APPENDIX C

Existing Capacity/Level-of-Service Analysis Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR
Lane Configurations						
Volume (vph)	3	5	21	212	172	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	0			0
Storage Lanes	1	0	0			0
Taper Length (ft)	75	75	75			75
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Factor						
Frt	0.916				0.984	
Flt Protected	0.982			0.995		
Satd. Flow (prot)	1512	0	0	1872	1851	0
Flt Permitted	0.982			0.995		
Satd. Flow (perm)	1512	0	0	1872	1851	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	642			604	1428	
Travel Time (s)	17.5			16.5	38.9	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.50	0.50	0.79	0.79	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	13%	13%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	6	10	27	268	191	26
Shared Lane Traffic (%)						
Lane Group Flow (vph)	16	0	0	295	217	0
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

McMahon Associates, Inc.
9: Quaker Lane & Warren Avenue

Existing Conditions
Weekday Morning Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR
Lane Configurations						
Volume (veh/h)	3	5	21	212	172	23
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.50	0.50	0.79	0.79	0.90	0.90
Hourly flow rate (vph)	6	10	27	268	191	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	525	204	217			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	525	204	217			
tC, single (s)	6.5	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	99	99	98			
cM capacity (veh/h)	484	810	1359			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	16	295	217
Volume Left	6	27	0
Volume Right	10	0	26
cSH	647	1359	1700
Volume to Capacity	0.02	0.02	0.13
Queue Length 95th (ft)	2	1	0
Control Delay (s)	10.7	0.9	0.0
Lane LOS	B	A	
Approach Delay (s)	10.7	0.9	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	36.1%	ICU Level of Service	A
Analysis Period (min)	15		

Existing Conditions
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9: Quaker Lane & Warren Avenue

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	13	9	42	227	128	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	0			0
Storage Lanes	1	0	0			0
Taper Length (ft)	75	75	75			75
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Factor						
Frt	0.945				0.971	
Flt Protected	0.971			0.992		
Satd. Flow (prot)	1709	0	0	1848	1809	0
Flt Permitted	0.971			0.992		
Satd. Flow (perm)	1709	0	0	1848	1809	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	682			853	604	
Travel Time (s)	18.6			23.3	16.5	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.50	0.50	0.86	0.86	0.76	0.76
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	26	18	49	264	168	46
Shared Lane Traffic (%)						
Lane Group Flow (vph)	44	0	0	313	214	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	13	9	42	227	128	35
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.50	0.50	0.86	0.86	0.76	0.76
Hourly flow rate (vph)	26	18	49	264	168	46
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				853		
pX, platoon unblocked						
vC, conflicting volume	553	191	214			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	553	191	214			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	98	96			
cM capacity (veh/h)	426	850	1356			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	44	313	214
Volume Left	26	49	0
Volume Right	18	0	46
cSH	581	1356	1700
Volume to Capacity	0.08	0.04	0.13
Queue Length 95th (ft)	6	3	0
Control Delay (s)	11.7	1.5	0.0
Lane LOS	B	A	
Approach Delay (s)	11.7	1.5	0.0
Approach LOS	B		

Intersection Summary

Average Delay	1.7		
Intersection Capacity Utilization	36.5%	ICU Level of Service	A
Analysis Period (min)	15		

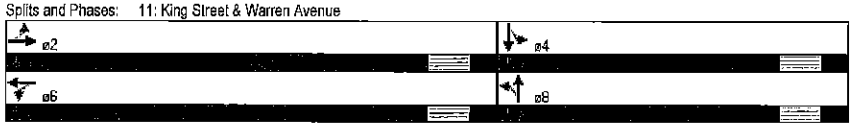
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	369	14	66	195	9	51	368	120	1	95	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	13	13	13	10	10	10	10	10	10
Grade (%)		-1%			2%			-5%			10%	
Storage Length (ft)	0		0	0		0	90		0	50		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	75		75	75		75	75		75	75		75
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		0.996			0.996			0.963			0.968	
Flt Protected		0.987			0.988		0.950			0.950		
Satd. Flow (prot)	0	1763	0	0	1739	0	1676	1699	0	1554	1583	0
Flt Permitted		0.828			0.790		0.663			0.200		
Satd. Flow (perm)	0	1479	0	0	1390	0	1170	1699	0	327	1583	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			4			29			25	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		738			1106			498			853	
Travel Time (s)		20.1			30.2			13.6			23.3	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.78	0.78	0.78	0.96	0.96	0.96	0.90	0.90	0.90	0.82	0.82	0.82
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	3%	3%	3%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	181	473	18	69	203	9	57	409	133	1	116	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	672	0	0	281	0	57	542	0	1	148	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.0	21.0		21.0	21.0		21.0	21.0		21.0	21.0	
Total Split (s)	35.0	35.0	0.0	35.0	35.0	0.0	25.0	25.0	0.0	25.0	25.0	0.0
Total Split (%)	58.3%	58.3%	0.0%	58.3%	58.3%	0.0%	41.7%	41.7%	0.0%	41.7%	41.7%	0.0%
Maximum Green (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Max	Max		Max	Max		Max	Max		Max	Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.91			0.40			0.15	0.92		0.01	0.27
Control Delay		33.5			11.5			15.3	44.2		14.0	13.8
Queue Delay		0.0			0.0			0.0	0.0		0.0	0.0
Total Delay		33.5			11.5			15.3	44.2		14.0	13.8
Queue Length 50th (ft)		204			58			14	176		0	31
Queue Length 95th (ft)		#321			108			37	#356		3	61
Internal Link Dist (ft)		658			1026				418			773
Turn Bay Length (ft)								90			50	
Base Capacity (vph)		741			697			390	586		109	544
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		0.91			0.40			0.15	0.92		0.01	0.27

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, 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: 11: King Street & Warren Avenue



Movement	EBR	EBT	EBL	WBR	WBT	WBL	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	369	14	66	195	9	51	368	120	1	95	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	13	13	13	10	10	10	10	10	10
Grade (%)		-1%			2%			-5%			10%	
Total Lost time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		1.00			1.00		1.00	0.96		1.00	0.97	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1764			1738		1676	1700		1554	1583	
Flt Permitted		0.83			0.79		0.66	1.00		0.20	1.00	
Satd. Flow (perm)		1480			1390		1170	1700		327	1583	
Peak-hour factor, PHF	0.78	0.78	0.78	0.96	0.96	0.96	0.90	0.90	0.90	0.82	0.82	0.82
Adj. Flow (vph)	181	473	18	69	203	9	57	409	133	1	116	32
RTOR Reduction (vph)	0	2	0	0	2	0	0	19	0	0	17	0
Lane Group Flow (vph)	0	671	0	0	279	0	57	523	0	1	131	0
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	3%	3%	3%	3%	3%	3%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		30.0			30.0		20.0	20.0		20.0	20.0	
Effective Green, g (s)		30.0			30.0		20.0	20.0		20.0	20.0	
Actuated g/C Ratio		0.50			0.50		0.33	0.33		0.33	0.33	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		740			695		390	567		109	528	
v/s Ratio Prot								c0.31			0.08	
v/s Ratio Perm		c0.45			0.20		0.05			0.00		
v/c Ratio		0.91			0.40		0.15	0.92		0.01	0.25	
Uniform Delay, d1		13.7			9.4		14.0	19.2		13.4	14.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		16.8			1.7		0.8	22.7		0.2	1.1	
Delay (s)		30.5			11.1		14.8	42.0		13.5	15.7	
Level of Service		C			B		B	D		B	B	
Approach Delay (s)		30.5			11.1			39.4			15.6	
Approach LOS		C			B			D			B	

Intersection Summary			
HCM Average Control Delay	29.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	32	19	3	116	287	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	0			0
Storage Lanes	1	0	0			0
Taper Length (ft)	75	75	75			75
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Factor						
Frt	0.949					
Flt Protected	0.970			0.999		
Satd. Flow (prot)	1715	0	0	1879	1900	0
Flt Permitted	0.970			0.999		
Satd. Flow (perm)	1715	0	0	1879	1900	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	642			604	1428	
Travel Time (s)	17.5			16.5	38.9	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.58	0.58	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	1%	1%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	55	33	3	129	319	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	88	0	0	132	320	0
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

McMahon Associates, Inc.
9: Quaker Lane & Warren Avenue

Existing Conditions
Weekday Afternoon Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	32	19	3	116	287	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.58	0.58	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	55	33	3	129	319	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	455	319	320			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	455	319	320			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	95	100			
cM capacity (veh/h)	562	721	1246			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	88	132	320
Volume Left	55	3	0
Volume Right	33	0	1
cSH	612	1246	1700
Volume to Capacity	0.14	0.00	0.19
Queue Length 95th (ft)	12	0	0
Control Delay (s)	11.9	0.2	0.0
Lane LOS	B	A	
Approach Delay (s)	11.9	0.2	0.0
Approach LOS	B		

Intersection Summary

Average Delay	2.0		
Intersection Capacity Utilization	25.2%	ICU Level of Service	A
Analysis Period (min)	15		

Existing Conditions
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9: Quaker Lane & Warren Avenue

Movement	EBL	EBT	EBR	NBL	NBT	NBR
Lane Configurations						
Volume (vph)	27	40	9	100	279	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	0			0
Storage Lanes	1	0	0			0
Taper Length (ft)	75	75	75			75
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Factor						
Frt	0.919				0.996	
Flt Protected	0.980			0.996		
Satd. Flow (prot)	1678	0	0	1855	1855	0
Flt Permitted	0.980			0.996		
Satd. Flow (perm)	1678	0	0	1855	1855	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	682			917	604	
Travel Time (s)	18.6			25.0	16.5	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.73	0.73	0.91	0.91	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	37	55	10	110	291	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	92	0	0	120	300	0
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

McMahon Associates, Inc.
10: Pennsylvania Avenue & Warren Avenue

Existing Conditions
Weekday Afternoon Peak Hour

Movement	EBL	EBT	EBR	NBL	NBT	NBR
Lane Configurations						
Volume (veh/h)	27	40	9	100	279	9
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.73	0.73	0.91	0.91	0.96	0.96
Hourly flow rate (vph)	37	55	10	110	291	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				917		
pX, platoon unblocked						
vC, conflicting volume	425	295	300			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	425	295	300			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	93	99			
cM capacity (veh/h)	581	744	1261			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	92	120	300
Volume Left	37	10	0
Volume Right	55	0	9
cSH	669	1261	1700
Volume to Capacity	0.14	0.01	0.18
Queue Length 95th (ft)	12	1	0
Control Delay (s)	11.2	0.7	0.0
Lane LOS	B	A	
Approach Delay (s)	11.2	0.7	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	25.8%	ICU Level of Service	A
Analysis Period (min)	15		

Existing Conditions
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10: Pennsylvania Avenue & Warren Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	46	209	30	123	439	7	56	74	84	8	303	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	13	13	13	13	13	13	10	10	10	10	10	10
Grade (%)		-1%			2%			-5%			10%	
Storage Length (ft)	0		0	0		0	90		0	50		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	75		75	75		75	75		75	75		75
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		0.986			0.998			0.920			0.964	
Flt Protected		0.992			0.989		0.950			0.950		
Sald. Flow (prot)	0	1892	0	0	1899	0	1693	1639	0	1600	1624	0
Flt Permitted		0.860			0.655		0.315			0.648		
Sald. Flow (perm)	0	1640	0	0	1642	0	561	1639	0	1092	1624	0
Right Turn on Red			Yes			Yes			Yes			Yes
Sald. Flow (RTOR)		14			1			92			28	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		727			928			282			917	
Travel Time (s)		19.8			25.3			7.7			25.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.96	0.96	0.96	0.91	0.91	0.91	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	2%	2%	2%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	54	246	35	128	457	7	62	81	92	9	329	104
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	335	0	0	592	0	62	173	0	9	433	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	21.0	21.0		21.0	21.0		21.0	21.0		21.0	21.0	
Total Split (s)	35.0	35.0	0.0	35.0	35.0	0.0	25.0	25.0	0.0	25.0	25.0	0.0
Total Split (%)	58.3%	58.3%	0.0%	58.3%	58.3%	0.0%	41.7%	41.7%	0.0%	41.7%	41.7%	0.0%
Maximum Green (s)	30.0	30.0		30.0	30.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Max	Max		Max	Max		Max	Max		Max	Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
v/c Ratio		0.41			0.72		0.33	0.28		0.02	0.77	
Control Delay		10.8			18.1		21.1	9.0		13.8	28.7	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		10.8			18.1		21.1	9.0		13.8	28.7	
Queue Length 50th (ft)		67			154		16	20		2	129	
Queue Length 95th (ft)		110			268		47	58		10	#265	
Internal Link Dist (ft)		647			848			202			837	
Turn Bay Length (ft)							90			50		
Base Capacity (vph)		827			822		187	608		364	560	
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		0.41			0.72		0.33	0.28		0.02	0.77	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 21 (35%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 50

Control Type: Pretimed

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

Splits and Phases: 11: King Street & Warren Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	46	209	30	123	439	7	56	74	84	8	303	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	13	13	13	10	10	10	10	10	10
Grade (%)		-1%			2%			-5%			10%	
Total Lost time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			1.00		1.00	0.92		1.00	0.96	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1892			1901		1693	1640		1600	1624	
Flt Permitted		0.86			0.85		0.31	1.00		0.65	1.00	
Satd. Flow (perm)		1641			1642		56	1640		1092	1624	
Peak-hour factor, PHF	0.85	0.85	0.85	0.96	0.96	0.96	0.91	0.91	0.91	0.92	0.92	0.92
Adj. Flow (vph)	54	246	35	128	457	7	62	81	92	9	329	104
RTOR Reduction (vph)	0	7	0	0	1	0	0	61	0	0	19	0
Lane Group Flow (vph)	0	328	0	0	592	0	62	112	0	9	414	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	2%	2%	2%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		30.0			30.0		20.0	20.0		20.0	20.0	
Effective Green, g (s)		30.0			30.0		20.0	20.0		20.0	20.0	
Actuated g/C Ratio		0.50			0.50		0.33	0.33		0.33	0.33	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)		821			821		187	547		364	541	
v/s Ratio Prot								0.07			c0.26	
v/s Ratio Perm		0.20			c0.36		0.11			0.01		
v/c Ratio		0.40			0.72		0.33	0.20		0.02	0.77	
Uniform Delay, d1		9.4			11.7		15.0	14.3		13.4	17.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.5			5.4		4.7	0.8		0.1	9.9	
Delay (s)		10.8			17.1		19.7	15.1		13.6	27.8	
Level of Service		B			B		B	B		B	C	
Approach Delay (s)		10.8			17.1			16.3			27.6	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM Average Control Delay	18.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		
c = Critical Lane Group			