												
Act Effct Green (s)					45.7	45.7		33.0				
Actuated g/C Ratio					0.51	0.51		0.37				
v/c Ratio					0.44	0.66		0.51				
Control Delay					11.0	15.2		3.0				
Queue Delay					0.0	0.0		0.1				
Total Delay					11.0	15.2		3.1				
LOS					B	B		A				
Approach Delay					13.2			3.1				
Approach LOS					B			A				
Queue Length 50th (ft)					100	167		8				
Queue Length 95th (ft)					m131	m213		10				
Internal Link Dist (ft)		350			380			90			264	
Turn Bay Length (ft)												

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	7
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	1.8	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			

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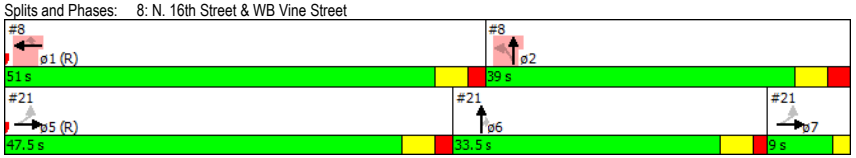
Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)					1787	1283		1695				
Starvation Cap Reductn					0	0		174				
Spillback Cap Reductn					0	0		0				
Storage Cap Reductn					0	0		0				
Reduced v/c Ratio					0.44	0.66		0.57				

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 9.7	Intersection LOS: A
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 8: N. 16th Street & WB Vine Street



Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

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Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	77	939	0	0	0	0	0	1357	586
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			2%	
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	0.86	0.86
Ped Bike Factor					1.00						0.99	
Frt											0.955	
Flt Protected					0.996							
Satd. Flow (prot)	0	0	0	0	4846	0	0	0	0	0	5758	0
Flt Permitted					0.996							
Satd. Flow (perm)	0	0	0	0	4845	0	0	0	0	0	5758	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					6						62	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		460			480			170			414	
Travel Time (s)		12.5			13.1			4.6			11.3	
Confl. Peds. (#/hr)	59		2	2		59	34		518	518		34
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Parking (#/hr)					0							
Adj. Flow (vph)	0	0	0	80	978	0	0	0	0	0	1414	610
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1058	0	0	0	0	0	2024	0
Turn Type				Perm	NA						NA	
Protected Phases					1 3						2	
Permitted Phases				1 3								
Minimum Split (s)											39.0	
Total Split (s)											39.0	
Total Split (%)											43.3%	
Yellow Time (s)											3.5	
All-Red Time (s)											1.5	
Lost Time Adjust (s)											0.0	
Total Lost Time (s)											5.0	
Lead/Lag											Lag	
Lead-Lag Optimize?												
Act Effct Green (s)					46.0						34.0	
Actuated g/C Ratio					0.51						0.38	
v/c Ratio					0.43						1.00dr	
Control Delay					9.4						33.6	
Queue Delay					0.0						5.7	
Total Delay					9.4						39.3	
LOS					A						D	
Approach Delay					9.4						39.3	
Approach LOS					A						D	
Queue Length 50th (ft)					66						304	
Queue Length 95th (ft)					71						#368	
Internal Link Dist (ft)		380			400			90			334	
Turn Bay Length (ft)												
Base Capacity (vph)					2479						2213	

Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø6	ø7
Lane Configurations					
Volume (vph)					
Ideal Flow (vphpl)					
Lane Width (ft)					
Grade (%)					
Lane Util. Factor					
Ped Bike Factor					
Frt					
Flt Protected					
Satd. Flow (prot)					
Flt Permitted					
Satd. Flow (perm)					
Right Turn on Red					
Satd. Flow (RTOR)					
Link Speed (mph)					
Link Distance (ft)					
Travel Time (s)					
Confl. Peds. (#/hr)					
Peak Hour Factor					
Parking (#/hr)					
Adj. Flow (vph)					
Shared Lane Traffic (%)					
Lane Group Flow (vph)					
Turn Type					
Protected Phases	1	3	5	6	7
Permitted Phases					
Minimum Split (s)	41.0	10.0	41.0	34.0	15.0
Total Split (s)	41.0	10.0	41.0	34.0	15.0
Total Split (%)	46%	11%	46%	38%	17%
Yellow Time (s)	3.5	3.0	3.5	3.5	3.0
All-Red Time (s)	1.5	0.0	1.5	0.0	2.0
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag	Lead		Lead	Lag	
Lead-Lag Optimize?					
Act Effct Green (s)					
Actuated g/C Ratio					
v/c Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Queue Length 50th (ft)					
Queue Length 95th (ft)					
Internal Link Dist (ft)					
Turn Bay Length (ft)					
Base Capacity (vph)					

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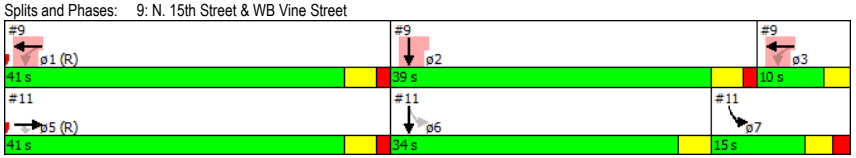
Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					65						161	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.44						0.99	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green
Natural Cycle: 90
Control Type: Pretimed
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 29.1 Intersection LOS: C
Intersection Capacity Utilization 69.2% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 9: N. 15th Street & WB Vine Street



Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø6	ø7
Starvation Cap Reductn					
Spillback Cap Reductn					
Storage Cap Reductn					
Reduced v/c Ratio					

Intersection Summary

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Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	172	878	198	0	790	0	0	656	131
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	11	12	12	10	12	12	10	12
Grade (%)		0%			1%			-1%			1%	
Storage Length (ft)	0		0	0		0	0		0	100		0
Storage Lanes	0		0	1		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.86	0.86
Ped Bike Factor				1.00		0.90					0.94	
Frt						0.850					0.975	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	0	1751	3386	1552	0	4686	0	0	5354	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	0	1750	3386	1403	0	4686	0	0	5354	0
Right Turn on Red			Yes			No			Yes			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		480			605			170			560	
Travel Time (s)		13.1			16.5			4.6			15.3	
Confl. Peds. (#/hr)	107		1	1		107	564		239	239		564
Confl. Bikes (#/hr)						39			1			11
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	2%	2%	3%	2%	3%	2%	2%	3%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	2	0	0	5	0
Adj. Flow (vph)	0	0	0	181	924	208	0	832	0	0	691	138
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	181	924	208	0	832	0	0	829	0
Turn Type				Perm	NA	Perm		NA			NA	
Protected Phases					1 3!			2			6!	
Permitted Phases				1 3!		1 3						
Minimum Split (s)								34.0			34.0	
Total Split (s)								36.0			36.0	
Total Split (%)								40.0%			40.0%	
Yellow Time (s)								2.4			3.6	
All-Red Time (s)								3.0			5.4	
Lost Time Adjust (s)								0.0			0.0	
Total Lost Time (s)								5.4			9.0	
Lead/Lag								Lead			Lead	
Lead-Lag Optimize?												
Act Effct Green (s)				44.0	44.0	44.0		30.6			27.0	
Actuated g/C Ratio				0.49	0.49	0.49		0.34			0.30	
v/c Ratio				0.21	0.56	0.30		0.52			0.52	
Control Delay				27.1	32.2	28.9		7.3			11.9	
Queue Delay				0.0	0.0	0.0		1.0			0.0	
Total Delay				27.1	32.2	28.9		8.3			11.9	
LOS				C	C	C		A			B	
Approach Delay					31.0			8.3			11.9	
Approach LOS					C			A			B	

Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø7	ø8
Lane Configurations					
Volume (vph)					
Ideal Flow (vphpl)					
Lane Width (ft)					
Grade (%)					
Storage Length (ft)					
Storage Lanes					
Taper Length (ft)					
Lane Util. Factor					
Ped Bike Factor					
Frt					
Flt Protected					
Satd. Flow (prot)					
Flt Permitted					
Satd. Flow (perm)					
Right Turn on Red					
Satd. Flow (RTOR)					
Link Speed (mph)					
Link Distance (ft)					
Travel Time (s)					
Confl. Peds. (#/hr)					
Confl. Bikes (#/hr)					
Peak Hour Factor					
Heavy Vehicles (%)					
Bus Blockages (#/hr)					
Adj. Flow (vph)					
Shared Lane Traffic (%)					
Lane Group Flow (vph)					
Turn Type					
Protected Phases	1	3	5	7	8
Permitted Phases					
Minimum Split (s)	40.0	14.0	40.0	48.0	14.0
Total Split (s)	40.0	14.0	40.0	50.0	14.0
Total Split (%)	44%	16%	44%	56%	16%
Yellow Time (s)	3.6	2.0	3.6	3.6	3.6
All-Red Time (s)	6.4	0.0	6.4	2.4	2.4
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag		Lag			Lag
Lead-Lag Optimize?		Yes			
Act Effct Green (s)					
Actuated g/C Ratio					
v/c Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					

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Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

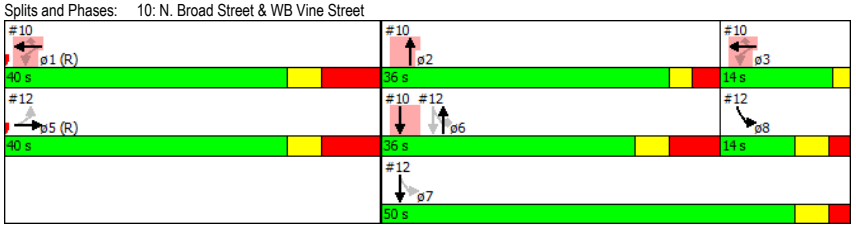
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)				84	244	98		49			79	
Queue Length 95th (ft)				143	306	163		m59			96	
Internal Link Dist (ft)		400			525			90			480	
Turn Bay Length (ft)												
Base Capacity (vph)				855	1655	685		1593			1606	
Starvation Cap Reductn				0	0	0		473			0	
Spillback Cap Reductn				0	0	0		0			47	
Storage Cap Reductn				0	0	0		0			0	
Reduced v/c Ratio				0.21	0.56	0.30		0.74			0.53	

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 100	
Control Type: Pretimed	
Maximum v/c Ratio: 1.32	
Intersection Signal Delay: 19.3	Intersection LOS: B
Intersection Capacity Utilization 92.5%	ICU Level of Service F
Analysis Period (min) 15	

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

! Phase conflict between lane groups.

Splits and Phases: 10: N. Broad Street & WB Vine Street



Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø7	ø8
Queue Length 50th (ft)					
Queue Length 95th (ft)					
Internal Link Dist (ft)					
Turn Bay Length (ft)					
Base Capacity (vph)					
Starvation Cap Reductn					
Spillback Cap Reductn					
Storage Cap Reductn					
Reduced v/c Ratio					

Intersection Summary

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP

Timing Plan: Friday PM Peak
Synchro 8 Report

Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1380	349	0	0	0	0	0	0	554	777	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		2%			0%			0%			4%	
Lane Util. Factor	1.00	0.86	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00
Ped Bike Factor			0.97							0.68		
Frt			0.850									
Flt Protected										0.950		
Satd. Flow (prot)	0	6310	2692	0	0	0	0	0	0	1725	4746	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	6310	2620	0	0	0	0	0	0	1179	4746	0
Right Turn on Red			No			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)										24		
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		82			480			430			170	
Travel Time (s)		2.2			13.1			11.7			4.6	
Confl. Peds. (#/hr)	1		19	19		1	19		433	433		19
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	4%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Adj. Flow (vph)	0	1438	364	0	0	0	0	0	0	577	809	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1438	364	0	0	0	0	0	0	577	809	0
Turn Type		NA	Perm							pm+pt	NA	
Protected Phases		5								7	6	
Permitted Phases			5							6		
Minimum Split (s)		41.0	41.0							15.0	34.0	
Total Split (s)		41.0	41.0							15.0	34.0	
Total Split (%)		45.6%	45.6%							16.7%	37.8%	
Yellow Time (s)		3.5	3.5							3.0	3.5	
All-Red Time (s)		1.5	1.5							2.0	0.0	
Lost Time Adjust (s)		0.0	0.0							0.0	0.0	
Total Lost Time (s)		5.0	5.0							5.0	3.5	
Lead/Lag		Lead	Lead								Lag	
Lead-Lag Optimize?												
Act Effct Green (s)		36.0	36.0							39.0	30.5	
Actuated g/C Ratio		0.40	0.40							0.43	0.34	
v/c Ratio		0.57	0.35							0.99	0.50	
Control Delay		17.1	20.0							33.4	12.1	
Queue Delay		0.0	0.0							37.1	2.8	
Total Delay		17.1	20.0							70.5	14.9	
LOS		B	C							E	B	
Approach Delay		17.7									38.0	
Approach LOS		B									D	
Queue Length 50th (ft)		132	80							134	41	
Queue Length 95th (ft)		208	120							m#184	m59	
Internal Link Dist (ft)		2			400			350			90	
Turn Bay Length (ft)												

Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	3
Permitted Phases			
Minimum Split (s)	41.0	39.0	10.0
Total Split (s)	41.0	39.0	10.0
Total Split (%)	46%	43%	11%
Yellow Time (s)	3.5	3.5	3.0
All-Red Time (s)	1.5	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 Report

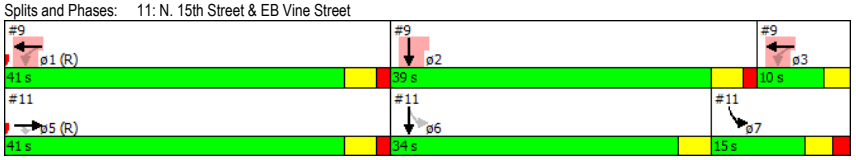
Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)		2524	1048							585	1608	
Starvation Cap Reductn		0	0							69	659	
Spillback Cap Reductn		0	0							0	0	
Storage Cap Reductn		0	0							0	0	
Reduced v/c Ratio		0.57	0.35							1.12	0.85	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green
Natural Cycle: 90
Control Type: Pretimed
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 26.5 Intersection LOS: C
Intersection Capacity Utilization 69.2% ICU Level of Service C
Analysis Period (min) 15
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.

Splits and Phases: 11: N. 15th Street & EB Vine Street



Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 Report

Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	198	1608	64	0	0	0	0	597	426	225	670	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	10	12	12	10	12
Grade (%)		2%			0%			2%			2%	
Storage Length (ft)	0		250	0		0	0		0	45		0
Storage Lanes	0		1	0		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.81	0.81	0.81	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.91	1.00
Ped Bike Factor		0.99							0.79	0.96		
Frt		0.995							0.850			
Flt Protected		0.995								0.950		
Satd. Flow (prot)	0	7312	0	0	0	0	0	3028	1473	1743	4674	0
Flt Permitted		0.995								0.340		
Satd. Flow (perm)	0	7308	0	0	0	0	0	3028	1167	596	4674	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		480			163			430			170	
Travel Time (s)		13.1			4.4			11.7			4.6	
Confl. Peds. (#/hr)	6		131	131		6	611		191	191		611
Confl. Bikes (#/hr)			7						16			20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	3%	2%	2%	2%	2%	3%	8%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	30	0	0	0	0
Adj. Flow (vph)	215	1748	70	0	0	0	0	649	463	245	728	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2033	0	0	0	0	0	649	463	245	728	0
Turn Type	Perm	NA						NA	Perm	custom	NA	
Protected Phases		5						6		8	7	
Permitted Phases	5								6	6 7	6 7	
Minimum Split (s)	40.0	40.0						34.0	34.0	14.0	48.0	
Total Split (s)	40.0	40.0						36.0	36.0	14.0	50.0	
Total Split (%)	44.4%	44.4%						40.0%	40.0%	15.6%	55.6%	
Yellow Time (s)	3.6	3.6						3.6	3.6	3.6	3.6	
All-Red Time (s)	6.4	6.4						5.4	5.4	2.4	2.4	
Lost Time Adjust (s)		0.0						0.0	0.0	0.0	0.0	
Total Lost Time (s)		10.0						9.0	9.0	6.0	6.0	
Lead/Lag								Lead	Lead	Lag		
Lead-Lag Optimize?												
Act Effct Green (s)		30.0						27.0	27.0	44.0	44.0	
Actuated g/C Ratio		0.33						0.30	0.30	0.49	0.49	
v/c Ratio		0.83						0.71	1.32	0.62	0.32	
Control Delay		20.8						33.3	193.4	20.1	5.5	
Queue Delay		0.0						0.0	0.0	61.7	0.4	
Total Delay		20.8						33.3	193.4	81.8	5.9	
LOS		C						C	F	F	A	
Approach Delay		20.8						100.0			25.0	
Approach LOS		C						F			C	

Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Bus Blockages (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	3
Permitted Phases			
Minimum Split (s)	40.0	34.0	14.0
Total Split (s)	40.0	36.0	14.0
Total Split (%)	44%	40%	16%
Yellow Time (s)	3.6	2.4	2.0
All-Red Time (s)	6.4	3.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag		Lead	Lag
Lead-Lag Optimize?			Yes
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 Report

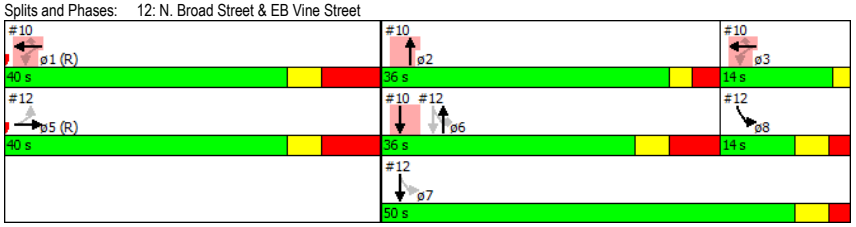
Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		149						172	~344	45	27	
Queue Length 95th (ft)		m178						235	#529	119	40	
Internal Link Dist (ft)		400			83			350			90	
Turn Bay Length (ft)										45		
Base Capacity (vph)		2436						908	350	393	2285	
Starvation Cap Reductn		0						0	0	173	951	
Spillback Cap Reductn		0						0	0	0	0	
Storage Cap Reductn		0						0	0	0	0	
Reduced v/c Ratio		0.83						0.71	1.32	1.11	0.55	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green
Natural Cycle: 100
Control Type: Pretimed
Maximum v/c Ratio: 1.32
Intersection Signal Delay: 43.2 Intersection LOS: D
Intersection Capacity Utilization 92.5% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
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.

Splits and Phases: 12: N. Broad Street & EB Vine Street



Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 Report

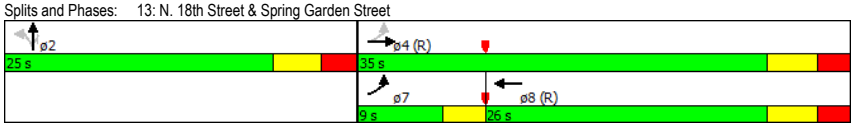
Timings
13: N. 18th Street & Spring Garden Street

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	65	627	879	207	175
Lane Group Flow (vph)	68	660	1012	400	184
Turn Type	pm+pt	NA	NA	NA	Perm
Protected Phases	7	4	8	2	
Permitted Phases	4				2
Minimum Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?					
v/c Ratio	0.23	0.42	0.96	0.90	0.37
Control Delay	8.9	11.1	38.0	47.3	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	8.9	11.1	38.0	47.3	9.8
Queue Length 50th (ft)	11	75	217	136	19
Queue Length 95th (ft)	26	112	#315	#286	62
Internal Link Dist (ft)		476	350	810	
Turn Bay Length (ft)	145				150
Base Capacity (vph)	292	1562	1057	444	491
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	0.23	0.42	0.96	0.90	0.37

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 65
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 13: N. 18th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
13: N. 18th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	65	627	0	0	879	83	173	207	175	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.98		1.00	1.00		0.83	1.00		0.91			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln	185.3	185.3	0.0	0.0	185.3	189.0	189.0	177.1	177.9			
Lanes	1	2	0	0	2	0	0	1	1			
Cap, veh/h	345	1791	0	0	1090	103	306	239	435			
Arrive On Green	0.10	0.48	0.00	0.00	0.44	0.44	0.32	0.32	0.32			
Sat Flow, veh/h	1765	3706	0	0	3270	308	967	756	1375			
Grp Volume(v), veh/h	68	660	0	0	524	488	324	76	184			
Grp Sat Flow(s),veh/h/ln	1765	1853	0	0	1853	1725	1723	1771	1375			
Q Serve(g_s), s	1.3	6.7	0.0	0.0	15.1	15.1	9.5	0.0	6.3			
Cycle Q Clear(g_c), s	1.3	6.7	0.0	0.0	15.1	15.1	9.5	0.0	6.3			
Prop In Lane	1.00		0.00	0.00		0.18	0.56		1.00			
Lane Grp Cap(c), veh/h	345	1791	0	0	618	575	545	0	435			
V/C Ratio(X)	0.20	0.37	0.00	0.00	0.85	0.85	0.59	0.00	0.42			
Avail Cap(c_a), veh/h	345	1791	0	0	618	575	545	0	435			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	11.6	9.7	0.0	0.0	15.3	15.3	17.3	0.0	16.2			
Incr Delay (d2), s/veh	1.3	0.6	0.0	0.0	13.6	14.5	4.7	0.0	3.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln	1.0	4.5	0.0	0.0	10.7	10.2	6.6	0.0	4.0			
Lane Grp Delay (d), s/veh	12.9	10.3	0.0	0.0	29.0	29.8	22.0	0.0	19.2			
Lane Grp LOS	B	B			C	C	C		B			
Approach Vol, veh/h		728			1012			584				
Approach Delay, s/veh		10.6			29.4			18.2				
Approach LOS		B			C			B				

Timer

Assigned Phs	7	4			8			2	
Phs Duration (G+Y+Rc), s	9.0	35.0			26.0			25.0	
Change Period (Y+Rc), s	3.0	6.0			6.0			6.0	
Max Green Setting (Gmax), s	6.0	29.0			20.0			19.0	
Max Q Clear Time (g_c+I1), s	0.0	0.0			0.0			0.0	
Green Ext Time (p_c), s	0.0	0.0			0.0			0.0	

Intersection Summary

HCM 2010 Ctrl Delay			20.7
HCM 2010 LOS			C

Notes

Timings
14: N. Broad Street & Spring Garden Street

Lane Group	EBT	WBT	NBT	SBL	SBT	SBR
Lane Configurations						
Volume (vph)	841	772	798	140	839	110
Lane Group Flow (vph)	912	871	864	143	856	112
Turn Type	NA	NA	NA	pm+pt	NA	Perm
Protected Phases	4	8	2	1	6	
Permitted Phases				6		6
Minimum Split (s)	33.0	33.0	35.0	9.0	35.0	35.0
Total Split (s)	40.0	40.0	41.0	9.0	50.0	50.0
Total Split (%)	44.4%	44.4%	45.6%	10.0%	55.6%	55.6%
Yellow Time (s)	3.6	3.6	3.4	3.0	3.4	3.4
All-Red Time (s)	2.4	2.4	2.6	0.0	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	3.0	6.0	6.0
Lead/Lag			Lag	Lead		
Lead-Lag Optimize?						
v/c Ratio	0.76	0.73	0.46	0.48	0.52	0.20
Control Delay	29.6	28.5	23.7	17.2	17.1	14.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.6	28.5	23.7	17.2	17.1	14.2
Queue Length 50th (ft)	234	220	96	40	167	34
Queue Length 95th (ft)	309	292	143	72	220	67
Internal Link Dist (ft)	400	550	990		290	
Turn Bay Length (ft)				170		
Base Capacity (vph)	1196	1191	1877	296	1655	573
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	0.73	0.46	0.48	0.52	0.20

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Pretimed

Splits and Phases: 14: N. Broad Street & Spring Garden Street

HCM 2010 Signalized Intersection Summary
14: N. Broad Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	841	53	0	772	81	0	798	49	140	839	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.84	1.00		0.91	1.00		0.89	0.98		0.82
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.3	189.0	0.0	185.3	189.0	0.0	185.3	189.0	186.2	184.4	186.2
Lanes	0	2	0	0	2	0	0	3	0	1	2	1
Cap, veh/h	0	1286	81	0	1232	130	0	2000	122	374	1803	636
Arrive On Green	0.00	0.38	0.38	0.00	0.38	0.38	0.00	0.26	0.26	0.07	0.49	0.49
Sat Flow, veh/h	0	3404	214	0	3261	343	0	5142	314	1774	3688	1301
Grp Volume(v), veh/h	0	467	445	0	448	423	0	585	279	143	856	112
Grp Sat Flow(s),veh/h/ln	0	1853	1765	0	1853	1751	0	1853	1750	1774	1844	1301
Q Serve(g_s), s	0.0	18.9	18.9	0.0	17.8	17.9	0.0	11.8	11.9	4.1	13.9	4.3
Cycle Q Clear(g_c), s	0.0	18.9	18.9	0.0	17.8	17.9	0.0	11.8	11.9	4.1	13.9	4.3
Prop In Lane	0.00		0.12	0.00		0.20	0.00		0.18	1.00		1.00
Lane Grp Cap(c), veh/h	0	700	667	0	700	662	0	1441	680	374	1803	636
V/C Ratio(X)	0.00	0.67	0.67	0.00	0.64	0.64	0.00	0.41	0.41	0.38	0.47	0.18
Avail Cap(c_a), veh/h	0	700	667	0	700	662	0	1441	680	374	1803	636
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	23.3	23.3	0.0	23.0	23.0	0.0	24.7	24.7	14.7	15.3	12.9
Incr Delay (d2), s/veh	0.0	5.0	5.2	0.0	4.4	4.7	0.0	0.9	1.8	3.0	0.9	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	12.6	12.1	0.0	11.9	11.4	0.0	8.2	8.2	3.4	8.8	2.5
Lane Grp Delay (d), s/veh	0.0	28.3	28.5	0.0	27.4	27.7	0.0	25.5	26.5	17.7	16.2	13.5
Lane Grp LOS		C	C		C	C		C	C	B	B	B
Approach Vol, veh/h		912			871			864			1111	
Approach Delay, s/veh		28.4			27.5			25.9			16.1	
Approach LOS		C			C			C			B	

Timer

Assigned Phs		4			8			2		1	6	
Phs Duration (G+Y+Rc), s		40.0			40.0			41.0		9.0	50.0	
Change Period (Y+Rc), s		6.0			6.0			6.0		3.0	6.0	
Max Green Setting (Gmax), s		34.0			34.0			35.0		6.0	44.0	
Max Q Clear Time (g_c+I1), s		0.0			0.0			0.0		0.0	0.0	
Green Ext Time (p_c), s		0.0			0.0			0.0		0.0	0.0	

Intersection Summary

HCM 2010 Ctrl Delay		24.0	
HCM 2010 LOS		C	

Notes

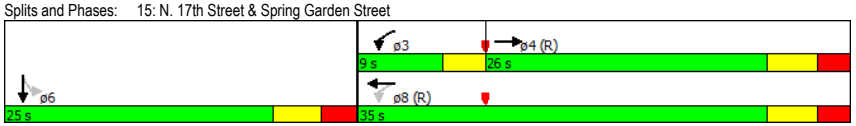
Timings
15: N. 17th Street & Spring Garden Street

Lane Group	EBT	WBL	WBT	SBT
Lane Configurations				
Volume (vph)	937	66	815	88
Lane Group Flow (vph)	1075	71	876	193
Turn Type	NA	pm+pt	NA	NA
Protected Phases	4	3	8	6
Permitted Phases		8		
Minimum Split (s)	26.0	9.0	35.0	25.0
Total Split (s)	26.0	9.0	35.0	25.0
Total Split (%)	43.3%	15.0%	58.3%	41.7%
Yellow Time (s)	3.6	3.0	3.6	3.4
All-Red Time (s)	2.4	0.0	2.4	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	3.0	6.0	6.0
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?				
v/c Ratio	1.02	0.24	0.56	0.39
Control Delay	48.8	12.1	15.9	15.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	48.8	12.1	15.9	15.5
Queue Length 50th (ft)	~210	12	120	42
Queue Length 95th (ft)	#338	m14	m134	91
Internal Link Dist (ft)	350		350	290
Turn Bay Length (ft)		165		
Base Capacity (vph)	1058	290	1562	491
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	1.02	0.24	0.56	0.39

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
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.

Splits and Phases: 15: N. 17th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
15: N. 17th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	937	62	66	815	0	0	0	0	36	88	55
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.78	0.98		1.00				1.00		0.91
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.3	189.0	185.3	185.3	0.0				189.0	184.4	189.0
Lanes	0	2	0	1	2	0				0	1	0
Cap, veh/h	0	1123	75	328	1791	0				168	141	267
Arrive On Green	0.00	0.44	0.44	0.20	0.97	0.00				0.32	0.32	0.32
Sat Flow, veh/h	0	3369	224	1765	3706	0				529	205	842
Grp Volume(v), veh/h	0	554	521	71	876	0				134	0	112
Grp Sat Flow(s),veh/h/ln	0	1853	1740	1765	1853	0				1818	0	1603
Q Serve(g_s), s	0.0	16.6	16.6	1.2	0.9	0.0				2.7	0.0	0.0
Cycle Q Clear(g_c), s	0.0	16.6	16.6	1.2	0.9	0.0				2.7	0.0	0.0
Prop In Lane	0.00		0.13	1.00		0.00				0.29		0.53
Lane Grp Cap(c), veh/h	0	618	580	328	1791	0				576	0	0
V/C Ratio(X)	0.00	0.90	0.90	0.22	0.49	0.00				0.23	0.00	0.00
Avail Cap(c_a), veh/h	0	618	580	328	1791	0				576	0	0
HCM Platoon Ratio	1.00	1.33	1.33	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	15.8	15.8	10.8	0.5	0.0				11.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	18.2	19.2	1.5	1.0	0.0				0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	12.2	11.8	1.0	0.8	0.0				2.2	0.0	0.0
Lane Grp Delay (d), s/veh	0.0	34.0	35.0	12.3	1.5	0.0				12.8	0.0	0.0
Lane Grp LOS		C	C	B	A					B		
Approach Vol, veh/h		1075			947						246	
Approach Delay, s/veh		34.5			2.3						7.0	
Approach LOS		C			A						A	

Timer

Assigned Phs		4		3	8						6	
Phs Duration (G+Y+Rc), s		26.0		9.0	35.0						25.0	
Change Period (Y+Rc), s		6.0		3.0	6.0						6.0	
Max Green Setting (Gmax), s		20.0		6.0	29.0						19.0	
Max Q Clear Time (g_c+I1), s		0.0		0.0	0.0						0.0	
Green Ext Time (p_c), s		0.0		0.0	0.0						0.0	

Intersection Summary

HCM 2010 Ctrl Delay			18.1									
HCM 2010 LOS			B									

Notes

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	192	581	76	0	0	0	0	405	52
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					0.99						1.00	
Frt					0.987						0.985	
Flt Protected					0.989							
Satd. Flow (prot)	0	0	0	0	3243	0	0	0	0	0	1635	0
Flt Permitted					0.989							
Satd. Flow (perm)	0	0	0	0	3243	0	0	0	0	0	1635	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					80						8	
Link Speed (mph)		30			25			30			25	
Link Distance (ft)		975			430			170			647	
Travel Time (s)		22.2			11.7			3.9			17.6	
Confl. Peds. (#/hr)	49		1	1		49	33		142	142		33
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Parking (#/hr)					0						0	
Adj. Flow (vph)	0	0	0	204	618	81	0	0	0	0	431	55
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	903	0	0	0	0	0	486	0
Turn Type				custom	NA						NA	
Protected Phases					1 3						2	
Permitted Phases				1								
Minimum Split (s)				46.0							35.0	
Total Split (s)				46.0							35.0	
Total Split (%)				51.1%							38.9%	
Yellow Time (s)				3.5							3.5	
All-Red Time (s)				1.8							1.5	
Lost Time Adjust (s)											0.0	
Total Lost Time (s)											5.0	
Lead/Lag				Lead							Lag	
Lead-Lag Optimize?												
Act Effct Green (s)					49.7						30.0	
Actuated g/C Ratio					0.55						0.33	
v/c Ratio					0.49						0.88	
Control Delay					4.6						47.8	
Queue Delay					0.0						5.8	
Total Delay					4.6						53.6	
LOS					A						D	
Approach Delay					4.6						53.6	
Approach LOS					A						D	
Queue Length 50th (ft)					34						255	
Queue Length 95th (ft)					74						#440	
Internal Link Dist (ft)		895			350			90			567	
Turn Bay Length (ft)												
Base Capacity (vph)					1826						550	
Starvation Cap Reductn					27						0	
Spillback Cap Reductn					27						37	

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	ø3	ø5	ø6
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	5	6
Permitted Phases			
Minimum Split (s)	9.0	49.5	40.5
Total Split (s)	9.0	49.5	40.5
Total Split (%)	10%	55%	45%
Yellow Time (s)	2.0	3.5	3.5
All-Red Time (s)	0.0	1.8	2.5
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag		Lead	Lag
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 Report

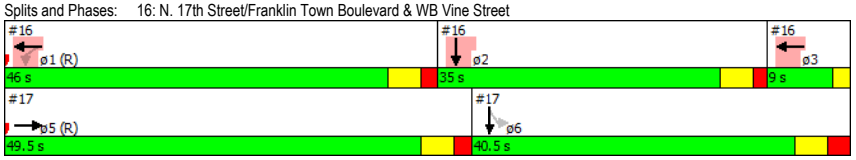
Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.50						0.95	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 21.8	Intersection LOS: C
Intersection Capacity Utilization 67.5%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 16: N. 17th Street/Franklin Town Boulevard & WB Vine Street



Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	ø3	ø5	ø6
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 Report

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	520	49	0	0	0	0	0	0	205	461	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor		1.00									0.95	
Frt		0.987										
Flt Protected											0.985	
Satd. Flow (prot)	0	3291	0	0	0	0	0	0	0	0	3468	0
Flt Permitted											0.985	
Satd. Flow (perm)	0	3291	0	0	0	0	0	0	0	0	3289	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)		16									92	
Link Speed (mph)		30			25			30			30	
Link Distance (ft)		975			430			430			170	
Travel Time (s)		22.2			11.7			9.8			3.9	
Confl. Peds. (#/hr)	2		32	32		2	46		155	155		46
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Parking (#/hr)		0										
Adj. Flow (vph)	0	547	52	0	0	0	0	0	0	216	485	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	599	0	0	0	0	0	0	0	0	701	0
Turn Type		NA								Perm	NA	
Protected Phases		5									6	
Permitted Phases										6		
Minimum Split (s)		49.5								40.5	40.5	
Total Split (s)		49.5								40.5	40.5	
Total Split (%)		55.0%								45.0%	45.0%	
Yellow Time (s)		3.5								3.5	3.5	
All-Red Time (s)		1.8								2.5	2.5	
Lost Time Adjust (s)		0.0									0.0	
Total Lost Time (s)		5.3									6.0	
Lead/Lag		Lead								Lag	Lag	
Lead-Lag Optimize?												
Act Effct Green (s)		44.2									34.5	
Actuated g/C Ratio		0.49									0.38	
v/c Ratio		0.37									0.53	
Control Delay		14.6									9.9	
Queue Delay		0.0									17.1	
Total Delay		14.6									27.0	
LOS		B									C	
Approach Delay		14.6									27.0	
Approach LOS		B									C	
Queue Length 50th (ft)		103									57	
Queue Length 95th (ft)		142									m75	
Internal Link Dist (ft)		895			350			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		1624									1317	
Starvation Cap Reductn		0									613	
Spillback Cap Reductn		0									0	

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	3
Permitted Phases			
Minimum Split (s)	46.0	35.0	9.0
Total Split (s)	46.0	35.0	9.0
Total Split (%)	51%	39%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	1.8	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 Report

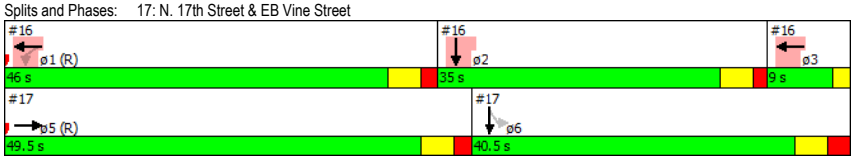
Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.37									1.00	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 21.3	Intersection LOS: C
Intersection Capacity Utilization 73.8%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 17: N. 17th Street & EB Vine Street



Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

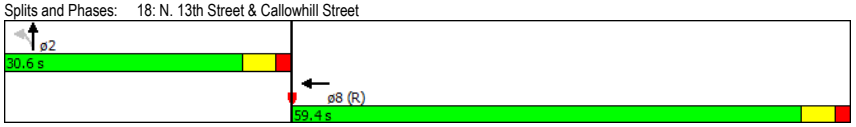
Timings
18: N. 13th Street & Callowhill Street

Lane Group	WBT	NBT
Lane Configurations		
Volume (vph)	307	239
Lane Group Flow (vph)	408	313
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Minimum Split (s)	59.4	30.6
Total Split (s)	59.4	30.6
Total Split (%)	66.0%	34.0%
Yellow Time (s)	3.6	3.6
All-Red Time (s)	1.8	1.8
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.4	5.4
Lead/Lag		
Lead-Lag Optimize?		
v/c Ratio	0.23	0.70
Control Delay	7.7	26.8
Queue Delay	0.0	0.0
Total Delay	7.7	26.8
Queue Length 50th (ft)	45	67
Queue Length 95th (ft)	67	#150
Internal Link Dist (ft)	195	480
Turn Bay Length (ft)		
Base Capacity (vph)	1813	446
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.23	0.70

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 90
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 18: N. 13th Street & Callowhill Street



HCM 2010 Signalized Intersection Summary
18: N. 13th Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	307	60	42	239	0	0	0	0
Number				3	8	18	5	2	12			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.90	1.00		1.00			
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln				0.0	185.3	189.0	189.0	184.8	0.0			
Lanes				0	2	0	0	1	0			
Cap, veh/h				0	1775	342	77	436	0			
Arrive On Green				0.00	0.60	0.60	0.28	0.28	0.00			
Sat Flow, veh/h				0	2959	570	275	1558	0			
Grp Volume(v), veh/h				0	211	197	313	0	0			
Grp Sat Flow(s),veh/h/ln				0	1853	1676	1834	1848	0			
Q Serve(g_s), s				0.0	4.6	4.8	13.3	0.0	0.0			
Cycle Q Clear(g_c), s				0.0	4.6	4.8	13.3	0.0	0.0			
Prop In Lane				0.00		0.34	0.15		0.00			
Lane Grp Cap(c), veh/h				0	1112	1005	513	0	0			
V/C Ratio(X)				0.00	0.19	0.20	0.61	0.00	0.00			
Avail Cap(c_a), veh/h				0	1112	1005	513	0	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	8.1	8.2	28.1	0.0	0.0			
Incr Delay (d2), s/veh				0.0	0.4	0.4	5.3	0.0	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln				0.0	3.5	3.3	9.5	0.0	0.0			
Lane Grp Delay (d), s/veh				0.0	8.5	8.6	33.4	0.0	0.0			
Lane Grp LOS					A	A	C					
Approach Vol, veh/h					408			313				
Approach Delay, s/veh					8.5			33.4				
Approach LOS					A			C				

Timer

Assigned Phs	8	2
Phs Duration (G+Y+Rc), s	59.4	30.6
Change Period (Y+Rc), s	5.4	5.4
Max Green Setting (Gmax), s	54.0	25.2
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	19.4
HCM 2010 LOS	B

Notes

Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	1057	80	119	255	0	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	11	12	11	10	12	12	10	12
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					0.99		0.96					
Frt					0.989							
Flt Protected							0.950					
Satd. Flow (prot)	0	0	0	0	4651	0	1702	1729	0	0	0	0
Flt Permitted							0.950					
Satd. Flow (perm)	0	0	0	0	4651	0	1631	1729	0	0	0	0
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Satd. Flow (RTOR)					19		49					
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		605			275			170			560	
Travel Time (s)		16.5			6.3			3.9			12.7	
Confl. Peds. (#/hr)	54		5	5		54	51		81	81		51
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Parking (#/hr)					0							
Adj. Flow (vph)	0	0	0	0	1162	88	131	280	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1250	0	131	280	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					1			2				
Permitted Phases							2					
Minimum Split (s)					51.0		39.0	39.0				
Total Split (s)					51.0		39.0	39.0				
Total Split (%)					56.7%		43.3%	43.3%				
Yellow Time (s)					3.7		3.5	3.5				
All-Red Time (s)					1.8		2.5	2.5				
Lost Time Adjust (s)					0.0		0.0	0.0				
Total Lost Time (s)					5.5		6.0	6.0				
Lead/Lag					Lead		Lag	Lag				
Lead-Lag Optimize?					Yes		Yes	Yes				
Act Effct Green (s)					45.5		33.0	33.0				
Actuated g/C Ratio					0.51		0.37	0.37				
v/c Ratio					0.53		0.21	0.44				
Control Delay					15.8		3.0	10.9				
Queue Delay					0.0		1.4	2.3				
Total Delay					15.8		4.3	13.2				
LOS					B		A	B				
Approach Delay					15.8			10.3				
Approach LOS					B			B				
Queue Length 50th (ft)					164		2	41				
Queue Length 95th (ft)					204		m14	61				
Internal Link Dist (ft)		525			195			90			480	
Turn Bay Length (ft)												
Base Capacity (vph)					2360		629	633				
Starvation Cap Reductn					0		343	230				

Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	7
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	2.0	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
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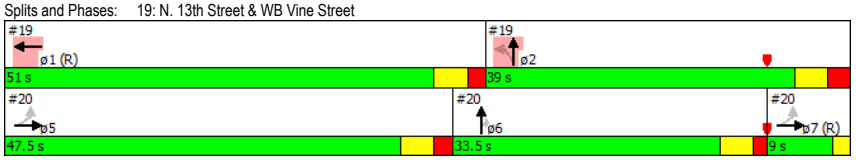
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.53		0.46	0.69				

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 7:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 14.4	Intersection LOS: B
Intersection Capacity Utilization 110.0%	ICU Level of Service H
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 19: N. 13th Street & WB Vine Street



Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday PM Peak
Synchro 8 Report

Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	74	619	0	0	0	0	0	267	102	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	11	9	12	12	12
Lane Util. Factor	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.92			
Frt									0.850			
Flt Protected		0.995										
Satd. Flow (prot)	0	5033	0	0	0	0	0	1612	1417	0	0	0
Flt Permitted		0.995										
Satd. Flow (perm)	0	5033	0	0	0	0	0	1612	1302	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		38							116			
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		442			275			430			170	
Travel Time (s)		12.1			6.3			9.8			3.9	
Confl. Peds. (#/hr)	2		45	45		2	111		75	75		111
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Parking (#/hr)								0				
Adj. Flow (vph)	84	703	0	0	0	0	0	303	116	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	787	0	0	0	0	0	303	116	0	0	0
Turn Type	Perm	NA						NA	Perm			
Protected Phases		5 7						6				
Permitted Phases	5 7								6			
Minimum Split (s)								33.5	33.5			
Total Split (s)								33.5	33.5			
Total Split (%)								37.2%	37.2%			
Yellow Time (s)								3.5	3.5			
All-Red Time (s)								1.5	1.5			
Lost Time Adjust (s)								0.0	0.0			
Total Lost Time (s)								5.0	5.0			
Lead/Lag								Lag	Lag			
Lead-Lag Optimize?								Yes	Yes			
Act Effct Green (s)		51.0						28.5	28.5			
Actuated g/C Ratio		0.57						0.32	0.32			
v/c Ratio		0.27						0.59	0.24			
Control Delay		5.6						31.6	5.9			
Queue Delay		0.0						0.2	0.0			
Total Delay		5.6						31.9	5.9			
LOS		A						C	A			
Approach Delay		5.6						24.7				
Approach LOS		A						C				
Queue Length 50th (ft)		46						144	0			
Queue Length 95th (ft)		m47						223	35			
Internal Link Dist (ft)		362			195			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		2868						510	491			
Starvation Cap Reductn		0						0	0			

Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Lane Configurations				
Volume (vph)				
Ideal Flow (vphpl)				
Lane Width (ft)				
Lane Util. Factor				
Ped Bike Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Confl. Peds. (#/hr)				
Peak Hour Factor				
Parking (#/hr)				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	2	5	7
Permitted Phases				
Minimum Split (s)	51.0	39.0	47.5	9.0
Total Split (s)	51.0	39.0	47.5	9.0
Total Split (%)	57%	43%	53%	10%
Yellow Time (s)	3.7	3.5	3.5	2.0
All-Red Time (s)	1.8	2.5	2.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				

Projected (Build) Conditions - Recommended Improvements
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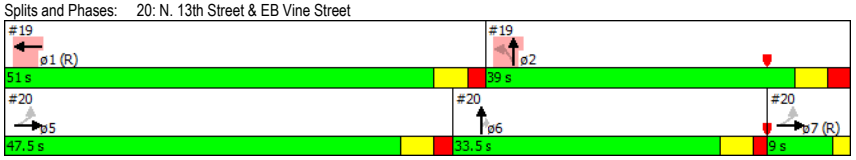
Synchro 8 Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0						21	0			
Storage Cap Reductn		0						0	0			
Reduced v/c Ratio		0.27						0.62	0.24			

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 7:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 12.2	Intersection LOS: B
Intersection Capacity Utilization 103.5%	ICU Level of Service G
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 20: N. 13th Street & EB Vine Street



Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
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Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	49	709	0	0	0	0	0	778	440	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.97			
Frt									0.850			
Flt Protected		0.997										
Satd. Flow (prot)	0	3510	0	0	0	0	0	5009	1560	0	0	0
Flt Permitted		0.997										
Satd. Flow (perm)	0	3510	0	0	0	0	0	5009	1516	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24							192			
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		430			378			430			170	
Travel Time (s)		11.7			10.3			11.7			4.6	
Confl. Peds. (#/hr)	1		8	8		1	493		10	10		493
Confl. Bikes (#/hr)									10			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	3%	2%	2%	2%
Adj. Flow (vph)	51	739	0	0	0	0	0	810	458	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	790	0	0	0	0	0	810	458	0	0	0
Turn Type	Perm	NA						NA	Perm			
Protected Phases		5 7						6				
Permitted Phases	5 7								6			
Minimum Split (s)								33.5	33.5			
Total Split (s)								33.5	33.5			
Total Split (%)								37.2%	37.2%			
Yellow Time (s)								3.5	3.5			
All-Red Time (s)								1.5	1.5			
Lost Time Adjust (s)								0.0	0.0			
Total Lost Time (s)								5.0	5.0			
Lead/Lag								Lag	Lag			
Lead-Lag Optimize?												
Act Effct Green (s)		51.2						28.5	28.5			
Actuated g/C Ratio		0.57						0.32	0.32			
v/c Ratio		0.39						0.51	0.75			
Control Delay		7.8						26.4	24.6			
Queue Delay		0.0						0.0	0.0			
Total Delay		7.8						26.4	24.6			
LOS		A						C	C			
Approach Delay		7.8						25.8				
Approach LOS		A						C				
Queue Length 50th (ft)		84						136	135			
Queue Length 95th (ft)		104						175	#261			
Internal Link Dist (ft)		350			298			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		2007						1586	611			
Starvation Cap Reductn		0						0	0			

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Lane Configurations				
Volume (vph)				
Ideal Flow (vphpl)				
Lane Util. Factor				
Ped Bike Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Confl. Peds. (#/hr)				
Confl. Bikes (#/hr)				
Peak Hour Factor				
Heavy Vehicles (%)				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	2	5	7
Permitted Phases				
Minimum Split (s)	51.0	39.0	47.5	9.0
Total Split (s)	51.0	39.0	47.5	9.0
Total Split (%)	57%	43%	53%	10%
Yellow Time (s)	3.5	3.5	3.5	2.0
All-Red Time (s)	1.8	2.5	1.8	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lead	
Lead-Lag Optimize?				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
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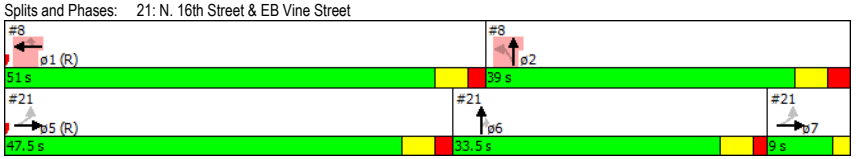
Synchro 8 Report

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0						0	0			
Storage Cap Reductn		0						0	0			
Reduced v/c Ratio		0.39						0.51	0.75			

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 18.9	Intersection LOS: B
Intersection Capacity Utilization 72.2%	ICU Level of Service C
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 21: N. 16th Street & EB Vine Street



Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

FRIDAY EVENING (7-10 PM)
PEAK HOUR TIME PERIOD

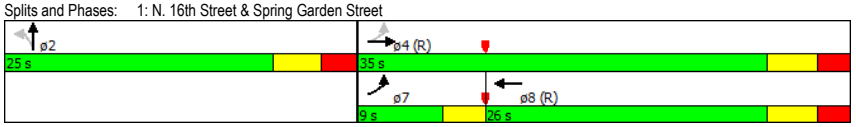
Timings
1: N. 16th Street & Spring Garden Street

Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Volume (vph)	64	468	421	250
Lane Group Flow (vph)	67	493	505	476
Turn Type	pm+pt	NA	NA	NA
Protected Phases	7	4	8	2
Permitted Phases	4			
Minimum Split (s)	9.0	35.0	26.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?				
v/c Ratio	0.17	0.32	0.49	0.49
Control Delay	6.5	10.3	27.9	15.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.5	10.3	27.9	15.1
Queue Length 50th (ft)	6	34	92	83
Queue Length 95th (ft)	m17	79	134	128
Internal Link Dist (ft)		350	380	990
Turn Bay Length (ft)	140			
Base Capacity (vph)	403	1550	1031	962
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	0.17	0.32	0.49	0.49

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: N. 16th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
1: N. 16th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	64	468	0	0	421	59	90	250	112	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.99		1.00	1.00		0.94	1.00		0.83			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln	185.3	185.3	0.0	0.0	183.4	187.1	186.2	180.2	186.2			
Lanes	1	2	0	0	2	0	0	2	0			
Cap, veh/h	476	1791	0	0	991	137	200	563	261			
Arrive On Green	0.20	0.97	0.00	0.00	0.11	0.11	0.32	0.32	0.32			
Sat Flow, veh/h	1765	3706	0	0	2972	412	632	1779	824			
Grp Volume(v), veh/h	67	493	0	0	272	233	266	0	210			
Grp Sat Flow(s),veh/h/ln	1765	1853	0	0	1834	1549	1771	0	1463			
Q Serve(g_s), s	1.2	0.4	0.0	0.0	8.3	8.5	7.3	0.0	6.9			
Cycle Q Clear(g_c), s	1.2	0.4	0.0	0.0	8.3	8.5	7.3	0.0	6.9			
Prop In Lane	1.00		0.00	0.00		0.27	0.36		0.56			
Lane Grp Cap(c), veh/h	476	1791	0	0	611	516	561	0	463			
V/C Ratio(X)	0.14	0.28	0.00	0.00	0.44	0.45	0.48	0.00	0.45			
Avail Cap(c_a), veh/h	476	1791	0	0	611	516	561	0	463			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	8.7	0.5	0.0	0.0	21.5	21.6	16.5	0.0	16.4			
Incr Delay (d2), s/veh	0.6	0.4	0.0	0.0	2.3	2.8	2.9	0.0	3.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln	0.9	0.4	0.0	0.0	6.6	5.9	5.3	0.0	4.4			
Lane Grp Delay (d), s/veh	9.3	0.9	0.0	0.0	23.8	24.4	19.4	0.0	19.5			
Lane Grp LOS	A	A			C	C	B		B			
Approach Vol, veh/h		560			505			476				
Approach Delay, s/veh		1.9			24.1			19.4				
Approach LOS		A			C			B				

Timer

Assigned Phs	7	4			8			2				
Phs Duration (G+Y+Rc), s	9.0	35.0			26.0			25.0				
Change Period (Y+Rc), s	3.0	6.0			6.0			6.0				
Max Green Setting (Gmax), s	6.0	29.0			20.0			19.0				
Max Q Clear Time (g_c+I1), s	0.0	0.0			0.0			0.0				
Green Ext Time (p_c), s	0.0	0.0			0.0			0.0				

Intersection Summary

HCM 2010 Ctrl Delay			14.6									
HCM 2010 LOS			B									

Notes

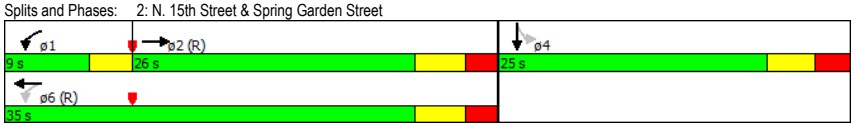
Timings
2: N. 15th Street & Spring Garden Street

Lane Group	EBT	WBL	WBT	SBL	SBT
Lane Configurations					
Volume (vph)	517	78	447	41	155
Lane Group Flow (vph)	634	87	497	46	262
Turn Type	NA	pm+pt	NA	Perm	NA
Protected Phases	2	1	6		4
Permitted Phases		6		4	
Minimum Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (%)	43.3%	15.0%	58.3%	41.7%	41.7%
Yellow Time (s)	3.6	3.0	3.6	3.4	3.4
All-Red Time (s)	2.4	0.0	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	3.0	6.0	6.0	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?					
v/c Ratio	0.59	0.26	0.32	0.10	0.58
Control Delay	13.2	9.0	10.2	15.2	23.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.2	9.0	10.2	15.2	23.2
Queue Length 50th (ft)	65	14	53	12	78
Queue Length 95th (ft)	118	32	82	31	145
Internal Link Dist (ft)	380		400		290
Turn Bay Length (ft)		115		100	
Base Capacity (vph)	1080	336	1534	472	454
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	0.26	0.32	0.10	0.58

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 15 (25%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 2: N. 15th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
2: N. 15th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	517	54	78	447	0	0	0	0	41	155	81
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.87	0.96		1.00				1.00		0.93
Parking Bus Adj	1.00	1.00	0.90	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	183.7	189.0	183.4	183.4	0.0				177.9	185.3	189.0
Lanes	0	2	0	1	2	0				1	1	0
Cap, veh/h	0	1019	106	481	1773	0				536	353	185
Arrive On Green	0.00	0.67	0.67	0.10	0.48	0.00				0.32	0.32	0.32
Sat Flow, veh/h	0	3057	318	1747	3669	0				1694	1114	583
Grp Volume(v), veh/h	0	344	290	87	497	0				46	0	262
Grp Sat Flow(s),veh/h/ln	0	1837	1538	1747	1834	0				1694	1853	1697
Q Serve(g_s), s	0.0	6.0	6.1	1.7	4.9	0.0				1.1	0.0	7.5
Cycle Q Clear(g_c), s	0.0	6.0	6.1	1.7	4.9	0.0				1.1	0.0	7.5
Prop In Lane	0.00		0.21	1.00		0.00				1.00		0.34
Lane Grp Cap(c), veh/h	0	612	513	481	1773	0				536	0	537
V/C Ratio(X)	0.00	0.56	0.57	0.18	0.28	0.00				0.09	0.00	0.49
Avail Cap(c_a), veh/h	0	612	513	481	1773	0				536	0	537
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	7.7	7.7	9.6	9.3	0.0				14.4	0.0	16.6
Incr Delay (d2), s/veh	0.0	3.7	4.5	0.8	0.4	0.0				0.3	0.0	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	3.9	3.6	1.3	3.4	0.0				0.9	0.0	5.3
Lane Grp Delay (d), s/veh	0.0	11.4	12.2	10.4	9.7	0.0				14.7	0.0	19.7
Lane Grp LOS		B	B	B	A					B		B
Approach Vol, veh/h		634			584						308	
Approach Delay, s/veh		11.7			9.8						19.0	
Approach LOS		B			A						B	

Timer

Assigned Phs		2		1	6						4	
Phs Duration (G+Y+Rc), s		26.0		9.0	35.0						25.0	
Change Period (Y+Rc), s		6.0		3.0	6.0						6.0	
Max Green Setting (Gmax), s		20.0		6.0	29.0						19.0	
Max Q Clear Time (g_c+I1), s		0.0		0.0	0.0						0.0	
Green Ext Time (p_c), s		0.0		0.0	0.0						0.0	

Intersection Summary

HCM 2010 Ctrl Delay			12.4									
HCM 2010 LOS			B									

Notes

Lanes, Volumes, Timings
3: Franklin Town Boulevard & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	46	108	23	161	69	16	36	6	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	11	12	12	12	12	12	16	12	12	12	12
Grade (%)		-1%			2%			3%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.947			0.963			0.987				
Flt Protected		0.979			0.995			0.986				
Satd. Flow (prot)	0	1669	0	0	1582	0	0	1812	0	0	0	0
Flt Permitted		0.979			0.995			0.986				
Satd. Flow (perm)	0	1669	0	0	1582	0	0	1812	0	0	0	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		646			325			647			208	
Travel Time (s)		17.6			8.9			17.6			5.7	
Confl. Peds. (#/hr)	61		94	94		61	74		64	64		74
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Parking (#/hr)					0			0				
Adj. Flow (vph)	125	48	113	24	168	72	17	38	6	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	285	0	0	264	0	0	61	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.05	1.00	1.02	1.17	1.02	1.03	1.00	1.03	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization 56.3%		ICU Level of Service B	
Analysis Period (min) 15			

HCM 2010 AWSC
3: Franklin Town Boulevard & Callowhill Street

Intersection	
Intersection Delay, s/veh	9.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	120	46	108	23	161	69	16	36	6	0	0	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	125	48	112	24	168	72	17	38	6	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.3	9.1	8.6
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	28%	44%	9%
Vol Thru, %	62%	17%	64%
Vol Right, %	10%	39%	27%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	58	274	253
LT Vol	36	46	161
Through Vol	6	108	69
RT Vol	16	120	23
Lane Flow Rate	60	285	264
Geometry Grp	1	1	1
Degree of Util (X)	0.085	0.333	0.31
Departure Headway (Hd)	5.081	4.205	4.229
Convergence, Y/N	Yes	Yes	Yes
Cap	705	856	851
Service Time	3.113	2.221	2.245
HCM Lane V/C Ratio	0.085	0.333	0.31
HCM Control Delay	8.6	9.3	9.1
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.3	1.5	1.3

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
4: N. 17th Street & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	43	102	131	0	0	0	0	0	194	89
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	11	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			-4%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.865								0.958	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	1443	1693	1659	0	0	0	0	0	1544	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	1443	1693	1659	0	0	0	0	0	1544	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		325			430			230			1070	
Travel Time (s)		8.9			11.7			6.3			29.2	
Confl. Peds. (#/hr)	46		72	72		46	41		6	6		41
Confl. Bikes (#/hr)			3			1						7
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	5	0
Parking (#/hr)			0		0						0	
Adj. Flow (vph)	0	0	49	116	149	0	0	0	0	0	220	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	49	116	149	0	0	0	0	0	321	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.15	1.06	1.16	1.01	1.01	1.01	1.01	0.98	1.20	0.98
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	CBD
Control Type: Unsignalized	
Intersection Capacity Utilization 47.1%	ICU Level of Service A
Analysis Period (min) 15	

HCM 2010 AWSC
4: N. 17th Street & Callowhill Street

Intersection	
Intersection Delay, s/veh	10
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	43	102	131	0	0	0	0	0	194	89
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	49	116	149	0	0	0	0	0	220	101
Number of Lanes	0	0	1	1	1	0	0	0	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.9	9.7	10.6
HCM LOS	A	A	B

Lane	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	100%	0%	0%
Vol Thru, %	0%	0%	100%	69%
Vol Right, %	100%	0%	0%	31%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	43	102	131	283
LT Vol	0	0	131	194
Through Vol	43	0	0	89
RT Vol	0	102	0	0
Lane Flow Rate	49	116	149	322
Geometry Grp	5	7	7	2
Degree of Util (X)	0.062	0.188	0.221	0.404
Departure Headway (Hd)	4.534	5.838	5.334	4.526
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	784	613	670	794
Service Time	2.598	3.591	3.087	2.558
HCM Lane V/C Ratio	0.063	0.189	0.222	0.406
HCM Control Delay	7.9	9.9	9.6	10.6
HCM Lane LOS	A	A	A	B
HCM 95th-tile Q	0.2	0.7	0.8	2

Notes

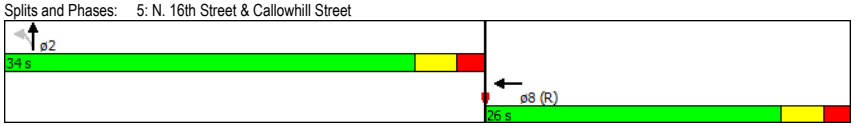
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Timings
5: N. 16th Street & Callowhill Street

Lane Group	WBT	NBT
Lane Configurations		
Volume (vph)	197	648
Lane Group Flow (vph)	435	841
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Minimum Split (s)	26.0	34.0
Total Split (s)	26.0	34.0
Total Split (%)	43.3%	56.7%
Yellow Time (s)	3.0	3.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
v/c Ratio	0.42	0.52
Control Delay	13.1	11.6
Queue Delay	0.0	0.0
Total Delay	13.1	11.6
Queue Length 50th (ft)	28	97
Queue Length 95th (ft)	63	123
Internal Link Dist (ft)	380	136
Turn Bay Length (ft)		
Base Capacity (vph)	1034	1628
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.42	0.52

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 17 (28%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 5: N. 16th Street & Callowhill Street



HCM 2010 Signalized Intersection Summary
5: N. 16th Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	197	160	42	648	0	0	0	0
Number				3	8	18	5	2	12			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.73	1.00		1.00			
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln				0.0	185.3	189.0	187.1	180.1	0.0			
Lanes				0	2	0	0	2	0			
Cap, veh/h				0	649	403	101	1636	0			
Arrive On Green				0.00	0.12	0.12	0.48	0.48	0.00			
Sat Flow, veh/h				0	1853	1152	208	3384	0			
Grp Volume(v), veh/h				0	240	195	439	402	0			
Grp Sat Flow(s),veh/h/ln				0	1853	1152	1791	1801	0			
Q Serve(g_s), s				0.0	7.2	9.5	10.1	8.9	0.0			
Cycle Q Clear(g_c), s				0.0	7.2	9.5	10.1	8.9	0.0			
Prop In Lane				0.00		1.00	0.12		0.00			
Lane Grp Cap(c), veh/h				0	649	403	866	871	0			
V/C Ratio(X)				0.00	0.37	0.48	0.51	0.46	0.00			
Avail Cap(c_a), veh/h				0	649	403	866	871	0			
HCM Platoon Ratio				1.00	0.33	0.33	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	20.4	21.5	10.6	10.3	0.0			
Incr Delay (d2), s/veh				0.0	1.6	4.1	2.1	1.8	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln				0.0	5.8	5.3	6.4	5.8	0.0			
Lane Grp Delay (d), s/veh				0.0	22.0	25.6	12.7	12.1	0.0			
Lane Grp LOS					C	C	B	B				
Approach Vol, veh/h					435			841				
Approach Delay, s/veh					23.6			12.4				
Approach LOS					C			B				

Timer	
Assigned Phs	8	2
Phs Duration (G+Y+Rc), s	26.0	34.0
Change Period (Y+Rc), s	5.0	5.0
Max Green Setting (Gmax), s	21.0	29.0
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	16.2
HCM 2010 LOS	B

Notes

HCM 2010 Signals-Pedestrians
5: N. 16th Street & Callowhill Street

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	23.0	24.0	24.0	24.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	2	2	2
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	0	2	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	25	25	25
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	30.0	30.0	30.0	30.0
Pedestrian Compliance Code	Fair	Fair	Fair	Fair
Pedestrian Crosswalk Score	1.83	1.89	2.05	2.11
Pedestrian Crosswalk LOS	A	A	B	B

HCM 2010 Signals-Bicycles
5: N. 16th Street & Callowhill Street

Approach	EB	WB	NB	SB
Bicycle Flow Rate (bike/h)	0	0	0	0
Total Flow Rate (veh/h)	0	435	841	0
Effct. Green for Bike (s)	0.0	21.0	29.0	0.0
Cross Street Width (ft)	24.0	24.0	24.0	23.0
Through Lanes Number	0	2	2	0
Through Lane Width (ft)	12.0	12.0	12.0	12.0
Bicycle Lane Width (ft)	0.0	0.0	0.0	0.0
Paved Shoulder Width (ft)	0.0	0.0	0.0	0.0
Curb Is Present?	No	No	No	No
On Street Parking?	No	No	No	No
Bicycle Lane Capacity (bike/h)	0	700	967	0
Bicycle Delay (s/bike)	0.0	12.7	8.0	0.0
Bicycle Compliance		Fair	Good	
Bicycle LOS Score	0.00	2.29	2.62	0.00
Bicycle LOS		B	B	

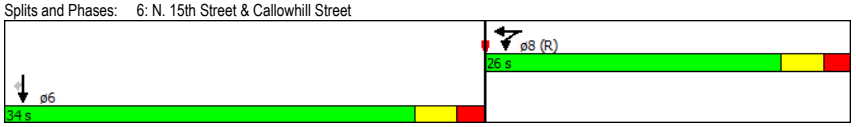
Timings
6: N. 15th Street & Callowhill Street

Lane Group	WBT	SBT	SBR
Lane Configurations			
Volume (vph)	313	447	91
Lane Group Flow (vph)	538	552	112
Turn Type	NA	NA	Perm
Protected Phases	8	6	
Permitted Phases			6
Minimum Split (s)	26.0	34.0	34.0
Total Split (s)	26.0	34.0	34.0
Total Split (%)	43.3%	56.7%	56.7%
Yellow Time (s)	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0
Lead/Lag			
Lead-Lag Optimize?			
v/c Ratio	0.47	0.70	0.14
Control Delay	15.7	18.5	3.8
Queue Delay	0.0	0.0	0.0
Total Delay	15.7	18.5	3.8
Queue Length 50th (ft)	71	141	1
Queue Length 95th (ft)	96	220	m20
Internal Link Dist (ft)	400	990	
Turn Bay Length (ft)			100
Base Capacity (vph)	1153	790	812
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.47	0.70	0.14

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 20 (33%), Referenced to phase 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed

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

Splits and Phases: 6: N. 15th Street & Callowhill Street



HCM 2010 Signalized Intersection Summary
6: N. 15th Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	123	313	0	0	0	0	0	447	91
Number				3	8	18				1	6	16
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.98
Parking Bus Adj				1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln				189.0	181.5	0.0				0.0	188.1	188.1
Lanes				0	2	0				0	1	1
Cap, veh/h				337	916	0				0	909	755
Arrive On Green				0.35	0.35	0.00				0.00	0.16	0.16
Sat Flow, veh/h				963	2618	0				0	1881	1561
Grp Volume(v), veh/h				279	259	0				0	552	112
Grp Sat Flow(s),veh/h/ln				1766	1815	0				0	1881	1561
Q Serve(g_s), s				7.3	6.5	0.0				0.0	16.4	3.7
Cycle Q Clear(g_c), s				7.3	6.5	0.0				0.0	16.4	3.7
Prop In Lane				0.55		0.00				0.00		1.00
Lane Grp Cap(c), veh/h				618	635	0				0	909	755
V/C Ratio(X)				0.45	0.41	0.00				0.00	0.61	0.15
Avail Cap(c_a), veh/h				618	635	0				0	909	755
HCM Platoon Ratio				1.00	1.00	1.00				1.00	0.33	0.33
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				15.1	14.8	0.0				0.0	19.9	14.6
Incr Delay (d2), s/veh				2.4	1.9	0.0				0.0	3.0	0.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (85%), veh/ln				5.2	4.8	0.0				0.0	12.0	2.6
Lane Grp Delay (d), s/veh				17.4	16.7	0.0				0.0	22.9	15.0
Lane Grp LOS				B	B						C	B
Approach Vol, veh/h					538						664	
Approach Delay, s/veh					17.1						21.6	
Approach LOS					B						C	

Timer			
Assigned Phs		8	6
Phs Duration (G+Y+Rc), s		26.0	34.0
Change Period (Y+Rc), s		5.0	5.0
Max Green Setting (Gmax), s		21.0	29.0
Max Q Clear Time (g_c+I1), s		0.0	0.0
Green Ext Time (p_c), s		0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	19.6
HCM 2010 LOS	B

Notes

HCM 2010 Signals-Pedestrians
6: N. 15th Street & Callowhill Street

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	24.0	24.0	24.0	23.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	2	2	2
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	6	0	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	25	25	25
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	30.0	30.0	30.0	30.0
Pedestrian Compliance Code	Fair	Fair	Fair	Fair
Pedestrian Crosswalk Score	1.91	1.93	1.99	1.98
Pedestrian Crosswalk LOS	A	A	A	A

HCM 2010 Signals-Bicycles
6: N. 15th Street & Callowhill Street

Approach	EB	WB	NB	SB
Bicycle Flow Rate (bike/h)	0	0	0	0
Total Flow Rate (veh/h)	0	538	0	664
Effct. Green for Bike (s)	0.0	21.0	0.0	29.0
Cross Street Width (ft)	24.0	23.0	24.0	24.0
Through Lanes Number	0	2	0	1
Through Lane Width (ft)	12.0	12.0	12.0	11.0
Bicycle Lane Width (ft)	0.0	0.0	0.0	0.0
Paved Shoulder Width (ft)	0.0	0.0	0.0	0.0
Curb Is Present?	No	No	No	No
On Street Parking?	No	No	No	No
Bicycle Lane Capacity (bike/h)	0	700	0	967
Bicycle Delay (s/bike)	0.0	12.7	0.0	8.0
Bicycle Compliance		Fair		Good
Bicycle LOS Score	0.00	2.36	0.00	3.24
Bicycle LOS		B		C

Timings
7: N. Broad Street & Callowhill Street

Lane Group	WBL	WBT	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	30	173	169	551	773	134
Lane Group Flow (vph)	33	235	186	605	849	147
Turn Type	Perm	NA	pm+pt	NA	NA	Perm
Protected Phases		8	5	2	6	
Permitted Phases	8		2			6
Minimum Split (s)	29.0	29.0	9.0	57.0	37.0	37.0
Total Split (s)	29.0	29.0	9.0	61.0	52.0	52.0
Total Split (%)	32.2%	32.2%	10.0%	67.8%	57.8%	57.8%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	0.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	3.0	5.0	5.0	5.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
v/c Ratio	0.10	0.29	0.51	0.30	0.50	0.26
Control Delay	28.9	30.2	26.7	21.7	8.6	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.9	30.2	26.7	21.7	8.6	8.3
Queue Length 50th (ft)	16	62	96	167	70	23
Queue Length 95th (ft)	m40	97	156	224	86	38
Internal Link Dist (ft)		525		200	990	
Turn Bay Length (ft)			125			100
Base Capacity (vph)	329	803	364	1995	1707	572
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	0.10	0.29	0.51	0.30	0.50	0.26

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 47 (52%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: N. Broad Street & Callowhill Street

HCM 2010 Signalized Intersection Summary
7: N. Broad Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	30	173	41	169	551	0	0	773	134
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.79	0.93		1.00	1.00		0.71
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln				182.5	181.1	186.2	181.6	181.6	0.0	0.0	186.2	182.6
Lanes				1	2	0	1	2	0	0	2	1
Cap, veh/h				444	695	154	491	2260	0	0	1945	572
Arrive On Green				0.08	0.08	0.08	0.07	0.62	0.00	0.00	1.00	1.00
Sat Flow, veh/h				1738	2719	603	1729	3632	0	0	3724	1096
Grp Volume(v), veh/h				33	122	113	186	605	0	0	849	147
Grp Sat Flow(s),veh/h/ln				1738	1811	1511	1729	1816	0	0	1862	1096
Q Serve(g_s), s				1.6	5.7	6.3	4.2	6.8	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s				1.6	5.7	6.3	4.2	6.8	0.0	0.0	0.0	0.0
Prop In Lane				1.00		0.40	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				444	463	386	491	2260	0	0	1945	572
V/C Ratio(X)				0.07	0.26	0.29	0.38	0.27	0.00	0.00	0.44	0.26
Avail Cap(c_a), veh/h				444	463	386	491	2260	0	0	1945	572
HCM Platoon Ratio				0.33	0.33	0.33	1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				31.4	33.3	33.6	7.7	7.7	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh				0.3	1.4	1.9	2.2	0.3	0.0	0.0	0.7	1.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (85%), veh/ln				1.3	4.7	4.5	3.3	4.5	0.0	0.0	0.3	0.3
Lane Grp Delay (d), s/veh				31.7	34.7	35.5	9.9	8.0	0.0	0.0	0.7	1.1
Lane Grp LOS				C	C	D	A	A			A	A
Approach Vol, veh/h					268			791			996	
Approach Delay, s/veh					34.6			8.4			0.8	
Approach LOS					C			A			A	

Timer

Assigned Phs					8		5	2			6	
Phs Duration (G+Y+Rc), s					29.0		9.0	61.0			52.0	
Change Period (Y+Rc), s					6.0		3.0	5.0			5.0	
Max Green Setting (Gmax), s					23.0		6.0	56.0			47.0	
Max Q Clear Time (g_c+I1), s					0.0		0.0	0.0			0.0	
Green Ext Time (p_c), s					0.0		0.0	0.0			0.0	

Intersection Summary

HCM 2010 Ctrl Delay		8.1
HCM 2010 LOS		A

Notes

HCM 2010 Signals-Pedestrians
7: N. Broad Street & Callowhill Street

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	25.1	32.2	56.2	66.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	3	5	5
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	6	2	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	25	25	25
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	45.0	45.0	45.0	45.0
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	1.94	2.02	2.58	2.58
Pedestrian Crosswalk LOS	A	B	B	B

HCM 2010 Signals-Bicycles
7: N. Broad Street & Callowhill Street

Approach	EB	WB	NB	SB
Bicycle Flow Rate (bike/h)	0	0	0	0
Total Flow Rate (veh/h)	0	268	791	996
Effct. Green for Bike (s)	0.0	23.0	56.0	47.0
Cross Street Width (ft)	56.2	66.0	32.2	25.1
Through Lanes Number	0	2	2	2
Through Lane Width (ft)	12.0	11.0	10.0	10.0
Bicycle Lane Width (ft)	0.0	0.0	0.0	0.0
Paved Shoulder Width (ft)	0.0	0.0	0.0	0.0
Curb Is Present?	No	No	No	No
On Street Parking?	No	No	No	No
Bicycle Lane Capacity (bike/h)	0	511	1244	1044
Bicycle Delay (s/bike)	0.0	24.9	6.4	10.3
Bicycle Compliance		Fair	Good	Fair
Bicycle LOS Score	0.00	3.00	3.13	3.19
Bicycle LOS		C	C	C

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	264	722	59	590	0	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	11	12	11	12	12	12	12
Grade (%)		0%			0%			-1%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.88	0.91	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor						0.98		0.97				
Frt						0.850						
Flt Protected								0.996				
Satd. Flow (prot)	0	0	0	0	3521	2680	0	4851	0	0	0	0
Flt Permitted								0.996				
Satd. Flow (perm)	0	0	0	0	3521	2622	0	4716	0	0	0	0
Right Turn on Red			Yes			No	Yes		Yes			Yes
Satd. Flow (RTOR)								28				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		430			460			170			344	
Travel Time (s)		11.7			12.5			4.6			9.4	
Confl. Peds. (#/hr)	15		7	7		15	323		1	1		323
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%
Adj. Flow (vph)	0	0	0	0	275	752	61	615	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	275	752	0	676	0	0	0	0
Turn Type					NA	Perm	Perm	NA				
Protected Phases					1			2				
Permitted Phases						1	2					
Minimum Split (s)					51.0	51.0	39.0	39.0				
Total Split (s)					51.0	51.0	39.0	39.0				
Total Split (%)					56.7%	56.7%	43.3%	43.3%				
Yellow Time (s)					3.5	3.5	3.5	3.5				
All-Red Time (s)					1.8	1.8	2.5	2.5				
Lost Time Adjust (s)					0.0	0.0		0.0				
Total Lost Time (s)					5.3	5.3		6.0				
Lead/Lag					Lead	Lead	Lag	Lag				
Lead-Lag Optimize?												
Act Effct Green (s)					45.7	45.7		33.0				
Actuated g/C Ratio					0.51	0.51		0.37				
v/c Ratio					0.15	0.56		0.39				
Control Delay					12.4	20.2		3.0				
Queue Delay					0.0	0.0		0.2				
Total Delay					12.4	20.2		3.2				
LOS					B	C		A				
Approach Delay					18.1			3.2				
Approach LOS					B			A				
Queue Length 50th (ft)					46	239		8				
Queue Length 95th (ft)					m61	m313		12				
Internal Link Dist (ft)		350			380			90			264	
Turn Bay Length (ft)												
Base Capacity (vph)					1787	1331		1746				

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	7
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	1.8	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			

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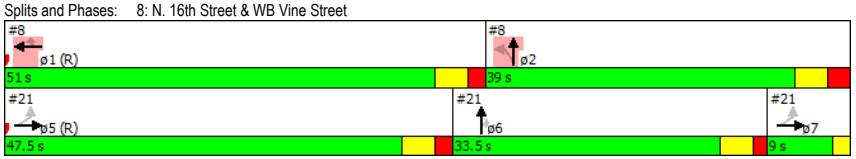
Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn					0	0		389				
Spillback Cap Reductn					0	0		0				
Storage Cap Reductn					0	0		0				
Reduced v/c Ratio					0.15	0.56		0.50				

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 12.2	Intersection LOS: B
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 8: N. 16th Street & WB Vine Street



Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Projected (Build) Conditions - Recommended Improvements
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Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	35	482	0	0	0	0	0	1199	559
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			2%	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.86	0.86
Ped Bike Factor					1.00						0.99	
Frt											0.952	
Flt Protected					0.997							
Satd. Flow (prot)	0	0	0	0	3318	0	0	0	0	0	5761	0
Flt Permitted					0.997							
Satd. Flow (perm)	0	0	0	0	3318	0	0	0	0	0	5761	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					6						150	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		460			480			170			414	
Travel Time (s)		12.5			13.1			4.6			11.3	
Confl. Peds. (#/hr)	18		1	1		18	17		383	383		17
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Parking (#/hr)					0							
Adj. Flow (vph)	0	0	0	39	536	0	0	0	0	0	1332	621
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	575	0	0	0	0	0	1953	0
Turn Type				Perm	NA						NA	
Protected Phases					1 3						2	
Permitted Phases				1 3								
Minimum Split (s)											39.0	
Total Split (s)											39.0	
Total Split (%)											43.3%	
Yellow Time (s)											3.5	
All-Red Time (s)											1.5	
Lost Time Adjust (s)											0.0	
Total Lost Time (s)											5.0	
Lead/Lag											Lag	
Lead-Lag Optimize?												
Act Effct Green (s)					46.0						34.0	
Actuated g/C Ratio					0.51						0.38	
v/c Ratio					0.34						0.93dr	
Control Delay					15.4						28.6	
Queue Delay					0.0						0.2	
Total Delay					15.4						28.9	
LOS					B						C	
Approach Delay					15.4						28.9	
Approach LOS					B						C	
Queue Length 50th (ft)					82						272	
Queue Length 95th (ft)					92						324	
Internal Link Dist (ft)		380			400			90			334	
Turn Bay Length (ft)												
Base Capacity (vph)					1698						2269	

Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø6	ø7
Lane Configurations					
Volume (vph)					
Ideal Flow (vphpl)					
Lane Width (ft)					
Grade (%)					
Lane Util. Factor					
Ped Bike Factor					
Frt					
Flt Protected					
Satd. Flow (prot)					
Flt Permitted					
Satd. Flow (perm)					
Right Turn on Red					
Satd. Flow (RTOR)					
Link Speed (mph)					
Link Distance (ft)					
Travel Time (s)					
Confl. Peds. (#/hr)					
Peak Hour Factor					
Parking (#/hr)					
Adj. Flow (vph)					
Shared Lane Traffic (%)					
Lane Group Flow (vph)					
Turn Type					
Protected Phases	1	3	5	6	7
Permitted Phases					
Minimum Split (s)	41.0	10.0	41.0	34.0	15.0
Total Split (s)	41.0	10.0	41.0	34.0	15.0
Total Split (%)	46%	11%	46%	38%	17%
Yellow Time (s)	3.5	3.0	3.5	3.5	3.0
All-Red Time (s)	1.5	0.0	1.5	0.0	2.0
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag	Lead		Lead	Lag	
Lead-Lag Optimize?					
Act Effct Green (s)					
Actuated g/C Ratio					
v/c Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Queue Length 50th (ft)					
Queue Length 95th (ft)					
Internal Link Dist (ft)					
Turn Bay Length (ft)					
Base Capacity (vph)					

Projected (Build) Conditions - Recommended Improvements
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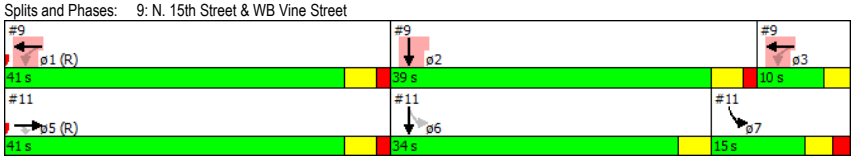
Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					0						42	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.34						0.88	

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 25.8	Intersection LOS: C
Intersection Capacity Utilization 66.7%	ICU Level of Service C
Analysis Period (min) 15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 9: N. 15th Street & WB Vine Street



Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø6	ø7
Starvation Cap Reductn					
Spillback Cap Reductn					
Storage Cap Reductn					
Reduced v/c Ratio					

Intersection Summary

Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	104	424	124	0	670	0	0	601	92
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	11	12	12	10	12	12	10	12
Grade (%)		0%			1%			-1%			1%	
Storage Length (ft)	0		0	0		0	0		0	100		100
Storage Lanes	0		0	1		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.86	0.86
Ped Bike Factor				1.00		0.95					0.95	
Frt						0.850					0.980	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	0	1751	3386	1567	0	4732	0	0	5503	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	0	1750	3386	1487	0	4732	0	0	5503	0
Right Turn on Red			Yes			No			Yes			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		480			605			170			280	
Travel Time (s)		13.1			16.5			4.6			7.6	
Confl. Peds. (#/hr)	61		1	1		61	513		161	161		513
Confl. Bikes (#/hr)						1			13			10
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Bus Blockages (#/hr)	0	0	0	0	0	0	0	2	0	0	5	0
Adj. Flow (vph)	0	0	0	111	451	132	0	713	0	0	639	98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	111	451	132	0	713	0	0	737	0
Turn Type				Perm	NA	Perm		NA			NA	
Protected Phases					1 3!			2			6!	
Permitted Phases				1 3!		1 3						
Minimum Split (s)								34.0			34.0	
Total Split (s)								36.0			36.0	
Total Split (%)								40.0%			40.0%	
Yellow Time (s)								2.4			3.6	
All-Red Time (s)								3.0			5.4	
Lost Time Adjust (s)								0.0			0.0	
Total Lost Time (s)								5.4			9.0	
Lead/Lag								Lead			Lead	
Lead-Lag Optimize?												
Act Effct Green (s)				44.0	44.0	44.0		30.6			27.0	
Actuated g/C Ratio				0.49	0.49	0.49		0.34			0.30	
v/c Ratio				0.13	0.27	0.18		0.44			0.45	
Control Delay				21.1	21.4	21.8		11.8			11.1	
Queue Delay				0.0	0.0	0.0		0.7			0.0	
Total Delay				21.1	21.4	21.8		12.5			11.2	
LOS				C	C	C		B			B	
Approach Delay					21.5			12.5			11.2	
Approach LOS					C			B			B	
Queue Length 50th (ft)				42	89	49		69			59	

Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø7	ø8
Lane Configurations					
Volume (vph)					
Ideal Flow (vphpl)					
Lane Width (ft)					
Grade (%)					
Storage Length (ft)					
Storage Lanes					
Taper Length (ft)					
Lane Util. Factor					
Ped Bike Factor					
Frt					
Flt Protected					
Satd. Flow (prot)					
Flt Permitted					
Satd. Flow (perm)					
Right Turn on Red					
Satd. Flow (RTOR)					
Link Speed (mph)					
Link Distance (ft)					
Travel Time (s)					
Confl. Peds. (#/hr)					
Confl. Bikes (#/hr)					
Peak Hour Factor					
Bus Blockages (#/hr)					
Adj. Flow (vph)					
Shared Lane Traffic (%)					
Lane Group Flow (vph)					
Turn Type					
Protected Phases	1	3	5	7	8
Permitted Phases					
Minimum Split (s)	40.0	14.0	40.0	48.0	14.0
Total Split (s)	40.0	14.0	40.0	50.0	14.0
Total Split (%)	44%	16%	44%	56%	16%
Yellow Time (s)	3.6	2.0	3.6	3.6	3.6
All-Red Time (s)	6.4	0.0	6.4	2.4	2.4
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag		Lag			Lag
Lead-Lag Optimize?		Yes			
Act Effct Green (s)					
Actuated g/C Ratio					
v/c Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Queue Length 50th (ft)					

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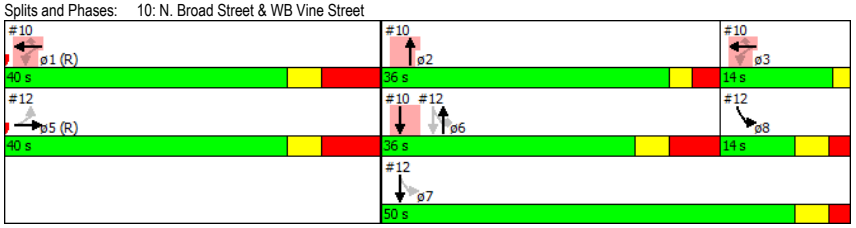
Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)				84	139	98		m86			75	
Internal Link Dist (ft)		400			525			90			200	
Turn Bay Length (ft)												
Base Capacity (vph)				855	1655	726		1608			1650	
Starvation Cap Reductn				0	0	0		536			0	
Spillback Cap Reductn				0	0	0		0			86	
Storage Cap Reductn				0	0	0		0			0	
Reduced v/c Ratio				0.13	0.27	0.18		0.67			0.47	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green
Natural Cycle: 90
Control Type: Pretimed
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 14.9 Intersection LOS: B
Intersection Capacity Utilization 115.7% ICU Level of Service H
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.
! Phase conflict between lane groups.

Splits and Phases: 10: N. Broad Street & WB Vine Street



Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø7	ø8
Queue Length 95th (ft)					
Internal Link Dist (ft)					
Turn Bay Length (ft)					
Base Capacity (vph)					
Starvation Cap Reductn					
Spillback Cap Reductn					
Storage Cap Reductn					
Reduced v/c Ratio					

Intersection Summary

Projected (Build) Conditions - Recommended Improvements
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Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1246	466	0	0	0	0	0	0	411	830	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		2%			0%			0%			4%	
Lane Util. Factor	1.00	0.86	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00
Ped Bike Factor			0.98							0.69		
Frt			0.850									
Flt Protected										0.950		
Satd. Flow (prot)	0	6310	2744	0	0	0	0	0	0	1725	4792	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	6310	2687	0	0	0	0	0	0	1190	4792	0
Right Turn on Red			No			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)										24		
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		82			480			430			170	
Travel Time (s)		2.2			13.1			11.7			4.6	
Confl. Peds. (#/hr)			12	12			21		398	398		21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1354	507	0	0	0	0	0	0	447	902	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1354	507	0	0	0	0	0	0	447	902	0
Turn Type		NA	Perm							pm+pt	NA	
Protected Phases		5								7	6	
Permitted Phases			5							6		
Minimum Split (s)		41.0	41.0							15.0	34.0	
Total Split (s)		41.0	41.0							15.0	34.0	
Total Split (%)		45.6%	45.6%							16.7%	37.8%	
Yellow Time (s)		3.5	3.5							3.0	3.5	
All-Red Time (s)		1.5	1.5							2.0	0.0	
Lost Time Adjust (s)		0.0	0.0							0.0	0.0	
Total Lost Time (s)		5.0	5.0							5.0	3.5	
Lead/Lag		Lead	Lead								Lag	
Lead-Lag Optimize?												
Act Effct Green (s)		36.0	36.0							39.0	30.5	
Actuated g/C Ratio		0.40	0.40							0.43	0.34	
v/c Ratio		0.54	0.47							0.76	0.56	
Control Delay		17.8	21.6							9.7	11.1	
Queue Delay		0.0	0.0							3.1	2.4	
Total Delay		17.8	21.6							12.8	13.5	
LOS		B	C							B	B	
Approach Delay		18.8									13.3	
Approach LOS		B									B	
Queue Length 50th (ft)		119	114							27	34	
Queue Length 95th (ft)		163	155							m30	m68	
Internal Link Dist (ft)		2			400			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		2524	1074							588	1623	
Starvation Cap Reductn		0	0							69	564	

Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	3
Permitted Phases			
Minimum Split (s)	41.0	39.0	10.0
Total Split (s)	41.0	39.0	10.0
Total Split (%)	46%	43%	11%
Yellow Time (s)	3.5	3.5	3.0
All-Red Time (s)	1.5	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			

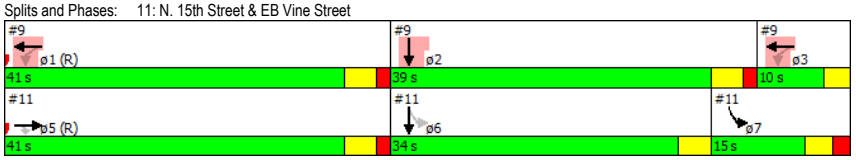
Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening
Synchro 8 Report

Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0	0							0	0	
Storage Cap Reductn		0	0							0	0	
Reduced v/c Ratio		0.54	0.47							0.86	0.85	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 16.5	Intersection LOS: B
Intersection Capacity Utilization 66.7%	ICU Level of Service C
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 11: N. 15th Street & EB Vine Street



Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
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Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	283	1489	102	0	0	0	0	397	207	285	469	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	10	12	12	10	12
Grade (%)		2%			0%			2%			2%	
Storage Length (ft)	0		250	0		0	0		0	45		0
Storage Lanes	0		1	0		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.81	0.81	0.81	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.91	1.00
Ped Bike Factor		1.00							0.84	0.95		
Frt		0.992							0.850			
Flt Protected		0.993								0.950		
Satd. Flow (prot)	0	7272	0	0	0	0	0	3058	1529	1743	4674	0
Flt Permitted		0.993								0.509		
Satd. Flow (perm)	0	7272	0	0	0	0	0	3058	1287	887	4674	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		480			163			250			170	
Travel Time (s)		13.1			4.4			6.8			4.6	
Confl. Peds. (#/hr)			63	63			420		144	144		420
Confl. Bikes (#/hr)			1						9			8
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	7%	2%	2%	2%	2%	2%	4%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	30	0	0	0	0
Adj. Flow (vph)	295	1551	106	0	0	0	0	414	216	297	489	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1952	0	0	0	0	0	414	216	297	489	0
Turn Type	Perm	NA						NA	Perm	custom	NA	
Protected Phases		5						6		8	7	
Permitted Phases	5								6	6 7	6 7	
Minimum Split (s)	40.0	40.0						34.0	34.0	14.0	48.0	
Total Split (s)	40.0	40.0						36.0	36.0	14.0	50.0	
Total Split (%)	44.4%	44.4%						40.0%	40.0%	15.6%	55.6%	
Yellow Time (s)	3.6	3.6						3.6	3.6	3.6	3.6	
All-Red Time (s)	6.4	6.4						5.4	5.4	2.4	2.4	
Lost Time Adjust (s)		0.0						0.0	0.0	0.0	0.0	
Total Lost Time (s)		10.0						9.0	9.0	6.0	6.0	
Lead/Lag								Lead	Lead	Lag		
Lead-Lag Optimize?												
Act Effct Green (s)		30.0						27.0	27.0	44.0	44.0	
Actuated g/C Ratio		0.33						0.30	0.30	0.49	0.49	
v/c Ratio		0.81						0.45	0.56	0.58	0.21	
Control Delay		19.9						27.4	33.2	12.5	2.4	
Queue Delay		0.0						0.1	0.0	13.8	0.3	
Total Delay		20.0						27.5	33.2	26.4	2.7	
LOS		B						C	C	C	A	
Approach Delay		20.0						29.4			11.6	
Approach LOS		B						C			B	

Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Bus Blockages (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	3
Permitted Phases			
Minimum Split (s)	40.0	34.0	14.0
Total Split (s)	40.0	36.0	14.0
Total Split (%)	44%	40%	16%
Yellow Time (s)	3.6	2.4	2.0
All-Red Time (s)	6.4	3.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag		Lead	Lag
Lead-Lag Optimize?			Yes
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			

Projected (Build) Conditions - Recommended Improvements
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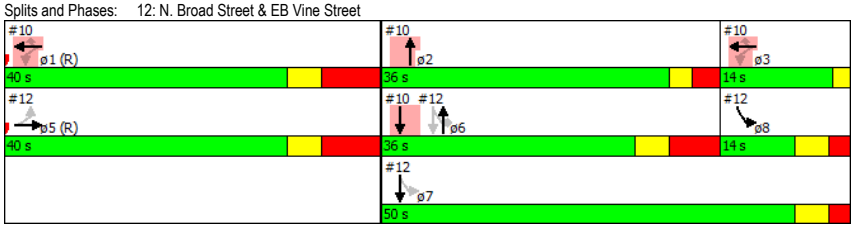
Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		143						100	103	57	8	
Queue Length 95th (ft)		150						143	177	110	17	
Internal Link Dist (ft)		400			83			170			90	
Turn Bay Length (ft)										45		
Base Capacity (vph)		2424						917	386	509	2285	
Starvation Cap Reductn		0						0	0	190	1166	
Spillback Cap Reductn		15						35	0	0	0	
Storage Cap Reductn		0						0	0	0	0	
Reduced v/c Ratio		0.81						0.47	0.56	0.93	0.44	

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 19.8	Intersection LOS: B
Intersection Capacity Utilization 115.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 12: N. Broad Street & EB Vine Street



Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening
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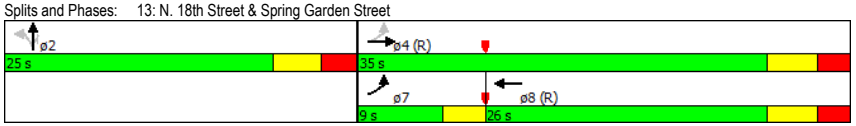
Timings
13: N. 18th Street & Spring Garden Street

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	52	482	472	75	58
Lane Group Flow (vph)	56	518	539	133	62
Turn Type	pm+pt	NA	NA	NA	Perm
Protected Phases	7	4	8	2	
Permitted Phases	4				2
Minimum Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?					
v/c Ratio	0.13	0.33	0.51	0.29	0.12
Control Delay	7.6	10.3	22.6	17.7	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.6	10.3	22.6	17.7	1.9
Queue Length 50th (ft)	9	56	77	36	0
Queue Length 95th (ft)	23	85	80	74	9
Internal Link Dist (ft)		476	350	810	
Turn Bay Length (ft)	145				150
Base Capacity (vph)	420	1562	1065	455	500
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	0.13	0.33	0.51	0.29	0.12

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 13: N. 18th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
13: N. 18th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	52	482	0	0	472	29	48	75	58	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.96		1.00	1.00		0.87	1.00		0.93			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln	185.3	185.3	0.0	0.0	185.3	189.0	189.0	177.9	176.2			
Lanes	1	2	0	0	2	0	0	1	1			
Cap, veh/h	527	1791	0	0	1142	69	272	277	441			
Arrive On Green	0.10	0.48	0.00	0.00	0.67	0.67	0.32	0.32	0.32			
Sat Flow, veh/h	1765	3706	0	0	3425	208	860	876	1393			
Grp Volume(v), veh/h	56	518	0	0	274	265	105	28	62			
Grp Sat Flow(s),veh/h/ln	1765	1853	0	0	1853	1780	1736	1779	1393			
Q Serve(g_s), s	1.0	5.0	0.0	0.0	4.2	4.2	2.6	0.0	1.9			
Cycle Q Clear(g_c), s	1.0	5.0	0.0	0.0	4.2	4.2	2.6	0.0	1.9			
Prop In Lane	1.00		0.00	0.00		0.12	0.50		1.00			
Lane Grp Cap(c), veh/h	527	1791	0	0	618	593	550	0	441			
V/C Ratio(X)	0.11	0.29	0.00	0.00	0.44	0.45	0.19	0.00	0.14			
Avail Cap(c_a), veh/h	527	1791	0	0	618	593	550	0	441			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	9.2	9.3	0.0	0.0	7.4	7.4	14.9	0.0	14.7			
Incr Delay (d2), s/veh	0.4	0.4	0.0	0.0	2.3	2.4	0.8	0.0	0.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln	0.8	3.5	0.0	0.0	3.1	3.0	2.1	0.0	1.2			
Lane Grp Delay (d), s/veh	9.6	9.7	0.0	0.0	9.7	9.8	15.7	0.0	15.3			
Lane Grp LOS	A	A			A	A	B		B			
Approach Vol, veh/h		574			539			195				
Approach Delay, s/veh		9.7			9.7			13.3				
Approach LOS		A			A			B				

Timer

Assigned Phs	7	4			8			2	
Phs Duration (G+Y+Rc), s	9.0	35.0			26.0			25.0	
Change Period (Y+Rc), s	3.0	6.0			6.0			6.0	
Max Green Setting (Gmax), s	6.0	29.0			20.0			19.0	
Max Q Clear Time (g_c+I1), s	0.0	0.0			0.0			0.0	
Green Ext Time (p_c), s	0.0	0.0			0.0			0.0	

Intersection Summary

HCM 2010 Ctrl Delay			10.3
HCM 2010 LOS			B

Notes

Timings
14: N. Broad Street & Spring Garden Street

Lane Group	EBT	WBT	NBT	NBR	SBL	SBT	SBR
Lane Configurations							
Volume (vph)	508	427	531	56	75	831	102
Lane Group Flow (vph)	631	514	571	60	81	894	110
Turn Type	NA	NA	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	8	2		1	6	
Permitted Phases				2	6		6
Minimum Split (s)	33.0	33.0	35.0	35.0	9.0	35.0	35.0
Total Split (s)	40.0	40.0	41.0	41.0	9.0	50.0	50.0
Total Split (%)	44.4%	44.4%	45.6%	45.6%	10.0%	55.6%	55.6%
Yellow Time (s)	3.6	3.6	3.4	3.4	3.0	3.4	3.4
All-Red Time (s)	2.4	2.4	2.6	2.6	0.0	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Lead/Lag			Lag	Lag	Lead		
Lead-Lag Optimize?							
v/c Ratio	0.53	0.43	0.43	0.10	0.22	0.53	0.18
Control Delay	23.9	22.2	9.7	3.0	12.3	17.4	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.9	22.2	9.7	3.0	12.3	17.4	13.9
Queue Length 50th (ft)	144	112	33	0	22	176	34
Queue Length 95th (ft)	197	156	93	3	45	232	65
Internal Link Dist (ft)	400	550	990			290	
Turn Bay Length (ft)				100	170		100
Base Capacity (vph)	1182	1194	1323	603	375	1672	604
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.43	0.43	0.10	0.22	0.53	0.18

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Pretimed

Splits and Phases: 14: N. Broad Street & Spring Garden Street

HCM 2010 Signalized Intersection Summary
14: N. Broad Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	508	79	0	427	51	0	531	56	75	831	102
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	1.00		0.95	1.00		0.93	0.98		0.85
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.3	189.0	0.0	185.3	189.0	0.0	185.3	185.3	186.2	186.2	186.2
Lanes	0	2	0	0	2	0	0	2	1	1	2	1
Cap, veh/h	0	1171	181	0	1221	145	0	1441	567	445	1821	659
Arrive On Green	0.00	0.38	0.38	0.00	0.38	0.38	0.00	0.52	0.52	0.07	0.49	0.49
Sat Flow, veh/h	0	3101	480	0	3231	385	0	3706	1458	1774	3724	1347
Grp Volume(v), veh/h	0	325	306	0	262	252	0	571	60	81	894	110
Grp Sat Flow(s),veh/h/ln	0	1853	1728	0	1853	1763	0	1853	1458	1774	1862	1347
Q Serve(g_s), s	0.0	11.9	12.0	0.0	9.2	9.3	0.0	8.4	1.9	2.2	14.5	4.1
Cycle Q Clear(g_c), s	0.0	11.9	12.0	0.0	9.2	9.3	0.0	8.4	1.9	2.2	14.5	4.1
Prop In Lane	0.00		0.28	0.00		0.22	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	700	653	0	700	666	0	1441	567	445	1821	659
V/C Ratio(X)	0.00	0.46	0.47	0.00	0.37	0.38	0.00	0.40	0.11	0.18	0.49	0.17
Avail Cap(c_a), veh/h	0	700	653	0	700	666	0	1441	567	445	1821	659
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	21.1	21.2	0.0	20.3	20.3	0.0	15.3	13.7	13.5	15.5	12.8
Incr Delay (d2), s/veh	0.0	2.2	2.4	0.0	1.5	1.6	0.0	0.8	0.4	0.9	0.9	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	8.3	7.9	0.0	6.6	6.4	0.0	5.5	1.3	1.8	9.2	2.5
Lane Grp Delay (d), s/veh	0.0	23.3	23.6	0.0	21.8	22.0	0.0	16.1	14.1	14.4	16.4	13.3
Lane Grp LOS		C	C		C	C		B	B	B	B	B
Approach Vol, veh/h		631			514			631			1085	
Approach Delay, s/veh		23.5			21.9			15.9			16.0	
Approach LOS		C			C			B			B	

Timer

Assigned Phs		4			8			2		1	6	
Phs Duration (G+Y+Rc), s		40.0			40.0			41.0		9.0	50.0	
Change Period (Y+Rc), s		6.0			6.0			6.0		3.0	6.0	
Max Green Setting (Gmax), s		34.0			34.0			35.0		6.0	44.0	
Max Q Clear Time (g_c+I1), s		0.0			0.0			0.0		0.0	0.0	
Green Ext Time (p_c), s		0.0			0.0			0.0		0.0	0.0	

Intersection Summary

HCM 2010 Ctrl Delay			18.7									
HCM 2010 LOS			B									

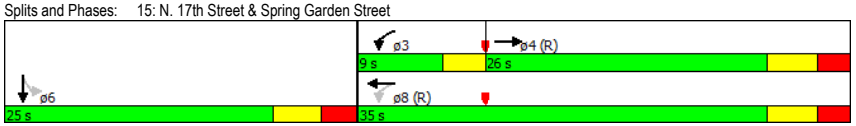
Notes

Timings
15: N. 17th Street & Spring Garden Street

Lane Group	EBT	WBL	WBT	SBT
Lane Configurations				
Volume (vph)	446	73	439	69
Lane Group Flow (vph)	613	87	523	170
Turn Type	NA	pm+pt	NA	NA
Protected Phases	4	3	8	6
Permitted Phases		8		
Minimum Split (s)	26.0	9.0	35.0	25.0
Total Split (s)	26.0	9.0	35.0	25.0
Total Split (%)	43.3%	15.0%	58.3%	41.7%
Yellow Time (s)	3.6	3.0	3.6	3.4
All-Red Time (s)	2.4	0.0	2.4	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	3.0	6.0	6.0
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?				
v/c Ratio	0.58	0.22	0.33	0.35
Control Delay	10.3	6.9	8.6	15.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	10.3	6.9	8.6	15.1
Queue Length 50th (ft)	31	10	35	37
Queue Length 95th (ft)	42	25	77	73
Internal Link Dist (ft)	350		350	290
Turn Bay Length (ft)		165		
Base Capacity (vph)	1053	388	1562	490
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	0.58	0.22	0.33	0.35

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 15: N. 17th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
15: N. 17th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	446	69	73	439	0	0	0	0	36	69	38
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.86	0.96		1.00				1.00		0.92
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.3	189.0	185.3	185.3	0.0				189.0	184.8	189.0
Lanes	0	2	0	1	2	0				0	1	0
Cap, veh/h	0	1022	157	499	1791	0				198	158	219
Arrive On Green	0.00	0.67	0.67	0.20	0.97	0.00				0.32	0.32	0.32
Sat Flow, veh/h	0	3066	470	1765	3706	0				625	306	692
Grp Volume(v), veh/h	0	319	294	87	523	0				125	0	108
Grp Sat Flow(s),veh/h/ln	0	1853	1683	1765	1853	0				1817	0	1654
Q Serve(g_s), s	0.0	5.3	5.4	1.6	0.4	0.0				2.6	0.0	0.0
Cycle Q Clear(g_c), s	0.0	5.3	5.4	1.6	0.4	0.0				2.6	0.0	0.0
Prop In Lane	0.00		0.28	1.00		0.00				0.34		0.42
Lane Grp Cap(c), veh/h	0	618	561	499	1791	0				575	0	0
V/C Ratio(X)	0.00	0.52	0.52	0.17	0.29	0.00				0.22	0.00	0.00
Avail Cap(c_a), veh/h	0	618	561	499	1791	0				575	0	0
HCM Platoon Ratio	1.00	2.00	2.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	7.5	7.6	8.4	0.5	0.0				12.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	3.1	3.5	0.8	0.4	0.0				0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	3.6	3.5	1.2	0.4	0.0				2.1	0.0	0.0
Lane Grp Delay (d), s/veh	0.0	10.6	11.0	9.2	0.9	0.0				13.3	0.0	0.0
Lane Grp LOS		B	B	A	A					B		
Approach Vol, veh/h		613			610						233	
Approach Delay, s/veh		10.8			2.1						7.1	
Approach LOS		B			A						A	

Timer												
Assigned Phs		4		3	8						6	
Phs Duration (G+Y+Rc), s		26.0		9.0	35.0						25.0	
Change Period (Y+Rc), s		6.0		3.0	6.0						6.0	
Max Green Setting (Gmax), s		20.0		6.0	29.0						19.0	
Max Q Clear Time (g_c+I1), s		0.0		0.0	0.0						0.0	
Green Ext Time (p_c), s		0.0		0.0	0.0						0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	6.6
HCM 2010 LOS	A

Notes

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	73	220	51	0	0	0	0	361	51
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					0.99						0.99	
Frt					0.978						0.983	
Flt Protected					0.989							
Satd. Flow (prot)	0	0	0	0	3213	0	0	0	0	0	1630	0
Flt Permitted					0.989							
Satd. Flow (perm)	0	0	0	0	3212	0	0	0	0	0	1630	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					95						8	
Link Speed (mph)		30			25			30			25	
Link Distance (ft)		975			430			170			647	
Travel Time (s)		22.2			11.7			3.9			17.6	
Confl. Peds. (#/hr)	24		2	2		24	37		104	104		37
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Parking (#/hr)					0						0	
Adj. Flow (vph)	0	0	0	89	268	62	0	0	0	0	440	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	419	0	0	0	0	0	502	0
Turn Type				custom	NA						NA	
Protected Phases					1 3						2	
Permitted Phases				1								
Minimum Split (s)				46.0							35.0	
Total Split (s)				46.0							35.0	
Total Split (%)				51.1%							38.9%	
Yellow Time (s)				3.5							3.5	
All-Red Time (s)				1.8							1.5	
Lost Time Adjust (s)											0.0	
Total Lost Time (s)											5.0	
Lead/Lag				Lead							Lag	
Lead-Lag Optimize?												
Act Effct Green (s)					49.7						30.0	
Actuated g/C Ratio					0.55						0.33	
v/c Ratio					0.23						0.92	
Control Delay					2.3						52.5	
Queue Delay					0.0						0.0	
Total Delay					2.3						52.5	
LOS					A						D	
Approach Delay					2.3						52.5	
Approach LOS					A						D	
Queue Length 50th (ft)					16						267	
Queue Length 95th (ft)					23						#391	
Internal Link Dist (ft)		895			350			90			567	
Turn Bay Length (ft)												
Base Capacity (vph)					1816						548	
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					0						0	

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	ø3	ø5	ø6
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	5	6
Permitted Phases			
Minimum Split (s)	9.0	49.5	40.5
Total Split (s)	9.0	49.5	40.5
Total Split (%)	10%	55%	45%
Yellow Time (s)	2.0	3.5	3.5
All-Red Time (s)	0.0	1.8	2.5
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag		Lead	Lag
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			

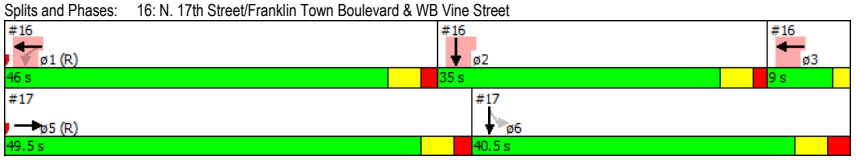
Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening
Synchro 8 Report

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.23						0.92	

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 29.7	Intersection LOS: C
Intersection Capacity Utilization 67.5%	ICU Level of Service C
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 16: N. 17th Street/Franklin Town Boulevard & WB Vine Street



Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	ø3	ø5	ø6
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	340	26	0	0	0	0	0	0	185	262	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor		1.00									0.95	
Frt		0.989										
Flt Protected											0.980	
Satd. Flow (prot)	0	3302	0	0	0	0	0	0	0	0	3450	0
Flt Permitted											0.980	
Satd. Flow (perm)	0	3302	0	0	0	0	0	0	0	0	3272	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)		12									231	
Link Speed (mph)		30			25			30			30	
Link Distance (ft)		975			430			430			170	
Travel Time (s)		22.2			11.7			9.8			3.9	
Confl. Peds. (#/hr)			18	18			33		116	116		33
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Parking (#/hr)		0										
Adj. Flow (vph)	0	425	32	0	0	0	0	0	0	231	328	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	457	0	0	0	0	0	0	0	0	559	0
Turn Type		NA								Perm	NA	
Protected Phases		5									6	
Permitted Phases										6		
Minimum Split (s)		49.5								40.5	40.5	
Total Split (s)		49.5								40.5	40.5	
Total Split (%)		55.0%								45.0%	45.0%	
Yellow Time (s)		3.5								3.5	3.5	
All-Red Time (s)		1.8								2.5	2.5	
Lost Time Adjust (s)		0.0									0.0	
Total Lost Time (s)		5.3									6.0	
Lead/Lag		Lead								Lag	Lag	
Lead-Lag Optimize?												
Act Effct Green (s)		44.2									34.5	
Actuated g/C Ratio		0.49									0.38	
v/c Ratio		0.28									0.40	
Control Delay		13.7									1.4	
Queue Delay		0.0									1.7	
Total Delay		13.7									3.1	
LOS		B									A	
Approach Delay		13.7									3.1	
Approach LOS		B									A	
Queue Length 50th (ft)		74									0	
Queue Length 95th (ft)		92									m1	
Internal Link Dist (ft)		895			350			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		1627									1396	
Starvation Cap Reductn		0									636	
Spillback Cap Reductn		0									0	

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	3
Permitted Phases			
Minimum Split (s)	46.0	35.0	9.0
Total Split (s)	46.0	35.0	9.0
Total Split (%)	51%	39%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	1.8	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
Timing Plan: Friday Evening
Synchro 8 Report

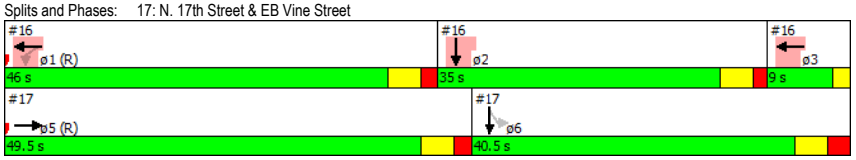
Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.28									0.74	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 7.9	Intersection LOS: A
Intersection Capacity Utilization 73.8%	ICU Level of Service D
Analysis Period (min) 15	

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

Splits and Phases: 17: N. 17th Street & EB Vine Street



Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Storage Cap Reductn			
Reduced v/c Ratio			

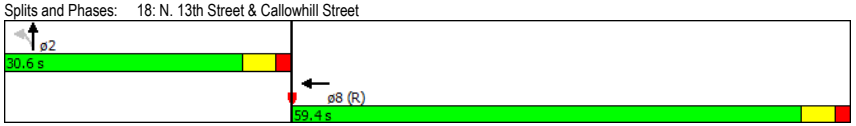
Intersection Summary

Timings
18: N. 13th Street & Callowhill Street

Lane Group	WBT	NBT
Lane Configurations		
Volume (vph)	155	162
Lane Group Flow (vph)	190	222
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Minimum Split (s)	59.4	30.6
Total Split (s)	59.4	30.6
Total Split (%)	66.0%	34.0%
Yellow Time (s)	3.6	3.6
All-Red Time (s)	1.8	1.8
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.4	5.4
Lead/Lag		
Lead-Lag Optimize?		
v/c Ratio	0.10	0.49
Control Delay	7.0	14.9
Queue Delay	0.0	0.0
Total Delay	7.0	14.9
Queue Length 50th (ft)	19	36
Queue Length 95th (ft)	33	66
Internal Link Dist (ft)	195	480
Turn Bay Length (ft)		
Base Capacity (vph)	1842	450
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.10	0.49

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 90
Control Type: Pretimed

Splits and Phases: 18: N. 13th Street & Callowhill Street



HCM 2010 Signalized Intersection Summary
18: N. 13th Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	155	18	40	162	0	0	0	0
Number				3	8	18	5	2	12			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.96	1.00		1.00			
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln				0.0	185.3	189.0	189.0	185.3	0.0			
Lanes				0	2	0	0	1	0			
Cap, veh/h				0	1947	225	102	412	0			
Arrive On Green				0.00	0.60	0.60	0.28	0.28	0.00			
Sat Flow, veh/h				0	3245	375	364	1471	0			
Grp Volume(v), veh/h				0	96	94	222	0	0			
Grp Sat Flow(s),veh/h/ln				0	1853	1768	1835	1853	0			
Q Serve(g_s), s				0.0	2.0	2.0	8.9	0.0	0.0			
Cycle Q Clear(g_c), s				0.0	2.0	2.0	8.9	0.0	0.0			
Prop In Lane				0.00		0.21	0.20		0.00			
Lane Grp Cap(c), veh/h				0	1112	1061	514	0	0			
V/C Ratio(X)				0.00	0.09	0.09	0.43	0.00	0.00			
Avail Cap(c_a), veh/h				0	1112	1061	514	0	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	7.6	7.6	26.5	0.0	0.0			
Incr Delay (d2), s/veh				0.0	0.2	0.2	2.6	0.0	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln				0.0	1.5	1.5	6.6	0.0	0.0			
Lane Grp Delay (d), s/veh				0.0	7.7	7.8	29.2	0.0	0.0			
Lane Grp LOS					A	A	C					
Approach Vol, veh/h					190			222				
Approach Delay, s/veh					7.8			29.2				
Approach LOS					A			C				

Timer	
Assigned Phs	8	2
Phs Duration (G+Y+Rc), s	59.4	30.6
Change Period (Y+Rc), s	5.4	5.4
Max Green Setting (Gmax), s	54.0	25.2
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	19.3
HCM 2010 LOS	B

Notes

Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	572	49	67	144	0	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	11	12	11	10	12	12	10	12
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					0.99		0.94					
Frt					0.988							
Flt Protected							0.950					
Satd. Flow (prot)	0	0	0	0	4637	0	1702	1729	0	0	0	0
Flt Permitted							0.950					
Satd. Flow (perm)	0	0	0	0	4637	0	1604	1729	0	0	0	0
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Satd. Flow (RTOR)					22		73					
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		605			275			170			560	
Travel Time (s)		16.5			6.3			3.9			12.7	
Confl. Peds. (#/hr)	73					73	70		58	58		70
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Parking (#/hr)					0							
Adj. Flow (vph)	0	0	0	0	622	53	73	157	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	675	0	73	157	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					1			2				
Permitted Phases							2					
Minimum Split (s)					51.0		39.0	39.0				
Total Split (s)					51.0		39.0	39.0				
Total Split (%)					56.7%		43.3%	43.3%				
Yellow Time (s)					3.7		3.5	3.5				
All-Red Time (s)					1.8		2.5	2.5				
Lost Time Adjust (s)					0.0		0.0	0.0				
Total Lost Time (s)					5.5		6.0	6.0				
Lead/Lag					Lead		Lag	Lag				
Lead-Lag Optimize?					Yes		Yes	Yes				
Act Effct Green (s)					45.5		33.0	33.0				
Actuated g/C Ratio					0.51		0.37	0.37				
v/c Ratio					0.29		0.12	0.25				
Control Delay					12.8		1.1	12.0				
Queue Delay					0.0		0.8	1.9				
Total Delay					12.8		1.9	14.0				
LOS					B		A	B				
Approach Delay					12.8			10.1				
Approach LOS					B			B				
Queue Length 50th (ft)					74		0	30				
Queue Length 95th (ft)					99		5	50				
Internal Link Dist (ft)		525			195			90			480	
Turn Bay Length (ft)												
Base Capacity (vph)					2355		634	633				
Starvation Cap Reductn					0		391	345				

Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	7
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	2.0	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
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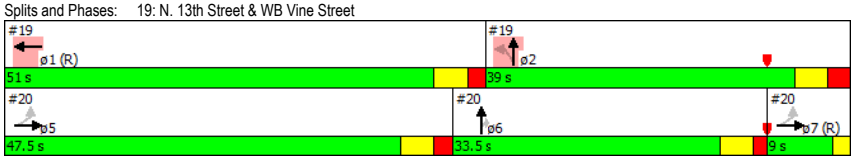
Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.29		0.30	0.55				

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 7:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.30	
Intersection Signal Delay: 12.1	Intersection LOS: B
Intersection Capacity Utilization 110.0%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 19: N. 13th Street & WB Vine Street



Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
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Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	64	507	0	0	0	0	0	147	65	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	11	9	12	12	12
Lane Util. Factor	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.93			
Frt									0.850			
Flt Protected		0.994										
Satd. Flow (prot)	0	5028	0	0	0	0	0	1612	1417	0	0	0
Flt Permitted		0.994										
Satd. Flow (perm)	0	5027	0	0	0	0	0	1612	1320	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		41							103			
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		442			275			430			170	
Travel Time (s)		12.1			6.3			9.8			3.9	
Confl. Peds. (#/hr)	4		43	43		4	64		61	61		64
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Parking (#/hr)								0				
Adj. Flow (vph)	67	528	0	0	0	0	0	153	68	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	595	0	0	0	0	0	153	68	0	0	0
Turn Type	Perm	NA						NA	Perm			
Protected Phases		5 7						6				
Permitted Phases	5 7								6			
Minimum Split (s)								33.5	33.5			
Total Split (s)								33.5	33.5			
Total Split (%)								37.2%	37.2%			
Yellow Time (s)								3.5	3.5			
All-Red Time (s)								1.5	1.5			
Lost Time Adjust (s)								0.0	0.0			
Total Lost Time (s)								5.0	5.0			
Lead/Lag								Lag	Lag			
Lead-Lag Optimize?								Yes	Yes			
Act Effct Green (s)		51.0						28.5	28.5			
Actuated g/C Ratio		0.57						0.32	0.32			
v/c Ratio		0.21						0.30	0.14			
Control Delay		4.9						25.2	2.6			
Queue Delay		0.0						0.0	0.0			
Total Delay		4.9						25.3	2.6			
LOS		A						C	A			
Approach Delay		4.9						18.3				
Approach LOS		A						B				
Queue Length 50th (ft)		27						65	0			
Queue Length 95th (ft)		m32						116	14			
Internal Link Dist (ft)		362			195			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		2866						510	488			
Starvation Cap Reductn		0						0	0			

Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Lane Configurations				
Volume (vph)				
Ideal Flow (vphpl)				
Lane Width (ft)				
Lane Util. Factor				
Ped Bike Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Confl. Peds. (#/hr)				
Peak Hour Factor				
Parking (#/hr)				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	2	5	7
Permitted Phases				
Minimum Split (s)	51.0	39.0	47.5	9.0
Total Split (s)	51.0	39.0	47.5	9.0
Total Split (%)	57%	43%	53%	10%
Yellow Time (s)	3.7	3.5	3.5	2.0
All-Red Time (s)	1.8	2.5	2.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				

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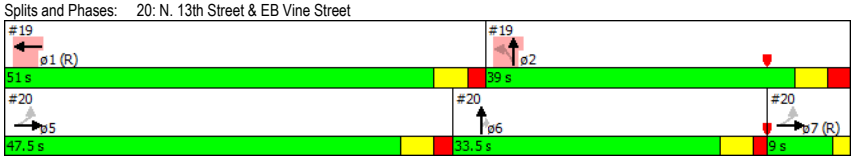
Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0						7	0			
Storage Cap Reductn		0						0	0			
Reduced v/c Ratio		0.21						0.30	0.14			

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 7:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.30	
Intersection Signal Delay: 8.5	Intersection LOS: A
Intersection Capacity Utilization 103.5%	ICU Level of Service G
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 20: N. 13th Street & EB Vine Street



Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

Projected (Build) Conditions - Recommended Improvements
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Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	425	0	0	0	0	0	571	388	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.99			
Frt									0.850			
Flt Protected		0.995										
Satd. Flow (prot)	0	3415	0	0	0	0	0	4961	1575	0	0	0
Flt Permitted		0.995										
Satd. Flow (perm)	0	3415	0	0	0	0	0	4961	1552	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24							368			
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		430			378			430			170	
Travel Time (s)		11.7			10.3			11.7			4.6	
Confl. Peds. (#/hr)	3		10	10		3	366		3	3		366
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	20%	3%	2%	2%	2%	2%	2%	4%	2%	2%	2%	2%
Adj. Flow (vph)	48	457	0	0	0	0	0	614	417	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	505	0	0	0	0	0	614	417	0	0	0
Turn Type	Perm	NA						NA	Perm			
Protected Phases		5 7						6				
Permitted Phases	5 7								6			
Minimum Split (s)								33.5	33.5			
Total Split (s)								33.5	33.5			
Total Split (%)								37.2%	37.2%			
Yellow Time (s)								3.5	3.5			
All-Red Time (s)								1.5	1.5			
Lost Time Adjust (s)								0.0	0.0			
Total Lost Time (s)								5.0	5.0			
Lead/Lag								Lag	Lag			
Lead-Lag Optimize?												
Act Effct Green (s)		51.2						28.5	28.5			
Actuated g/C Ratio		0.57						0.32	0.32			
v/c Ratio		0.26						0.39	0.56			
Control Delay		6.6						24.9	7.5			
Queue Delay		0.0						0.0	0.0			
Total Delay		6.6						24.9	7.5			
LOS		A						C	A			
Approach Delay		6.6						17.9				
Approach LOS		A						B				
Queue Length 50th (ft)		47						98	20			
Queue Length 95th (ft)		63						131	96			
Internal Link Dist (ft)		350			298			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		1953						1570	742			
Starvation Cap Reductn		0						0	0			
Spillback Cap Reductn		0						0	0			

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Lane Configurations				
Volume (vph)				
Ideal Flow (vphpl)				
Lane Util. Factor				
Ped Bike Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Confl. Peds. (#/hr)				
Peak Hour Factor				
Heavy Vehicles (%)				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	2	5	7
Permitted Phases				
Minimum Split (s)	51.0	39.0	47.5	9.0
Total Split (s)	51.0	39.0	47.5	9.0
Total Split (%)	57%	43%	53%	10%
Yellow Time (s)	3.5	3.5	3.5	2.0
All-Red Time (s)	1.8	2.5	1.8	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lead	
Lead-Lag Optimize?				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				

Projected (Build) Conditions - Recommended Improvements
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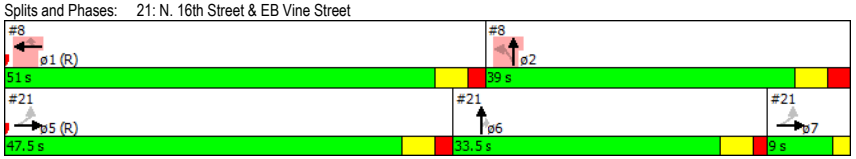
Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn		0						0	0			
Reduced v/c Ratio		0.26						0.39	0.56			

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 68.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 21: N. 16th Street & EB Vine Street



Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

Projected (Build) Conditions - Recommended Improvements
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SATURDAY EVENING (6-9 PM)
PEAK HOUR TIME PERIOD

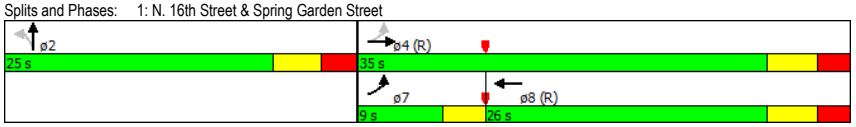
Timings
1: N. 16th Street & Spring Garden Street

Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Volume (vph)	56	406	394	230
Lane Group Flow (vph)	62	446	471	447
Turn Type	pm+pt	NA	NA	NA
Protected Phases	7	4	8	2
Permitted Phases	4			
Minimum Split (s)	9.0	35.0	26.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?				
v/c Ratio	0.15	0.29	0.45	0.46
Control Delay	5.1	8.2	27.4	15.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.1	8.2	27.4	15.1
Queue Length 50th (ft)	6	25	83	76
Queue Length 95th (ft)	m12	60	127	118
Internal Link Dist (ft)		350	380	990
Turn Bay Length (ft)	140			
Base Capacity (vph)	417	1550	1040	980
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	0.29	0.45	0.46

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: N. 16th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
1: N. 16th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	56	406	0	0	394	35	81	230	96	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.98		1.00	1.00		0.94	1.00		0.84			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln	185.3	185.3	0.0	0.0	183.4	187.1	186.2	182.5	186.2			
Lanes	1	2	0	0	2	0	0	2	0			
Cap, veh/h	492	1791	0	0	1048	91	204	589	252			
Arrive On Green	0.20	0.97	0.00	0.00	0.11	0.11	0.32	0.32	0.32			
Sat Flow, veh/h	1765	3706	0	0	3144	274	643	1859	794			
Grp Volume(v), veh/h	62	446	0	0	252	219	248	0	199			
Grp Sat Flow(s),veh/h/ln	1765	1853	0	0	1834	1583	1793	0	1504			
Q Serve(g_s), s	1.1	0.3	0.0	0.0	7.7	7.8	6.6	0.0	6.2			
Cycle Q Clear(g_c), s	1.1	0.3	0.0	0.0	7.7	7.8	6.6	0.0	6.2			
Prop In Lane	1.00		0.00	0.00		0.17	0.36		0.53			
Lane Grp Cap(c), veh/h	492	1791	0	0	611	528	568	0	476			
V/C Ratio(X)	0.13	0.25	0.00	0.00	0.41	0.42	0.44	0.00	0.42			
Avail Cap(c_a), veh/h	492	1791	0	0	611	528	568	0	476			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	8.6	0.5	0.0	0.0	21.2	21.3	16.3	0.0	16.1			
Incr Delay (d2), s/veh	0.5	0.3	0.0	0.0	2.0	2.4	2.4	0.0	2.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln	0.8	0.3	0.0	0.0	6.2	5.6	4.9	0.0	4.2			
Lane Grp Delay (d), s/veh	9.1	0.9	0.0	0.0	23.3	23.7	18.7	0.0	18.8			
Lane Grp LOS	A	A			C	C	B		B			
Approach Vol, veh/h		508			471			447				
Approach Delay, s/veh		1.9			23.4			18.8				
Approach LOS		A			C			B				

Timer

Assigned Phs	7	4			8			2				
Phs Duration (G+Y+Rc), s	9.0	35.0			26.0			25.0				
Change Period (Y+Rc), s	3.0	6.0			6.0			6.0				
Max Green Setting (Gmax), s	6.0	29.0			20.0			19.0				
Max Q Clear Time (g_c+I1), s	0.0	0.0			0.0			0.0				
Green Ext Time (p_c), s	0.0	0.0			0.0			0.0				

Intersection Summary

HCM 2010 Ctrl Delay			14.3									
HCM 2010 LOS			B									

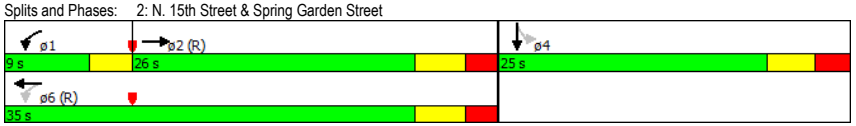
Notes

Timings
2: N. 15th Street & Spring Garden Street

Lane Group	EBT	WBL	WBT	SBL	SBT
Lane Configurations					
Volume (vph)	466	87	389	33	150
Lane Group Flow (vph)	524	91	405	34	200
Turn Type	NA	pm+pt	NA	Perm	NA
Protected Phases	2	1	6		4
Permitted Phases		6		4	
Minimum Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (%)	43.3%	15.0%	58.3%	41.7%	41.7%
Yellow Time (s)	3.6	3.0	3.6	3.4	3.4
All-Red Time (s)	2.4	0.0	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	3.0	6.0	6.0	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?					
v/c Ratio	0.47	0.24	0.26	0.07	0.43
Control Delay	11.4	8.6	9.8	14.9	19.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.4	8.6	9.8	14.9	19.7
Queue Length 50th (ft)	49	15	42	8	56
Queue Length 95th (ft)	90	34	66	25	108
Internal Link Dist (ft)	380		400		290
Turn Bay Length (ft)		115		100	
Base Capacity (vph)	1104	387	1534	476	470
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	0.47	0.24	0.26	0.07	0.43

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 15 (25%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 2: N. 15th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
2: N. 15th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	466	37	87	389	0	0	0	0	33	150	42
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	0.98		1.00				1.00		0.96
Parking Bus Adj	1.00	1.00	0.90	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.2	189.0	183.4	183.4	0.0				177.9	185.3	189.0
Lanes	0	2	0	1	2	0				1	1	0
Cap, veh/h	0	1066	85	529	1773	0				536	436	123
Arrive On Green	0.00	0.67	0.67	0.10	0.48	0.00				0.32	0.32	0.32
Sat Flow, veh/h	0	3197	256	1747	3669	0				1694	1376	388
Grp Volume(v), veh/h	0	280	244	91	405	0				34	0	200
Grp Sat Flow(s),veh/h/ln	0	1852	1602	1747	1834	0				1694	1853	1765
Q Serve(g_s), s	0.0	4.3	4.4	1.8	3.8	0.0				0.8	0.0	5.2
Cycle Q Clear(g_c), s	0.0	4.3	4.4	1.8	3.8	0.0				0.8	0.0	5.2
Prop In Lane	0.00		0.16	1.00		0.00				1.00		0.22
Lane Grp Cap(c), veh/h	0	617	534	529	1773	0				536	0	559
V/C Ratio(X)	0.00	0.45	0.46	0.17	0.23	0.00				0.06	0.00	0.36
Avail Cap(c_a), veh/h	0	617	534	529	1773	0				536	0	559
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	7.4	7.4	9.4	9.0	0.0				14.3	0.0	15.8
Incr Delay (d2), s/veh	0.0	2.4	2.8	0.7	0.3	0.0				0.2	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	3.2	2.9	1.3	2.8	0.0				0.6	0.0	4.0
Lane Grp Delay (d), s/veh	0.0	9.8	10.2	10.1	9.3	0.0				14.5	0.0	17.6
Lane Grp LOS		A	B	B	A					B		B
Approach Vol, veh/h		524			496						234	
Approach Delay, s/veh		10.0			9.4						17.1	
Approach LOS		A			A						B	

Timer												
Assigned Phs		2		1	6						4	
Phs Duration (G+Y+Rc), s		26.0		9.0	35.0						25.0	
Change Period (Y+Rc), s		6.0		3.0	6.0						6.0	
Max Green Setting (Gmax), s		20.0		6.0	29.0						19.0	
Max Q Clear Time (g_c+I1), s		0.0		0.0	0.0						0.0	
Green Ext Time (p_c), s		0.0		0.0	0.0						0.0	

Intersection Summary	
HCM 2010 Ctrl Delay	11.1
HCM 2010 LOS	B

Notes

Lanes, Volumes, Timings
3: Franklin Town Boulevard & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	106	33	80	25	158	47	11	19	8	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	11	12	12	12	12	12	16	12	12	12	12
Grade (%)		-1%			2%			3%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.951			0.972			0.971				
Flt Protected		0.976			0.995			0.986				
Satd. Flow (prot)	0	1671	0	0	1597	0	0	1782	0	0	0	0
Flt Permitted		0.976			0.995			0.986				
Satd. Flow (perm)	0	1671	0	0	1597	0	0	1782	0	0	0	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		646			325			647			208	
Travel Time (s)		17.6			8.9			17.6			5.7	
Confl. Peds. (#/hr)	41		85	85		41	71		41	41		71
Confl. Bikes (#/hr)			7			4						
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Parking (#/hr)					0			0				
Adj. Flow (vph)	128	40	96	30	190	57	13	23	10	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	264	0	0	277	0	0	46	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.05	1.00	1.02	1.17	1.02	1.03	1.00	1.03	1.01	1.01	1.01
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	CBD		
Control Type: Unsignalized			
Intersection Capacity Utilization 50.3%		ICU Level of Service A	
Analysis Period (min) 15			

HCM 2010 AWSC
3: Franklin Town Boulevard & Callowhill Street

Intersection	
Intersection Delay, s/veh	9.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	106	33	80	25	158	47	11	19	8	0	0	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	128	40	96	30	190	57	13	23	10	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.1	9.2	8.4
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	29%	48%	11%
Vol Thru, %	50%	15%	69%
Vol Right, %	21%	37%	20%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	38	219	230
LT Vol	19	33	158
Through Vol	8	80	47
RT Vol	11	106	25
Lane Flow Rate	46	264	277
Geometry Grp	1	1	1
Degree of Util (X)	0.064	0.308	0.317
Departure Headway (Hd)	5.007	4.204	4.224
Convergence, Y/N	Yes	Yes	Yes
Cap	718	860	856
Service Time	3.019	2.21	2.224
HCM Lane V/C Ratio	0.064	0.307	0.324
HCM Control Delay	8.4	9.1	9.2
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.2	1.3	1.4

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
4: N. 17th Street & Callowhill Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	29	86	135	0	0	0	0	0	194	91
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	11	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			-4%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.865								0.957	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	1443	1693	1659	0	0	0	0	0	1542	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	1443	1693	1659	0	0	0	0	0	1542	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		325			430			230			1070	
Travel Time (s)		8.9			11.7			6.3			29.2	
Confl. Peds. (#/hr)	39		44	44		39	5		5	5		5
Confl. Bikes (#/hr)			4									1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	5	0
Parking (#/hr)			0		0						0	
Adj. Flow (vph)	0	0	32	96	150	0	0	0	0	0	216	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	32	96	150	0	0	0	0	0	317	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.15	1.06	1.16	1.01	1.01	1.01	1.01	0.98	1.20	0.98
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	CBD
Control Type: Unsignalized	
Intersection Capacity Utilization 45.8%	ICU Level of Service A
Analysis Period (min) 15	

HCM 2010 AWSC
4: N. 17th Street & Callowhill Street

Intersection	
Intersection Delay, s/veh	9.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	0	0	29	86	135	0	0	0	0	0	194	91
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	32	96	150	0	0	0	0	0	216	101
Number of Lanes	0	0	1	1	1	0	0	0	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.7	9.6	10.3
HCM LOS	A	A	B

Lane	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	100%	0%	0%
Vol Thru, %	0%	0%	100%	68%
Vol Right, %	100%	0%	0%	32%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	29	86	135	285
LT Vol	0	0	135	194
Through Vol	29	0	0	91
RT Vol	0	86	0	0
Lane Flow Rate	32	96	150	317
Geometry Grp	5	7	7	2
Degree of Util (X)	0.04	0.154	0.221	0.391
Departure Headway (Hd)	4.487	5.8	5.296	4.442
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	793	617	677	811
Service Time	2.544	3.547	3.043	2.468
HCM Lane V/C Ratio	0.04	0.156	0.222	0.391
HCM Control Delay	7.7	9.6	9.6	10.3
HCM Lane LOS	A	A	A	B
HCM 95th-tile Q	0.1	0.5	0.8	1.9

Notes

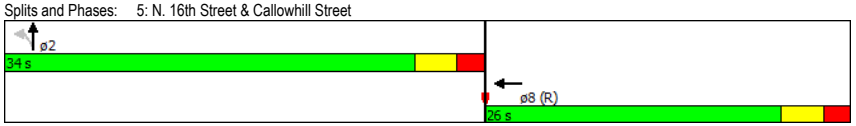
~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Timings
5: N. 16th Street & Callowhill Street

Lane Group	WBT	NBT
Lane Configurations		
Volume (vph)	183	636
Lane Group Flow (vph)	354	757
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Minimum Split (s)	26.0	34.0
Total Split (s)	26.0	34.0
Total Split (%)	43.3%	56.7%
Yellow Time (s)	3.0	3.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
v/c Ratio	0.34	0.46
Control Delay	18.9	10.8
Queue Delay	0.0	0.0
Total Delay	18.9	10.8
Queue Length 50th (ft)	50	84
Queue Length 95th (ft)	80	123
Internal Link Dist (ft)	380	136
Turn Bay Length (ft)		
Base Capacity (vph)	1055	1655
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.34	0.46

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 17 (28%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 5: N. 16th Street & Callowhill Street



HCM 2010 Signalized Intersection Summary
5: N. 16th Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	183	136	45	636	0	0	0	0
Number				3	8	18	5	2	12			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.72	1.00		1.00			
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln				0.0	185.3	189.0	187.1	183.4	0.0			
Lanes				0	2	0	0	2	0			
Cap, veh/h				0	649	395	111	1656	0			
Arrive On Green				0.00	0.12	0.12	0.48	0.48	0.00			
Sat Flow, veh/h				0	1853	1129	231	3427	0			
Grp Volume(v), veh/h				0	203	151	395	362	0			
Grp Sat Flow(s),veh/h/ln				0	1853	1129	1823	1834	0			
Q Serve(g_s), s				0.0	6.0	7.4	8.6	7.6	0.0			
Cycle Q Clear(g_c), s				0.0	6.0	7.4	8.6	7.6	0.0			
Prop In Lane				0.00		1.00	0.13		0.00			
Lane Grp Cap(c), veh/h				0	649	395	881	887	0			
V/C Ratio(X)				0.00	0.31	0.38	0.45	0.41	0.00			
Avail Cap(c_a), veh/h				0	649	395	881	887	0			
HCM Platoon Ratio				1.00	0.33	0.33	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh				0.0	19.9	20.5	10.2	10.0	0.0			
Incr Delay (d2), s/veh				0.0	1.3	2.8	1.7	1.4	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln				0.0	4.9	4.2	5.7	5.1	0.0			
Lane Grp Delay (d), s/veh				0.0	21.2	23.3	11.9	11.4	0.0			
Lane Grp LOS					C	C	B	B				
Approach Vol, veh/h					354			757				
Approach Delay, s/veh					22.1			11.6				
Approach LOS					C			B				

Timer	
Assigned Phs	8	2
Phs Duration (G+Y+Rc), s	26.0	34.0
Change Period (Y+Rc), s	5.0	5.0
Max Green Setting (Gmax), s	21.0	29.0
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	15.0
HCM 2010 LOS	B

Notes

HCM 2010 Signals-Pedestrians
5: N. 16th Street & Callowhill Street

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	23.0	24.0	24.0	24.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	2	2	2
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	0	2	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	25	25	25
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	30.0	30.0	30.0	30.0
Pedestrian Compliance Code	Fair	Fair	Fair	Fair
Pedestrian Crosswalk Score	1.81	1.85	2.02	2.06
Pedestrian Crosswalk LOS	A	A	B	B

HCM 2010 Signals-Bicycles
5: N. 16th Street & Callowhill Street

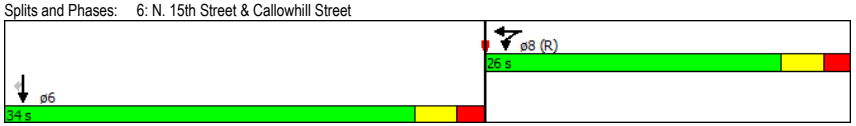
Approach	EB	WB	NB	SB
Bicycle Flow Rate (bike/h)	0	0	0	0
Total Flow Rate (veh/h)	0	354	757	0
Effct. Green for Bike (s)	0.0	21.0	29.0	0.0
Cross Street Width (ft)	24.0	24.0	24.0	23.0
Through Lanes Number	0	2	2	0
Through Lane Width (ft)	12.0	12.0	12.0	12.0
Bicycle Lane Width (ft)	0.0	0.0	0.0	0.0
Paved Shoulder Width (ft)	0.0	0.0	0.0	0.0
Curb Is Present?	No	No	No	No
On Street Parking?	No	No	No	No
Bicycle Lane Capacity (bike/h)	0	700	967	0
Bicycle Delay (s/bike)	0.0	12.7	8.0	0.0
Bicycle Compliance		Fair	Good	
Bicycle LOS Score	0.00	2.22	2.55	0.00
Bicycle LOS		B	B	

Timings
6: N. 15th Street & Callowhill Street

Lane Group	WBT	SBT	SBR
Lane Configurations			
Volume (vph)	279	444	89
Lane Group Flow (vph)	402	477	96
Turn Type	NA	NA	Perm
Protected Phases	8	6	
Permitted Phases			6
Minimum Split (s)	26.0	34.0	34.0
Total Split (s)	26.0	34.0	34.0
Total Split (%)	43.3%	56.7%	56.7%
Yellow Time (s)	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0
Lead/Lag			
Lead-Lag Optimize?			
v/c Ratio	0.34	0.60	0.12
Control Delay	14.0	13.3	2.3
Queue Delay	0.0	0.0	0.0
Total Delay	14.0	13.3	2.3
Queue Length 50th (ft)	49	99	0
Queue Length 95th (ft)	80	157	15
Internal Link Dist (ft)	400	990	
Turn Bay Length (ft)			100
Base Capacity (vph)	1178	790	808
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.34	0.60	0.12

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 34 (57%), Referenced to phase 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 6: N. 15th Street & Callowhill Street



HCM 2010 Signalized Intersection Summary
6: N. 15th Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	95	279	0	0	0	0	0	444	89
Number				3	8	18				1	6	16
Initial Q (Qb), veh				0	0	0				0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00				1.00		0.98
Parking Bus Adj				1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln				189.0	185.3	0.0				0.0	188.1	188.1
Lanes				0	2	0				0	1	1
Cap, veh/h				309	972	0				0	909	759
Arrive On Green				0.35	0.35	0.00				0.00	0.16	0.16
Sat Flow, veh/h				883	2778	0				0	1881	1570
Grp Volume(v), veh/h				209	193	0				0	477	96
Grp Sat Flow(s),veh/h/ln				1809	1853	0				0	1881	1570
Q Serve(g_s), s				5.1	4.5	0.0				0.0	14.0	3.1
Cycle Q Clear(g_c), s				5.1	4.5	0.0				0.0	14.0	3.1
Prop In Lane				0.49		0.00				0.00		1.00
Lane Grp Cap(c), veh/h				633	649	0				0	909	759
V/C Ratio(X)				0.33	0.30	0.00				0.00	0.52	0.13
Avail Cap(c_a), veh/h				633	649	0				0	909	759
HCM Platoon Ratio				1.00	1.00	1.00				1.00	0.33	0.33
Upstream Filter(I)				1.00	1.00	0.00				0.00	1.00	1.00
Uniform Delay (d), s/veh				14.3	14.1	0.0				0.0	18.9	14.4
Incr Delay (d2), s/veh				1.4	1.2	0.0				0.0	2.2	0.3
Initial Q Delay(d3),s/veh				0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (85%), veh/ln				3.9	3.6	0.0				0.0	10.3	2.2
Lane Grp Delay (d), s/veh				15.7	15.3	0.0				0.0	21.1	14.7
Lane Grp LOS				B	B						C	B
Approach Vol, veh/h					402						573	
Approach Delay, s/veh					15.5						20.0	
Approach LOS					B						B	

Timer			
Assigned Phs		8	6
Phs Duration (G+Y+Rc), s		26.0	34.0
Change Period (Y+Rc), s		5.0	5.0
Max Green Setting (Gmax), s		21.0	29.0
Max Q Clear Time (g_c+I1), s		0.0	0.0
Green Ext Time (p_c), s		0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	18.2
HCM 2010 LOS	B

Notes

HCM 2010 Signals-Pedestrians
6: N. 15th Street & Callowhill Street

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	24.0	24.0	24.0	23.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	2	2	2
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	6	0	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	25	25	25
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	30.0	30.0	30.0	30.0
Pedestrian Compliance Code	Fair	Fair	Fair	Fair
Pedestrian Crosswalk Score	1.87	1.87	1.94	1.94
Pedestrian Crosswalk LOS	A	A	A	A

HCM 2010 Signals-Bicycles
6: N. 15th Street & Callowhill Street

Approach	EB	WB	NB	SB
Bicycle Flow Rate (bike/h)	0	0	0	0
Total Flow Rate (veh/h)	0	402	0	573
Effct. Green for Bike (s)	0.0	21.0	0.0	29.0
Cross Street Width (ft)	24.0	23.0	24.0	24.0
Through Lanes Number	0	2	0	1
Through Lane Width (ft)	12.0	12.0	12.0	11.0
Bicycle Lane Width (ft)	0.0	0.0	0.0	0.0
Paved Shoulder Width (ft)	0.0	0.0	0.0	0.0
Curb Is Present?	No	No	No	No
On Street Parking?	No	No	No	No
Bicycle Lane Capacity (bike/h)	0	700	0	967
Bicycle Delay (s/bike)	0.0	12.7	0.0	8.0
Bicycle Compliance		Fair		Good
Bicycle LOS Score	0.00	2.24	0.00	3.09
Bicycle LOS		B		C

Timings
7: N. Broad Street & Callowhill Street

Lane Group	WBL	WBT	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	46	148	172	603	678	90
Lane Group Flow (vph)	47	183	177	622	699	93
Turn Type	Perm	NA	pm+pt	NA	NA	Perm
Protected Phases		8	5	2	6	
Permitted Phases	8		2			6
Minimum Split (s)	29.0	29.0	9.0	57.0	37.0	37.0
Total Split (s)	29.0	29.0	9.0	61.0	52.0	52.0
Total Split (%)	32.2%	32.2%	10.0%	67.8%	57.8%	57.8%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	0.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	3.0	5.0	5.0	5.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
v/c Ratio	0.15	0.22	0.42	0.31	0.41	0.16
Control Delay	28.8	28.5	23.3	21.8	8.3	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.8	28.5	23.3	21.8	8.3	7.9
Queue Length 50th (ft)	23	48	91	172	57	14
Queue Length 95th (ft)	55	79	149	228	73	27
Internal Link Dist (ft)		525		160	990	
Turn Bay Length (ft)			125			100
Base Capacity (vph)	322	817	420	1995	1707	567
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	0.15	0.22	0.42	0.31	0.41	0.16

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 47 (52%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Pretimed

Splits and Phases: 7: N. Broad Street & Callowhill Street

HCM 2010 Signalized Intersection Summary
7: N. Broad Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	46	148	29	172	603	0	0	678	90
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.77	0.90		1.00	1.00		0.69
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln				182.5	182.5	186.2	181.6	181.6	0.0	0.0	186.2	186.2
Lanes				1	2	0	1	2	0	0	2	1
Cap, veh/h				444	729	134	536	2260	0	0	1945	568
Arrive On Green				0.08	0.08	0.08	0.07	0.62	0.00	0.00	1.00	1.00
Sat Flow, veh/h				1738	2852	524	1729	3632	0	0	3724	1087
Grp Volume(v), veh/h				47	94	89	177	622	0	0	699	93
Grp Sat Flow(s),veh/h/ln				1738	1825	1550	1729	1816	0	0	1862	1087
Q Serve(g_s), s				2.2	4.3	4.8	4.0	7.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s				2.2	4.3	4.8	4.0	7.0	0.0	0.0	0.0	0.0
Prop In Lane				1.00		0.34	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				444	466	396	536	2260	0	0	1945	568
V/C Ratio(X)				0.11	0.20	0.22	0.33	0.28	0.00	0.00	0.36	0.16
Avail Cap(c_a), veh/h				444	466	396	536	2260	0	0	1945	568
HCM Platoon Ratio				0.33	0.33	0.33	1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(I)				1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				31.7	32.7	32.9	7.6	7.7	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh				0.5	1.0	1.3	1.6	0.3	0.0	0.0	0.5	0.6
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (85%), veh/ln				1.9	3.7	3.6	3.1	4.6	0.0	0.0	0.3	0.2
Lane Grp Delay (d), s/veh				32.2	33.6	34.2	9.3	8.1	0.0	0.0	0.5	0.6
Lane Grp LOS				C	C	C	A	A			A	A
Approach Vol, veh/h					230			799			792	
Approach Delay, s/veh					33.5			8.3			0.5	
Approach LOS					C			A			A	

Timer

Assigned Phs					8		5	2			6	
Phs Duration (G+Y+Rc), s					29.0		9.0	61.0			52.0	
Change Period (Y+Rc), s					6.0		3.0	5.0			5.0	
Max Green Setting (Gmax), s					23.0		6.0	56.0			47.0	
Max Q Clear Time (g_c+I1), s					0.0		0.0	0.0			0.0	
Green Ext Time (p_c), s					0.0		0.0	0.0			0.0	

Intersection Summary

HCM 2010 Ctrl Delay		8.1
HCM 2010 LOS		A

Notes

HCM 2010 Signals-Pedestrians
7: N. Broad Street & Callowhill Street

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	25.0	32.2	56.2	66.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	3	5	5
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	6	2	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	25	25	25	25
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	45.0	45.0	45.0	45.0
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	1.90	2.01	2.56	2.54
Pedestrian Crosswalk LOS	A	B	B	B

HCM 2010 Signals-Bicycles
7: N. Broad Street & Callowhill Street

Approach	EB	WB	NB	SB
Bicycle Flow Rate (bike/h)	0	0	0	0
Total Flow Rate (veh/h)	0	230	799	792
Effct. Green for Bike (s)	0.0	23.0	56.0	47.0
Cross Street Width (ft)	56.2	66.0	32.2	25.0
Through Lanes Number	0	2	2	2
Through Lane Width (ft)	12.0	11.0	10.0	10.0
Bicycle Lane Width (ft)	0.0	0.0	0.0	0.0
Paved Shoulder Width (ft)	0.0	0.0	0.0	0.0
Curb Is Present?	No	No	No	No
On Street Parking?	No	No	No	No
Bicycle Lane Capacity (bike/h)	0	511	1244	1044
Bicycle Delay (s/bike)	0.0	24.9	6.4	10.3
Bicycle Compliance		Fair	Good	Fair
Bicycle LOS Score	0.00	2.97	3.14	3.02
Bicycle LOS		C	C	C

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	563	787	73	466	0	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	11	12	11	12	12	12	12
Grade (%)		0%			0%			-1%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.88	0.91	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor						0.97		0.96				
Frt						0.850						
Flt Protected								0.993				
Satd. Flow (prot)	0	0	0	0	3521	2680	0	4880	0	0	0	0
Flt Permitted								0.993				
Satd. Flow (perm)	0	0	0	0	3521	2599	0	4663	0	0	0	0
Right Turn on Red			Yes			No	Yes		Yes			Yes
Satd. Flow (RTOR)								37				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		430			460			170			344	
Travel Time (s)		11.7			12.5			4.6			9.4	
Confl. Peds. (#/hr)	29		14	14		29	405		4	4		405
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	0	0	0	0	670	937	87	555	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	670	937	0	642	0	0	0	0
Turn Type					NA	Perm	Perm	NA				
Protected Phases					1			2				
Permitted Phases						1	2					
Minimum Split (s)					51.0	51.0	39.0	39.0				
Total Split (s)					51.0	51.0	39.0	39.0				
Total Split (%)					56.7%	56.7%	43.3%	43.3%				
Yellow Time (s)					3.5	3.5	3.5	3.5				
All-Red Time (s)					1.8	1.8	2.5	2.5				
Lost Time Adjust (s)					0.0	0.0		0.0				
Total Lost Time (s)					5.3	5.3		6.0				
Lead/Lag					Lead	Lead	Lag	Lag				
Lead-Lag Optimize?												
Act Effct Green (s)					45.7	45.7		33.0				
Actuated g/C Ratio					0.51	0.51		0.37				
v/c Ratio					0.37	0.71		0.37				
Control Delay					14.2	22.5		4.2				
Queue Delay					0.0	0.2		0.3				
Total Delay					14.2	22.6		4.5				
LOS					B	C		A				
Approach Delay					19.1			4.5				
Approach LOS					B			A				
Queue Length 50th (ft)					115	318		12				
Queue Length 95th (ft)					m138	m339		16				
Internal Link Dist (ft)		350			380			90			264	
Turn Bay Length (ft)												
Base Capacity (vph)					1787	1319		1733				
Starvation Cap Reductn					0	41		475				

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	7
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	1.8	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			

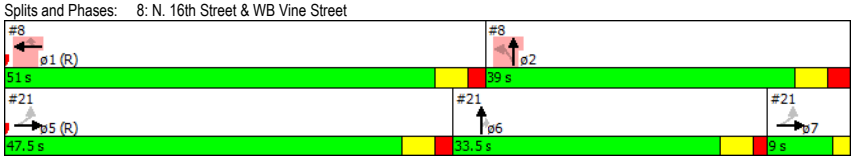
Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 Report

Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn					0	0		0				
Storage Cap Reductn					0	0		0				
Reduced v/c Ratio					0.37	0.73		0.51				

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 15.0	Intersection LOS: B
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 8: N. 16th Street & WB Vine Street



Lanes, Volumes, Timings
8: N. 16th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 Report

Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	42	622	0	0	0	0	0	1191	695
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			2%	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.86	0.86
Ped Bike Factor					1.00						0.99	
Frt											0.945	
Flt Protected					0.997							
Satd. Flow (prot)	0	0	0	0	3318	0	0	0	0	0	5723	0
Flt Permitted					0.997							
Satd. Flow (perm)	0	0	0	0	3317	0	0	0	0	0	5723	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					6						161	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		460			480			170			414	
Travel Time (s)		12.5			13.1			4.6			11.3	
Confl. Peds. (#/hr)	27		3	3		27	8		414	414		8
Confl. Bikes (#/hr)						3						2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Parking (#/hr)					0							
Adj. Flow (vph)	0	0	0	47	691	0	0	0	0	0	1323	772
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	738	0	0	0	0	0	2095	0
Turn Type				Perm	NA						NA	
Protected Phases					1 3						2	
Permitted Phases				1 3								
Minimum Split (s)											39.0	
Total Split (s)											39.0	
Total Split (%)											43.3%	
Yellow Time (s)											3.5	
All-Red Time (s)											1.5	
Lost Time Adjust (s)											0.0	
Total Lost Time (s)											5.0	
Lead/Lag											Lag	
Lead-Lag Optimize?												
Act Effct Green (s)					46.0						34.0	
Actuated g/C Ratio					0.51						0.38	
v/c Ratio					0.43						1.14dr	
Control Delay					12.5						33.3	
Queue Delay					0.0						0.5	
Total Delay					12.5						33.7	
LOS					B						C	
Approach Delay					12.5						33.7	
Approach LOS					B						C	
Queue Length 50th (ft)					78						305	
Queue Length 95th (ft)					84						#393	
Internal Link Dist (ft)		380			400			90			334	
Turn Bay Length (ft)												

Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø6	ø7
Lane Configurations					
Volume (vph)					
Ideal Flow (vphpl)					
Lane Width (ft)					
Grade (%)					
Lane Util. Factor					
Ped Bike Factor					
Frt					
Flt Protected					
Satd. Flow (prot)					
Flt Permitted					
Satd. Flow (perm)					
Right Turn on Red					
Satd. Flow (RTOR)					
Link Speed (mph)					
Link Distance (ft)					
Travel Time (s)					
Confl. Peds. (#/hr)					
Confl. Bikes (#/hr)					
Peak Hour Factor					
Parking (#/hr)					
Adj. Flow (vph)					
Shared Lane Traffic (%)					
Lane Group Flow (vph)					
Turn Type					
Protected Phases	1	3	5	6	7
Permitted Phases					
Minimum Split (s)	41.0	10.0	41.0	34.0	15.0
Total Split (s)	41.0	10.0	41.0	34.0	15.0
Total Split (%)	46%	11%	46%	38%	17%
Yellow Time (s)	3.5	3.0	3.5	3.5	3.0
All-Red Time (s)	1.5	0.0	1.5	0.0	2.0
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag	Lead		Lead	Lag	
Lead-Lag Optimize?					
Act Effct Green (s)					
Actuated g/C Ratio					
v/c Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Queue Length 50th (ft)					
Queue Length 95th (ft)					
Internal Link Dist (ft)					
Turn Bay Length (ft)					

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
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Synchro 8 Report

Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

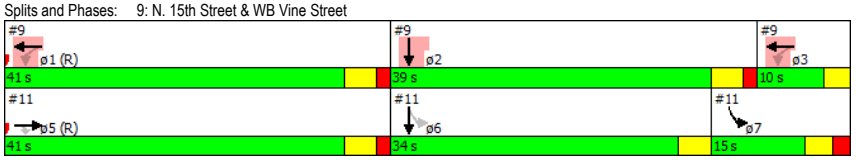
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)					1698						2262	
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					0						26	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.43						0.94	

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 28.2	Intersection LOS: C
Intersection Capacity Utilization 67.7%	ICU Level of Service C
Analysis Period (min) 15	

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

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 9: N. 15th Street & WB Vine Street



Lanes, Volumes, Timings
9: N. 15th Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø6	ø7
Base Capacity (vph)					
Starvation Cap Reductn					
Spillback Cap Reductn					
Storage Cap Reductn					
Reduced v/c Ratio					

Intersection Summary

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
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Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	129	600	130	0	684	0	0	615	75
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	11	12	12	10	12	12	10	12
Grade (%)		0%			1%			-1%			1%	
Storage Length (ft)	0		0	0		0	0		0	100		100
Storage Lanes	0		0	1		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.86	0.86
Ped Bike Factor						0.96					0.96	
Frt						0.850					0.984	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	0	1751	3386	1567	0	4732	0	0	5584	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	0	1751	3386	1500	0	4732	0	0	5584	0
Right Turn on Red			Yes			No			Yes			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		480			605			170			320	
Travel Time (s)		13.1			16.5			4.6			8.7	
Confl. Peds. (#/hr)	46					46	429		171	171		429
Confl. Bikes (#/hr)						4			11			16
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Bus Blockages (#/hr)	0	0	0	0	0	0	0	2	0	0	5	0
Adj. Flow (vph)	0	0	0	142	659	143	0	752	0	0	676	82
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	142	659	143	0	752	0	0	758	0
Turn Type				Perm	NA	Perm		NA			NA	
Protected Phases					1 3!			2			6!	
Permitted Phases				1 3!		1 3						
Minimum Split (s)								34.0			34.0	
Total Split (s)								36.0			36.0	
Total Split (%)								40.0%			40.0%	
Yellow Time (s)								2.4			3.6	
All-Red Time (s)								3.0			5.4	
Lost Time Adjust (s)								0.0			0.0	
Total Lost Time (s)								5.4			9.0	
Lead/Lag								Lead			Lead	
Lead-Lag Optimize?												
Act Effct Green (s)				44.0	44.0	44.0		30.6			27.0	
Actuated g/C Ratio				0.49	0.49	0.49		0.34			0.30	
v/c Ratio				0.17	0.40	0.20		0.47			0.45	
Control Delay				23.1	25.2	23.6		15.1			13.8	
Queue Delay				0.0	0.0	0.0		1.5			0.0	
Total Delay				23.1	25.2	23.6		16.7			13.8	
LOS				C	C	C		B			B	
Approach Delay					24.6			16.7			13.8	
Approach LOS					C			B			B	
Queue Length 50th (ft)				58	150	58		87			77	

Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø7	ø8
Lane Configurations					
Volume (vph)					
Ideal Flow (vphpl)					
Lane Width (ft)					
Grade (%)					
Storage Length (ft)					
Storage Lanes					
Taper Length (ft)					
Lane Util. Factor					
Ped Bike Factor					
Frt					
Flt Protected					
Satd. Flow (prot)					
Flt Permitted					
Satd. Flow (perm)					
Right Turn on Red					
Satd. Flow (RTOR)					
Link Speed (mph)					
Link Distance (ft)					
Travel Time (s)					
Confl. Peds. (#/hr)					
Confl. Bikes (#/hr)					
Peak Hour Factor					
Bus Blockages (#/hr)					
Adj. Flow (vph)					
Shared Lane Traffic (%)					
Lane Group Flow (vph)					
Turn Type					
Protected Phases	1	3	5	7	8
Permitted Phases					
Minimum Split (s)	40.0	14.0	40.0	48.0	14.0
Total Split (s)	40.0	14.0	40.0	50.0	14.0
Total Split (%)	44%	16%	44%	56%	16%
Yellow Time (s)	3.6	2.0	3.6	3.6	3.6
All-Red Time (s)	6.4	0.0	6.4	2.4	2.4
Lost Time Adjust (s)					
Total Lost Time (s)					
Lead/Lag		Lag			Lag
Lead-Lag Optimize?		Yes			
Act Effct Green (s)					
Actuated g/C Ratio					
v/c Ratio					
Control Delay					
Queue Delay					
Total Delay					
LOS					
Approach Delay					
Approach LOS					
Queue Length 50th (ft)					

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
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Synchro 8 Report

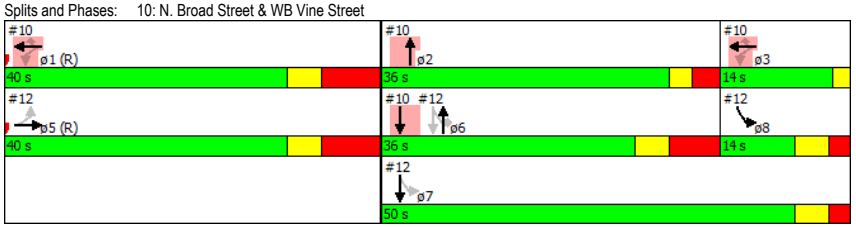
Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)				107	206	108		109			96	
Internal Link Dist (ft)		400			525			90			240	
Turn Bay Length (ft)												
Base Capacity (vph)				856	1655	733		1608			1675	
Starvation Cap Reductn				0	0	0		633			0	
Spillback Cap Reductn				0	0	0		0			37	
Storage Cap Reductn				0	0	0		0			0	
Reduced v/c Ratio				0.17	0.40	0.20		0.77			0.46	

Intersection Summary

Area Type: CBD
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green
Natural Cycle: 90
Control Type: Pretimed
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 18.8 Intersection LOS: B
Intersection Capacity Utilization 115.7% ICU Level of Service H
Analysis Period (min) 15
! Phase conflict between lane groups.

Splits and Phases: 10: N. Broad Street & WB Vine Street



Lanes, Volumes, Timings
10: N. Broad Street & WB Vine Street

Lane Group	ø1	ø3	ø5	ø7	ø8
Queue Length 95th (ft)					
Internal Link Dist (ft)					
Turn Bay Length (ft)					
Base Capacity (vph)					
Starvation Cap Reductn					
Spillback Cap Reductn					
Storage Cap Reductn					
Reduced v/c Ratio					

Intersection Summary

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
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Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1246	685	0	0	0	0	0	0	390	840	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		2%			0%			0%			4%	
Lane Util. Factor	1.00	0.86	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00
Ped Bike Factor			0.98							0.69		
Frt			0.850									
Flt Protected										0.950		
Satd. Flow (prot)	0	6310	2744	0	0	0	0	0	0	1725	4792	0
Flt Permitted										0.950		
Satd. Flow (perm)	0	6310	2679	0	0	0	0	0	0	1183	4792	0
Right Turn on Red			No			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)										24		
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		82			480			430			170	
Travel Time (s)		2.2			13.1			11.7			4.6	
Confl. Peds. (#/hr)			16	16			8		418	418		8
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	1271	699	0	0	0	0	0	0	398	857	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1271	699	0	0	0	0	0	0	398	857	0
Turn Type		NA	Perm							pm+pt	NA	
Protected Phases		5								7	6	
Permitted Phases			5							6		
Minimum Split (s)		41.0	41.0							15.0	34.0	
Total Split (s)		41.0	41.0							15.0	34.0	
Total Split (%)		45.6%	45.6%							16.7%	37.8%	
Yellow Time (s)		3.5	3.5							3.0	3.5	
All-Red Time (s)		1.5	1.5							2.0	0.0	
Lost Time Adjust (s)		0.0	0.0							0.0	0.0	
Total Lost Time (s)		5.0	5.0							5.0	3.5	
Lead/Lag		Lead	Lead								Lag	
Lead-Lag Optimize?												
Act Effct Green (s)		36.0	36.0							39.0	30.5	
Actuated g/C Ratio		0.40	0.40							0.43	0.34	
v/c Ratio		0.50	0.65							0.68	0.53	
Control Delay		18.5	25.8							5.4	12.5	
Queue Delay		0.0	0.0							2.2	3.4	
Total Delay		18.5	25.8							7.6	16.0	
LOS		B	C							A	B	
Approach Delay		21.1									13.3	
Approach LOS		C									B	
Queue Length 50th (ft)		132	187							10	46	
Queue Length 95th (ft)		198	273							m11	m61	
Internal Link Dist (ft)		2			400			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		2524	1071							586	1623	
Starvation Cap Reductn		0	0							89	649	

Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	3
Permitted Phases			
Minimum Split (s)	41.0	39.0	10.0
Total Split (s)	41.0	39.0	10.0
Total Split (%)	46%	43%	11%
Yellow Time (s)	3.5	3.5	3.0
All-Red Time (s)	1.5	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
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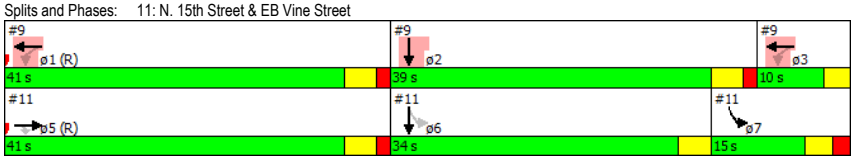
Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0	0							0	0	
Storage Cap Reductn		0	0							0	0	
Reduced v/c Ratio		0.50	0.65							0.80	0.88	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 18.1	Intersection LOS: B
Intersection Capacity Utilization 67.7%	ICU Level of Service C
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 11: N. 15th Street & EB Vine Street



Lanes, Volumes, Timings
11: N. 15th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
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Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	316	1097	86	0	0	0	0	336	147	244	473	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	10	12	12	10	12
Grade (%)		2%			0%			2%			2%	
Storage Length (ft)	0		250	0		0	0		0	45		0
Storage Lanes	0		1	0		0	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.81	0.81	0.81	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.91	1.00
Ped Bike Factor		1.00							0.85	0.95		
Frt		0.991							0.850			
Flt Protected		0.990								0.950		
Satd. Flow (prot)	0	7255	0	0	0	0	0	2810	1559	1743	4674	0
Flt Permitted		0.990								0.542		
Satd. Flow (perm)	0	7255	0	0	0	0	0	2810	1329	945	4674	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		480			163			270			170	
Travel Time (s)		13.1			4.4			7.4			4.6	
Confl. Peds. (#/hr)			53	53			516		130	130		516
Confl. Bikes (#/hr)			2						14			15
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	2%	4%	2%	2%	2%	3%	11%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	30	0	0	0	0
Adj. Flow (vph)	329	1143	90	0	0	0	0	350	153	254	493	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1562	0	0	0	0	0	350	153	254	493	0
Turn Type	Perm	NA						NA	Perm	custom	NA	
Protected Phases		5						6		8	7	
Permitted Phases	5								6	6 7	6 7	
Minimum Split (s)	40.0	40.0						34.0	34.0	14.0	48.0	
Total Split (s)	40.0	40.0						36.0	36.0	14.0	50.0	
Total Split (%)	44.4%	44.4%						40.0%	40.0%	15.6%	55.6%	
Yellow Time (s)	3.6	3.6						3.6	3.6	3.6	3.6	
All-Red Time (s)	6.4	6.4						5.4	5.4	2.4	2.4	
Lost Time Adjust (s)		0.0						0.0	0.0	0.0	0.0	
Total Lost Time (s)		10.0						9.0	9.0	6.0	6.0	
Lead/Lag								Lead	Lead	Lag		
Lead-Lag Optimize?												
Act Effct Green (s)		30.0						27.0	27.0	44.0	44.0	
Actuated g/C Ratio		0.33						0.30	0.30	0.49	0.49	
v/c Ratio		0.65						0.42	0.38	0.48	0.22	
Control Delay		16.7						27.0	28.4	9.3	2.9	
Queue Delay		0.1						0.1	0.0	3.8	0.3	
Total Delay		16.7						27.2	28.4	13.1	3.2	
LOS		B						C	C	B	A	
Approach Delay		16.7						27.5			6.5	
Approach LOS		B						C			A	

Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Grade (%)			
Storage Length (ft)			
Storage Lanes			
Taper Length (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Heavy Vehicles (%)			
Bus Blockages (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	3
Permitted Phases			
Minimum Split (s)	40.0	34.0	14.0
Total Split (s)	40.0	36.0	14.0
Total Split (%)	44%	40%	16%
Yellow Time (s)	3.6	2.4	2.0
All-Red Time (s)	6.4	3.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag		Lead	Lag
Lead-Lag Optimize?			Yes
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			

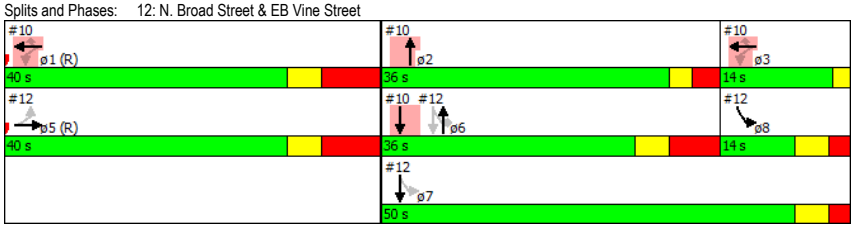
Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 Report

Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		104						83	68	31	10	
Queue Length 95th (ft)		108						124	124	88	18	
Internal Link Dist (ft)		400			83			190			90	
Turn Bay Length (ft)										45		
Base Capacity (vph)		2418						843	398	532	2285	
Starvation Cap Reductn		0						0	0	195	1155	
Spillback Cap Reductn		79						68	0	0	0	
Storage Cap Reductn		0						0	0	0	0	
Reduced v/c Ratio		0.67						0.45	0.38	0.75	0.44	

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 16.0	Intersection LOS: B
Intersection Capacity Utilization 115.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 12: N. Broad Street & EB Vine Street



Lanes, Volumes, Timings
12: N. Broad Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 Report

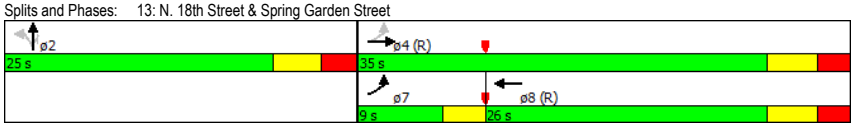
Timings
13: N. 18th Street & Spring Garden Street

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	43	406	406	57	49
Lane Group Flow (vph)	44	419	444	107	51
Turn Type	pm+pt	NA	NA	NA	Perm
Protected Phases	7	4	8	2	
Permitted Phases	4				2
Minimum Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?					
v/c Ratio	0.09	0.27	0.42	0.24	0.10
Control Delay	7.3	9.8	23.3	16.9	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.3	9.8	23.3	16.9	1.1
Queue Length 50th (ft)	7	44	66	28	0
Queue Length 95th (ft)	19	68	75	62	5
Internal Link Dist (ft)		476	350	810	
Turn Bay Length (ft)	145				150
Base Capacity (vph)	464	1562	1066	454	507
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	0.09	0.27	0.42	0.24	0.10

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 13: N. 18th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
13: N. 18th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	43	406	0	0	406	24	47	57	49	0	0	0
Number	7	4	14	3	8	18	5	2	12			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.95		1.00	1.00		0.87	1.00		0.96			
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln	185.3	185.3	0.0	0.0	185.3	189.0	189.0	177.9	177.9			
Lanes	1	2	0	0	2	0	0	1	1			
Cap, veh/h	560	1791	0	0	1143	68	316	232	458			
Arrive On Green	0.10	0.48	0.00	0.00	0.67	0.67	0.32	0.32	0.32			
Sat Flow, veh/h	1765	3706	0	0	3430	203	998	731	1446			
Grp Volume(v), veh/h	44	419	0	0	225	219	83	24	51			
Grp Sat Flow(s),veh/h/ln	1765	1853	0	0	1853	1780	1729	1779	1446			
Q Serve(g_s), s	0.8	4.0	0.0	0.0	3.2	3.3	2.1	0.0	1.5			
Cycle Q Clear(g_c), s	0.8	4.0	0.0	0.0	3.2	3.3	2.1	0.0	1.5			
Prop In Lane	1.00		0.00	0.00		0.11	0.58		1.00			
Lane Grp Cap(c), veh/h	560	1791	0	0	618	593	547	0	458			
V/C Ratio(X)	0.08	0.23	0.00	0.00	0.36	0.37	0.15	0.00	0.11			
Avail Cap(c_a), veh/h	560	1791	0	0	618	593	547	0	458			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	9.0	9.0	0.0	0.0	7.2	7.2	14.7	0.0	14.5			
Incr Delay (d2), s/veh	0.3	0.3	0.0	0.0	1.7	1.8	0.6	0.0	0.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln	0.6	3.0	0.0	0.0	2.5	2.4	1.6	0.0	1.0			
Lane Grp Delay (d), s/veh	9.3	9.3	0.0	0.0	8.9	9.0	15.3	0.0	15.0			
Lane Grp LOS	A	A			A	A	B		B			
Approach Vol, veh/h		463			444			158				
Approach Delay, s/veh		9.3			8.9			12.9				
Approach LOS		A			A			B				

Timer

Assigned Phs	7	4			8			2				
Phs Duration (G+Y+Rc), s	9.0	35.0			26.0			25.0				
Change Period (Y+Rc), s	3.0	6.0			6.0			6.0				
Max Green Setting (Gmax), s	6.0	29.0			20.0			19.0				
Max Q Clear Time (g_c+I1), s	0.0	0.0			0.0			0.0				
Green Ext Time (p_c), s	0.0	0.0			0.0			0.0				

Intersection Summary

HCM 2010 Ctrl Delay			9.7									
HCM 2010 LOS			A									

Notes

Timings
14: N. Broad Street & Spring Garden Street

Lane Group	EBT	WBT	NBT	NBR	SBL	SBT	SBR
Lane Configurations							
Volume (vph)	407	396	554	43	69	691	76
Lane Group Flow (vph)	500	485	577	45	72	720	79
Turn Type	NA	NA	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	8	2		1	6	
Permitted Phases				2	6		6
Minimum Split (s)	33.0	33.0	35.0	35.0	9.0	35.0	35.0
Total Split (s)	40.0	40.0	41.0	41.0	9.0	50.0	50.0
Total Split (%)	44.4%	44.4%	45.6%	45.6%	10.0%	55.6%	55.6%
Yellow Time (s)	3.6	3.6	3.4	3.4	3.0	3.4	3.4
All-Red Time (s)	2.4	2.4	2.6	2.6	0.0	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Lead/Lag			Lag	Lag	Lead		
Lead-Lag Optimize?							
v/c Ratio	0.42	0.41	0.44	0.07	0.19	0.43	0.12
Control Delay	22.1	21.9	10.6	2.7	12.1	15.9	13.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.1	21.9	10.6	2.7	12.1	15.9	13.2
Queue Length 50th (ft)	108	104	35	0	19	133	23
Queue Length 95th (ft)	153	147	94	4	41	178	48
Internal Link Dist (ft)	400	550	990			290	
Turn Bay Length (ft)				100	170		100
Base Capacity (vph)	1180	1184	1323	625	376	1672	658
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.41	0.44	0.07	0.19	0.43	0.12

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Pretimed

Splits and Phases: 14: N. Broad Street & Spring Garden Street

HCM 2010 Signalized Intersection Summary
14: N. Broad Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	407	73	0	396	70	0	554	43	69	691	76
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	1.00		0.96	1.00		0.95	0.99		0.90
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.3	189.0	0.0	185.3	189.0	0.0	185.3	185.3	186.2	186.2	186.2
Lanes	0	2	0	0	2	0	0	2	1	1	2	1
Cap, veh/h	0	1146	203	0	1152	202	0	1441	584	448	1821	693
Arrive On Green	0.00	0.38	0.38	0.00	0.38	0.38	0.00	0.52	0.52	0.07	0.49	0.49
Sat Flow, veh/h	0	3032	538	0	3049	535	0	3706	1502	1774	3724	1418
Grp Volume(v), veh/h	0	257	243	0	249	236	0	577	45	72	720	79
Grp Sat Flow(s),veh/h/ln	0	1853	1717	0	1853	1731	0	1853	1502	1774	1862	1418
Q Serve(g_s), s	0.0	9.0	9.2	0.0	8.7	8.9	0.0	8.5	1.4	2.0	11.0	2.7
Cycle Q Clear(g_c), s	0.0	9.0	9.2	0.0	8.7	8.9	0.0	8.5	1.4	2.0	11.0	2.7
Prop In Lane	0.00		0.31	0.00		0.31	0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	700	649	0	700	654	0	1441	584	448	1821	693
V/C Ratio(X)	0.00	0.37	0.37	0.00	0.36	0.36	0.00	0.40	0.08	0.16	0.40	0.11
Avail Cap(c_a), veh/h	0	700	649	0	700	654	0	1441	584	448	1821	693
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	20.2	20.3	0.0	20.1	20.2	0.0	15.3	13.6	13.5	14.6	12.4
Incr Delay (d2), s/veh	0.0	1.5	1.6	0.0	1.4	1.5	0.0	0.8	0.3	0.8	0.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	6.4	6.3	0.0	6.3	6.0	0.0	5.6	0.9	1.6	7.3	1.7
Lane Grp Delay (d), s/veh	0.0	21.7	21.9	0.0	21.5	21.7	0.0	16.2	13.9	14.2	15.2	12.8
Lane Grp LOS		C	C		C	C		B	B	B	B	B
Approach Vol, veh/h		500			485			622			871	
Approach Delay, s/veh		21.8			21.6			16.0			14.9	
Approach LOS		C			C			B			B	

Timer

Assigned Phs		4			8			2		1	6	
Phs Duration (G+Y+Rc), s		40.0			40.0			41.0		9.0	50.0	
Change Period (Y+Rc), s		6.0			6.0			6.0		3.0	6.0	
Max Green Setting (Gmax), s		34.0			34.0			35.0		6.0	44.0	
Max Q Clear Time (g_c+I1), s		0.0			0.0			0.0		0.0	0.0	
Green Ext Time (p_c), s		0.0			0.0			0.0		0.0	0.0	

Intersection Summary

HCM 2010 Ctrl Delay			17.9									
HCM 2010 LOS			B									

Notes

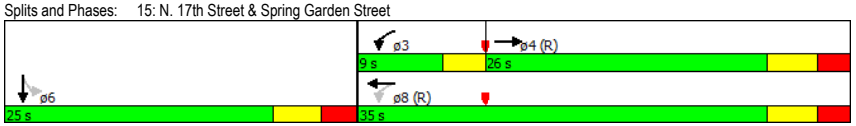
Timings
15: N. 17th Street & Spring Garden Street

Lane Group	EBT	WBL	WBT	SBT
Lane Configurations				
Volume (vph)	395	61	414	63
Lane Group Flow (vph)	502	68	460	132
Turn Type	NA	pm+pt	NA	NA
Protected Phases	4	3	8	6
Permitted Phases		8		
Minimum Split (s)	26.0	9.0	35.0	25.0
Total Split (s)	26.0	9.0	35.0	25.0
Total Split (%)	43.3%	15.0%	58.3%	41.7%
Yellow Time (s)	3.6	3.0	3.6	3.4
All-Red Time (s)	2.4	0.0	2.4	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	3.0	6.0	6.0
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?				
v/c Ratio	0.48	0.16	0.29	0.27
Control Delay	9.2	4.9	7.9	14.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	9.2	4.9	7.9	14.0
Queue Length 50th (ft)	25	8	31	27
Queue Length 95th (ft)	38	m15	68	64
Internal Link Dist (ft)	350		350	290
Turn Bay Length (ft)		165		
Base Capacity (vph)	1055	438	1562	496
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	0.48	0.16	0.29	0.27

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: N. 17th Street & Spring Garden Street



HCM 2010 Signalized Intersection Summary
15: N. 17th Street & Spring Garden Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	395	57	61	414	0	0	0	0	28	63	28
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.87	0.96		1.00				1.00		0.96
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	185.3	189.0	185.3	185.3	0.0				189.0	183.4	189.0
Lanes	0	2	0	1	2	0				0	1	0
Cap, veh/h	0	1037	147	538	1791	0				176	209	187
Arrive On Green	0.00	0.67	0.67	0.20	0.97	0.00				0.32	0.32	0.32
Sat Flow, veh/h	0	3110	441	1765	3706	0				554	530	591
Grp Volume(v), veh/h	0	259	243	68	460	0				101	0	89
Grp Sat Flow(s),veh/h/ln	0	1853	1699	1765	1853	0				1806	0	1703
Q Serve(g_s), s	0.0	3.9	4.0	1.2	0.3	0.0				2.1	0.0	0.0
Cycle Q Clear(g_c), s	0.0	3.9	4.0	1.2	0.3	0.0				2.1	0.0	0.0
Prop In Lane	0.00		0.26	1.00		0.00				0.31		0.35
Lane Grp Cap(c), veh/h	0	618	566	538	1791	0				572	0	0
V/C Ratio(X)	0.00	0.42	0.43	0.13	0.26	0.00				0.18	0.00	0.00
Avail Cap(c_a), veh/h	0	618	566	538	1791	0				572	0	0
HCM Platoon Ratio	1.00	2.00	2.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	7.3	7.3	8.2	0.5	0.0				12.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	2.1	2.4	0.5	0.3	0.0				0.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (85%), veh/ln	0.0	2.9	2.8	0.9	0.3	0.0				1.7	0.0	0.0
Lane Grp Delay (d), s/veh	0.0	9.4	9.7	8.6	0.9	0.0				13.3	0.0	0.0
Lane Grp LOS		A	A	A	A					B		
Approach Vol, veh/h		502			528						190	
Approach Delay, s/veh		9.5			1.9						7.1	
Approach LOS		A			A						A	

Timer

Assigned Phs		4		3	8						6	
Phs Duration (G+Y+Rc), s		26.0		9.0	35.0						25.0	
Change Period (Y+Rc), s		6.0		3.0	6.0						6.0	
Max Green Setting (Gmax), s		20.0		6.0	29.0						19.0	
Max Q Clear Time (g_c+I1), s		0.0		0.0	0.0						0.0	
Green Ext Time (p_c), s		0.0		0.0	0.0						0.0	

Intersection Summary

HCM 2010 Ctrl Delay			5.8									
HCM 2010 LOS			A									

Notes

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	98	282	136	0	0	0	0	276	69
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					0.99						0.99	
Frt					0.961						0.973	
Flt Protected					0.991							
Satd. Flow (prot)	0	0	0	0	3150	0	0	0	0	0	1609	0
Flt Permitted					0.991							
Satd. Flow (perm)	0	0	0	0	3150	0	0	0	0	0	1609	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					140						15	
Link Speed (mph)		30			25			30			25	
Link Distance (ft)		975			430			170			647	
Travel Time (s)		22.2			11.7			3.9			17.6	
Confl. Peds. (#/hr)	17		1	1		17	32		100	100		32
Confl. Bikes (#/hr)						5						2
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Parking (#/hr)					0						0	
Adj. Flow (vph)	0	0	0	113	324	156	0	0	0	0	317	79
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	593	0	0	0	0	0	396	0
Turn Type				custom	NA						NA	
Protected Phases					1 3						2	
Permitted Phases				1								
Minimum Split (s)				46.0							35.0	
Total Split (s)				46.0							35.0	
Total Split (%)				51.1%							38.9%	
Yellow Time (s)				3.5							3.5	
All-Red Time (s)				1.8							1.5	
Lost Time Adjust (s)											0.0	
Total Lost Time (s)											5.0	
Lead/Lag				Lead							Lag	
Lead-Lag Optimize?												
Act Effct Green (s)					49.7						30.0	
Actuated g/C Ratio					0.55						0.33	
v/c Ratio					0.33						0.73	
Control Delay					1.3						34.4	
Queue Delay					0.0						0.0	
Total Delay					1.3						34.4	
LOS					A						C	
Approach Delay					1.3						34.4	
Approach LOS					A						C	
Queue Length 50th (ft)					3						189	
Queue Length 95th (ft)					9						283	
Internal Link Dist (ft)		895			350			90			567	
Turn Bay Length (ft)												
Base Capacity (vph)					1802						546	
Starvation Cap Reductn					0						0	

Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	ø3	ø5	ø6
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	3	5	6
Permitted Phases			
Minimum Split (s)	9.0	49.5	40.5
Total Split (s)	9.0	49.5	40.5
Total Split (%)	10%	55%	45%
Yellow Time (s)	2.0	3.5	3.5
All-Red Time (s)	0.0	1.8	2.5
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag		Lead	Lag
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			

Projected (Build) Conditions - Recommended Improvements
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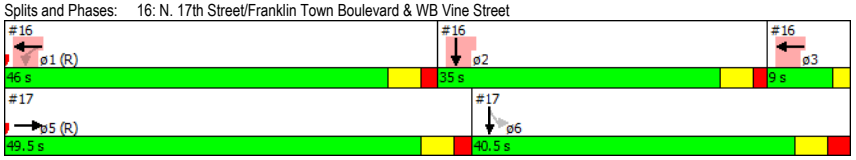
Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn					0						0	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.33						0.73	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 14.5	Intersection LOS: B
Intersection Capacity Utilization 67.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 16: N. 17th Street/Franklin Town Boulevard & WB Vine Street



Lanes, Volumes, Timings
16: N. 17th Street/Franklin Town Boulevard & WB Vine Street

Lane Group	ø3	ø5	ø6
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Projected (Build) Conditions - Recommended Improvements
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Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	231	29	0	0	0	0	0	0	147	232	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor		1.00									0.97	
Frt		0.983										
Flt Protected											0.981	
Satd. Flow (prot)	0	3280	0	0	0	0	0	0	0	0	3454	0
Flt Permitted											0.981	
Satd. Flow (perm)	0	3280	0	0	0	0	0	0	0	0	3362	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)		21									175	
Link Speed (mph)		30			25			30			30	
Link Distance (ft)		975			430			430			170	
Travel Time (s)		22.2			11.7			9.8			3.9	
Confl. Peds. (#/hr)	1		16	16		1	31		87	87		31
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Parking (#/hr)		0										
Adj. Flow (vph)	0	275	35	0	0	0	0	0	0	175	276	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	310	0	0	0	0	0	0	0	0	451	0
Turn Type		NA								Perm	NA	
Protected Phases		5									6	
Permitted Phases										6		
Minimum Split (s)		49.5								40.5	40.5	
Total Split (s)		49.5								40.5	40.5	
Total Split (%)		55.0%								45.0%	45.0%	
Yellow Time (s)		3.5								3.5	3.5	
All-Red Time (s)		1.8								2.5	2.5	
Lost Time Adjust (s)		0.0									0.0	
Total Lost Time (s)		5.3									6.0	
Lead/Lag		Lead								Lag	Lag	
Lead-Lag Optimize?												
Act Effct Green (s)		44.2									34.5	
Actuated g/C Ratio		0.49									0.38	
v/c Ratio		0.19									0.32	
Control Delay		12.3									3.5	
Queue Delay		0.0									1.2	
Total Delay		12.3									4.8	
LOS		B									A	
Approach Delay		12.3									4.8	
Approach LOS		B									A	
Queue Length 50th (ft)		46									8	
Queue Length 95th (ft)		65									22	
Internal Link Dist (ft)		895			350			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		1621									1396	
Starvation Cap Reductn		0									702	

Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	3
Permitted Phases			
Minimum Split (s)	46.0	35.0	9.0
Total Split (s)	46.0	35.0	9.0
Total Split (%)	51%	39%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	1.8	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?			
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			

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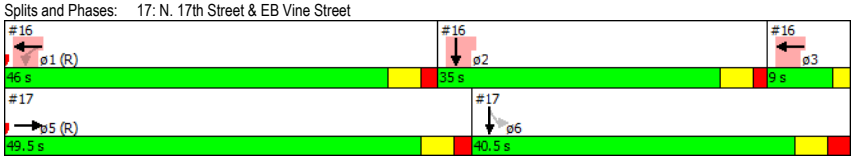
Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0									0	
Storage Cap Reductn		0									0	
Reduced v/c Ratio		0.19									0.65	

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 7.8	Intersection LOS: A
Intersection Capacity Utilization 75.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 17: N. 17th Street & EB Vine Street



Lanes, Volumes, Timings
17: N. 17th Street & EB Vine Street

Lane Group	ø1	ø2	ø3
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

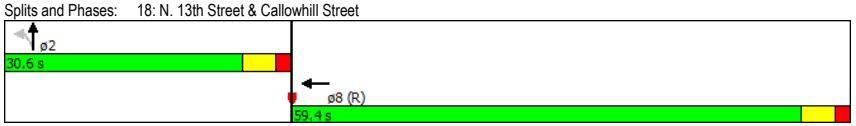
Timings
18: N. 13th Street & Callowhill Street

Lane Group	WBT	NBT
Lane Configurations		
Volume (vph)	182	141
Lane Group Flow (vph)	214	187
Turn Type	NA	NA
Protected Phases	8	2
Permitted Phases		
Minimum Split (s)	59.4	30.6
Total Split (s)	59.4	30.6
Total Split (%)	66.0%	34.0%
Yellow Time (s)	3.6	3.6
All-Red Time (s)	1.8	1.8
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.4	5.4
Lead/Lag		
Lead-Lag Optimize?		
v/c Ratio	0.12	0.41
Control Delay	7.1	12.5
Queue Delay	0.0	0.0
Total Delay	7.1	12.5
Queue Length 50th (ft)	22	27
Queue Length 95th (ft)	37	57
Internal Link Dist (ft)	195	480
Turn Bay Length (ft)		
Base Capacity (vph)	1848	451
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.12	0.41

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 90
Control Type: Pretimed

Splits and Phases: 18: N. 13th Street & Callowhill Street



HCM 2010 Signalized Intersection Summary
18: N. 13th Street & Callowhill Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	0	182	21	37	141	0	0	0	0
Number				3	8	18	5	2	12			
Initial Q (Qb), veh				0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)				1.00		0.97	1.00		1.00			
Parking Bus Adj				1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow veh/h/ln				0.0	185.3	189.0	189.0	185.3	0.0			
Lanes				0	2	0	0	1	0			
Cap, veh/h				0	1956	221	107	406	0			
Arrive On Green				0.00	0.60	0.60	0.28	0.28	0.00			
Sat Flow, veh/h				0	3261	368	382	1451	0			
Grp Volume(v), veh/h				0	108	106	187	0	0			
Grp Sat Flow(s),veh/h/ln				0	1853	1776	1834	1853	0			
Q Serve(g_s), s				0.0	2.2	2.3	7.4	0.0	0.0			
Cycle Q Clear(g_c), s				0.0	2.2	2.3	7.4	0.0	0.0			
Prop In Lane				0.00		0.21	0.21		0.00			
Lane Grp Cap(c), veh/h				0	1112	1066	513	0	0			
V/C Ratio(X)				0.00	0.10	0.10	0.36	0.00	0.00			
Avail Cap(c_a), veh/h				0	1112	1066	513	0	0			
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)				0.00	1.00	1.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh				0.0	7.6	7.7	26.0	0.0	0.0			
Incr Delay (d2), s/veh				0.0	0.2	0.2	2.0	0.0	0.0			
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0			
%ile Back of Q (85%), veh/ln				0.0	1.7	1.7	5.6	0.0	0.0			
Lane Grp Delay (d), s/veh				0.0	7.8	7.8	28.0	0.0	0.0			
Lane Grp LOS					A	A	C					
Approach Vol, veh/h					214			187				
Approach Delay, s/veh					7.8			28.0				
Approach LOS					A			C				

Timer

Assigned Phs	8	2
Phs Duration (G+Y+Rc), s	59.4	30.6
Change Period (Y+Rc), s	5.4	5.4
Max Green Setting (Gmax), s	54.0	25.2
Max Q Clear Time (g_c+I1), s	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0

Intersection Summary

HCM 2010 Ctrl Delay	17.2
HCM 2010 LOS	B

Notes

Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	743	52	73	144	0	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	11	12	11	10	12	12	10	12
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00		0.96					
Frt					0.990							
Flt Protected							0.950					
Satd. Flow (prot)	0	0	0	0	4661	0	1702	1729	0	0	0	0
Flt Permitted							0.950					
Satd. Flow (perm)	0	0	0	0	4661	0	1628	1729	0	0	0	0
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Satd. Flow (RTOR)					18		76					
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		605			275			170			560	
Travel Time (s)		16.5			6.3			3.9			12.7	
Confl. Peds. (#/hr)	44		3	3		44	53		40	40		53
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Parking (#/hr)					0							
Adj. Flow (vph)	0	0	0	0	774	54	76	150	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	828	0	76	150	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					1			2				
Permitted Phases							2					
Minimum Split (s)					51.0		39.0	39.0				
Total Split (s)					51.0		39.0	39.0				
Total Split (%)					56.7%		43.3%	43.3%				
Yellow Time (s)					3.7		3.5	3.5				
All-Red Time (s)					1.8		2.5	2.5				
Lost Time Adjust (s)					0.0		0.0	0.0				
Total Lost Time (s)					5.5		6.0	6.0				
Lead/Lag					Lead		Lag	Lag				
Lead-Lag Optimize?					Yes		Yes	Yes				
Act Effct Green (s)					45.5		33.0	33.0				
Actuated g/C Ratio					0.51		0.37	0.37				
v/c Ratio					0.35		0.12	0.24				
Control Delay					13.6		0.9	10.8				
Queue Delay					0.0		0.8	1.7				
Total Delay					13.6		1.7	12.5				
LOS					B		A	B				
Approach Delay					13.6			8.8				
Approach LOS					B			A				
Queue Length 50th (ft)					96		0	26				
Queue Length 95th (ft)					124		2	44				
Internal Link Dist (ft)		525			195			90			480	
Turn Bay Length (ft)												
Base Capacity (vph)					2365		645	633				
Starvation Cap Reductn					0		391	341				

Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Lane Configurations			
Volume (vph)			
Ideal Flow (vphpl)			
Lane Width (ft)			
Lane Util. Factor			
Ped Bike Factor			
Frt			
Flt Protected			
Satd. Flow (prot)			
Flt Permitted			
Satd. Flow (perm)			
Right Turn on Red			
Satd. Flow (RTOR)			
Link Speed (mph)			
Link Distance (ft)			
Travel Time (s)			
Confl. Peds. (#/hr)			
Peak Hour Factor			
Parking (#/hr)			
Adj. Flow (vph)			
Shared Lane Traffic (%)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	7
Permitted Phases			
Minimum Split (s)	47.5	33.5	9.0
Total Split (s)	47.5	33.5	9.0
Total Split (%)	53%	37%	10%
Yellow Time (s)	3.5	3.5	2.0
All-Red Time (s)	2.0	1.5	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	
Act Effct Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Queue Length 50th (ft)			
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			

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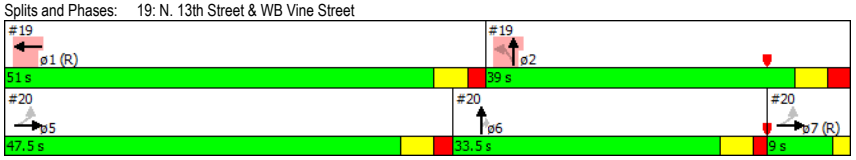
Timing Plan: Saturday Evening
Synchro 8 Report

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.35		0.30	0.51				

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 7:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.35	
Intersection Signal Delay: 12.5	Intersection LOS: B
Intersection Capacity Utilization 110.0%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 19: N. 13th Street & WB Vine Street



Lanes, Volumes, Timings
19: N. 13th Street & WB Vine Street

Lane Group	ø5	ø6	ø7
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			

Intersection Summary

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 Report

Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	62	499	0	0	0	0	0	155	43	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Width (ft)	12	12	12	12	12	12	12	11	9	12	12	12
Lane Util. Factor	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor									0.95			
Frt									0.850			
Flt Protected		0.995										
Satd. Flow (prot)	0	5033	0	0	0	0	0	1612	1417	0	0	0
Flt Permitted		0.995										
Satd. Flow (perm)	0	5033	0	0	0	0	0	1612	1349	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		40							103			
Link Speed (mph)		25			30			30			30	
Link Distance (ft)		442			275			430			170	
Travel Time (s)		12.1			6.3			9.8			3.9	
Confl. Peds. (#/hr)			23	23			49		36	36		49
Confl. Bikes (#/hr)			2						4			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Parking (#/hr)								0				
Adj. Flow (vph)	68	548	0	0	0	0	0	170	47	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	616	0	0	0	0	0	170	47	0	0	0
Turn Type	Perm	NA						NA	Perm			
Protected Phases		5 7						6				
Permitted Phases	5 7								6			
Minimum Split (s)								33.5	33.5			
Total Split (s)								33.5	33.5			
Total Split (%)								37.2%	37.2%			
Yellow Time (s)								3.5	3.5			
All-Red Time (s)								1.5	1.5			
Lost Time Adjust (s)								0.0	0.0			
Total Lost Time (s)								5.0	5.0			
Lead/Lag								Lag	Lag			
Lead-Lag Optimize?								Yes	Yes			
Act Effct Green (s)		51.0						28.5	28.5			
Actuated g/C Ratio		0.57						0.32	0.32			
v/c Ratio		0.21						0.33	0.09			
Control Delay		5.6						25.8	0.4			
Queue Delay		0.0						0.0	0.0			
Total Delay		5.6						25.8	0.4			
LOS		A						C	A			
Approach Delay		5.6						20.3				
Approach LOS		A						C				
Queue Length 50th (ft)		31						73	0			
Queue Length 95th (ft)		40						128	1			
Internal Link Dist (ft)		362			195			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		2869						510	497			

Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Lane Configurations				
Volume (vph)				
Ideal Flow (vphpl)				
Lane Width (ft)				
Lane Util. Factor				
Ped Bike Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Confl. Peds. (#/hr)				
Confl. Bikes (#/hr)				
Peak Hour Factor				
Parking (#/hr)				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	2	5	7
Permitted Phases				
Minimum Split (s)	51.0	39.0	47.5	9.0
Total Split (s)	51.0	39.0	47.5	9.0
Total Split (%)	57%	43%	53%	10%
Yellow Time (s)	3.7	3.5	3.5	2.0
All-Red Time (s)	1.8	2.5	2.0	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				

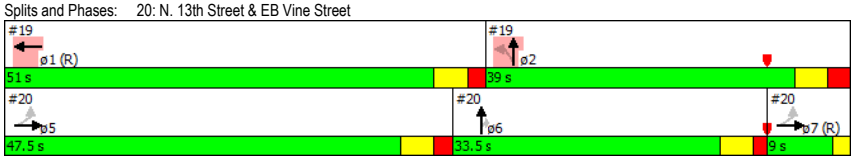
Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 Report

Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0						0	0			
Spillback Cap Reductn		0						4	0			
Storage Cap Reductn		0						0	0			
Reduced v/c Ratio		0.21						0.34	0.09			

Intersection Summary	
Area Type:	CBD
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 7:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.35	
Intersection Signal Delay: 9.5	Intersection LOS: A
Intersection Capacity Utilization 103.5%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 20: N. 13th Street & EB Vine Street



Lanes, Volumes, Timings
20: N. 13th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 Report

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	49	333	0	0	0	0	0	507	276	0	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00							0.98			
Frt									0.850			
Flt Protected		0.994										
Satd. Flow (prot)	0	3482	0	0	0	0	0	5009	1575	0	0	0
Flt Permitted		0.994										
Satd. Flow (perm)	0	3481	0	0	0	0	0	5009	1546	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24							297			
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		430			378			430			170	
Travel Time (s)		11.7			10.3			11.7			4.6	
Confl. Peds. (#/hr)	2		13	13		2	372		7	7		372
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	6%	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%
Adj. Flow (vph)	53	358	0	0	0	0	0	545	297	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	411	0	0	0	0	0	545	297	0	0	0
Turn Type	Perm	NA						NA	Perm			
Protected Phases		5 7						6				
Permitted Phases	5 7								6			
Minimum Split (s)								33.5	33.5			
Total Split (s)								33.5	33.5			
Total Split (%)								37.2%	37.2%			
Yellow Time (s)								3.5	3.5			
All-Red Time (s)								1.5	1.5			
Lost Time Adjust (s)								0.0	0.0			
Total Lost Time (s)								5.0	5.0			
Lead/Lag								Lag	Lag			
Lead-Lag Optimize?												
Act Effct Green (s)		51.2						28.5	28.5			
Actuated g/C Ratio		0.57						0.32	0.32			
v/c Ratio		0.21						0.34	0.43			
Control Delay		7.6						24.3	5.0			
Queue Delay		0.0						0.0	0.0			
Total Delay		7.6						24.3	5.0			
LOS		A						C	A			
Approach Delay		7.6						17.5				
Approach LOS		A						B				
Queue Length 50th (ft)		50						86	0			
Queue Length 95th (ft)		59						116	55			
Internal Link Dist (ft)		350			298			350			90	
Turn Bay Length (ft)												
Base Capacity (vph)		1990						1586	692			
Starvation Cap Reductn		0						0	0			
Spillback Cap Reductn		0						14	0			

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Lane Configurations				
Volume (vph)				
Ideal Flow (vphpl)				
Lane Util. Factor				
Ped Bike Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Confl. Peds. (#/hr)				
Peak Hour Factor				
Heavy Vehicles (%)				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	1	2	5	7
Permitted Phases				
Minimum Split (s)	51.0	39.0	47.5	9.0
Total Split (s)	51.0	39.0	47.5	9.0
Total Split (%)	57%	43%	53%	10%
Yellow Time (s)	3.5	3.5	3.5	2.0
All-Red Time (s)	1.8	2.5	1.8	0.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lead	
Lead-Lag Optimize?				
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				

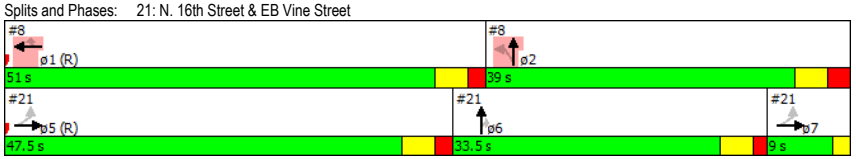
Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 Report

Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn		0						0	0			
Reduced v/c Ratio		0.21						0.35	0.43			

Intersection Summary	
Area Type: CBD	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 1:WBT and 5:, Start of Green	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 14.3	Intersection LOS: B
Intersection Capacity Utilization 67.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 21: N. 16th Street & EB Vine Street



Lanes, Volumes, Timings
21: N. 16th Street & EB Vine Street

Lane Group	ø1	ø2	ø5	ø7
Storage Cap Reductn				
Reduced v/c Ratio				

Intersection Summary

Projected (Build) Conditions - Recommended Improvements
Traffic Planning and Design, Inc. - BMP
Timing Plan: Saturday Evening
Synchro 8 Report

SITE ACCESS EVALUATION

FRIDAY PM (4-6 PM)
PEAK HOUR TIME PERIOD

Lanes, Volumes, Timings
1: N. 17th Street & Site Access

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	93	0	0	0	17	336
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100
Grade (%)	0%		0%			-4%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950					0.998
Satd. Flow (prot)	1956	2059	0	0	0	2096
Flt Permitted	0.950					0.998
Satd. Flow (perm)	1956	2059	0	0	0	2096
Link Speed (mph)	30		25			25
Link Distance (ft)	125		480			590
Travel Time (s)	2.8		13.1			16.1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	103	0	0	0	19	373
Shared Lane Traffic (%)						
Lane Group Flow (vph)	103	0	0	0	0	392
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.85	0.85
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 28.2%		ICU Level of Service A	
Analysis Period (min) 15			

HCM 2010 TWSC
1: N. 17th Street & Site Access

Intersection	
Intersection Delay, s/veh	2.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	93	0	0	0	17	336
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	-4
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	103	0	0	0	19	373

Major/Minor	Minor1			Major2	
Conflicting Flow All	411	0		0	0
Stage 1	0	-		-	-
Stage 2	411	-		-	-
Follow-up Headway	3.518	-		-	-
Pot Capacity-1 Maneuver	551	-		-	-
Stage 1	-	-		-	-
Stage 2	618	-		-	-
Time blocked-Platoon, %					-
Mov Capacity-1 Maneuver	551	-		-	-
Mov Capacity-2 Maneuver	551	-		-	-
Stage 1	-	-		-	-
Stage 2	618	-		-	-

Approach	WB	SB
HCM Control Delay, s	13	0

Minor Lane / Major Mvmt	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	551	+	-	-
HCM Lane V/C Ratio	0.188	+	-	-
HCM Control Delay (s)	13	0	-	-
HCM Lane LOS	B	A		
HCM 95th %tile Q(veh)	0.684	+	-	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
2: N. 16th Street & Site Access (S)

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	62	0	175	887	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100
Grade (%)	0%			3%	0%	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt						
Flt Protected	0.950			0.992		
Satd. Flow (prot)	1956	2059	0	3822	0	0
Flt Permitted	0.950			0.992		
Satd. Flow (perm)	1956	2059	0	3822	0	0
Link Speed (mph)	30			25	25	
Link Distance (ft)	155			480	310	
Travel Time (s)	3.5			13.1	8.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	69	0	194	986	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	69	0	0	1180	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.89	0.89	0.88	0.88
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 36.8% ICU Level of Service A
Analysis Period (min) 15

HCM 2010 TWSC
2: N. 16th Street & Site Access (S)

Intersection

Intersection Delay, s/veh 1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	62	0	175	887	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	3	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	69	0	194	986	0	0

Major/Minor	Minor2		Major1	
Conflicting Flow All	882	0	0	0
Stage 1	0	-	-	-
Stage 2	882	-	-	-
Follow-up Headway	3.52	-	-	-
Pot Capacity-1 Maneuver	241	-	-	-
Stage 1	-	-	-	-
Stage 2	307	-	-	-
Time blocked-Platoon, %				-
Mov Capacity-1 Maneuver	241	-	-	-
Mov Capacity-2 Maneuver	241	-	-	-
Stage 1	-	-	-	-
Stage 2	307	-	-	-

Approach	EB	NB
HCM Control Delay, s	26	0

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	EBLn2
Capacity (veh/h)	-	-	241	+
HCM Lane V/C Ratio	-	-	0.286	+
HCM Control Delay (s)	-	-	25.8	0
HCM Lane LOS			D	A
HCM 95th %tile Q(veh)	-	-	1.14	+

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
3: N. 15th Street & Site Access (N)

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	170	0	0	628	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100
Grade (%)	0%			0%	-3%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				
Flt Protected						
Satd. Flow (prot)	0	1781	0	0	2090	0
Flt Permitted						
Satd. Flow (perm)	0	1781	0	0	2090	0
Link Speed (mph)	30			25	25	
Link Distance (ft)	140			310	280	
Travel Time (s)	3.2			8.5	7.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	189	0	0	698	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	189	0	0	698	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.86	0.86
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 46.1%		ICU Level of Service A	
Analysis Period (min) 15			

HCM 2010 TWSC
3: N. 15th Street & Site Access (N)

Intersection	
Intersection Delay, s/veh	4.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	0	170	0	0	628	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-3	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	189	0	0	698	0

Major/Minor	Minor2		Major2	
Conflicting Flow All	698	698	-	0
Stage 1	698	-	-	-
Stage 2	0	-	-	-
Follow-up Headway	3.518	3.318	-	-
Pot Capacity-1 Maneuver	355	440	-	-
Stage 1	431	-	-	-
Stage 2	-	-	-	-
Time blocked-Platoon, %			-	-
Mov Capacity-1 Maneuver	355	440	-	-
Mov Capacity-2 Maneuver	355	-	-	-
Stage 1	431	-	-	-
Stage 2	-	-	-	-

Approach	EB	SB
HCM Control Delay, s	19	0

Minor Lane / Major Mvmt	EBLn1	SBT	SBR
Capacity (veh/h)	440	-	-
HCM Lane V/C Ratio	0.429	-	-
HCM Control Delay (s)	19.2	-	-
HCM Lane LOS	C		
HCM 95th %tile Q(veh)	2.114	-	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
4: N. 15th Street & Site Access (S)

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	13	0	0	783	15
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100
Grade (%)	0%			0%	-3%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865			0.997	
Flt Protected						
Satd. Flow (prot)	0	1781	0	0	2083	0
Flt Permitted						
Satd. Flow (perm)	0	1781	0	0	2083	0
Link Speed (mph)	30			25	25	
Link Distance (ft)	140			480	310	
Travel Time (s)	3.2			13.1	8.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	14	0	0	870	17
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	14	0	0	887	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.86	0.86
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 48.1%		ICU Level of Service A	
Analysis Period (min) 15			

HCM 2010 TWSC
4: N. 15th Street & Site Access (S)

Intersection	
Intersection Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	0	13	0	0	783	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-3	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	14	0	0	870	17

Major/Minor	Minor2		Major2	
Conflicting Flow All	878	878	-	0
Stage 1	878	-	-	-
Stage 2	0	-	-	-
Follow-up Headway	3.518	3.318	-	-
Pot Capacity-1 Maneuver	268	347	-	-
Stage 1	343	-	-	-
Stage 2	-	-	-	-
Time blocked-Platoon, %			-	-
Mov Capacity-1 Maneuver	268	347	-	-
Mov Capacity-2 Maneuver	268	-	-	-
Stage 1	343	-	-	-
Stage 2	-	-	-	-

Approach	EB	SB
HCM Control Delay, s	16	0

Minor Lane / Major Mvmt	EBLn1	SBT	SBR
Capacity (veh/h)	347	-	-
HCM Lane V/C Ratio	0.042	-	-
HCM Control Delay (s)	15.8	-	-
HCM Lane LOS	C		
HCM 95th %tile Q(veh)	0.13	-	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
5: Callowhill Street & Site Access

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	0	591	116	0	99
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt			0.975			0.865
Flt Protected						
Satd. Flow (prot)	0	0	3814	0	0	1781
Flt Permitted						
Satd. Flow (perm)	0	0	3814	0	0	1781
Link Speed (mph)		25	25		30	
Link Distance (ft)		230	250		161	
Travel Time (s)		6.3	6.8		3.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	657	129	0	110
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	786	0	0	110
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 30.3%	ICU Level of Service A
Analysis Period (min) 15	

HCM 2010 TWSC
5: Callowhill Street & Site Access

Intersection	
Intersection Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	0	591	116	0	99
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	657	129	0	110

Major/Minor	Major2		Minor2	
Conflicting Flow All	-	0	721	392
Stage 1	-	-	721	-
Stage 2	-	-	0	-
Follow-up Headway	-	-	3.52	3.32
Pot Capacity-1 Maneuver	-	-	315	607
Stage 1	-	-	385	-
Stage 2	-	-	-	-
Time blocked-Platoon, %	-	-		
Mov Capacity-1 Maneuver	-	-	315	607
Mov Capacity-2 Maneuver	-	-	315	-
Stage 1	-	-	385	-
Stage 2	-	-	-	-

Approach	WB	SB
HCM Control Delay, s	0	12

Minor Lane / Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	607
HCM Lane V/C Ratio	-	-	0.181
HCM Control Delay (s)	-	-	12.2
HCM Lane LOS			B
HCM 95th %tile Q(veh)	-	-	0.657

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

FRIDAY EVENING (7-10 PM)
PEAK HOUR TIME PERIOD

Lanes, Volumes, Timings
1: N. 17th Street & Site Access

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	111	0	0	0	21	172
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100
Grade (%)	0%		0%			-4%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950					0.995
Satd. Flow (prot)	1956	2059	0	0	0	2089
Flt Permitted	0.950					0.995
Satd. Flow (perm)	1956	2059	0	0	0	2089
Link Speed (mph)	30		25			25
Link Distance (ft)	125		480			590
Travel Time (s)	2.8		13.1			16.1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	123	0	0	0	23	191
Shared Lane Traffic (%)						
Lane Group Flow (vph)	123	0	0	0	0	214
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.85	0.85
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 21.5%		ICU Level of Service A	
Analysis Period (min) 15			

HCM 2010 TWSC
1: N. 17th Street & Site Access

Intersection	
Intersection Delay, s/veh	4.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	111	0	0	0	21	172
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	-4
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	123	0	0	0	23	191

Major/Minor	Minor1				Major2	
Conflicting Flow All	238	0			0	0
Stage 1	0	-			-	-
Stage 2	238	-			-	-
Follow-up Headway	3.518	-			-	-
Pot Capacity-1 Maneuver	716	-			-	-
Stage 1	-	-			-	-
Stage 2	765	-			-	-
Time blocked-Platoon, %						-
Mov Capacity-1 Maneuver	716	-			-	-
Mov Capacity-2 Maneuver	716	-			-	-
Stage 1	-	-			-	-
Stage 2	765	-			-	-

Approach	WB	SB
HCM Control Delay, s	11	0

Minor Lane / Major Mvmt	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	716	+	-	-
HCM Lane V/C Ratio	0.172	+	-	-
HCM Control Delay (s)	11.1	0	-	-
HCM Lane LOS	B	A		
HCM 95th %tile Q(veh)	0.619	+	-	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
2: N. 16th Street & Site Access (S)

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	74	0	218	561	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100
Grade (%)	0%			3%	0%	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt						
Flt Protected	0.950			0.986		
Satd. Flow (prot)	1956	2059	0	3799	0	0
Flt Permitted	0.950			0.986		
Satd. Flow (perm)	1956	2059	0	3799	0	0
Link Speed (mph)	30			25	25	
Link Distance (ft)	155			480	310	
Travel Time (s)	3.5			13.1	8.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	82	0	242	623	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	82	0	0	865	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.89	0.89	0.88	0.88
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary		
Area Type:	Other	
Control Type: Unsignalized		
Intersection Capacity Utilization 30.1%		ICU Level of Service A
Analysis Period (min) 15		

HCM 2010 TWSC
2: N. 16th Street & Site Access (S)

Intersection	
Intersection Delay, s/veh	2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	74	0	218	561	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	3	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	82	0	242	623	0	0

Major/Minor	Minor2		Major1	
Conflicting Flow All	796	0	0	0
Stage 1	0	-	-	-
Stage 2	796	-	-	-
Follow-up Headway	3.52	-	-	-
Pot Capacity-1 Maneuver	278	-	-	-
Stage 1	-	-	-	-
Stage 2	347	-	-	-
Time blocked-Platoon, %				-
Mov Capacity-1 Maneuver	278	-	-	-
Mov Capacity-2 Maneuver	278	-	-	-
Stage 1	-	-	-	-
Stage 2	347	-	-	-

Approach	EB	NB
HCM Control Delay, s	23	0

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	EBLn2
Capacity (veh/h)	-	-	278	+
HCM Lane V/C Ratio	-	-	0.296	+
HCM Control Delay (s)	-	-	23.3	0
HCM Lane LOS			C	A
HCM 95th %tile Q(veh)	-	-	1.201	+

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
3: N. 15th Street & Site Access (N)

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	200	0	0	311	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100
Grade (%)	0%			0%	-3%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				
Flt Protected						
Satd. Flow (prot)	0	1781	0	0	2090	0
Flt Permitted						
Satd. Flow (perm)	0	1781	0	0	2090	0
Link Speed (mph)	30			25	25	
Link Distance (ft)	140			310	280	
Travel Time (s)	3.2			8.5	7.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	222	0	0	346	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	222	0	0	346	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.86	0.86
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 32.7%		ICU Level of Service A	
Analysis Period (min) 15			

HCM 2010 TWSC
3: N. 15th Street & Site Access (N)

Intersection	
Intersection Delay, s/veh	4.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	0	200	0	0	311	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-3	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	222	0	0	346	0

Major/Minor	Minor2				Major2	
Conflicting Flow All	346	346			-	0
Stage 1	346	-			-	-
Stage 2	0	-			-	-
Follow-up Headway	3.518	3.318			-	-
Pot Capacity-1 Maneuver	608	697			-	-
Stage 1	670	-			-	-
Stage 2	-	-			-	-
Time blocked-Platoon, %					-	-
Mov Capacity-1 Maneuver	608	697			-	-
Mov Capacity-2 Maneuver	608	-			-	-
Stage 1	670	-			-	-
Stage 2	-	-			-	-

Approach	EB	SB
HCM Control Delay, s	13	0

Minor Lane / Major Mvmt	EBLn1	SBT	SBR
Capacity (veh/h)	697	-	-
HCM Lane V/C Ratio	0.319	-	-
HCM Control Delay (s)	12.6	-	-
HCM Lane LOS	B		
HCM 95th %tile Q(veh)	1.372	-	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
4: N. 15th Street & Site Access (S)

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	14	0	0	495	16
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100
Grade (%)	0%			0%	-3%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865			0.996	
Flt Protected						
Satd. Flow (prot)	0	1781	0	0	2081	0
Flt Permitted						
Satd. Flow (perm)	0	1781	0	0	2081	0
Link Speed (mph)	30			25	25	
Link Distance (ft)	140			480	310	
Travel Time (s)	3.2			13.1	8.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	16	0	0	550	18
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	16	0	0	568	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.86	0.86
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 34.4%		ICU Level of Service A	
Analysis Period (min) 15			

HCM 2010 TWSC
4: N. 15th Street & Site Access (S)

Intersection	
Intersection Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	0	14	0	0	495	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-3	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	16	0	0	550	18

Major/Minor	Minor2		Major2	
Conflicting Flow All	559	559	-	0
Stage 1	559	-	-	-
Stage 2	0	-	-	-
Follow-up Headway	3.518	3.318	-	-
Pot Capacity-1 Maneuver	440	529	-	-
Stage 1	513	-	-	-
Stage 2	-	-	-	-
Time blocked-Platoon, %			-	-
Mov Capacity-1 Maneuver	440	529	-	-
Mov Capacity-2 Maneuver	440	-	-	-
Stage 1	513	-	-	-
Stage 2	-	-	-	-

Approach	EB	SB
HCM Control Delay, s	12	0

Minor Lane / Major Mvmt	EBLn1	SBT	SBR
Capacity (veh/h)	529	-	-
HCM Lane V/C Ratio	0.029	-	-
HCM Control Delay (s)	12	-	-
HCM Lane LOS	B		
HCM 95th %tile Q(veh)	0.091	-	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
5: Callowhill Street & Site Access

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	0	354	137	0	112
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt			0.958			0.865
Flt Protected						
Satd. Flow (prot)	0	0	3747	0	0	1781
Flt Permitted						
Satd. Flow (perm)	0	0	3747	0	0	1781
Link Speed (mph)		25	25		30	
Link Distance (ft)		230	250		161	
Travel Time (s)		6.3	6.8		3.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	393	152	0	124
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	545	0	0	124
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 25.8%		ICU Level of Service A	
Analysis Period (min) 15			

HCM 2010 TWSC
5: Callowhill Street & Site Access

Intersection	
Intersection Delay, s/veh	2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	0	354	137	0	112
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	393	152	0	124

Major/Minor	Major2		Minor2	
Conflicting Flow All	-	0	469	272
Stage 1	-	-	469	-
Stage 2	-	-	0	-
Follow-up Headway	-	-	3.52	3.32
Pot Capacity-1 Maneuver	-	-	477	726
Stage 1	-	-	544	-
Stage 2	-	-	-	-
Time blocked-Platoon, %	-	-		
Mov Capacity-1 Maneuver	-	-	477	726
Mov Capacity-2 Maneuver	-	-	477	-
Stage 1	-	-	544	-
Stage 2	-	-	-	-

Approach	WB	SB
HCM Control Delay, s	0	11

Minor Lane / Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	726
HCM Lane V/C Ratio	-	-	0.171
HCM Control Delay (s)	-	-	11
HCM Lane LOS			B
HCM 95th %tile Q(veh)	-	-	0.616

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

SATURDAY EVENING (6-9 PM)
PEAK HOUR TIME PERIOD

Lanes, Volumes, Timings
1: N. 17th Street & Site Access

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	129	0	0	0	21	156
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100
Grade (%)	0%		0%			-4%
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950					0.994
Satd. Flow (prot)	1956	2059	0	0	0	2087
Flt Permitted	0.950					0.994
Satd. Flow (perm)	1956	2059	0	0	0	2087
Link Speed (mph)	30		25			25
Link Distance (ft)	125		480			590
Travel Time (s)	2.8		13.1			16.1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	143	0	0	0	23	173
Shared Lane Traffic (%)						
Lane Group Flow (vph)	143	0	0	0	0	196
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.85	0.85
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 21.6%		ICU Level of Service A	
Analysis Period (min) 15			

HCM 2010 TWSC
1: N. 17th Street & Site Access

Intersection	
Intersection Delay, s/veh	4.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	129	0	0	0	21	156
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	-4
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	143	0	0	0	23	173

Major/Minor	Minor1				Major2	
Conflicting Flow All	220	0			0	0
Stage 1	0	-			-	-
Stage 2	220	-			-	-
Follow-up Headway	3.518	-			-	-
Pot Capacity-1 Maneuver	736	-			-	-
Stage 1	-	-			-	-
Stage 2	782	-			-	-
Time blocked-Platoon, %						-
Mov Capacity-1 Maneuver	736	-			-	-
Mov Capacity-2 Maneuver	736	-			-	-
Stage 1	-	-			-	-
Stage 2	782	-			-	-

Approach	WB	SB
HCM Control Delay, s	11	0

Minor Lane / Major Mvmt	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	736	+	-	-
HCM Lane V/C Ratio	0.195	+	-	-
HCM Control Delay (s)	11.1	0	-	-
HCM Lane LOS	B	A		
HCM 95th %tile Q(veh)	0.719	+	-	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
2: N. 16th Street & Site Access (S)

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	86	0	220	531	0	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100
Grade (%)	0%			3%	0%	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt						
Flt Protected	0.950			0.986		
Satd. Flow (prot)	1956	2059	0	3799	0	0
Flt Permitted	0.950			0.986		
Satd. Flow (perm)	1956	2059	0	3799	0	0
Link Speed (mph)	30			25	25	
Link Distance (ft)	155			480	310	
Travel Time (s)	3.5			13.1	8.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	96	0	244	590	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	96	0	0	834	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.89	0.89	0.88	0.88
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary		
Area Type:	Other	
Control Type: Unsignalized		
Intersection Capacity Utilization 30.0%		ICU Level of Service A
Analysis Period (min) 15		

HCM 2010 TWSC
2: N. 16th Street & Site Access (S)

Intersection	
Intersection Delay, s/veh	2.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	86	0	220	531	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	3	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	96	0	244	590	0	0

Major/Minor	Minor2		Major1	
Conflicting Flow All	784	0	0	0
Stage 1	0	-	-	-
Stage 2	784	-	-	-
Follow-up Headway	3.52	-	-	-
Pot Capacity-1 Maneuver	283	-	-	-
Stage 1	-	-	-	-
Stage 2	352	-	-	-
Time blocked-Platoon, %				-
Mov Capacity-1 Maneuver	283	-	-	-
Mov Capacity-2 Maneuver	283	-	-	-
Stage 1	-	-	-	-
Stage 2	352	-	-	-

Approach	EB	NB
HCM Control Delay, s	24	0

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	EBLn2
Capacity (veh/h)	-	-	283	+
HCM Lane V/C Ratio	-	-	0.338	+
HCM Control Delay (s)	-	-	24.1	0
HCM Lane LOS			C	A
HCM 95th %tile Q(veh)	-	-	1.441	+

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
3: N. 15th Street & Site Access (N)

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	231	0	0	273	0
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100
Grade (%)	0%			0%	-3%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865				
Flt Protected						
Satd. Flow (prot)	0	1781	0	0	2090	0
Flt Permitted						
Satd. Flow (perm)	0	1781	0	0	2090	0
Link Speed (mph)	30			25	25	
Link Distance (ft)	140			310	280	
Travel Time (s)	3.2			8.5	7.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	257	0	0	303	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	257	0	0	303	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.86	0.86
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 32.6%		ICU Level of Service A	
Analysis Period (min) 15			

HCM 2010 TWSC
3: N. 15th Street & Site Access (N)

Intersection	
Intersection Delay, s/veh	5.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	0	231	0	0	273	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-3	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	257	0	0	303	0

Major/Minor	Minor2		Major2	
Conflicting Flow All	303	303	-	0
Stage 1	303	-	-	-
Stage 2	0	-	-	-
Follow-up Headway	3.518	3.318	-	-
Pot Capacity-1 Maneuver	649	737	-	-
Stage 1	706	-	-	-
Stage 2	-	-	-	-
Time blocked-Platoon, %			-	-
Mov Capacity-1 Maneuver	649	737	-	-
Mov Capacity-2 Maneuver	649	-	-	-
Stage 1	706	-	-	-
Stage 2	-	-	-	-

Approach	EB	SB
HCM Control Delay, s	12	0

Minor Lane / Major Mvmt	EBLn1	SBT	SBR
Capacity (veh/h)	737	-	-
HCM Lane V/C Ratio	0.348	-	-
HCM Control Delay (s)	12.5	-	-
HCM Lane LOS	B		
HCM 95th %tile Q(veh)	1.562	-	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
4: N. 15th Street & Site Access (S)

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	16	0	0	487	17
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100
Grade (%)	0%			0%	-3%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.865			0.995	
Flt Protected						
Satd. Flow (prot)	0	1781	0	0	2079	0
Flt Permitted						
Satd. Flow (perm)	0	1781	0	0	2079	0
Link Speed (mph)	30			25	25	
Link Distance (ft)	140			480	310	
Travel Time (s)	3.2			13.1	8.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	18	0	0	541	19
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	18	0	0	560	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.86	0.86
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 34.1%		ICU Level of Service A	
Analysis Period (min) 15			

HCM 2010 TWSC
4: N. 15th Street & Site Access (S)

Intersection	
Intersection Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	0	16	0	0	487	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	-3	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	18	0	0	541	19

Major/Minor	Minor2		Major2	
Conflicting Flow All	551	551	-	0
Stage 1	551	-	-	-
Stage 2	0	-	-	-
Follow-up Headway	3.518	3.318	-	-
Pot Capacity-1 Maneuver	445	534	-	-
Stage 1	519	-	-	-
Stage 2	-	-	-	-
Time blocked-Platoon, %			-	-
Mov Capacity-1 Maneuver	445	534	-	-
Mov Capacity-2 Maneuver	445	-	-	-
Stage 1	519	-	-	-
Stage 2	-	-	-	-

Approach	EB	SB
HCM Control Delay, s	12	0

Minor Lane / Major Mvmt	EBLn1	SBT	SBR
Capacity (veh/h)	534	-	-
HCM Lane V/C Ratio	0.033	-	-
HCM Control Delay (s)	12	-	-
HCM Lane LOS	B		
HCM 95th %tile Q(veh)	0.103	-	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Lanes, Volumes, Timings
5: Callowhill Street & Site Access

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	0	278	138	0	126
Ideal Flow (vphpl)	2100	2100	2100	2100	2100	2100
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt			0.950			0.865
Flt Protected						
Satd. Flow (prot)	0	0	3716	0	0	1781
Flt Permitted						
Satd. Flow (perm)	0	0	3716	0	0	1781
Link Speed (mph)		25	25		30	
Link Distance (ft)		230	250		161	
Travel Time (s)		6.3	6.8		3.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	309	153	0	140
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	462	0	0	140
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	0.88	0.88	0.88	0.88	0.88	0.88
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary		
Area Type:	Other	
Control Type: Unsignalized		
Intersection Capacity Utilization 24.7%		ICU Level of Service A
Analysis Period (min) 15		

HCM 2010 TWSC
5: Callowhill Street & Site Access

Intersection	
Intersection Delay, s/veh	2.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	0	278	138	0	126
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	309	153	0	140

Major/Minor	Major2		Minor2	
Conflicting Flow All	-	0	386	230
Stage 1	-	-	386	-
Stage 2	-	-	0	-
Follow-up Headway	-	-	3.52	3.32
Pot Capacity-1 Maneuver	-	-	547	772
Stage 1	-	-	609	-
Stage 2	-	-	-	-
Time blocked-Platoon, %	-	-		
Mov Capacity-1 Maneuver	-	-	547	772
Mov Capacity-2 Maneuver	-	-	547	-
Stage 1	-	-	609	-
Stage 2	-	-	-	-

Approach	WB	SB
HCM Control Delay, s	0	11

Minor Lane / Major Mvmt	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	772
HCM Lane V/C Ratio	-	-	0.181
HCM Control Delay (s)	-	-	10.7
HCM Lane LOS			B
HCM 95th %tile Q(veh)	-	-	0.659

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined