APPENDIX C

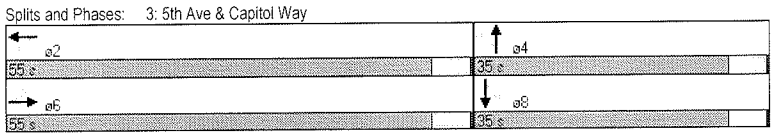
Capacity Analysis Worksheets

Lane Group	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations						
Volume (vph)	170	2	100	2	185	200
Lane Group Flow (vph)	413	0	158	0	223	225
Turn Type		Perm		Perm		
Protected Phases	6		2		4	8
Permitted Phases		2		4		
Detector Phase	6	2	2	4	4	8
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	26.0	26.0	26.0	20.0	20.0	20.0
Total Split (s)	55.0	55.0	55.0	35.0	35.0	35.0
Total Split (%)	61.1%	61.1%	61.1%	38.9%	38.9%	38.9%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Max	Max	Max	Max	Max	Max
v/c Ratio	0.45		0.16		0.24	0.23
Control Delay	10.8		8.9		8.9	15.9
Queue Delay	3.3		0.0		0.0	0.0
Total Delay	14.1		8.9		8.9	15.9
Queue Length 50th (ft)	102		36		14	27
Queue Length 95th (ft)	109		50		24	46
Internal Link Dist (ft)	221		238		221	223
Turn Bay Length (ft)						
Base Capacity (vph)	927		959		921	973
Starvation Cap Reductn	405		0		0	0
Spillback Cap Reductn	0		0		0	0
Storage Cap Reductn	0		0		0	0
Reduced v/c Ratio	0.79		0.16		0.24	0.23

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 26 (29%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow
Natural Cycle: 50
Control Type: Pretimed

Splits and Phases: 3: 5th Ave & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	170	115	2	100	10	2	185	25	0	200	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frpb, ped/bikes		0.98			0.99			0.98			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.95			0.99			0.98			1.00	
Flt Protected		1.00			1.00			1.00			1.00	
Satd. Flow (prot)		1558			1661			2683			2730	
Flt Permitted		1.00			0.99			0.95			1.00	
Satd. Flow (perm)		1558			1654			2559			2730	
Peak-hour factor, PHF	0.69	0.69	0.69	0.71	0.71	0.71	0.95	0.95	0.95	0.91	0.91	0.91
Adj. Flow (vph)	0	246	167	3	141	14	2	195	26	0	220	5
RTOR Reduction (vph)	0	27	0	0	4	0	0	12	0	0	2	0
Lane Group Flow (vph)	0	386	0	0	154	0	0	211	0	0	223	0
Confl. Peds. (#/hr)	38		60	60		38	43		56	56		43
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	7%	7%	7%	9%	9%	9%
Parking (#/hr)								12			12	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		50.0			50.0			30.0			30.0	
Effective Green, g (s)		52.0			52.0			32.0			32.0	
Actuated g/C Ratio		0.58			0.58			0.36			0.36	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)		900			956			910			971	
v/s Ratio Prot		c0.25									0.08	
v/s Ratio Perm					0.09			c0.08				
v/c Ratio		0.43			0.16			0.23			0.23	
Uniform Delay, d1		10.7			8.8			20.4			20.4	
Progression Factor		1.00			1.00			0.43			0.76	
Incremental Delay, d2		1.5			0.4			0.6			0.5	
Delay (s)		12.2			9.2			9.4			15.9	
Level of Service		B			A			A			B	
Approach Delay (s)		12.2			9.2			9.4			15.9	
Approach LOS		B			A			A			B	

Intersection Summary

HCM Average Control Delay	11.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		

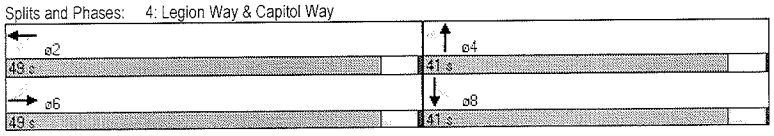
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations							
Volume (vph)	5	85	40	60	1	190	305
Lane Group Flow (vph)	0	148	0	174	0	251	383
Turn Type	Perm		Perm		Perm		
Protected Phases		6		2		4	8
Permitted Phases	6		2		4		
Detector Phase	6	6	2	2	4	4	8
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	49.0	49.0	49.0	49.0	41.0	41.0	41.0
Total Split (%)	54.4%	54.4%	54.4%	54.4%	45.6%	45.6%	45.6%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	Max	Max	Max	Max	Max	Max	Max
v/c Ratio		0.17		0.23		0.21	0.29
Control Delay		10.2		11.6		7.7	12.6
Queue Delay		0.0		0.0		0.0	0.0
Total Delay		10.2		11.6		7.7	12.6
Queue Length 50th (ft)		35		45		14	46
Queue Length 95th (ft)		59		62		20	59
Internal Link Dist (ft)		221		241		1485	221
Turn Bay Length (ft)							
Base Capacity (vph)		851		751		1213	1318
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		0.23		0.21	0.29

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 30 (33%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow
Natural Cycle: 50
Control Type: Pretimed

Splits and Phases: 4: Legion Way & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	85	30	40	60	25	1	190	30	0	305	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.97			0.97			0.98			1.00	
Flt Protected		1.00			0.98			1.00			1.00	
Satd. Flow (prot)		1649			1621			2974			3117	
Flt Permitted		0.99			0.88			0.95			1.00	
Satd. Flow (perm)		1638			1449			2838			3117	
Peak-hour factor, PHF	0.81	0.81	0.81	0.72	0.72	0.72	0.88	0.88	0.88	0.81	0.81	0.81
Adj. Flow (vph)	6	105	37	56	83	35	1	216	34	0	377	6
RTOR Reduction (vph)	0	13	0	0	10	0	0	14	0	0	1	0
Lane Group Flow (vph)	0	135	0	0	164	0	0	237	0	0	382	0
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	7%	7%	7%	4%	4%	4%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		44.0			44.0			36.0			36.0	
Effective Green, g (s)		46.0			46.0			38.0			38.0	
Actuated g/C Ratio		0.51			0.51			0.42			0.42	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)		837			741			1198			1316	
v/s Ratio Prot											c0.12	
v/s Ratio Perm		0.08			c0.11			0.08				
v/c Ratio		0.16			0.22			0.20			0.29	
Uniform Delay, d1		11.7			12.1			16.4			17.1	
Progression Factor		1.00			1.00			0.49			0.70	
Incremental Delay, d2		0.4			0.7			0.4			0.5	
Delay (s)		12.1			12.8			8.4			12.5	
Level of Service		B			B			A			B	
Approach Delay (s)		12.1			12.8			8.4			12.5	
Approach LOS		B			B			A			B	

Intersection Summary

HCM Average Control Delay	11.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	30.5%	ICU Level of Service	A
Analysis Period (min)	15		

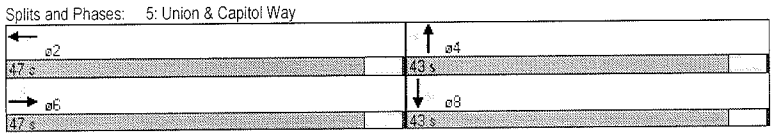
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	5	55	100	145	60	375	60	315
Lane Group Flow (vph)	0	103	112	219	74	599	67	365
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		6		2		4		8
Permitted Phases	6		2		4		8	
Detector Phase	6	6	2	2	4	4	8	8
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	47.0	47.0	47.0	47.0	43.0	43.0	43.0	43.0
Total Split (%)	52.2%	52.2%	52.2%	52.2%	47.8%	47.8%	47.8%	47.8%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
v/c Ratio		0.18	0.50	0.34	0.10	0.23	0.11	0.14
Control Delay		21.9	40.0	24.3	1.5	1.2	1.4	0.9
Queue Delay		0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay		21.9	40.0	24.3	1.5	1.3	1.4	0.9
Queue Length 50th (ft)		18	58	42	4	14	1	4
Queue Length 95th (ft)		33	101	67	7	13	6	11
Internal Link Dist (ft)		205		541		240		1485
Turn Bay Length (ft)			200		100		200	
Base Capacity (vph)		1564	632	1709	747	2581	586	2671
Starvation Cap Reductn		0	0	0	0	865	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		0.07	0.18	0.13	0.10	0.35	0.11	0.14

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 82 (91%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 5: Union & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	55	25	100	145	50	60	375	110	60	315	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor		0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt		0.96		1.00	0.96		1.00	0.97		1.00	1.00	
Flt Protected		1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3375		1787	3437		1752	3385		1770	3523	
Flt Permitted		0.94		0.69	1.00		0.53	1.00		0.42	1.00	
Satd. Flow (perm)		3167		1292	3437		985	3385		774	3523	
Peak-hour factor, PHF	0.82	0.82	0.82	0.89	0.89	0.89	0.81	0.81	0.81	0.89	0.89	0.89
Adj. Flow (vph)	6	67	30	112	163	56	74	463	136	67	354	11
RTOR Reduction (vph)	0	25	0	0	46	0	0	13	0	0	1	0
Lane Group Flow (vph)	0	78	0	112	173	0	74	586	0	67	364	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		13.8		13.8	13.8		66.2	66.2		66.2	66.2	
Effective Green, g (s)		15.8		15.8	15.8		68.2	68.2		68.2	68.2	
Actuated g/C Ratio		0.18		0.18	0.18		0.76	0.76		0.76	0.76	
Clearance Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.5		3.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)		556		227	603		746	2565		587	2670	
v/s Ratio Prot					0.05			c0.17			0.10	
v/s Ratio Perm		0.02		c0.09			0.08			0.09		
v/c Ratio		0.14		0.49	0.29		0.10	0.23		0.11	0.14	
Uniform Delay, d1		31.4		33.5	32.2		2.9	3.2		2.9	2.9	
Progression Factor		1.00		1.00	1.00		0.33	0.29		0.25	0.24	
Incremental Delay, d2		0.1		2.0	0.3		0.3	0.2		0.4	0.1	
Delay (s)		31.5		35.5	32.5		1.2	1.1		1.1	0.8	
Level of Service		C		D	C		A	A		A	A	
Approach Delay (s)		31.5			33.5			1.1			0.8	
Approach LOS		C			C			A			A	

Intersection Summary

HCM Average Control Delay	10.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	39.4%	ICU Level of Service	A
Analysis Period (min)	15		

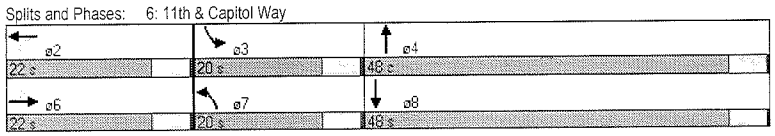
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	10	45	20	40	65	520	35	385
Lane Group Flow (vph)	15	123	25	64	77	732	39	450
Turn Type	Perm		Perm		Prot		Prot	
Protected Phases		6		2	7	4	3	8
Permitted Phases	6		2					
Detector Phase	6	6	2	2	7	4	3	8
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	12.0	25.0	12.0	25.0
Total Split (s)	22.0	22.0	22.0	22.0	20.0	48.0	20.0	48.0
Total Split (%)	24.4%	24.4%	24.4%	24.4%	22.2%	53.3%	22.2%	53.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
v/c Ratio	0.09	0.49	0.21	0.28	0.36	0.29	0.22	0.19
Control Delay	33.7	30.8	37.9	31.3	51.0	4.1	37.9	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.7	30.8	37.9	31.3	51.0	4.1	37.9	7.0
Queue Length 50th (ft)	8	44	13	27	47	41	20	50
Queue Length 95th (ft)	17	58	31	52	87	63	54	77
Internal Link Dist (ft)		205		230		830		240
Turn Bay Length (ft)					150		100	
Base Capacity (vph)	273	388	193	374	334	2494	334	2377
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.32	0.13	0.17	0.23	0.29	0.12	0.19

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 82 (91%), Referenced to phase 4:NBT and 8:SBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 6: 11th & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	45	35	20	40	10	65	520	95	35	385	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.93		1.00	0.97		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1719	1690		1687	1722		1770	3457		1770	3513	
Flt Permitted	0.72	1.00		0.52	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1294	1690		915	1722		1770	3457		1770	3513	
Peak-hour factor, PHF	0.65	0.65	0.65	0.79	0.79	0.79	0.84	0.84	0.84	0.90	0.90	0.90
Adj. Flow (vph)	15	69	54	25	51	13	77	619	113	39	428	22
RTOR Reduction (vph)	0	35	0	0	11	0	0	10	0	0	3	0
Lane Group Flow (vph)	15	88	0	25	53	0	77	722	0	39	447	0
Heavy Vehicles (%)	5%	5%	5%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		6			2		7	4		3	8	
Permitted Phases	6			2								
Actuated Green, G (s)	9.5	9.5		9.5	9.5		7.7	60.7		4.8	57.8	
Effective Green, g (s)	11.5	11.5		11.5	11.5		9.7	62.7		6.8	59.8	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.11	0.70		0.08	0.66	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	165	216		117	220		191	2408		134	2334	
v/s Ratio Prot		c0.05			0.03		c0.04	c0.21		0.02	0.13	
v/s Ratio Perm	0.01			0.03								
v/c Ratio	0.09	0.41		0.21	0.24		0.40	0.30		0.29	0.19	
Uniform Delay, d1	34.6	36.1		35.2	35.3		37.4	5.2		39.3	5.8	
Progression Factor	1.00	1.00		1.00	1.00		1.31	0.68		0.95	1.00	
Incremental Delay, d2	0.2	0.9		0.7	0.4		0.9	0.3		0.9	0.2	
Delay (s)	34.8	37.0		35.9	35.7		49.9	3.8		38.4	6.0	
Level of Service	C	D		D	D		D	A		D	A	
Approach Delay (s)		36.8			35.8			8.2			8.6	
Approach LOS		D			D			A			A	

Intersection Summary

HCM Average Control Delay	12.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		

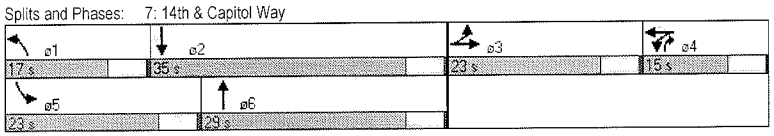
c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations									
Volume (vph)	45	210	175	70	490	50	75	235	70
Lane Group Flow (vph)	110	352	216	93	653	67	89	280	83
Turn Type			Perm	Prot		Over	Prot		Perm
Protected Phases	3	4		1	6	4	5	2	
Permitted Phases			4						2
Detector Phase	3	4	4	1	6	4	5	2	2
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	10.0	10.0	10.0	15.0	10.0	12.0	25.0	25.0
Total Split (s)	23.0	15.0	15.0	17.0	29.0	15.0	23.0	35.0	35.0
Total Split (%)	25.6%	16.7%	16.7%	18.9%	32.2%	16.7%	25.6%	38.9%	38.9%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	C-Min	None	None	C-Min	C-Min
v/c Ratio	0.31	0.59	0.42	0.42	0.52	0.12	0.40	0.23	0.14
Control Delay	34.8	33.5	29.8	48.1	26.0	13.3	33.6	28.5	16.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.8	33.5	29.8	48.1	26.0	13.3	33.6	28.5	16.6
Queue Length 50th (ft)	27	171	99	49	177	4	52	77	0
Queue Length 95th (ft)	46	#282	163	83	181	27	94	106	42
Internal Link Dist (ft)	70	1141			579			830	
Turn Bay Length (ft)				250		250	250		250
Base Capacity (vph)	733	600	517	275	1259	557	386	1297	632
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.59	0.42	0.34	0.52	0.12	0.23	0.22	0.13

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 44 (49%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: 14th & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	45	10	75	210	175	70	490	50	75	235	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.98			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98			0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3255			1857	1599	1770	3539	1583	1736	3471	1553
Flt Permitted		0.98			0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3255			1857	1599	1770	3539	1583	1736	3471	1553
Peak-hour factor, PHF	0.82	0.82	0.82	0.81	0.81	0.81	0.75	0.75	0.75	0.84	0.84	0.84
Adj. Flow (vph)	43	55	12	93	259	216	93	653	67	89	280	83
RTOR Reduction (vph)	0	11	0	0	0	0	0	0	45	0	0	55
Lane Group Flow (vph)	0	99	0	0	352	216	93	653	22	89	280	28
Heavy Vehicles (%)	7%	7%	7%	1%	1%	1%	2%	2%	2%	4%	4%	4%
Turn Type	Split			Split		Perm	Prot		Over	Prot		Perm
Protected Phases	3	3		4	4		1	6	4	5	2	
Permitted Phases						4						2
Actuated Green, G (s)		6.6			27.1	27.1	8.1	28.0	27.1	8.3	28.2	28.2
Effective Green, g (s)		8.6			29.1	29.1	10.1	30.0	29.1	10.3	30.2	30.2
Actuated g/C Ratio		0.10			0.32	0.32	0.11	0.33	0.32	0.11	0.34	0.34
Clearance Time (s)		5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)		2.5			2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)		311			600	517	199	1180	512	199	1165	521
v/s Ratio Prot		c0.03			c0.19		c0.05	c0.18	0.01	0.05	0.08	
v/s Ratio Perm						0.14						0.02
v/c Ratio		0.32			0.59	0.42	0.47	0.55	0.04	0.45	0.24	0.05
Uniform Delay, d1		38.0			25.4	23.8	37.4	24.5	20.9	37.2	21.6	20.2
Progression Factor		1.00			1.00	1.00	1.19	1.03	1.71	0.80	1.34	3.24
Incremental Delay, d2		0.4			1.2	0.4	1.2	1.8	0.0	1.2	0.5	0.2
Delay (s)		38.4			26.6	24.2	45.7	27.1	35.7	30.9	29.5	65.7
Level of Service		D			C	C	D	C	D	C	C	E
Approach Delay (s)		38.4			25.7			29.9			36.4	
Approach LOS		D			C			C			D	

Intersection Summary

HCM Average Control Delay	30.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	49.6%	ICU Level of Service	A
Analysis Period (min)	15		

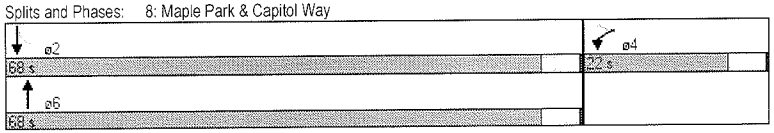
c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Volume (vph)	15	40	635	30	210
Lane Group Flow (vph)	21	56	910	34	236
Turn Type		Perm		Perm	
Protected Phases	4		6		2
Permitted Phases		4		2	
Detector Phase	4	4	6	2	2
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	29.0	15.0	15.0
Total Split (s)	22.0	22.0	68.0	68.0	68.0
Total Split (%)	24.4%	24.4%	75.6%	75.6%	75.6%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	C-Min	C-Min	C-Min
v/c Ratio	0.13	0.29	0.30	0.07	0.08
Control Delay	38.7	15.0	1.6	1.8	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	38.7	15.0	1.6	1.8	0.8
Queue Length 50th (ft)	11	0	34	0	0
Queue Length 95th (ft)	26	21	47	m0	0
Internal Link Dist (ft)	541		1242		579
Turn Bay Length (ft)		200		250	
Base Capacity (vph)	353	360	3062	490	3046
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	0.06	0.16	0.30	0.07	0.08

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 65 (72%), Referenced to phase 2:SBTL and 6:NBT, Start of Yellow
Natural Cycle: 55
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Maple Park & Capitol Way



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	15	40	635	75	30	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1671	1495	3518		1752	3505
Flt Permitted	0.95	1.00	1.00		0.31	1.00
Satd. Flow (perm)	1671	1495	3518		564	3505
Peak-hour factor, PHF	0.72	0.72	0.78	0.78	0.89	0.89
Adj. Flow (vph)	21	56	814	96	34	236
RTOR Reduction (vph)	0	51	5	0	0	0
Lane Group Flow (vph)	21	5	905	0	34	236
Heavy Vehicles (%)	8%	8%	1%	1%	3%	3%
Turn Type		Perm			Perm	
Protected Phases	4		6			2
Permitted Phases		4			2	
Actuated Green, G (s)	5.4	5.4	74.6		74.6	74.6
Effective Green, g (s)	7.4	7.4	76.6		76.6	76.6
Actuated g/C Ratio	0.08	0.08	0.85		0.85	0.85
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0
Vehicle Extension (s)	2.5	2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	137	123	2994		480	2983
v/s Ratio Prot	c0.01		c0.26			0.07
v/s Ratio Perm		0.00			0.06	
v/c Ratio	0.15	0.04	0.30		0.07	0.08
Uniform Delay, d1	38.4	38.0	1.3		1.1	1.1
Progression Factor	1.00	1.00	0.99		1.01	0.63
Incremental Delay, d2	0.4	0.1	0.3		0.3	0.1
Delay (s)	38.8	38.1	1.6		1.4	0.7
Level of Service	D	D	A		A	A
Approach Delay (s)	38.3		1.6			0.8
Approach LOS	D		A			A

Intersection Summary

HCM Average Control Delay	3.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	34.9%	ICU Level of Service	A
Analysis Period (min)	15		

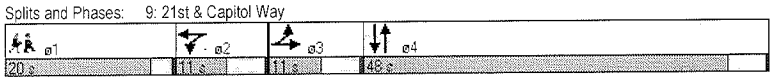
c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT	ø1
Lane Configurations							
Volume (vph)	0	0	5	625	5	195	
Lane Group Flow (vph)	18	24	0	878	0	271	
Turn Type			Perm		Perm		
Protected Phases	3	2		4		4	1
Permitted Phases			4		4		
Detector Phase	3	2	4	4	4	4	
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	10.0	15.0	15.0	15.0	15.0	20.0
Total Split (s)	11.0	11.0	48.0	48.0	48.0	48.0	20.0
Total Split (%)	12.2%	12.2%	53.3%	53.3%	53.3%	53.3%	22%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	2.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	
Lead/Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead
Lead-Lag Optimize?							
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	None
v/c Ratio	0.11	0.15		0.30		0.09	
Control Delay	28.0	23.9		3.0		1.2	
Queue Delay	0.0	0.0		0.0		0.0	
Total Delay	28.0	23.9		3.0		1.2	
Queue Length 50th (ft)	5	4		0		0	
Queue Length 95th (ft)	14	16		90		15	
Internal Link Dist (ft)	166	123		1148		1242	
Turn Bay Length (ft)							
Base Capacity (vph)	167	172		2974		2890	
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	0.11	0.14		0.30		0.09	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 15 (17%), Referenced to phase 4:NBSB, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 9: 21st & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	0	5	5	0	10	5	625	2	5	195	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.93			0.91			1.00			1.00	
Flt Protected		0.98			0.98			1.00			1.00	
Satd. Flow (prot)		1729			1701			3536			3487	
Flt Permitted		0.98			0.98			0.95			0.94	
Satd. Flow (perm)		1729			1701			3371			3273	
Peak-hour factor, PHF	0.56	0.56	0.56	0.61	0.61	0.61	0.72	0.72	0.72	0.76	0.76	0.76
Adj. Flow (vph)	9	0	9	8	0	16	7	868	3	7	257	7
RTOR Reduction (vph)	0	9	0	0	15	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	9	0	0	9	0	0	878	0	0	270	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	3%	3%	3%
Turn Type	Split			Split			Perm			Perm		
Protected Phases	3	3		2	2			4			4	
Permitted Phases							4			4		
Actuated Green, G (s)		2.6			2.7			69.7			69.7	
Effective Green, g (s)		4.6			4.7			71.7			71.7	
Actuated g/C Ratio		0.05			0.05			0.80			0.80	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		2.5			2.5			2.5			2.5	
Lane Grp Cap (vph)		88			89			2686			2607	
v/s Ratio Prot		c0.01			c0.01							
v/s Ratio Perm								c0.26			0.08	
v/c Ratio		0.11			0.10			0.33			0.10	
Uniform Delay, d1		40.7			40.6			2.5			2.0	
Progression Factor		1.00			1.00			1.00			0.49	
Incremental Delay, d2		0.4			0.4			0.3			0.1	
Delay (s)		41.1			41.0			2.8			1.1	
Level of Service		D			D			A			A	
Approach Delay (s)		41.1			41.0			2.8			1.1	
Approach LOS		D			D			A			A	

Intersection Summary

HCM Average Control Delay	3.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	30.8%	ICU Level of Service	A
Analysis Period (min)	15		

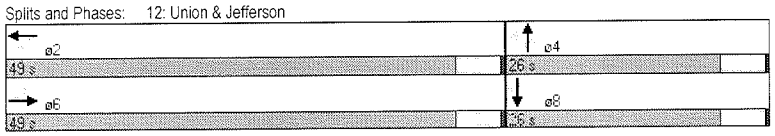
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	15	175	160	370	60	185	45	30	75	15
Lane Group Flow (vph)	20	253	208	559	0	266	49	0	146	21
Turn Type	Perm		Perm		Perm		Perm	Perm		Perm
Protected Phases		6		2		4			8	
Permitted Phases	6		2		4		4	8		8
Detector Phase	6	6	2	2	4	4	4	8	8	8
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	19.0	19.0	19.0	19.0	21.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	49.0	49.0	49.0	49.0	26.0	26.0	26.0	26.0	26.0	26.0
Total Split (%)	65.3%	65.3%	65.3%	65.3%	34.7%	34.7%	34.7%	34.7%	34.7%	34.7%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min	Min
v/c Ratio	0.06	0.16	0.42	0.36		0.42	0.08		0.24	0.03
Control Delay	6.3	5.6	9.9	6.5		11.4	4.0		9.8	4.9
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	6.3	5.6	9.9	6.5		11.4	4.0		9.8	4.9
Queue Length 50th (ft)	2	10	21	25		31	0		16	0
Queue Length 95th (ft)	8	24	55	51		99	15		43	7
Internal Link Dist (ft)		542		982		380			249	
Turn Bay Length (ft)	200		200							300
Base Capacity (vph)	791	3482	1114	3484		1244	1192		1184	1173
Starvation Cap Reductn	0	0	0	0		0	0		0	0
Spillback Cap Reductn	0	0	0	0		0	0		0	0
Storage Cap Reductn	0	0	0	0		0	0		0	0
Reduced v/c Ratio	0.03	0.07	0.19	0.16		0.21	0.04		0.12	0.02

Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 33.4
Natural Cycle: 40
Control Type: Actuated-Uncoordinated

Splits and Phases: 12: Union & Jefferson



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	175	15	160	370	60	60	185	45	30	75	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.99	1.00
Satd. Flow (prot)	1770	3497		1787	3499			1877	1615		1855	1599
Flt Permitted	0.43	1.00		0.60	1.00			0.90	1.00		0.86	1.00
Satd. Flow (perm)	793	3497		1119	3499			1705	1615		1622	1599
Peak-hour factor, PHF	0.75	0.75	0.75	0.77	0.77	0.77	0.92	0.92	0.92	0.72	0.72	0.72
Adj. Flow (vph)	20	233	20	208	481	78	65	201	49	42	104	21
RTOR Reduction (vph)	0	11	0	0	25	0	0	0	31	0	0	13
Lane Group Flow (vph)	20	242	0	208	534	0	0	266	18	0	146	8
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4		4	8		8
Actuated Green, G (s)	12.6	12.6		12.6	12.6			10.2	10.2		10.2	10.2
Effective Green, g (s)	14.6	14.6		14.6	14.6			12.2	12.2		12.2	12.2
Actuated g/C Ratio	0.45	0.45		0.45	0.45			0.37	0.37		0.37	0.37
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	2.5	2.5		2.5	2.5			2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	353	1557		498	1557			634	601		603	595
v/s Ratio Prot		0.07			0.15							
v/s Ratio Perm	0.03			c0.19				c0.16	0.01		0.09	0.00
v/c Ratio	0.06	0.16		0.42	0.34			0.42	0.03		0.24	0.01
Uniform Delay, d1	5.2	5.4		6.2	6.0			7.7	6.5		7.1	6.5
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.0	0.0		0.4	0.1			0.3	0.0		0.2	0.0
Delay (s)	5.2	5.5		6.6	6.1			8.0	6.6		7.3	6.5
Level of Service	A	A		A	A			A	A		A	A
Approach Delay (s)		5.4			6.2			7.8			7.2	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	6.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	32.8	Sum of lost time (s)	6.0
Intersection Capacity Utilization	47.5%	ICU Level of Service	A
Analysis Period (min)	15		

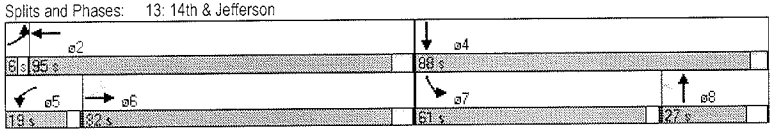
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Volume (vph)	5	120	275	765	595	15	40	45	70	80
Lane Group Flow (vph)	0	147	344	956	744	0	65	53	97	194
Turn Type	pm+pt		Prot		Free	Perm		Free	Prot	
Protected Phases	1	6	5	2			8		7	4
Permitted Phases	6				Free	8		Free		
Detector Phase	1	6	5	2		8	8		7	4
Switch Phase										
Minimum Initial (s)	2.0	4.0	4.0	4.0		2.0	2.0		2.0	4.0
Minimum Split (s)	6.0	10.0	12.0	17.0		26.0	26.0		12.0	25.0
Total Split (s)	6.0	82.0	19.0	95.0	0.0	27.0	27.0	0.0	61.0	88.0
Total Split (%)	3.2%	43.4%	10.1%	50.3%	0.0%	14.3%	14.3%	0.0%	32.3%	46.6%
Yellow Time (s)	2.5	5.5	3.5	5.5		5.5	5.5		3.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5		0.5	0.5		0.5	0.5
Lost Time Adjust (s)	0.0	-3.0	-1.0	-3.0	-1.0	-3.0	-3.0	-1.0	-1.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag		Lag	Lag		Lead	
Lead-Lag Optimize?										
Recall Mode	None	Min	None	Min		None	None		None	None
v/c Ratio		0.25	0.68	0.51	0.47		0.22	0.03	0.33	0.30
Control Delay		22.9	30.5	11.6	1.0		24.1	0.0	26.1	11.8
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Delay		22.9	30.5	11.6	1.0		24.1	0.0	26.1	11.8
Queue Length 50th (ft)		23	109	112	0		20	0	31	38
Queue Length 95th (ft)		50	#225	170	0		52	0	58	62
Internal Link Dist (ft)		1141		344			117			586
Turn Bay Length (ft)			200		300					
Base Capacity (vph)		3135	507	3574	1599		668	1524	1648	1710
Starvation Cap Reductn		0	0	0	0		0	0	0	0
Spillback Cap Reductn		0	0	0	0		0	0	0	0
Storage Cap Reductn		0	0	0	0		0	0	0	0
Reduced v/c Ratio		0.05	0.68	0.27	0.47		0.10	0.03	0.06	0.11

Intersection Summary

Cycle Length: 189
Actuated Cycle Length: 57.9
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 13: 14th & Jefferson



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	120	5	275	765	595	15	40	45	70	80	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Util. Factor		0.95		1.00	0.95	1.00		1.00	1.00	1.00	1.00	
Frt		0.99		1.00	1.00	0.85		1.00	0.85	1.00	0.94	
Flt Protected		1.00		0.95	1.00	1.00		0.99	1.00	0.95	1.00	
Satd. Flow (prot)		3510		1787	3574	1599		1768	1524	1736	1710	
Flt Permitted		0.89		0.95	1.00	1.00		0.87	1.00	0.95	1.00	
Satd. Flow (perm)		3135		1787	3574	1599		1568	1524	1736	1710	
Peak-hour factor, PHF	0.89	0.89	0.89	0.80	0.80	0.80	0.85	0.85	0.85	0.72	0.72	0.72
Adj. Flow (vph)	6	135	6	344	956	744	18	47	53	97	111	83
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	16	0
Lane Group Flow (vph)	0	145	0	344	956	744	0	65	53	97	178	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	6%	6%	6%	4%	4%	4%
Turn Type	pm+pt			Prot		Free	Perm		Free	Prot		
Protected Phases	1	6		5	2			8		7	4	
Permitted Phases	6					Free	8		Free			
Actuated Green, G (s)		7.8		15.4	27.2	58.5		8.0	58.5	7.3	20.3	
Effective Green, g (s)		10.8		16.4	30.2	58.5		11.0	58.5	8.3	22.3	
Actuated g/C Ratio		0.18		0.28	0.52	1.00		0.19	1.00	0.14	0.38	
Clearance Time (s)		6.0		4.0	6.0			6.0		4.0	5.0	
Vehicle Extension (s)		2.0		2.0	2.0			2.0		2.0	2.0	
Lane Grp Cap (vph)		579		501	1845	1599		295	1524	246	652	
v/s Ratio Prot				c0.19	c0.27					0.06	0.10	
v/s Ratio Perm		0.05				c0.47		0.04	0.03			
v/c Ratio		0.25		0.69	0.52	0.47		0.22	0.03	0.39	0.27	
Uniform Delay, d1		20.4		18.8	9.3	0.0		20.1	0.0	22.8	12.5	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1		3.1	0.1	1.0		0.1	0.0	0.4	0.1	
Delay (s)		20.5		21.9	9.4	1.0		20.3	0.0	23.2	12.6	
Level of Service		C		C	A	A		C	A	C	B	
Approach Delay (s)		20.5			8.5			11.2			16.1	
Approach LOS		C			A			B			B	

Intersection Summary

HCM Average Control Delay	10.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	58.5	Sum of lost time (s)	3.0
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	EMP	Intersection	14
Agency/Co.	Parametrix	Jurisdiction	City of Olympia
Date Performed	3/14/2008	Analysis Year	2008 Existing
Analysis Time Period	AM Peak Hour		

Project Description 247-4575-003

East/West Street: SE Maple Park Avenue | North/South Street: SE Jefferson Street

Intersection Orientation: North-South | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	2	20	1	5	10	245
Peak-Hour Factor, PHF	0.78	0.78	0.78	0.77	0.77	0.77
Hourly Flow Rate, HFR (veh/h)	2	25	1	6	12	318
Percent Heavy Vehicles	3	--	--	3	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LTR			LTR		
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	75	5	2	0	5	5
Peak-Hour Factor, PHF	0.89	0.89	0.89	0.56	0.56	0.56
Hourly Flow Rate, HFR (veh/h)	84	5	2	0	8	8
Percent Heavy Vehicles	3	3	3	0	0	0
Percent Grade (%)	-3			-2		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LTR	LTR		LTR			LTR	
v (veh/h)	2	6		16			91	
C (m) (veh/h)	1224	1582		730			717	
v/c	0.00	0.00		0.02			0.13	
95% queue length	0.00	0.01		0.07			0.43	
Control Delay (s/veh)	7.9	7.3		10.0			10.7	
LOS	A	A		B			B	
Approach Delay (s/veh)	--	--	10.0			10.7		
Approach LOS	--	--	B			B		

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SIDRA INTERSECTION

Movement Summary

14th Ave Extension / Henderson Blvd

2008 Existing AM Peak Hour

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
NB Driveway										
3L	L	2	0.0	0.008	14.9	LOS B	1	0.54	0.66	28.4
8T	T	2	0.0	0.008	7.8	LOS A	1	0.54	0.53	31.9
8R	R	2	0.0	0.008	9.1	LOS A	1	0.54	0.54	31.3
Approach		**6**	**0.0**	**0.008**	**10.6**	**LOS B**	**1**	**0.54**	**0.57**	**30.4**
WB Henderson Blvd										
1L	L	1	0.0	0.333	12.2	LOS B	77	0.06	0.68	29.8
6T	T	398	1.0	0.345	5.1	LOS A	77	0.06	0.42	34.5
6R	R	145	0.7	0.345	6.5	LOS A	77	0.06	0.50	33.4
Approach		**544**	**0.9**	**0.346**	**5.5**	**LOS A**	**77**	**0.06**	**0.44**	**34.2**
SB 14th Ave Extension										
7L	L	36	5.6	0.054	14.9	LOS B	9	0.51	0.71	28.5
4T	T	6	14.3	0.054	7.8	LOS A	9	0.51	0.58	32.1
4R	R	464	5.0	0.244	6.2	LOS B#	12#	0.00	0.50	34.0
Approach		**507**	**5.1**	**0.244**	**6.8**	**LOS A**	**9**	**0.04**	**0.51**	**33.5**
EB Henderson Blvd										
5L	L	2	33.3	0.333	12.4	LOS B	72	0.22	0.65	29.4
2T	T	420	1.9	0.323	5.4	LOS A	72	0.22	0.42	33.6
2R	R	2	33.3	0.333	6.7	LOS A	72	0.22	0.50	32.7
Approach		**426**	**2.3**	**0.323**	**5.5**	**LOS A**	**72**	**0.22**	**0.42**	**33.6**
All Vehicles		**1483**	**2.8**	**0.345**	**6.0**	**LOS A**	**77**	**0.10**	**0.46**	**33.7**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

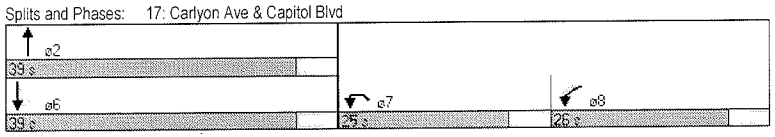
Following Queue
- Density for continuous movement

Lane Group	WBL	NBT	SBL2	SBL	SBT	NWL
Lane Configurations						
Volume (vph)	60	385	40	10	585	30
Lane Group Flow (vph)	168	681	0	64	750	49
Turn Type			Perm	Perm		
Protected Phases	8	2			6	7
Permitted Phases			6	6		
Detector Phase	8	2	6	6	6	7
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	26.0	39.0	39.0	39.0	39.0	25.0
Total Split (%)	28.9%	43.3%	43.3%	43.3%	43.3%	27.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag					Lead
Lead-Lag Optimize?						
Recall Mode	None	Max	Max	Max	Max	None
v/c Ratio	0.58	0.34		0.16	0.37	0.27
Control Delay	30.2	9.9		11.5	10.2	31.6
Queue Delay	0.0	0.0		0.0	0.0	0.0
Total Delay	30.2	9.9		11.5	10.2	31.6
Queue Length 50th (ft)	54	80		13	91	18
Queue Length 95th (ft)	59	109		35	135	46
Internal Link Dist (ft)	1602	636			2617	614
Turn Bay Length (ft)				150		
Base Capacity (vph)	563	1985		389	2010	539
Starvation Cap Reductn	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0
Reduced v/c Ratio	0.30	0.34		0.16	0.37	0.09

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 66.1
Natural Cycle: 75
Control Type: Semi Act-Uncoord

Splits and Phases: 17: Carlyon Ave & Capitol Blvd



Movement	WBL2	WBL	WBR	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2
Lane Configurations												
Volume (vph)	2	60	30	385	90	15	40	10	585	30	10	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0				5.0	5.0	5.0		
Lane Util. Factor		1.00		0.95				1.00	0.95	1.00		
Frt		0.96		0.97				1.00	1.00	0.96		
Flt Protected		0.97		1.00				0.95	1.00	0.96		
Satd. Flow (prot)		1706		3425				1736	3471	1767		
Flt Permitted		0.97		1.00				0.37	1.00	0.96		
Satd. Flow (perm)		1706		3425				672	3471	1767		
Peak-hour factor, PHF	0.55	0.55	0.55	0.72	0.72	0.72	0.78	0.78	0.78	0.84	0.84	0.84
Adj. Flow (vph)	4	109	55	535	125	21	51	13	750	36	12	1
RTOR Reduction (vph)	0	21	0	2	0	0	0	0	0	1	0	0
Lane Group Flow (vph)	0	147	0	679	0	0	0	64	750	48	0	0
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	4%	4%	4%	0%	0%	0%
Turn Type	Perm						Perm	Perm				
Protected Phases		8		2					6	7		
Permitted Phases	8						6	6				
Actuated Green, G (s)		10.4		38.3				38.3	38.3	4.5		
Effective Green, g (s)		10.4		38.3				38.3	38.3	4.5		
Actuated g/C Ratio		0.15		0.56				0.56	0.56	0.07		
Clearance Time (s)		5.0		5.0				5.0	5.0	5.0		
Vehicle Extension (s)		2.5		2.5				2.5	2.5	2.5		
Lane Grp Cap (vph)		260		1923				377	1949	117		
v/s Ratio Prot				0.20					c0.22	c0.03		
v/s Ratio Perm		0.09						0.10				
v/c Ratio		0.56		0.35				0.17	0.38	0.41		
Uniform Delay, d1		26.8		8.2				7.2	8.4	30.6		
Progression Factor		1.00		1.00				1.00	1.00	1.00		
Incremental Delay, d2		2.3		0.5				1.0	0.6	1.7		
Delay (s)		29.1		8.7				8.2	8.9	32.3		
Level of Service		C		A				A	A	C		
Approach Delay (s)		29.1		8.7					8.9	32.3		
Approach LOS		C		A					A	C		

Intersection Summary

HCM Average Control Delay	11.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	68.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	42.6%	ICU Level of Service	A
Analysis Period (min)	15		

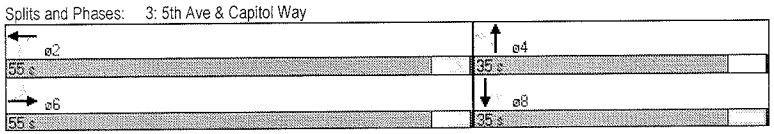
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	10	250	5	285	5	320	5	205
Lane Group Flow (vph)	0	470	0	443	0	405	0	252
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		6		2		4		8
Permitted Phases	6		2		4		8	
Detector Phase	6	6	2	2	4	4	8	8
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	26.0	26.0	26.0	26.0	20.0	20.0	20.0	20.0
Total Split (s)	55.0	55.0	55.0	55.0	35.0	35.0	35.0	35.0
Total Split (%)	61.1%	61.1%	61.1%	61.1%	38.9%	38.9%	38.9%	38.9%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max
v/c Ratio		0.50		0.46		0.43		0.27
Control Delay		15.4		9.6		9.8		15.7
Queue Delay		0.7		0.9		0.2		0.0
Total Delay		16.1		10.5		10.0		15.7
Queue Length 50th (ft)		146		85		30		30
Queue Length 95th (ft)		124		90		48		46
Internal Link Dist (ft)		221		238		221		223
Turn Bay Length (ft)								
Base Capacity (vph)		939		969		948		940
Starvation Cap Reductn		197		276		117		0
Spillback Cap Reductn		0		0		0		0
Storage Cap Reductn		0		0		0		0
Reduced v/c Ratio		0.63		0.64		0.49		0.27

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 26 (29%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow
Natural Cycle: 50
Control Type: Pretimed

Splits and Phases: 3: 5th Ave & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	250	65	5	285	25	5	320	60	5	205	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frpb, ped/bikes		0.99			1.00			0.97			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.97			0.99			0.98			0.99	
Flt Protected		1.00			1.00			1.00			1.00	
Satd. Flow (prot)		1630			1682			2749			2764	
Flt Permitted		0.99			0.99			0.95			0.95	
Satd. Flow (perm)		1608			1672			2618			2623	
Peak-hour factor, PHF	0.69	0.69	0.69	0.71	0.71	0.71	0.95	0.95	0.95	0.91	0.91	0.91
Adj. Flow (vph)	14	362	94	7	401	35	5	337	63	5	225	22
RTOR Reduction (vph)	0	10	0	0	3	0	0	17	0	0	8	0
Lane Group Flow (vph)	0	460	0	0	440	0	0	388	0	0	244	0
Confl. Peds. (#/hr)	38		60	60		38	43		56	56		43
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	3%	3%	3%	6%	6%	6%
Parking (#/hr)								12			12	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		50.0			50.0			30.0			30.0	
Effective Green, g (s)		52.0			52.0			32.0			32.0	
Actuated g/C Ratio		0.58			0.58			0.36			0.36	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)		929			966			931			933	
v/s Ratio Prot												
v/s Ratio Perm		c0.29			0.26			c0.15			0.09	
v/c Ratio		0.50			0.46			0.42			0.26	
Uniform Delay, d1		11.2			10.9			21.9			20.6	
Progression Factor		1.25			0.73			0.41			0.76	
Incremental Delay, d2		1.6			1.5			1.3			0.6	
Delay (s)		15.7			9.5			10.3			16.3	
Level of Service		B			A			B			B	
Approach Delay (s)		15.7			9.5			10.3			16.3	
Approach LOS		B			A			B			B	

Intersection Summary

HCM Average Control Delay	12.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		

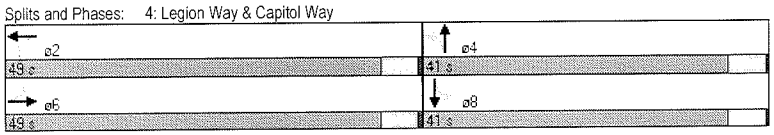
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	10	130	50	180	5	350	1	290
Lane Group Flow (vph)	0	228	0	395	0	484	0	378
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		6		2		4		8
Permitted Phases	6		2		4		8	
Detector Phase	6	6	2	2	4	4	8	8
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	49.0	49.0	49.0	49.0	41.0	41.0	41.0	41.0
Total Split (%)	54.4%	54.4%	54.4%	54.4%	45.6%	45.6%	45.6%	45.6%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max
v/c Ratio		0.27		0.50		0.38		0.30
Control Delay		9.3		11.0		11.3		9.3
Queue Delay		0.5		1.2		0.0		0.0
Total Delay		9.9		12.1		11.3		9.3
Queue Length 50th (ft)		45		80		58		33
Queue Length 95th (ft)		64		94		62		45
Internal Link Dist (ft)		221		241		1485		221
Turn Bay Length (ft)								
Base Capacity (vph)		839		784		1265		1240
Starvation Cap Reductn		313		196		0		0
Spillback Cap Reductn		0		0		0		0
Storage Cap Reductn		0		0		0		0
Reduced v/c Ratio		0.43		0.67		0.38		0.30

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 30 (33%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow
Natural Cycle: 50
Control Type: Pretimed

Splits and Phases: 4: Legion Way & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	130	45	50	180	55	5	350	70	1	290	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.97			0.97			0.98			0.99	
Flt Protected		1.00			0.99			1.00			1.00	
Satd. Flow (prot)		1649			1651			3104			3071	
Flt Permitted		0.98			0.91			0.95			0.95	
Satd. Flow (perm)		1616			1515			2953			2931	
Peak-hour factor, PHF	0.81	0.81	0.81	0.72	0.72	0.72	0.88	0.88	0.88	0.81	0.81	0.81
Adj. Flow (vph)	12	160	56	69	250	76	6	398	80	1	358	19
RTOR Reduction (vph)	0	13	0	0	9	0	0	18	0	0	4	0
Lane Group Flow (vph)	0	215	0	0	386	0	0	466	0	0	374	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	5%	5%	5%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		44.0			44.0			36.0			36.0	
Effective Green, g (s)		46.0			46.0			38.0			38.0	
Actuated g/C Ratio		0.51			0.51			0.42			0.42	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)		826			774			1247			1238	
v/s Ratio Prot												
v/s Ratio Perm		0.13			c0.25			c0.16			0.13	
v/c Ratio		0.26			0.50			0.37			0.30	
Uniform Delay, d1		12.4			14.4			17.8			17.2	
Progression Factor		0.76			0.61			0.62			0.51	
Incremental Delay, d2		0.8			2.3			0.8			0.6	
Delay (s)		10.2			11.1			11.9			9.4	
Level of Service		B			B			B			A	
Approach Delay (s)		10.2			11.1			11.9			9.4	
Approach LOS		B			B			B			A	

Intersection Summary

HCM Average Control Delay	10.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		

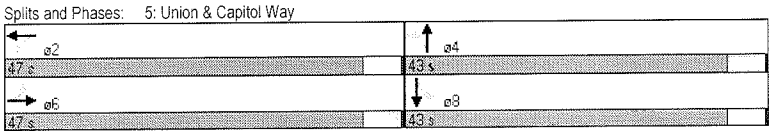
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	5	200	135	110	45	485	80	425
Lane Group Flow (vph)	0	345	153	193	54	729	100	537
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		6		2		4		8
Permitted Phases	6		2		4		8	
Detector Phase	6	6	2	2	4	4	8	8
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	47.0	47.0	47.0	47.0	43.0	43.0	43.0	43.0
Total Split (%)	52.2%	52.2%	52.2%	52.2%	47.8%	47.8%	47.8%	47.8%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
v/c Ratio		0.40	0.75	0.22	0.10	0.31	0.23	0.22
Control Delay		24.3	52.6	15.9	3.6	3.4	5.4	3.7
Queue Delay		0.0	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay		24.3	52.6	15.9	3.6	3.6	5.4	3.7
Queue Length 50th (ft)		73	81	29	4	26	11	31
Queue Length 95th (ft)		74	129	46	10	35	25	47
Internal Link Dist (ft)		205		541		240		1485
Turn Bay Length (ft)			200		100		200	
Base Capacity (vph)		1632	398	1690	554	2364	437	2396
Starvation Cap Reductn		0	0	0	0	729	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		0.21	0.38	0.11	0.10	0.45	0.23	0.22

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 82 (91%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 5: Union & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	200	50	135	110	60	45	485	120	80	425	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor		0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt		0.97		1.00	0.95		1.00	0.97		1.00	1.00	
Flt Protected		1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3465		1787	3385		1770	3434		1752	3499	
Flt Permitted		0.95		0.43	1.00		0.44	1.00		0.35	1.00	
Satd. Flow (perm)		3292		815	3385		811	3434		638	3499	
Peak-hour factor, PHF	0.74	0.74	0.74	0.88	0.88	0.88	0.83	0.83	0.83	0.80	0.80	0.80
Adj. Flow (vph)	7	270	68	153	125	68	54	584	145	100	531	6
RTOR Reduction (vph)	0	35	0	0	51	0	0	14	0	0	1	0
Lane Group Flow (vph)	0	310	0	153	142	0	54	715	0	100	536	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	3%	3%	3%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		20.4		20.4	20.4		59.6	59.6		59.6	59.6	
Effective Green, g (s)		22.4		22.4	22.4		61.6	61.6		61.6	61.6	
Actuated g/C Ratio		0.25		0.25	0.25		0.68	0.68		0.68	0.68	
Clearance Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.5		3.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)		819		203	842		555	2350		437	2395	
v/s Ratio Prot					0.04			c0.21			0.15	
v/s Ratio Perm		0.09		c0.19			0.07			0.16		
v/c Ratio		0.38		0.75	0.17		0.10	0.30		0.23	0.22	
Uniform Delay, d1		28.0		31.2	26.5		4.8	5.7		5.3	5.3	
Progression Factor		1.00		1.00	1.00		0.46	0.48		0.55	0.55	
Incremental Delay, d2		0.3		15.1	0.1		0.3	0.3		1.2	0.2	
Delay (s)		28.4		46.3	26.6		2.5	3.1		4.1	3.1	
Level of Service		C		D	C		A	A		A	A	
Approach Delay (s)		28.4			35.3			3.0			3.3	
Approach LOS		C			D			A			A	

Intersection Summary

HCM Average Control Delay	12.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		

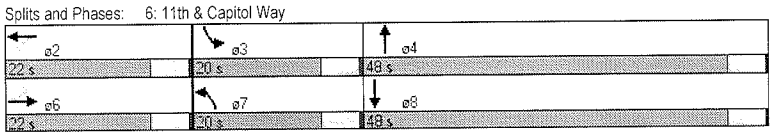
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	25	35	60	45	55	590	10	570
Lane Group Flow (vph)	30	141	70	93	62	715	11	659
Turn Type	Perm		Perm		Prot		Prot	
Protected Phases		6		2	7	4	3	8
Permitted Phases	6		2					
Detector Phase	6	6	2	2	7	4	3	8
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	12.0	25.0	12.0	25.0
Total Split (s)	22.0	22.0	22.0	22.0	20.0	48.0	20.0	48.0
Total Split (%)	24.4%	24.4%	24.4%	24.4%	22.2%	53.3%	22.2%	53.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
v/c Ratio	0.18	0.44	0.55	0.33	0.31	0.26	0.07	0.28
Control Delay	34.2	16.5	50.7	23.2	48.9	3.5	40.2	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	34.2	16.5	50.7	23.2	48.9	3.5	40.2	6.5
Queue Length 50th (ft)	15	22	38	27	38	50	5	72
Queue Length 95th (ft)	34	58	72	62	m75	73	m21	89
Internal Link Dist (ft)		205		230		830		240
Turn Bay Length (ft)					150		100	
Base Capacity (vph)	246	426	188	395	338	2709	334	2357
Starvation Cap Reductn	0	0	0	0	0	0	0	860
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.33	0.37	0.24	0.18	0.26	0.03	0.44

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 82 (91%), Referenced to phase 4:NBT and 8:SBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: 11th & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	35	80	60	45	35	55	590	40	10	570	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.90		1.00	0.93		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1652		1752	1723		1787	3541		1770	3530	
Flt Permitted	0.63	1.00		0.48	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1166	1652		892	1723		1787	3541		1770	3530	
Peak-hour factor, PHF	0.82	0.82	0.82	0.86	0.86	0.86	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	30	43	98	70	52	41	62	670	45	11	648	11
RTOR Reduction (vph)	0	84	0	0	34	0	0	3	0	0	1	0
Lane Group Flow (vph)	30	57	0	70	59	0	62	712	0	11	658	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	1%	1%	1%	2%	2%	2%
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		6			2		7	4		3	8	
Permitted Phases	6			2								
Actuated Green, G (s)	10.9	10.9		10.9	10.9		7.0	62.7		1.4	57.1	
Effective Green, g (s)	12.9	12.9		12.9	12.9		9.0	64.7		3.4	59.1	
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.10	0.72		0.04	0.66	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	167	237		128	247		179	2546		67	2318	
v/s Ratio Prot		0.03			0.03		c0.03	c0.20		0.01	0.19	
v/s Ratio Perm	0.03			c0.08								
v/c Ratio	0.18	0.24		0.55	0.24		0.35	0.28		0.16	0.28	
Uniform Delay, d1	33.9	34.2		35.8	34.2		37.8	4.5		41.9	6.5	
Progression Factor	1.00	1.00		1.00	1.00		1.25	0.77		1.05	0.79	
Incremental Delay, d2	0.4	0.4		3.7	0.4		0.8	0.2		0.8	0.3	
Delay (s)	34.3	34.6		39.6	34.6		48.1	3.7		44.6	5.4	
Level of Service	C	C		D	C		D	A		D	A	
Approach Delay (s)		34.5			36.7			7.2			6.1	
Approach LOS		C			D			A			A	

Intersection Summary

HCM Average Control Delay	12.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		

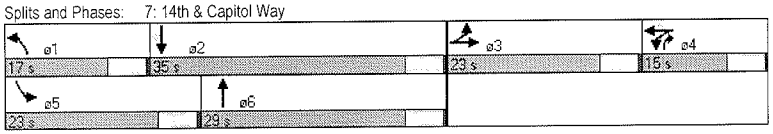
c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations									
Volume (vph)	110	40	180	15	450	85	150	545	25
Lane Group Flow (vph)	260	169	202	17	517	98	192	699	32
Turn Type			Perm	Prot		Over	Prot		Perm
Protected Phases	3	4		1	6	4	5	2	
Permitted Phases			4						2
Detector Phase	3	4	4	1	6	4	5	2	2
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	10.0	10.0	10.0	15.0	10.0	12.0	25.0	25.0
Total Split (s)	23.0	15.0	15.0	17.0	29.0	15.0	23.0	35.0	35.0
Total Split (%)	25.6%	16.7%	16.7%	18.9%	32.2%	16.7%	25.6%	38.9%	38.9%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	C-Min	None	None	C-Min	C-Min
v/c Ratio	0.50	0.44	0.60	0.11	0.44	0.24	0.61	0.40	0.04
Control Delay	35.9	35.2	40.8	46.9	24.3	12.2	38.2	22.2	13.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.9	35.2	40.8	46.9	24.3	12.2	38.2	22.2	13.0
Queue Length 50th (ft)	67	82	102	10	129	0	104	167	2
Queue Length 95th (ft)	74	148	#191	30	183	36	151	204	24
Internal Link Dist (ft)	70	1141			579			830	
Turn Bay Length (ft)				250		250	250		250
Base Capacity (vph)	767	380	334	278	1224	412	393	1735	792
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.44	0.60	0.06	0.42	0.24	0.49	0.40	0.04

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 44 (49%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: 14th & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	110	25	110	40	180	15	450	85	150	545	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.98			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3390			1815	1599	1787	3574	1599	1770	3539	1583
Flt Permitted		0.99			0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3390			1815	1599	1787	3574	1599	1770	3539	1583
Peak-hour factor, PHF	0.69	0.69	0.69	0.89	0.89	0.89	0.87	0.87	0.87	0.78	0.78	0.78
Adj. Flow (vph)	65	159	36	124	45	202	17	517	98	192	699	32
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	78	0	0	17
Lane Group Flow (vph)	0	245	0	0	169	202	17	517	20	192	699	15
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Turn Type	Split			Split		Perm	Prot		Over	Prot		Perm
Protected Phases	3	3		4	4		1	6	4	5	2	
Permitted Phases						4						2
Actuated Green, G (s)		11.3			16.8	16.8	2.8	27.8	16.8	14.1	39.1	39.1
Effective Green, g (s)		13.3			18.8	18.8	4.8	29.8	18.8	16.1	41.1	41.1
Actuated g/C Ratio		0.15			0.21	0.21	0.05	0.33	0.21	0.18	0.46	0.46
Clearance Time (s)		5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)		2.5			2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)		501			379	334	95	1183	334	317	1616	723
v/s Ratio Prot		c0.07			0.09		0.01	0.14	0.01	c0.11	c0.20	
v/s Ratio Perm						c0.13						0.01
v/c Ratio		0.49			0.45	0.60	0.18	0.44	0.06	0.61	0.43	0.02
Uniform Delay, d1		35.2			31.1	32.2	40.7	23.5	28.5	34.0	16.6	13.4
Progression Factor		1.00			1.00	1.00	1.22	0.91	1.58	0.90	1.29	1.96
Incremental Delay, d2		0.5			0.6	2.6	0.7	1.2	0.1	2.7	0.8	0.1
Delay (s)		35.8			31.7	34.8	50.3	22.6	45.2	33.2	22.2	26.4
Level of Service		D			C	C	D	C	D	C	C	C
Approach Delay (s)		35.8			33.4			26.9			24.6	
Approach LOS		D			C			C			C	

Intersection Summary

HCM Average Control Delay	28.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		

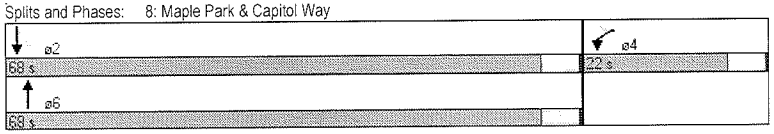
c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Volume (vph)	105	40	400	20	690
Lane Group Flow (vph)	164	62	483	24	831
Turn Type		Perm		Perm	
Protected Phases	4		6		2
Permitted Phases		4		2	
Detector Phase	4	4	6	2	2
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	29.0	15.0	15.0
Total Split (s)	22.0	22.0	68.0	68.0	68.0
Total Split (%)	24.4%	24.4%	75.6%	75.6%	75.6%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	C-Min	C-Min	C-Min
v/c Ratio	0.55	0.19	0.18	0.04	0.30
Control Delay	40.8	9.7	3.1	8.0	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	9.7	3.1	8.0	9.2
Queue Length 50th (ft)	87	0	27	4	84
Queue Length 95th (ft)	95	14	50	m27	251
Internal Link Dist (ft)	541		1242		579
Turn Bay Length (ft)		200		250	
Base Capacity (vph)	385	393	2731	685	2751
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	0.43	0.16	0.18	0.04	0.30

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 65 (72%), Referenced to phase 2:SBTL and 6:NBT, Start of Yellow
Natural Cycle: 55
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Maple Park & Capitol Way



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	105	40	400	25	20	690
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	1615	3543		1787	3574
Flt Permitted	0.95	1.00	1.00		0.47	1.00
Satd. Flow (perm)	1805	1615	3543		891	3574
Peak-hour factor, PHF	0.64	0.64	0.88	0.88	0.83	0.83
Adj. Flow (vph)	164	62	455	28	24	831
RTOR Reduction (vph)	0	52	4	0	0	0
Lane Group Flow (vph)	164	10	479	0	24	831
Heavy Vehicles (%)	0%	0%	1%	1%	1%	1%
Turn Type		Perm			Perm	
Protected Phases	4		6			2
Permitted Phases		4			2	
Actuated Green, G (s)	12.9	12.9	67.1		67.1	67.1
Effective Green, g (s)	14.9	14.9	69.1		69.1	69.1
Actuated g/C Ratio	0.17	0.17	0.77		0.77	0.77
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0
Vehicle Extension (s)	2.5	2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	299	267	2720		684	2744
v/s Ratio Prot	c0.09		0.14			c0.23
v/s Ratio Perm		0.01			0.03	
v/c Ratio	0.55	0.04	0.18		0.04	0.30
Uniform Delay, d1	34.5	31.5	2.8		2.5	3.2
Progression Factor	1.00	1.00	0.95		2.35	2.50
Incremental Delay, d2	1.6	0.0	0.1		0.1	0.3
Delay (s)	36.1	31.6	2.8		6.0	8.2
Level of Service	D	C	A		A	A
Approach Delay (s)	34.9		2.8			8.1
Approach LOS	C		A			A

Intersection Summary

HCM Average Control Delay	10.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	31.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT	ø1
Lane Configurations							
Volume (vph)	0	2	2	395	25	740	
Lane Group Flow (vph)	32	40	0	467	0	957	
Turn Type			Perm		Perm		
Protected Phases	3	2		4		4	1
Permitted Phases			4		4		
Detector Phase	3	2	4	4	4	4	
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	10.0	15.0	15.0	15.0	15.0	20.0
Total Split (s)	11.0	11.0	48.0	48.0	48.0	48.0	20.0
Total Split (%)	12.2%	12.2%	53.3%	53.3%	53.3%	53.3%	22%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	2.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	
Lead/Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead
Lead-Lag Optimize?							
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	None
v/c Ratio	0.19	0.22		0.17		0.35	
Control Delay	26.6	27.3		3.7		2.2	
Queue Delay	0.0	0.0		0.0		0.0	
Total Delay	26.6	27.3		3.7		2.2	
Queue Length 50th (ft)	9	12		37		36	
Queue Length 95th (ft)	22	21		63		58	
Internal Link Dist (ft)	166	123		1148		1242	
Turn Bay Length (ft)							
Base Capacity (vph)	179	186		2752		2715	
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	0.18	0.22		0.17		0.35	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 15 (17%), Referenced to phase 4:NBSB, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 9: 21st & Capitol Way

ø1	ø2	ø3	ø4
20 s	11 s	11 s	48 s

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	0	10	10	2	10	2	395	10	25	740	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.93			0.94			1.00			1.00	
Flt Protected		0.98			0.98			1.00			1.00	
Satd. Flow (prot)		1729			1745			3526			3562	
Flt Permitted		0.98			0.98			0.95			0.93	
Satd. Flow (perm)		1729			1745			3361			3315	
Peak-hour factor, PHF	0.64	0.64	0.64	0.55	0.55	0.55	0.87	0.87	0.87	0.81	0.81	0.81
Adj. Flow (vph)	16	0	16	18	4	18	2	454	11	31	914	12
RTOR Reduction (vph)	0	15	0	0	17	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	17	0	0	23	0	0	466	0	0	957	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Turn Type	Split			Split			Perm			Perm		
Protected Phases	3	3		2	2			4			4	
Permitted Phases							4			4		
Actuated Green, G (s)		4.1			4.4			66.5			66.5	
Effective Green, g (s)		6.1			6.4			68.5			68.5	
Actuated g/C Ratio		0.07			0.07			0.76			0.76	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		2.5			2.5			2.5			2.5	
Lane Grp Cap (vph)		117			124			2558			2523	
v/s Ratio Prot		c0.01			c0.01							
v/s Ratio Perm								0.14			c0.29	
v/c Ratio		0.15			0.19			0.18			0.38	
Uniform Delay, d1		39.5			39.4			3.0			3.6	
Progression Factor		1.00			1.00			1.00			0.44	
Incremental Delay, d2		0.4			0.5			0.2			0.4	
Delay (s)		39.9			39.9			3.1			2.0	
Level of Service		D			D			A			A	
Approach Delay (s)		39.9			39.9			3.1			2.0	
Approach LOS		D			D			A			A	

Intersection Summary

HCM Average Control Delay	4.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		

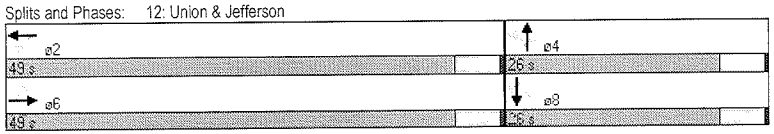
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	40	490	30	215	55	270	210	85	90	15
Lane Group Flow (vph)	50	650	36	339	0	427	276	0	206	18
Turn Type	Perm		Perm		Perm		Perm	Perm		Perm
Protected Phases		6		2		4			8	
Permitted Phases	6		2		4		4	8		8
Detector Phase	6	6	2	2	4	4	4	8	8	8
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	19.0	19.0	19.0	19.0	21.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	49.0	49.0	49.0	49.0	26.0	26.0	26.0	26.0	26.0	26.0
Total Split (%)	65.3%	65.3%	65.3%	65.3%	34.7%	34.7%	34.7%	34.7%	34.7%	34.7%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min	Min
v/c Ratio	0.14	0.53	0.18	0.28		0.47	0.29		0.29	0.02
Control Delay	10.9	12.9	12.6	8.3		9.5	2.1		8.1	3.5
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	10.9	12.9	12.6	8.3		9.5	2.1		8.1	3.5
Queue Length 50th (ft)	8	65	6	23		56	0		24	0
Queue Length 95th (ft)	22	86	20	40		105	16		62	7
Internal Link Dist (ft)		542		982		380			249	
Turn Bay Length (ft)	200		200							300
Base Capacity (vph)	1015	3515	570	3417		936	989		730	870
Starvation Cap Reductn	0	0	0	0		0	0		0	0
Spillback Cap Reductn	0	0	0	0		0	0		0	0
Storage Cap Reductn	0	0	0	0		0	0		0	0
Reduced v/c Ratio	0.05	0.18	0.06	0.10		0.46	0.28		0.28	0.02

Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 43
Natural Cycle: 40
Control Type: Actuated-Uncoordinated

Splits and Phases: 12: Union & Jefferson



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	490	30	30	215	70	55	270	210	85	90	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.96			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.98	1.00
Satd. Flow (prot)	1787	3543		1787	3443			1865	1599		1837	1599
Flt Permitted	0.54	1.00		0.30	1.00			0.92	1.00		0.72	1.00
Satd. Flow (perm)	1022	3543		573	3443			1737	1599		1355	1599
Peak-hour factor, PHF	0.80	0.80	0.80	0.84	0.84	0.84	0.76	0.76	0.76	0.85	0.85	0.85
Adj. Flow (vph)	50	612	38	36	256	83	72	355	276	100	106	18
RTOR Reduction (vph)	0	11	0	0	55	0	0	0	133	0	0	9
Lane Group Flow (vph)	50	639	0	36	284	0	0	427	143	0	206	9
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4		4	8		8
Actuated Green, G (s)	12.7	12.7		12.7	12.7			20.3	20.3		20.3	20.3
Effective Green, g (s)	14.7	14.7		14.7	14.7			22.3	22.3		22.3	22.3
Actuated g/C Ratio	0.34	0.34		0.34	0.34			0.52	0.52		0.52	0.52
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	2.5	2.5		2.5	2.5			2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	349	1211		196	1177			901	829		703	829
v/s Ratio Prot		c0.18			0.08							
v/s Ratio Perm	0.05			0.06				c0.25	0.09		0.15	0.01
v/c Ratio	0.14	0.53		0.18	0.24			0.47	0.17		0.29	0.01
Uniform Delay, d1	9.8	11.4		9.9	10.2			6.6	5.5		5.9	5.0
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	0.3		0.3	0.1			0.3	0.1		0.2	0.0
Delay (s)	9.9	11.7		10.3	10.2			6.9	5.5		6.0	5.0
Level of Service	A	B		B	B			A	A		A	A
Approach Delay (s)		11.6			10.2			6.4			6.0	
Approach LOS		B			B			A			A	

Intersection Summary

HCM Average Control Delay	8.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	43.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		

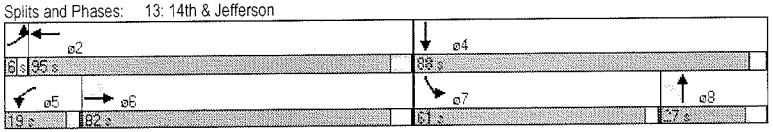
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Volume (vph)	75	710	70	215	215	5	50	170	330	100
Lane Group Flow (vph)	0	1094	80	247	247	0	89	274	351	143
Turn Type	pm+pt		Prot		Free	Perm		Free	Prot	
Protected Phases	1	6	5	2			8		7	4
Permitted Phases	6				Free	8		Free		
Detector Phase	1	6	5	2		8	8		7	4
Switch Phase										
Minimum Initial (s)	2.0	4.0	4.0	4.0		2.0	2.0		2.0	4.0
Minimum Split (s)	6.0	10.0	12.0	17.0		26.0	26.0		12.0	25.0
Total Split (s)	6.0	82.0	19.0	95.0	0.0	27.0	27.0	0.0	61.0	88.0
Total Split (%)	3.2%	43.4%	10.1%	50.3%	0.0%	14.3%	14.3%	0.0%	32.3%	46.6%
Yellow Time (s)	2.5	5.5	3.5	5.5		5.5	5.5		3.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5		0.5	0.5		0.5	0.5
Lost Time Adjust (s)	0.0	-3.0	-1.0	-3.0	-1.0	-3.0	-3.0	-1.0	-1.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag		Lag	Lag		Lead	
Lead-Lag Optimize?										
Recall Mode	None	Min	None	Min		None	None		None	None
v/c Ratio		0.82	0.50	0.13	0.15		0.44	0.18	0.77	0.20
Control Delay		40.1	76.9	16.0	0.2		69.4	0.3	59.8	26.1
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Delay		40.1	76.9	16.0	0.2		69.4	0.3	59.8	26.1
Queue Length 50th (ft)		412	65	50	0		71	0	273	70
Queue Length 95th (ft)		514	151	98	0		111	0	503	150
Internal Link Dist (ft)		1141		344			117			586
Turn Bay Length (ft)			200		300					
Base Capacity (vph)		1997	233	2642	1599		339	1524	822	1219
Starvation Cap Reductn		0	0	0	0		0	0	12	0
Spillback Cap Reductn		0	0	0	0		0	0	0	0
Storage Cap Reductn		0	0	0	0		0	0	0	0
Reduced v/c Ratio		0.55	0.34	0.09	0.15		0.26	0.18	0.43	0.12

Intersection Summary

Cycle Length: 189
Actuated Cycle Length: 131.6
Natural Cycle: 90
Control Type: Actuated-Uncoordinated

Splits and Phases: 13: 14th & Jefferson



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	710	25	70	215	215	5	50	170	330	100	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Util. Factor		0.95		1.00	0.95	1.00		1.00	1.00	1.00	1.00	
Frt		1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.96	
Flt Protected		1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3507		1787	3574	1599		1784	1524	1736	1756	
Flt Permitted		0.88		0.95	1.00	1.00		0.97	1.00	0.95	1.00	
Satd. Flow (perm)		3098		1787	3574	1599		1733	1524	1736	1756	
Peak-hour factor, PHF	0.74	0.74	0.74	0.87	0.87	0.87	0.62	0.62	0.62	0.94	0.94	0.94
Adj. Flow (vph)	101	959	34	80	247	247	8	81	274	351	106	37
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	0	0	7	0
Lane Group Flow (vph)	0	1093	0	80	247	247	0	89	274	351	136	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	6%	6%	6%	4%	4%	4%
Turn Type	pm+pt			Prot		Free	Perm		Free	Prot		
Protected Phases	1	6		5	2			8		7	4	
Permitted Phases	6					Free	8		Free			
Actuated Green, G (s)		54.1		10.8	68.9	130.8		12.4	130.8	33.5	50.9	
Effective Green, g (s)		57.1		11.8	71.9	130.8		15.4	130.8	34.5	52.9	
Actuated g/C Ratio		0.44		0.09	0.55	1.00		0.12	1.00	0.26	0.40	
Clearance Time (s)		6.0		4.0	6.0			6.0		4.0	5.0	
Vehicle Extension (s)		2.0		2.0	2.0			2.0		2.0	2.0	
Lane Grp Cap (vph)		1352		161	1965	1599		204	1524	458	710	
v/s Ratio Prot				c0.04	0.07					c0.20	0.08	
v/s Ratio Perm		c0.35				0.15		c0.05	0.18			
v/c Ratio		0.81		0.50	0.13	0.15		0.44	0.18	0.77	0.19	
Uniform Delay, d1		32.1		56.7	14.2	0.0		53.7	0.0	44.4	25.1	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		3.5		0.9	0.0	0.2		0.5	0.3	6.8	0.0	
Delay (s)		35.5		57.6	14.3	0.2		54.2	0.3	51.2	25.2	
Level of Service		D		E	B	A		D	A	D	C	
Approach Delay (s)		35.5			14.2			13.5			43.7	
Approach LOS		D			B			B			D	

Intersection Summary

HCM Average Control Delay	29.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	130.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	EMP	Intersection	14
Agency/Co.	Parametrix	Jurisdiction	City of Olympia
Date Performed	3/14/2008	Analysis Year	2008 Existing
Analysis Time Period	PM Peak Hour		

Project Description 247-4575-003

East/West Street: SE Maple Park Avenue | North/South Street: SE Jefferson Street

Intersection Orientation: North-South | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	5	15	1	10	35	95
Peak-Hour Factor, PHF	0.55	0.55	0.55	0.84	0.84	0.84
Hourly Flow Rate, HFR (veh/h)	9	27	1	11	41	113
Percent Heavy Vehicles	0	--	--	3	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LTR			LTR		
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	185	5	5	2	2	5
Peak-Hour Factor, PHF	0.67	0.67	0.67	0.50	0.50	0.50
Hourly Flow Rate, HFR (veh/h)	276	7	7	4	4	10
Percent Heavy Vehicles	1	1	1	10	10	10
Percent Grade (%)	-3			-2		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LTR	LTR		LTR			LTR	
v (veh/h)	9	11		18			290	
C (m) (veh/h)	1439	1579		850			776	
v/c	0.01	0.01		0.02			0.37	
95% queue length	0.02	0.02		0.06			1.74	
Control Delay (s/veh)	7.5	7.3		9.3			12.4	
LOS	A	A		A			B	
Approach Delay (s/veh)	--	--	9.3			12.4		
Approach LOS	--	--	A			B		

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SIDRA INTERSECTION

Movement Summary

14th Ave Extension / Henderson Blvd

2008 Existing PM Peak Hour

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
NB Driveway										
3L	L	2	0.0	0.011	17.2	LOS B	2	0.70	0.70	27.2
8T	T	2	0.0	0.011	10.2	LOS B	2	0.70	0.61	30.8
8R	R	2	0.0	0.011	11.5	LOS B	2	0.70	0.58	29.9
Approach		**6**	**0.0**	**0.011**	**13.0**	**LOS B**	**2**	**0.70**	**0.63**	**29.2**
WB Henderson Blvd										
1L	L	1	50.0	0.133	12.2	LOS B	25	0.07	0.68	29.8
6T	T	170	1.8	0.135	5.2	LOS A	25	0.07	0.42	34.4
6R	R	22	4.3	0.135	6.5	LOS A	25	0.07	0.50	33.3
Approach		**195**	**2.6**	**0.135**	**5.4**	**LOS A**	**25**	**0.07**	**0.43**	**34.2**
SB 14th Ave Extension										
7L	L	301	1.0	0.294	13.5	LOS B	54	0.42	0.69	28.9
4T	T	1	0.0	0.333	6.4	LOS A	54	0.42	0.52	32.6
4R	R	318	0.9	0.167	6.1	LOS A#	8#	0.00	0.50	34.0
Approach		**620**	**1.0**	**0.294**	**9.7**	**LOS A**	**54**	**0.20**	**0.59**	**31.2**
EB Henderson Blvd										
5L	L	5	16.7	0.500	15.0	LOS B	111	0.67	0.80	28.2
2T	T	429	0.9	0.496	8.0	LOS A	111	0.67	0.68	31.3
2R	R	1	0.0	0.500	9.3	LOS A	111	0.67	0.67	30.7
Approach		**435**	**1.1**	**0.496**	**8.1**	**LOS A**	**111**	**0.67**	**0.68**	**31.3**
All Vehicles		**1256**	**1.3**	**0.500**	**8.5**	**LOS A**	**111**	**0.35**	**0.60**	**31.6**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

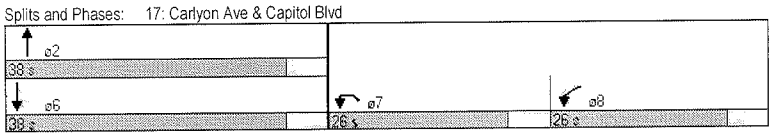
Following Queue
- Density for continuous movement

Lane Group	WBL	NBT	SBL2	SBL	SBT	NWL
Lane Configurations						
Volume (vph)	60	385	40	10	585	30
Lane Group Flow (vph)	117	545	0	60	696	66
Turn Type			Perm	Perm		
Protected Phases	8	2			6	7
Permitted Phases			6	6		
Detector Phase	8	2	6	6	6	7
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	26.0	38.0	38.0	38.0	38.0	26.0
Total Split (%)	28.9%	42.2%	42.2%	42.2%	42.2%	28.9%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag					Lead
Lead-Lag Optimize?						
Recall Mode	None	Max	Max	Max	Max	None
v/c Ratio	0.46	0.25		0.11	0.30	0.32
Control Delay	27.0	8.4		9.8	8.8	30.0
Queue Delay	0.0	0.0		0.0	0.0	0.0
Total Delay	27.0	8.4		9.8	8.8	30.0
Queue Length 50th (ft)	33	57		11	77	23
Queue Length 95th (ft)	68	106		32	125	40
Internal Link Dist (ft)	1602	636			2617	614
Turn Bay Length (ft)				150		
Base Capacity (vph)	617	2191		539	2284	605
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	0.19	0.25		0.11	0.30	0.11

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 62
Natural Cycle: 75
Control Type: Semi Act-Uncoord

Splits and Phases: 17: Carlyon Ave & Capitol Blvd



Movement	WBL2	WBL	WBR	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2
Lane Configurations												
Volume (vph)	2	60	30	385	90	15	40	10	585	30	10	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0				5.0	5.0	5.0		
Lane Util. Factor		1.00		0.95				1.00	0.95	1.00		
Frt		0.96		0.97				1.00	1.00	0.96		
Flt Protected		0.97		1.00				0.95	1.00	0.96		
Satd. Flow (prot)		1757		3425				1787	3574	1766		
Flt Permitted		0.97		1.00				0.45	1.00	0.96		
Satd. Flow (perm)		1757		3425				842	3574	1766		
Peak-hour factor, PHF	0.79	0.79	0.79	0.90	0.90	0.90	0.84	0.84	0.84	0.63	0.63	0.63
Adj. Flow (vph)	3	76	38	428	100	17	48	12	696	48	16	2
RTOR Reduction (vph)	0	22	0	2	0	0	0	0	0	2	0	0
Lane Group Flow (vph)	0	95	0	543	0	0	0	60	696	64	0	0
Heavy Vehicles (%)	0%	0%	0%	2%	2%	2%	1%	1%	1%	0%	0%	0%
Turn Type	Perm						Perm	Perm				
Protected Phases		8		2					6	7		
Permitted Phases	8						6	6				
Actuated Green, G (s)		7.1		38.4				38.4	38.4	4.7		
Effective Green, g (s)		7.1		38.4				38.4	38.4	4.7		
Actuated g/C Ratio		0.11		0.59				0.59	0.59	0.07		
Clearance Time (s)		5.0		5.0				5.0	5.0	5.0		
Vehicle Extension (s)		2.5		2.5				2.5	2.5	2.5		
Lane Grp Cap (vph)		191		2017				496	2105	127		
v/s Ratio Prot				0.16					c0.19	c0.04		
v/s Ratio Perm		0.05						0.07				
v/c Ratio		0.50		0.27				0.12	0.33	0.51		
Uniform Delay, d1		27.4		6.5				5.9	6.8	29.1		
Progression Factor		1.00		1.00				1.00	1.00	1.00		
Incremental Delay, d2		1.5		0.3				0.5	0.4	2.3		
Delay (s)		28.8		6.9				6.4	7.3	31.4		
Level of Service		C		A				A	A	C		
Approach Delay (s)		28.8		6.9					7.2	31.4		
Approach LOS		C		A					A	C		

Intersection Summary

HCM Average Control Delay	9.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	65.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	42.6%	ICU Level of Service	A
Analysis Period (min)	15		

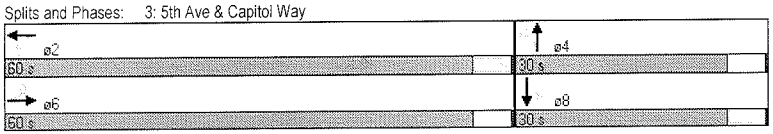
c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations						
Volume (vph)	175	2	105	2	190	210
Lane Group Flow (vph)	428	0	165	0	228	236
Turn Type		Perm		Perm		
Protected Phases	6		2		4	8
Permitted Phases		2		4		
Detector Phase	6	2	2	4	4	8
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	26.0	26.0	26.0	20.0	20.0	20.0
Total Split (s)	60.0	60.0	60.0	30.0	30.0	30.0
Total Split (%)	66.7%	66.7%	66.7%	33.3%	33.3%	33.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Max	Max	Max	Max	Max	Max
v/c Ratio	0.42		0.16		0.29	0.29
Control Delay	8.1		6.7		15.9	14.8
Queue Delay	2.8		0.0		0.0	0.0
Total Delay	10.9		6.7		15.9	14.8
Queue Length 50th (ft)	87		32		17	28
Queue Length 95th (ft)	92		43		48	46
Internal Link Dist (ft)	221		238		221	223
Turn Bay Length (ft)						
Base Capacity (vph)	1015		1053		780	821
Starvation Cap Reductn	459		0		0	0
Spillback Cap Reductn	0		0		0	0
Storage Cap Reductn	0		0		0	0
Reduced v/c Ratio	0.77		0.16		0.29	0.29

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 15 (17%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow
Natural Cycle: 50
Control Type: Pretimed

Splits and Phases: 3: 5th Ave & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	175	120	2	105	10	2	190	25	0	210	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frpb, ped/bikes		0.98			0.99			0.98			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.95			0.99			0.98			1.00	
Flt Protected		1.00			1.00			1.00			1.00	
Satd. Flow (prot)		1559			1663			2686			2730	
Flt Permitted		1.00			1.00			0.95			1.00	
Satd. Flow (perm)		1559			1656			2561			2730	
Peak-hour factor, PHF	0.69	0.69	0.69	0.71	0.71	0.71	0.95	0.95	0.95	0.91	0.91	0.91
Adj. Flow (vph)	0	254	174	3	148	14	2	200	26	0	231	5
RTOR Reduction (vph)	0	28	0	0	4	0	0	11	0	0	1	0
Lane Group Flow (vph)	0	401	0	0	161	0	0	217	0	0	235	0
Confl. Peds. (#/hr)	38		60	60		38	43		56	56		43
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	7%	7%	7%	9%	9%	9%
Parking (#/hr)								12			12	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		55.0			55.0			25.0			25.0	
Effective Green, g (s)		57.0			57.0			27.0			27.0	
Actuated g/C Ratio		0.63			0.63			0.30			0.30	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)		987			1049			768			819	
v/s Ratio Prot		c0.26									c0.09	
v/s Ratio Perm					0.10			0.08				
v/c Ratio		0.41			0.15			0.28			0.29	
Uniform Delay, d1		8.1			6.7			24.1			24.1	
Progression Factor		1.00			1.00			0.66			0.57	
Incremental Delay, d2		1.2			0.3			0.9			0.9	
Delay (s)		9.4			7.0			16.8			14.7	
Level of Service		A			A			B			B	
Approach Delay (s)		9.4			7.0			16.8			14.7	
Approach LOS		A			A			B			B	

Intersection Summary

HCM Average Control Delay	11.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	40.2%	ICU Level of Service	A
Analysis Period (min)	15		

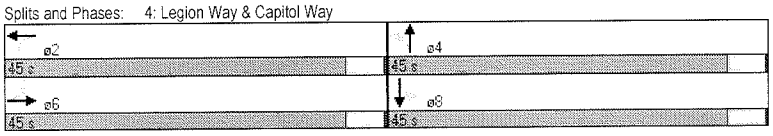
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations							
Volume (vph)	5	90	40	60	1	200	315
Lane Group Flow (vph)	0	154	0	174	0	262	395
Turn Type	Perm		Perm		Perm		
Protected Phases		6		2		4	8
Permitted Phases	6		2		4		
Detector Phase	6	6	2	2	4	4	8
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	45.0	45.0	45.0	45.0	45.0	45.0	45.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	Max	Max	Max	Max	Max	Max	Max
v/c Ratio		0.20		0.25		0.20	0.27
Control Delay		12.6		14.1		7.9	7.6
Queue Delay		0.0		0.0		0.0	0.0
Total Delay		12.6		14.1		7.9	7.6
Queue Length 50th (ft)		41		51		46	27
Queue Length 95th (ft)		68		70		13	40
Internal Link Dist (ft)		221		241		1485	221
Turn Bay Length (ft)							
Base Capacity (vph)		779		684		1340	1456
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		0.20		0.25		0.20	0.27

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 39 (43%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow
Natural Cycle: 50
Control Type: Pretimed

Splits and Phases: 4: Legion Way & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	90	30	40	60	25	1	200	30	0	315	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.97			0.97			0.98			1.00	
Flt Protected		1.00			0.98			1.00			1.00	
Satd. Flow (prot)		1651			1621			2977			3117	
Flt Permitted		0.99			0.88			0.95			1.00	
Satd. Flow (perm)		1641			1444			2841			3117	
Peak-hour factor, PHF	0.81	0.81	0.81	0.72	0.72	0.72	0.88	0.88	0.88	0.81	0.81	0.81
Adj. Flow (vph)	6	111	37	56	83	35	1	227	34	0	389	6
RTOR Reduction (vph)	0	13	0	0	10	0	0	13	0	0	1	0
Lane Group Flow (vph)	0	141	0	0	164	0	0	249	0	0	394	0
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	7%	7%	7%	4%	4%	4%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		40.0			40.0			40.0			40.0	
Effective Green, g (s)		42.0			42.0			42.0			42.0	
Actuated g/C Ratio		0.47			0.47			0.47			0.47	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)		766			674			1326			1455	
v/s Ratio Prot											c0.13	
v/s Ratio Perm		0.09			c0.11			0.09				
v/c Ratio		0.18			0.24			0.19			0.27	
Uniform Delay, d1		14.0			14.4			14.0			14.7	
Progression Factor		1.00			1.00			0.59			0.48	
Incremental Delay, d2		0.5			0.9			0.3			0.4	
Delay (s)		14.5			15.3			8.6			7.5	
Level of Service		B			B			A			A	
Approach Delay (s)		14.5			15.3			8.6			7.5	
Approach LOS		B			B			A			A	

Intersection Summary

HCM Average Control Delay	10.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	30.8%	ICU Level of Service	A
Analysis Period (min)	15		

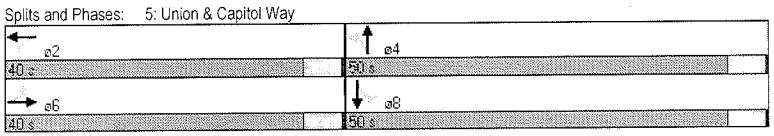
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	5	55	105	150	60	390	60	330
Lane Group Flow (vph)	0	103	118	225	74	623	67	382
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		6		2		4		8
Permitted Phases	6		2		4		8	
Detector Phase	6	6	2	2	4	4	8	8
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	40.0	40.0	40.0	40.0	50.0	50.0	50.0	50.0
Total Split (%)	44.4%	44.4%	44.4%	44.4%	55.6%	55.6%	55.6%	55.6%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
v/c Ratio		0.17	0.51	0.34	0.10	0.24	0.12	0.14
Control Delay		21.7	40.1	24.3	4.9	4.4	1.5	0.9
Queue Delay		0.0	0.0	0.0	0.0	0.4	0.0	0.0
Total Delay		21.7	40.1	24.3	4.9	4.9	1.5	0.9
Queue Length 50th (ft)		18	61	44	5	0	2	4
Queue Length 95th (ft)		33	105	69	22	56	4	8
Internal Link Dist (ft)		205		541		240		1485
Turn Bay Length (ft)			200		100		200	
Base Capacity (vph)		1320	531	1448	730	2569	568	2660
Starvation Cap Reductn		0	0	0	0	1369	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		0.08	0.22	0.16	0.10	0.52	0.12	0.14

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 14 (16%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 5: Union & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	55	25	105	150	50	60	390	115	60	330	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor		0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt		0.96		1.00	0.96		1.00	0.97		1.00	1.00	
Flt Protected		1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3375		1787	3441		1752	3385		1770	3524	
Flt Permitted		0.94		0.69	1.00		0.53	1.00		0.40	1.00	
Satd. Flow (perm)		3166		1292	3441		969	3385		752	3524	
Peak-hour factor, PHF	0.82	0.82	0.82	0.89	0.89	0.89	0.81	0.81	0.81	0.89	0.89	0.89
Adj. Flow (vph)	6	67	30	118	169	56	74	481	142	67	371	11
RTOR Reduction (vph)	0	25	0	0	46	0	0	16	0	0	1	0
Lane Group Flow (vph)	0	78	0	118	179	0	74	607	0	67	381	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		14.1		14.1	14.1		65.9	65.9		65.9	65.9	
Effective Green, g (s)		16.1		16.1	16.1		67.9	67.9		67.9	67.9	
Actuated g/C Ratio		0.18		0.18	0.18		0.75	0.75		0.75	0.75	
Clearance Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.5		3.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)		566		231	616		731	2554		567	2659	
v/s Ratio Prot					0.05			c0.18			0.11	
v/s Ratio Perm		0.02		c0.09			0.08			0.09		
v/c Ratio		0.14		0.51	0.29		0.10	0.24		0.12	0.14	
Uniform Delay, d1		31.1		33.4	32.0		2.9	3.3		3.0	3.0	
Progression Factor		1.00		1.00	1.00		1.16	1.24		0.27	0.23	
Incremental Delay, d2		0.1		2.2	0.3		0.3	0.2		0.4	0.1	
Delay (s)		31.2		35.6	32.3		3.7	4.3		1.2	0.8	
Level of Service		C		D	C		A	A		A	A	
Approach Delay (s)		31.2			33.4			4.2			0.9	
Approach LOS		C			C			A			A	

Intersection Summary

HCM Average Control Delay	11.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	40.3%	ICU Level of Service	A
Analysis Period (min)	15		

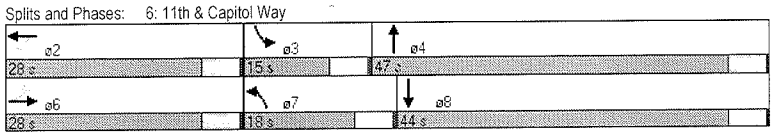
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	10	45	20	40	70	540	35	400
Lane Group Flow (vph)	15	123	25	64	83	762	39	466
Turn Type	Perm		Perm		Prot		Prot	
Protected Phases		6		2	7	4	3	8
Permitted Phases	6		2					
Detector Phase	6	6	2	2	7	4	3	8
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	12.0	25.0	12.0	25.0
Total Split (s)	28.0	28.0	28.0	28.0	18.0	47.0	15.0	44.0
Total Split (%)	31.1%	31.1%	31.1%	31.1%	20.0%	52.2%	16.7%	48.9%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
v/c Ratio	0.09	0.49	0.22	0.28	0.38	0.30	0.22	0.20
Control Delay	33.9	30.1	38.2	31.5	40.2	3.7	38.2	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	33.9	30.1	38.2	31.5	40.2	3.7	38.2	7.8
Queue Length 50th (ft)	8	42	13	27	47	53	22	47
Queue Length 95th (ft)	17	57	31	52	81	71	53	73
Internal Link Dist (ft)		205		230		830		240
Turn Bay Length (ft)					150		100	
Base Capacity (vph)	359	501	253	488	295	2500	236	2371
Starvation Cap Reductn	0	0	0	0	0	0	0	1069
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.25	0.10	0.13	0.28	0.30	0.17	0.36

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 64 (71%), Referenced to phase 4:NBT and 8:SBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 6: 11th & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	45	35	20	40	10	70	540	100	35	400	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.93		1.00	0.97		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1719	1690		1687	1722		1770	3456		1770	3514	
Flt Permitted	0.72	1.00		0.51	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1294	1690		909	1722		1770	3456		1770	3514	
Peak-hour factor, PHF	0.65	0.65	0.65	0.79	0.79	0.79	0.84	0.84	0.84	0.90	0.90	0.90
Adj. Flow (vph)	15	69	54	25	51	13	83	643	119	39	444	22
RTOR Reduction (vph)	0	38	0	0	11	0	0	10	0	0	2	0
Lane Group Flow (vph)	15	85	0	25	53	0	83	752	0	39	464	0
Heavy Vehicles (%)	5%	5%	5%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		6			2		7	4		3	8	
Permitted Phases	6			2								
Actuated Green, G (s)	9.3	9.3		9.3	9.3		8.0	60.9		4.8	57.7	
Effective Green, g (s)	11.3	11.3		11.3	11.3		10.0	62.9		6.8	59.7	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.11	0.70		0.08	0.66	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	162	212		114	216		197	2415		134	2331	
v/s Ratio Prot		c0.05			0.03		c0.05	c0.22		0.02	0.13	
v/s Ratio Perm	0.01			0.03								
v/c Ratio	0.09	0.40		0.22	0.24		0.42	0.31		0.29	0.20	
Uniform Delay, d1	34.8	36.2		35.4	35.5		37.3	5.2		39.3	5.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	0.60		0.96	1.09	
Incremental Delay, d2	0.2	0.9		0.7	0.4		1.0	0.3		0.9	0.2	
Delay (s)	35.0	37.2		36.1	35.9		38.2	3.4		38.7	6.6	
Level of Service	C	D		D	D		D	A		D	A	
Approach Delay (s)		36.9			36.0			6.8			9.1	
Approach LOS		D			D			A			A	

Intersection Summary

HCM Average Control Delay	11.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	39.2%	ICU Level of Service	A
Analysis Period (min)	15		

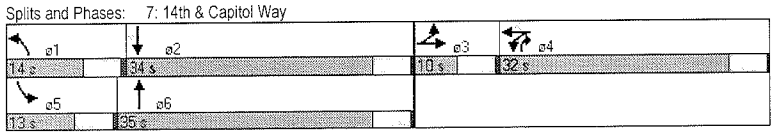
c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations									
Volume (vph)	45	220	180	75	510	50	80	245	75
Lane Group Flow (vph)	110	371	222	100	680	67	95	292	89
Turn Type			Perm	Prot		Over	Prot		Perm
Protected Phases	3	4		1	6	4	5	2	
Permitted Phases			4						2
Detector Phase	3	4	4	1	6	4	5	2	2
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	10.0	10.0	10.0	15.0	10.0	12.0	25.0	25.0
Total Split (s)	10.0	32.0	32.0	14.0	35.0	32.0	13.0	34.0	34.0
Total Split (%)	11.1%	35.6%	35.6%	15.6%	38.9%	35.6%	14.4%	37.8%	37.8%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	C-Min	None	None	C-Min	C-Min
v/c Ratio	0.33	0.74	0.52	0.47	0.45	0.14	0.48	0.20	0.13
Control Delay	36.4	39.2	31.6	39.9	19.9	14.5	35.4	22.9	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	39.2	31.6	39.9	19.9	14.5	35.4	22.9	11.1
Queue Length 50th (ft)	27	191	106	53	160	0	38	73	4
Queue Length 95th (ft)	48	236	144	67	179	33	94	118	51
Internal Link Dist (ft)	70	1141			579			830	
Turn Bay Length (ft)				250		250	250		250
Base Capacity (vph)	337	598	515	228	1574	555	208	1526	732
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.62	0.43	0.44	0.43	0.12	0.46	0.19	0.12

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 42 (47%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 7: 14th & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	45	10	80	220	180	75	510	50	80	245	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.98			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98			0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3255			1856	1599	1770	3539	1583	1736	3471	1553
Flt Permitted		0.98			0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3255			1856	1599	1770	3539	1583	1736	3471	1553
Peak-hour factor, PHF	0.82	0.82	0.82	0.81	0.81	0.81	0.75	0.75	0.75	0.84	0.84	0.84
Adj. Flow (vph)	43	55	12	99	272	222	100	680	67	95	292	89
RTOR Reduction (vph)	0	10	0	0	0	0	0	0	49	0	0	53
Lane Group Flow (vph)	0	100	0	0	371	222	100	680	18	95	292	36
Heavy Vehicles (%)	7%	7%	7%	1%	1%	1%	2%	2%	2%	4%	4%	4%
Turn Type	Split			Split		Perm	Prot		Over	Prot		Perm
Protected Phases	3	3		4	4		1	6	4	5	2	
Permitted Phases						4						2
Actuated Green, G (s)		6.0			22.2	22.2	7.7	34.6	22.2	7.2	34.1	34.1
Effective Green, g (s)		8.0			24.2	24.2	9.7	36.6	24.2	9.2	36.1	36.1
Actuated g/C Ratio		0.09			0.27	0.27	0.11	0.41	0.27	0.10	0.40	0.40
Clearance Time (s)		5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)		2.5			2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)		289			499	430	191	1439	426	177	1392	623
v/s Ratio Prot		c0.03			c0.20		c0.06	c0.19	0.01	0.05	0.08	
v/s Ratio Perm						0.14						0.02
v/c Ratio		0.35			0.74	0.52	0.52	0.47	0.04	0.54	0.21	0.06
Uniform Delay, d1		38.5			30.1	27.9	38.0	19.6	24.3	38.4	17.6	16.5
Progression Factor		1.00			1.00	1.00	0.89	0.88	2.31	0.73	1.12	2.02
Incremental Delay, d2		0.5			5.6	0.8	1.9	1.1	0.0	2.4	0.3	0.2
Delay (s)		39.1			35.7	28.7	35.7	18.3	56.3	30.6	20.1	33.5
Level of Service		D			D	C	D	B	E	C	C	C
Approach Delay (s)		39.1			33.1			23.3			24.7	
Approach LOS		D			C			C			C	

Intersection Summary

HCM Average Control Delay	27.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	51.2%	ICU Level of Service	A
Analysis Period (min)	15		

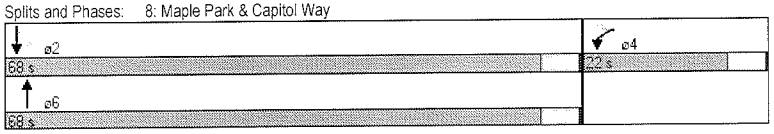
c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Volume (vph)	15	40	660	30	220
Lane Group Flow (vph)	21	56	949	34	247
Turn Type		Perm		Perm	
Protected Phases	4		6		2
Permitted Phases		4		2	
Detector Phase	4	4	6	2	2
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	29.0	15.0	15.0
Total Split (s)	22.0	22.0	68.0	68.0	68.0
Total Split (%)	24.4%	24.4%	75.6%	75.6%	75.6%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	C-Min	C-Min	C-Min
v/c Ratio	0.13	0.29	0.31	0.07	0.08
Control Delay	38.7	15.0	0.9	2.4	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	38.7	15.0	0.9	2.4	1.6
Queue Length 50th (ft)	11	0	37	0	1
Queue Length 95th (ft)	26	21	3	m9	22
Internal Link Dist (ft)	541		1242		579
Turn Bay Length (ft)		200		250	
Base Capacity (vph)	353	360	3062	469	3046
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	0.06	0.16	0.31	0.07	0.08

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 82 (91%), Referenced to phase 2:SBTL and 6:NBT, Start of Yellow
Natural Cycle: 55
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Maple Park & Capitol Way



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	15	40	660	80	30	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1671	1495	3516		1752	3505
Flt Permitted	0.95	1.00	1.00		0.29	1.00
Satd. Flow (perm)	1671	1495	3516		541	3505
Peak-hour factor, PHF	0.72	0.72	0.78	0.78	0.89	0.89
Adj. Flow (vph)	21	56	846	103	34	247
RTOR Reduction (vph)	0	51	6	0	0	0
Lane Group Flow (vph)	21	5	943	0	34	247
Heavy Vehicles (%)	8%	8%	1%	1%	3%	3%
Turn Type		Perm			Perm	
Protected Phases	4		6			2
Permitted Phases		4			2	
Actuated Green, G (s)	5.4	5.4	74.6		74.6	74.6
Effective Green, g (s)	7.4	7.4	76.6		76.6	76.6
Actuated g/C Ratio	0.08	0.08	0.85		0.85	0.85
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0
Vehicle Extension (s)	2.5	2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	137	123	2993		460	2983
v/s Ratio Prot	c0.01		c0.27			0.07
v/s Ratio Perm		0.00			0.06	
v/c Ratio	0.15	0.04	0.32		0.07	0.08
Uniform Delay, d1	38.4	38.0	1.4		1.1	1.1
Progression Factor	1.00	1.00	0.45		1.41	1.24
Incremental Delay, d2	0.4	0.1	0.3		0.3	0.1
Delay (s)	38.8	38.1	0.9		1.8	1.4
Level of Service	D	D	A		A	A
Approach Delay (s)	38.3		0.9			1.4
Approach LOS	D		A			A

Intersection Summary

HCM Average Control Delay	3.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	34.9%	ICU Level of Service	A
Analysis Period (min)	15		

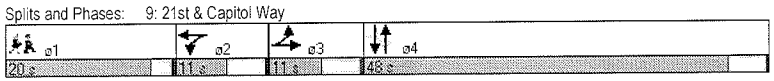
c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT	ø1
Lane Configurations							
Volume (vph)	0	0	5	650	5	205	
Lane Group Flow (vph)	18	24	0	917	0	284	
Turn Type			Perm		Perm		
Protected Phases	3	2		4		4	1
Permitted Phases			4		4		
Detector Phase	3	2	4	4	4	4	
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	10.0	15.0	15.0	15.0	15.0	20.0
Total Split (s)	11.0	11.0	48.0	48.0	48.0	48.0	20.0
Total Split (%)	12.2%	12.2%	53.3%	53.3%	53.3%	53.3%	22%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	2.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	
Lead/Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead
Lead-Lag Optimize?							
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	None
v/c Ratio	0.11	0.15		0.31		0.10	
Control Delay	28.0	23.9		3.0		2.1	
Queue Delay	0.0	0.0		0.0		0.0	
Total Delay	28.0	23.9		3.0		2.1	
Queue Length 50th (ft)	5	4		0		0	
Queue Length 95th (ft)	14	16		94		24	
Internal Link Dist (ft)	166	123		1148		1242	
Turn Bay Length (ft)							
Base Capacity (vph)	167	172		2974		2888	
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	0.11	0.14		0.31		0.10	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 4:NBSB, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 9: 21st & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	0	5	5	0	10	5	650	5	5	205	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.93			0.91			1.00			1.00	
Flt Protected		0.98			0.98			1.00			1.00	
Satd. Flow (prot)		1729			1701			3534			3488	
Flt Permitted		0.98			0.98			0.95			0.94	
Satd. Flow (perm)		1729			1701			3369			3273	
Peak-hour factor, PHF	0.56	0.56	0.56	0.61	0.61	0.61	0.72	0.72	0.72	0.76	0.76	0.76
Adj. Flow (vph)	9	0	9	8	0	16	7	903	7	7	270	7
RTOR Reduction (vph)	0	9	0	0	15	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	9	0	0	9	0	0	917	0	0	283	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	3%	3%	3%
Turn Type	Split			Split			Perm			Perm		
Protected Phases	3	3		2	2			4			4	
Permitted Phases							4			4		
Actuated Green, G (s)		2.6			2.7			69.7			69.7	
Effective Green, g (s)		4.6			4.7			71.7			71.7	
Actuated g/C Ratio		0.05			0.05			0.80			0.80	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		2.5			2.5			2.5			2.5	
Lane Grp Cap (vph)		88			89			2684			2607	
v/s Ratio Prot		c0.01			c0.01							
v/s Ratio Perm								c0.27			0.09	
v/c Ratio		0.11			0.10			0.34			0.11	
Uniform Delay, d1		40.7			40.6			2.6			2.0	
Progression Factor		1.00			1.00			1.00			0.85	
Incremental Delay, d2		0.4			0.4			0.3			0.1	
Delay (s)		41.1			41.0			2.9			1.8	
Level of Service		D			D			A			A	
Approach Delay (s)		41.1			41.0			2.9			1.8	
Approach LOS		D			D			A			A	

Intersection Summary

HCM Average Control Delay	3.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	31.6%	ICU Level of Service	A
Analysis Period (min)	15		

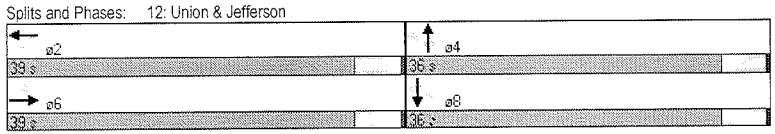
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	15	180	165	385	60	190	45	30	80	15
Lane Group Flow (vph)	20	260	214	578	0	272	49	0	153	21
Turn Type	Perm		Perm		Perm		Perm	Perm		Perm
Protected Phases		6		2		4			8	
Permitted Phases	6		2		4		4	8		8
Detector Phase	6	6	2	2	4	4	4	8	8	8
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	19.0	19.0	19.0	19.0	21.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	39.0	39.0	39.0	39.0	36.0	36.0	36.0	36.0	36.0	36.0
Total Split (%)	52.0%	52.0%	52.0%	52.0%	48.0%	48.0%	48.0%	48.0%	48.0%	48.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min	Min
v/c Ratio	0.06	0.17	0.45	0.38		0.42	0.08		0.24	0.03
Control Delay	6.9	6.2	10.9	7.2		11.0	3.8		9.5	4.7
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	6.9	6.2	10.9	7.2		11.0	3.8		9.5	4.7
Queue Length 50th (ft)	2	12	23	29		32	0		17	0
Queue Length 95th (ft)	9	27	62	59		101	14		45	7
Internal Link Dist (ft)		542		982		380			249	
Turn Bay Length (ft)	200		200							300
Base Capacity (vph)	714	3277	1042	3284		1554	1472		1486	1455
Starvation Cap Reductn	0	0	0	0		0	0		0	0
Spillback Cap Reductn	0	0	0	0		0	0		0	0
Storage Cap Reductn	0	0	0	0		0	0		0	0
Reduced v/c Ratio	0.03	0.08	0.21	0.18		0.18	0.03		0.10	0.01

Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 34.2
Natural Cycle: 40
Control Type: Actuated-Uncoordinated

Splits and Phases: 12: Union & Jefferson



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	180	15	165	385	60	60	190	45	30	80	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.99	1.00
Satd. Flow (prot)	1770	3498		1787	3502			1878	1615		1856	1599
Flt Permitted	0.41	1.00		0.59	1.00			0.90	1.00		0.87	1.00
Satd. Flow (perm)	761	3498		1112	3502			1710	1615		1635	1599
Peak-hour factor, PHF	0.75	0.75	0.75	0.77	0.77	0.77	0.92	0.92	0.92	0.72	0.72	0.72
Adj. Flow (vph)	20	240	20	214	500	78	65	207	49	42	111	21
RTOR Reduction (vph)	0	9	0	0	18	0	0	0	30	0	0	13
Lane Group Flow (vph)	20	251	0	214	560	0	0	272	19	0	153	8
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4		4	8		8
Actuated Green, G (s)	12.6	12.6		12.6	12.6			11.0	11.0		11.0	11.0
Effective Green, g (s)	14.6	14.6		14.6	14.6			13.0	13.0		13.0	13.0
Actuated g/C Ratio	0.43	0.43		0.43	0.43			0.39	0.39		0.39	0.39
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	2.5	2.5		2.5	2.5			2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	331	1520		483	1522			662	625		633	619
v/s Ratio Prot		0.07			0.16							
v/s Ratio Perm	0.03			c0.19				c0.16	0.01		0.09	0.01
v/c Ratio	0.06	0.17		0.44	0.37			0.41	0.03		0.24	0.01
Uniform Delay, d1	5.5	5.8		6.7	6.4			7.5	6.4		7.0	6.3
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	0.0		0.5	0.1			0.3	0.0		0.1	0.0
Delay (s)	5.6	5.8		7.1	6.5			7.8	6.4		7.1	6.4
Level of Service	A	A		A	A			A	A		A	A
Approach Delay (s)		5.8			6.7			7.6			7.0	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	6.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	33.6	Sum of lost time (s)	6.0
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		

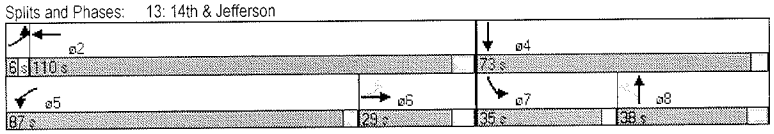
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Volume (vph)	5	125	285	795	620	15	40	45	75	85
Lane Group Flow (vph)	0	152	356	994	775	0	65	53	104	201
Turn Type	pm+pt		Prot		Free	Perm		Free	Prot	
Protected Phases	1	6	5	2			8		7	4
Permitted Phases	6				Free	8		Free		
Detector Phase	1	6	5	2		8	8		7	4
Switch Phase										
Minimum Initial (s)	2.0	4.0	4.0	4.0		2.0	2.0		2.0	4.0
Minimum Split (s)	6.0	10.0	12.0	17.0		26.0	26.0		12.0	25.0
Total Split (s)	6.0	29.0	87.0	110.0	0.0	38.0	38.0	0.0	35.0	73.0
Total Split (%)	3.2%	15.3%	46.0%	58.2%	0.0%	20.1%	20.1%	0.0%	18.5%	38.6%
Yellow Time (s)	2.5	5.5	3.5	5.5		5.5	5.5		3.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5		0.5	0.5		0.5	0.5
Lost Time Adjust (s)	0.0	-3.0	-1.0	-3.0	-1.0	-3.0	-3.0	-1.0	-1.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag		Lag	Lag		Lead	
Lead-Lag Optimize?										
Recall Mode	None	Min	None	Min		None	None		None	None
v/c Ratio		0.26	0.63	0.50	0.48		0.24	0.03	0.34	0.33
Control Delay		27.7	25.9	10.9	1.1		30.1	0.0	31.4	16.4
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Delay		27.7	25.9	10.9	1.1		30.1	0.0	31.4	16.4
Queue Length 50th (ft)		26	119	121	0		22	0	37	48
Queue Length 95th (ft)		66	208	181	0		65	0	77	91
Internal Link Dist (ft)		1141		344			117			586
Turn Bay Length (ft)			200		300					
Base Capacity (vph)		1366	1772	3574	1599		898	1524	927	1633
Starvation Cap Reductn		0	0	0	0		0	0	0	0
Spillback Cap Reductn		0	0	0	0		0	0	0	0
Storage Cap Reductn		0	0	0	0		0	0	0	0
Reduced v/c Ratio		0.11	0.20	0.28	0.48		0.07	0.03	0.11	0.12

Intersection Summary

Cycle Length: 189
Actuated Cycle Length: 64.3
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Splits and Phases: 13: 14th & Jefferson



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	125	5	285	795	620	15	40	45	75	85	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Util. Factor		0.95		1.00	0.95	1.00		1.00	1.00	1.00	1.00	
Frt		0.99		1.00	1.00	0.85		1.00	0.85	1.00	0.94	
Flt Protected		1.00		0.95	1.00	1.00		0.99	1.00	0.95	1.00	
Satd. Flow (prot)		3511		1787	3574	1599		1768	1524	1736	1714	
Flt Permitted		0.89		0.95	1.00	1.00		0.86	1.00	0.95	1.00	
Satd. Flow (perm)		3146		1787	3574	1599		1538	1524	1736	1714	
Peak-hour factor, PHF	0.89	0.89	0.89	0.80	0.80	0.80	0.85	0.85	0.85	0.72	0.72	0.72
Adj. Flow (vph)	6	140	6	356	994	775	18	47	53	104	118	83
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	13	0
Lane Group Flow (vph)	0	150	0	356	994	775	0	65	53	104	188	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	6%	6%	6%	4%	4%	4%
Turn Type	pm+pt			Prot		Free	Perm		Free	Prot		
Protected Phases	1	6		5	2			8		7	4	
Permitted Phases	6					Free	8		Free			
Actuated Green, G (s)		9.0		19.4	32.4	65.1		6.4	65.1	10.3	21.7	
Effective Green, g (s)		12.0		20.4	35.4	65.1		9.4	65.1	11.3	23.7	
Actuated g/C Ratio		0.18		0.31	0.54	1.00		0.14	1.00	0.17	0.36	
Clearance Time (s)		6.0		4.0	6.0			6.0		4.0	5.0	
Vehicle Extension (s)		2.0		2.0	2.0			2.0		2.0	2.0	
Lane Grp Cap (vph)		580		560	1943	1599		222	1524	301	624	
v/s Ratio Prot				c0.20	c0.28					0.06	0.11	
v/s Ratio Perm		0.05				c0.48		0.04	0.03			
v/c Ratio		0.26		0.64	0.51	0.48		0.29	0.03	0.35	0.30	
Uniform Delay, d1		22.7		19.2	9.4	0.0		24.9	0.0	23.6	14.8	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1		1.7	0.1	1.1		0.3	0.0	0.3	0.1	
Delay (s)		22.8		20.9	9.5	1.1		25.1	0.0	23.9	14.9	
Level of Service		C		C	A	A		C	A	C	B	
Approach Delay (s)		22.8			8.3			13.9			18.0	
Approach LOS		C			A			B			B	

Intersection Summary

HCM Average Control Delay	10.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	65.1	Sum of lost time (s)	3.0
Intersection Capacity Utilization	50.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	EMP	Intersection	14
Agency/Co.	Parametrix	Jurisdiction	City of Olympia
Date Performed	3/14/2008	Analysis Year	2010 Baseline
Analysis Time Period	AM Peak Hour		

Project Description 247-4575-003

East/West Street: SE Maple Park Avenue | North/South Street: SE Jefferson Street

Intersection Orientation: North-South | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	5	20	5	5	10	255
Peak-Hour Factor, PHF	0.78	0.78	0.78	0.77	0.77	0.77
Hourly Flow Rate, HFR (veh/h)	6	25	6	6	12	331
Percent Heavy Vehicles	3	--	--	3	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LTR			LTR		
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	80	5	5	0	5	5
Peak-Hour Factor, PHF	0.89	0.89	0.89	0.56	0.56	0.56
Hourly Flow Rate, HFR (veh/h)	89	5	5	0	8	8
Percent Heavy Vehicles	3	3	3	0	0	0
Percent Grade (%)	-3			-2		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LTR	LTR		LTR			LTR	
v (veh/h)	6	6		16			99	
C (m) (veh/h)	1210	1575		714			701	
v/c	0.00	0.00		0.02			0.14	
95% queue length	0.01	0.01		0.07			0.49	
Control Delay (s/veh)	8.0	7.3		10.2			11.0	
LOS	A	A		B			B	
Approach Delay (s/veh)	--	--	10.2			11.0		
Approach LOS	--	--	B			B		

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SIDRA INTERSECTION

Movement Summary

14th Ave Extension / Henderson Blvd

2010 Baseline AM Peak Hour

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
NB Driveway										
3L	L	2	0.0	0.008	15.1	LOS B	1	0.56	0.66	28.3
8T	T	2	0.0	0.008	8.0	LOS A	1	0.56	0.53	31.8
8R	R	2	0.0	0.008	9.3	LOS A	1	0.56	0.54	31.2
Approach		**6**	**0.0**	**0.008**	**10.8**	**LOS B**	**1**	**0.56**	**0.58**	**30.3**
WB Henderson Blvd										
1L	L	1	0.0	0.333	12.2	LOS B	82	0.11	0.67	29.7
6T	T	414	1.0	0.376	5.2	LOS A	82	0.11	0.41	34.2
6R	R	151	1.3	0.376	6.5	LOS A	82	0.11	0.49	33.2
Approach		**566**	**1.1**	**0.376**	**5.6**	**LOS A**	**82**	**0.11**	**0.43**	**33.9**
SB 14th Ave Extension										
7L	L	36	5.6	0.055	15.0	LOS B	9	0.53	0.72	28.4
4T	T	6	14.3	0.055	8.0	LOS A	9	0.53	0.59	32.0
4R	R	482	5.0	0.254	6.2	LOS B#	13#	0.00	0.50	34.0
Approach		**525**	**5.1**	**0.254**	**6.8**	**LOS A**	**9**	**0.04**	**0.51**	**33.5**
EB Henderson Blvd										
5L	L	10	9.1	0.344	12.5	LOS B	80	0.22	0.64	29.4
2T	T	440	2.0	0.348	5.4	LOS A	80	0.22	0.42	33.6
2R	R	10	9.1	0.344	6.7	LOS A	80	0.22	0.49	32.6
Approach		**462**	**2.4**	**0.348**	**5.6**	**LOS A**	**80**	**0.22**	**0.43**	**33.4**
All Vehicles		**1559**	**2.8**	**0.376**	**6.0**	**LOS A**	**82**	**0.12**	**0.46**	**33.6**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

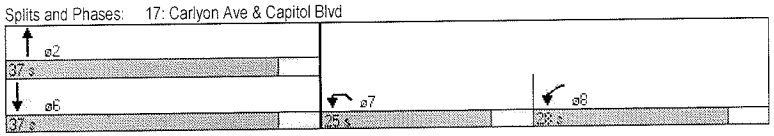
Following Queue
- Density for continuous movement

Lane Group	WBL	NBT	SBL2	SBL	SBT	NWL
Lane Configurations						
Volume (vph)	80	545	30	10	205	10
Lane Group Flow (vph)	327	854	0	51	263	30
Turn Type			Perm	Perm		
Protected Phases	8	2			6	7
Permitted Phases			6	6		
Detector Phase	8	2	6	6	6	7
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	28.0	37.0	37.0	37.0	37.0	25.0
Total Split (%)	31.1%	41.1%	41.1%	41.1%	41.1%	27.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag					Lead
Lead-Lag Optimize?						
Recall Mode	None	Max	Max	Max	Max	None
v/c Ratio	0.74	0.46		0.19	0.14	0.17
Control Delay	29.2	12.5		14.6	10.3	28.2
Queue Delay	0.0	0.0		0.0	0.0	0.0
Total Delay	29.2	12.5		14.6	10.3	28.2
Queue Length 50th (ft)	80	73		7	18	8
Queue Length 95th (ft)	92	163		36	56	32
Internal Link Dist (ft)	1602	636			2617	614
Turn Bay Length (ft)				150		
Base Capacity (vph)	667	1860		268	1854	563
Starvation Cap Reductn	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0
Reduced v/c Ratio	0.49	0.46		0.19	0.14	0.05

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 62.8
Natural Cycle: 75
Control Type: Semi Act-Uncoord

Splits and Phases: 17: Carlyon Ave & Capitol Blvd



Movement	WBL2	WBL	WBR	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2
Lane Configurations												
Volume (vph)	5	80	95	545	50	20	30	10	205	10	10	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0				5.0	5.0	5.0		
Lane Util. Factor		1.00		0.95				1.00	0.95	1.00		
Frt		0.93		0.98				1.00	1.00	0.92		
Flt Protected		0.98		1.00				0.95	1.00	0.98		
Satd. Flow (prot)		1674		3479				1736	3471	1712		
Flt Permitted		0.98		1.00				0.27	1.00	0.98		
Satd. Flow (perm)		1674		3479				501	3471	1712		
Peak-hour factor, PHF	0.55	0.55	0.55	0.72	0.72	0.72	0.78	0.78	0.78	0.84	0.84	0.84
Adj. Flow (vph)	9	145	173	757	69	28	38	13	263	12	12	6
RTOR Reduction (vph)	0	46	0	2	0	0	0	0	0	6	0	0
Lane Group Flow (vph)	0	281	0	852	0	0	0	51	263	24	0	0
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	4%	4%	4%	0%	0%	0%
Turn Type	Perm						Perm	Perm				
Protected Phases		8		2					6	7		
Permitted Phases	8						6	6				
Actuated Green, G (s)		14.9		33.6				33.6	33.6	2.5		
Effective Green, g (s)		14.9		33.6				33.6	33.6	2.5		
Actuated g/C Ratio		0.23		0.51				0.51	0.51	0.04		
Clearance Time (s)		5.0		5.0				5.0	5.0	5.0		
Vehicle Extension (s)		2.5		2.5				2.5	2.5	2.5		
Lane Grp Cap (vph)		378		1771				255	1767	65		
v/s Ratio Prot				c0.24					0.08	c0.01		
v/s Ratio Perm		0.17						0.10				
v/c Ratio		0.74		0.48				0.20	0.15	0.37		
Uniform Delay, d1		23.8		10.5				8.9	8.6	31.0		
Progression Factor		1.00		1.00				1.00	1.00	1.00		
Incremental Delay, d2		7.3		0.9				1.8	0.2	2.6		
Delay (s)		31.0		11.5				10.6	8.8	33.6		
Level of Service		C		B				B	A	C		
Approach Delay (s)		31.0		11.5					9.1	33.6		
Approach LOS		C		B					A	C		

Intersection Summary

HCM Average Control Delay	15.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	66.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	51.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	10	260	5	295	5	335	5	215
Lane Group Flow (vph)	0	492	0	457	0	421	0	263
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		6		2		4		8
Permitted Phases	6		2		4		8	
Detector Phase	6	6	2	2	4	4	8	8
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	26.0	26.0	26.0	26.0	20.0	20.0	20.0	20.0
Total Split (s)	57.0	57.0	57.0	57.0	33.0	33.0	33.0	33.0
Total Split (%)	63.3%	63.3%	63.3%	63.3%	36.7%	36.7%	36.7%	36.7%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max
v/c Ratio		0.51		0.45		0.47		0.30
Control Delay		9.4		9.0		9.1		17.9
Queue Delay		0.4		0.9		0.2		0.0
Total Delay		9.8		9.9		9.2		17.9
Queue Length 50th (ft)		97		121		28		32
Queue Length 95th (ft)		89		131		36		48
Internal Link Dist (ft)		221		238		221		223
Turn Bay Length (ft)								
Base Capacity (vph)		974		1008		891		882
Starvation Cap Reductn		148		289		75		0
Spillback Cap Reductn		0		0		0		0
Storage Cap Reductn		0		0		0		0
Reduced v/c Ratio		0.60		0.64		0.52		0.30

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 30 (33%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow
Natural Cycle: 50
Control Type: Pretimed

Splits and Phases: 3: 5th Ave & Capitol Way

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	260	70	5	295	25	5	335	60	5	215	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frpb, ped/bikes		0.99			1.00			0.97			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.97			0.99			0.98			0.99	
Flt Protected		1.00			1.00			1.00			1.00	
Satd. Flow (prot)		1629			1682			2755			2766	
Flt Permitted		0.99			0.99			0.95			0.95	
Satd. Flow (perm)		1608			1673			2624			2624	
Peak-hour factor, PHF	0.69	0.69	0.69	0.71	0.71	0.71	0.95	0.95	0.95	0.91	0.91	0.91
Adj. Flow (vph)	14	377	101	7	415	35	5	353	63	5	236	22
RTOR Reduction (vph)	0	10	0	0	3	0	0	16	0	0	7	0
Lane Group Flow (vph)	0	482	0	0	454	0	0	405	0	0	256	0
Confl. Peds. (#/hr)	38		60	60		38	43		56	56		43
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	3%	3%	3%	6%	6%	6%
Parking (#/hr)								12			12	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		52.0			52.0			28.0			28.0	
Effective Green, g (s)		54.0			54.0			30.0			30.0	
Actuated g/C Ratio		0.60			0.60			0.33			0.33	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)		965			1004			875			875	
v/s Ratio Prot												
v/s Ratio Perm		c0.30			0.27			c0.15			0.10	
v/c Ratio		0.50			0.45			0.46			0.29	
Uniform Delay, d1		10.3			9.9			23.6			22.2	
Progression Factor		0.77			0.76			0.33			0.79	
Incremental Delay, d2		1.6			1.5			1.6			0.8	
Delay (s)		9.5			8.9			9.4			18.4	
Level of Service		A			A			A			B	
Approach Delay (s)		9.5			8.9			9.4			18.4	
Approach LOS		A			A			A			B	

Intersection Summary

HCM Average Control Delay	10.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	51.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	10	135	50	185	5	365	1	300
Lane Group Flow (vph)	0	235	0	402	0	506	0	390
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		6		2		4		8
Permitted Phases	6		2		4		8	
Detector Phase	6	6	2	2	4	4	8	8
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	52.0	52.0	52.0	52.0	38.0	38.0	38.0	38.0
Total Split (%)	57.8%	57.8%	57.8%	57.8%	42.2%	42.2%	42.2%	42.2%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max
v/c Ratio		0.26		0.48		0.43		0.34
Control Delay		8.4		9.7		13.5		8.4
Queue Delay		0.5		1.0		0.0		0.0
Total Delay		8.9		10.7		13.5		8.4
Queue Length 50th (ft)		44		77		79		30
Queue Length 95th (ft)		62		91		51		43
Internal Link Dist (ft)		221		241		1485		221
Turn Bay Length (ft)								
Base Capacity (vph)		894		834		1167		1144
Starvation Cap Reductn		349		217		0		0
Spillback Cap Reductn		0		0		0		0
Storage Cap Reductn		0		0		0		0
Reduced v/c Ratio		0.43		0.65		0.43		0.34

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 29 (32%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow
Natural Cycle: 50
Control Type: Pretimed

Splits and Phases: 4: Legion Way & Capitol Way

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	135	45	50	185	55	5	365	75	1	300	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.97			0.97			0.97			0.99	
Flt Protected		1.00			0.99			1.00			1.00	
Satd. Flow (prot)		1651			1652			3103			3071	
Flt Permitted		0.98			0.91			0.95			0.95	
Satd. Flow (perm)		1618			1517			2952			2931	
Peak-hour factor, PHF	0.81	0.81	0.81	0.72	0.72	0.72	0.88	0.88	0.88	0.81	0.81	0.81
Adj. Flow (vph)	12	167	56	69	257	76	6	415	85	1	370	19
RTOR Reduction (vph)	0	12	0	0	9	0	0	19	0	0	4	0
Lane Group Flow (vph)	0	223	0	0	393	0	0	487	0	0	386	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	5%	5%	5%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		47.0			47.0			33.0			33.0	
Effective Green, g (s)		49.0			49.0			35.0			35.0	
Actuated g/C Ratio		0.54			0.54			0.39			0.39	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)		881			826			1148			1140	
v/s Ratio Prot												
v/s Ratio Perm		0.14			c0.26			c0.17			0.13	
v/c Ratio		0.25			0.48			0.42			0.34	
Uniform Delay, d1		10.8			12.6			20.1			19.4	
Progression Factor		0.78			0.62			0.65			0.39	
Incremental Delay, d2		0.7			1.9			1.1			0.8	
Delay (s)		9.2			9.8			14.1			8.4	
Level of Service		A			A			B			A	
Approach Delay (s)		9.2			9.8			14.1			8.4	
Approach LOS		A			A			B			A	

Intersection Summary

HCM Average Control Delay	10.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	5	210	140	115	45	505	85	440
Lane Group Flow (vph)	0	359	159	199	54	759	106	556
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		6		2		4		8
Permitted Phases	6		2		4		8	
Detector Phase	6	6	2	2	4	4	8	8
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	39.0	39.0	39.0	39.0	51.0	51.0	51.0	51.0
Total Split (%)	43.3%	43.3%	43.3%	43.3%	56.7%	56.7%	56.7%	56.7%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
v/c Ratio		0.41	0.76	0.21	0.10	0.33	0.26	0.24
Control Delay		24.7	52.3	15.7	4.4	3.8	7.8	4.8
Queue Delay		0.0	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay		24.7	52.3	15.7	4.4	4.0	7.8	4.8
Queue Length 50th (ft)		78	83	30	3	20	9	24
Queue Length 95th (ft)		78	132	47	11	38	55	83
Internal Link Dist (ft)		205		541		240		1485
Turn Bay Length (ft)			200		100		200	
Base Capacity (vph)		1341	321	1398	532	2329	412	2357
Starvation Cap Reductn		0	0	0	0	679	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		0.27	0.50	0.14	0.10	0.46	0.26	0.24

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 9 (10%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 5: Union & Capitol Way

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	210	50	140	115	60	45	505	125	85	440	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor		0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt		0.97		1.00	0.95		1.00	0.97		1.00	1.00	
Flt Protected		1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3469		1787	3391		1770	3434		1752	3499	
Flt Permitted		0.95		0.43	1.00		0.42	1.00		0.33	1.00	
Satd. Flow (perm)		3297		803	3391		790	3434		611	3499	
Peak-hour factor, PHF	0.74	0.74	0.74	0.88	0.88	0.88	0.83	0.83	0.83	0.80	0.80	0.80
Adj. Flow (vph)	7	284	68	159	131	68	54	608	151	106	550	6
RTOR Reduction (vph)	0	27	0	0	50	0	0	17	0	0	1	0
Lane Group Flow (vph)	0	332	0	159	149	0	54	742	0	106	555	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	3%	3%	3%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		21.4		21.4	21.4		58.6	58.6		58.6	58.6	
Effective Green, g (s)		23.4		23.4	23.4		60.6	60.6		60.6	60.6	
Actuated g/C Ratio		0.26		0.26	0.26		0.67	0.67		0.67	0.67	
Clearance Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.5		3.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)		857		209	882		532	2312		411	2356	
v/s Ratio Prot					0.04			c0.22			0.16	
v/s Ratio Perm		0.10		c0.20			0.07			0.17		
v/c Ratio		0.39		0.76	0.17		0.10	0.32		0.26	0.24	
Uniform Delay, d1		27.4		30.7	25.8		5.2	6.1		5.8	5.7	
Progression Factor		1.00		1.00	1.00		0.54	0.51		0.76	0.67	
Incremental Delay, d2		0.3		15.4	0.1		0.4	0.4		1.5	0.2	
Delay (s)		27.7		46.1	25.9		3.1	3.5		5.9	4.1	
Level of Service		C		D	C		A	A		A	A	
Approach Delay (s)		27.7			34.9			3.5			4.4	
Approach LOS		C			C			A			A	

Intersection Summary

HCM Average Control Delay	12.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	25	35	60	45	55	615	10	595
Lane Group Flow (vph)	30	147	70	93	62	744	11	687
Turn Type	Perm		Perm		Prot		Prot	
Protected Phases		6		2	7	4	3	8
Permitted Phases	6		2					
Detector Phase	6	6	2	2	7	4	3	8
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	12.0	25.0	12.0	25.0
Total Split (s)	29.0	29.0	29.0	29.0	17.0	46.0	15.0	44.0
Total Split (%)	32.2%	32.2%	32.2%	32.2%	18.9%	51.1%	16.7%	48.9%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
v/c Ratio	0.19	0.46	0.59	0.34	0.31	0.27	0.07	0.29
Control Delay	34.7	16.6	55.1	23.3	55.0	1.9	43.1	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	34.7	16.6	55.1	23.3	55.0	1.9	43.1	5.1
Queue Length 50th (ft)	15	22	38	27	32	0	6	69
Queue Length 95th (ft)	35	59	74	62	m73	21	m20	87
Internal Link Dist (ft)		205		230		830		240
Turn Bay Length (ft)					150		100	
Base Capacity (vph)	335	550	245	527	278	2719	236	2370
Starvation Cap Reductn	0	0	0	0	0	0	0	833
Spillback Cap Reductn	0	0	0	0	0	9	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.27	0.29	0.18	0.22	0.27	0.05	0.45

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 5 (6%), Referenced to phase 4:NBT and 8:SBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: 11th & Capitol Way

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	35	85	60	45	35	55	615	40	10	595	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.89		1.00	0.93		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1649		1752	1723		1787	3542		1770	3531	
Flt Permitted	0.63	1.00		0.46	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1161	1649		847	1723		1787	3542		1770	3531	
Peak-hour factor, PHF	0.82	0.82	0.82	0.86	0.86	0.86	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	30	43	104	70	52	41	62	699	45	11	676	11
RTOR Reduction (vph)	0	89	0	0	35	0	0	3	0	0	1	0
Lane Group Flow (vph)	30	58	0	70	58	0	62	741	0	11	686	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	1%	1%	1%	2%	2%	2%
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		6			2		7	4		3	8	
Permitted Phases	6			2								
Actuated Green, G (s)	10.6	10.6		10.6	10.6		7.0	63.0		1.4	57.4	
Effective Green, g (s)	12.6	12.6		12.6	12.6		9.0	65.0		3.4	59.4	
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.10	0.72		0.04	0.66	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	163	231		119	241		179	2558		67	2330	
v/s Ratio Prot		0.03			0.03		c0.03	c0.21		0.01	0.19	
v/s Ratio Perm	0.03			c0.08								
v/c Ratio	0.18	0.25		0.59	0.24		0.35	0.29		0.16	0.29	
Uniform Delay, d1	34.2	34.5		36.3	34.4		37.8	4.4		41.9	6.5	
Progression Factor	1.00	1.00		1.00	1.00		1.42	0.39		1.12	0.62	
Incremental Delay, d2	0.4	0.4		6.0	0.4		0.8	0.3		0.8	0.3	
Delay (s)	34.6	34.9		42.3	34.8		54.5	2.0		47.9	4.3	
Level of Service	C	C		D	C		D	A		D	A	
Approach Delay (s)		34.8			38.0			6.0			5.0	
Approach LOS		C			D			A			A	

Intersection Summary

HCM Average Control Delay	11.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	41.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations									
Volume (vph)	115	40	185	15	470	90	155	565	25
Lane Group Flow (vph)	268	174	208	17	540	103	199	724	32
Turn Type			Perm	Prot		Over	Prot		Perm
Protected Phases	3	4		1	6	4	5	2	
Permitted Phases			4						2
Detector Phase	3	4	4	1	6	4	5	2	2
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	10.0	10.0	10.0	15.0	10.0	12.0	25.0	25.0
Total Split (s)	14.0	25.0	25.0	10.0	28.0	25.0	23.0	41.0	41.0
Total Split (%)	15.6%	27.8%	27.8%	11.1%	31.1%	27.8%	25.6%	45.6%	45.6%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	C-Min	None	None	C-Min	C-Min
v/c Ratio	0.56	0.48	0.66	0.12	0.43	0.26	0.62	0.39	0.04
Control Delay	39.1	35.9	42.9	37.9	21.3	15.7	33.6	14.8	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.1	35.9	42.9	37.9	21.3	15.7	33.6	14.8	5.7
Queue Length 50th (ft)	70	88	109	8	108	0	101	145	0
Queue Length 95th (ft)	83	141	172	24	140	57	120	203	12
Internal Link Dist (ft)	70	1141			579			830	
Turn Bay Length (ft)				250		250	250		250
Base Capacity (vph)	482	443	391	147	1269	469	393	1865	850
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.39	0.53	0.12	0.43	0.22	0.51	0.39	0.04

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 41 (46%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 7: 14th & Capitol Way

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	115	25	115	40	185	15	470	90	155	565	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.98			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3393			1814	1599	1787	3574	1599	1770	3539	1583
Flt Permitted		0.99			0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3393			1814	1599	1787	3574	1599	1770	3539	1583
Peak-hour factor, PHF	0.69	0.69	0.69	0.89	0.89	0.89	0.87	0.87	0.87	0.78	0.78	0.78
Adj. Flow (vph)	65	167	36	129	45	208	17	540	103	199	724	32
RTOR Reduction (vph)	0	14	0	0	0	0	0	0	83	0	0	16
Lane Group Flow (vph)	0	254	0	0	174	208	17	540	20	199	724	16
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Turn Type	Split			Split		Perm	Prot		Over	Prot		Perm
Protected Phases	3	3		4	4		1	6	4	5	2	
Permitted Phases						4						2
Actuated Green, G (s)		10.2			15.8	15.8	2.2	29.7	15.8	14.3	41.8	41.8
Effective Green, g (s)		12.2			17.8	17.8	4.2	31.7	17.8	16.3	43.8	43.8
Actuated g/C Ratio		0.14			0.20	0.20	0.05	0.35	0.20	0.18	0.49	0.49
Clearance Time (s)		5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)		2.5			2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)		460			359	316	83	1259	316	321	1722	770
v/s Ratio Prot		c0.07			0.10		0.01	0.15	0.01	c0.11	c0.20	
v/s Ratio Perm						c0.13						0.01
v/c Ratio		0.55			0.48	0.66	0.20	0.43	0.06	0.62	0.42	0.02
Uniform Delay, d1		36.3			32.0	33.3	41.3	22.2	29.3	34.0	14.9	12.0
Progression Factor		1.00			1.00	1.00	0.94	0.83	2.31	0.75	0.94	0.94
Incremental Delay, d2		1.2			0.8	4.4	0.9	1.1	0.1	3.0	0.7	0.0
Delay (s)		37.5			32.8	37.7	39.7	19.5	67.8	28.4	14.7	11.3
Level of Service		D			C	D	D	B	E	C	B	B
Approach Delay (s)		37.5			35.4			27.6			17.4	
Approach LOS		D			D			C			B	

Intersection Summary

HCM Average Control Delay	25.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Volume (vph)	110	40	415	20	720
Lane Group Flow (vph)	172	62	500	24	867
Turn Type		Perm		Perm	
Protected Phases	4		6		2
Permitted Phases		4		2	
Detector Phase	4	4	6	2	2
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	29.0	15.0	15.0
Total Split (s)	22.0	22.0	68.0	68.0	68.0
Total Split (%)	24.4%	24.4%	75.6%	75.6%	75.6%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	C-Min	C-Min	C-Min
v/c Ratio	0.56	0.19	0.18	0.04	0.32
Control Delay	40.7	9.5	3.6	2.0	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	40.7	9.5	3.6	2.0	2.5
Queue Length 50th (ft)	91	0	30	2	39
Queue Length 95th (ft)	98	14	61	m0	45
Internal Link Dist (ft)	541		1242		579
Turn Bay Length (ft)		200		250	
Base Capacity (vph)	387	395	2721	669	2739
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	0.44	0.16	0.18	0.04	0.32

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 25 (28%), Referenced to phase 2:SBTL and 6:NBT, Start of Yellow
Natural Cycle: 55
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Maple Park & Capitol Way

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	110	40	415	25	20	720
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	1615	3544		1787	3574
Flt Permitted	0.95	1.00	1.00		0.46	1.00
Satd. Flow (perm)	1805	1615	3544		873	3574
Peak-hour factor, PHF	0.64	0.64	0.88	0.88	0.83	0.83
Adj. Flow (vph)	172	62	472	28	24	867
RTOR Reduction (vph)	0	51	4	0	0	0
Lane Group Flow (vph)	172	11	496	0	24	867
Heavy Vehicles (%)	0%	0%	1%	1%	1%	1%
Turn Type		Perm			Perm	
Protected Phases	4		6			2
Permitted Phases		4			2	
Actuated Green, G (s)	13.3	13.3	66.7		66.7	66.7
Effective Green, g (s)	15.3	15.3	68.7		68.7	68.7
Actuated g/C Ratio	0.17	0.17	0.76		0.76	0.76
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0
Vehicle Extension (s)	2.5	2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	307	275	2705		666	2728
v/s Ratio Prot	c0.10		0.14			c0.24
v/s Ratio Perm		0.01			0.03	
v/c Ratio	0.56	0.04	0.18		0.04	0.32
Uniform Delay, d1	34.3	31.2	2.9		2.6	3.3
Progression Factor	1.00	1.00	1.07		0.56	0.59
Incremental Delay, d2	1.9	0.0	0.1		0.1	0.3
Delay (s)	36.2	31.2	3.3		1.5	2.2
Level of Service	D	C	A		A	A
Approach Delay (s)	34.9		3.3			2.2
Approach LOS	C		A			A

Intersection Summary

HCM Average Control Delay	7.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	32.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT	ø1
Lane Configurations							
Volume (vph)	0	5	5	410	25	770	
Lane Group Flow (vph)	32	45	0	488	0	994	
Turn Type			Perm		Perm		
Protected Phases	3	2		4		4	1
Permitted Phases			4		4		
Detector Phase	3	2	4	4	4	4	
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	10.0	15.0	15.0	15.0	15.0	20.0
Total Split (s)	10.0	10.0	50.0	50.0	50.0	50.0	20.0
Total Split (%)	11.1%	11.1%	55.6%	55.6%	55.6%	55.6%	22%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	2.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	
Lead/Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead
Lead-Lag Optimize?							
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	None
v/c Ratio	0.19	0.24		0.18		0.37	
Control Delay	26.6	28.6		3.8		2.1	
Queue Delay	0.0	0.0		0.0		0.0	
Total Delay	26.6	28.6		3.8		2.1	
Queue Length 50th (ft)	9	14		39		60	
Queue Length 95th (ft)	22	23		67		42	
Internal Link Dist (ft)	166	123		1148		1242	
Turn Bay Length (ft)							
Base Capacity (vph)	170	184		2726		2708	
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	0.19	0.24		0.18		0.37	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 4:NBSB, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 9: 21st & Capitol Way

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	0	10	10	5	10	5	410	10	25	770	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.93			0.95			1.00			1.00	
Flt Protected		0.98			0.98			1.00			1.00	
Satd. Flow (prot)		1729			1762			3525			3562	
Flt Permitted		0.98			0.98			0.95			0.93	
Satd. Flow (perm)		1729			1762			3334			3315	
Peak-hour factor, PHF	0.64	0.64	0.64	0.55	0.55	0.55	0.87	0.87	0.87	0.81	0.81	0.81
Adj. Flow (vph)	16	0	16	18	9	18	6	471	11	31	951	12
RTOR Reduction (vph)	0	15	0	0	17	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	17	0	0	28	0	0	487	0	0	994	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Turn Type	Split			Split			Perm			Perm		
Protected Phases	3	3		2	2			4			4	
Permitted Phases							4			4		
Actuated Green, G (s)		4.1			4.5			66.4			66.4	
Effective Green, g (s)		6.1			6.5			68.4			68.4	
Actuated g/C Ratio		0.07			0.07			0.76			0.76	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		2.5			2.5			2.5			2.5	
Lane Grp Cap (vph)		117			127			2534			2519	
v/s Ratio Prot		c0.01			c0.02							
v/s Ratio Perm								0.15			c0.30	
v/c Ratio		0.15			0.22			0.19			0.39	
Uniform Delay, d1		39.5			39.4			3.0			3.7	
Progression Factor		1.00			1.00			1.00			0.39	
Incremental Delay, d2		0.4			0.6			0.2			0.4	
Delay (s)		39.9			40.0			3.2			1.9	
Level of Service		D			D			A			A	
Approach Delay (s)		39.9			40.0			3.2			1.9	
Approach LOS		D			D			A			A	

Intersection Summary

HCM Average Control Delay	4.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	47.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	40	510	30	225	55	280	220	90	95	15
Lane Group Flow (vph)	50	676	36	357	0	440	289	0	218	18
Turn Type	Perm		Perm		Perm		Perm	Perm		Perm
Protected Phases		6		2		4			8	
Permitted Phases	6		2		4		4	8		8
Detector Phase	6	6	2	2	4	4	4	8	8	8
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	19.0	19.0	19.0	19.0	21.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	30.0	30.0	30.0	30.0	45.0	45.0	45.0	45.0	45.0	45.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min	Min
v/c Ratio	0.13	0.50	0.16	0.27		0.55	0.36		0.36	0.02
Control Delay	11.0	11.8	12.4	8.4		11.1	6.1		9.4	3.7
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	11.0	11.8	12.4	8.4		11.1	6.1		9.4	3.7
Queue Length 50th (ft)	6	51	5	20		58	20		26	0
Queue Length 95th (ft)	27	112	24	54		120	52		72	7
Internal Link Dist (ft)		542		982		380			249	
Turn Bay Length (ft)	200		200							300
Base Capacity (vph)	729	2559	428	2500		1615	1497		1208	1491
Starvation Cap Reductn	0	0	0	0		0	0		0	0
Spillback Cap Reductn	0	0	0	0		0	0		0	0
Storage Cap Reductn	0	0	0	0		0	0		0	0
Reduced v/c Ratio	0.07	0.26	0.08	0.14		0.27	0.19		0.18	0.01

Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 40
Natural Cycle: 40
Control Type: Actuated-Uncoordinated

Splits and Phases: 12: Union & Jefferson

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	510	30	30	225	75	55	280	220	90	95	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.96			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.98	1.00
Satd. Flow (prot)	1787	3544		1787	3441			1866	1599		1837	1599
Flt Permitted	0.54	1.00		0.32	1.00			0.92	1.00		0.69	1.00
Satd. Flow (perm)	1013	3544		595	3441			1733	1599		1296	1599
Peak-hour factor, PHF	0.80	0.80	0.80	0.84	0.84	0.84	0.76	0.76	0.76	0.85	0.85	0.85
Adj. Flow (vph)	50	638	38	36	268	89	72	368	289	106	112	18
RTOR Reduction (vph)	0	6	0	0	41	0	0	0	56	0	0	10
Lane Group Flow (vph)	50	670	0	36	316	0	0	440	233	0	218	8
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4		4	8		8
Actuated Green, G (s)	13.0	13.0		13.0	13.0			16.3	16.3		16.3	16.3
Effective Green, g (s)	15.0	15.0		15.0	15.0			18.3	18.3		18.3	18.3
Actuated g/C Ratio	0.38	0.38		0.38	0.38			0.47	0.47		0.47	0.47
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	2.5	2.5		2.5	2.5			2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	387	1353		227	1313			807	745		603	745
v/s Ratio Prot		c0.19			0.09							
v/s Ratio Perm	0.05			0.06				c0.25	0.15		0.17	0.01
v/c Ratio	0.13	0.50		0.16	0.24			0.55	0.31		0.36	0.01
Uniform Delay, d1	7.9	9.3		8.0	8.3			7.5	6.6		6.7	5.6
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	0.2		0.2	0.1			0.6	0.2		0.3	0.0
Delay (s)	8.0	9.5		8.2	8.3			8.1	6.7		7.0	5.6
Level of Service	A	A		A	A			A	A		A	A
Approach Delay (s)		9.4			8.3			7.6			6.9	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	8.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	39.3	Sum of lost time (s)	6.0
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Volume (vph)	80	740	75	225	225	5	50	175	345	105
Lane Group Flow (vph)	0	1142	86	259	259	0	89	282	367	149
Turn Type	pm+pt		Prot		Free	Perm		Free	Prot	
Protected Phases	1	6	5	2			8		7	4
Permitted Phases	6				Free	8		Free		
Detector Phase	1	6	5	2		8	8		7	4
Switch Phase										
Minimum Initial (s)	2.0	4.0	4.0	4.0		2.0	2.0		2.0	4.0
Minimum Split (s)	6.0	10.0	12.0	17.0		26.0	26.0		12.0	25.0
Total Split (s)	6.0	84.0	20.0	98.0	0.0	27.0	27.0	0.0	58.0	85.0
Total Split (%)	3.2%	44.4%	10.6%	51.9%	0.0%	14.3%	14.3%	0.0%	30.7%	45.0%
Yellow Time (s)	2.5	5.5	3.5	5.5		5.5	5.5		3.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5		0.5	0.5		0.5	0.5
Lost Time Adjust (s)	0.0	-3.0	-1.0	-3.0	-1.0	-3.0	-3.0	-1.0	-1.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag		Lag	Lag		Lead	
Lead-Lag Optimize?										
Recall Mode	None	Min	None	Min		None	None		None	None
v/c Ratio		0.84	0.53	0.13	0.16		0.46	0.19	0.80	0.21
Control Delay		43.1	81.6	16.5	0.2		74.0	0.3	64.5	28.2
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.1	0.0
Total Delay		43.1	81.6	16.5	0.2		74.0	0.3	64.5	28.2
Queue Length 50th (ft)		468	75	55	0		77	0	311	81
Queue Length 95th (ft)		564	164	105	0		114	0	542	161
Internal Link Dist (ft)		1141		344			117			586
Turn Bay Length (ft)			200		300					
Base Capacity (vph)		1912	233	2581	1599		319	1524	732	1110
Starvation Cap Reductn		0	0	0	0		0	0	16	0
Spillback Cap Reductn		0	0	0	0		0	0	0	0
Storage Cap Reductn		0	0	0	0		0	0	0	0
Reduced v/c Ratio		0.60	0.37	0.10	0.16		0.28	0.19	0.51	0.13

Intersection Summary

Cycle Length: 189
Actuated Cycle Length: 139.7
Natural Cycle: 90
Control Type: Actuated-Uncoordinated

Splits and Phases: 13: 14th & Jefferson

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	740	25	75	225	225	5	50	175	345	105	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Util. Factor		0.95		1.00	0.95	1.00		1.00	1.00	1.00	1.00	
Frt		1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.96	
Flt Protected		1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3507		1787	3574	1599		1784	1524	1736	1759	
Flt Permitted		0.87		0.95	1.00	1.00		0.97	1.00	0.95	1.00	
Satd. Flow (perm)		3077		1787	3574	1599		1732	1524	1736	1759	
Peak-hour factor, PHF	0.74	0.74	0.74	0.87	0.87	0.87	0.62	0.62	0.62	0.94	0.94	0.94
Adj. Flow (vph)	108	1000	34	86	259	259	8	81	282	367	112	37
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	0	0	7	0
Lane Group Flow (vph)	0	1141	0	86	259	259	0	89	282	367	142	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	6%	6%	6%	4%	4%	4%
Turn Type	pm+pt			Prot		Free	Perm		Free	Prot		
Protected Phases	1	6		5	2			8		7	4	
Permitted Phases	6					Free	8		Free			
Actuated Green, G (s)		58.8		11.5	74.3	139.0		12.8	139.0	35.9	53.7	
Effective Green, g (s)		61.8		12.5	77.3	139.0		15.8	139.0	36.9	55.7	
Actuated g/C Ratio		0.44		0.09	0.56	1.00		0.11	1.00	0.27	0.40	
Clearance Time (s)		6.0		4.0	6.0			6.0		4.0	5.0	
Vehicle Extension (s)		2.0		2.0	2.0			2.0		2.0	2.0	
Lane Grp Cap (vph)		1368		161	1988	1599		197	1524	461	705	
v/s Ratio Prot				c0.05	0.07					c0.21	0.08	
v/s Ratio Perm		c0.37				0.16		c0.05	0.19			
v/c Ratio		0.83		0.53	0.13	0.16		0.45	0.19	0.80	0.20	
Uniform Delay, d1		34.1		60.5	14.8	0.0		57.6	0.0	47.5	27.2	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		4.3		1.7	0.0	0.2		0.6	0.3	8.6	0.1	
Delay (s)		38.4		62.2	14.8	0.2		58.2	0.3	56.2	27.2	
Level of Service		D		E	B	A		E	A	E	C	
Approach Delay (s)		38.4			15.3			14.2			47.8	
Approach LOS		D			B			B			D	

Intersection Summary

HCM Average Control Delay	31.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	139.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	EMP	Intersection	14
Agency/Co.	Parametrix	Jurisdiction	City of Olympia
Date Performed	3/14/2008	Analysis Year	2010 Baseline
Analysis Time Period	PM Peak Hour		

Project Description 247-4575-003

East/West Street: SE Maple Park Avenue | North/South Street: SE Jefferson Street

Intersection Orientation: North-South | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	5	15	5	10	35	100
Peak-Hour Factor, PHF	0.55	0.55	0.55	0.84	0.84	0.84
Hourly Flow Rate, HFR (veh/h)	9	27	9	11	41	119
Percent Heavy Vehicles	0	--	--	3	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LTR			LTR		
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	190	5	5	5	5	5
Peak-Hour Factor, PHF	0.67	0.67	0.67	0.50	0.50	0.50
Hourly Flow Rate, HFR (veh/h)	283	7	7	10	10	10
Percent Heavy Vehicles	1	1	1	10	10	10
Percent Grade (%)	-3			-2		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LTR	LTR		LTR			LTR	
v (veh/h)	9	11		30			297	
C (m) (veh/h)	1432	1568		775			760	
v/c	0.01	0.01		0.04			0.39	
95% queue length	0.02	0.02		0.12			1.86	
Control Delay (s/veh)	7.5	7.3		9.8			12.7	
LOS	A	A		A			B	
Approach Delay (s/veh)	--	--	9.8			12.7		
Approach LOS	--	--	A			B		

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SIDRA INTERSECTION

Movement Summary

14th Ave Extension / Henderson Blvd

2010 Baseline PM Peak Hour

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
NB Driveway										
3L	L	2	0.0	0.011	17.6	LOS B	2	0.72	0.70	27.0
8T	T	2	0.0	0.011	10.5	LOS B	2	0.72	0.62	30.6
8R	R	2	0.0	0.011	11.8	LOS B	2	0.72	0.59	29.7
Approach		**6**	**0.0**	**0.011**	**13.3**	**LOS B**	**2**	**0.72**	**0.64**	**29.0**
WB Henderson Blvd										
1L	L	1	50.0	0.143	12.2	LOS B	26	0.07	0.68	29.8
6T	T	176	2.3	0.139	5.2	LOS A	26	0.07	0.42	34.4
6R	R	22	4.3	0.139	6.5	LOS A	26	0.07	0.50	33.3
Approach		**201**	**3.0**	**0.139**	**5.4**	**LOS A**	**26**	**0.07**	**0.43**	**34.2**
SB 14th Ave Extension										
7L	L	313	1.0	0.306	13.6	LOS B	57	0.43	0.69	28.8
4T	T	1	0.0	0.333	6.5	LOS A	57	0.43	0.53	32.5
4R	R	330	0.9	0.173	6.1	LOS A#	8#	0.00	0.50	34.0
Approach		**642**	**0.9**	**0.306**	**9.7**	**LOS A**	**57**	**0.21**	**0.59**	**31.2**
EB Henderson Blvd										
5L	L	5	16.7	0.500	15.5	LOS B	123	0.69	0.83	28.1
2T	T	445	0.9	0.521	8.5	LOS A	123	0.69	0.72	31.2
2R	R	1	0.0	0.500	9.7	LOS A	123	0.69	0.70	30.6
Approach		**452**	**1.1**	**0.521**	**8.6**	**LOS A**	**123**	**0.69**	**0.72**	**31.1**
All Vehicles		**1301**	**1.3**	**0.521**	**8.7**	**LOS A**	**123**	**0.36**	**0.61**	**31.6**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

Lane Group	WBL	NBT	SBL2	SBL	SBT	NWL
Lane Configurations						
Volume (vph)	60	400	40	10	610	30
Lane Group Flow (vph)	120	567	0	60	726	72
Turn Type			Perm	Perm		
Protected Phases	8	2			6	7
Permitted Phases			6	6		
Detector Phase	8	2	6	6	6	7
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	26.0	38.0	38.0	38.0	38.0	26.0
Total Split (%)	28.9%	42.2%	42.2%	42.2%	42.2%	28.9%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag					Lead
Lead-Lag Optimize?						
Recall Mode	None	Max	Max	Max	Max	None
v/c Ratio	0.47	0.27		0.12	0.33	0.34
Control Delay	28.1	9.3		10.4	9.8	29.6
Queue Delay	0.0	0.0		0.0	0.0	0.0
Total Delay	28.1	9.3		10.4	9.8	29.6
Queue Length 50th (ft)	35	61		11	82	24
Queue Length 95th (ft)	70	112		33	134	40
Internal Link Dist (ft)	1602	636			2617	614
Turn Bay Length (ft)				150		
Base Capacity (vph)	599	2090		496	2181	587
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	0.20	0.27		0.12	0.33	0.12

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 63.9
Natural Cycle: 75
Control Type: Semi Act-Uncoord

Splits and Phases: 17: Carlyon Ave & Capitol Blvd

Movement	WBL2	WBL	WBR	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2
Lane Configurations												
Volume (vph)	5	60	30	400	95	15	40	10	610	30	10	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0				5.0	5.0	5.0		
Lane Util. Factor		1.00		0.95				1.00	0.95	1.00		
Frt		0.96		0.97				1.00	1.00	0.96		
Flt Protected		0.97		1.00				0.95	1.00	0.97		
Satd. Flow (prot)		1759		3424				1787	3574	1756		
Flt Permitted		0.97		1.00				0.43	1.00	0.97		
Satd. Flow (perm)		1759		3424				812	3574	1756		
Peak-hour factor, PHF	0.79	0.79	0.79	0.90	0.90	0.90	0.84	0.84	0.84	0.63	0.63	0.63
Adj. Flow (vph)	6	76	38	444	106	17	48	12	726	48	16	8
RTOR Reduction (vph)	0	21	0	2	0	0	0	0	0	6	0	0
Lane Group Flow (vph)	0	99	0	565	0	0	0	60	726	66	0	0
Heavy Vehicles (%)	0%	0%	0%	2%	2%	2%	1%	1%	1%	0%	0%	0%
Turn Type	Perm						Perm	Perm				
Protected Phases		8		2					6	7		
Permitted Phases	8						6	6				
Actuated Green, G (s)		7.2		37.8				37.8	37.8	6.2		
Effective Green, g (s)		7.2		37.8				37.8	37.8	6.2		
Actuated g/C Ratio		0.11		0.57				0.57	0.57	0.09		
Clearance Time (s)		5.0		5.0				5.0	5.0	5.0		
Vehicle Extension (s)		2.5		2.5				2.5	2.5	2.5		
Lane Grp Cap (vph)		191		1955				464	2041	164		
v/s Ratio Prot				0.17					c0.20	c0.04		
v/s Ratio Perm		0.06						0.07				
v/c Ratio		0.52		0.29				0.13	0.36	0.40		
Uniform Delay, d1		27.9		7.3				6.6	7.6	28.2		
Progression Factor		1.00		1.00				1.00	1.00	1.00		
Incremental Delay, d2		1.8		0.4				0.6	0.5	1.2		
Delay (s)		29.6		7.7				7.2	8.1	29.4		
Level of Service		C		A				A	A	C		
Approach Delay (s)		29.6		7.7					8.1	29.4		
Approach LOS		C		A					A	C		

Intersection Summary

HCM Average Control Delay	10.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	66.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	43.3%	ICU Level of Service	A
Analysis Period (min)	15		

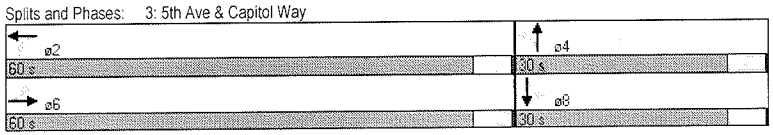
c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations						
Volume (vph)	175	2	107	2	190	222
Lane Group Flow (vph)	450	0	168	0	228	249
Turn Type		Perm		Perm		
Protected Phases	6		2		4	8
Permitted Phases		2		4		
Detector Phase	6	2	2	4	4	8
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	26.0	26.0	26.0	20.0	20.0	20.0
Total Split (s)	60.0	60.0	60.0	30.0	30.0	30.0
Total Split (%)	66.7%	66.7%	66.7%	33.3%	33.3%	33.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Max	Max	Max	Max	Max	Max
v/c Ratio	0.44		0.16		0.29	0.30
Control Delay	8.3		6.8		15.8	15.2
Queue Delay	3.1		0.0		0.0	0.0
Total Delay	11.3		6.8		15.8	15.2
Queue Length 50th (ft)	92		33		17	31
Queue Length 95th (ft)	97		44		48	51
Internal Link Dist (ft)	221		238		221	223
Turn Bay Length (ft)						
Base Capacity (vph)	1012		1053		780	821
Starvation Cap Reductn	444		0		0	0
Spillback Cap Reductn	0		0		0	0
Storage Cap Reductn	0		0		0	0
Reduced v/c Ratio	0.79		0.16		0.29	0.30

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 15 (17%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow
Natural Cycle: 50
Control Type: Pretimed

Splits and Phases: 3: 5th Ave & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	175	135	2	107	10	2	190	25	0	222	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frpb, ped/bikes		0.98			1.00			0.98			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.94			0.99			0.98			1.00	
Flt Protected		1.00			1.00			1.00			1.00	
Satd. Flow (prot)		1551			1663			2686			2731	
Flt Permitted		1.00			1.00			0.95			1.00	
Satd. Flow (perm)		1551			1656			2561			2731	
Peak-hour factor, PHF	0.69	0.69	0.69	0.71	0.71	0.71	0.95	0.95	0.95	0.91	0.91	0.91
Adj. Flow (vph)	0	254	196	3	151	14	2	200	26	0	244	5
RTOR Reduction (vph)	0	31	0	0	4	0	0	11	0	0	1	0
Lane Group Flow (vph)	0	419	0	0	164	0	0	217	0	0	248	0
Confl. Peds. (#/hr)	38		60	60		38	43		56	56		43
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	7%	7%	7%	9%	9%	9%
Parking (#/hr)								12			12	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		55.0			55.0			25.0			25.0	
Effective Green, g (s)		57.0			57.0			27.0			27.0	
Actuated g/C Ratio		0.63			0.63			0.30			0.30	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)		982			1049			768			819	
v/s Ratio Prot		c0.27									c0.09	
v/s Ratio Perm					0.10			0.08				
v/c Ratio		0.43			0.16			0.28			0.30	
Uniform Delay, d1		8.3			6.7			24.1			24.2	
Progression Factor		1.00			1.00			0.66			0.59	
Incremental Delay, d2		1.4			0.3			0.9			0.9	
Delay (s)		9.6			7.0			16.7			15.1	
Level of Service		A			A			B			B	
Approach Delay (s)		9.6			7.0			16.7			15.1	
Approach LOS		A			A			B			B	

Intersection Summary

HCM Average Control Delay	12.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	41.3%	ICU Level of Service	A
Analysis Period (min)	15		

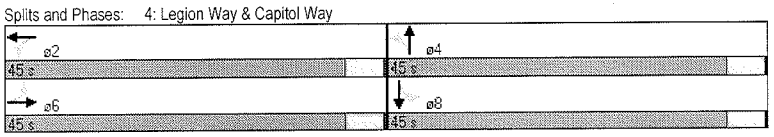
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations							
Volume (vph)	5	90	40	60	1	200	342
Lane Group Flow (vph)	0	154	0	174	0	262	428
Turn Type	Perm		Perm		Perm		
Protected Phases		6		2		4	8
Permitted Phases	6		2		4		
Detector Phase	6	6	2	2	4	4	8
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	45.0	45.0	45.0	45.0	45.0	45.0	45.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	Max	Max	Max	Max	Max	Max	Max
v/c Ratio		0.20		0.25		0.20	0.29
Control Delay		12.6		14.1		7.8	8.2
Queue Delay		0.0		0.0		0.0	0.5
Total Delay		12.6		14.1		7.8	8.7
Queue Length 50th (ft)		41		51		42	31
Queue Length 95th (ft)		68		70		13	45
Internal Link Dist (ft)		221		241		1485	221
Turn Bay Length (ft)							
Base Capacity (vph)		779		684		1340	1456
Starvation Cap Reductn		0		0		0	595
Spillback Cap Reductn		0		0		0	0
Storage Cap Reductn		0		0		0	0
Reduced v/c Ratio		0.20		0.25		0.20	0.50

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 39 (43%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow
Natural Cycle: 50
Control Type: Pretimed

Splits and Phases: 4: Legion Way & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	90	30	40	60	25	1	200	30	0	342	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.97			0.97			0.98			1.00	
Flt Protected		1.00			0.98			1.00			1.00	
Satd. Flow (prot)		1651			1621			2977			3117	
Flt Permitted		0.99			0.88			0.95			1.00	
Satd. Flow (perm)		1641			1444			2841			3117	
Peak-hour factor, PHF	0.81	0.81	0.81	0.72	0.72	0.72	0.88	0.88	0.88	0.81	0.81	0.81
Adj. Flow (vph)	6	111	37	56	83	35	1	227	34	0	422	6
RTOR Reduction (vph)	0	13	0	0	10	0	0	13	0	0	1	0
Lane Group Flow (vph)	0	141	0	0	164	0	0	249	0	0	427	0
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	7%	7%	7%	4%	4%	4%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		40.0			40.0			40.0			40.0	
Effective Green, g (s)		42.0			42.0			42.0			42.0	
Actuated g/C Ratio		0.47			0.47			0.47			0.47	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)		766			674			1326			1455	
v/s Ratio Prot											c0.14	
v/s Ratio Perm		0.09			c0.11			0.09				
v/c Ratio		0.18			0.24			0.19			0.29	
Uniform Delay, d1		14.0			14.4			14.0			14.8	
Progression Factor		1.00			1.00			0.59			0.52	
Incremental Delay, d2		0.5			0.9			0.3			0.5	
Delay (s)		14.5			15.3			8.5			8.1	
Level of Service		B			B			A			A	
Approach Delay (s)		14.5			15.3			8.5			8.1	
Approach LOS		B			B			A			A	

Intersection Summary

HCM Average Control Delay	10.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		

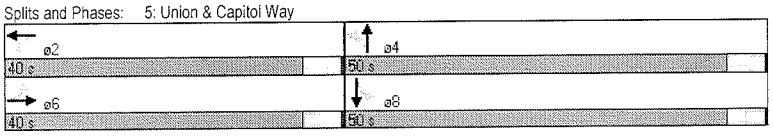
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	5	55	105	150	60	390	60	357
Lane Group Flow (vph)	0	103	118	225	74	623	67	412
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		6		2		4		8
Permitted Phases	6		2		4		8	
Detector Phase	6	6	2	2	4	4	8	8
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	40.0	40.0	40.0	40.0	50.0	50.0	50.0	50.0
Total Split (%)	44.4%	44.4%	44.4%	44.4%	55.6%	55.6%	55.6%	55.6%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
v/c Ratio		0.17	0.51	0.34	0.10	0.24	0.12	0.15
Control Delay		21.7	40.1	24.3	4.7	4.1	1.4	0.9
Queue Delay		0.0	0.0	0.0	0.0	0.4	0.0	0.0
Total Delay		21.7	40.1	24.3	4.7	4.5	1.4	0.9
Queue Length 50th (ft)		18	61	44	5	0	1	4
Queue Length 95th (ft)		33	105	69	22	56	4	7
Internal Link Dist (ft)		205		541		240		1485
Turn Bay Length (ft)			200		100		200	
Base Capacity (vph)		1320	531	1448	710	2569	568	2660
Starvation Cap Reductn		0	0	0	0	1369	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		0.08	0.22	0.16	0.10	0.52	0.12	0.15

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 14 (16%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 5: Union & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	55	25	105	150	50	60	390	115	60	357	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor		0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt		0.96		1.00	0.96		1.00	0.97		1.00	1.00	
Flt Protected		1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3375		1787	3441		1752	3385		1770	3525	
Flt Permitted		0.94		0.69	1.00		0.51	1.00		0.40	1.00	
Satd. Flow (perm)		3166		1292	3441		941	3385		752	3525	
Peak-hour factor, PHF	0.82	0.82	0.82	0.89	0.89	0.89	0.81	0.81	0.81	0.89	0.89	0.89
Adj. Flow (vph)	6	67	30	118	169	56	74	481	142	67	401	11
RTOR Reduction (vph)	0	25	0	0	46	0	0	16	0	0	1	0
Lane Group Flow (vph)	0	78	0	118	179	0	74	607	0	67	411	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		14.1		14.1	14.1		65.9	65.9		65.9	65.9	
Effective Green, g (s)		16.1		16.1	16.1		67.9	67.9		67.9	67.9	
Actuated g/C Ratio		0.18		0.18	0.18		0.75	0.75		0.75	0.75	
Clearance Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.5		3.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)		566		231	616		710	2554		567	2659	
v/s Ratio Prot					0.05			c0.18			0.12	
v/s Ratio Perm		0.02		c0.09			0.08			0.09		
v/c Ratio		0.14		0.51	0.29		0.10	0.24		0.12	0.15	
Uniform Delay, d1		31.1		33.4	32.0		2.9	3.3		3.0	3.1	
Progression Factor		1.00		1.00	1.00		1.12	1.14		0.25	0.22	
Incremental Delay, d2		0.1		2.2	0.3		0.3	0.2		0.4	0.1	
Delay (s)		31.2		35.6	32.3		3.6	4.0		1.2	0.8	
Level of Service		C		D	C		A	A		A	A	
Approach Delay (s)		31.2			33.4			3.9			0.9	
Approach LOS		C			C			A			A	

Intersection Summary

HCM Average Control Delay	11.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	40.3%	ICU Level of Service	A
Analysis Period (min)	15		

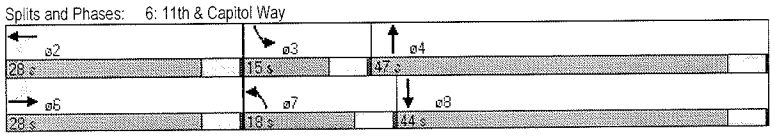
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	10	45	20	40	71	540	35	427
Lane Group Flow (vph)	15	123	25	64	85	762	39	496
Turn Type	Perm		Perm		Prot		Prot	
Protected Phases		6		2	7	4	3	8
Permitted Phases	6		2					
Detector Phase	6	6	2	2	7	4	3	8
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	12.0	25.0	12.0	25.0
Total Split (s)	28.0	28.0	28.0	28.0	18.0	47.0	15.0	44.0
Total Split (%)	31.1%	31.1%	31.1%	31.1%	20.0%	52.2%	16.7%	48.9%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
v/c Ratio	0.09	0.49	0.22	0.28	0.39	0.30	0.22	0.21
Control Delay	33.9	30.1	38.2	31.5	40.0	3.4	37.4	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	33.9	30.1	38.2	31.5	40.0	3.4	37.4	7.8
Queue Length 50th (ft)	8	42	13	27	48	53	21	51
Queue Length 95th (ft)	17	57	31	52	83	71	54	76
Internal Link Dist (ft)		205		230		830		240
Turn Bay Length (ft)					150		100	
Base Capacity (vph)	359	501	253	488	295	2500	236	2367
Starvation Cap Reductn	0	0	0	0	0	0	0	1048
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.25	0.10	0.13	0.29	0.30	0.17	0.38

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 64 (71%), Referenced to phase 4:NBT and 8:SBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 6: 11th & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	45	35	20	40	10	71	540	100	35	427	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.93		1.00	0.97		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1719	1690		1687	1722		1770	3456		1770	3516	
Flt Permitted	0.72	1.00		0.51	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1294	1690		909	1722		1770	3456		1770	3516	
Peak-hour factor, PHF	0.65	0.65	0.65	0.79	0.79	0.79	0.84	0.84	0.84	0.90	0.90	0.90
Adj. Flow (vph)	15	69	54	25	51	13	85	643	119	39	474	22
RTOR Reduction (vph)	0	38	0	0	11	0	0	10	0	0	2	0
Lane Group Flow (vph)	15	85	0	25	53	0	85	752	0	39	494	0
Heavy Vehicles (%)	5%	5%	5%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		6			2		7	4		3	8	
Permitted Phases	6			2								
Actuated Green, G (s)	9.3	9.3		9.3	9.3		8.1	60.9		4.8	57.6	
Effective Green, g (s)	11.3	11.3		11.3	11.3		10.1	62.9		6.8	59.6	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.11	0.70		0.08	0.66	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	162	212		114	216		199	2415		134	2328	
v/s Ratio Prot		c0.05			0.03		c0.05	c0.22		0.02	0.14	
v/s Ratio Perm	0.01			0.03								
v/c Ratio	0.09	0.40		0.22	0.24		0.43	0.31		0.29	0.21	
Uniform Delay, d1	34.8	36.2		35.4	35.5		37.3	5.2		39.3	6.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	0.55		0.94	1.05	
Incremental Delay, d2	0.2	0.9		0.7	0.4		1.0	0.3		0.9	0.2	
Delay (s)	35.0	37.2		36.1	35.9		38.2	3.2		37.9	6.5	
Level of Service	C	D		D	D		D	A		D	A	
Approach Delay (s)		36.9			36.0			6.7			8.8	
Approach LOS		D			D			A			A	

Intersection Summary

HCM Average Control Delay	11.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	39.2%	ICU Level of Service	A
Analysis Period (min)	15		

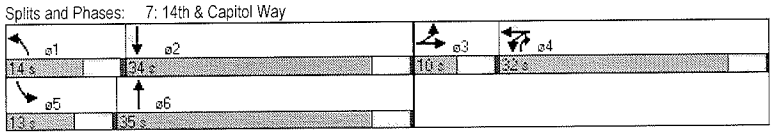
c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations									
Volume (vph)	45	220	181	75	510	50	107	245	75
Lane Group Flow (vph)	110	373	223	100	680	67	127	292	89
Turn Type			Perm	Prot		Over	Prot		Perm
Protected Phases	3	4		1	6	4	5	2	
Permitted Phases			4						2
Detector Phase	3	4	4	1	6	4	5	2	2
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	10.0	10.0	10.0	15.0	10.0	12.0	25.0	25.0
Total Split (s)	10.0	32.0	32.0	14.0	35.0	32.0	13.0	34.0	34.0
Total Split (%)	11.1%	35.6%	35.6%	15.6%	38.9%	35.6%	14.4%	37.8%	37.8%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	C-Min	None	None	C-Min	C-Min
v/c Ratio	0.33	0.74	0.52	0.47	0.49	0.14	0.58	0.20	0.13
Control Delay	36.4	39.2	31.6	39.8	21.3	16.3	39.0	22.7	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	39.2	31.6	39.8	21.3	16.3	39.0	22.7	11.2
Queue Length 50th (ft)	27	192	107	47	167	0	50	71	5
Queue Length 95th (ft)	48	237	145	65	180	33	#128	121	53
Internal Link Dist (ft)	70	1141			579			830	
Turn Bay Length (ft)				250		250	250		250
Base Capacity (vph)	337	598	515	227	1465	555	222	1524	732
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.62	0.43	0.44	0.46	0.12	0.57	0.19	0.12

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 42 (47%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: 14th & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	45	10	82	220	181	75	510	50	107	245	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.98			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98			0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3255			1856	1599	1770	3539	1583	1736	3471	1553
Flt Permitted		0.98			0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3255			1856	1599	1770	3539	1583	1736	3471	1553
Peak-hour factor, PHF	0.82	0.82	0.82	0.81	0.81	0.81	0.75	0.75	0.75	0.84	0.84	0.84
Adj. Flow (vph)	43	55	12	101	272	223	100	680	67	127	292	89
RTOR Reduction (vph)	0	10	0	0	0	0	0	0	49	0	0	53
Lane Group Flow (vph)	0	100	0	0	373	223	100	680	18	127	292	36
Heavy Vehicles (%)	7%	7%	7%	1%	1%	1%	2%	2%	2%	4%	4%	4%
Turn Type	Split			Split		Perm	Prot		Over	Prot		Perm
Protected Phases	3	3		4	4		1	6	4	5	2	
Permitted Phases						4						2
Actuated Green, G (s)		6.0			22.3	22.3	7.6	32.4	22.3	9.3	34.1	34.1
Effective Green, g (s)		8.0			24.3	24.3	9.6	34.4	24.3	11.3	36.1	36.1
Actuated g/C Ratio		0.09			0.27	0.27	0.11	0.38	0.27	0.13	0.40	0.40
Clearance Time (s)		5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)		2.5			2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)		289			501	432	189	1353	427	218	1392	623
v/s Ratio Prot		c0.03			c0.20		0.06	c0.19	0.01	c0.07	0.08	
v/s Ratio Perm						0.14						0.02
v/c Ratio		0.35			0.74	0.52	0.53	0.50	0.04	0.58	0.21	0.06
Uniform Delay, d1		38.5			30.0	27.9	38.1	21.3	24.3	37.1	17.6	16.5
Progression Factor		1.00			1.00	1.00	0.88	0.88	2.63	0.72	1.12	2.02
Incremental Delay, d2		0.5			5.6	0.8	2.0	1.3	0.0	3.2	0.3	0.2
Delay (s)		39.1			35.6	28.6	35.6	20.0	63.7	29.9	20.0	33.6
Level of Service		D			D	C	D	C	E	C	B	C
Approach Delay (s)		39.1			33.0			25.3			24.9	
Approach LOS		D			C			C			C	

Intersection Summary

HCM Average Control Delay	28.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		

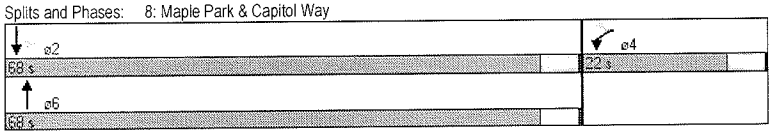
c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Volume (vph)	15	40	660	30	222
Lane Group Flow (vph)	21	56	975	34	249
Turn Type		Perm		Perm	
Protected Phases	4		6		2
Permitted Phases		4		2	
Detector Phase	4	4	6	2	2
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	29.0	15.0	15.0
Total Split (s)	22.0	22.0	68.0	68.0	68.0
Total Split (%)	24.4%	24.4%	75.6%	75.6%	75.6%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	C-Min	C-Min	C-Min
v/c Ratio	0.13	0.29	0.32	0.07	0.08
Control Delay	38.7	15.0	0.8	0.8	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	38.7	15.0	0.8	0.8	0.5
Queue Length 50th (ft)	11	0	37	0	0
Queue Length 95th (ft)	26	21	0	m0	0
Internal Link Dist (ft)	541		1242		579
Turn Bay Length (ft)		200		250	
Base Capacity (vph)	353	360	3051	457	3046
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	0.06	0.16	0.32	0.07	0.08

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Yellow
Natural Cycle: 55
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Maple Park & Capitol Way



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	15	40	660	101	30	222
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1671	1495	3503		1752	3505
Flt Permitted	0.95	1.00	1.00		0.28	1.00
Satd. Flow (perm)	1671	1495	3503		525	3505
Peak-hour factor, PHF	0.72	0.72	0.78	0.78	0.89	0.89
Adj. Flow (vph)	21	56	846	129	34	249
RTOR Reduction (vph)	0	51	7	0	0	0
Lane Group Flow (vph)	21	5	968	0	34	249
Heavy Vehicles (%)	8%	8%	1%	1%	3%	3%
Turn Type		Perm			Perm	
Protected Phases	4		6			2
Permitted Phases		4			2	
Actuated Green, G (s)	5.4	5.4	74.6		74.6	74.6
Effective Green, g (s)	7.4	7.4	76.6		76.6	76.6
Actuated g/C Ratio	0.08	0.08	0.85		0.85	0.85
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0
Vehicle Extension (s)	2.5	2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	137	123	2981		447	2983
v/s Ratio Prot	c0.01		c0.28			0.07
v/s Ratio Perm		0.00			0.06	
v/c Ratio	0.15	0.04	0.32		0.08	0.08
Uniform Delay, d1	38.4	38.0	1.4		1.1	1.1
Progression Factor	1.00	1.00	0.38		0.31	0.37
Incremental Delay, d2	0.4	0.1	0.3		0.3	0.1
Delay (s)	38.8	38.1	0.8		0.7	0.5
Level of Service	D	D	A		A	A
Approach Delay (s)	38.3		0.8			0.5
Approach LOS	D		A			A

Intersection Summary

HCM Average Control Delay	2.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	34.9%	ICU Level of Service	A
Analysis Period (min)	15		

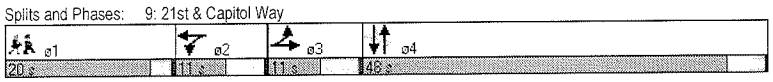
c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT	ø1
Lane Configurations							
Volume (vph)	0	0	5	668	5	207	
Lane Group Flow (vph)	23	24	0	942	0	286	
Turn Type			Perm		Perm		
Protected Phases	3	2		4		4	1
Permitted Phases			4		4		
Detector Phase	3	2	4	4	4	4	
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	10.0	15.0	15.0	15.0	15.0	20.0
Total Split (s)	11.0	11.0	48.0	48.0	48.0	48.0	20.0
Total Split (%)	12.2%	12.2%	53.3%	53.3%	53.3%	53.3%	22%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	2.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	
Lead/Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead
Lead-Lag Optimize?							
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	None
v/c Ratio	0.14	0.15		0.32		0.10	
Control Delay	29.5	23.9		3.2		1.6	
Queue Delay	0.0	0.0		0.0		0.0	
Total Delay	29.5	23.9		3.2		1.6	
Queue Length 50th (ft)	8	4		0		0	
Queue Length 95th (ft)	17	16		100		13	
Internal Link Dist (ft)	166	123		1148		1242	
Turn Bay Length (ft)							
Base Capacity (vph)	171	172		2967		2881	
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	0.13	0.14		0.32		0.10	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 4:NBSB, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 9: 21st & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	0	5	5	0	10	5	668	5	5	207	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.95			0.91			1.00			1.00	
Flt Protected		0.97			0.98			1.00			1.00	
Satd. Flow (prot)		1746			1701			3534			3488	
Flt Permitted		0.97			0.98			0.95			0.94	
Satd. Flow (perm)		1746			1701			3369			3272	
Peak-hour factor, PHF	0.56	0.56	0.56	0.61	0.61	0.61	0.72	0.72	0.72	0.76	0.76	0.76
Adj. Flow (vph)	14	0	9	8	0	16	7	928	7	7	272	7
RTOR Reduction (vph)	0	9	0	0	15	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	14	0	0	9	0	0	942	0	0	285	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	3%	3%	3%
Turn Type	Split			Split			Perm			Perm		
Protected Phases	3	3		2	2			4			4	
Permitted Phases							4			4		
Actuated Green, G (s)		2.8			2.7			69.5			69.5	
Effective Green, g (s)		4.8			4.7			71.5			71.5	
Actuated g/C Ratio		0.05			0.05			0.79			0.79	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		2.5			2.5			2.5			2.5	
Lane Grp Cap (vph)		93			89			2676			2599	
v/s Ratio Prot		c0.01			c0.01							
v/s Ratio Perm								c0.28			0.09	
v/c Ratio		0.16			0.10			0.35			0.11	
Uniform Delay, d1		40.7			40.6			2.6			2.1	
Progression Factor		1.00			1.00			1.00			0.65	
Incremental Delay, d2		0.6			0.4			0.4			0.1	
Delay (s)		41.2			41.0			3.0			1.4	
Level of Service		D			D			A			A	
Approach Delay (s)		41.2			41.0			3.0			1.4	
Approach LOS		D			D			A			A	

Intersection Summary

HCM Average Control Delay	4.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	32.1%	ICU Level of Service	A
Analysis Period (min)	15		

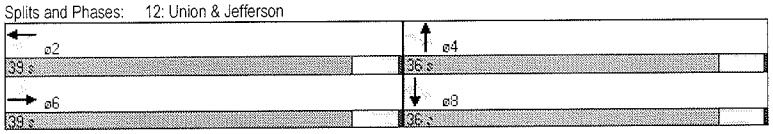
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	15	180	192	385	60	193	47	30	83	15
Lane Group Flow (vph)	20	263	249	578	0	275	51	0	157	21
Turn Type	Perm		Perm		Perm		Perm	Perm		Perm
Protected Phases		6		2		4			8	
Permitted Phases	6		2		4		4	8		8
Detector Phase	6	6	2	2	4	4	4	8	8	8
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	19.0	19.0	19.0	19.0	21.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	39.0	39.0	39.0	39.0	36.0	36.0	36.0	36.0	36.0	36.0
Total Split (%)	52.0%	52.0%	52.0%	52.0%	48.0%	48.0%	48.0%	48.0%	48.0%	48.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min	Min
v/c Ratio	0.06	0.17	0.51	0.37		0.43	0.08		0.25	0.03
Control Delay	7.0	6.2	11.9	7.2		12.0	4.1		10.4	5.1
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	7.0	6.2	11.9	7.2		12.0	4.1		10.4	5.1
Queue Length 50th (ft)	2	12	29	30		36	0		19	0
Queue Length 95th (ft)	10	29	77	63		113	16		51	7
Internal Link Dist (ft)		542		982		380			249	
Turn Bay Length (ft)	200		200							300
Base Capacity (vph)	693	3185	1010	3195		1499	1422		1438	1404
Starvation Cap Reductn	0	0	0	0		0	0		0	0
Spillback Cap Reductn	0	0	0	0		0	0		0	0
Storage Cap Reductn	0	0	0	0		0	0		0	0
Reduced v/c Ratio	0.03	0.08	0.25	0.18		0.18	0.04		0.11	0.01

Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 36.3
Natural Cycle: 40
Control Type: Actuated-Uncoordinated

Splits and Phases: 12: Union & Jefferson



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	180	17	192	385	60	60	193	47	30	83	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.99	1.00
Satd. Flow (prot)	1770	3493		1787	3502			1878	1615		1856	1599
Flt Permitted	0.41	1.00		0.59	1.00			0.90	1.00		0.87	1.00
Satd. Flow (perm)	760	3493		1109	3502			1710	1615		1640	1599
Peak-hour factor, PHF	0.75	0.75	0.75	0.77	0.77	0.77	0.92	0.92	0.92	0.72	0.72	0.72
Adj. Flow (vph)	20	240	23	249	500	78	65	210	51	42	115	21
RTOR Reduction (vph)	0	10	0	0	18	0	0	0	32	0	0	13
Lane Group Flow (vph)	20	253	0	249	560	0	0	275	19	0	157	8
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4		4	8		8
Actuated Green, G (s)	14.0	14.0		14.0	14.0			11.5	11.5		11.5	11.5
Effective Green, g (s)	16.0	16.0		16.0	16.0			13.5	13.5		13.5	13.5
Actuated g/C Ratio	0.45	0.45		0.45	0.45			0.38	0.38		0.38	0.38
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	2.5	2.5		2.5	2.5			2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	343	1574		500	1578			650	614		624	608
v/s Ratio Prot		0.07			0.16							
v/s Ratio Perm	0.03			c0.22				c0.16	0.01		0.10	0.00
v/c Ratio	0.06	0.16		0.50	0.36			0.42	0.03		0.25	0.01
Uniform Delay, d1	5.5	5.8		6.9	6.4			8.1	6.9		7.5	6.9
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	0.0		0.6	0.1			0.3	0.0		0.2	0.0
Delay (s)	5.6	5.8		7.5	6.5			8.4	6.9		7.7	6.9
Level of Service	A	A		A	A			A	A		A	A
Approach Delay (s)		5.8			6.8			8.2			7.6	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	7.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	35.5	Sum of lost time (s)	6.0
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		

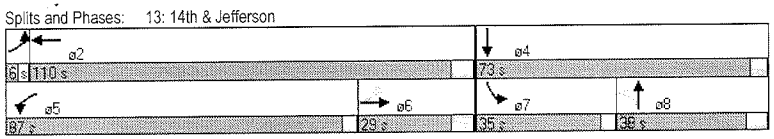
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Volume (vph)	5	125	499	795	620	18	46	47	75	117
Lane Group Flow (vph)	0	182	624	994	775	0	75	55	104	245
Turn Type	pm+pt		Prot		Free	Perm		Free	Prot	
Protected Phases	1	6	5	2			8		7	4
Permitted Phases	6				Free	8		Free		
Detector Phase	1	6	5	2		8	8		7	4
Switch Phase										
Minimum Initial (s)	2.0	4.0	4.0	4.0		2.0	2.0		2.0	4.0
Minimum Split (s)	6.0	10.0	12.0	17.0		26.0	26.0		12.0	25.0
Total Split (s)	6.0	29.0	87.0	110.0	0.0	38.0	38.0	0.0	35.0	73.0
Total Split (%)	3.2%	15.3%	46.0%	58.2%	0.0%	20.1%	20.1%	0.0%	18.5%	38.6%
Yellow Time (s)	2.5	5.5	3.5	5.5		5.5	5.5		3.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5		0.5	0.5		0.5	0.5
Lost Time Adjust (s)	0.0	-3.0	-1.0	-3.0	-1.0	-3.0	-3.0	-1.0	-1.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag		Lag	Lag		Lead	
Lead-Lag Optimize?										
Recall Mode	None	Min	None	Min		None	None		None	None
v/c Ratio		0.36	0.81	0.44	0.48		0.33	0.04	0.38	0.46
Control Delay		39.0	33.6	10.2	1.1		46.4	0.0	46.8	29.6
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0
Total Delay		39.0	33.6	10.2	1.1		46.4	0.0	46.8	29.6
Queue Length 50th (ft)		44	301	142	0		38	0	54	101
Queue Length 95th (ft)		107	483	217	0		104	0	112	181
Internal Link Dist (ft)		1141		344			117			586
Turn Bay Length (ft)			200		300					
Base Capacity (vph)		982	1564	3432	1599		640	1524	668	1357
Starvation Cap Reductn		0	0	0	0		0	0	0	0
Spillback Cap Reductn		0	0	0	0		0	0	0	0
Storage Cap Reductn		0	0	0	0		0	0	0	0
Reduced v/c Ratio		0.19	0.40	0.29	0.48		0.12	0.04	0.16	0.18

Intersection Summary

Cycle Length: 189
Actuated Cycle Length: 91.3
Natural Cycle: 80
Control Type: Actuated-Uncoordinated

Splits and Phases: 13: 14th & Jefferson



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	125	32	499	795	620	18	46	47	75	117	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Util. Factor		0.95		1.00	0.95	1.00		1.00	1.00	1.00	1.00	
Frt		0.97		1.00	1.00	0.85		1.00	0.85	1.00	0.95	
Flt Protected		1.00		0.95	1.00	1.00		0.99	1.00	0.95	1.00	
Satd. Flow (prot)		3429		1787	3574	1599		1768	1524	1736	1734	
Flt Permitted		0.91		0.95	1.00	1.00		0.85	1.00	0.95	1.00	
Satd. Flow (perm)		3112		1787	3574	1599		1519	1524	1736	1734	
Peak-hour factor, PHF	0.89	0.89	0.89	0.80	0.80	0.80	0.85	0.85	0.85	0.72	0.72	0.72
Adj. Flow (vph)	6	140	36	624	994	775	21	54	55	104	162	83
RTOR Reduction (vph)	0	12	0	0	0	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	170	0	624	994	775	0	75	55	104	235	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	6%	6%	6%	4%	4%	4%
Turn Type	pm+pt			Prot		Free	Perm		Free	Prot		
Protected Phases	1	6		5	2			8		7	4	
Permitted Phases	6					Free	8		Free			
Actuated Green, G (s)		11.7		38.2	53.9	91.8		8.4	91.8	13.5	26.9	
Effective Green, g (s)		14.7		39.2	56.9	91.8		11.4	91.8	14.5	28.9	
Actuated g/C Ratio		0.16		0.43	0.62	1.00		0.12	1.00	0.16	0.31	
Clearance Time (s)		6.0		4.0	6.0			6.0		4.0	5.0	
Vehicle Extension (s)		2.0		2.0	2.0			2.0		2.0	2.0	
Lane Grp Cap (vph)		498		763	2215	1599		189	1524	274	546	
v/s Ratio Prot				c0.35	0.28					0.06	0.14	
v/s Ratio Perm		0.05				c0.48		0.05	0.04			
v/c Ratio		0.34		0.82	0.45	0.48		0.40	0.04	0.38	0.43	
Uniform Delay, d1		34.3		23.2	9.2	0.0		37.0	0.0	34.6	24.9	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.2		6.5	0.1	1.1		0.5	0.0	0.3	0.2	
Delay (s)		34.4		29.6	9.2	1.1		37.5	0.0	34.9	25.1	
Level of Service		C		C	A	A		D	A	C	C	
Approach Delay (s)		34.4			11.9			21.7			28.0	
Approach LOS		C			B			C			C	

Intersection Summary

HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	91.8	Sum of lost time (s)	3.0
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	EMP	Intersection	14
Agency/Co.	Parametrix	Jurisdiction	City of Olympia
Date Performed	3/14/2008	Analysis Year	2010 With-Project
Analysis Time Period	AM Peak Hour		

Project Description 247-4575-003

East/West Street: SE Maple Park Avenue | North/South Street: SE Jefferson Street

Intersection Orientation: North-South | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	5	20	5	0	10	255
Peak-Hour Factor, PHF	0.78	0.78	0.78	0.77	0.77	0.77
Hourly Flow Rate, HFR (veh/h)	6	25	6	0	12	331
Percent Heavy Vehicles	3	--	--	3	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LTR			LTR		
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	113	5	5	0	5	5
Peak-Hour Factor, PHF	0.89	0.89	0.89	0.56	0.56	0.56
Hourly Flow Rate, HFR (veh/h)	126	5	5	0	8	8
Percent Heavy Vehicles	3	3	3	0	0	0
Percent Grade (%)	-3			-2		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LTR	LTR		LTR			LTR	
v (veh/h)	6	0		16			136	
C (m) (veh/h)	1210	1575		723			715	
v/c	0.00	0.00		0.02			0.19	
95% queue length	0.01	0.00		0.07			0.70	
Control Delay (s/veh)	8.0	7.3		10.1			11.2	
LOS	A	A		B			B	
Approach Delay (s/veh)	--	--	10.1			11.2		
Approach LOS	--	--	B			B		

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SIDRA INTERSECTION

Movement Summary

14th Ave Extension / Henderson Blvd

2010 With-Project AM Peak Hour

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
NB Driveway										
3L	L	2	0.0	0.008	15.1	LOS B	1	0.56	0.66	28.3
8T	T	2	0.0	0.008	8.0	LOS A	1	0.56	0.53	31.8
8R	R	2	0.0	0.008	9.3	LOS A	1	0.56	0.54	31.2
Approach		**6**	**0.0**	**0.008**	**10.8**	**LOS B**	**1**	**0.56**	**0.58**	**30.3**
WB Henderson Blvd										
1L	L	1	0.0	0.333	12.2	LOS B	90	0.11	0.67	29.7
6T	T	414	1.0	0.400	5.2	LOS A	90	0.11	0.41	34.2
6R	R	189	1.1	0.400	6.5	LOS A	90	0.11	0.49	33.2
Approach		**604**	**1.0**	**0.400**	**5.6**	**LOS A**	**90**	**0.11**	**0.44**	**33.9**
SB 14th Ave Extension										
7L	L	39	5.1	0.059	15.0	LOS B	10	0.53	0.72	28.4
4T	T	6	14.3	0.059	8.0	LOS A	10	0.53	0.60	32.0
4R	R	482	5.0	0.254	6.2	LOS B#	13#	0.00	0.50	34.0
Approach		**528**	**5.1**	**0.254**	**6.9**	**LOS A**	**10**	**0.05**	**0.51**	**33.4**
EB Henderson Blvd										
5L	L	10	9.1	0.355	12.5	LOS B	80	0.23	0.64	29.3
2T	T	440	2.0	0.351	5.5	LOS A	80	0.23	0.42	33.5
2R	R	10	9.1	0.355	6.8	LOS A	80	0.23	0.49	32.6
Approach		**462**	**2.4**	**0.351**	**5.7**	**LOS A**	**80**	**0.23**	**0.43**	**33.4**
All Vehicles		**1600**	**2.8**	**0.400**	**6.1**	**LOS A**	**90**	**0.13**	**0.46**	**33.6**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

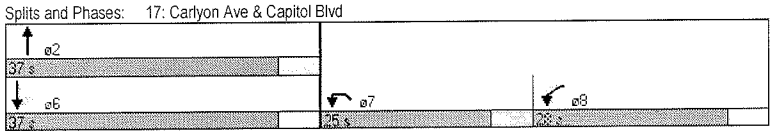
Following Queue
- Density for continuous movement

Lane Group	WBL	NBT	SBL2	SBL	SBT	NWL
Lane Configurations						
Volume (vph)	80	557	30	10	207	10
Lane Group Flow (vph)	332	871	0	51	265	30
Turn Type			Perm	Perm		
Protected Phases	8	2			6	7
Permitted Phases			6	6		
Detector Phase	8	2	6	6	6	7
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	28.0	37.0	37.0	37.0	37.0	25.0
Total Split (%)	31.1%	41.1%	41.1%	41.1%	41.1%	27.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag					Lead
Lead-Lag Optimize?						
Recall Mode	None	Max	Max	Max	Max	None
v/c Ratio	0.74	0.47		0.20	0.14	0.17
Control Delay	29.1	12.7		14.9	10.4	28.2
Queue Delay	0.0	0.0		0.0	0.0	0.0
Total Delay	29.1	12.7		14.9	10.4	28.2
Queue Length 50th (ft)	81	75		7	18	8
Queue Length 95th (ft)	93	167		36	56	32
Internal Link Dist (ft)	1602	636			2617	614
Turn Bay Length (ft)				150		
Base Capacity (vph)	666	1854		259	1847	562
Starvation Cap Reductn	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0
Reduced v/c Ratio	0.50	0.47		0.20	0.14	0.05

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 62.9
Natural Cycle: 75
Control Type: Semi Act-Uncoord

Splits and Phases: 17: Carlyon Ave & Capitol Blvd



Movement	WBL2	WBL	WBR	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2
Lane Configurations												
Volume (vph)	5	80	98	557	50	20	30	10	207	10	10	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0				5.0	5.0	5.0		
Lane Util. Factor		1.00		0.95				1.00	0.95	1.00		
Frt		0.93		0.98				1.00	1.00	0.92		
Flt Protected		0.98		1.00				0.95	1.00	0.98		
Satd. Flow (prot)		1672		3480				1736	3471	1712		
Flt Permitted		0.98		1.00				0.27	1.00	0.98		
Satd. Flow (perm)		1672		3480				486	3471	1712		
Peak-hour factor, PHF	0.55	0.55	0.55	0.72	0.72	0.72	0.78	0.78	0.78	0.84	0.84	0.84
Adj. Flow (vph)	9	145	178	774	69	28	38	13	265	12	12	6
RTOR Reduction (vph)	0	48	0	2	0	0	0	0	0	6	0	0
Lane Group Flow (vph)	0	284	0	869	0	0	0	51	265	24	0	0
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	4%	4%	4%	0%	0%	0%
Turn Type	Perm						Perm	Perm				
Protected Phases		8		2					6	7		
Permitted Phases	8						6	6				
Actuated Green, G (s)		15.1		33.5				33.5	33.5	2.5		
Effective Green, g (s)		15.1		33.5				33.5	33.5	2.5		
Actuated g/C Ratio		0.23		0.51				0.51	0.51	0.04		
Clearance Time (s)		5.0		5.0				5.0	5.0	5.0		
Vehicle Extension (s)		2.5		2.5				2.5	2.5	2.5		
Lane Grp Cap (vph)		382		1764				246	1759	65		
v/s Ratio Prot				c0.25					0.08	c0.01		
v/s Ratio Perm		0.17						0.10				
v/c Ratio		0.74		0.49				0.21	0.15	0.37		
Uniform Delay, d1		23.7		10.7				9.0	8.7	31.0		
Progression Factor		1.00		1.00				1.00	1.00	1.00		
Incremental Delay, d2		7.3		1.0				1.9	0.2	2.6		
Delay (s)		31.0		11.7				10.9	8.9	33.6		
Level of Service		C		B				B	A	C		
Approach Delay (s)		31.0		11.7					9.2	33.6		
Approach LOS		C		B					A	C		

Intersection Summary

HCM Average Control Delay	15.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	66.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	EMP
Agency/Co.	Parametrix
Date Performed	3/14/2008
Analysis Time Period	AM Peak Hour

Site Information

Intersection	D1
Jurisdiction	City of Olympia
Analysis Year	2010 With-Project

Project Description 247-4575-003

East/West Street: North Site Driveway | North/South Street: SE Jefferson Street

Intersection Orientation: North-South | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		102	10	12	601	
Peak-Hour Factor, PHF	0.55	0.78	0.78	0.77	0.77	0.84
Hourly Flow Rate, HFR (veh/h)	0	130	12	15	780	0
Percent Heavy Vehicles	0	--	--	3	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration		T	TR	LT	T	
Upstream Signal		0			1	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				0		9
Peak-Hour Factor, PHF	0.67	0.67	0.67	0.50	0.50	0.50
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	18
Percent Heavy Vehicles	1	1	1	0	10	0
Percent Grade (%)	-3			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR				
v (veh/h)		15		18				
C (m) (veh/h)		1431		983				
v/c		0.01		0.02				
95% queue length		0.03		0.06				
Control Delay (s/veh)		7.5		8.7				
LOS		A		A				
Approach Delay (s/veh)	--	--	8.7					
Approach LOS	--	--	A					

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	EMP
Agency/Co.	Parametrix
Date Performed	3/14/2008
Analysis Time Period	AM Peak Hour

Site Information

Intersection	D2
Jurisdiction	City of Olympia
Analysis Year	2010 With-Project

Project Description 247-4575-003

East/West Street: South Site Driveway | North/South Street: SE Jefferson Street

Intersection Orientation: North-South | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		102	26	295	296	
Peak-Hour Factor, PHF	0.55	0.78	0.78	0.77	0.77	0.84
Hourly Flow Rate, HFR (veh/h)	0	130	33	383	384	0
Percent Heavy Vehicles	0	--	--	3	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	2	0
Configuration			TR	LT	T	
Upstream Signal		0			1	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						15
Peak-Hour Factor, PHF	0.67	0.67	0.67	0.50	0.50	0.50
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	30
Percent Heavy Vehicles	1	1	1	0	10	0
Percent Grade (%)	-3			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			1
Lanes	0	0	0	0	0	1
Configuration						R

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT			R			
v (veh/h)		383			30			
C (m) (veh/h)		1406			881			
v/c		0.27			0.03			
95% queue length		1.11			0.11			
Control Delay (s/veh)		8.5			9.2			
LOS		A			A			
Approach Delay (s/veh)	--	--	9.2					
Approach LOS	--	--	A					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	EMP	Intersection	D3 - RIRO
Agency/Co.	Parametrix	Jurisdiction	City of Olympia
Date Performed	3/14/2008	Analysis Year	2010 With-Project
Analysis Time Period	AM Peak Hour		

Project Description 247-4575-003

East/West Street: SE 14th Avenue | North/South Street: 14th Ave Driveway

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		247	30		1914	
Peak-Hour Factor, PHF	0.67	0.89	0.89	0.50	0.80	0.50
Hourly Flow Rate, HFR (veh/h)	0	277	33	0	2392	0
Percent Heavy Vehicles	1	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			1
Lanes	0	2	0	0	2	0
Configuration		T	TR		T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)			12			
Peak-Hour Factor, PHF	0.55	0.78	0.80	0.77	0.77	0.84
Hourly Flow Rate, HFR (veh/h)	0	0	14	0	0	0
Percent Heavy Vehicles	0	0	0	3	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	1	0	0	0
Configuration			R			

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration					R			
v (veh/h)					14			
C (m) (veh/h)					869			
v/c					0.02			
95% queue length					0.05			
Control Delay (s/veh)					9.2			
LOS					A			
Approach Delay (s/veh)	--	--	9.2					
Approach LOS	--	--	A					

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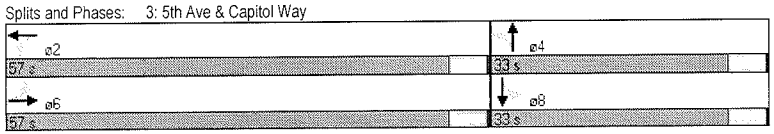
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	10	260	5	304	9	351	5	216
Lane Group Flow (vph)	0	503	0	470	0	441	0	264
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		6		2		4		8
Permitted Phases	6		2		4		8	
Detector Phase	6	6	2	2	4	4	8	8
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	26.0	26.0	26.0	26.0	20.0	20.0	20.0	20.0
Total Split (s)	57.0	57.0	57.0	57.0	33.0	33.0	33.0	33.0
Total Split (%)	63.3%	63.3%	63.3%	63.3%	36.7%	36.7%	36.7%	36.7%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max
v/c Ratio		0.52		0.47		0.50		0.30
Control Delay		9.5		9.3		9.1		17.9
Queue Delay		0.4		0.9		0.2		0.0
Total Delay		9.9		10.2		9.2		17.9
Queue Length 50th (ft)		100		125		28		32
Queue Length 95th (ft)		91		136		36		48
Internal Link Dist (ft)		221		238		221		223
Turn Bay Length (ft)								
Base Capacity (vph)		973		1008		888		882
Starvation Cap Reductn		140		285		66		0
Spillback Cap Reductn		0		0		0		0
Storage Cap Reductn		0		0		0		0
Reduced v/c Ratio		0.60		0.65		0.54		0.30

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 30 (33%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow
Natural Cycle: 50
Control Type: Pretimed

Splits and Phases: 3: 5th Ave & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	260	77	5	304	25	9	351	60	5	216	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frpb, ped/bikes		0.99			1.00			0.97			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.97			0.99			0.98			0.99	
Flt Protected		1.00			1.00			1.00			1.00	
Satd. Flow (prot)		1624			1683			2759			2767	
Flt Permitted		0.99			0.99			0.95			0.95	
Satd. Flow (perm)		1603			1674			2619			2624	
Peak-hour factor, PHF	0.69	0.69	0.69	0.71	0.71	0.71	0.95	0.95	0.95	0.91	0.91	0.91
Adj. Flow (vph)	14	377	112	7	428	35	9	369	63	5	237	22
RTOR Reduction (vph)	0	12	0	0	3	0	0	15	0	0	7	0
Lane Group Flow (vph)	0	491	0	0	467	0	0	426	0	0	257	0
Confl. Peds. (#/hr)	38		60	60		38	43		56	56		43
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	3%	3%	3%	6%	6%	6%
Parking (#/hr)								12			12	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		52.0			52.0			28.0			28.0	
Effective Green, g (s)		54.0			54.0			30.0			30.0	
Actuated g/C Ratio		0.60			0.60			0.33			0.33	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)		962			1004			873			875	
v/s Ratio Prot												
v/s Ratio Perm		c0.31			0.28			c0.16			0.10	
v/c Ratio		0.51			0.46			0.49			0.29	
Uniform Delay, d1		10.4			10.0			23.9			22.2	
Progression Factor		0.77			0.76			0.32			0.80	
Incremental Delay, d2		1.7			1.5			1.8			0.8	
Delay (s)		9.7			9.1			9.3			18.4	
Level of Service		A			A			A			B	
Approach Delay (s)		9.7			9.1			9.3			18.4	
Approach LOS		A			A			A			B	

Intersection Summary

HCM Average Control Delay	10.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		

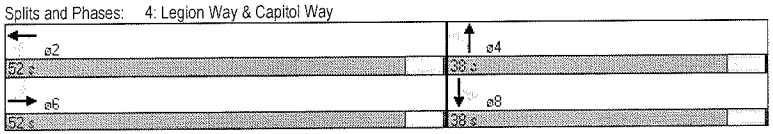
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	10	135	50	185	5	385	1	308
Lane Group Flow (vph)	0	235	0	402	0	529	0	400
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		6		2		4		8
Permitted Phases	6		2		4		8	
Detector Phase	6	6	2	2	4	4	8	8
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	52.0	52.0	52.0	52.0	38.0	38.0	38.0	38.0
Total Split (%)	57.8%	57.8%	57.8%	57.8%	42.2%	42.2%	42.2%	42.2%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max
v/c Ratio		0.26		0.48		0.45		0.35
Control Delay		8.4		9.7		13.8		8.7
Queue Delay		0.5		1.0		0.0		0.2
Total Delay		8.9		10.7		13.8		8.9
Queue Length 50th (ft)		44		77		75		32
Queue Length 95th (ft)		62		91		51		45
Internal Link Dist (ft)		221		241		1485		221
Turn Bay Length (ft)								
Base Capacity (vph)		894		834		1168		1144
Starvation Cap Reductn		349		217		0		254
Spillback Cap Reductn		0		0		0		0
Storage Cap Reductn		0		0		0		0
Reduced v/c Ratio		0.43		0.65		0.45		0.45

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 29 (32%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow
Natural Cycle: 50
Control Type: Pretimed

Splits and Phases: 4: Legion Way & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	135	45	50	185	55	5	385	75	1	308	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.97			0.97			0.98			0.99	
Flt Protected		1.00			0.99			1.00			1.00	
Satd. Flow (prot)		1651			1652			3107			3072	
Flt Permitted		0.98			0.91			0.95			0.95	
Satd. Flow (perm)		1618			1517			2955			2932	
Peak-hour factor, PHF	0.81	0.81	0.81	0.72	0.72	0.72	0.88	0.88	0.88	0.81	0.81	0.81
Adj. Flow (vph)	12	167	56	69	257	76	6	438	85	1	380	19
RTOR Reduction (vph)	0	12	0	0	9	0	0	18	0	0	4	0
Lane Group Flow (vph)	0	223	0	0	393	0	0	511	0	0	396	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	5%	5%	5%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		47.0			47.0			33.0			33.0	
Effective Green, g (s)		49.0			49.0			35.0			35.0	
Actuated g/C Ratio		0.54			0.54			0.39			0.39	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)		881			826			1149			1140	
v/s Ratio Prot												
v/s Ratio Perm		0.14			c0.26			c0.17			0.14	
v/c Ratio		0.25			0.48			0.44			0.35	
Uniform Delay, d1		10.8			12.6			20.3			19.4	
Progression Factor		0.78			0.62			0.65			0.41	
Incremental Delay, d2		0.7			1.9			1.2			0.8	
Delay (s)		9.2			9.8			14.4			8.7	
Level of Service		A			A			B			A	
Approach Delay (s)		9.2			9.8			14.4			8.7	
Approach LOS		A			A			B			A	

Intersection Summary

HCM Average Control Delay	11.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		

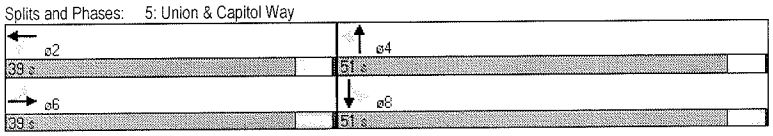
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	5	210	140	115	45	525	85	448
Lane Group Flow (vph)	0	359	159	199	54	784	106	566
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		6		2		4		8
Permitted Phases	6		2		4		8	
Detector Phase	6	6	2	2	4	4	8	8
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	39.0	39.0	39.0	39.0	51.0	51.0	51.0	51.0
Total Split (%)	43.3%	43.3%	43.3%	43.3%	56.7%	56.7%	56.7%	56.7%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
v/c Ratio		0.41	0.76	0.21	0.10	0.34	0.27	0.24
Control Delay		24.7	52.3	15.7	4.4	3.8	8.0	4.8
Queue Delay		0.0	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay		24.7	52.3	15.7	4.4	4.0	8.0	4.8
Queue Length 50th (ft)		78	83	30	4	24	9	24
Queue Length 95th (ft)		78	132	47	11	40	60	86
Internal Link Dist (ft)		205		541		240		1485
Turn Bay Length (ft)			200		100		200	
Base Capacity (vph)		1341	321	1398	525	2331	399	2357
Starvation Cap Reductn		0	0	0	0	652	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		0.27	0.50	0.14	0.10	0.47	0.27	0.24

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 9 (10%), Referenced to phase 4:NBTL and 8:SBTL, Start of Yellow
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 5: Union & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	210	50	140	115	60	45	525	125	85	448	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor		0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt		0.97		1.00	0.95		1.00	0.97		1.00	1.00	
Flt Protected		1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3469		1787	3391		1770	3437		1752	3499	
Flt Permitted		0.95		0.43	1.00		0.42	1.00		0.32	1.00	
Satd. Flow (perm)		3297		803	3391		780	3437		593	3499	
Peak-hour factor, PHF	0.74	0.74	0.74	0.88	0.88	0.88	0.83	0.83	0.83	0.80	0.80	0.80
Adj. Flow (vph)	7	284	68	159	131	68	54	633	151	106	560	6
RTOR Reduction (vph)	0	27	0	0	50	0	0	16	0	0	1	0
Lane Group Flow (vph)	0	332	0	159	149	0	54	768	0	106	565	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	3%	3%	3%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)		21.4		21.4	21.4		58.6	58.6		58.6	58.6	
Effective Green, g (s)		23.4		23.4	23.4		60.6	60.6		60.6	60.6	
Actuated g/C Ratio		0.26		0.26	0.26		0.67	0.67		0.67	0.67	
Clearance Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.5		3.5	3.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)		857		209	882		525	2314		399	2356	
v/s Ratio Prot					0.04			c0.22			0.16	
v/s Ratio Perm		0.10		c0.20			0.07			0.18		
v/c Ratio		0.39		0.76	0.17		0.10	0.33		0.27	0.24	
Uniform Delay, d1		27.4		30.7	25.8		5.2	6.2		5.8	5.7	
Progression Factor		1.00		1.00	1.00		0.54	0.50		0.76	0.67	
Incremental Delay, d2		0.3		15.4	0.1		0.4	0.4		1.6	0.2	
Delay (s)		27.7		46.1	25.9		3.2	3.5		6.1	4.1	
Level of Service		C		D	C		A	A		A	A	
Approach Delay (s)		27.7			34.9			3.5			4.4	
Approach LOS		C			C			A			A	

Intersection Summary

HCM Average Control Delay	12.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		

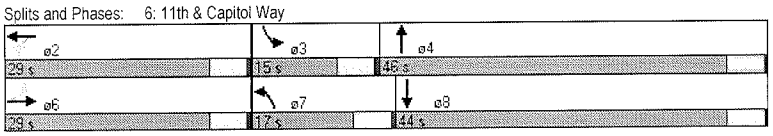
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	25	35	60	45	55	635	10	603
Lane Group Flow (vph)	30	148	70	93	62	767	11	696
Turn Type	Perm		Perm		Prot		Prot	
Protected Phases		6		2	7	4	3	8
Permitted Phases	6		2					
Detector Phase	6	6	2	2	7	4	3	8
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	12.0	25.0	12.0	25.0
Total Split (s)	29.0	29.0	29.0	29.0	17.0	46.0	15.0	44.0
Total Split (%)	32.2%	32.2%	32.2%	32.2%	18.9%	51.1%	16.7%	48.9%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
v/c Ratio	0.18	0.46	0.59	0.34	0.31	0.28	0.07	0.29
Control Delay	34.7	16.6	55.5	23.3	55.3	2.2	43.4	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	34.7	16.6	55.5	23.3	55.3	2.2	43.4	5.1
Queue Length 50th (ft)	15	22	38	27	36	0	6	69
Queue Length 95th (ft)	35	60	74	62	m71	23	m19	87
Internal Link Dist (ft)		205		230		830		240
Turn Bay Length (ft)					150		100	
Base Capacity (vph)	335	551	243	527	278	2719	236	2369
Starvation Cap Reductn	0	0	0	0	0	0	0	821
Spillback Cap Reductn	0	0	0	0	0	11	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.27	0.29	0.18	0.22	0.28	0.05	0.45

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 5 (6%), Referenced to phase 4:NBT and 8:SBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: 11th & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	35	86	60	45	35	55	635	40	10	603	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.89		1.00	0.93		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1648		1752	1723		1787	3543		1770	3531	
Flt Permitted	0.63	1.00		0.46	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1161	1648		841	1723		1787	3543		1770	3531	
Peak-hour factor, PHF	0.82	0.82	0.82	0.86	0.86	0.86	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	30	43	105	70	52	41	62	722	45	11	685	11
RTOR Reduction (vph)	0	90	0	0	35	0	0	3	0	0	1	0
Lane Group Flow (vph)	30	58	0	70	58	0	62	764	0	11	695	0
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	1%	1%	1%	2%	2%	2%
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		6			2		7	4		3	8	
Permitted Phases	6			2								
Actuated Green, G (s)	10.6	10.6		10.6	10.6		7.0	63.0		1.4	57.4	
Effective Green, g (s)	12.6	12.6		12.6	12.6		9.0	65.0		3.4	59.4	
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.10	0.72		0.04	0.66	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	163	231		118	241		179	2559		67	2330	
v/s Ratio Prot		0.04			0.03		c0.03	c0.22		0.01	0.20	
v/s Ratio Perm	0.03			c0.08								
v/c Ratio	0.18	0.25		0.59	0.24		0.35	0.30		0.16	0.30	
Uniform Delay, d1	34.2	34.5		36.3	34.4		37.8	4.4		41.9	6.5	
Progression Factor	1.00	1.00		1.00	1.00		1.43	0.46		1.13	0.61	
Incremental Delay, d2	0.4	0.4		6.5	0.4		0.8	0.3		0.8	0.3	
Delay (s)	34.6	34.9		42.8	34.8		54.9	2.3		48.1	4.2	
Level of Service	C	C		D	C		D	A		D	A	
Approach Delay (s)		34.8			38.3			6.3			4.9	
Approach LOS		C			D			A			A	

Intersection Summary

HCM Average Control Delay	11.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		

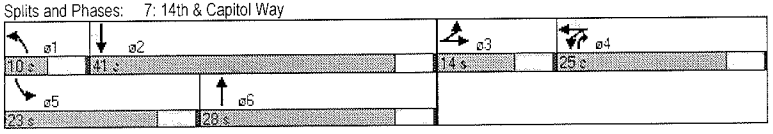
c Critical Lane Group

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations									
Volume (vph)	115	40	205	15	470	90	164	565	25
Lane Group Flow (vph)	268	201	230	17	540	103	210	724	32
Turn Type			Perm	Prot		Over	Prot		Perm
Protected Phases	3	4		1	6	4	5	2	
Permitted Phases			4						2
Detector Phase	3	4	4	1	6	4	5	2	2
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	10.0	10.0	10.0	15.0	10.0	12.0	25.0	25.0
Total Split (s)	14.0	25.0	25.0	10.0	28.0	25.0	23.0	41.0	41.0
Total Split (%)	15.6%	27.8%	27.8%	11.1%	31.1%	27.8%	25.6%	45.6%	45.6%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	C-Min	None	None	C-Min	C-Min
v/c Ratio	0.57	0.53	0.69	0.12	0.45	0.25	0.64	0.40	0.04
Control Delay	39.3	36.6	44.0	47.1	23.5	17.3	33.9	15.0	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.3	36.6	44.0	47.1	23.5	17.3	33.9	15.0	5.8
Queue Length 50th (ft)	70	101	120	8	132	0	106	144	0
Queue Length 95th (ft)	83	162	190	31	186	56	127	204	12
Internal Link Dist (ft)	70	1141			579			830	
Turn Bay Length (ft)				250		250	250		250
Base Capacity (vph)	479	443	391	143	1231	469	393	1840	838
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.45	0.59	0.12	0.44	0.22	0.53	0.39	0.04

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 41 (46%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 7: 14th & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	115	25	139	40	205	15	470	90	164	565	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.98			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3393			1811	1599	1787	3574	1599	1770	3539	1583
Flt Permitted		0.99			0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3393			1811	1599	1787	3574	1599	1770	3539	1583
Peak-hour factor, PHF	0.69	0.69	0.69	0.89	0.89	0.89	0.87	0.87	0.87	0.78	0.78	0.78
Adj. Flow (vph)	65	167	36	156	45	230	17	540	103	210	724	32
RTOR Reduction (vph)	0	14	0	0	0	0	0	0	82	0	0	17
Lane Group Flow (vph)	0	254	0	0	201	230	17	540	21	210	724	15
Heavy Vehicles (%)	3%	3%	3%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Turn Type	Split			Split		Perm	Prot		Over	Prot		Perm
Protected Phases	3	3		4	4		1	6	4	5	2	
Permitted Phases						4						2
Actuated Green, G (s)		10.1			16.7	16.7	2.0	28.5	16.7	14.7	41.2	41.2
Effective Green, g (s)		12.1			18.7	18.7	4.0	30.5	18.7	16.7	43.2	43.2
Actuated g/C Ratio		0.13			0.21	0.21	0.04	0.34	0.21	0.19	0.48	0.48
Clearance Time (s)		5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)		2.5			2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)		456			376	332	79	1211	332	328	1699	760
v/s Ratio Prot		c0.07			0.11		0.01	0.15	0.01	c0.12	c0.20	
v/s Ratio Perm						c0.14						0.01
v/c Ratio		0.56			0.53	0.69	0.22	0.45	0.06	0.64	0.43	0.02
Uniform Delay, d1		36.4			31.8	33.0	41.5	23.2	28.6	33.9	15.3	12.3
Progression Factor		1.00			1.00	1.00	1.17	0.88	2.62	0.75	0.94	0.95
Incremental Delay, d2		1.2			1.1	5.7	1.0	1.2	0.1	3.7	0.8	0.0
Delay (s)		37.6			32.9	38.7	49.4	21.6	75.1	29.0	15.1	11.7
Level of Service		D			C	D	D	C	E	C	B	B
Approach Delay (s)		37.6			36.0			30.7			18.0	
Approach LOS		D			D			C			B	

Intersection Summary

HCM Average Control Delay	27.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	50.5%	ICU Level of Service	A
Analysis Period (min)	15		

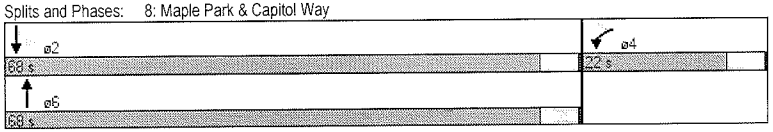
c Critical Lane Group

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Volume (vph)	100	40	415	20	744
Lane Group Flow (vph)	156	62	508	24	896
Turn Type		Perm		Perm	
Protected Phases	4		6		2
Permitted Phases	4	4		2	
Detector Phase	4	4	6	2	2
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	29.0	15.0	15.0
Total Split (s)	22.0	22.0	68.0	68.0	68.0
Total Split (%)	24.4%	24.4%	75.6%	75.6%	75.6%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	C-Min	C-Min	C-Min
v/c Ratio	0.53	0.20	0.19	0.04	0.32
Control Delay	40.8	9.9	2.0	1.8	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	9.9	2.0	1.8	1.8
Queue Length 50th (ft)	82	0	2	1	26
Queue Length 95th (ft)	91	14	89	m4	40
Internal Link Dist (ft)	541		1242		579
Turn Bay Length (ft)		200		250	
Base Capacity (vph)	383	391	2736	670	2762
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	0.41	0.16	0.19	0.04	0.32

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Yellow
Natural Cycle: 55
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Maple Park & Capitol Way



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	100	40	415	32	20	744
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	1615	3536		1787	3574
Flt Permitted	0.95	1.00	1.00		0.46	1.00
Satd. Flow (perm)	1805	1615	3536		868	3574
Peak-hour factor, PHF	0.64	0.64	0.88	0.88	0.83	0.83
Adj. Flow (vph)	156	62	472	36	24	896
RTOR Reduction (vph)	0	52	5	0	0	0
Lane Group Flow (vph)	156	10	503	0	24	896
Heavy Vehicles (%)	0%	0%	1%	1%	1%	1%
Turn Type		Perm			Perm	
Protected Phases	4		6			2
Permitted Phases	4	4			2	
Actuated Green, G (s)	12.5	12.5	67.5		67.5	67.5
Effective Green, g (s)	14.5	14.5	69.5		69.5	69.5
Actuated g/C Ratio	0.16	0.16	0.77		0.77	0.77
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0
Vehicle Extension (s)	2.5	2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	291	260	2731		670	2760
v/s Ratio Prot	c0.09		0.14			c0.25
v/s Ratio Perm		0.01			0.03	
v/c Ratio	0.54	0.04	0.18		0.04	0.32
Uniform Delay, d1	34.7	31.9	2.7		2.4	3.1
Progression Factor	1.00	1.00	0.62		0.51	0.43
Incremental Delay, d2	1.5	0.0	0.1		0.1	0.3
Delay (s)	36.1	31.9	1.8		1.3	1.6
Level of Service	D	C	A		A	A
Approach Delay (s)	34.9		1.8			1.6
Approach LOS	C		A			A

Intersection Summary

HCM Average Control Delay	6.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	32.8%	ICU Level of Service	A
Analysis Period (min)	15		

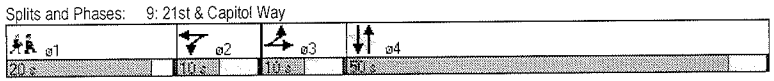
c Critical Lane Group

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT	ø1
Lane Configurations							
Volume (vph)	0	5	5	416	25	792	
Lane Group Flow (vph)	33	45	0	495	0	1024	
Turn Type			Perm		Perm		
Protected Phases	3	2		4		4	1
Permitted Phases			4		4		
Detector Phase	3	2	4	4	4	4	
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	10.0	15.0	15.0	15.0	15.0	20.0
Total Split (s)	10.0	10.0	50.0	50.0	50.0	50.0	20.0
Total Split (%)	11.1%	11.1%	55.6%	55.6%	55.6%	55.6%	22%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	2.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	
Lead/Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead
Lead-Lag Optimize?							
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	None
v/c Ratio	0.19	0.24		0.18		0.38	
Control Delay	26.7	28.6		3.8		3.4	
Queue Delay	0.0	0.0		0.0		0.0	
Total Delay	26.7	28.6		3.8		3.4	
Queue Length 50th (ft)	9	14		40		69	
Queue Length 95th (ft)	23	23		68		121	
Internal Link Dist (ft)	166	123		1148		1242	
Turn Bay Length (ft)							
Base Capacity (vph)	171	184		2724		2709	
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	0.19	0.24		0.18		0.38	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 4:NBSB, Start of Yellow
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 9: 21st & Capitol Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	0	10	10	5	10	5	416	10	25	792	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.93			0.95			1.00			1.00	
Flt Protected		0.97			0.98			1.00			1.00	
Satd. Flow (prot)		1731			1762			3525			3561	
Flt Permitted		0.97			0.98			0.95			0.93	
Satd. Flow (perm)		1731			1762			3334			3315	
Peak-hour factor, PHF	0.64	0.64	0.64	0.55	0.55	0.55	0.87	0.87	0.87	0.81	0.81	0.81
Adj. Flow (vph)	17	0	16	18	9	18	6	478	11	31	978	15
RTOR Reduction (vph)	0	15	0	0	17	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	18	0	0	28	0	0	494	0	0	1024	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Turn Type	Split			Split			Perm			Perm		
Protected Phases	3	3		2	2			4			4	
Permitted Phases							4			4		
Actuated Green, G (s)		4.2			4.5			66.3			66.3	
Effective Green, g (s)		6.2			6.5			68.3			68.3	
Actuated g/C Ratio		0.07			0.07			0.76			0.76	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		2.5			2.5			2.5			2.5	
Lane Grp Cap (vph)		119			127			2530			2516	
v/s Ratio Prot		c0.01			c0.02							
v/s Ratio Perm								0.15			c0.31	
v/c Ratio		0.15			0.22			0.20			0.41	
Uniform Delay, d1		39.4			39.4			3.1			3.8	
Progression Factor		1.00			1.00			1.00			0.67	
Incremental Delay, d2		0.4			0.6			0.2			0.5	
Delay (s)		39.9			40.0			3.2			3.0	
Level of Service		D			D			A			A	
Approach Delay (s)		39.9			40.0			3.2			3.0	
Approach LOS		D			D			A			A	

Intersection Summary

HCM Average Control Delay	4.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		

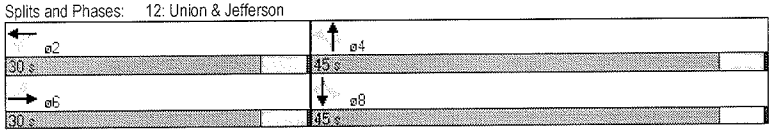
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	40	510	38	225	55	289	244	90	99	15
Lane Group Flow (vph)	50	677	45	357	0	452	321	0	222	18
Turn Type	Perm		Perm		Perm		Perm	Perm		Perm
Protected Phases		6		2		4			8	
Permitted Phases	6		2		4		4	8		8
Detector Phase	6	6	2	2	4	4	4	8	8	8
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	19.0	19.0	19.0	19.0	21.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	30.0	30.0	30.0	30.0	45.0	45.0	45.0	45.0	45.0	45.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min	Min
v/c Ratio	0.13	0.51	0.20	0.27		0.56	0.40		0.37	0.02
Control Delay	11.3	12.1	13.4	8.6		11.2	6.6		9.4	3.7
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	11.3	12.1	13.4	8.6		11.2	6.6		9.4	3.7
Queue Length 50th (ft)	7	55	6	21		61	25		27	0
Queue Length 95th (ft)	27	115	29	55		124	60		74	7
Internal Link Dist (ft)		542		982		380			249	
Turn Bay Length (ft)	200		200							300
Base Capacity (vph)	716	2509	417	2455		1608	1489		1192	1482
Starvation Cap Reductn	0	0	0	0		0	0		0	0
Spillback Cap Reductn	0	0	0	0		0	0		0	0
Storage Cap Reductn	0	0	0	0		0	0		0	0
Reduced v/c Ratio	0.07	0.27	0.11	0.15		0.28	0.22		0.19	0.01

Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 40.8
Natural Cycle: 40
Control Type: Actuated-Uncoordinated

Splits and Phases: 12: Union & Jefferson



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	510	31	38	225	75	55	289	244	90	99	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.96			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.98	1.00
Satd. Flow (prot)	1787	3543		1787	3441			1866	1599		1837	1599
Flt Permitted	0.54	1.00		0.31	1.00			0.92	1.00		0.68	1.00
Satd. Flow (perm)	1013	3543		588	3441			1736	1599		1287	1599
Peak-hour factor, PHF	0.80	0.80	0.80	0.84	0.84	0.84	0.76	0.76	0.76	0.85	0.85	0.85
Adj. Flow (vph)	50	638	39	45	268	89	72	380	321	106	116	18
RTOR Reduction (vph)	0	6	0	0	42	0	0	0	55	0	0	10
Lane Group Flow (vph)	50	671	0	45	315	0	0	452	266	0	222	8
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4		4	8		8
Actuated Green, G (s)	13.2	13.2		13.2	13.2			16.9	16.9		16.9	16.9
Effective Green, g (s)	15.2	15.2		15.2	15.2			18.9	18.9		18.9	18.9
Actuated g/C Ratio	0.38	0.38		0.38	0.38			0.47	0.47		0.47	0.47
Clearance Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	2.5	2.5		2.5	2.5			2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	384	1343		223	1304			818	754		607	754
v/s Ratio Prot		c0.19			0.09							
v/s Ratio Perm	0.05			0.08				c0.26	0.17		0.17	0.01
v/c Ratio	0.13	0.50		0.20	0.24			0.55	0.35		0.37	0.01
Uniform Delay, d1	8.1	9.5		8.4	8.5			7.6	6.7		6.8	5.6
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	0.2		0.3	0.1			0.7	0.2		0.3	0.0
Delay (s)	8.2	9.8		8.7	8.6			8.2	6.9		7.0	5.6
Level of Service	A	A		A	A			A	A		A	A
Approach Delay (s)		9.6			8.6			7.7			6.9	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	8.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	40.1	Sum of lost time (s)	6.0
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		

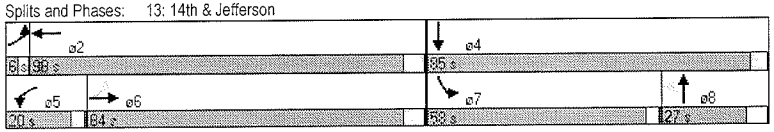
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Volume (vph)	80	740	131	225	225	49	83	208	345	119
Lane Group Flow (vph)	0	1154	151	259	259	0	213	335	367	164
Turn Type	pm+pt		Prot		Free	Perm		Free	Prot	
Protected Phases	1	6	5	2			8		7	4
Permitted Phases	6				Free	8		Free		
Detector Phase	1	6	5	2		8	8		7	4
Switch Phase										
Minimum Initial (s)	2.0	4.0	4.0	4.0		2.0	2.0		2.0	4.0
Minimum Split (s)	6.0	10.0	12.0	17.0		26.0	26.0		12.0	25.0
Total Split (s)	6.0	84.0	20.0	98.0	0.0	27.0	27.0	0.0	58.0	85.0
Total Split (%)	3.2%	44.4%	10.6%	51.9%	0.0%	14.3%	14.3%	0.0%	30.7%	45.0%
Yellow Time (s)	2.5	5.5	3.5	5.5		5.5	5.5		3.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5		0.5	0.5		0.5	0.5
Lost Time Adjust (s)	0.0	-3.0	-1.0	-3.0	-1.0	-3.0	-3.0	-1.0	-1.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag		Lag	Lag		Lead	
Lead-Lag Optimize?										
Recall Mode	None	Min	None	Min		None	None		None	None
v/c Ratio		0.89	0.80	0.13	0.16		0.96	0.22	0.86	0.22
Control Delay		53.6	101.4	18.9	0.2		117.9	0.3	79.0	30.3
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.1	0.0
Total Delay		53.6	101.4	18.9	0.2		117.9	0.3	79.2	30.3
Queue Length 50th (ft)		585	159	67	0		229	0	376	105
Queue Length 95th (ft)		581	#328	107	0		#269	0	548	177
Internal Link Dist (ft)		1141		344			117			586
Turn Bay Length (ft)			200		300					
Base Capacity (vph)		1583	193	2204	1599		222	1524	608	926
Starvation Cap Reductn		0	0	0	0		0	0	16	0
Spillback Cap Reductn		0	0	0	0		0	0	0	0
Storage Cap Reductn		0	0	0	0		0	0	0	0
Reduced v/c Ratio		0.73	0.78	0.12	0.16		0.96	0.22	0.62	0.18

Intersection Summary

Cycle Length: 189
Actuated Cycle Length: 160.6
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 13: 14th & Jefferson



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	740	34	131	225	225	49	83	208	345	119	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Util. Factor		0.95		1.00	0.95	1.00		1.00	1.00	1.00	1.00	
Frt		0.99		1.00	1.00	0.85		1.00	0.85	1.00	0.97	
Flt Protected		1.00		0.95	1.00	1.00		0.98	1.00	0.95	1.00	
Satd. Flow (prot)		3502		1787	3574	1599		1760	1524	1736	1765	
Flt Permitted		0.87		0.95	1.00	1.00		0.81	1.00	0.95	1.00	
Satd. Flow (perm)		3068		1787	3574	1599		1454	1524	1736	1765	
Peak-hour factor, PHF	0.74	0.74	0.74	0.87	0.87	0.87	0.62	0.62	0.62	0.94	0.94	0.94
Adj. Flow (vph)	108	1000	46	151	259	259	79	134	335	367	127	37
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	6	0
Lane Group Flow (vph)	0	1152	0	151	259	259	0	213	335	367	158	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	6%	6%	6%	4%	4%	4%
Turn Type	pm+pt			Prot		Free	Perm		Free	Prot		
Protected Phases	1	6		5	2			8		7	4	
Permitted Phases	6					Free	8		Free			
Actuated Green, G (s)		64.5		15.9	84.4	160.4		21.6	160.4	38.4	65.0	
Effective Green, g (s)		67.5		16.9	87.4	160.4		24.6	160.4	39.4	67.0	
Actuated g/C Ratio		0.42		0.11	0.54	1.00		0.15	1.00	0.25	0.42	
Clearance Time (s)		6.0		4.0	6.0			6.0		4.0	5.0	
Vehicle Extension (s)		2.0		2.0	2.0			2.0		2.0	2.0	
Lane Grp Cap (vph)		1291		188	1947	1599		223	1524	426	737	
v/s Ratio Prot				c0.08	0.07					c0.21	0.09	
v/s Ratio Perm		c0.38				0.16		c0.15	0.22			
v/c Ratio		0.89		0.80	0.13	0.16		0.96	0.22	0.86	0.21	
Uniform Delay, d1		43.1		70.1	17.9	0.0		67.4	0.0	57.9	29.9	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		8.0		20.3	0.0	0.2		47.0	0.3	15.7	0.1	
Delay (s)		51.1		90.5	17.9	0.2		114.4	0.3	73.6	29.9	
Level of Service		D		F	B	A		F	A	E	C	
Approach Delay (s)		51.1			27.4			44.6			60.1	
Approach LOS		D			C			D			E	

Intersection Summary

HCM Average Control Delay	46.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	160.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	EMP	Intersection	14
Agency/Co.	Parametrix	Jurisdiction	City of Olympia
Date Performed	3/14/2008	Analysis Year	2010 With-Project
Analysis Time Period	PM Peak Hour		

Project Description 247-4575-003

East/West Street: SE Maple Park Avenue | North/South Street: SE Jefferson Street

Intersection Orientation: North-South | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	5	15	5	5	35	109
Peak-Hour Factor, PHF	0.55	0.55	0.55	0.84	0.84	0.84
Hourly Flow Rate, HFR (veh/h)	9	27	9	5	41	129
Percent Heavy Vehicles	0	--	--	3	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LTR			LTR		
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	213	5	5	5	5	5
Peak-Hour Factor, PHF	0.67	0.67	0.67	0.50	0.50	0.50
Hourly Flow Rate, HFR (veh/h)	317	7	7	10	10	10
Percent Heavy Vehicles	1	1	1	10	10	10
Percent Grade (%)	-3			-2		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LTR	LTR		LTR			LTR	
v (veh/h)	9	5		30			331	
C (m) (veh/h)	1420	1568		781			768	
v/c	0.01	0.00		0.04			0.43	
95% queue length	0.02	0.01		0.12			2.18	
Control Delay (s/veh)	7.6	7.3		9.8			13.2	
LOS	A	A		A			B	
Approach Delay (s/veh)	--	--	9.8			13.2		
Approach LOS	--	--	A			B		

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SIDRA INTERSECTION

Movement Summary

14th Ave Extension / Henderson Blvd

2010 With-Project PM Peak Hour

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
NB Driveway										
3L	L	2	0.0	0.011	17.9	LOS B	2	0.73	0.71	26.8
8T	T	2	0.0	0.011	10.8	LOS B	2	0.73	0.63	30.4
8R	R	2	0.0	0.011	12.1	LOS B	2	0.73	0.59	29.5
Approach		**6**	**0.0**	**0.011**	**13.6**	**LOS B**	**2**	**0.73**	**0.64**	**28.8**
WB Henderson Blvd										
1L	L	1	50.0	0.143	12.2	LOS B	27	0.07	0.68	29.8
6T	T	176	2.3	0.144	5.2	LOS A	27	0.07	0.42	34.4
6R	R	30	3.3	0.144	6.5	LOS A	27	0.07	0.50	33.3
Approach		**208**	**2.9**	**0.144**	**5.4**	**LOS A**	**27**	**0.07**	**0.43**	**34.2**
SB 14th Ave Extension										
7L	L	341	0.9	0.332	13.6	LOS B	63	0.44	0.69	28.8
4T	T	1	0.0	0.333	6.5	LOS A	63	0.44	0.53	32.4
4R	R	330	0.9	0.173	6.1	LOS A#	8#	0.00	0.50	34.0
Approach		**671**	**0.9**	**0.332**	**9.9**	**LOS A**	**63**	**0.22**	**0.60**	**31.1**
EB Henderson Blvd										
5L	L	5	16.7	0.545	16.1	LOS B	134	0.72	0.86	27.7
2T	T	445	0.9	0.539	9.1	LOS A	134	0.72	0.76	31.0
2R	R	1	0.0	0.500	10.4	LOS B	134	0.72	0.73	30.5
Approach		**452**	**1.1**	**0.539**	**9.2**	**LOS A**	**134**	**0.72**	**0.76**	**31.0**
All Vehicles		**1337**	**1.3**	**0.545**	**9.0**	**LOS A**	**134**	**0.37**	**0.63**	**31.5**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

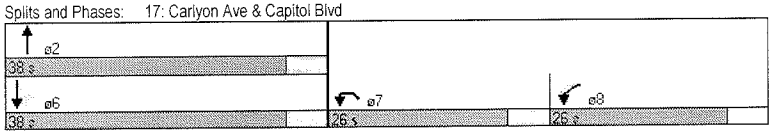
Following Queue
- Density for continuous movement

Lane Group	WBL	NBT	SBL2	SBL	SBT	NWL
Lane Configurations						
Volume (vph)	60	403	40	12	628	30
Lane Group Flow (vph)	123	571	0	62	748	72
Turn Type			Perm	Perm		
Protected Phases	8	2			6	7
Permitted Phases			6	6		
Detector Phase	8	2	6	6	6	7
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	25.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	26.0	38.0	38.0	38.0	38.0	26.0
Total Split (%)	28.9%	42.2%	42.2%	42.2%	42.2%	28.9%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag					Lead
Lead-Lag Optimize?						
Recall Mode	None	Max	Max	Max	Max	None
v/c Ratio	0.48	0.27		0.13	0.34	0.34
Control Delay	28.0	9.3		10.5	9.9	29.6
Queue Delay	0.0	0.0		0.0	0.0	0.0
Total Delay	28.0	9.3		10.5	9.9	29.6
Queue Length 50th (ft)	35	61		12	85	24
Queue Length 95th (ft)	70	113		34	138	41
Internal Link Dist (ft)	1602	636			2617	614
Turn Bay Length (ft)				150		
Base Capacity (vph)	600	2091		492	2180	588
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	0.21	0.27		0.13	0.34	0.12

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 63.9
Natural Cycle: 75
Control Type: Semi Act-Uncoord

Splits and Phases: 17: Carlyon Ave & Capitol Blvd



Movement	WBL2	WBL	WBR	NBT	NBR	NBR2	SBL2	SBL	SBT	NWL	NWR	NWR2
Lane Configurations												
Volume (vph)	5	60	32	403	95	15	40	12	628	30	10	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0				5.0	5.0	5.0		
Lane Util. Factor		1.00		0.95				1.00	0.95	1.00		
Frt		0.96		0.97				1.00	1.00	0.96		
Flt Protected		0.97		1.00				0.95	1.00	0.97		
Satd. Flow (prot)		1756		3425				1787	3574	1756		
Flt Permitted		0.97		1.00				0.43	1.00	0.97		
Satd. Flow (perm)		1756		3425				808	3574	1756		
Peak-hour factor, PHF	0.79	0.79	0.79	0.90	0.90	0.90	0.84	0.84	0.84	0.63	0.63	0.63
Adj. Flow (vph)	6	76	41	448	106	17	48	14	748	48	16	8
RTOR Reduction (vph)	0	23	0	2	0	0	0	0	0	6	0	0
Lane Group Flow (vph)	0	100	0	569	0	0	0	62	748	66	0	0
Heavy Vehicles (%)	0%	0%	0%	2%	2%	2%	1%	1%	1%	0%	0%	0%
Turn Type	Perm						Perm	Perm				
Protected Phases		8		2					6	7		
Permitted Phases	8						6	6				
Actuated Green, G (s)		7.2		37.7				37.7	37.7	6.2		
Effective Green, g (s)		7.2		37.7				37.7	37.7	6.2		
Actuated g/C Ratio		0.11		0.57				0.57	0.57	0.09		
Clearance Time (s)		5.0		5.0				5.0	5.0	5.0		
Vehicle Extension (s)		2.5		2.5				2.5	2.5	2.5		
Lane Grp Cap (vph)		191		1953				461	2038	165		
v/s Ratio Prot				0.17					c0.21	c0.04		
v/s Ratio Perm		0.06						0.08				
v/c Ratio		0.52		0.29				0.13	0.37	0.40		
Uniform Delay, d1		27.8		7.3				6.6	7.7	28.2		
Progression Factor		1.00		1.00				1.00	1.00	1.00		
Incremental Delay, d2		2.0		0.4				0.6	0.5	1.1		
Delay (s)		29.8		7.7				7.2	8.2	29.3		
Level of Service		C		A				A	A	C		
Approach Delay (s)		29.8		7.7					8.1	29.3		
Approach LOS		C		A					A	C		

Intersection Summary

HCM Average Control Delay	10.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	66.1	Sum of lost time (s)	15.0
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	EMP	Intersection	D1
Agency/Co.	Parametrix	Jurisdiction	City of Olympia
Date Performed	3/14/2008	Analysis Year	2010 With-Project
Analysis Time Period	PM Peak Hour		

Project Description 247-4575-003

East/West Street: North Site Driveway | North/South Street: SE Jefferson Street

Intersection Orientation: North-South | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		328	10	12	255	
Peak-Hour Factor, PHF	0.55	0.55	0.55	0.84	0.84	0.84
Hourly Flow Rate, HFR (veh/h)	0	596	18	14	303	0
Percent Heavy Vehicles	0	--	--	3	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration		T	TR	LT	T	
Upstream Signal		0			1	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				0		17
Peak-Hour Factor, PHF	0.67	0.67	0.67	0.50	0.50	0.50
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	34
Percent Heavy Vehicles	1	1	1	0	10	0
Percent Grade (%)	-3			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR				
v (veh/h)		14		34				
C (m) (veh/h)		955		695				
v/c		0.01		0.05				
95% queue length		0.04		0.15				
Control Delay (s/veh)		8.8		10.4				
LOS		A		B				
Approach Delay (s/veh)	--	--	10.4					
Approach LOS	--	--	B					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	EMP	Intersection	D2
Agency/Co.	Parametrix	Jurisdiction	City of Olympia
Date Performed	3/14/2008	Analysis Year	2010 With-Project
Analysis Time Period	PM Peak Hour		

Project Description 247-4575-003

East/West Street: South Site Driveway	North/South Street: SE Jefferson Street
Intersection Orientation: North-South	Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		206	22	91	154	
Peak-Hour Factor, PHF	0.55	0.55	0.55	0.84	0.84	0.84
Hourly Flow Rate, HFR (veh/h)	0	374	39	108	183	0
Percent Heavy Vehicles	0	--	--	3	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	2	0
Configuration			TR	LT	T	
Upstream Signal		0			1	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						142
Peak-Hour Factor, PHF	0.67	0.67	0.67	0.50	0.50	0.50
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	284
Percent Heavy Vehicles	1	1	1	0	10	0
Percent Grade (%)	-3			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			1
Lanes	0	0	0	0	0	1
Configuration						R

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT			R			
v (veh/h)		108			284			
C (m) (veh/h)		1135			611			
v/c		0.10			0.46			
95% queue length		0.31			2.46			
Control Delay (s/veh)		8.5			15.9			
LOS		A			C			
Approach Delay (s/veh)	--	--	15.9					
Approach LOS	--	--	C					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	EMP	Intersection	D3 - RIRO
Agency/Co.	Parametrix	Jurisdiction	City of Olympia
Date Performed	3/14/2008	Analysis Year	2010 With-Project
Analysis Time Period	PM Peak Hour		

Project Description 247-4575-003

East/West Street: SE 14th Avenue | North/South Street: 14th Ave Driveway

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		1293	12		581	
Peak-Hour Factor, PHF	0.67	0.74	0.74	0.50	0.87	0.50
Hourly Flow Rate, HFR (veh/h)	0	1747	16	0	667	0
Percent Heavy Vehicles	1	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			1
Lanes	0	2	0	0	2	0
Configuration		T	TR		T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)			110			
Peak-Hour Factor, PHF	0.55	0.78	0.80	0.77	0.77	0.84
Hourly Flow Rate, HFR (veh/h)	0	0	137	0	0	0
Percent Heavy Vehicles	0	0	0	3	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	1	0	0	0
Configuration			R			

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration					R			
v (veh/h)					137			
C (m) (veh/h)					293			
v/c					0.47			
95% queue length					2.35			
Control Delay (s/veh)					27.6			
LOS					D			
Approach Delay (s/veh)	--	--	27.6					
Approach LOS	--	--	D					

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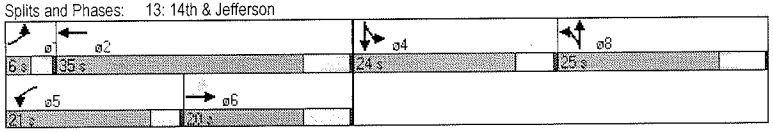
Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	5	125	499	795	620	46	47	75	117
Lane Group Flow (vph)	6	176	624	994	775	75	55	94	255
Turn Type	pm+pt		Prot		Free		Free	Split	
Protected Phases	1	6	5	2		8		4	4
Permitted Phases	6				Free		Free		
Detector Phase	1	6	5	2		8		4	4
Switch Phase									
Minimum Initial (s)	2.0	4.0	4.0	4.0		2.0		4.0	4.0
Minimum Split (s)	6.0	20.0	12.0	20.0		25.0		24.0	24.0
Total Split (s)	6.0	20.0	21.0	35.0	0.0	25.0	0.0	24.0	24.0
Total Split (%)	6.7%	22.2%	23.3%	38.9%	0.0%	27.8%	0.0%	26.7%	26.7%
Yellow Time (s)	2.5	5.5	3.5	5.5		5.5		4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5		0.5		0.5	0.5
Lost Time Adjust (s)	0.0	-3.0	-1.0	-3.0	-1.0	-3.0	-1.0	-1.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?									
Recall Mode	None	Min	None	Min		None		None	None
v/c Ratio	0.03	0.28	0.68	0.58	0.48	0.25	0.04	0.25	0.61
Control Delay	13.8	22.8	28.4	16.2	1.1	29.5	0.0	24.9	28.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.8	22.8	28.4	16.2	1.1	29.5	0.0	24.9	28.4
Queue Length 50th (ft)	1	27	115	145	0	27	0	33	87
Queue Length 95th (ft)	8	59	187	245	0	68	0	64	138
Internal Link Dist (ft)		1141		344		117			586
Turn Bay Length (ft)	75		200		300				
Base Capacity (vph)	211	1011	1058	1945	1599	659	1524	559	603
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.17	0.59	0.51	0.48	0.11	0.04	0.17	0.42

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 63.4
Natural Cycle: 85
Control Type: Actuated-Uncoordinated

Splits and Phases: 13: 14th & Jefferson



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	125	32	499	795	620	18	46	47	75	117	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	4.0	3.0	
Lane Util. Factor	1.00	0.95		0.97	0.95	1.00		1.00	1.00	0.95	0.95	
Frt	1.00	0.97		1.00	1.00	0.85		1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3431		3467	3574	1599		1768	1524	1649	1648	
Flt Permitted	0.36	1.00		0.95	1.00	1.00		0.99	1.00	0.95	1.00	
Satd. Flow (perm)	677	3431		3467	3574	1599		1768	1524	1649	1648	
Peak-hour factor, PHF	0.89	0.89	0.89	0.80	0.80	0.80	0.85	0.85	0.85	0.72	0.72	0.72
Adj. Flow (vph)	6	140	36	624	994	775	21	54	55	104	162	83
RTOR Reduction (vph)	0	24	0	0	0	0	0	0	0	0	19	0
Lane Group Flow (vph)	6	152	0	624	994	775	0	75	55	94	236	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	6%	6%	6%	4%	4%	4%
Turn Type	pm+pt			Prot		Free	Split		Free	Split		
Protected Phases	1	6		5	2		8	8		4	4	
Permitted Phases	6					Free			Free			
Actuated Green, G (s)	11.5	11.0		15.6	27.1	66.7		5.9	66.7	13.2	13.2	
Effective Green, g (s)	11.5	14.0		16.6	30.1	66.7		8.9	66.7	14.2	15.2	
Actuated g/C Ratio	0.17	0.21		0.25	0.45	1.00		0.13	1.00	0.21	0.23	
Clearance Time (s)	3.0	6.0		4.0	6.0			6.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0		2.0	2.0	
Lane Grp Cap (vph)	125	720		863	1613	1599		236	1524	351	376	
v/s Ratio Prot	0.00	0.04		c0.18	c0.28			0.04		0.06	c0.14	
v/s Ratio Perm	0.01					c0.48			0.04			
v/c Ratio	0.05	0.21		0.72	0.62	0.48		0.32	0.04	0.27	0.63	
Uniform Delay, d1	22.9	21.8		22.9	13.9	0.0		26.2	0.0	21.9	23.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.1		2.6	0.5	1.1		0.3	0.0	0.1	2.3	
Delay (s)	23.0	21.8		25.5	14.4	1.1		26.4	0.0	22.1	25.5	
Level of Service	C	C		C	B	A		C	A	C	C	
Approach Delay (s)		21.9			13.0			15.3			24.6	
Approach LOS		C			B			B			C	

Intersection Summary

HCM Average Control Delay	14.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	66.7	Sum of lost time (s)	3.0
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		

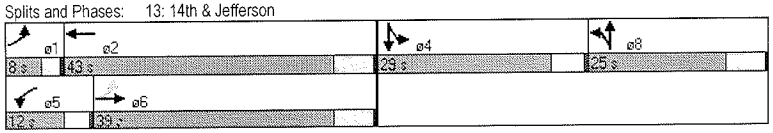
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	80	740	131	225	225	83	208	345	119
Lane Group Flow (vph)	108	1046	151	259	259	213	335	264	267
Turn Type	pm+pt		Prot		Free		Free	Split	
Protected Phases	1	6	5	2		8		4	4
Permitted Phases	6				Free		Free		
Detector Phase	1	6	5	2		8		4	4
Switch Phase									
Minimum Initial (s)	2.0	4.0	4.0	4.0		2.0		4.0	4.0
Minimum Split (s)	6.0	20.0	12.0	20.0		25.0		24.0	24.0
Total Split (s)	8.0	39.0	12.0	43.0	0.0	25.0	0.0	29.0	29.0
Total Split (%)	7.6%	37.1%	11.4%	41.0%	0.0%	23.8%	0.0%	27.6%	27.6%
Yellow Time (s)	2.5	5.5	3.5	5.5		5.5		4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5		0.5		0.5	0.5
Lost Time Adjust (s)	0.0	-3.0	-1.0	-3.0	-1.0	-3.0	-1.0	-1.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?									
Recall Mode	None	Min	None	Min		None		None	None
v/c Ratio	0.22	0.84	0.47	0.17	0.16	0.62	0.22	0.75	0.70
Control Delay	17.1	35.5	48.3	19.6	0.2	44.5	0.3	49.7	44.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.1	35.5	48.3	19.6	0.2	44.5	0.3	49.7	44.4
Queue Length 50th (ft)	35	303	46	53	0	123	0	163	157
Queue Length 95th (ft)	60	322	80	86	0	134	0	266	258
Internal Link Dist (ft)		1141		344		117			586
Turn Bay Length (ft)			200		300				
Base Capacity (vph)	490	1414	348	1595	1599	432	1524	460	488
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.74	0.43	0.16	0.16	0.49	0.22	0.57	0.55

Intersection Summary

Cycle Length: 105
Actuated Cycle Length: 92.3
Natural Cycle: 85
Control Type: Actuated-Uncoordinated

Splits and Phases: 13: 14th & Jefferson



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	740	34	131	225	225	49	83	208	345	119	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	4.0	3.0	
Lane Util. Factor	1.00	0.95		0.97	0.95	1.00		1.00	1.00	0.95	0.95	
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.98	
Satd. Flow (prot)	1770	3516		3467	3574	1599		1760	1524	1649	1667	
Flt Permitted	0.59	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.98	
Satd. Flow (perm)	1102	3516		3467	3574	1599		1760	1524	1649	1667	
Peak-hour factor, PHF	0.74	0.74	0.74	0.87	0.87	0.87	0.62	0.62	0.62	0.94	0.94	0.94
Adj. Flow (vph)	108	1000	46	151	259	259	79	134	335	367	127	37
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	0	0	5	0
Lane Group Flow (vph)	108	1043	0	151	259	259	0	213	335	264	262	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	6%	6%	6%	4%	4%	4%
Turn Type	pm+pt			Prot		Free	Split		Free	Split		
Protected Phases	1	6		5	2		8	8		4	4	
Permitted Phases	6					Free			Free			
Actuated Green, G (s)	34.3	30.5		7.5	35.2	92.5		14.9	92.5	18.6	18.6	
Effective Green, g (s)	34.3	33.5		8.5	38.2	92.5		17.9	92.5	19.6	20.6	
Actuated g/C Ratio	0.37	0.36		0.09	0.41	1.00		0.19	1.00	0.21	0.22	
Clearance Time (s)	3.0	6.0		4.0	6.0			6.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0		2.0	2.0	
Lane Grp Cap (vph)	436	1273		319	1476	1599		341	1524	349	371	
v/s Ratio Prot	0.01	c0.30		c0.04	0.07			c0.12		c0.16	0.16	
v/s Ratio Perm	0.08					0.16			0.22			
v/c Ratio	0.25	0.82		0.47	0.18	0.16		0.62	0.22	0.76	0.71	
Uniform Delay, d1	19.5	26.8		39.9	17.2	0.0		34.2	0.0	34.2	33.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	4.0		0.4	0.0	0.2		2.6	0.3	8.1	4.9	
Delay (s)	19.6	30.8		40.3	17.2	0.2		36.8	0.3	42.3	38.1	
Level of Service	B	C		D	B	A		D	A	D	D	
Approach Delay (s)		29.7			15.8			14.5			40.2	
Approach LOS		C			B			B			D	

Intersection Summary

HCM Average Control Delay	25.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	92.5	Sum of lost time (s)	13.0
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		

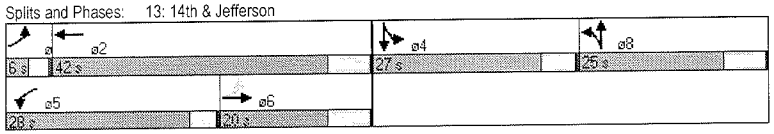
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	5	145	540	915	710	55	55	85	125
Lane Group Flow (vph)	6	202	675	1144	888	89	65	106	283
Turn Type	pm+pt		Prot		Free		Free	Split	
Protected Phases	1	6	5	2		8		4	4
Permitted Phases	6				Free		Free		
Detector Phase	1	6	5	2		8		4	4
Switch Phase									
Minimum Initial (s)	2.0	4.0	4.0	4.0		2.0		4.0	4.0
Minimum Split (s)	6.0	20.0	12.0	20.0		25.0		25.0	25.0
Total Split (s)	6.0	20.0	28.0	42.0	0.0	25.0	0.0	27.0	27.0
Total Split (%)	6.0%	20.0%	28.0%	42.0%	0.0%	25.0%	0.0%	27.0%	27.0%
Yellow Time (s)	2.5	5.5	3.5	5.5		5.5		4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5		0.5		0.5	0.5
Lost Time Adjust (s)	0.0	-3.0	-1.0	-3.0	-1.0	-3.0	-1.0	-1.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?									
Recall Mode	None	Min	None	Min		None		None	None
v/c Ratio	0.03	0.33	0.71	0.66	0.56	0.30	0.04	0.27	0.65
Control Delay	16.0	28.1	30.1	18.9	1.4	34.3	0.1	27.8	32.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.0	28.1	30.1	18.9	1.4	34.3	0.1	27.8	32.2
Queue Length 50th (ft)	1	38	143	205	0	37	0	42	111
Queue Length 95th (ft)	9	80	216	319	0	86	0	78	174
Internal Link Dist (ft)		1141		344		117			586
Turn Bay Length (ft)	75		200		300				
Base Capacity (vph)	190	924	1343	2160	1599	603	1524	588	627
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.22	0.50	0.53	0.56	0.15	0.04	0.18	0.45

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 71.1
Natural Cycle: 85
Control Type: Actuated-Uncoordinated

Splits and Phases: 13: 14th & Jefferson



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	145	35	540	915	710	20	55	55	85	125	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	4.0	3.0	
Lane Util. Factor	1.00	0.95		0.97	0.95	1.00		1.00	1.00	0.95	0.95	
Frt	1.00	0.97		1.00	1.00	0.85		1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3437		3467	3574	1599		1769	1524	1649	1643	
Flt Permitted	0.33	1.00		0.95	1.00	1.00		0.99	1.00	0.95	1.00	
Satd. Flow (perm)	621	3437		3467	3574	1599		1769	1524	1649	1643	
Peak-hour factor, PHF	0.89	0.89	0.89	0.80	0.80	0.80	0.85	0.85	0.85	0.72	0.72	0.72
Adj. Flow (vph)	6	163	39	675	1144	888	24	65	65	118	174	97
RTOR Reduction (vph)	0	20	0	0	0	0	0	0	0	0	19	0
Lane Group Flow (vph)	6	182	0	675	1144	888	0	89	65	106	264	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	6%	6%	6%	4%	4%	4%
Turn Type	pm+pt			Prot		Free	Split		Free	Split		
Protected Phases	1	6		5	2		8	8		4	4	
Permitted Phases	6					Free			Free			
Actuated Green, G (s)	12.5	12.0		18.5	31.0	74.2		6.8	74.2	15.9	15.9	
Effective Green, g (s)	12.5	15.0		19.5	34.0	74.2		9.8	74.2	16.9	17.9	
Actuated g/C Ratio	0.17	0.20		0.26	0.46	1.00		0.13	1.00	0.23	0.24	
Clearance Time (s)	3.0	6.0		4.0	6.0			6.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0		2.0	2.0	
Lane Grp Cap (vph)	112	695		911	1638	1599		234	1524	376	396	
v/s Ratio Prot	0.00	0.05		c0.19	c0.32			0.05		0.06	c0.16	
v/s Ratio Perm	0.01					c0.56			0.04			
v/c Ratio	0.05	0.26		0.74	0.70	0.56		0.38	0.04	0.28	0.67	
Uniform Delay, d1	25.7	24.9		25.0	16.0	0.0		29.4	0.0	23.6	25.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.1		2.9	1.1	1.4		0.4	0.1	0.2	3.3	
Delay (s)	25.8	25.0		27.9	17.1	1.4		29.8	0.1	23.8	28.7	
Level of Service	C	C		C	B	A		C	A	C	C	
Approach Delay (s)		25.0			14.6			17.2			27.4	
Approach LOS		C			B			B			C	

Intersection Summary

HCM Average Control Delay	16.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	74.2	Sum of lost time (s)	3.0
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

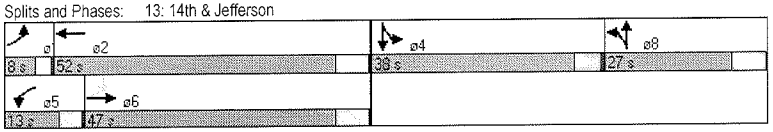
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	90	850	155	300	300	135	375	395	135
Lane Group Flow (vph)	112	1112	178	345	345	238	469	302	305
Turn Type	pm+pt		Prot		Free		Free	Split	
Protected Phases	1	6	5	2		8		4	4
Permitted Phases	6				Free		Free		
Detector Phase	1	6	5	2		8		4	4
Switch Phase									
Minimum Initial (s)	2.0	4.0	4.0	4.0		2.0		4.0	4.0
Minimum Split (s)	6.0	20.0	12.0	20.0		26.0		24.0	24.0
Total Split (s)	8.0	47.0	13.0	52.0	0.0	27.0	0.0	38.0	38.0
Total Split (%)	6.4%	37.6%	10.4%	41.6%	0.0%	21.6%	0.0%	30.4%	30.4%
Yellow Time (s)	2.5	5.5	3.5	5.5		5.5		4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5		0.5		0.5	0.5
Lost Time Adjust (s)	0.0	-3.0	-1.0	-3.0	-1.0	-3.0	-1.0	-1.0	-2.0
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	3.0
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?									
Recall Mode	None	Min	None	Min		None		None	None
v/c Ratio	0.25	0.86	0.58	0.24	0.22	0.71	0.31	0.79	0.75
Control Delay	20.3	41.1	59.5	22.9	0.3	56.0	0.5	56.1	50.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.3	41.1	59.5	22.9	0.3	56.0	0.5	56.1	50.7
Queue Length 50th (ft)	45	394	67	86	0	167	0	227	221
Queue Length 95th (ft)	78	452	108	129	0	237	0	338	331
Internal Link Dist (ft)		1141		344		117			586
Turn Bay Length (ft)	75		200		300				
Base Capacity (vph)	456	1461	327	1652	1599	400	1524	529	555
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.76	0.54	0.21	0.22	0.60	0.31	0.57	0.55

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 109.1
Natural Cycle: 85
Control Type: Actuated-Uncoordinated

Splits and Phases: 13: 14th & Jefferson



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	850	40	155	300	300	55	135	375	395	135	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	4.0	3.0	
Lane Util. Factor	1.00	0.95		0.97	0.95	1.00		1.00	1.00	0.95	0.95	
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.98	
Satd. Flow (prot)	1770	3515		3467	3574	1599		1767	1524	1649	1667	
Flt Permitted	0.54	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.98	
Satd. Flow (perm)	1014	3515		3467	3574	1599		1767	1524	1649	1667	
Peak-hour factor, PHF	0.80	0.80	0.80	0.87	0.87	0.87	0.80	0.80	0.80	0.94	0.94	0.94
Adj. Flow (vph)	112	1062	50	178	345	345	69	169	469	420	144	43
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	0	0	5	0
Lane Group Flow (vph)	112	1109	0	178	345	345	0	238	469	302	300	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	6%	6%	6%	4%	4%	4%
Turn Type	pm+pt			Prot		Free	Split		Free	Split		
Protected Phases	1	6		5	2		8	8		4	4	
Permitted Phases	6					Free			Free			
Actuated Green, G (s)	42.0	36.9		8.6	41.4	108.5		17.7	108.5	24.3	24.3	
Effective Green, g (s)	42.0	39.9		9.6	44.4	108.5		20.7	108.5	25.3	26.3	
Actuated g/C Ratio	0.39	0.37		0.09	0.41	1.00		0.19	1.00	0.23	0.24	
Clearance Time (s)	3.0	6.0		4.0	6.0			6.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0		2.0	2.0	
Lane Grp Cap (vph)	428	1293		307	1463	1599		337	1524	385	404	
v/s Ratio Prot	0.01	c0.32		c0.05	0.10			c0.13		c0.18	0.18	
v/s Ratio Perm	0.09					0.22			0.31			
v/c Ratio	0.26	0.86		0.58	0.24	0.22		0.71	0.31	0.78	0.74	
Uniform Delay, d1	21.8	31.7		47.5	21.0	0.0		41.1	0.0	39.0	38.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	5.6		1.7	0.0	0.3		5.4	0.5	9.3	6.3	
Delay (s)	21.9	37.3		49.2	21.0	0.3		46.5	0.5	48.4	44.3	
Level of Service	C	D		D	C	A		D	A	D	D	
Approach Delay (s)		35.9			18.5			16.0			46.3	
Approach LOS		D			B			B			D	

Intersection Summary

HCM Average Control Delay	29.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	108.5	Sum of lost time (s)	13.0
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

SIDRA INTERSECTION

Movement Summary

14th / Jefferson

2010 AM With-Project RBT Improvement

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
NB Jefferson										
3L	L	21	4.8	0.089	13.7	LOS B	12	0.39	0.70	28.9
8T	T	54	5.6	0.089	6.7	LOS A	12	0.39	0.54	32.6
8R	R	55	5.5	0.064	7.3	LOS A	9	0.38	0.55	32.3
Approach		**130**	**5.4**	**0.089**	**8.1**	**LOS A**	**12**	**0.38**	**0.57**	**31.8**
WB 14th										
1L	L	624	1.0	0.585	13.0	LOS B	171	0.41	0.63	28.9
6T	T	994	1.0	0.585	5.9	LOS A	171	0.40	0.46	32.6
6R	R	775	1.0	0.525	6.8	LOS A	143	0.31	0.49	32.3
Approach		**2393**	**1.0**	**0.585**	**8.0**	**LOS A**	**171**	**0.37**	**0.51**	**31.4**
SB Jefferson										
7L	L	104	3.8	0.301	21.2	LOS C	41	0.79	0.96	25.4
4T	T	163	3.7	0.482	13.5	LOS B	83	0.81	0.96	28.8
4R	R	83	3.6	0.483	14.7	LOS B	83	0.81	0.98	28.0
Approach		**349**	**3.7**	**0.482**	**16.1**	**LOS B**	**83**	**0.80**	**0.96**	**27.5**
EB 14th										
5L	L	6	14.3	0.146	17.0	LOS B	23	0.69	0.88	27.3
2T	T	140	2.1	0.145	10.1	LOS B	23	0.69	0.78	31.0
2R	R	36	2.8	0.145	11.2	LOS B	23	0.69	0.80	30.1
Approach		**184**	**2.7**	**0.145**	**10.6**	**LOS B**	**23**	**0.69**	**0.79**	**30.6**
All Vehicles		**3056**	**1.6**	**0.585**	**9.1**	**LOS A**	**171**	**0.44**	**0.58**	**30.9**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

SIDRA INTERSECTION

Movement Summary

14th / Jefferson

2010 PM With-Project RBT Improvement

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
NB Jefferson										
3L	L	79	6.3	0.712	31.7	LOS C	148	0.92	1.13	21.4
8T	T	134	6.0	0.709	25.3	LOS C	148	0.92	1.11	23.0
8R	R	335	6.0	0.176	6.4	LOS A#	9#	0.00	0.51	33.8
Approach		**548**	**6.0**	**0.710**	**14.7**	**LOS B**	**148**	**0.36**	**0.75**	**28.1**
WB 14th										
1L	L	151	1.3	0.211	14.0	LOS B	40	0.55	0.73	28.5
6T	T	259	1.2	0.211	7.6	LOS A	40	0.54	0.61	31.6
6R	R	259	1.2	0.240	8.1	LOS A	46	0.47	0.61	31.4
Approach		**669**	**1.2**	**0.240**	**9.2**	**LOS A**	**46**	**0.52**	**0.64**	**30.7**
SB Jefferson										
7L	L	367	4.1	0.435	15.0	LOS B	76	0.61	0.87	28.3
4T	T	127	3.9	0.256	9.0	LOS A	36	0.57	0.74	31.5
4R	R	37	2.7	0.255	10.2	LOS B	36	0.57	0.78	30.9
Approach		**531**	**4.0**	**0.435**	**13.2**	**LOS B**	**76**	**0.60**	**0.83**	**29.2**
EB 14th										
5L	L	108	1.9	0.766	21.0	LOS C	236	0.88	1.12	25.3
2T	T	1000	2.0	0.765	14.7	LOS B	236	0.88	1.09	28.0
2R	R	46	2.2	0.767	15.8	LOS B	236	0.88	1.10	27.3
Approach		**1154**	**2.0**	**0.765**	**15.3**	**LOS B**	**236**	**0.88**	**1.10**	**27.7**
All Vehicles		**2902**	**2.9**	**0.767**	**13.4**	**LOS B**	**236**	**0.65**	**0.88**	**28.7**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

SIDRA INTERSECTION

Movement Summary

14th / Jefferson

2030 AM With-Project RBT Improvement

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
NB Jefferson										
3L	L	24	4.3	0.108	13.9	LOS B	15	0.42	0.72	28.8
8T	T	65	6.2	0.108	7.0	LOS A	15	0.42	0.56	32.4
8R	R	65	6.2	0.079	7.5	LOS A	11	0.41	0.57	32.1
Approach		**153**	**5.9**	**0.108**	**8.2**	**LOS A**	**15**	**0.41**	**0.59**	**31.7**
WB 14th										
1L	L	675	1.0	0.666	13.2	LOS B	221	0.51	0.62	28.6
6T	T	1144	1.0	0.666	6.2	LOS A	222	0.49	0.48	32.1
6R	R	888	1.0	0.609	6.9	LOS A	188	0.38	0.50	32.0
Approach		**2706**	**1.0**	**0.666**	**8.2**	**LOS A**	**222**	**0.46**	**0.52**	**31.1**
SB Jefferson										
7L	L	118	4.2	0.400	24.3	LOS C	59	0.85	1.01	24.1
4T	T	174	4.0	0.628	17.8	LOS B	124	0.88	1.06	26.4
4R	R	97	4.1	0.626	19.1	LOS B	124	0.88	1.07	25.7
Approach		**389**	**4.1**	**0.627**	**20.1**	**LOS C**	**124**	**0.87**	**1.05**	**25.4**
EB 14th										
5L	L	6	14.3	0.179	17.8	LOS B	30	0.73	0.92	26.9
2T	T	163	1.8	0.181	10.8	LOS B	31	0.74	0.83	30.4
2R	R	39	2.5	0.181	11.9	LOS B	31	0.74	0.85	29.7
Approach		**210**	**2.4**	**0.181**	**11.3**	**LOS B**	**31**	**0.74**	**0.83**	**30.2**
All Vehicles		**3458**	**1.6**	**0.666**	**9.7**	**LOS A**	**222**	**0.52**	**0.60**	**30.3**

Symbols which may appear in this table:

Following Degree of Saturation
x = 1.00 for Short Lane with resulting Excess Flow
* x = 1.00 due to minimum capacity

Following LOS
- Based on density for continuous movements

Following Queue
- Density for continuous movement

SIDRA INTERSECTION

Movement Summary

14th / Jefferson

2030 PM With-Project RBT Improvement

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
NB Jefferson										
3L	L	69	5.8	0.920	56.0	LOS E	267	0.98	1.37	15.7
8T	T	169	5.9	0.923	49.6	LOS D	267	0.98	1.36	16.4
8R	R	469	6.0	0.247	6.4	LOS B#	12#	0.00	0.51	33.8
Approach		**707**	**5.9**	**0.922**	**21.6**	**LOS C**	**267**	**0.33**	**0.80**	**24.6**
WB 14th										
1L	L	178	1.1	0.277	14.4	LOS B	56	0.60	0.75	28.4
6T	T	345	0.9	0.277	7.9	LOS A	56	0.60	0.65	31.3
6R	R	345	0.9	0.332	8.5	LOS A	69	0.55	0.65	31.1
Approach		**866**	**0.9**	**0.332**	**9.5**	**LOS A**	**69**	**0.58**	**0.67**	**30.5**
SB Jefferson										
7L	L	420	4.0	0.534	16.2	LOS B	107	0.70	0.96	27.7
4T	T	144	4.2	0.318	9.7	LOS A	46	0.63	0.79	31.2
4R	R	43	4.7	0.319	10.8	LOS B	46	0.63	0.83	30.4
Approach		**607**	**4.1**	**0.534**	**14.3**	**LOS B**	**107**	**0.68**	**0.91**	**28.6**
EB 14th										
5L	L	112	1.8	0.875	27.6	LOS C	350	0.98	1.31	22.7
2T	T	1063	2.0	0.878	21.3	LOS C	350	0.98	1.30	24.7
2R	R	50	2.0	0.877	22.4	LOS C	350	0.98	1.30	24.1
Approach		**1224**	**2.0**	**0.878**	**21.9**	**LOS C**	**350**	**0.98**	**1.30**	**24.5**
All Vehicles		**3404**	**2.9**	**0.923**	**17.3**	**LOS B**	**350**	**0.69**	**0.97**	**26.6**

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Following LOS
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Following Queue
- Density for continuous movement