

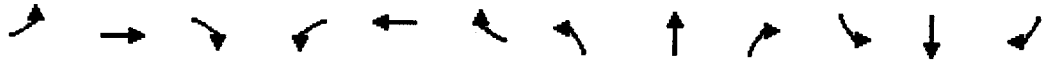
APPENDIX D

Synchro 6.0 Analysis Reports: Future Year (2010) AM and PM Peak Hour Intersection Capacity Analyses for Selected Intersections with Improvements

1. Washington Street at Norman/New Derby Street
2. Washington Street at Canal Street/Mill Street
3. Margin Street at Mill Street
4. Essex Street at North/Summer Street
5. Derby Street at Congress Street/Hawthorne Boulevard
6. Essex Street at Hawthorne Boulevard/Washington Square West
7. Lafayette Street at Washington Street
8. Lafayette Street at Harbor Street
9. Lafayette Street at Derby Street

Washington St. @ Norman/New Derby St.
AM Peak Hour

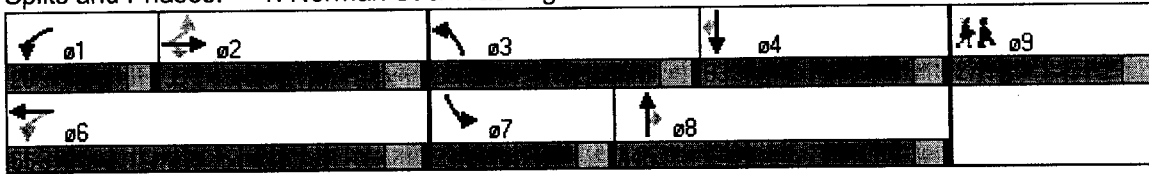
Future w/ Improvements



Lane Configurations	↖	↑	↗	↔	↖	↑	↗	↖	↑	↗	↖	↗
Volume (vph)	32	282	326	49	232	88	224	612	172	132	229	169
Confl. Peds. (#/hr)	10		18	18		10	12		8	8		12
Confl. Bikes (#/hr)									1			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												40
Mid-Block Traffic (%)		0%			0%			0%				0%
Turn Type	Perm		Perm	pm+pt		Prot		Perm	Prot		Perm	
Protected Phases		2		1	6	3	8		7	4		
Permitted Phases	2		2	6				8				4
Detector Phases	2	2	2	1	6	3	8	8	7	4	4	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	9.0	21.0	9.5	21.0	21.0	9.0	21.0	21.0	21.0
Total Split (s)	35.0	35.0	35.0	20.0	55.0	0.0	35.0	44.0	44.0	24.0	33.0	33.0
Total Split (%)	23.3%	23.3%	23.3%	13.3%	36.7%	0.0%	23.3%	29.3%	29.3%	16.0%	22.0%	22.0%
Yellow Time (s)	5.0	5.0	5.0	3.0	5.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lag	Lag	Lag	Lead		Lead	Lag	Lag	Lead	Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	30.4	30.4	30.4		30.4		20.8	31.2	31.2	14.5	20.6	20.6
Actuated g/C Ratio	0.32	0.32	0.32		0.32		0.22	0.33	0.33	0.15	0.22	0.22
v/c Ratio	0.13	0.59	0.53		0.66		0.72	0.65	0.33	0.62	0.70	0.53
Control Delay	31.9	34.9	6.1		34.1		43.9	35.0	7.0	50.6	44.4	10.6
Queue Delay	0.0	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.9	34.9	6.1		34.1		43.9	35.0	7.0	50.6	44.4	10.6
LOS	C	C	A		C		D	C	A	D	D	B
Approach Delay		20.1			34.1			32.2				35.1
Approach LOS		C			C			C				D

Cycle Length: 150
 Actuated Cycle Length: 93.6
 Natural Cycle: 100
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 30.0
 Intersection LOS: C
 Intersection Capacity Utilization 72.6%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 1: Norman St & Washington St



Lane Configurations

Volume (vph)

Confl. Peds. (#/hr)

Confl. Bikes (#/hr)

Peak Hour Factor

Growth Factor

Heavy Vehicles (%)

Bus Blockages (#/hr)

Parking (#/hr)

Mid-Block Traffic (%)

Turn Type

Protected Phases 9

Permitted Phases

Detector Phases

Minimum Initial (s) 4.0

Minimum Split (s) 27.0

Total Split (s) 27.0

Total Split (%) 18%

Yellow Time (s) 4.0

All-Red Time (s) 1.0

Lead/Lag

Lead-Lag Optimize?

Recall Mode None

Act Effct Green (s)

Actuated g/C Ratio

v/c Ratio

Control Delay

Queue Delay

Total Delay

LOS

Approach Delay

Approach LOS

Phase Splits

Washington St. @ Norman/New Derby St.
PM Peak Hour

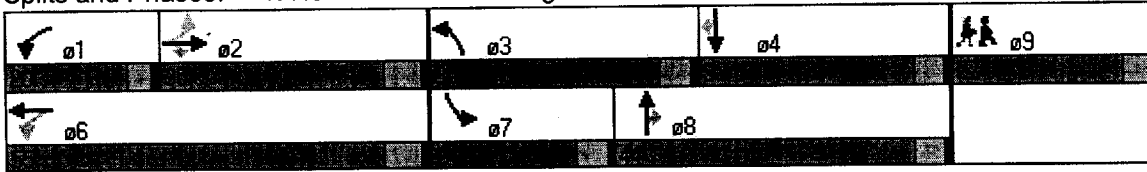
Future w/ Improvements



Lane Configurations	↖	↑	↗	↕		↖	↗	↑	↖	↗	↑	↖
Volume (vph)	39	237	436	59	335	135	242	503	208	136	260	158
Confl. Peds. (#/hr)	25		15	15		25	15		10	10		15
Confl. Bikes (#/hr)									1			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												40
Mid-Block Traffic (%)		0%			0%			0%				0%
Turn Type	Perm		Perm	pm+pt		Prot		Perm	Prot		Perm	
Protected Phases		2		1	6	3	8		7		4	
Permitted Phases	2		2	6				8				4
Detector Phases	2	2	2	1	6	3	8	8	7	4	4	
Minimum Initial (s)	4.0	4.0	4.0	4.0	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	10.0	21.0	10.0	21.0	21.0	10.0	21.0	21.0	21.0
Total Split (s)	35.0	35.0	35.0	20.0	55.0	0.0	35.0	44.0	44.0	24.0	33.0	33.0
Total Split (%)	23.3%	23.3%	23.3%	13.3%	36.7%	0.0%	23.3%	29.3%	29.3%	16.0%	22.0%	22.0%
Yellow Time (s)	5.0	5.0	5.0	3.0	5.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lag	Lag	Lag	Lead		Lead	Lag	Lag	Lead	Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	38.1	38.1	38.1		38.1	24.2	37.7	37.7	15.9	24.5	24.5	
Actuated g/C Ratio	0.33	0.33	0.33		0.33	0.21	0.33	0.33	0.14	0.22	0.22	
v/c Ratio	0.19	0.47	0.62		0.67	0.79	0.53	0.37	0.69	0.80	0.51	
Control Delay	35.7	36.6	6.3		43.8	55.1	40.9	6.8	62.4	56.5	11.4	
Queue Delay	0.0	0.0	0.1		0.2	0.0	0.0	0.0	0.0	0.1	0.0	
Total Delay	35.7	36.6	6.4		44.0	55.1	40.9	6.9	62.5	56.5	11.4	
LOS	D	D	A		D	E	D	A	E	E	B	
Approach Delay		18.1			44.0		37.1				45.1	
Approach LOS		B			D		D				D	

Cycle Length: 150
 Actuated Cycle Length: 113.9
 Natural Cycle: 100
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.87
 Intersection Signal Delay: 35.1 Intersection LOS: D
 Intersection Capacity Utilization 78.5% ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 1: Norman St & Washington St



Lane Configurations

Volume (vph)

Confl. Peds. (#/hr)

Confl. Bikes (#/hr)

Peak Hour Factor

Growth Factor

Heavy Vehicles (%)

Bus Blockages (#/hr)

Parking (#/hr)

Mid-Block Traffic (%)

Turn Type

Protected Phases 9

Permitted Phases

Detector Phases

Minimum Initial (s) 4.0

Minimum Split (s) 27.0

Total Split (s) 27.0

Total Split (%) 18%

Yellow Time (s) 4.0

All-Red Time (s) 1.0

Lead/Lag

Lead-Lag Optimize?

Recall Mode None

Act Effct Green (s)

Actuated g/C Ratio

v/c Ratio

Control Delay

Queue Delay

Total Delay

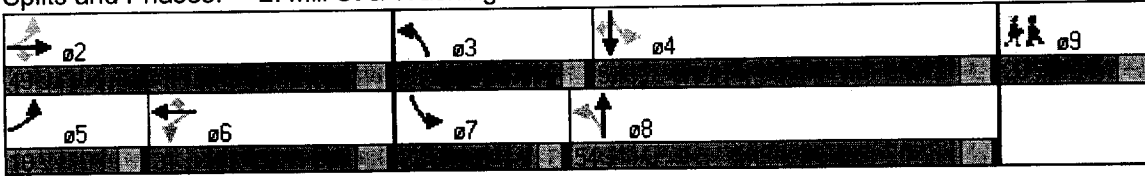
LOS

Approach Delay

Approach LOS

Intersection Summary

Splits and Phases: 2: Mill St & Washington St



Lane Configurations

Volume (vph)

Confl. Peds. (#/hr)

Confl. Bikes (#/hr)

Peak Hour Factor

Growth Factor

Heavy Vehicles (%)

Bus Blockages (#/hr)

Parking (#/hr)

Mid-Block Traffic (%)

Turn Type

Protected Phases 9

Permitted Phases

Detector Phases

Minimum Initial (s) 4.0

Minimum Split (s) 20.0

Total Split (s) 20.0

Total Split (%) 14%

Yellow Time (s) 4.0

All-Red Time (s) 1.0

Lead/Lag

Lead-Lag Optimize?

Recall Mode None

Act Effct Green (s)

Actuated g/C Ratio

v/c Ratio

Control Delay

Queue Delay

Total Delay

LOS

Approach Delay

Approach LOS

Intersection Summary

Washington St. @ Canal St./Mill St.
PM Peak Hour

Future w/ Improvements



Lane Configurations	↖	↗	↖	↗	↖	↗	↖	↗	↖	↗	↖	↗
Volume (vph)	164	219	382	11	185	306	168	526	45	228	465	72
Confl. Peds. (#/hr)	10		15	15		10	7		7	7		7
Confl. Bikes (#/hr)						2						1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)						0		0	0			
Mid-Block Traffic (%)		0%			0%			0%			0%	
Turn Type	pm+pt		Perm	Perm		Perm	pm+pt		pm+pt		Perm	
Protected Phases	5	2			6		3	8		7	4	
Permitted Phases	2		2	6		6	8		4		4	
Detector Phases	5	2	2	6	6	6	3	8		7	4	4
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	8.0	21.0	21.0	21.0	21.0	21.0	8.0	21.0		8.0	21.0	21.0
Total Split (s)	17.0	49.0	49.0	32.0	32.0	32.0	18.0	51.0	0.0	25.0	58.0	58.0
Total Split (%)	11.7%	33.8%	33.8%	22.1%	22.1%	22.1%	12.4%	35.2%	0.0%	17.2%	40.0%	40.0%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None	None		None	None	None
Act Effct Green (s)	62.9	62.9	62.9		44.3	44.3	57.2	43.2		65.9	48.2	48.2
Actuated g/C Ratio	0.43	0.43	0.43		0.31	0.31	0.39	0.30		0.45	0.33	0.33
v/c Ratio	0.55	0.33	0.51		0.44	0.55	0.72	0.68		0.74	0.93	0.16
Control Delay	39.0	34.3	14.0		48.6	8.7	39.9	46.8		35.8	58.6	9.5
Queue Delay	3.0	3.7	1.1		0.1	0.0	0.0	0.0		0.0	3.2	0.0
Total Delay	41.9	38.0	15.1		48.7	8.7	39.9	46.8		35.8	61.8	9.5
LOS	D	D	B		D	A	D	D		D	E	A
Approach Delay		27.4			24.3			45.2			49.1	
Approach LOS		C			C			D			D	

Cycle Length: 145

Actuated Cycle Length: 145

Offset: 0 (0%), Referenced to phase 6:WBTL, Start of Green, Master Intersection

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 37.6

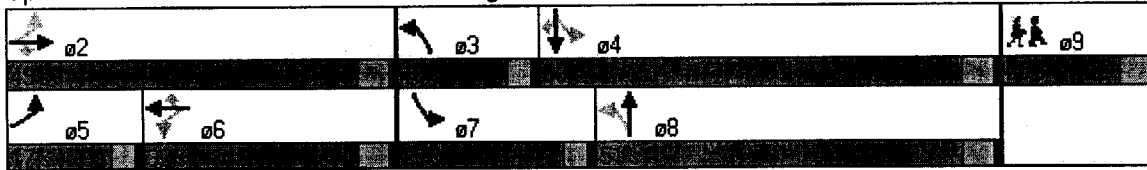
Intersection LOS: D

Intersection Capacity Utilization 81.5%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 2: Mill St & Washington St



Lane Configurations

Volume (vph)

Confl. Peds. (#/hr)

Confl. Bikes (#/hr)

Peak Hour Factor

Growth Factor

Heavy Vehicles (%)

Bus Blockages (#/hr)

Parking (#/hr)

Mid-Block Traffic (%)

Turn Type

Protected Phases 9

Permitted Phases

Detector Phases

Minimum Initial (s) 4.0

Minimum Split (s) 20.0

Total Split (s) 20.0

Total Split (%) 14%

Yellow Time (s) 4.0

All-Red Time (s) 1.0

Lead/Lag

Lead-Lag Optimize?

Recall Mode None

Act Effct Green (s)

Actuated g/C Ratio

v/c Ratio

Control Delay

Queue Delay




Total Delay

LOS

Approach Delay

Approach LOS

Splits and Phases: 3: Mill St & Margin St




 06	 04	 09
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Lane Configurations	↙		↗		↑	
Volume (vph)	425	0	0	402	363	345
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	106%	106%	106%	106%	106%	106%
Heavy Vehicles (%)	2%	2%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Turn Type				Over	Perm	
Protected Phases	6			6		4 9
Permitted Phases						4
Detector Phases	6			6	4	4
Minimum Initial (s)	4.0			4.0	4.0	4.0 4.0
Minimum Split (s)	30.0			30.0	20.0	20.0 20.0
Total Split (s)	60.0	0.0	0.0	60.0	65.0	65.0 20.0
Total Split (%)	41.4%	0.0%	0.0%	41.4%	44.8%	44.8% 14%
Yellow Time (s)	4.0			4.0	4.0	4.0 4.0
All-Red Time (s)	1.0			1.0	1.0	1.0 1.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Min			C-Min	Min	Min None
Act Effct Green (s)	91.6			91.6	41.4	41.4
Actuated g/C Ratio	0.63			0.63	0.29	0.29
v/c Ratio	0.47			0.38	0.88	0.80
Control Delay	10.6			2.4	52.2	49.7
Queue Delay	0.6			0.0	0.3	0.0
Total Delay	11.2			2.5	52.5	49.7
LOS	B			A	D	D
Approach Delay	11.2					51.1
Approach LOS	B					D

Cycle Length: 145
 Actuated Cycle Length: 145
 Offset: 5 (3%), Referenced to phase 6:WBL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 27.3 Intersection LOS: C
 Intersection Capacity Utilization 59.7% ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 3: Mill St & Margin St

 06	 04	 09
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North/Summer St. @ Essex St.
AM Peak Hour

Future w/ Improvements



Lane Configurations	4	7						8	7	7	7	
Volume (vph)	238	48	113	0	0	0	0	578	40	198	751	74
Confl. Peds. (#/hr)	20		28	28				20	5	12	12	5
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)	0	0	0						0			
Mid-Block Traffic (%)		0%			0%			0%				0%
Turn Type	Perm		Perm							Perm	pm+pt	
Protected Phases		2						8		7		4
Permitted Phases	2		2					8	8	4		
Detector Phases	2	2	2					8	8	7		4
Minimum Initial (s)	4.0	4.0	4.0					4.0	4.0	4.0		4.0
Minimum Split (s)	20.0	20.0	20.0					20.0	20.0	9.0		20.0
Total Split (s)	38.0	38.0	38.0	0.0	0.0	0.0	0.0	69.0	69.0	24.0	93.0	0.0
Total Split (%)	25.3%	25.3%	25.3%	0.0%	0.0%	0.0%	0.0%	46.0%	46.0%	16.0%	62.0%	0.0%
Yellow Time (s)	4.0	4.0	4.0					4.0	4.0	3.0		4.0
All-Red Time (s)	1.0	1.0	1.0					1.0	1.0	1.0		1.0
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?								Yes	Yes	Yes		
Recall Mode	None	None	None					None	None	None		None
Act Effct Green (s)		33.8	33.8					56.1	56.1	74.5		74.5
Actuated g/C Ratio		0.27	0.27					0.46	0.46	0.61		0.61
v/c Ratio		0.82	0.35					0.85	0.08	0.79		0.94
Control Delay		61.2	30.3					39.3	18.6	30.1		33.2
Queue Delay		0.0	0.0					0.0	0.0	0.0		0.0
Total Delay		61.2	30.3					39.3	18.6	30.1		33.2
LOS		E	C					D	B	C		C
Approach Delay		52.4						37.9				32.6
Approach LOS		D						D				C

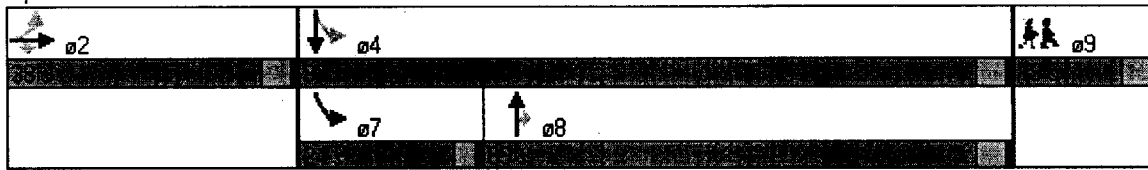
Cycle Length: 150
 Actuated Cycle Length: 123
 Natural Cycle: 130
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 38.1
 Intersection Capacity Utilization 83.9%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service E

North/Summer St. @ Essex St.
 AM Peak Hour

Future w/ Improvements

Splits and Phases: 14: Essex St & North St



Lane Configurations	
Volume (vph)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phases	
Minimum Initial (s)	4.0
Minimum Split (s)	19.0
Total Split (s)	19.0
Total Split (%)	13%
Yellow Time (s)	4.0
All-Red Time (s)	1.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

North/Summer St. @ Essex St.
PM Peak Hour

Future w/ Improvements

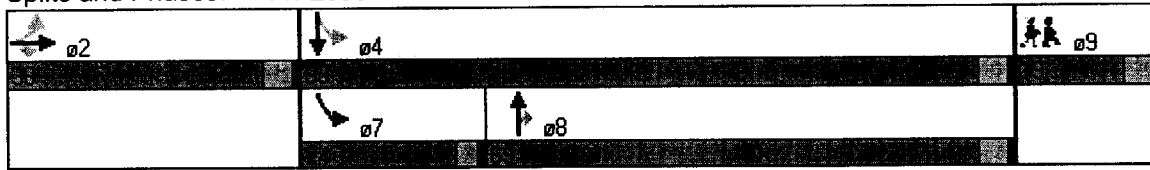


Lane Configurations	↖	↗	↖	↗	↖	↗	↖	↗	↖	↗	↖	↗
Volume (vph)	233	66	93	0	0	0	0	602	63	192	786	60
Confl. Peds. (#/hr)	40		24	24		40	6		12	12		6
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)	0	0	0						0			
Mid-Block Traffic (%)		0%			0%			0%				0%
Turn Type	Perm		Perm						Perm	pm+pt		
Protected Phases		2						8		7		4
Permitted Phases	2		2					8	8	4		
Detector Phases	2	2	2					8	8	7		4
Minimum Initial (s)	4.0	4.0	4.0					4.0	4.0	4.0		4.0
Minimum Split (s)	20.0	20.0	20.0					20.0	20.0	9.0		20.0
Total Split (s)	38.0	38.0	38.0	0.0	0.0	0.0	0.0	69.0	69.0	24.0	93.0	0.0
Total Split (%)	25.3%	25.3%	25.3%	0.0%	0.0%	0.0%	0.0%	46.0%	46.0%	16.0%	62.0%	0.0%
Yellow Time (s)	4.0	4.0	4.0					4.0	4.0	3.0		4.0
All-Red Time (s)	1.0	1.0	1.0					1.0	1.0	1.0		1.0
Lead/Lag								Lag	Lag	Lead		
Lead-Lag Optimize?								Yes	Yes	Yes		
Recall Mode	None	None	None					None	None	None		None
Act Effct Green (s)		35.3	35.3					56.0	56.0	74.2		74.2
Actuated g/C Ratio		0.28	0.28					0.45	0.45	0.60		0.60
v/c Ratio		0.85	0.28					0.88	0.12	0.79		0.94
Control Delay		66.3	29.9					41.1	18.7	32.4		33.9
Queue Delay		0.0	0.0					0.0	0.0	0.0		0.0
Total Delay		66.3	29.9					41.1	18.7	32.4		33.9
LOS		E	C					D	B	C		C
Approach Delay		57.7						39.0				33.6
Approach LOS		E						D				C

Cycle Length: 150
 Actuated Cycle Length: 124.1
 Natural Cycle: 130
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 39.8
 Intersection Capacity Utilization 85.8%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service E

Splits and Phases: 14: Essex St & North St



Signal Phases	
Lane Configurations	
Volume (vph)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phases	
Minimum Initial (s)	4.0
Minimum Split (s)	19.0
Total Split (s)	19.0
Total Split (%)	13%
Yellow Time (s)	4.0
All-Red Time (s)	1.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary



Lane Configurations	↖	↗			↖	↗			↖	↗		↖	↗
Volume (vph)	398	236	115	78	63	15	40	102	90	12	239	570	
Confl. Peds. (#/hr)	9		10	10		9	8		7	7		8	
Confl. Bikes (#/hr)			1			1							
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%
Heavy Vehicles (%)	4%	4%	4%	1%	1%	1%	4%	4%	4%	3%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)													
Mid-Block Traffic (%)		0%			0%			0%				0%	
Turn Type	pm+pt				Perm	Perm	Perm		Perm	Perm		Perm	Perm
Protected Phases	7	4			8			2				6	
Permitted Phases	4			8		8	2		2	6			6
Detector Phases	7	4		8	8	8	2	2	2	6		6	6
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	8.0	21.0		21.0	21.0	21.0	21.0	21.0	21.0	21.0		21.0	21.0
Total Split (s)	25.0	50.0	0.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0		25.0	25.0
Total Split (%)	25.0%	50.0%	0.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%		25.0%	25.0%
Yellow Time (s)	3.5	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	0.5	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0
Lead/Lag	Lead			Lag	Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes	Yes							
Recall Mode	C-Min	None		None	None	None	Min	Min	Min	Min		Min	Min
Act Effct Green (s)	61.0	61.0			18.6	18.6		26.0	26.0			26.0	26.0
Actuated g/C Ratio	0.61	0.61			0.19	0.19		0.26	0.26			0.26	0.26
v/c Ratio	0.59	0.41			0.80	0.06		0.68	0.24			0.67	0.78
Control Delay	18.3	13.2			56.7	14.7		47.4	7.6			30.9	9.3
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			0.0	0.3
Total Delay	18.3	13.2			56.7	14.7		47.4	7.6			30.9	9.6
LOS	B	B			E	B		D	A			C	A
Approach Delay		15.9			52.6			32.0				16.1	
Approach LOS		B			D			C				B	

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 7:EBL, Start of Green, Master Intersection

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 20.8

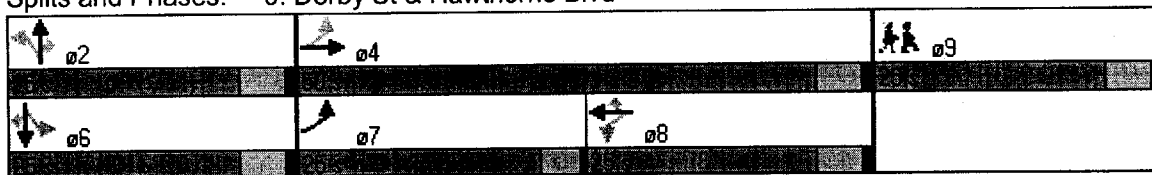
Intersection LOS: C

Intersection Capacity Utilization 74.9%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 9: Derby St & Hawthorne Blvd



Lane Configurations

Volume (vph)

Confl. Peds. (#/hr)

Confl. Bikes (#/hr)

Peak Hour Factor

Growth Factor

Heavy Vehicles (%)

Bus Blockages (#/hr)

Parking (#/hr)

Mid-Block Traffic (%)

Turn Type

Protected Phases 9

Permitted Phases

Detector Phases

Minimum Initial (s) 4.0

Minimum Split (s) 25.0

Total Split (s) 25.0

Total Split (%) 25%

Yellow Time (s) 4.0

All-Red Time (s) 1.0

Lead/Lag

Lead-Lag Optimize?

Recall Mode None

Act Effct Green (s)

Actuated g/C Ratio

v/c Ratio

Control Delay

Queue Delay

Total Delay

LOS

Approach Delay

Approach LOS

Derby St @ Congress St/Hawthorne Blvd
PM Peak Hour

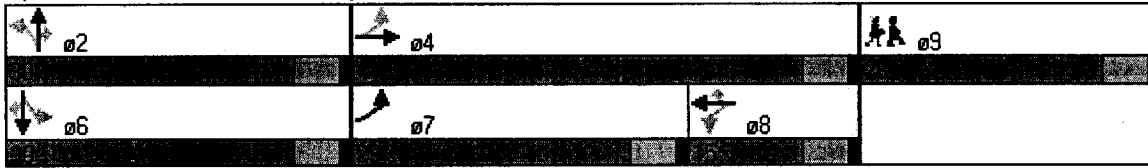
Future w/ Improvements



Lane Configurations	↖	↗			↖	↗	↖	↗	↖	↗	↖	↗
Volume (vph)	372	281	46	27	78	16	127	228	153	20	150	545
Confl. Peds. (#/hr)	9		10	10		9	8		7	7		8
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%				0%
Turn Type	pm+pt				Perm		Perm	Perm		Perm	Perm	
Protected Phases	7	4			8			2				6
Permitted Phases	4				8		8	2		2	6	6
Detector Phases	7	4			8	8	8	2	2	2	6	6
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)	9.0	20.0			9.0	9.0	9.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	29.0	44.0	0.0	15.0	15.0	15.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	29.0%	44.0%	0.0%	15.0%	15.0%	15.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Yellow Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead				Lag	Lag	Lag					
Lead-Lag Optimize?	Yes				Yes	Yes	Yes					
Recall Mode	C-Min	Min			None	None	None	None	None	None	None	None
Act Effct Green (s)	39.4	39.4			10.8	10.8		47.4	47.4		47.4	47.4
Actuated g/C Ratio	0.39	0.39			0.11	0.11		0.47	0.47		0.47	0.47
v/c Ratio	0.85	0.56			0.80	0.11		0.76	0.23		0.36	0.63
Control Delay	41.8	26.6			78.1	19.1		35.8	6.5		26.9	9.0
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0		0.0	0.1
Total Delay	41.8	26.6			78.1	19.1		35.8	6.5		26.9	9.1
LOS	D	C			E	B		D	A		C	A
Approach Delay		34.7			70.2			27.0			13.3	
Approach LOS		C			E			C			B	

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 7:EBL, Start of Green, Master Intersection
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 27.4
 Intersection LOS: C
 Intersection Capacity Utilization 81.3%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 9: Derby St & Hawthorne Blvd



Lamp Configurations

Volume (vph)

Confl. Peds. (#/hr)

Confl. Bikes (#/hr)

Peak Hour Factor

Growth Factor

Heavy Vehicles (%)

Bus Blockages (#/hr)

Parking (#/hr)

Mid-Block Traffic (%)

Turn Type

Protected Phases 9

Permitted Phases

Detector Phases

Minimum Initial (s) 4.0

Minimum Split (s) 26.0

Total Split (s) 26.0

Total Split (%) 26%

Yellow Time (s) 4.0

All-Red Time (s) 1.0

Lead/Lag

Lead-Lag Optimize?

Recall Mode None

Act Effct Green (s)

Actuated g/C Ratio

v/c Ratio

Control Delay

Queue Delay

Total Delay

LOS

Approach Delay

Approach LOS

Notes

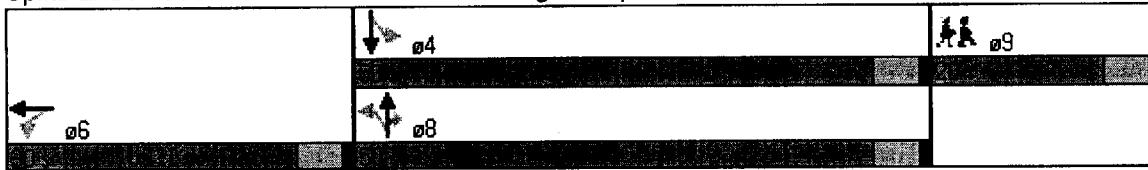
Hawthorne Blvd @ Essex St
AM Peak Hour

Future w/ Improvements



Signal													
Lane Configurations				↕				↑		↗		↕	
Volume (vph)	0	0	0	258	18	44	23	448	49	14	552	4	4
Confl. Peds. (#/hr)	30		10	10		30	8		7	7		8	8
Confl. Bikes (#/hr)									1				1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%
Heavy Vehicles (%)	0%	0%	0%	1%	1%	1%	3%	3%	3%	3%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)				0	0	0	0	0	0	0	0	0	0
Mid-Block Traffic (%)		0%			0%			0%					0%
Turn Type				Perm		Perm		Perm		Perm		Perm	
Protected Phases				6				8				14	
Permitted Phases				6		8		8		4		4	
Detector Phases				6		6		8		8		4	
Minimum Initial (s)				4.0		4.0		4.0		4.0		4.0	
Minimum Split (s)				20.0		20.0		20.0		20.0		20.0	
Total Split (s)	0.0	0.0	0.0	30.0	30.0	0.0	50.0	50.0	50.0	50.0	50.0	50.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	30.0%	30.0%	0.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	0.0%
Yellow Time (s)				4.0		4.0		4.0		4.0		4.0	
All-Red Time (s)				1.0		1.0		1.0		1.0		1.0	
Lead/Lag													
Lead-Lag Optimize?													
Recall Mode				None		None		C-Min		C-Min		C-Min	
Act Effct Green (s)				31.1				52.9		52.9		52.9	
Actuated g/C Ratio				0.31				0.53		0.53		0.53	
v/c Ratio				0.82				0.70		0.08		0.33	
Control Delay				49.2				27.1		9.3		33.1	
Queue Delay				0.0				0.0		0.0		0.0	
Total Delay				49.2				27.1		9.3		33.1	
LOS				D				C		A		C	
Approach Delay				49.2				25.4				33.1	
Approach LOS				D				C				C	
Cycle Length: 100													
Actuated Cycle Length: 100													
Offset: 33 (33%), Referenced to phase 8:NBTL, Start of Green													
Natural Cycle: 90													
Control Type: Actuated-Coordinated													
Maximum v/c Ratio: 0.83													
Intersection Signal Delay: 33.9							Intersection LOS: C						
Intersection Capacity Utilization 82.6%							ICU Level of Service E						
Analysis Period (min) 15													

Splits and Phases: 11: Essex St & Washington Sq W



Lane Configurations

Volume (vph)

Confl. Peds. (#/hr)

Confl. Bikes (#/hr)

Peak Hour Factor

Growth Factor

Heavy Vehicles (%)

Bus Blockages (#/hr)

Parking (#/hr)

Mid-Block Traffic (%)

Turn Type

Protected Phases 9

Permitted Phases

Detector Phases

Minimum Initial (s) 4.0

Minimum Split (s) 20.0

Total Split (s) 20.0

Total Split (%) 20%

Yellow Time (s) 4.0

All-Red Time (s) 1.0

Lead/Lag

Lead-Lag Optimize?

Recall Mode None

Act Effect Green (s)

Actuated g/C Ratio

v/c Ratio

Control Delay

Queue Delay

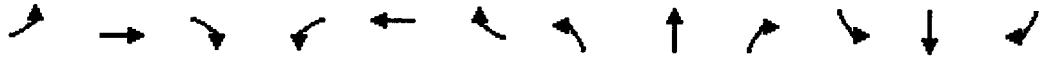
Total Delay

LOS

Approach Delay

Approach LOS

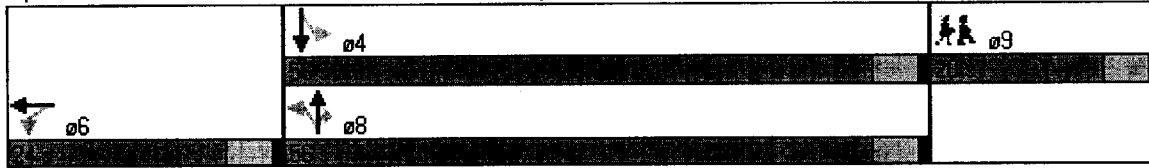
Notes: Summary



Lane Configurations				↕	↕	↕	↕	↕	↕	↕	↕	↕
Volume (vph)	0	0	0	167	14	41	21	535	69	30	524	16
Confl. Peds. (#/hr)	54		24	24		54	9		7	7		9
Confl. Bikes (#/hr)									1			1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%
Heavy Vehicles (%)	0%	0%	0%	1%	0%	1%	0%	2%	2%	2%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)				0	0	0	0	0	0	0	0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Turn Type				Perm		Perm		Perm	Perm			
Protected Phases					6			8				4
Permitted Phases				6			8	8	8	4		4
Detector Phases				6	6		8	8	8	4		4
Minimum Initial (s)				4.0	4.0		4.0	4.0	4.0	4.0		4.0
Minimum Split (s)				20.0	20.0		20.0	20.0	20.0	20.0		20.0
Total Split (s)	0.0	0.0	0.0	24.0	24.0	0.0	56.0	56.0	56.0	56.0	56.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	24.0%	24.0%	0.0%	56.0%	56.0%	56.0%	56.0%	56.0%	0.0%
Yellow Time (s)				4.0	4.0		4.0	4.0	4.0	4.0		4.0
All-Red Time (s)				1.0	1.0		1.0	1.0	1.0	1.0		1.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode				None	None		C-Min	C-Min	C-Min	None	None	
Act Effct Green (s)					20.6			59.4	59.4			59.4
Actuated g/C Ratio					0.21			0.59	0.59			0.59
v/c Ratio					0.88			0.71	0.10			0.79
Control Delay					66.9			13.5	3.5			27.3
Queue Delay					0.0			0.0	0.0			0.0
Total Delay					66.9			13.5	3.5			27.3
LOS					E			B	A			C
Approach Delay					66.9			12.4				27.3
Approach LOS					E			B				C

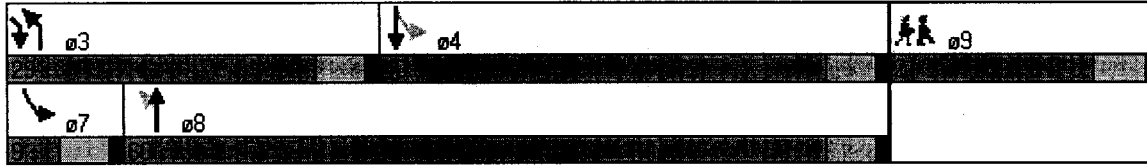
Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 96 (96%), Referenced to phase 8:NBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 27.0 Intersection LOS: C
 Intersection Capacity Utilization 91.4% ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 11: Essex St & Washington Sq W



Lane Configurations	
Volume (vph)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phases	
Minimum Initial (s)	4.0
Minimum Split (s)	20.0
Total Split (s)	20.0
Total Split (%)	20%
Yellow Time (s)	4.0
All-Red Time (s)	1.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Splits and Phases: 6: Dow St & Lafayette St










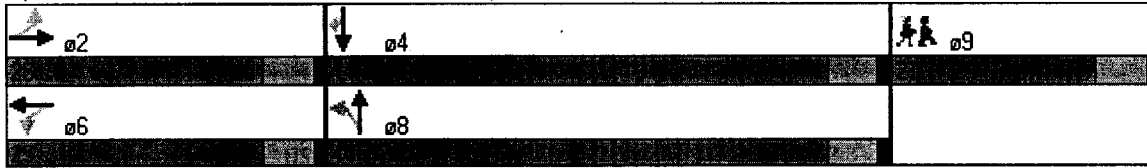
Lane Configurations			↖	↗	↖	↗			↖	↗
Volume (vph)	0	0	351	490	51	46	600	0	0	372
Confl. Peds. (#/hr)			15		38	38		15		10
Confl. Bikes (#/hr)										
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)										
Mid-Block Traffic (%)	0%			0%			0%		0%	
Turn Type			pm+pt				pm+pt			Over
Protected Phases			3	8			7	4		3 9
Permitted Phases			8				4			
Detector Phases			3	8			7	4		3
Minimum Initial (s)			4.0	4.0			4.0	4.0		4.0 4.0
Minimum Split (s)			9.0	20.0			9.0	20.0		9.0 21.0
Total Split (s)	0.0	0.0	30.0	60.0	0.0	9.0	39.0	0.0	0.0	30.0 21.0
Total Split (%)	0.0%	0.0%	33.3%	66.7%	0.0%	10.0%	43.3%	0.0%	0.0%	33.3% 23%
Yellow Time (s)			4.0	4.0			4.0	4.0		4.0 4.0
All-Red Time (s)			1.0	1.0			1.0	1.0		1.0 1.0
Lead/Lag			Lead	Lag			Lead	Lag		Lead
Lead-Lag Optimize?			Yes	Yes			Yes	Yes		Yes
Recall Mode			None	Min			None	C-Min		None None
Act Effct Green (s)			81.8	77.4			54.2	48.0		29.8
Actuated g/C Ratio			0.91	0.86			0.60	0.53		0.33
v/c Ratio			0.56	0.38			0.09	0.67		0.77
Control Delay			15.9	4.4			4.1	15.9		37.0
Queue Delay			0.0	0.0			0.0	0.3		0.0
Total Delay			15.9	4.4			4.1	16.2		37.0
LOS			B	A			A	B		D
Approach Delay				8.9				15.4		
Approach LOS				A				B		

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 13 (14%), Referenced to phase 4:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 16.6
 Intersection Capacity Utilization 70.3%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 6: Dow St & Lafayette St

 03	 04	 09
 07	 08	

Splits and Phases: 7: Harbor St & Lafayette St



Signal	
Lamp Configurations	
Volume (vph)	
Conf. Peds. (#/hr)	
Conf. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phases	
Minimum Initial (s)	4.0
Minimum Split (s)	21.0
Total Split (s)	21.0
Total Split (%)	23%
Yellow Time (s)	4.0
All-Red Time (s)	1.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Intersections	



Lane Configurations	↕		↕		↗		↑		↖		↗	
Volume (vph)	84	0	22	51	96	67	10	484	0	0	573	57
Confl. Peds. (#/hr)	41		15	15		41	38		44	44		38
Confl. Bikes (#/hr)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Turn Type	Perm		Perm		Perm						Perm	
Protected Phases	6		2		4		8		8		8	
Permitted Phases	6		2		4		8		8		8	
Detector Phases	6	6	2	2	4	4	8	8	8	8	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	23.0	23.0	0.0	23.0	23.0	0.0	46.0	46.0	0.0	0.0	46.0	46.0
Total Split (%)	25.6%	25.6%	0.0%	25.6%	25.6%	0.0%	51.1%	51.1%	0.0%	0.0%	51.1%	51.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	Min	Min	C-Min	C-Min				
Act Effct Green (s)	19.2		19.2		58.6	58.6	58.6	58.6				
Actuated g/C Ratio	0.21		0.21		0.65	0.65	0.65	0.65				
v/c Ratio	0.70		0.75		0.05	0.49	0.58	0.07				
Control Delay	47.7		41.3		6.2	8.7	14.6	7.2				
Queue Delay	0.0		0.0		0.0	0.2	0.1	0.0				
Total Delay	47.7		41.3		6.2	8.9	14.7	7.2				
LOS	D		D		A	A	B	A				
Approach Delay	47.7		41.3		8.8		14.0					
Approach LOS	D		D		A		B					

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 8: SBT, Start of Green, Master Intersection

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 18.8

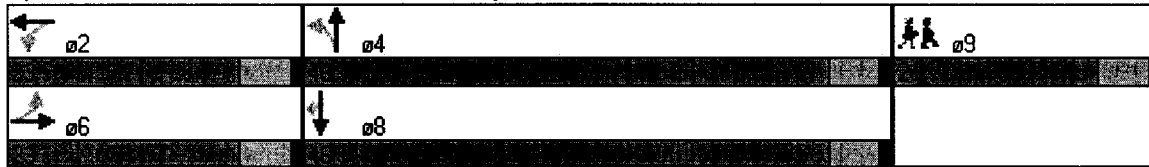
Intersection LOS: B

Intersection Capacity Utilization 56.2%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 7: Harbor St & Lafayette St



Lane Configurations	
Volume (vph)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phases	
Minimum Initial (s)	4.0
Minimum Split (s)	21.0
Total Split (s)	21.0
Total Split (%)	23%
Yellow Time (s)	4.0
All-Red Time (s)	1.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effect Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Lafayette St. @ Derby St.
AM Peak Hour

Future w/ Improvements



Lane Configurations	↖	↗	↘	↙	←	↖	↗	↘	↙	↖	↗	
Volume (vph)	14	379	167	375	276	22	101	44	368	2	6	17
Confl. Peds. (#/hr)	3		14	14		3	6		16	16		6
Confl. Bikes (#/hr)			1									1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0	0		0	0			30			0
Mid-Block Traffic (%)		0%			0%				0%			0%
Turn Type	Perm		Perm	pm+pt		Perm		Perm	Perm	Perm		Perm
Protected Phases		4		3	8			2				6
Permitted Phases	4	4	4	8		2		2	2	6		6
Detector Phases	4	4	4	3	8	2	2	2	2	6	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	9.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	61.0	61.0	61.0	37.0	98.0	0.0	26.0	26.0	26.0	26.0	26.0	26.0
Total Split (%)	40.7%	40.7%	40.7%	24.7%	65.3%	0.0%	17.3%	17.3%	17.3%	17.3%	17.3%	17.3%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Act Effect Green (s)		30.9	30.9	54.1	54.1		18.0	18.0		18.0	18.0	
Actuated g/C Ratio		0.37	0.37	0.64	0.64		0.21	0.21		0.21	0.21	
v/c Ratio		0.83	0.34	0.81	0.36		0.59	0.74		0.03	0.07	
Control Delay		30.3	5.4	17.7	8.7		43.4	11.4		41.2	19.6	
Queue Delay		0.1	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		30.3	5.4	17.7	8.7		43.4	11.4		41.2	19.6	
LOS		C	A	B	A		D	B		D	B	
Approach Delay		22.9			13.7		20.4			26.5		
Approach LOS		C			B		C			C		

Cycle Length: 150

Actuated Cycle Length: 84.6

Natural Cycle: 110

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 18.7

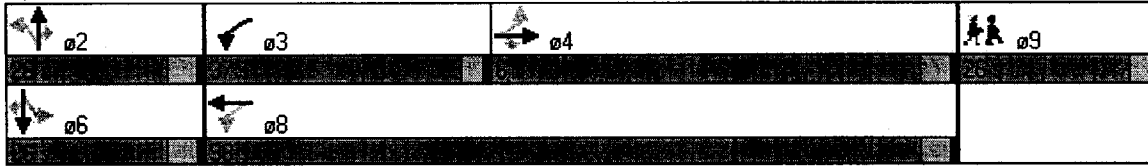
Intersection LOS: B

Intersection Capacity Utilization 74.9%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 8: New Derby St & Lafayette St



Intersection Summary	
Lan g Configurations	
Volume (vph)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phases	
Minimum Initial (s)	4.0
Minimum Split (s)	26.0
Total Split (s)	26.0
Total Split (%)	17%
Yellow Time (s)	3.5
All-Red Time (s)	0.5
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effect Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Intersection Summary	

Lafayette St. @ Derby St.
PM Peak Hour

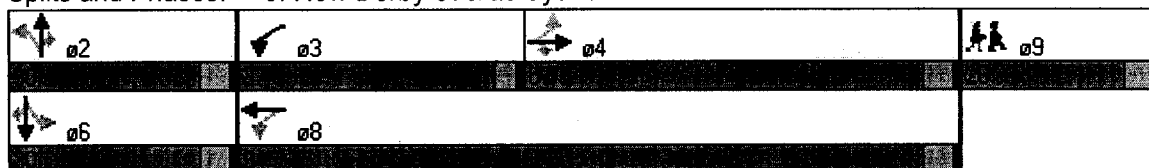
Future w/ Improvements



Lane Configurations	↕	↗	↘	↖	↔	↔	↕	↗	↘	↖	↔	↔
Volume (vph)	10	367	182	372	354	23	158	55	327	5	22	25
Confl. Peds. (#/hr)	14		23	23		14	9		13	13		9
Confl. Bikes (#/hr)			1									1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%	106%
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0	0		0	0			30			0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Turn Type	Perm		Perm	pm+pt			Perm		Perm	Perm		Perm
Protected Phases		4		3	8			2				6
Permitted Phases	4	4	4	8			2		2	6		6
Detector Phases	4	4	4	3	8		2	2	2	6	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	9.0	20.0		20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	57.0	57.0	57.0	37.0	94.0	0.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	38.0%	38.0%	38.0%	24.7%	62.7%	0.0%	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Recall Mode	None	None	None	None	None		None	None	None	None	None	None
Act Effect Green (s)		34.5	34.5	61.0	61.0		29.0	29.0		29.0	29.0	29.0
Actuated g/C Ratio		0.33	0.33	0.57	0.57		0.27	0.27		0.27	0.27	0.27
v/c Ratio		0.86	0.38	0.86	0.49		0.69	0.63		0.68	0.68	0.68
Control Delay		40.2	6.2	25.5	14.9		53.9	10.8		44.4	17.9	17.9
Queue Delay		0.1	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		40.3	6.2	25.5	14.9		53.9	10.8		44.4	17.9	17.9
LOS		D	A	C	B		D	B		D	B	B
Approach Delay		29.2			20.2		27.8			31.8		
Approach LOS		C			C		C			C		C

Cycle Length: 150
 Actuated Cycle Length: 106.1
 Natural Cycle: 110
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 25.3
 Intersection Capacity Utilization 78.1%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 8: New Derby St & Lafayette St



Lane Configurations

Volume (vph)

Confl. Peds. (#/hr)

Confl. Bikes (#/hr)

Peak Hour Factor

Growth Factor

Heavy Vehicles (%)

Bus Blockages (#/hr)

Parking (#/hr)

Mid-Block Traffic (%)

Turn Type

Protected Phases 9

Permitted Phases

Detector Phases

Minimum Initial (s) 4.0

Minimum Split (s) 26.0

Total Split (s) 26.0

Total Split (%) 17%

Yellow Time (s) 4.0

All-Red Time (s) 1.0

Lead/Lag

Lead-Lag Optimize?

Recall Mode None

Act Effct Green (s)

Actuated g/C Ratio

v/c Ratio

Control Delay

Queue Delay

Total Delay

LOS

Approach Delay

Approach LOS