

Appendix D – Synchro Reports

Lanes, Volumes, Timings

1: Michigan & Goodell

09/13/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	168	1808	333	182	674	0	0	296	83
Future Volume (vph)	0	0	0	168	1808	333	182	674	0	0	296	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.86	0.86	0.86	1.00	1.00	1.00	1.00	0.95	0.95
Frt				0.978							0.967	
Fit Protected				0.996			0.950					
Satd. Flow (prot)	0	0	0	0	6242	0	1770	1863	0	0	3422	0
Fit Permitted				0.996			0.314					
Satd. Flow (perm)	0	0	0	0	6242	0	585	1863	0	0	3422	0
Right Turn on Red			Yes		Yes			Yes				Yes
Satd. Flow (RTOR)				52							27	
Link Speed (mph)	30			30			30				30	
Link Distance (ft)	402			246			648				972	
Travel Time (s)	9.1			5.6			14.7				22.1	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	175	1883	347	190	702	0	0	308	86
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	2405	0	190	702	0	0	394	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			0			12				12	
Link Offset(ft)	0			0			0				0	
Crosswalk Width(ft)	16			16			16				16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type			Perm	NA		D.P+P	NA				NA	
Protected Phases				1		3	3 4				4	
Permitted Phases				1		4						
Minimum Split (s)				45.0	45.0		10.6				14.6	
Total Split (s)				58.0	58.0		30.0				22.0	
Total Split (%)				52.7%	52.7%		27.3%				20.0%	
Maximum Green (s)				52.1	52.1		24.3				16.2	
Yellow Time (s)				3.2	3.2		3.2				3.2	
All-Red Time (s)				2.7	2.7		2.5				2.6	
Lost Time Adjust (s)				0.0	0.0		0.0				0.0	
Total Lost Time (s)				5.9	5.9		5.7				5.8	
Lead/Lag						Lead	Lag					
Lead-Lag Optimize?						Yes					Yes	
Walk Time (s)				7.0	7.0						7.0	
Flash Dont Walk (s)				15.0	15.0						14.0	
Pedestrian Calls (#/hr)				4	4						8	
Act Effect Green (s)				52.1	52.1		40.6	46.3			16.2	
Actuated g/C Ratio				0.47	0.47		0.37	0.42			0.15	
v/c Ratio				0.81	0.81		0.40	0.90			0.75	
Control Delay				26.7	26.7		23.7	45.5			51.6	
Queue Delay				0.0	0.0		0.0	0.0			0.0	
Total Delay				26.7	26.7		23.7	45.5			51.6	

AM 2025 Baseline - No Changes to Lane Conf 7:30 am 04/11/2018 Alt 1_2025
C&S Engineers

Synchro 11 Report
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Lanes, Volumes, Timings

1: Michigan & Goodell

09/13/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
LOS					C		C	D				D
Approach Delay					26.7			40.9				51.6
Approach LOS					C			D				D
Queue Length 50th (ft)					400		85	452				132
Queue Length 95th (ft)					450		138	#683				187
Internal Link Dist (ft)		322			166			568				892
Turn Bay Length (ft)												
Base Capacity (vph)					2983		477	784				526
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					0.81		0.40	0.90				0.75

Intersection Summary

Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 6 (5%), Referenced to phase 1:WBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Pretimed
 Maximum v/c Ratio: 0.90
 Intersection Signal Delay: 32.8 Intersection LOS: C
 Intersection Capacity Utilization 79.5% ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Michigan & Goodell



AM 2025 Baseline - No Changes to Lane Conf 7:30 am 04/11/2018 Alt 1_2025
C&S Engineers

Synchro 11 Report
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Lanes, Volumes, Timings
2: Elm St/Bennett Ln & Goodell

09/13/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↑↑↑	↑↑↑		↖	↗				↗
Traffic Volume (vph)	0	0	0	0	2081	8	602	2	0	0	0	19
Future Volume (vph)	0	0	0	0	2081	8	602	2	0	0	0	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.86	0.86	0.95	0.95	1.00	1.00	1.00	1.00
Friction					0.999							0.865
Fit Protected							0.950	0.953				
Satd. Flow (prot)	0	0	0	0	6401	0	1681	1686	0	0	0	1611
Fit Permitted							0.950	0.953				
Satd. Flow (perm)	0	0	0	0	6401	0	1681	1686	0	0	0	1611
Link Speed (mph)	30				30			30				30
Link Distance (ft)	335				402			586				380
Travel Time (s)	7.6				9.1			13.3				8.6
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	0	0	2238	9	647	2	0	0	0	20
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	0	0	0	0	2247	0	323	326	0	0	0	20
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0				0			12				12
Link Offset(ft)	0				0			0				0
Crosswalk Width(ft)	16				16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15				9			15				9
Sign Control		Free			Free			Stop				Stop

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 53.7% ICU Level of Service A
Analysis Period (min) 15

Lanes, Volumes, Timings
3: Oak & Goodell

09/13/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations				↑↑↑	↑↑↑		↖	↗				↗	
Traffic Volume (vph)	0	0	0	0	173	2447	100	0	0	0	0	119	2
Future Volume (vph)	0	0	0	0	173	2447	100	0	0	0	0	119	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Friction						0.994							0.998
Fit Protected													0.997
Satd. Flow (prot)	0	0	0	0	6350	0	0	0	0	0	0	1859	0
Fit Permitted													0.997
Satd. Flow (perm)	0	0	0	0	6350	0	0	0	0	0	0	1859	0
Right Turn on Red				Yes	Yes	Yes			Yes				Yes
Satd. Flow (RTOR)													44
Link Speed (mph)	30				30			30				30	
Link Distance (ft)	385				335			680				542	
Travel Time (s)	8.8				7.6			15.5				12.3	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.92
Adj. Flow (vph)	0	0	0	178	2523	103	0	0	0	0	0	123	2
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	0	0	0	2804	0	0	0	0	0	0	125	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(ft)	0				0			0				0	
Link Offset(ft)	0				0			0				0	
Crosswalk Width(ft)	16				16			16				16	
Two way Left Turn Lane													
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15				9			15				9	
Turn Type					Perm			NA				NA	
Protected Phases								1				3	
Permitted Phases								1					
Minimum Split (s)					58.0			58.0					27.0
Total Split (s)					81.0			81.0					29.0
Total Split (%)					73.6%			73.6%					26.4%
Maximum Green (s)					75.4			75.4					23.3
Yellow Time (s)					3.2			3.2					3.2
All-Red Time (s)					2.4			2.4					2.5
Lost Time Adjust (s)								0.0					0.0
Total Lost Time (s)								5.6					5.7
Lead/Lag													
Lead-Lag Optimize?													
Walk Time (s)					7.0			7.0					7.0
Flash Dont Walk (s)					12.0			12.0					14.0
Pedestrian Calls (#/hr)					5			5					11
Act Effct Green (s)								75.4					23.3
Actuated g/C Ratio								0.69					0.21
v/c Ratio								0.64					0.32
Control Delay								3.9					39.0
Queue Delay								0.0					0.0
Total Delay								3.9					39.0

Lanes, Volumes, Timings

3: Oak & Goodell

09/13/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS					A						D	
Approach Delay					3.9						39.0	
Approach LOS					A						D	
Queue Length 50th (ft)					86						74	
Queue Length 95th (ft)					92						130	
Internal Link Dist (ft)		305			255			600			462	
Turn Bay Length (ft)												
Base Capacity (vph)					4366						394	
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					23						0	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.65						0.32	

Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	24 (22%), Referenced to phase 1:WBTL, Start of Yellow
Natural Cycle:	85
Control Type:	Pretimed
Maximum v/c Ratio:	0.64
Intersection Signal Delay:	5.4
Intersection LOS:	A
Intersection Capacity Utilization:	55.6%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 3: Oak & Goodell



Lanes, Volumes, Timings

4: Ellicott & Goodell

09/13/2022

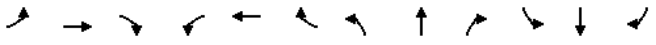


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					←←←			↑				→
Traffic Volume (vph)	0	0	0	113	1931	405	19	90	0	0	87	11
Future Volume (vph)	0	0	0	113	1931	405	19	90	0	0	87	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Fit					0.975						0.984	
Fit Protected					0.998			0.991				
Satd. Flow (prot)	0	0	0	0	6235	0	0	1846	0	0	1833	0
Fit Permitted					0.998			0.947				
Satd. Flow (perm)	0	0	0	0	6235	0	0	1764	0	0	1833	0
Right Turn on Red						Yes		Yes			Yes	Yes
Satd. Flow (RTOR)					75						6	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		140			385			361			475	
Travel Time (s)		3.2			8.8			8.2			10.8	
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
Adj. Flow (vph)	0	0	0	119	2033	426	20	95	0	0	92	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	2578	0	0	115	0	0	104	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)					0			0			0	
Link Offset(ft)					0			0			0	
Crosswalk Width(ft)					16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9		15		9	15	9
Turn Type					Perm			Perm			NA	
Protected Phases						1					3	
Permitted Phases						1					3	
Minimum Split (s)					50.0	50.0		40.0			40.0	
Total Split (s)					68.0	68.0		42.0			42.0	
Total Split (%)					61.8%	61.8%		38.2%			38.2%	
Maximum Green (s)					62.5	62.5		36.3			36.3	
Yellow Time (s)					3.2	3.2		3.2			3.2	
All-Red Time (s)					2.3	2.3		2.5			2.5	
Lost Time Adjust (s)						0.0		0.0			0.0	
Total Lost Time (s)						5.5		5.7			5.7	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)					7.0	7.0		7.0			7.0	
Flash Dont Walk (s)					13.0	13.0		14.0			14.0	
Pedestrian Calls (#/hr)					0	0		21			21	
Act Effct Green (s)					62.5	62.5		36.3			36.3	
Actuated g/C Ratio					0.57	0.57		0.33			0.33	
v/c Ratio					0.72	0.72		0.20			0.17	
Control Delay					4.7	4.7		11.1			25.6	
Queue Delay					0.2	0.2		0.0			0.0	
Total Delay					4.9	4.9		11.1			25.6	

Lanes, Volumes, Timings

4: Elliccott & Goodell

09/13/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS					A			B				C
Approach Delay					4.9			11.1				25.6
Approach LOS					A			B				C
Queue Length 50th (ft)					125			18				49
Queue Length 95th (ft)					135			31				91
Internal Link Dist (ft)		60			305			281				395
Turn Bay Length (ft)												
Base Capacity (vph)					3575			582				608
Starvation Cap Reductn					257			0				0
Spillback Cap Reductn					0			0				0
Storage Cap Reductn					0			0				0
Reduced v/c Ratio					0.78			0.20				0.17

Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	35 (32%), Referenced to phase 1:WBTL, Start of Yellow
Natural Cycle:	90
Control Type:	Pretimed
Maximum v/c Ratio:	0.72
Intersection Signal Delay:	5.9
Intersection LOS:	A
Intersection Capacity Utilization:	58.3%
ICU Level of Service:	B
Analysis Period (min):	15


Splits and Phases: 4: Elliccott & Goodell



Lanes, Volumes, Timings

5: Washington & Goodell

09/13/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	0	0	0	71	1807	66	20	23	0	0	78	6
Future Volume (vph)	0	0	0	71	1807	66	20	23	0	0	78	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	50	0	0	0	0	0	0	0	66
Storage Lanes	0	0	0	1	0	0	0	0	0	0	0	1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.995							0.850
Fit Protected				0.950				0.977				
Satd. Flow (prot)	0	0	0	1770	5060	0	0	1820	0	0	1863	1583
Fit Permitted				0.950				0.868				
Satd. Flow (perm)	0	0	0	1770	5060	0	0	1617	0	0	1863	1583
Right Turn on Red			Yes		Yes		Yes			Yes		Yes
Satd. Flow (RTOR)				10								24
Link Speed (mph)		30		30		30		30		30		30
Link Distance (ft)		156		189		726		324		324		324
Travel Time (s)		3.5		4.3		16.5		7.4		7.4		7.4
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	0.92
Adj. Flow (vph)	0	0	0	75	1902	69	21	24	0	0	82	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	75	1971	0	0	45	0	0	82	7
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12		12		12		12		12		12
Link Offset(ft)		0		0		0		0		0		0
Crosswalk Width(ft)		16		16		16		16		16		16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9		15		9		15
Turn Type				Perm		NA		Perm		NA		Perm
Protected Phases				1		3		3		3		3
Permitted Phases												
Minimum Split (s)				55.0	55.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (s)				78.0	78.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
Total Split (%)				70.9%	70.9%	29.1%	29.1%	29.1%	29.1%	29.1%	29.1%	29.1%
Maximum Green (s)				72.6	72.6	26.3	26.3	26.3	26.3	26.3	26.3	26.3
Yellow Time (s)				3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
All-Red Time (s)				2.2	2.2	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)				5.4	5.4	5.7	5.7	5.7	5.7	5.7	5.7	5.7
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)				7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)				11.0	11.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)				8	8	9	9	9	9	9	9	9
Act Effct Green (s)				72.6	72.6	26.3	26.3	26.3	26.3	26.3	26.3	26.3
Actuated g/C Ratio				0.66	0.66	0.24	0.24	0.24	0.24	0.24	0.24	0.24
v/c Ratio				0.06	0.59	0.12	0.12	0.12	0.12	0.12	0.18	0.02

Lanes, Volumes, Timings

5: Washington & Goodell

09/13/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	1.3	1.8		24.7	1.8		24.7			34.7	1.3	
Queue Delay	0.0	0.1		0.0			0.0			0.0	0.0	
Total Delay	1.3	1.8		24.7			24.7			34.7	1.3	
LOS	A	A		C			C			C	A	
Approach Delay				1.8			24.7			32.1		
Approach LOS				A			C			C		
Queue Length 50th (ft)				2	21		15			46	0	
Queue Length 95th (ft)				m3	22		m33			88	3	
Internal Link Dist (ft)	76			109			646			244		
Turn Bay Length (ft)				50							66	
Base Capacity (vph)	1168	3343					386			445	396	
Starvation Cap Reductn	0	148					0			0	0	
Spillback Cap Reductn	0	234					0			0	0	
Storage Cap Reductn	0	0					0			0	0	
Reduced v/c Ratio	0.06	0.63					0.12			0.18	0.02	

Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	36 (33%), Referenced to phase 1:WBTL, Start of Yellow
Natural Cycle:	85
Control Type:	Pretimed
Maximum v/c Ratio:	0.59
Intersection Signal Delay:	3.5
Intersection LOS:	A
Intersection Capacity Utilization:	57.0%
ICU Level of Service:	B
Analysis Period (min):	15
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 5: Washington & Goodell



Lanes, Volumes, Timings

6: Main St & Pearl/Goodell

09/13/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑	↑	↑	↑			↑	↑↑
Traffic Volume (vph)	0	0	0	41	1401	447	17	62	0	0	223	137
Future Volume (vph)	0	0	0	41	1401	447	17	62	0	0	223	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	54	0	0	0	0	0	0
Storage Lanes	0	0	0	0	0	1	0	0	0	0	0	2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Frt						0.850						0.850
Fit Protected					0.999		0.950					
Satd. Flow (prot)	0	0	0	0	3536	1583	1770	1863	0	0	1863	2787
Fit Permitted					0.999		0.182					
Satd. Flow (perm)	0	0	0	0	3536	1583	339	1863	0	0	1863	2787
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						393						149
Link Speed (mph)				30		30		30				30
Link Distance (ft)				127		123		709				848
Travel Time (s)				2.9		2.8		16.1				19.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	45	1523	486	18	67	0	0	242	149
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1568	486	18	67	0	0	242	149
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0	0	0	0	0	0	12	0	0	12	0	0
Link Offset(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Crosswalk Width(ft)	16			16		16		16		16		16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA	Perm	Perm	NA			NA	Perm
Protected Phases					1		2				3	
Permitted Phases					1		2				3	
Minimum Split (s)				36.3	36.3	36.3	28.0	28.0			25.0	25.0
Total Split (s)				57.0	57.0	57.0	28.0	28.0			25.0	25.0
Total Split (%)				51.8%	51.8%	51.8%	25.5%	25.5%			22.7%	22.7%
Maximum Green (s)				50.7	50.7	50.7	22.0	22.0			19.1	19.1
Yellow Time (s)				3.2	3.2	3.2	3.2	3.2			3.0	3.0
All-Red Time (s)				3.1	3.1	3.1	2.8	2.8			2.9	2.9
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				6.3	6.3	6.3	6.0	6.0			5.9	5.9
Lead/Lag				Lead	Lead	Lead	Lag	Lag				
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes				
Walk Time (s)				7.0	7.0	7.0	7.0	7.0			7.0	7.0
Flash Dont Walk (s)				18.0	18.0	18.0	15.0	15.0			9.0	9.0
Pedestrian Calls (#/hr)				0	0	0	0	0			0	0
Act Effect Green (s)				50.7	50.7	50.7	22.0	22.0			19.1	19.1
Actuated g/C Ratio				0.46	0.46	0.46	0.20	0.20			0.17	0.17
v/c Ratio				0.96	0.52	0.27	0.18				0.75	0.25

Lanes, Volumes, Timings
6: Main St & Pearl/Goodell

09/13/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay					24.2	1.8	54.2	42.6			58.7	7.5
Queue Delay					0.0	0.9	0.0	0.0			0.0	0.0
Total Delay					24.2	2.7	54.2	42.6			58.7	7.5
LOS					C	A	D	D			E	A
Approach Delay					19.1			45.0			39.2	
Approach LOS					B			D			D	
Queue Length 50th (ft)					424	0	10	39			164	0
Queue Length 95th (ft)					#707	0	m32	82			#276	30
Internal Link Dist (ft)	47				43			629			768	
Turn Bay Length (ft)							54					
Base Capacity (vph)					1629	941	67	372			323	607
Starvation Cap Reductn					0	219	0	0			0	0
Spillback Cap Reductn					0	0	0	0			0	0
Storage Cap Reductn					0	0	0	0			0	0
Reduced v/c Ratio					0.96	0.67	0.27	0.18			0.75	0.25

Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	37 (34%), Referenced to phase 1:WBTL, Start of Yellow
Natural Cycle:	100
Control Type:	Pretimed
Maximum v/c Ratio:	0.96
Intersection Signal Delay:	23.1
Intersection LOS:	C
Intersection Capacity Utilization:	64.3%
ICU Level of Service:	C
Analysis Period (min):	15
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.
m	Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Main St & Pearl/Goodell



Lanes, Volumes, Timings
7: Tupper & Pearl

09/13/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↓		↑		↑		↑	↑
Traffic Volume (vph)	0	624	54	72	47	0	18	0	61	9	414	115
Future Volume (vph)	0	624	54	72	47	0	18	0	61	9	414	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988							0.850			0.850
Fit Protected					0.971		0.950				0.999	
Satd. Flow (prot)	0	3497	0	0	1809	0	1770	0	1583	0	1861	1583
Fit Permitted					0.442		0.362				0.999	
Satd. Flow (perm)	0	3497	0	0	823	0	674	0	1583	0	1861	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10							66			125
Link Speed (mph)		30			30		30				30	
Link Distance (ft)		225			351		561				440	
Travel Time (s)		5.1			8.0		12.8				10.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	678	59	78	51	0	20	0	66	10	450	125
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	737	0	0	129	0	20	0	66	0	460	125
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0		12				12	
Link Offset(ft)		0			0		0				0	
Crosswalk Width(ft)		16			16		16				16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA		Perm	NA		D.Pm		Perm	Perm	NA	Perm
Protected Phases		1			1						3	
Permitted Phases				1			3		3	3		3
Minimum Split (s)		50.0		50.0		50.0	40.0		40.0	40.0		40.0
Total Split (s)		52.0		52.0		52.0	58.0		58.0	58.0		58.0
Total Split (%)		47.3%		47.3%		47.3%	52.7%		52.7%	52.7%		52.7%
Maximum Green (s)		46.4		46.4		46.4	52.8		52.8	52.8		52.8
Yellow Time (s)		3.2		3.2		3.2	3.2		3.2	3.2		3.2
All-Red Time (s)		2.4		2.4		2.4	2.0		2.0	2.0		2.0
Lost Time Adjust (s)		0.0		0.0		0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)		5.6		5.6		5.6	5.2		5.2	5.2		5.2
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)		7.0		7.0		7.0	7.0		7.0	7.0		7.0
Flash Dont Walk (s)		15.0		15.0		15.0	12.0		12.0	12.0		12.0
Pedestrian Calls (#/hr)		0		0		0	0		0	0		0
Act Effct Green (s)		46.4		46.4		46.4	52.8		52.8	52.8		52.8
Actuated g/C Ratio		0.42		0.42		0.42	0.48		0.48	0.48		0.48
v/c Ratio		0.50		0.37		0.37	0.06		0.08	0.08		0.52
Control Delay		24.4		25.8		25.8	16.1		4.1	4.1		2.8
Queue Delay		0.0		0.0		0.0	0.0		0.0	0.0		0.0
Total Delay		24.4		25.8		25.8	16.1		4.1	4.1		2.8

Lanes, Volumes, Timings

7: Tupper & Pearl

09/13/2022

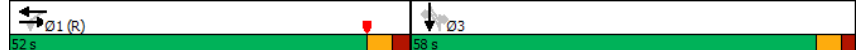


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	C			C			B			A		
Approach Delay	24.4			25.8			6.9			2.3		
Approach LOS	C			C			A			A		
Queue Length 50th (ft)	193			63			7			0		
Queue Length 95th (ft)	249			125			22			m26 m0		
Internal Link Dist (ft)	145			271			481			360		
Turn Bay Length (ft)												
Base Capacity (vph)	1480			347			323			794		
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	0.50			0.37			0.06			0.08		

Intersection Summary

Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Yellow, Master Intersection
 Natural Cycle: 90
 Control Type: Pretimed
 Maximum v/c Ratio: 0.52
 Intersection Signal Delay: 15.1 Intersection LOS: B
 Intersection Capacity Utilization 68.0% ICU Level of Service C
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

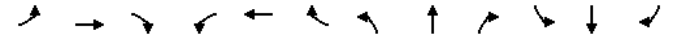
Splits and Phases: 7: Tupper & Pearl



Lanes, Volumes, Timings

8: Main St & Tupper

09/13/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕↕			↕↕			↕↕			↕↕		
Traffic Volume (vph)	37	645	8	5	35	11	2	22	6	146	71	49
Future Volume (vph)	37	645	8	5	35	11	2	22	6	146	71	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0			0			0		
Storage Lanes	0			0			0			0		
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.998			0.971			0.975			0.938		
Fit Protected	0.997			0.995			0.997			0.950		
Satd. Flow (prot)	0 3522			0 0 1800			0 0 1811			0 1770 1747		
Fit Permitted	0.936			0.949			0.989			0.736		
Satd. Flow (perm)	0 3306			0 0 1716			0 0 1796			0 1371 1747		
Right Turn on Red	Yes			Yes			Yes			Yes		
Satd. Flow (RTOR)	2			12			6			33		
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	351			263			1174			709		
Travel Time (s)	8.0			6.0			26.7			16.1		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.92
Adj. Flow (vph)	40	694	9	5	38	12	2	24	6	157	76	53
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	743	0	0	55	0	0	32	0	157	129	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			0			12			12		
Link Offset(ft)	0			0			0			0		
Crosswalk Width(ft)	16			16			16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9 15			9 15			9 15		
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	1			1			3			3		
Permitted Phases	1			1			3			3		
Minimum Split (s)	50.0	50.0		50.0	50.0		40.0	40.0		40.0	40.0	
Total Split (s)	69.0	69.0		69.0	69.0		41.0	41.0		41.0	41.0	
Total Split (%)	62.7%	62.7%		62.7%	62.7%		37.3%	37.3%		37.3%	37.3%	
Maximum Green (s)	62.8	62.8		62.8	62.8		34.9	34.9		34.9	34.9	
Yellow Time (s)	3.2	3.2		3.2	3.2		3.2	3.2		3.2	3.2	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.9	2.9		2.9	2.9	
Lost Time Adjust (s)	0.0			0.0			0.0			0.0		
Total Lost Time (s)	6.2			6.2			6.1			6.1		
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)	0			0			0			0		
Act Effct Green (s)	62.8			62.8			34.9			34.9		
Actuated g/C Ratio	0.57			0.57			0.32			0.32		
v/c Ratio	0.39			0.06			0.06			0.36		

Lanes, Volumes, Timings

8: Main St & Tupper

09/13/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	1.9			7.7				22.8		43.4	36.7	
Queue Delay	0.2			0.0				0.0		0.0	0.0	
Total Delay	2.0			7.7				22.8		43.4	36.7	
LOS	A			A				C		D	D	
Approach Delay	2.0			7.7				22.8			40.4	
Approach LOS	A			A				C			D	
Queue Length 50th (ft)	14			14				13		113	80	
Queue Length 95th (ft)	17			31				35		m147	m106	
Internal Link Dist (ft)	271			183				1094			629	
Turn Bay Length (ft)										40		
Base Capacity (vph)	1888			984				573		434	576	
Starvation Cap Reductn	381			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			0.06				0.06		0.36	0.22	

Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	20 (18%), Referenced to phase 1:EBWB, Start of Yellow
Natural Cycle:	90
Control Type:	Pretimed
Maximum v/c Ratio:	0.39
Intersection Signal Delay:	12.7
Intersection LOS:	B
Intersection Capacity Utilization:	47.1%
ICU Level of Service:	A
Analysis Period (min):	15
m Volume for 95th percentile queue is metered by upstream signal.	

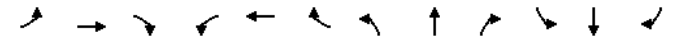
Splits and Phases: 8: Main St & Tupper



Lanes, Volumes, Timings

9: Washington & Tupper

09/13/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕	↕	↕	↕	↕
Traffic Volume (vph)	30	644	81	3	22	2	14	53	48	70	76	4
Future Volume (vph)	30	644	81	3	22	2	14	53	48	70	76	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		78	85		0
Storage Lanes	0		0	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.984			0.990					0.850		0.993
Fit Protected		0.998			0.995			0.990		0.950		
Satd. Flow (prot)	0	3476	0	0	1835	0	0	1844	1583	1770	1850	0
Fit Permitted		0.943			0.948			0.940		0.711		
Satd. Flow (perm)	0	3284	0	0	1748	0	0	1751	1583	1324	1850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			2				75			3
Link Speed (mph)		30			30				30			30
Link Distance (ft)		263			328				1190			726
Travel Time (s)		6.0			7.5				27.0			16.5
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	0.92
Adj. Flow (vph)	32	685	86	3	23	2	15	56	51	74	81	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	803	0	0	28	0	0	71	51	74	85	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0				12			12
Link Offset(ft)		0			0				0			0
Crosswalk Width(ft)		16			16				16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	D.P+P		NA
Protected Phases		1			1			4		3		3 4
Permitted Phases	1			1			4		4			4
Minimum Split (s)	47.0	47.0		47.0	47.0		28.0	28.0	28.0		15.0	
Total Split (s)	63.0	63.0		63.0	63.0		30.0	30.0	30.0		17.0	
Total Split (%)	57.3%	57.3%		57.3%	57.3%		27.3%	27.3%	27.3%		15.5%	
Maximum Green (s)	57.5	57.5		57.5	57.5		24.8	24.8	24.8		11.9	
Yellow Time (s)	3.2	3.2		3.2	3.2		3.2	3.2	3.2		3.2	
All-Red Time (s)	2.3	2.3		2.3	2.3		2.0	2.0	2.0		1.9	
Lost Time Adjust (s)		0.0			0.0			0.0	0.0		0.0	
Total Lost Time (s)		5.5			5.5			5.2	5.2		5.1	
Lead/Lag							Lag	Lag	Lag		Lead	
Lead-Lag Optimize?							Yes	Yes	Yes		Yes	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0		7.0	
Flash Dont Walk (s)	17.0	17.0		17.0	17.0		11.0	11.0	11.0			
Pedestrian Calls (#/hr)	17	17		17	17		23	23	23			
Act Effct Green (s)		57.5			57.5			24.8	24.8		36.8	41.9
Actuated g/C Ratio		0.52			0.52			0.23	0.23		0.33	0.38
v/c Ratio		0.47			0.03			0.18	0.12		0.15	0.12

Lanes, Volumes, Timings

9: Washington & Tupper

09/13/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	7.6			20.7				35.9	4.3	12.0	10.8	
Queue Delay	0.3			0.0				0.0	0.0	0.0	0.0	
Total Delay	7.9			20.7				35.9	4.3	12.0	10.8	
LOS	A			C				D	A	B	B	
Approach Delay	7.9			20.7				22.7			11.4	
Approach LOS	A			C				C			B	
Queue Length 50th (ft)	60			13				41	0	19	21	
Queue Length 95th (ft)	79			40				80	17	40	43	
Internal Link Dist (ft)	183			248				1110			646	
Turn Bay Length (ft)									78	85		
Base Capacity (vph)	1724			914				394	414	491	706	
Starvation Cap Reductn	386			0				0	0	0	0	
Spillback Cap Reductn	0			0				0	0	0	0	
Storage Cap Reductn	0			0				0	0	0	0	
Reduced v/c Ratio	0.60			0.03				0.18	0.12	0.15	0.12	

Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	17 (15%), Referenced to phase 1:EBWB, Start of Yellow
Natural Cycle:	90
Control Type:	Pretimed
Maximum v/c Ratio:	0.47
Intersection Signal Delay:	10.3
Intersection Capacity Utilization:	42.1%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	A

Splits and Phases: 9: Washington & Tupper



Lanes, Volumes, Timings

10: Ellicott & Tupper

09/13/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔						↕	↕		↕	↕
Traffic Volume (vph)	20	685	66	0	0	0	16	106	99	35	82	13
Future Volume (vph)	20	685	66	0	0	0	16	106	99	35	82	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	80		150
Storage Lanes	0		0	0		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987							0.850			0.850
Fit Protected		0.999						0.994			0.985	
Satd. Flow (prot)	0	3490	0	0	0	0	0	1852	1583	0	1835	1583
Fit Permitted		0.999						0.961			0.890	
Satd. Flow (perm)	0	3490	0	0	0	0	0	1790	1583	0	1658	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14							108			24
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		328			387			1108			362	
Travel Time (s)		7.5			8.8			25.2			8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	745	72	0	0	0	17	115	108	38	89	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	839	0	0	0	0	0	132	108	0	127	14
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			0			0		0		0	
Link Offset(ft)	0			0			0		0		0	
Crosswalk Width(ft)	16			16			16		16		16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA					Perm	NA	Perm	Perm	NA	Perm
Protected Phases		1						3			3	
Permitted Phases	1						3		3		3	
Minimum Split (s)	50.0	50.0					40.0	40.0	40.0	40.0	40.0	40.0
Total Split (s)	65.0	65.0					45.0	45.0	45.0	45.0	45.0	45.0
Total Split (%)	59.1%	59.1%					40.9%	40.9%	40.9%	40.9%	40.9%	40.9%
Maximum Green (s)	59.6	59.6					39.7	39.7	39.7	39.7	39.7	39.7
Yellow Time (s)	3.2	3.2					3.2	3.2	3.2	3.2	3.2	3.2
All-Red Time (s)	2.2	2.2					2.1	2.1	2.1	2.1	2.1	2.1
Lost Time Adjust (s)		0.0						0.0	0.0		0.0	0.0
Total Lost Time (s)		5.4						5.3	5.3		5.3	5.3
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0					7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	14.0	14.0					13.0	13.0	13.0	13.0	13.0	13.0
Pedestrian Calls (#/hr)	19	19					46	46	46	46	46	46
Act Effect Green (s)		59.6						39.7	39.7		39.7	39.7
Actuated g/C Ratio		0.54						0.36	0.36		0.36	0.36
v/c Ratio		0.44						0.20	0.17		0.21	0.02

Lanes, Volumes, Timings

10: Ellicott & Tupper

09/13/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	4.3							25.3	5.2		17.5	2.9
Queue Delay	0.2							0.0	0.0		0.0	0.0
Total Delay	4.5							25.3	5.2		17.5	2.9
LOS	A							C	A		B	A
Approach Delay	4.5							16.3			16.0	
Approach LOS	A							B			B	
Queue Length 50th (ft)	44							64	0		53	0
Queue Length 95th (ft)	54							110	36		m77	m3
Internal Link Dist (ft)	248				307			1028			282	
Turn Bay Length (ft)												150
Base Capacity (vph)	1897							646	640		598	586
Starvation Cap Reductn	312							0	0		0	0
Spillback Cap Reductn	0							0	0		0	0
Storage Cap Reductn	0							0	0		0	0
Reduced v/c Ratio	0.53							0.20	0.17		0.21	0.02

Intersection Summary

Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 22 (20%), Referenced to phase 1:EBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Pretimed
 Maximum v/c Ratio: 0.44
 Intersection Signal Delay: 8.1 Intersection LOS: A
 Intersection Capacity Utilization 47.3% ICU Level of Service A
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: Ellicott & Tupper



Lanes, Volumes, Timings

11: Oak & Tupper

09/13/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑							↓	↑↑	
Traffic Volume (vph)	0	582	242	0	0	0	0	0	0	42	181	0
Future Volume (vph)	0	582	242	0	0	0	0	0	0	42	181	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	0		0	0	0	0
Storage Lanes	0		1	0		0	0		0	1	0	0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00
Fit Protected										0.950	0.999	
Satd. Flow (prot)	0	3539	1583	0	0	0	0	0	0	1610	3387	0
Fit Permitted										0.950	0.999	
Satd. Flow (perm)	0	3539	1583	0	0	0	0	0	0	1610	3387	0
Right Turn on Red			Yes			Yes			Yes	Yes	Yes	Yes
Satd. Flow (RTOR)										43	24	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		387			354			125			680	
Travel Time (s)		8.8			8.0			2.8			15.5	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.92
Adj. Flow (vph)	0	661	275	0	0	0	0	0	0	48	206	0
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	0	661	275	0	0	0	0	0	0	43	211	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		15			9			15		9		15
Turn Type		NA	custom							Perm		NA
Protected Phases		1	1									3
Permitted Phases			3								3	
Minimum Split (s)		50.0	50.0							40.0	40.0	
Total Split (s)		67.0	67.0							43.0	43.0	
Total Split (%)		60.9%	60.9%							39.1%	39.1%	
Maximum Green (s)		61.6	61.6							37.9	37.9	
Yellow Time (s)		3.2	3.2							3.2	3.2	
All-Red Time (s)		2.2	2.2							1.9	1.9	
Lost Time Adjust (s)		0.0	0.0							0.0	0.0	
Total Lost Time (s)		5.4	5.4							5.1	5.1	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)		7.0	7.0							7.0	7.0	
Flash Dont Walk (s)		18.0	18.0							15.0	15.0	
Pedestrian Calls (#/hr)		0	0							0	0	
Act Effect Green (s)		61.6	110.0							37.9	37.9	
Actuated g/C Ratio		0.56	1.00							0.34	0.34	
v/c Ratio		0.33	0.17							0.07	0.18	

Lanes, Volumes, Timings

11: Oak & Tupper

09/13/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Control Delay	7.4	0.2								3.7	13.9		
Queue Delay	0.2	0.0								0.0	0.0		
Total Delay	7.6	0.2								3.7	13.9		
LOS	A	A								A	B		
Approach Delay	5.4						12.2						
Approach LOS	A						B						
Queue Length 50th (ft)	54		0							1	35		
Queue Length 95th (ft)	70		0							m8	58		
Internal Link Dist (ft)	307			274			45			600			
Turn Bay Length (ft)				200									
Base Capacity (vph)	1981		1583							582	1182		
Starvation Cap Reductn	516		0							0	0		
Spillback Cap Reductn	21		0							0	0		
Storage Cap Reductn	0		0							0	0		
Reduced v/c Ratio	0.45		0.17							0.07	0.18		

Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	11 (10%), Referenced to phase 1:EBT, Start of Yellow
Natural Cycle:	90
Control Type:	Pretimed
Maximum v/c Ratio:	0.33
Intersection Signal Delay:	6.9
Intersection LOS:	A
Intersection Capacity Utilization:	55.6%
ICU Level of Service:	B
Analysis Period (min):	15
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 11: Oak & Tupper



Lanes, Volumes, Timings

12: Elm St & Tupper

09/13/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑						↑↑				
Traffic Volume (vph)	9	622	0	0	0	0	0	571	4	0	0	0
Future Volume (vph)	9	622	0	0	0	0	0	571	4	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt	0.999											
Fit Protected	0.999											
Satd. Flow (prot)	0	3536	0	0	0	0	0	3536	0	0	0	0
Fit Permitted	0.999											
Satd. Flow (perm)	0	3536	0	0	0	0	0	3536	0	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)	21								1			
Link Speed (mph)	30		30				30		30			
Link Distance (ft)	354		313				418		586			
Travel Time (s)	8.0		7.1				9.5		13.3			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	10	691	0	0	0	0	0	634	4	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	701	0	0	0	0	0	638	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0		0				0		0			
Link Offset(ft)	0		0				0		0			
Crosswalk Width(ft)	16		16				16		16			
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9		15		9		15		9	
Turn Type	Perm	NA							NA			
Protected Phases	3								1			
Permitted Phases	3											
Minimum Split (s)	30.0								60.0			
Total Split (s)	44.0								66.0			
Total Split (%)	40.0%								60.0%			
Maximum Green (s)	38.9								60.9			
Yellow Time (s)	3.2								3.2			
All-Red Time (s)	1.9								1.9			
Lost Time Adjust (s)	0.0								0.0			
Total Lost Time (s)	5.1								5.1			
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0											
Flash Dont Walk (s)	12.0											
Pedestrian Calls (#/hr)	0											
Act Effct Green (s)	38.9								60.9			
Actuated g/C Ratio	0.35								0.55			
v/c Ratio	0.55								0.33			
Control Delay	10.1								13.9			
Queue Delay	0.5								0.0			
Total Delay	10.5								13.9			

Lanes, Volumes, Timings

12: Elm St & Tupper

09/13/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		B						B				
Approach Delay		10.5						13.9				
Approach LOS		B						B				
Queue Length 50th (ft)		97						122				
Queue Length 95th (ft)		162						159				
Internal Link Dist (ft)		274			233			338			506	
Turn Bay Length (ft)												
Base Capacity (vph)		1264						1958				
Starvation Cap Reductn		202						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.66						0.33				

Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	19 (17%), Referenced to phase 3:EBTL, Start of Yellow
Natural Cycle:	90
Control Type:	Pretimed
Maximum v/c Ratio:	0.55
Intersection Signal Delay:	12.2
Intersection LOS:	B
Intersection Capacity Utilization:	53.7%
ICU Level of Service:	A
Analysis Period (min):	15

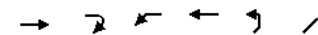
Splits and Phases: 12: Elm St & Tupper



Lanes, Volumes, Timings

34:

09/13/2022



Lane Group	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations	↑↑					↑↑
Traffic Volume (vph)	549	0	0	0	0	733
Future Volume (vph)	549	0	0	0	0	733
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	1.00	1.00	0.88
Fit						0.850
Fit Protected						
Satd. Flow (prot)	3539	0	0	0	0	2787
Fit Permitted						
Satd. Flow (perm)	3539	0	0	0	0	2787
Link Speed (mph)	30			55	55	
Link Distance (ft)	334			197	283	
Travel Time (s)	7.6			2.4	3.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	597	0	0	0	0	797
Shared Lane Traffic (%)						
Lane Group Flow (vph)	597	0	0	0	0	797
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	L NA	Right	Left	Left	Left	R NA
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

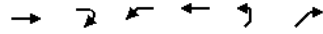
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization:	47.5%
ICU Level of Service:	A
Analysis Period (min):	15

Lanes, Volumes, Timings

41: Pearl & Edward

09/13/2022



Lane Group	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations			↘	↗		
Traffic Volume (vph)	0	0	692	863	0	0
Future Volume (vph)	0	0	692	863	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr						
Fit Protected			0.950			
Satd. Flow (prot)	0	0	1770	1863	0	0
Fit Permitted			0.950			
Satd. Flow (perm)	0	0	1770	1863	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	525			127	132	
Travel Time (s)	11.9			2.9	3.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	752	938	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	752	938	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

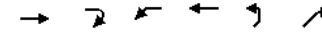
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	48.8%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings

43:

09/13/2022



Lane Group	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations			↘	↗		
Traffic Volume (vph)	0	0	2622	1263	0	0
Future Volume (vph)	0	0	2622	1263	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Fr						
Fit Protected			0.950	0.975		
Satd. Flow (prot)	0	0	1610	3305	0	0
Fit Permitted			0.950	0.975		
Satd. Flow (perm)	0	0	1610	3305	0	0
Link Speed (mph)	30			55	55	
Link Distance (ft)	208			242	179	
Travel Time (s)	4.7			3.0	2.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	2850	1373	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1425	2798	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

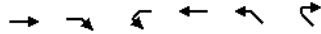
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	120.8%
ICU Level of Service	H
Analysis Period (min)	15

Lanes, Volumes, Timings

50: Goodell

09/13/2022



Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations				↑↑	↑↑	
Traffic Volume (vph)	0	0	0	952	1289	0
Future Volume (vph)	0	0	0	952	1289	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Fr						
Fit Protected					0.950	
Satd. Flow (prot)	0	0	0	3539	3433	0
Fit Permitted					0.950	
Satd. Flow (perm)	0	0	0	3539	3433	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	246			303	185	
Travel Time (s)	5.6			6.9	4.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	1035	1401	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1035	1401	0
Enter Blocked Intersection	No	No	No	Yes	Yes	Yes
Lane Alignment	Left	Right	Left	R NA	L NA	L NA
Median Width(ft)	0			0	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	69.8%
ICU Level of Service	C
Analysis Period (min)	15

Lanes, Volumes, Timings

86: Oak St

09/13/2022



Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations				↑↑	↑↑	
Traffic Volume (vph)	0	0	0	211	2622	0
Future Volume (vph)	0	0	0	211	2622	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Fr						
Fit Protected					0.950	
Satd. Flow (prot)	0	0	0	3539	3433	0
Fit Permitted					0.950	
Satd. Flow (perm)	0	0	0	3539	3433	0
Link Speed (mph)	30			30	55	
Link Distance (ft)	195			181	212	
Travel Time (s)	4.4			4.1	2.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	229	2850	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	229	2850	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

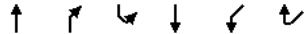
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	120.8%
ICU Level of Service	H
Analysis Period (min)	15

Lanes, Volumes, Timings

89: Elm St

09/13/2022



Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations	↑↑	↑				
Traffic Volume (vph)	619	755	0	0	0	0
Future Volume (vph)	619	755	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.91	0.91	1.00	1.00	1.00	1.00
Frt	0.948	0.850				
Fit Protected						
Satd. Flow (prot)	3214	1441	0	0	0	0
Fit Permitted						
Satd. Flow (perm)	3214	1441	0	0	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	155			418	135	
Travel Time (s)	3.5			9.5	3.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	673	821	0	0	0	0
Shared Lane Traffic (%)		43%				
Lane Group Flow (vph)	1026	468	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	34.5%		ICU Level of Service A			
Analysis Period (min)	15					

Alternative 1
1: Michigan & Goodell

AM 2045
09/14/2022

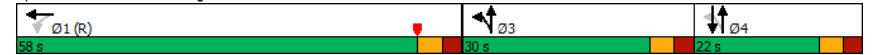
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	168	1808	333	162	719	0	0	296	128
Future Volume (vph)	0	0	0	168	1808	333	162	719	0	0	296	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.86	0.86	0.86	1.00	1.00	1.00	1.00	0.95	0.95
Frt				0.978							0.955	
Fit Protected				0.996			0.950					
Satd. Flow (prot)	0	0	0	0	6242	0	1770	1863	0	0	3380	0
Fit Permitted				0.996			0.249					
Satd. Flow (perm)	0	0	0	0	6242	0	464	1863	0	0	3380	0
Right Turn on Red			Yes		Yes			Yes				Yes
Satd. Flow (RTOR)				52							52	
Link Speed (mph)		30		30			30				30	
Link Distance (ft)		402		246			648				972	
Travel Time (s)		9.1		5.6			14.7				22.1	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	175	1883	347	169	749	0	0	308	133
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	2405	0	169	749	0	0	441	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0		0			12				12	
Link Offset(ft)		0		0			0				0	
Crosswalk Width(ft)		16		16			16				16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type			Perm	NA		D.P+P	NA				NA	
Protected Phases				1		3	3 4				4	
Permitted Phases				1		4						
Minimum Split (s)				45.0	45.0		10.6				14.6	
Total Split (s)				58.0	58.0		30.0				22.0	
Total Split (%)				52.7%	52.7%		27.3%				20.0%	
Maximum Green (s)				52.1	52.1		24.3				16.2	
Yellow Time (s)				3.2	3.2		3.2				3.2	
All-Red Time (s)				2.7	2.7		2.5				2.6	
Lost Time Adjust (s)				0.0	0.0		0.0				0.0	
Total Lost Time (s)				5.9	5.9		5.7				5.8	
Lead/Lag						Lead	Lag					
Lead-Lag Optimize?						Yes					Yes	
Walk Time (s)				7.0	7.0						7.0	
Flash Dont Walk (s)				15.0	15.0						14.0	
Pedestrian Calls (#/hr)				4	4						8	
Act Effct Green (s)				52.1	52.1		40.6	46.3			16.2	
Actuated g/C Ratio				0.47	0.47		0.37	0.42			0.15	
v/c Ratio				0.81	0.81		0.37	0.96			0.81	
Control Delay				26.7	26.7		23.3	54.8			53.1	
Queue Delay				0.0	0.0		0.0	0.0			0.0	
Total Delay				26.7	26.7		23.3	54.8			53.1	

Alternative 1
1: Michigan & Goodell

AM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS					C		C	D			D	
Approach Delay					26.7			49.0			53.1	
Approach LOS					C			D			D	
Queue Length 50th (ft)					400		75	502			142	
Queue Length 95th (ft)					450		123	#757			#218	
Internal Link Dist (ft)					322		166	568			892	
Turn Bay Length (ft)												
Base Capacity (vph)					2983		459	784			542	
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					0.81		0.37	0.96			0.81	
Intersection Summary												
Area Type:	Other											
Cycle Length:	110											
Actuated Cycle Length:	110											
Offset:	6 (5%), Referenced to phase 1:WBTL, Start of Yellow											
Natural Cycle:	90											
Control Type:	Pretimed											
Maximum v/c Ratio:	0.96											
Intersection Signal Delay:	35.2											
Intersection LOS:	D											
Intersection Capacity Utilization:	81.8%											
ICU Level of Service:	D											
Analysis Period (min):	15											
#	95th percentile volume exceeds capacity, queue may be longer.											
	Queue shown is maximum after two cycles.											

Splits and Phases: 1: Michigan & Goodell



Alternative 1
2: Elm St/Bennett Ln & Goodell

AM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↔	↔				↔
Traffic Volume (vph)	0	0	0	0	2106	8	647	2	0	0	0	19
Future Volume (vph)	0	0	0	0	2106	8	647	2	0	0	0	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.86	0.86	0.95	0.95	1.00	1.00	1.00	1.00
Fit					0.999		0.950	0.953				0.865
Fit Protected							0.950	0.953				
Satd. Flow (prot)	0	0	0	0	6401	0	1681	1686	0	0	0	1611
Fit Permitted							0.950	0.953				
Satd. Flow (perm)	0	0	0	0	6401	0	1681	1686	0	0	0	1611
Link Speed (mph)		30			30			30				30
Link Distance (ft)		335			402			586				380
Travel Time (s)		7.6			9.1			13.3				8.6
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	0	0	2265	9	696	2	0	0	0	20
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	0	0	0	0	2274	0	348	350	0	0	0	20
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop				Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.3%
ICU Level of Service	B
Analysis Period (min)	15

Alternative 1
3: Oak & Goodell

AM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↑↑↑							↔	
Traffic Volume (vph)	0	0	0	0	173	2517	100	0	0	0	0	94	2
Future Volume (vph)	0	0	0	0	173	2517	100	0	0	0	0	94	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fit						0.995						0.997	
Fit Protected						0.997							
Satd. Flow (prot)	0	0	0	0	6357	0	0	0	0	0	0	1857	0
Fit Permitted						0.997							
Satd. Flow (perm)	0	0	0	0	6357	0	0	0	0	0	0	1857	0
Right Turn on Red					Yes	Yes	Yes			Yes			Yes
Satd. Flow (RTOR)							43					1	
Link Speed (mph)		30			30			30				30	
Link Distance (ft)		385			335			680				542	
Travel Time (s)		8.8			7.6			15.5				12.3	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	0	0	0	178	2595	103	0	0	0	0	97	2
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	0	0	0	2876	0	0	0	0	0	0	99	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(ft)		0			0			0				0	
Link Offset(ft)		0			0			0				0	
Crosswalk Width(ft)		16			16			16				16	
Two way Left Turn Lane													
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9	
Turn Type					Perm			NA				NA	
Protected Phases								1				3	
Permitted Phases								1					
Minimum Split (s)					58.0			58.0				27.0	
Total Split (s)					81.0			81.0				29.0	
Total Split (%)					73.6%			73.6%				26.4%	
Maximum Green (s)					75.4			75.4				23.3	
Yellow Time (s)					3.2			3.2				3.2	
All-Red Time (s)					2.4			2.4				2.5	
Lost Time Adjust (s)								0.0				0.0	
Total Lost Time (s)								5.6				5.7	
Lead/Lag													
Lead-Lag Optimize?													
Walk Time (s)					7.0			7.0				7.0	
Flash Dont Walk (s)					12.0			12.0				14.0	
Pedestrian Calls (#/hr)					5			5				11	
Act Effct Green (s)								75.4				23.3	
Actuated g/C Ratio								0.69				0.21	
v/c Ratio								0.66				0.25	
Control Delay								3.9				37.8	
Queue Delay								0.0				0.0	
Total Delay								3.9				37.8	

Alternative 1
3: Oak & Goodell

AM 2045
09/14/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS					A						D	
Approach Delay					3.9						37.8	
Approach LOS					A						D	
Queue Length 50th (ft)					87						58	
Queue Length 95th (ft)					93						107	
Internal Link Dist (ft)		305			255			600			462	
Turn Bay Length (ft)												
Base Capacity (vph)					4370						394	
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					49						0	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.67						0.25	

Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	24 (22%), Referenced to phase 1:WBTL, Start of Yellow
Natural Cycle:	85
Control Type:	Pretimed
Maximum v/c Ratio:	0.66
Intersection Signal Delay:	5.0
Intersection LOS:	A
Intersection Capacity Utilization:	55.3%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 3: Oak & Goodell



Alternative 1
4: Ellicott & Goodell

AM 2045
09/14/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑↑			↑				↓
Traffic Volume (vph)	0	0	0	113	1971	435	19	90	0	0	112	11
Future Volume (vph)	0	0	0	113	1971	435	19	90	0	0	112	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.974							0.988
Fit Protected					0.998			0.991				
Satd. Flow (prot)	0	0	0	0	6229	0	0	1846	0	0	1840	0
Fit Permitted					0.998			0.943				
Satd. Flow (perm)	0	0	0	0	6229	0	0	1757	0	0	1840	0
Right Turn on Red					Yes		Yes		Yes			Yes
Satd. Flow (RTOR)					79						5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		140			385			361			475	
Travel Time (s)		3.2			8.8			8.2			10.8	
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
Adj. Flow (vph)	0	0	0	119	2075	458	20	95	0	0	118	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	2652	0	0	115	0	0	130	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)					0			0			0	
Link Offset(ft)					0			0			0	
Crosswalk Width(ft)					16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type					Perm			Perm			NA	
Protected Phases						1			3			3
Permitted Phases						1			3			3
Minimum Split (s)					50.0	50.0		40.0	40.0			40.0
Total Split (s)					68.0	68.0		42.0	42.0			42.0
Total Split (%)					61.8%	61.8%		38.2%	38.2%			38.2%
Maximum Green (s)					62.5	62.5		36.3	36.3			36.3
Yellow Time (s)					3.2	3.2		3.2	3.2			3.2
All-Red Time (s)					2.3	2.3		2.5	2.5			2.5
Lost Time Adjust (s)						0.0			0.0			0.0
Total Lost Time (s)						5.5			5.7			5.7
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)					7.0	7.0		7.0	7.0			7.0
Flash Dont Walk (s)					13.0	13.0		14.0	14.0			14.0
Pedestrian Calls (#/hr)					0	0		21	21			21
Act Effct Green (s)					62.5	62.5		36.3	36.3			36.3
Actuated g/C Ratio					0.57	0.57		0.33	0.33			0.33
v/c Ratio					0.74	0.74		0.20	0.20			0.21
Control Delay					5.2	5.2		11.2	11.2			26.7
Queue Delay					0.2	0.2		0.0	0.0			0.0
Total Delay					5.4	5.4		11.2	11.2			26.7

Alternative 1
4: Ellicott & Goodell

AM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS					A			B			C	
Approach Delay					5.4			11.2			26.7	
Approach LOS					A			B			C	
Queue Length 50th (ft)					135			19			63	
Queue Length 95th (ft)					145			31			110	
Internal Link Dist (ft)		60			305			281			395	
Turn Bay Length (ft)												
Base Capacity (vph)					3573			579			610	
Starvation Cap Reductn					248			0			0	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.80			0.20			0.21	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 35 (32%), Referenced to phase 1:WBTL, Start of Yellow

Natural Cycle: 90

Control Type: Pretimed

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 6.6

Intersection Capacity Utilization 64.0%

Analysis Period (min) 15

Intersection LOS: A

ICU Level of Service B



Alternative 1
5: Washington & Goodell

AM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↑	↑↑↑			↑			↑	↑
Traffic Volume (vph)	0	0	0	71	1847	66	20	23	0	0	109	6
Future Volume (vph)	0	0	0	71	1847	66	20	23	0	0	109	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	50	0	0	0	0	0	0	0	66
Storage Lanes	0	0	0	1	0	0	0	0	0	0	0	1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Fit Protected				0.950				0.977				
Satd. Flow (prot)	0	0	0	1770	5060	0	0	1820	0	0	1863	1583
Fit Permitted				0.950				0.857				
Satd. Flow (perm)	0	0	0	1770	5060	0	0	1596	0	0	1863	1583
Right Turn on Red			Yes		Yes		Yes				Yes	
Satd. Flow (RTOR)				10								24
Link Speed (mph)		30			30			30				30
Link Distance (ft)		156			189			726				324
Travel Time (s)		3.5			4.3			16.5				7.4
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
Adj. Flow (vph)	0	0	0	75	1944	69	21	24	0	0	115	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	75	2013	0	0	45	0	0	115	6
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA		Perm	NA			NA	Perm
Protected Phases					1			3				3
Permitted Phases				1			3					3
Minimum Split (s)				55.0	55.0		30.0	30.0			30.0	30.0
Total Split (s)				78.0	78.0		32.0	32.0			32.0	32.0
Total Split (%)				70.9%	70.9%		29.1%	29.1%			29.1%	29.1%
Maximum Green (s)				72.6	72.6		26.3	26.3			26.3	26.3
Yellow Time (s)				3.2	3.2		3.2	3.2			3.2	3.2
All-Red Time (s)				2.2	2.2		2.5	2.5			2.5	2.5
Lost Time Adjust (s)				0.0	0.0			0.0			0.0	0.0
Total Lost Time (s)				5.4	5.4			5.7			5.7	5.7
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)				7.0	7.0		7.0	7.0			7.0	7.0
Flash Dont Walk (s)				11.0	11.0		14.0	14.0			14.0	14.0
Pedestrian Calls (#/hr)				8	8		9	9			9	9
Act Effct Green (s)				72.6	72.6		26.3				26.3	26.3
Actuated g/C Ratio				0.66	0.66		0.24				0.24	0.24
v/c Ratio				0.06	0.60			0.12			0.26	0.02

Alternative 1
5: Washington & Goodell

AM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	1.3	1.8						24.8			35.9	0.0
Queue Delay				0.0	0.1			0.0			0.0	0.0
Total Delay	1.3	1.9						24.8			35.9	0.0
LOS	A	A						C			D	A
Approach Delay				1.8				24.8			34.1	
Approach LOS				A				C			C	
Queue Length 50th (ft)				2	21			15			66	0
Queue Length 95th (ft)				m3	23			m33			117	1
Internal Link Dist (ft)	76			109				646			244	
Turn Bay Length (ft)				50								66
Base Capacity (vph)	1168	3343						381			445	396
Starvation Cap Reductn	0	166						0			0	0
Spillback Cap Reductn	0	240						0			0	0
Storage Cap Reductn	0	0						0			0	0
Reduced v/c Ratio	0.06	0.65						0.12			0.26	0.02

Intersection Summary

Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 36 (33%), Referenced to phase 1:WBTL, Start of Yellow
 Natural Cycle: 85
 Control Type: Pretimed
 Maximum v/c Ratio: 0.60
 Intersection Signal Delay: 4.0
 Intersection LOS: A
 Intersection Capacity Utilization 57.8%
 ICU Level of Service B
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Washington & Goodell



Alternative 1
6: Main St & Pearl/Goodell

AM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑	↑	↑	↑			↑	↑↑
Traffic Volume (vph)	0	0	0	41	1471	417	17	62	0	0	188	137
Future Volume (vph)	0	0	0	41	1471	417	17	62	0	0	188	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	54	0	0	0	0	0	0
Storage Lanes	0	0	0	0	0	1	0	0	0	0	0	2
Taper Length (ft)	25			25		25		25		25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Frt						0.850						0.850
Fit Protected					0.999	0.950						
Satd. Flow (prot)	0	0	0	0	3536	1583	1770	1863	0	0	1863	2787
Fit Permitted					0.999	0.182						
Satd. Flow (perm)	0	0	0	0	3536	1583	339	1863	0	0	1863	2787
Right Turn on Red			Yes			Yes		Yes			Yes	Yes
Satd. Flow (RTOR)						350						149
Link Speed (mph)		30			30			30				30
Link Distance (ft)		127			123			709				848
Travel Time (s)		2.9			2.8			16.1				19.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	45	1599	453	18	67	0	0	204	149
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1644	453	18	67	0	0	204	149
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0	0	0	0	0	0	0	12	0	0	12	0
Link Offset(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Crosswalk Width(ft)	16			16		16		16		16		16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA	Perm	Perm	NA			NA	Perm
Protected Phases					1		2				3	
Permitted Phases					1	1	2				3	3
Minimum Split (s)				36.3	36.3	36.3	28.0	28.0			25.0	25.0
Total Split (s)				57.0	57.0	57.0	28.0	28.0			25.0	25.0
Total Split (%)				51.8%	51.8%	51.8%	25.5%	25.5%			22.7%	22.7%
Maximum Green (s)				50.7	50.7	50.7	22.0	22.0			19.1	19.1
Yellow Time (s)				3.2	3.2	3.2	3.2	3.2			3.0	3.0
All-Red Time (s)				3.1	3.1	3.1	2.8	2.8			2.9	2.9
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)				6.3	6.3	6.3	6.0	6.0			5.9	5.9
Lead/Lag				Lead	Lead	Lead	Lag	Lag				
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes				
Walk Time (s)				7.0	7.0	7.0	7.0	7.0			7.0	7.0
Flash Dont Walk (s)				18.0	18.0	18.0	15.0	15.0			9.0	9.0
Pedestrian Calls (#/hr)				0	0	0	0	0			0	0
Act Effect Green (s)				50.7	50.7	50.7	22.0	22.0			19.1	19.1
Actuated g/C Ratio				0.46	0.46	0.46	0.20	0.20			0.17	0.17
v/c Ratio				1.01	0.49	0.27	0.18				0.63	0.25

Alternative 1
6: Main St & Pearl/Goodell

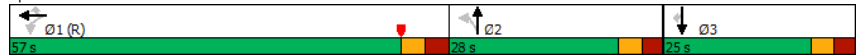
AM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay					34.4	1.7	54.1	42.6			51.9	7.5
Queue Delay					0.0	1.0	0.0	0.0			0.0	0.0
Total Delay					34.4	2.8	54.1	42.6			51.9	7.5
LOS					C	A	D	D			D	A
Approach Delay					27.6			45.0			33.2	
Approach LOS					C			D			C	
Queue Length 50th (ft)					-602	0	10	39			135	0
Queue Length 95th (ft)					#767	0	m32	82			214	30
Internal Link Dist (ft)	47				43			629			768	
Turn Bay Length (ft)							54					
Base Capacity (vph)					1629	918	67	372			323	607
Starvation Cap Reductn					0	243	0	0			0	0
Spillback Cap Reductn					0	0	0	0			0	0
Storage Cap Reductn					0	0	0	0			0	0
Reduced v/c Ratio					1.01	0.67	0.27	0.18			0.63	0.25

Intersection Summary

Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 37 (34%), Referenced to phase 1:WBTL, Start of Yellow
 Natural Cycle: 110
 Control Type: Pretimed
 Maximum v/c Ratio: 1.01
 Intersection Signal Delay: 29.0 Intersection LOS: C
 Intersection Capacity Utilization 66.2% ICU Level of Service C
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Main St & Pearl/Goodell



Alternative 1
7: Tupper & Pearl

AM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↓		↑		↑		↑	↑
Traffic Volume (vph)	0	624	54	57	67	0	18	0	61	9	469	130
Future Volume (vph)	0	624	54	57	67	0	18	0	61	9	469	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988							0.850		0.850	0.850
Fit Protected					0.978		0.950				0.999	
Satd. Flow (prot)	0	3497	0	0	1822	0	1770	0	1583	0	1861	1583
Fit Permitted					0.543		0.310				0.999	
Satd. Flow (perm)	0	3497	0	0	1011	0	577	0	1583	0	1861	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10							66			141
Link Speed (mph)		30			30		30				30	
Link Distance (ft)		570			351		561				440	
Travel Time (s)		13.0			8.0		12.8				10.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	678	59	62	73	0	20	0	66	10	510	141
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	737	0	0	135	0	20	0	66	0	520	141
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0		12				12	
Link Offset(ft)		0			0		0				0	
Crosswalk Width(ft)		16			16		16				16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA		Perm	NA		D.Pm		Perm	Perm	NA	Perm
Protected Phases		1			1						3	
Permitted Phases				1			3		3	3		3
Minimum Split (s)		50.0		50.0		50.0	40.0		40.0	40.0		40.0
Total Split (s)		52.0		52.0		52.0	58.0		58.0	58.0		58.0
Total Split (%)		47.3%		47.3%		47.3%	52.7%		52.7%	52.7%		52.7%
Maximum Green (s)		46.4		46.4		46.4	52.8		52.8	52.8		52.8
Yellow Time (s)		3.2		3.2		3.2	3.2		3.2	3.2		3.2
All-Red Time (s)		2.4		2.4		2.4	2.0		2.0	2.0		2.0
Lost Time Adjust (s)		0.0		0.0		0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)		5.6		5.6		5.6	5.2		5.2	5.2		5.2
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)		7.0		7.0		7.0	7.0		7.0	7.0		7.0
Flash Dont Walk (s)		15.0		15.0		15.0	12.0		12.0	12.0		12.0
Pedestrian Calls (#/hr)		0		0		0	0		0	0		0
Act Effect Green (s)		46.4		46.4		46.4	52.8		52.8	52.8		52.8
Actuated g/C Ratio		0.42		0.42		0.42	0.48		0.48	0.48		0.48
v/c Ratio		0.50		0.32		0.07	0.08		0.08	0.58		0.17
Control Delay		24.4		23.4		16.4	4.1		4.1	2.8		0.2
Queue Delay		0.0		0.0		0.0	0.0		0.0	0.0		0.0
Total Delay		24.4		23.4		16.4	4.1		4.1	2.8		0.2

Alternative 1
7: Tupper & Pearl

AM 2045
09/14/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	C			C			B			A		
Approach Delay	24.4			23.4			7.0			2.3		
Approach LOS	C			C			A			A		
Queue Length 50th (ft)	193			65			7			20		
Queue Length 95th (ft)	249			108			22			m27		
Internal Link Dist (ft)	490			271			481			360		
Turn Bay Length (ft)												
Base Capacity (vph)	1480			426			276			893		
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	0.50			0.32			0.07			0.08		

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Yellow, Master Intersection

Natural Cycle: 90

Control Type: Pretimed

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 14.3

Intersection LOS: B

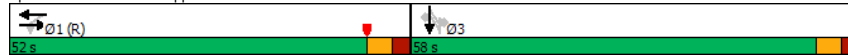
Intersection Capacity Utilization 71.2%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 7: Tupper & Pearl



Alternative 1
8: Main St & Tupper

AM 2045
09/14/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔			↔↔			↔↔			↔↔		
Traffic Volume (vph)	37	644	8	5	35	11	2	22	6	146	71	54
Future Volume (vph)	37	644	8	5	35	11	2	22	6	146	71	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0			0			0		
Storage Lanes	0			0			0			0		
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.998			0.971			0.975			0.935		
Fit Protected	0.997			0.995			0.997			0.950		
Satd. Flow (prot)	0	3522	0	0	1800	0	0	1811	0	1770	1742	0
Fit Permitted	0.936			0.949			0.989			0.736		
Satd. Flow (perm)	0	3306	0	0	1716	0	0	1796	0	1371	1742	0
Right Turn on Red	Yes			Yes			Yes			Yes		
Satd. Flow (RTOR)	2			12			6			37		
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	351			263			1174			709		
Travel Time (s)	8.0			6.0			26.7			16.1		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	40	692	9	5	38	12	2	24	6	157	76	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	741	0	0	55	0	0	32	0	157	134	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			0			12			12		
Link Offset(ft)	0			0			0			0		
Crosswalk Width(ft)	16			16			16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9			15			9		
Turn Type	Perm	NA	NA	Perm	NA	NA	Perm	NA	Perm	NA	NA	NA
Protected Phases	1			1			3			3		
Permitted Phases	1			1			3			3		
Minimum Split (s)	50.0	50.0	50.0	50.0	50.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (s)	69.0	69.0	69.0	69.0	69.0	41.0	41.0	41.0	41.0	41.0	41.0	41.0
Total Split (%)	62.7%	62.7%	62.7%	62.7%	62.7%	37.3%	37.3%	37.3%	37.3%	37.3%	37.3%	37.3%
Maximum Green (s)	62.8	62.8	62.8	62.8	62.8	34.9	34.9	34.9	34.9	34.9	34.9	34.9
Yellow Time (s)	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	2.9	2.9	2.9	2.9	2.9	2.9	2.9
Lost Time Adjust (s)	0.0			0.0			0.0			0.0		
Total Lost Time (s)	6.2			6.2			6.1			6.1		
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	15.0	15.0	15.0	15.0	15.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Pedestrian Calls (#/hr)	0			0			0			0		
Act Effct Green (s)	62.8			62.8			34.9			34.9		
Actuated g/C Ratio	0.57			0.57			0.32			0.32		
v/c Ratio	0.39			0.06			0.06			0.23		

Alternative 1
8: Main St & Tupper

AM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	1.9			7.6			22.8			41.9	32.4	
Queue Delay	0.2			0.0			0.0			0.0	0.0	
Total Delay	2.0			7.6			22.8			41.9	32.4	
LOS	A			A			C			D	C	
Approach Delay	2.0			7.6			22.8				37.5	
Approach LOS	A			A			C			D	C	
Queue Length 50th (ft)	14			13			13			108	73	
Queue Length 95th (ft)	17			32			35			m166	m120	
Internal Link Dist (ft)	271			183			1094				629	
Turn Bay Length (ft)										40		
Base Capacity (vph)	1888			984			573			434	577	
Starvation Cap Reductn	383			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			0.06			0.06			0.36	0.23	

Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	20 (18%), Referenced to phase 1:EBWB, Start of Yellow
Natural Cycle:	90
Control Type:	Pretimed
Maximum v/c Ratio:	0.39
Intersection Signal Delay:	12.1
Intersection LOS:	B
Intersection Capacity Utilization:	47.1%
ICU Level of Service:	A
Analysis Period (min):	15
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 8: Main St & Tupper



Alternative 1
9: Washington & Tupper

AM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕	↕	↕	↕	↕
Traffic Volume (vph)	30	644	81	3	22	2	14	53	53	80	76	4
Future Volume (vph)	30	644	81	3	22	2	14	53	53	80	76	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		78	85		0
Storage Lanes	0		0	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fit	0.984				0.990					0.850		0.993
Fit Protected	0.998				0.995			0.990		0.950		
Satd. Flow (prot)	0	3476	0	0	1835	0	0	1844	1583	1770	1850	0
Fit Permitted	0.943				0.948			0.940		0.711		
Satd. Flow (perm)	0	3284	0	0	1748	0	0	1751	1583	1324	1850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			2				75			3
Link Speed (mph)	30				30				30			30
Link Distance (ft)	263				328				1190			726
Travel Time (s)	6.0				7.5				27.0			16.5
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
Adj. Flow (vph)	32	685	86	3	23	2	15	56	56	85	81	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	803	0	0	28	0	0	71	56	85	85	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0				0				12			12
Link Offset(ft)	0				0				0			0
Crosswalk Width(ft)	16				16				16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15			9	15			9
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	D.P+P	NA	
Protected Phases		1			1			4		3	3	4
Permitted Phases	1			1			4		4			4
Minimum Split (s)	47.0	47.0		47.0	47.0		28.0	28.0	28.0		15.0	
Total Split (s)	63.0	63.0		63.0	63.0		30.0	30.0	30.0		17.0	
Total Split (%)	57.3%	57.3%		57.3%	57.3%		27.3%	27.3%	27.3%		15.5%	
Maximum Green (s)	57.5	57.5		57.5	57.5		24.8	24.8	24.8		11.9	
Yellow Time (s)	3.2	3.2		3.2	3.2		3.2	3.2	3.2		3.2	
All-Red Time (s)	2.3	2.3		2.3	2.3		2.0	2.0	2.0		1.9	
Lost Time Adjust (s)		0.0			0.0			0.0	0.0		0.0	
Total Lost Time (s)		5.5			5.5			5.2	5.2		5.1	
Lead/Lag							Lag	Lag	Lag		Lead	
Lead-Lag Optimize?							Yes	Yes	Yes		Yes	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0		7.0	
Flash Dont Walk (s)	17.0	17.0		17.0	17.0		11.0	11.0	11.0			
Pedestrian Calls (#/hr)	17	17		17	17		23	23	23			
Act Effct Green (s)		57.5			57.5			24.8	24.8		36.8	41.9
Actuated g/C Ratio		0.52			0.52			0.23	0.23		0.33	0.38
v/c Ratio		0.47			0.03			0.18	0.14		0.17	0.12

Alternative 1
9: Washington & Tupper

AM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	7.5	19.7						35.9	5.4	15.6	14.2	
Queue Delay	0.3				0.0			0.0	0.0	0.0	0.0	
Total Delay	7.8	19.7						35.9	5.4	15.6	14.2	
LOS	A				B			D	A	B	B	
Approach Delay	7.8	19.7						22.5			14.9	
Approach LOS	A				B			C			B	
Queue Length 50th (ft)	60				13			41	0	20	17	
Queue Length 95th (ft)	79				38			80	21	54	53	
Internal Link Dist (ft)	183				248			1110			646	
Turn Bay Length (ft)									78	85		
Base Capacity (vph)	1724				914			394	414	491	706	
Starvation Cap Reductn	387				0			0	0	0	0	
Spillback Cap Reductn	0				0			0	0	0	0	
Storage Cap Reductn	0				0			0	0	0	0	
Reduced v/c Ratio	0.60				0.03			0.18	0.14	0.17	0.12	

Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	17 (15%), Referenced to phase 1:EBWB, Start of Yellow
Natural Cycle:	90
Control Type:	Pretimed
Maximum v/c Ratio:	0.47
Intersection Signal Delay:	10.8
Intersection LOS:	B
Intersection Capacity Utilization:	42.7%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 9: Washington & Tupper



Alternative 1
10: Ellicott & Tupper

AM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔						↕	↕		↕	↕
Traffic Volume (vph)	20	655	41	0	0	0	16	106	99	60	82	13
Future Volume (vph)	20	655	41	0	0	0	16	106	99	60	82	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	80		150
Storage Lanes	0		0	0		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fit		0.991							0.850			0.850
Fit Protected		0.999						0.994			0.979	
Satd. Flow (prot)	0	3504	0	0	0	0	0	1852	1583	0	1824	1583
Fit Permitted		0.999						0.958			0.829	
Satd. Flow (perm)	0	3504	0	0	0	0	0	1785	1583	0	1544	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9							108			24
Link Speed (mph)		30				30			30			30
Link Distance (ft)		328				387			1108			362
Travel Time (s)		7.5				8.8			25.2			8.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	712	45	0	0	0	17	115	108	65	89	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	779	0	0	0	0	0	132	108	0	154	14
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			0		0		0		0		0
Link Offset(ft)	0			0		0		0		0		0
Crosswalk Width(ft)	16			16		16		16		16		16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA						Perm	NA	Perm	Perm	NA
Protected Phases		1						3		3		3
Permitted Phases	1								3		3	
Minimum Split (s)	50.0	50.0						40.0	40.0	40.0	40.0	40.0
Total Split (s)	65.0	65.0						45.0	45.0	45.0	45.0	45.0
Total Split (%)	59.1%	59.1%						40.9%	40.9%	40.9%	40.9%	40.9%
Maximum Green (s)	59.6	59.6						39.7	39.7	39.7	39.7	39.7
Yellow Time (s)	3.2	3.2						3.2	3.2	3.2	3.2	3.2
All-Red Time (s)	2.2	2.2						2.1	2.1	2.1	2.1	2.1
Lost Time Adjust (s)		0.0						0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.4						5.3	5.3	5.3	5.3	5.3
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0						7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	14.0	14.0						13.0	13.0	13.0	13.0	13.0
Pedestrian Calls (#/hr)	19	19						46	46	46	46	46
Act Effect Green (s)		59.6						39.7	39.7	39.7	39.7	39.7
Actuated g/C Ratio		0.54						0.36	0.36	0.36	0.36	0.36
v/c Ratio		0.41						0.20	0.17	0.28	0.28	0.02

Alternative 1
10: Ellicott & Tupper

AM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	4.2							25.4	5.2		17.8	1.9
Queue Delay	0.2							0.0	0.0		0.0	0.0
Total Delay	4.3							25.4	5.2		17.8	1.9
LOS	A							C	A		B	A
Approach Delay	4.3							16.3			16.5	
Approach LOS	A							B			B	
Queue Length 50th (ft)	37							64	0		61	0
Queue Length 95th (ft)	53							110	36		m87	m2
Internal Link Dist (ft)	248				307			1028			282	
Turn Bay Length (ft)												150
Base Capacity (vph)	1902							644	640		557	586
Starvation Cap Reductn	382							0	0		0	0
Spillback Cap Reductn	0							0	0		0	0
Storage Cap Reductn	0							0	0		0	0
Reduced v/c Ratio	0.51							0.20	0.17		0.28	0.02

Intersection Summary

Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 22 (20%), Referenced to phase 1:EBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Pretimed
 Maximum v/c Ratio: 0.41
 Intersection Signal Delay: 8.5 Intersection LOS: A
 Intersection Capacity Utilization 47.1% ICU Level of Service A
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: Ellicott & Tupper



Alternative 1
11: Oak & Tupper

AM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑							↓	↑↑	
Traffic Volume (vph)	0	607	237	0	0	0	0	0	0	42	181	0
Future Volume (vph)	0	607	237	0	0	0	0	0	0	42	181	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	0		0	0	0	0
Storage Lanes	0		1	0		0	0		0	1	0	0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00
Fit Protected										0.950	0.999	
Satd. Flow (prot)	0	3539	1583	0	0	0	0	0	0	1610	3387	0
Fit Permitted										0.950	0.999	
Satd. Flow (perm)	0	3539	1583	0	0	0	0	0	0	1610	3387	0
Right Turn on Red			Yes			Yes			Yes	Yes	Yes	Yes
Satd. Flow (RTOR)										43	24	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		387			354			125			680	
Travel Time (s)		8.8			8.0			2.8			15.5	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	690	269	0	0	0	0	0	0	48	206	0
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	0	690	269	0	0	0	0	0	0	43	211	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		15			9			15		9	15	
Turn Type		NA	custom							Perm	NA	
Protected Phases		1	1									3
Permitted Phases			3								3	
Minimum Split (s)		50.0	50.0							40.0	40.0	
Total Split (s)		67.0	67.0							43.0	43.0	
Total Split (%)		60.9%	60.9%							39.1%	39.1%	
Maximum Green (s)		61.6	61.6							37.9	37.9	
Yellow Time (s)		3.2	3.2							3.2	3.2	
All-Red Time (s)		2.2	2.2							1.9	1.9	
Lost Time Adjust (s)		0.0	0.0							0.0	0.0	
Total Lost Time (s)		5.4	5.4							5.1	5.1	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)		7.0	7.0							7.0	7.0	
Flash Dont Walk (s)		18.0	18.0							15.0	15.0	
Pedestrian Calls (#/hr)		0	0							0	0	
Act Effect Green (s)		61.6	110.0							37.9	37.9	
Actuated g/C Ratio		0.56	1.00							0.34	0.34	
v/c Ratio		0.35	0.17							0.07	0.18	

Alternative 1
11: Oak & Tupper

AM 2045
09/14/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	7.7	0.2								3.9	13.7	
Queue Delay	0.2	0.0								0.0	0.0	
Total Delay	7.9	0.2								3.9	13.7	
LOS	A	A								A	B	
Approach Delay	5.7						12.1					
Approach LOS	A						B					
Queue Length 50th (ft)	62	0								2	39	
Queue Length 95th (ft)	78	0								m8	56	
Internal Link Dist (ft)	307			274			45				600	
Turn Bay Length (ft)		200										
Base Capacity (vph)	1981	1583								582	1182	
Starvation Cap Reductn	528	0								0	0	
Spillback Cap Reductn	41	0								0	0	
Storage Cap Reductn	0	0								0	0	
Reduced v/c Ratio	0.47	0.17								0.07	0.18	

Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	11 (10%), Referenced to phase 1:E.B.T, Start of Yellow
Natural Cycle:	90
Control Type:	Pretimed
Maximum v/c Ratio:	0.35
Intersection Signal Delay:	7.1
Intersection LOS:	A
Intersection Capacity Utilization:	55.3%
ICU Level of Service:	B
Analysis Period (min):	15
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 11: Oak & Tupper



Alternative 1
12: Elm St & Tupper

AM 2045
09/14/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑						↑↑				
Traffic Volume (vph)	9	647	0	0	0	0	0	571	4	0	0	0
Future Volume (vph)	9	647	0	0	0	0	0	571	4	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt	0.999											
Fit Protected	0.999											
Satd. Flow (prot)	0	3536	0	0	0	0	0	3536	0	0	0	0
Fit Permitted	0.999											
Satd. Flow (perm)	0	3536	0	0	0	0	0	3536	0	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)	1											
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	354			313			418			586		
Travel Time (s)	8.0			7.1			9.5			13.3		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.92
Adj. Flow (vph)	10	719	0	0	0	0	0	634	4	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	729	0	0	0	0	0	638	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			0			0			0		
Link Offset(ft)	0			0			0			0		
Crosswalk Width(ft)	16			16			16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA						NA				
Protected Phases	3											
Permitted Phases	1											
Minimum Split (s)	30.0		60.0									
Total Split (s)	44.0		66.0									
Total Split (%)	40.0%		60.0%									
Maximum Green (s)	38.9		60.9									
Yellow Time (s)	3.2		3.2									
All-Red Time (s)	1.9		1.9									
Lost Time Adjust (s)	0.0											
Total Lost Time (s)	5.1											
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0											
Flash Dont Walk (s)	12.0											
Pedestrian Calls (#/hr)	0											
Act Effct Green (s)	38.9		60.9									
Actuated g/C Ratio	0.35		0.55									
v/c Ratio	0.58		0.33									
Control Delay	11.2		13.9									
Queue Delay	0.5		0.0									
Total Delay	11.7		13.9									

Alternative 1
12: Elm St & Tupper

AM 2045
09/14/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		B						B				
Approach Delay		11.7						13.9				
Approach LOS		B						B				
Queue Length 50th (ft)		121						122				
Queue Length 95th (ft)		195						159				
Internal Link Dist (ft)		274			233			338			506	
Turn Bay Length (ft)												
Base Capacity (vph)		1264						1958				
Starvation Cap Reductn		185						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.68						0.33				

Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	19 (17%), Referenced to phase 3:EBTL, Start of Yellow
Natural Cycle:	90
Control Type:	Pretimed
Maximum v/c Ratio:	0.58
Intersection Signal Delay:	12.7
Intersection LOS:	B
Intersection Capacity Utilization:	55.3%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 12: Elm St & Tupper



Alternative 1
34:

AM 2045
09/14/2022



Lane Group	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations	↑↑					↑↑
Traffic Volume (vph)	549	0	0	0	0	733
Future Volume (vph)	549	0	0	0	0	733
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	1.00	1.00	0.88
Fit						0.850
Fit Protected						
Satd. Flow (prot)	3539	0	0	0	0	2787
Fit Permitted						
Satd. Flow (perm)	3539	0	0	0	0	2787
Link Speed (mph)	30			55	55	
Link Distance (ft)	334			197	283	
Travel Time (s)	7.6			2.4	3.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	597	0	0	0	0	797
Shared Lane Traffic (%)						
Lane Group Flow (vph)	597	0	0	0	0	797
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	L NA	Right	Left	Left	Left	R NA
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization:	47.5%
ICU Level of Service:	A
Analysis Period (min):	15

Alternative 1
41: Pearl & Edward

AM 2045
09/14/2022



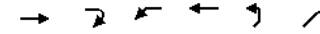
Lane Group	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations			↘	↗		
Traffic Volume (vph)	0	0	762	863	0	0
Future Volume (vph)	0	0	762	863	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr						
Fit Protected			0.950			
Satd. Flow (prot)	0	0	1770	1863	0	0
Fit Permitted			0.950			
Satd. Flow (perm)	0	0	1770	1863	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	525			127	132	
Travel Time (s)	11.9			2.9	3.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	828	938	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	828	938	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	48.8%
ICU Level of Service	A
Analysis Period (min)	15

Alternative 1
43:

AM 2045
09/14/2022



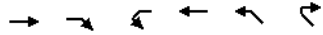
Lane Group	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations			↘	↗		
Traffic Volume (vph)	0	0	2622	1263	0	0
Future Volume (vph)	0	0	2622	1263	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Fr						
Fit Protected			0.950	0.975		
Satd. Flow (prot)	0	0	1610	3305	0	0
Fit Permitted			0.950	0.975		
Satd. Flow (perm)	0	0	1610	3305	0	0
Link Speed (mph)	30			55	55	
Link Distance (ft)	208			242	179	
Travel Time (s)	4.7			3.0	2.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	2850	1373	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	1425	2798	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	120.8%
ICU Level of Service	H
Analysis Period (min)	15

Alternative 1
50: Goodell

AM 2045
09/14/2022



Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations				↑↑	↑↑	
Traffic Volume (vph)	0	0	0	952	1289	0
Future Volume (vph)	0	0	0	952	1289	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Frt						
Fit Protected					0.950	
Satd. Flow (prot)	0	0	0	3539	3433	0
Fit Permitted					0.950	
Satd. Flow (perm)	0	0	0	3539	3433	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	246			303	185	
Travel Time (s)	5.6			6.9	4.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	1035	1401	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1035	1401	0
Enter Blocked Intersection	No	No	No	Yes	Yes	Yes
Lane Alignment	Left	Right	Left	R NA	L NA	L NA
Median Width(ft)	0			0	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	69.8%
ICU Level of Service	C
Analysis Period (min)	15

Alternative 1
86: Oak St

AM 2045
09/14/2022



Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations				↑↑	↑↑	
Traffic Volume (vph)	0	0	0	211	2622	0
Future Volume (vph)	0	0	0	211	2622	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Frt						
Fit Protected					0.950	
Satd. Flow (prot)	0	0	0	3539	3433	0
Fit Permitted					0.950	
Satd. Flow (perm)	0	0	0	3539	3433	0
Link Speed (mph)	30			30	55	
Link Distance (ft)	195			181	212	
Travel Time (s)	4.4			4.1	2.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	229	2850	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	229	2850	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary

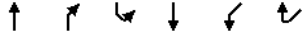
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	120.8%
ICU Level of Service	H
Analysis Period (min)	15

Alternative 1

AM 2045

89: Elm St

09/14/2022



Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations	↑↑	↑				
Traffic Volume (vph)	619	755	0	0	0	0
Future Volume (vph)	619	755	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.91	0.91	1.00	1.00	1.00	1.00
Frt	0.948	0.850				
Fit Protected						
Satd. Flow (prot)	3214	1441	0	0	0	0
Fit Permitted						
Satd. Flow (perm)	3214	1441	0	0	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	155			418	135	
Travel Time (s)	3.5			9.5	3.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	673	821	0	0	0	0
Shared Lane Traffic (%)		43%				
Lane Group Flow (vph)	1026	468	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	34.5%
ICU Level of Service	A
Analysis Period (min)	15

Alternative 1
1: Michigan & Goodell

PM 2025
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					←←←		↑	↑			↑↑	
Traffic Volume (vph)	0	0	0	83	655	110	75	223	0	0	545	178
Future Volume (vph)	0	0	0	83	655	110	75	223	0	0	545	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.86	0.86	0.86	1.00	1.00	1.00	1.00	0.95	0.95
Frt					0.981						0.963	
Flt Protected					0.995		0.950					
Satd. Flow (prot)	0	0	0	0	6255	0	1770	1863	0	0	3408	0
Flt Permitted					0.995		0.268					
Satd. Flow (perm)	0	0	0	0	6255	0	499	1863	0	0	3408	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					38						48	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		402			246			648			972	
Travel Time (s)		9.1			5.6			14.7			22.1	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	85	668	112	77	228	0	0	556	182
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	865	0	77	228	0	0	738	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type			Perm	NA		D,P+P	NA			NA		
Protected Phases					1		3	3			4	
Permitted Phases				1			4					
Minimum Split (s)				45.0	45.0		10.6				14.6	
Total Split (s)				45.0	45.0		15.0				50.0	
Total Split (%)				40.9%	40.9%		13.6%				45.5%	
Maximum Green (s)				39.1	39.1		9.2				44.2	
Yellow Time (s)				3.2	3.2		3.2				3.2	
All-Red Time (s)				2.7	2.7		2.6				2.6	
Lost Time Adjust (s)					0.0		0.0				0.0	
Total Lost Time (s)					5.9		5.8				5.8	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Walk Time (s)				7.0	7.0						7.0	
Flash Dont Walk (s)				15.0	15.0						14.0	
Pedestrian Calls (#/hr)				4	4						8	
Act Effect Green (s)				39.1	39.1		53.4	59.2			44.2	
Actuated g/C Ratio					0.36		0.49	0.54			0.40	
v/c Ratio					0.38		0.22	0.23			0.53	
Control Delay					25.8		14.1	14.1			24.9	
Queue Delay					0.0		0.0	0.0			0.0	
Total Delay					25.8		14.1	14.1			24.9	

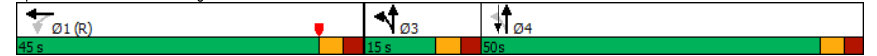
Alternative 1
1: Michigan & Goodell

PM 2025
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS					C		B	B			C	
Approach Delay					25.8			14.1			24.9	
Approach LOS					C			B			C	
Queue Length 50th (ft)					125		25	81			191	
Queue Length 95th (ft)					154		49	126			249	
Internal Link Dist (ft)		322			166			568			892	
Turn Bay Length (ft)												
Base Capacity (vph)					2247		348	1002			1398	
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					0.38		0.22	0.23			0.53	

Intersection Summary	
Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	0 (0%), Referenced to phase 1:WBTL, Start of Yellow
Natural Cycle:	80
Control Type:	Pretimed
Maximum v/c Ratio:	0.53
Intersection Signal Delay:	23.6
Intersection LOS:	C
Intersection Capacity Utilization:	52.1%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 1: Michigan & Goodell



Alternative 1
2: Elm St/Bennett Ln & Goodell

PM 2025
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↓	↑				↑
Traffic Volume (vph)	0	0	0	0	1001	15	407	5	0	0	0	15
Future Volume (vph)	0	0	0	0	1001	15	407	5	0	0	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.86	0.86	0.95	0.95	1.00	1.00	1.00	1.00
Frt					0.998							0.865
Flt Protected							0.950	0.953				
Satd. Flow (prot)	0	0	0	0	6395	0	1681	1686	0	0	0	1611
Flt Permitted							0.950	0.953				
Satd. Flow (perm)	0	0	0	0	6395	0	1681	1686	0	0	0	1611
Link Speed (mph)		30			30			30				30
Link Distance (ft)		335			402			586				380
Travel Time (s)		7.6			9.1			13.3				8.6
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	0	1021	15	415	5	0	0	0	15
Shared Lane Traffic (%)							49%					
Lane Group Flow (vph)	0	0	0	0	1036	0	212	208	0	0	0	15
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60		9	15		60	15		9	60		60
Sign Control		Stop			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	73.2%
ICU Level of Service	D
Analysis Period (min)	15

Alternative 1
3: Oak & Goodell

PM 2025
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑							↑
Traffic Volume (vph)	0	0	0	0	224	1117	43	0	0	0	0	380
Future Volume (vph)	0	0	0	0	224	1117	43	0	0	0	0	380
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.995						0.983
Flt Protected						0.992						
Satd. Flow (prot)	0	0	0	0	6325	0	0	0	0	0	1831	0
Flt Permitted						0.992						
Satd. Flow (perm)	0	0	0	0	6325	0	0	0	0	0	1831	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)						74						8
Link Speed (mph)		30			30			30				30
Link Distance (ft)		385			335			680				542
Travel Time (s)		8.8			7.6			15.5				12.3
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
Adj. Flow (vph)	0	0	0	0	236	1176	45	0	0	0	0	400
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1457	0	0	0	0	0	0	458
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type					Perm		NA					NA
Protected Phases						1						3
Permitted Phases					1							
Minimum Split (s)					58.0		58.0					27.7
Total Split (s)					63.0		63.0					47.0
Total Split (%)					57.3%		57.3%					42.7%
Maximum Green (s)					57.4		57.4					41.3
Yellow Time (s)					3.2		3.2					3.2
All-Red Time (s)					2.4		2.4					2.5
Lost Time Adjust (s)							0.0					0.0
Total Lost Time (s)							5.6					5.7
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)					7.0		7.0					7.0
Flash Dont Walk (s)					12.0		12.0					14.0
Pedestrian Calls (#/hr)					5		5					11
Act Effct Green (s)					57.4		57.4					41.3
Actuated g/C Ratio					0.52		0.52					0.38
v/c Ratio					0.44		0.44					0.66
Control Delay					10.5		10.5					33.6
Queue Delay					0.0		0.0					0.0
Total Delay					10.5		10.5					33.6

Alternative 1
3: Oak & Goodell

PM 2025
09/14/2022

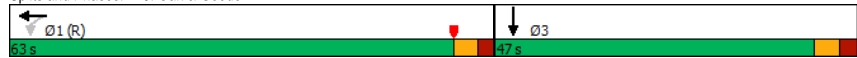


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS					B						C	
Approach Delay					10.5						33.6	
Approach LOS					B						C	
Queue Length 50th (ft)					112						261	
Queue Length 95th (ft)					128						377	
Internal Link Dist (ft)		305			255			600			462	
Turn Bay Length (ft)												
Base Capacity (vph)					3335						692	
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					0						0	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.44						0.66	

Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	10 (9%), Referenced to phase 1:WBTL, Start of Yellow
Natural Cycle:	90
Control Type:	Pretimed
Maximum v/c Ratio:	0.66
Intersection Signal Delay:	16.0
Intersection LOS:	B
Intersection Capacity Utilization:	67.1%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 3: Oak & Goodell



Alternative 1
4: Ellicott & Goodell

PM 2025
09/14/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					TTTT			T				
Traffic Volume (vph)	0	0	0	20	940	206	49	82	0	0	202	40
Future Volume (vph)	0	0	0	20	940	206	49	82	0	0	202	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.974						0.978	
Flt Protected					0.999			0.982				
Satd. Flow (prot)	0	0	0	0	6235	0	0	1829	0	0	1822	0
Flt Permitted					0.999			0.811				
Satd. Flow (perm)	0	0	0	0	6235	0	0	1511	0	0	1822	0
Right Turn on Red					Yes		Yes		Yes			Yes
Satd. Flow (RTOR)					72						11	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		140			385			361			475	
Travel Time (s)		3.2			8.8			8.2			10.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	22	1022	224	53	89	0	0	220	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1268	0	0	142	0	0	263	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)					0			0			0	
Link Offset(ft)					0			0			0	
Crosswalk Width(ft)					16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					1			3				3
Permitted Phases					1			3				3
Minimum Split (s)					50.0			40.0			40.0	
Total Split (s)					61.0			49.0			49.0	
Total Split (%)					55.5%			44.5%			44.5%	
Maximum Green (s)					56.4			43.5			43.5	
Yellow Time (s)					3.2			3.2			3.2	
All-Red Time (s)					1.4			2.3			2.3	
Lost Time Adjust (s)					0.0			0.0			0.0	
Total Lost Time (s)					4.6			5.5			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)					7.0			7.0			7.0	
Flash Dont Walk (s)					13.0			14.0			14.0	
Pedestrian Calls (#/hr)					0			21			21	
Act Effct Green (s)					56.4			43.5			43.5	
Actuated g/C Ratio					0.51			0.40			0.40	
v/c Ratio					0.39			0.24			0.36	
Control Delay					2.6			23.5			24.2	
Queue Delay					0.1			0.0			0.0	
Total Delay					2.6			23.5			24.2	

Alternative 1
4: Ellicott & Goodell

PM 2025
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS					A			C				C
Approach Delay					2.6			23.5			24.2	
Approach LOS					A			C				C
Queue Length 50th (ft)					16			66				123
Queue Length 95th (ft)					18			113				191
Internal Link Dist (ft)		60			305			281				395
Turn Bay Length (ft)												
Base Capacity (vph)					3231			597				727
Starvation Cap Reductn					448			0				0
Spillback Cap Reductn					0			0				0
Storage Cap Reductn					0			0				0
Reduced v/c Ratio					0.46			0.24				0.36

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 18 (16%), Referenced to phase 1:WBTL, Start of Yellow

Natural Cycle: 90

Control Type: Pretimed

Maximum v/c Ratio: 0.39

Intersection Signal Delay: 7.8

Intersection LOS: A

Intersection Capacity Utilization 50.5%

ICU Level of Service A

Analysis Period (min) 15




Alternative 1
5: Washington & Goodell

PM 2025
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔	↔	↔		↔			↔	↔
Traffic Volume (vph)	0	0	0	34	996	19	52	71	0	0	169	20
Future Volume (vph)	0	0	0	34	996	19	52	71	0	0	169	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	50	0	0	0	0	0	0	0	66
Storage Lanes	0	0	0	1	0	0	0	0	0	0	0	1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.997							0.850
Flt Protected				0.950			0.979					
Satd. Flow (prot)	0	0	0	1770	5070	0	0	1824	0	0	1863	1583
Flt Permitted				0.950			0.814					
Satd. Flow (perm)	0	0	0	1770	5070	0	0	1516	0	0	1863	1583
Right Turn on Red			Yes		Yes		Yes				Yes	
Satd. Flow (RTOR)				4								24
Link Speed (mph)		30			30			30				30
Link Distance (ft)		156			189			726				324
Travel Time (s)		3.5			4.3			16.5				7.4
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	35	1038	20	54	74	0	0	176	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	35	1058	0	0	128	0	0	176	21
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA		Perm	NA			NA	Perm
Protected Phases					1			3				3
Permitted Phases												
Minimum Split (s)				55.0	55.0		30.0	30.0			30.0	30.0
Total Split (s)				70.0	70.0		40.0	40.0			40.0	40.0
Total Split (%)				63.6%	63.6%		36.4%	36.4%			36.4%	36.4%
Maximum Green (s)				64.6	64.6		34.3	34.3			34.3	34.3
Yellow Time (s)				3.2	3.2		3.2	3.2			3.2	3.2
All-Red Time (s)				2.2	2.2		2.5	2.5			2.5	2.5
Lost Time Adjust (s)				0.0	0.0		0.0	0.0			0.0	0.0
Total Lost Time (s)				5.4	5.4		5.7	5.7			5.7	5.7
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)				7.0	7.0		7.0	7.0			7.0	7.0
Flash Dont Walk (s)				11.0	11.0		14.0	14.0			14.0	14.0
Pedestrian Calls (#/hr)				8	8		9	9			9	9
Act Effct Green (s)				64.6	64.6		34.3	34.3			34.3	34.3
Actuated g/C Ratio				0.59	0.59		0.31	0.31			0.31	0.31
v/c Ratio				0.03	0.36		0.27				0.30	0.04

Alternative 1
5: Washington & Goodell

PM 2025
09/14/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	4.7		5.2					30.4			30.6	9.6
Queue Delay			0.0	0.1				0.0			0.0	0.0
Total Delay	4.7		5.3					30.4			30.6	9.6
LOS	A		A					C			C	A
Approach Delay				5.2				30.4			28.3	
Approach LOS				A				C			C	
Queue Length 50th (ft)			4	45				68			94	0
Queue Length 95th (ft)			9	51				119			153	17
Internal Link Dist (ft)	76			109				646			244	
Turn Bay Length (ft)				50								66
Base Capacity (vph)	1039		2979					472			580	510
Starvation Cap Reductn	0		543					0			0	0
Spillback Cap Reductn	0		84					0			0	0
Storage Cap Reductn	0		0					0			0	0
Reduced v/c Ratio	0.03		0.43					0.27			0.30	0.04


Intersection Summary	
Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	16 (15%), Referenced to phase 1:WBTL, Start of Yellow
Natural Cycle:	85
Control Type:	Pretimed
Maximum v/c Ratio:	0.36
Intersection Signal Delay:	10.7
Intersection LOS:	B
Intersection Capacity Utilization:	49.2%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 5: Washington & Goodell



Alternative 1
6: Main St & Pearl/Goodell

PM 2025
09/14/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	28	797	254	18	113	0	0	177	144
Future Volume (vph)	0	0	0	28	797	254	18	113	0	0	177	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	54	0	0	0	0	0	0
Storage Lanes	0	0	0	0	1	1	0	0	0	0	0	2
Taper Length (ft)	25			25		25		25		25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Frnt						0.850						0.850
Fit Protected					0.998	0.950						
Satd. Flow (prot)	0	0	0	0	3532	1583	1770	1863	0	0	1863	2787
Fit Permitted					0.998	0.123						
Satd. Flow (perm)	0	0	0	0	3532	1583	229	1863	0	0	1863	2787
Right Turn on Red			Yes		Yes		Yes		Yes		Yes	
Satd. Flow (RTOR)					257							145
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		127			123			709			848	
Travel Time (s)		2.9			2.8			16.1			19.3	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	0	0	0	28	805	257	18	114	0	0	179	145
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	833	257	18	114	0	0	179	145
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			0			0	12			12	
Link Offset(ft)	0			0			0	0			0	
Crosswalk Width(ft)	16			16			16				16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type			Perm		NA	Perm	Perm	NA			NA	Perm
Protected Phases					1		2		2		3	
Permitted Phases					1	1	2				3	
Minimum Split (s)					35.5	35.5	35.5	30.6	30.6		27.5	27.5
Total Split (s)					45.0	45.0	45.0	38.0	38.0		27.0	27.0
Total Split (%)					40.9%	40.9%	40.9%	34.5%	34.5%		24.5%	24.5%
Maximum Green (s)					39.5	39.5	39.5	32.4	32.4		21.5	21.5
Yellow Time (s)					3.2	3.2	3.2	3.2	3.2		3.0	3.0
All-Red Time (s)					2.3	2.3	2.3	2.4	2.4		2.5	2.5
Lost Time Adjust (s)					0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)					5.5	5.5	5.5	5.6	5.6		5.5	5.5
Lead/Lag					Lead	Lead	Lead	Lag	Lag			
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes			
Walk Time (s)					7.0	7.0	7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)					18.0	18.0	18.0	15.0	15.0		9.0	9.0
Pedestrian Calls (#/hr)					0	0	0	0	0		0	0
Act Effct Green (s)					39.5	39.5	32.4	32.4			21.5	21.5
Actuated g/C Ratio					0.36	0.36	0.29	0.29			0.20	0.20
v/c Ratio					0.66	0.35	0.27	0.21			0.49	0.22

Alternative 1
6: Main St & Pearl/Goodell

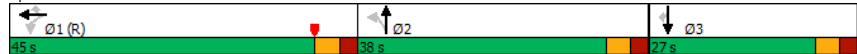
PM 2025
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay					19.7	3.2	42.2	30.4			44.7	7.0
Queue Delay					0.9	0.7	0.0	0.0			0.0	0.0
Total Delay					20.6	3.9	42.2	30.4			44.7	7.0
LOS					C	A	D	C			D	A
Approach Delay					16.7			32.0			27.8	
Approach LOS					B			C			C	
Queue Length 50th (ft)					124	0	10	60			114	0
Queue Length 95th (ft)					164	3	34	107			185	28
Internal Link Dist (ft)	47				43			629			768	
Turn Bay Length (ft)							54					
Base Capacity (vph)					1268	733	67	548			364	661
Starvation Cap Reductn					199	227	0	0			0	0
Spillback Cap Reductn					0	0	0	0			0	0
Storage Cap Reductn					0	0	0	0			0	0
Reduced v/c Ratio					0.78	0.51	0.27	0.21			0.49	0.22

Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	8 (7%), Referenced to phase 1:WBTL, Start of Yellow
Natural Cycle:	95
Control Type:	Pretimed
Maximum v/c Ratio:	0.66
Intersection Signal Delay:	20.3
Intersection LOS:	C
Intersection Capacity Utilization:	47.1%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 6: Main St & Pearl/Goodell



Alternative 1
7: Tupper & Pearl

PM 2025
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↓		↑		↑		↑↑	↑
Traffic Volume (vph)	0	811	20	10	99	0	77	0	330	41	139	65
Future Volume (vph)	0	811	20	10	99	0	77	0	330	41	139	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996							0.850			0.850
Flt Protected					0.995		0.950				0.989	
Satd. Flow (prot)	0	3525	0	0	1853	0	1770	0	1583	0	1842	1583
Flt Permitted					0.908		0.551				0.989	
Satd. Flow (perm)	0	3525	0	0	1691	0	1026	0	1583	0	1842	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3							159			69
Link Speed (mph)		30			30		30				30	
Link Distance (ft)		570			351		561				440	
Travel Time (s)		13.0			8.0		12.8				10.0	
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
Adj. Flow (vph)	0	863	21	11	105	0	82	0	351	44	148	69
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	884	0	0	116	0	82	0	351	0	192	69
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0		12				12	
Link Offset(ft)		0			0		0		0		0	
Crosswalk Width(ft)		16			16		16		16		16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA		Perm	NA		D,Pm		Perm	Perm	NA	Perm
Protected Phases		1			1						3	
Permitted Phases				1			3		3		3	3
Minimum Split (s)		50.0		50.0		50.0	40.0		40.0		40.0	40.0
Total Split (s)		100.0		100.0		100.0	60.0		60.0		60.0	60.0
Total Split (%)		62.5%		62.5%		62.5%	37.5%		37.5%		37.5%	37.5%
Maximum Green (s)		94.4		94.4		94.4	54.8		54.8		54.8	54.8
Yellow Time (s)		3.2		3.2		3.2	3.2		3.2		3.2	3.2
All-Red Time (s)		2.4		2.4		2.4	2.0		2.0		2.0	2.0
Lost Time Adjust (s)		0.0		0.0		0.0	0.0		0.0		0.0	0.0
Total Lost Time (s)		5.6		5.6		5.6	5.2		5.2		5.2	5.2
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)		7.0		7.0		7.0	7.0		7.0		7.0	7.0
Flash Dont Walk (s)		15.0		15.0		15.0	12.0		12.0		12.0	12.0
Pedestrian Calls (#/hr)		0		0		0	0		0		0	0
Act Effect Green (s)		94.4		94.4		94.4	54.8		54.8		54.8	54.8
Actuated g/C Ratio		0.59		0.59		0.59	0.34		0.34		0.34	0.34
v/c Ratio		0.42		0.12		0.23	0.54		0.54		0.30	0.12
Control Delay		18.7		7.1		39.9	25.8		25.8		40.3	7.8
Queue Delay		0.1		0.0		0.0	0.1		0.1		0.0	0.0
Total Delay		18.8		7.1		39.9	25.8		25.8		40.3	7.8

Alternative 1
7: Tupper & Pearl

PM 2025
09/14/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		B			A		D		C		D	A
Approach Delay		18.8			7.1			28.5			31.7	
Approach LOS		B			A			C			C	
Queue Length 50th (ft)		255			30		61		161		148	0
Queue Length 95th (ft)		304			47		110		267		218	37
Internal Link Dist (ft)		490			271			481			360	
Turn Bay Length (ft)												
Base Capacity (vph)		2080			997		351		646		630	587
Starvation Cap Reductn		0			0		0		0		0	0
Spillback Cap Reductn		313			0		0		13		0	0
Storage Cap Reductn		0			0		0		0		0	0
Reduced v/c Ratio		0.50			0.12		0.23		0.55		0.30	0.12

Intersection Summary

Area Type:	Other
Cycle Length:	160
Actuated Cycle Length:	160
Offset:	0 (0%), Referenced to phase 1:EBWB, Start of Yellow, Master Intersection
Natural Cycle:	90
Control Type:	Pretimed
Maximum v/c Ratio:	0.54
Intersection Signal Delay:	22.5
Intersection LOS:	C
Intersection Capacity Utilization:	66.4%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 7: Tupper & Pearl



Alternative 1
8: Main St & Tupper

PM 2025
09/14/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕			↕		↕	↕	↕
Traffic Volume (vph)	60	1030	25	6	88	25	14	46	61	145	54	15
Future Volume (vph)	60	1030	25	6	88	25	14	46	61	145	54	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	0	0	0	0	40	0	0
Storage Lanes	0	0	0	0	0	0	0	0	0	1	0	0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.997	0.997			0.972			0.932			0.967	
Flt Protected	0.997				0.998			0.994		0.950		
Satd. Flow (prot)	0	3518	0	0	1807	0	0	1726	0	1770	1801	0
Flt Permitted	0.924				0.944			0.966		0.623		
Satd. Flow (perm)	0	3260	0	0	1709	0	0	1677	0	1160	1801	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			17			32				9
Link Speed (mph)		30			30			30				30
Link Distance (ft)		351			263			1174				709
Travel Time (s)		8.0			6.0			26.7				16.1
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
Adj. Flow (vph)	63	1084	26	6	93	26	15	48	64	153	57	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1173	0	0	125	0	0	127	0	153	73	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0	0			0			12				12
Link Offset(ft)	0	0			0			0				0
Crosswalk Width(ft)	16				16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			3			3	
Permitted Phases	1			1			3			3		
Minimum Split (s)	50.0	50.0		50.0	50.0		40.0	40.0		40.0	40.0	
Total Split (s)	109.0	109.0		109.0	109.0		51.0	51.0		51.0	51.0	
Total Split (%)	68.1%	68.1%		68.1%	68.1%		31.9%	31.9%		31.9%	31.9%	
Maximum Green (s)	102.8	102.8		102.8	102.8		44.9	44.9		44.9	44.9	
Yellow Time (s)	3.2	3.2		3.2	3.2		3.2	3.2		3.2	3.2	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.9	2.9		2.9	2.9	
Lost Time Adjust (s)	0.0			0.0			0.0			0.0		0.0
Total Lost Time (s)	6.2			6.2			6.1			6.1		6.1
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		102.8			102.8			44.9		44.9	44.9	
Actuated g/C Ratio		0.64			0.64			0.28		0.28	0.28	
v/c Ratio		0.56			0.11			0.26		0.47	0.14	

Alternative 1
8: Main St & Tupper

PM 2025
09/14/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	15.3			18.4				34.6		53.4	38.7	
Queue Delay	0.3			2.7				0.0		0.1	0.0	
Total Delay	15.6			21.1				34.7		53.5	38.7	
LOS	B			C				C		D	D	
Approach Delay	15.6			21.1				34.7		53.5	38.7	
Approach LOS	B			C				C		D	D	
Queue Length 50th (ft)	435			88				76		134	50	
Queue Length 95th (ft)	529			139				137		212	95	
Internal Link Dist (ft)	271			183				1094		629		
Turn Bay Length (ft)										40		
Base Capacity (vph)	2095			1104				493		325	511	
Starvation Cap Reductn	334			874				0		0	0	
Spillback Cap Reductn	190			0				9		5	0	
Storage Cap Reductn	0			0				0		0	0	
Reduced v/c Ratio	0.67			0.54				0.26		0.48	0.14	

Intersection Summary

Area Type:	Other
Cycle Length:	160
Actuated Cycle Length:	160
Offset: 18 (11%), Referenced to phase 1:EBWB, Start of Yellow	
Natural Cycle:	90
Control Type:	Pretimed
Maximum v/c Ratio:	0.56
Intersection Signal Delay:	22.0
Intersection LOS:	C
Intersection Capacity Utilization:	59.3%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 8: Main St & Tupper



Alternative 1
9: Washington & Tupper


PM 2025
09/14/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔↔			↔↔	↔↔	↔↔	↔↔	↔↔
Traffic Volume (vph)	12	1174	43	0	38	1	68	92	135	115	122	11
Future Volume (vph)	12	1174	43	0	38	1	68	92	135	115	122	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		78	85		0
Storage Lanes	0		0	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.997				0.850		0.988	
Flt Protected								0.979		0.950		
Satd. Flow (prot)	0	3522	0	0	1857	0	0	1824	1583	1770	1840	0
Flt Permitted		0.953						0.795		0.487		
Satd. Flow (perm)	0	3356	0	0	1857	0	0	1481	1583	907	1840	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			1				100		3	
Link Speed (mph)	30				30				30		30	
Link Distance (ft)	263				328				1190		726	
Travel Time (s)	6.0				7.5				27.0		16.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	13	1304	48	0	42	1	76	102	150	128	136	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1365	0	0	43	0	0	178	150	128	148	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			0			0		12		12	
Link Offset(ft)	0			0			0		0		0	
Crosswalk Width(ft)	16			16			16		16		16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA			NA		Perm	NA	Perm	D.P+P	NA	
Protected Phases		1			1			4		3	3	4
Permitted Phases	1			1			4		4		4	
Minimum Split (s)	47.0	47.0		47.0	47.0		28.0	28.0	28.0		15.0	
Total Split (s)	103.0	103.0		103.0	103.0		40.0	40.0	40.0		17.0	
Total Split (%)	64.4%	64.4%		64.4%	64.4%		25.0%	25.0%	25.0%		10.6%	
Maximum Green (s)	97.5	97.5		97.5	97.5		34.8	34.8	34.8		11.9	
Yellow Time (s)	3.2	3.2		3.2	3.2		3.2	3.2	3.2		3.2	
All-Red Time (s)	2.3	2.3		2.3	2.3		2.0	2.0	2.0		1.9	
Lost Time Adjust (s)	0.0			0.0			0.0	0.0	0.0		0.0	
Total Lost Time (s)	5.5			5.5			5.2	5.2	5.2		5.1	
Lead/Lag							Lag	Lag	Lag		Lead	
Lead-Lag Optimize?							Yes	Yes	Yes		Yes	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0		7.0	
Flash Dont Walk (s)	17.0	17.0		17.0	17.0		11.0	11.0	11.0			
Pedestrian Calls (#/hr)	17	17		17	17		23	23	23			
Act Effct Green (s)		97.5			97.5			34.8	34.8		46.8	51.9
Actuated g/C Ratio		0.61			0.61			0.22	0.22		0.29	0.32
v/c Ratio		0.67			0.04			0.55	0.36		0.39	0.25

Alternative 1
9: Washington & Tupper

PM 2025
09/14/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	15.2			32.7			63.2	21.4	43.5	40.3		
Queue Delay	0.2			0.0			0.0	0.0	0.0	0.0		
Total Delay	15.4			32.7			63.2	21.4	43.5	40.3		
LOS	B			C			E	C	D	D		
Approach Delay	15.4			32.7			44.1			41.8		
Approach LOS	B			C			D			D		
Queue Length 50th (ft)	596			39			168	43	98	112		
Queue Length 95th (ft)	451			83			254	112	155	174		
Internal Link Dist (ft)	183			248			1110			646		
Turn Bay Length (ft)							78		85			
Base Capacity (vph)	2046			1132			322	422	329	598		
Starvation Cap Reductn	144			0			0	0	0	0		
Spillback Cap Reductn	58			14			0	1	0	0		
Storage Cap Reductn	0			0			0	0	0	0		
Reduced v/c Ratio	0.72			0.04			0.55	0.36	0.39	0.25		

Intersection Summary

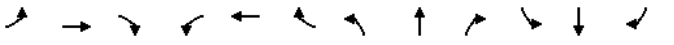
Area Type:	Other
Cycle Length:	160
Actuated Cycle Length:	160
Offset:	14 (9%), Referenced to phase 1:EBWB, Start of Yellow
Natural Cycle:	90
Control Type:	Pretimed
Maximum v/c Ratio:	0.67
Intersection Signal Delay:	24.1
Intersection Capacity Utilization:	66.4%
Analysis Period (min):	15
Intersection LOS:	C
ICU Level of Service:	C

Splits and Phases: 9: Washington & Tupper



Alternative 1
10: Ellicott & Tupper

PM 2025
09/14/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔						↔	↔		↔↔	↔
Traffic Volume (vph)	13	1469	19	0	0	0	32	100	317	148	97	7
Future Volume (vph)	13	1469	19	0	0	0	32	100	317	148	97	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	0	0	0	0	80	0	150
Storage Lanes	0	0	0	0	0	0	0	0	1	0	0	1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998							0.850			0.850
Fit Protected								0.988			0.971	
Satd. Flow (prot)	0	3532	0	0	0	0	0	1840	1583	0	1809	1583
Fit Permitted								0.842			0.680	
Satd. Flow (perm)	0	3532	0	0	0	0	0	1568	1583	0	1267	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2							43			16
Link Speed (mph)	30				30			30			30	
Link Distance (ft)	328				387			1108			362	
Travel Time (s)	7.5				8.8			25.2			8.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	13	1514	20	0	0	0	33	103	327	153	100	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1547	0	0	0	0	0	136	327	0	253	7
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			0			0		0		0	
Link Offset(ft)	0			0			0		0		0	
Crosswalk Width(ft)	16			16			16		16		16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9		15		9	15		9	
Turn Type	Perm	NA					Perm	NA	Perm	Perm	NA	Perm
Protected Phases		1						3			3	
Permitted Phases	1							3	3	3		3
Minimum Split (s)	50.0	50.0					40.0	40.0	40.0	40.0	40.0	40.0
Total Split (s)	106.0	106.0					54.0	54.0	54.0	54.0	54.0	54.0
Total Split (%)	66.3%	66.3%					33.8%	33.8%	33.8%	33.8%	33.8%	33.8%
Maximum Green (s)	100.6	100.6					48.7	48.7	48.7	48.7	48.7	48.7
Yellow Time (s)	3.2	3.2					3.2	3.2	3.2	3.2	3.2	3.2
All-Red Time (s)	2.2	2.2					2.1	2.1	2.1	2.1	2.1	2.1
Lost Time Adjust (s)	0.0						0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4						5.3	5.3	5.3	5.3	5.3	5.3
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0					7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	14.0	14.0					13.0	13.0	13.0	13.0	13.0	13.0
Pedestrian Calls (#/hr)	19	19					46	46	46	46	46	46
Act Effct Green (s)		100.6						48.7	48.7		48.7	48.7
Actuated g/C Ratio		0.63						0.30	0.30		0.30	0.30
v/c Ratio		0.70						0.29	0.64		0.66	0.01

Alternative 1
10: Ellicott & Tupper

PM 2025
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		8.6						44.4	48.0		57.9	6.3
Queue Delay		0.3						0.0	0.0		0.0	0.0
Total Delay		8.9						44.4	48.0		57.9	6.3
LOS		A						D	D		E	A
Approach Delay		8.9						47.0			56.5	
Approach LOS		A						D			E	
Queue Length 50th (ft)		143						109	260		231	0
Queue Length 95th (ft)		166						172	375		338	7
Internal Link Dist (ft)		248			307			1028			282	
Turn Bay Length (ft)												150
Base Capacity (vph)		2221						477	511		385	492
Starvation Cap Reductn		176						0	0		0	0
Spillback Cap Reductn		79						0	0		0	0
Storage Cap Reductn		0						0	0		0	0
Reduced v/c Ratio		0.76						0.29	0.64		0.66	0.01

Intersection Summary

Area Type:	Other
Cycle Length:	160
Actuated Cycle Length:	160
Offset:	16 (10%), Referenced to phase 1:EBTL, Start of Yellow
Natural Cycle:	90
Control Type:	Pretimed
Maximum v/c Ratio:	0.70
Intersection Signal Delay:	22.1
Intersection Capacity Utilization:	87.8%
Analysis Period (min):	15
Intersection LOS:	C
ICU Level of Service:	E

Splits and Phases: 10: Ellicott & Tupper



Alternative 1
11: Oak & Tupper

PM 2025
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑							↓	↑↑	↑
Traffic Volume (vph)	0	1653	276	0	0	0	0	0	0	216	459	0
Future Volume (vph)	0	1653	276	0	0	0	0	0	0	216	459	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	0		0	0	0	0
Storage Lanes	0		1	0		0	0		0	1	0	0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00
Frnt			0.850									
Flt Protected										0.950	0.998	
Satd. Flow (prot)	0	3539	1583	0	0	0	0	0	0	1610	3383	0
Flt Permitted										0.950	0.998	
Satd. Flow (perm)	0	3539	1583	0	0	0	0	0	0	1610	3383	0
Right Turn on Red			Yes			Yes			Yes	Yes	Yes	Yes
Satd. Flow (RTOR)			83							35	16	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		387			354			125			680	
Travel Time (s)		8.8			8.0			2.8			15.5	
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
Adj. Flow (vph)	0	1740	291	0	0	0	0	0	0	227	483	0
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	0	1740	291	0	0	0	0	0	0	204	506	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			0			12				12	
Link Offset(ft)	0			0			0			0	0	
Crosswalk Width(ft)	16			16			16			16	16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15	15	9
Turn Type		NA	Perm							Perm	NA	
Protected Phases		1									3	
Permitted Phases			1									3
Minimum Split (s)		50.0	50.0							40.0	40.0	
Total Split (s)		115.0	115.0							45.0	45.0	
Total Split (%)		71.9%	71.9%							28.1%	28.1%	
Maximum Green (s)		109.6	109.6							39.9	39.9	
Yellow Time (s)		3.2	3.2							3.2	3.2	
All-Red Time (s)		2.2	2.2							1.9	1.9	
Lost Time Adjust (s)		0.0	0.0							0.0	0.0	
Total Lost Time (s)		5.4	5.4							5.1	5.1	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)		7.0	7.0							7.0	7.0	
Flash Dont Walk (s)		18.0	18.0							15.0	15.0	
Pedestrian Calls (#/hr)		4	4							5	5	
Act Effct Green (s)		109.6	109.6							39.9	39.9	
Actuated g/C Ratio		0.68	0.68							0.25	0.25	
v/c Ratio		0.72	0.26							0.48	0.59	

Alternative 1
11: Oak & Tupper

PM 2025
09/14/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	10.1	4.3								46.3	54.4	
Queue Delay	0.5	0.8								0.1	0.0	
Total Delay	10.6	5.1								46.4	54.5	
LOS	B	A								D	D	
Approach Delay	9.8						52.1					
Approach LOS	A						D					
Queue Length 50th (ft)	263		47						167		250	
Queue Length 95th (ft)	282		68						261		317	
Internal Link Dist (ft)	307				274		45				600	
Turn Bay Length (ft)			200									
Base Capacity (vph)	2424		1110						427		855	
Starvation Cap Reductn	274		541						0		0	
Spillback Cap Reductn	165		0						7		6	
Storage Cap Reductn	0		0						0		0	
Reduced v/c Ratio	0.81		0.51						0.49		0.60	

Intersection Summary

Area Type:	Other
Cycle Length:	160
Actuated Cycle Length:	160
Offset:	16 (10%), Referenced to phase 1:EBT, Start of Yellow
Natural Cycle:	90
Control Type:	Pretimed
Maximum v/c Ratio:	0.72
Intersection Signal Delay:	20.7
Intersection LOS:	C
Intersection Capacity Utilization:	67.1%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 11: Oak & Tupper



Alternative 1
12: Elm St & Tupper

PM 2025
09/14/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑						↑↑				
Traffic Volume (vph)	7	1867	0	0	0	0	0	406	52	0	0	0
Future Volume (vph)	7	1867	0	0	0	0	0	406	52	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt	0.983											
Fit Protected												
Satd. Flow (prot)	0	3539	0	0	0	0	0	3479	0	0	0	0
Fit Permitted												
Satd. Flow (perm)	0	3539	0	0	0	0	0	3479	0	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)	14								9			
Link Speed (mph)	30				30				30		30	
Link Distance (ft)	354				313				418		586	
Travel Time (s)	8.0				7.1				9.5		13.3	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	7	1945	0	0	0	0	0	423	54	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1952	0	0	0	0	0	477	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0				0				0		0	
Link Offset(ft)	0				0				0		0	
Crosswalk Width(ft)	16				16				16		16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA						NA				
Protected Phases	3								1			
Permitted Phases	3								1			
Minimum Split (s)	30.0								60.0			
Total Split (s)	100.0								60.0			
Total Split (%)	62.5%								37.5%			
Maximum Green (s)	94.9								54.9			
Yellow Time (s)	3.2								3.2			
All-Red Time (s)	1.9								1.9			
Lost Time Adjust (s)	0.0								0.0			
Total Lost Time (s)	5.1								5.1			
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0											
Flash Dont Walk (s)	12.0											
Pedestrian Calls (#/hr)	0											
Act Effct Green (s)	94.9								54.9			
Actuated g/C Ratio	0.59								0.34			
v/c Ratio	0.93								0.40			
Control Delay	19.2								40.4			
Queue Delay	0.1								0.0			
Total Delay	19.3								40.4			

Alternative 1
12: Elm St & Tupper

PM 2025
09/14/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		B						D				
Approach Delay		19.3						40.4				
Approach LOS		B						D				
Queue Length 50th (ft)		217						196				
Queue Length 95th (ft)		593						248				
Internal Link Dist (ft)		274			233			338			506	
Turn Bay Length (ft)												
Base Capacity (vph)		2104						1199				
Starvation Cap Reductn		3						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.93						0.40				

Intersection Summary

Area Type:	Other
Cycle Length:	160
Actuated Cycle Length:	160
Offset:	158 (99%), Referenced to phase 3:EBTL, Start of Yellow
Natural Cycle:	140
Control Type:	Pretimed
Maximum v/c Ratio:	0.93
Intersection Signal Delay:	23.4
Intersection LOS:	C
Intersection Capacity Utilization:	73.2%
ICU Level of Service:	D
Analysis Period (min):	15

Splits and Phases: 12: Elm St & Tupper



Alternative 1
34:

PM 2025
09/14/2022



Lane Group	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations	↑↑					↑↑
Traffic Volume (vph)	1457	0	0	0	0	1603
Future Volume (vph)	1457	0	0	0	0	1603
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	1.00	1.00	0.88
Fr						0.850
Flt Protected						
Satd. Flow (prot)	3539	0	0	0	0	2787
Flt Permitted						
Satd. Flow (perm)	3539	0	0	0	0	2787
Link Speed (mph)	30			55	55	
Link Distance (ft)	334			197	283	
Travel Time (s)	7.6			2.4	3.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1584	0	0	0	0	1742
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1584	0	0	0	0	1742
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	L NA	Right	Left	Left	Left	R NA
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization:	103.0%
ICU Level of Service:	G
Analysis Period (min):	15

Alternative 1
41: Pearl & Edward

PM 2025
09/14/2022



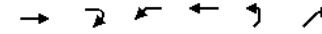
Lane Group	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations			↕	↕		
Traffic Volume (vph)	0	0	261	680	0	0
Future Volume (vph)	0	0	261	680	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected			0.950			
Satd. Flow (prot)	0	0	1770	1863	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	0	0	1770	1863	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	525			127	132	
Travel Time (s)	11.9			2.9	3.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	284	739	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	284	739	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	60		15	60
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	39.1%
ICU Level of Service	A
Analysis Period (min)	15

Alternative 1
43:

PM 2025
09/14/2022



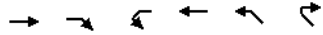
Lane Group	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations			↕	↕↕		
Traffic Volume (vph)	0	0	1452	524	0	0
Future Volume (vph)	0	0	1452	524	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Frt						
Flt Protected			0.950	0.972		
Satd. Flow (prot)	0	0	1610	3295	0	0
Flt Permitted			0.950	0.972		
Satd. Flow (perm)	0	0	1610	3295	0	0
Link Speed (mph)	30			55	55	
Link Distance (ft)	208			242	179	
Travel Time (s)	4.7			3.0	2.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	1578	570	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	789	1359	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	86.7%
ICU Level of Service	E
Analysis Period (min)	15

Alternative 1
50: Goodell

PM 2025
09/14/2022



Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations				↑↑	↑↑	
Traffic Volume (vph)	0	0	0	231	514	0
Future Volume (vph)	0	0	0	231	514	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Fr						
Flt Protected					0.950	
Satd. Flow (prot)	0	0	0	3539	3433	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	0	0	3539	3433	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	246			303	185	
Travel Time (s)	5.6			6.9	4.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	251	559	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	251	559	0
Enter Blocked Intersection	No	No	No	Yes	Yes	Yes
Lane Alignment	Left	Right	Left	R NA	L NA	L NA
Median Width(ft)	0			0	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	27.7%
ICU Level of Service	A
Analysis Period (min)	15

Alternative 1
86: Oak St

PM 2025
09/14/2022



Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations				↑↑	↑↑	
Traffic Volume (vph)	0	0	0	288	1452	0
Future Volume (vph)	0	0	0	288	1452	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Fr						
Flt Protected					0.950	
Satd. Flow (prot)	0	0	0	3539	3433	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	0	0	3539	3433	0
Link Speed (mph)	30			30	55	
Link Distance (ft)	195			181	212	
Travel Time (s)	4.4			4.1	2.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	313	1578	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	313	1578	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary

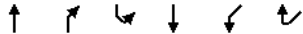
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	86.7%
ICU Level of Service	E
Analysis Period (min)	15

Alternative 1

PM 2025

89: Elm St

09/14/2022



Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations	↑↑	↑				
Traffic Volume (vph)	230	1619	0	0	0	0
Future Volume (vph)	230	1619	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.91	0.91	1.00	1.00	1.00	1.00
Frt	0.883	0.850				
Flt Protected						
Satd. Flow (prot)	2994	1441	0	0	0	0
Flt Permitted						
Satd. Flow (perm)	2994	1441	0	0	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	155			418	135	
Travel Time (s)	3.5			9.5	3.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	250	1760	0	0	0	0
Shared Lane Traffic (%)		50%				
Lane Group Flow (vph)	1130	880	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	70.2%
ICU Level of Service	C
Analysis Period (min)	15

Alternative 1
1: Michigan & Goodell

PM 2045
09/14/2022

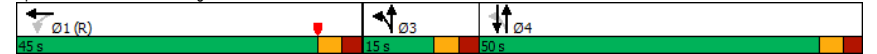
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				←←←←	←←←←	←←←←	←←	←←	←←	←←	←←	←←
Traffic Volume (vph)	0	0	0	83	655	110	75	223	0	0	545	178
Future Volume (vph)	0	0	0	83	655	110	75	223	0	0	545	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.86	0.86	0.86	1.00	1.00	1.00	1.00	0.95	0.95
Frt				0.981							0.963	
Fit Protected				0.995			0.950					
Satd. Flow (prot)	0	0	0	0	6255	0	1770	1863	0	0	3408	0
Fit Permitted				0.995			0.268					
Satd. Flow (perm)	0	0	0	0	6255	0	499	1863	0	0	3408	0
Right Turn on Red			Yes		Yes			Yes				Yes
Satd. Flow (RTOR)				38							48	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		402			246			648			972	
Travel Time (s)		9.1			5.6			14.7			22.1	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	85	668	112	77	228	0	0	556	182
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	865	0	77	228	0	0	738	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type			Perm	NA		D.P+P	NA				NA	
Protected Phases				1		3	3 4				4	
Permitted Phases				1		4						
Minimum Split (s)				45.0	45.0		10.6				14.6	
Total Split (s)				45.0	45.0		15.0				50.0	
Total Split (%)				40.9%	40.9%		13.6%				45.5%	
Maximum Green (s)				39.1	39.1		9.2				44.2	
Yellow Time (s)				3.2	3.2		3.2				3.2	
All-Red Time (s)				2.7	2.7		2.6				2.6	
Lost Time Adjust (s)					0.0		0.0				0.0	
Total Lost Time (s)					5.9		5.8				5.8	
Lead/Lag						Lead	Lag					
Lead-Lag Optimize?						Yes					Yes	
Walk Time (s)				7.0	7.0						7.0	
Flash Dont Walk (s)				15.0	15.0						14.0	
Pedestrian Calls (#/hr)				4	4						8	
Act Effect Green (s)				39.1	39.1		53.4	59.2			44.2	
Actuated g/C Ratio				0.36	0.36		0.49	0.54			0.40	
v/c Ratio				0.38	0.38		0.22	0.23			0.53	
Control Delay				25.8	25.8		14.1	14.1			24.9	
Queue Delay				0.0	0.0		0.0	0.0			0.0	
Total Delay				25.8	25.8		14.1	14.1			24.9	

Alternative 1
1: Michigan & Goodell

PM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				←←←←	←←←←	←←←←	←←	←←	←←	←←	←←	←←
LOS					C		B	B				C
Approach Delay					25.8			14.1				24.9
Approach LOS					C			B				C
Queue Length 50th (ft)					125		25	81				191
Queue Length 95th (ft)					154		49	126				249
Internal Link Dist (ft)		322			166			568				892
Turn Bay Length (ft)												
Base Capacity (vph)					2247		348	1002				1398
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					0.38		0.22	0.23				0.53
Intersection Summary												
Area Type:	Other											
Cycle Length:	110											
Actuated Cycle Length:	110											
Offset:	0 (0%), Referenced to phase 1:WBTL, Start of Yellow											
Natural Cycle:	80											
Control Type:	Pretimed											
Maximum v/c Ratio:	0.53											
Intersection Signal Delay:	23.6											
Intersection Capacity Utilization:	52.1%											
ICU Level of Service:	A											
Analysis Period (min):	15											

Splits and Phases: 1: Michigan & Goodell



Alternative 1
2: Elm St/Bennett Ln & Goodell

PM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↔	↔				↔
Traffic Volume (vph)	0	0	0	0	941	15	407	5	0	0	0	15
Future Volume (vph)	0	0	0	0	941	15	407	5	0	0	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.86	0.86	0.95	0.95	1.00	1.00	1.00	1.00
Friction					0.998							0.865
Fit Protected							0.950	0.953				
Satd. Flow (prot)	0	0	0	0	6395	0	1681	1686	0	0	0	1611
Fit Permitted							0.950	0.953				
Satd. Flow (perm)	0	0	0	0	6395	0	1681	1686	0	0	0	1611
Link Speed (mph)		30			30			30				30
Link Distance (ft)		335			402			586				380
Travel Time (s)		7.6			9.1			13.3				8.6
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	0	960	15	415	5	0	0	0	15
Shared Lane Traffic (%)							49%					
Lane Group Flow (vph)	0	0	0	0	975	0	212	208	0	0	0	15
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60		9	15		60	15		9	60		60
Sign Control		Stop			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 73.5% ICU Level of Service D
Analysis Period (min) 15

Alternative 1
3: Oak & Goodell

PM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↔	↔				↔
Traffic Volume (vph)	0	0	0	0	224	1097	43	0	0	0	0	380
Future Volume (vph)	0	0	0	0	224	1097	43	0	0	0	0	380
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Friction												0.983
Fit Protected												
Satd. Flow (prot)	0	0	0	0	6325	0	0	0	0	0	0	1831
Fit Permitted												
Satd. Flow (perm)	0	0	0	0	6325	0	0	0	0	0	0	1831
Right Turn on Red				Yes	Yes	Yes			Yes			Yes
Satd. Flow (RTOR)							75					8
Link Speed (mph)		30			30			30				30
Link Distance (ft)		385			335			680				542
Travel Time (s)		8.8			7.6			15.5				12.3
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
Adj. Flow (vph)	0	0	0	0	236	1155	45	0	0	0	0	400
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1436	0	0	0	0	0	0	458
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type					Perm			NA				NA
Protected Phases								1				3
Permitted Phases					1							
Minimum Split (s)					58.0			58.0				27.7
Total Split (s)					63.0			63.0				47.0
Total Split (%)					57.3%			57.3%				42.7%
Maximum Green (s)					57.4			57.4				41.3
Yellow Time (s)					3.2			3.2				3.2
All-Red Time (s)					2.4			2.4				2.5
Lost Time Adjust (s)								0.0				0.0
Total Lost Time (s)								5.6				5.7
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)					7.0			7.0				7.0
Flash Dont Walk (s)					12.0			12.0				14.0
Pedestrian Calls (#/hr)					5			5				11
Act Effct Green (s)								57.4				41.3
Actuated g/C Ratio								0.52				0.38
v/c Ratio								0.43				0.66
Control Delay								10.4				33.6
Queue Delay								0.0				0.0
Total Delay								10.4				33.6

Alternative 1
3: Oak & Goodell

PM 2045
09/14/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS					B						C	
Approach Delay					10.4						33.6	
Approach LOS					B						C	
Queue Length 50th (ft)					109						261	
Queue Length 95th (ft)					125						377	
Internal Link Dist (ft)		305			255			600			462	
Turn Bay Length (ft)												
Base Capacity (vph)					3336						692	
Starvation Cap Reductn					0						0	
Spillback Cap Reductn					0						0	
Storage Cap Reductn					0						0	
Reduced v/c Ratio					0.43						0.66	

Intersection Summary	
Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	10 (9%), Referenced to phase 1:WBTL, Start of Yellow
Natural Cycle:	90
Control Type:	Pretimed
Maximum v/c Ratio:	0.66
Intersection Signal Delay:	16.0
Intersection LOS:	B
Intersection Capacity Utilization:	67.4%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 3: Oak & Goodell



Alternative 1
4: Ellicott & Goodell

PM 2045
09/14/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					TTTT			T				T
Traffic Volume (vph)	0	0	0	20	940	136	49	82	0	0	172	40
Future Volume (vph)	0	0	0	20	940	136	49	82	0	0	172	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.981						0.975	
Fit Protected					0.999			0.982				
Satd. Flow (prot)	0	0	0	0	6280	0	0	1829	0	0	1816	0
Fit Permitted					0.999			0.822				
Satd. Flow (perm)	0	0	0	0	6280	0	0	1531	0	0	1816	0
Right Turn on Red					Yes		Yes		Yes			Yes
Satd. Flow (RTOR)					48						12	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		140			385			361			475	
Travel Time (s)		3.2			8.8			8.2			10.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	22	1022	148	53	89	0	0	187	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1192	0	0	142	0	0	230	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)					0			0			0	
Link Offset(ft)					0			0			0	
Crosswalk Width(ft)					16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					1			3				3
Permitted Phases					1			3				3
Minimum Split (s)					50.0			40.0				40.0
Total Split (s)					61.0			49.0				49.0
Total Split (%)					55.5%			44.5%				44.5%
Maximum Green (s)					56.4			43.5				43.5
Yellow Time (s)					3.2			3.2				3.2
All-Red Time (s)					1.4			2.3				2.3
Lost Time Adjust (s)					0.0			0.0				0.0
Total Lost Time (s)					4.6			5.5				5.5
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)					7.0			7.0				7.0
Flash Dont Walk (s)					13.0			14.0				14.0
Pedestrian Calls (#/hr)					0			21				21
Act Effct Green (s)					56.4			43.5				43.5
Actuated g/C Ratio					0.51			0.40				0.40
v/c Ratio					0.37			0.23				0.32
Control Delay					2.4			23.5				23.2
Queue Delay					0.1			0.0				0.0
Total Delay					2.5			23.5				23.2

Alternative 1
4: Ellicott & Goodell

PM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS					A			C				C
Approach Delay					2.5			23.5			23.2	
Approach LOS					A			C				C
Queue Length 50th (ft)					15			66			104	
Queue Length 95th (ft)					16			113			167	
Internal Link Dist (ft)		60			305			281			395	
Turn Bay Length (ft)												
Base Capacity (vph)					3243			605			725	
Starvation Cap Reductn					513			0			0	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.44			0.23			0.32	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 18 (16%), Referenced to phase 1:WBTL, Start of Yellow

Natural Cycle: 90

Control Type: Pretimed

Maximum v/c Ratio: 0.37

Intersection Signal Delay: 7.4

Intersection LOS: A

Intersection Capacity Utilization 47.7%

ICU Level of Service A

Analysis Period (min) 15



Alternative 1
5: Washington & Goodell

PM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔	↔	↔		↔			↔	↔
Traffic Volume (vph)	0	0	0	34	996	19	52	71	0	0	139	20
Future Volume (vph)	0	0	0	34	996	19	52	71	0	0	139	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	50	0	0	0	0	0	0	66	0
Storage Lanes	0	0	0	1	0	0	0	0	0	0	1	0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Fit					0.997							0.850
Fit Protected				0.950			0.979					
Satd. Flow (prot)	0	0	0	1770	5070	0	0	1824	0	0	1863	1583
Fit Permitted				0.950			0.826					
Satd. Flow (perm)	0	0	0	1770	5070	0	0	1539	0	0	1863	1583
Right Turn on Red				Yes		Yes		Yes			Yes	Yes
Satd. Flow (RTOR)				4								24
Link Speed (mph)		30			30			30				30
Link Distance (ft)		156			189			726				324
Travel Time (s)		3.5			4.3			16.5				7.4
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	35	1038	20	54	74	0	0	145	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	35	1058	0	0	128	0	0	145	21
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA		Perm	NA			NA	Perm
Protected Phases					1			3				3
Permitted Phases				1			3					3
Minimum Split (s)				55.0	55.0		30.0	30.0			30.0	30.0
Total Split (s)				70.0	70.0		40.0	40.0			40.0	40.0
Total Split (%)				63.6%	63.6%		36.4%	36.4%			36.4%	36.4%
Maximum Green (s)				64.6	64.6		34.3	34.3			34.3	34.3
Yellow Time (s)				3.2	3.2		3.2	3.2			3.2	3.2
All-Red Time (s)				2.2	2.2		2.5	2.5			2.5	2.5
Lost Time Adjust (s)				0.0	0.0			0.0			0.0	0.0
Total Lost Time (s)				5.4	5.4			5.7			5.7	5.7
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)				7.0	7.0		7.0	7.0			7.0	7.0
Flash Dont Walk (s)				11.0	11.0		14.0	14.0			14.0	14.0
Pedestrian Calls (#/hr)				8	8		9	9			9	9
Act Effct Green (s)				64.6	64.6		34.3	34.3			34.3	34.3
Actuated g/C Ratio				0.59	0.59		0.31	0.31			0.31	0.31
v/c Ratio				0.03	0.36			0.27			0.25	0.04

Alternative 1
5: Washington & Goodell

PM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	4.6	5.1			5.1			30.3			29.7	9.6
Queue Delay	0.0	0.1			0.1			0.0			0.0	0.0
Total Delay	4.6	5.2			5.2			30.3			29.7	9.6
LOS	A	A			A			C			C	A
Approach Delay				5.1				30.3			27.2	
Approach LOS				A				C			C	
Queue Length 50th (ft)				4	43			68			76	0
Queue Length 95th (ft)				9	49			118			128	17
Internal Link Dist (ft)	76			109				646			244	
Turn Bay Length (ft)				50								66
Base Capacity (vph)	1039	2979						479			580	510
Starvation Cap Reductn	0	540						0			0	0
Spillback Cap Reductn	0	86						0			0	0
Storage Cap Reductn	0	0						0			0	0
Reduced v/c Ratio	0.03	0.43						0.27			0.25	0.04

Intersection Summary

Area Type:	Other
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 16 (15%), Referenced to phase 1:WBTL, Start of Yellow	
Natural Cycle: 85	
Control Type: Pretimed	
Maximum v/c Ratio: 0.36	
Intersection Signal Delay: 10.1	Intersection LOS: B
Intersection Capacity Utilization 47.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: Washington & Goodell



Alternative 1
6: Main St & Pearl/Goodell

PM 2045
09/14/2022

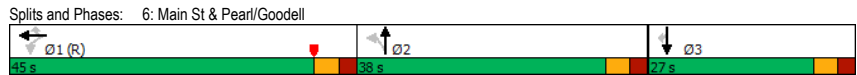
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	28	797	254	18	113	0	0	177	144
Future Volume (vph)	0	0	0	28	797	254	18	113	0	0	177	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	54	0	0	0	0	0	0
Storage Lanes	0	0	0	0	1	1	0	0	0	0	0	2
Taper Length (ft)	25			25		25			25			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Frt						0.850						0.850
Fit Protected					0.998		0.950					
Satd. Flow (prot)	0	0	0	0	3532	1583	1770	1863	0	0	1863	2787
Fit Permitted					0.998		0.123					
Satd. Flow (perm)	0	0	0	0	3532	1583	229	1863	0	0	1863	2787
Right Turn on Red			Yes		Yes		Yes		Yes		Yes	
Satd. Flow (RTOR)					257							145
Link Speed (mph)				30		30		30			30	
Link Distance (ft)				127		123		709			848	
Travel Time (s)				2.9		2.8		16.1			19.3	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	0	0	0	28	805	257	18	114	0	0	179	145
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	833	257	18	114	0	0	179	145
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			0		0		12			12	
Link Offset(ft)	0			0		0		0			0	
Crosswalk Width(ft)	16			16		16		16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9		15		9	15	9
Turn Type				Perm		NA		Perm		Perm	NA	Perm
Protected Phases					1			2			3	
Permitted Phases						1						3
Minimum Split (s)				35.5	35.5	35.5	30.6	30.6			27.5	27.5
Total Split (s)				45.0	45.0	45.0	38.0	38.0			27.0	27.0
Total Split (%)				40.9%	40.9%	40.9%	34.5%	34.5%			24.5%	24.5%
Maximum Green (s)				39.5	39.5	39.5	32.4	32.4			21.5	21.5
Yellow Time (s)				3.2	3.2	3.2	3.2	3.2			3.0	3.0
All-Red Time (s)				2.3	2.3	2.3	2.4	2.4			2.5	2.5
Lost Time Adjust (s)					0.0	0.0	0.0	0.0			0.0	0.0
Total Lost Time (s)					5.5	5.5	5.6	5.6			5.5	5.5
Lead/Lag					Lead	Lead	Lead	Lag			Lag	
Lead-Lag Optimize?					Yes	Yes	Yes	Yes			Yes	
Walk Time (s)				7.0	7.0	7.0	7.0	7.0			7.0	7.0
Flash Dont Walk (s)				18.0	18.0	18.0	15.0	15.0			9.0	9.0
Pedestrian Calls (#/hr)				0	0	0	0	0			0	0
Act Effect Green (s)					39.5	39.5	32.4	32.4			21.5	21.5
Actuated g/C Ratio					0.36	0.36	0.29	0.29			0.20	0.20
v/c Ratio					0.66	0.35	0.27	0.21			0.49	0.22

Alternative 1
6: Main St & Pearl/Goodell

PM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay					19.7	3.2	42.2	30.4			44.7	7.0
Queue Delay					0.9	0.7	0.0	0.0			0.0	0.0
Total Delay					20.7	3.9	42.2	30.4			44.7	7.0
LOS					C	A	D	C			D	A
Approach Delay					16.7			32.0			27.8	
Approach LOS					B			C			C	
Queue Length 50th (ft)					123	0	10	60			114	0
Queue Length 95th (ft)					289	3	34	107			185	28
Internal Link Dist (ft)	47				43			629			768	
Turn Bay Length (ft)							54					
Base Capacity (vph)					1268	733	67	548			364	661
Starvation Cap Reductn					199	227	0	0			0	0
Spillback Cap Reductn					0	0	0	0			0	0
Storage Cap Reductn					0	0	0	0			0	0
Reduced v/c Ratio					0.78	0.51	0.27	0.21			0.49	0.22

Intersection Summary	
Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	8 (7%), Referenced to phase 1:WBTL, Start of Yellow
Natural Cycle:	95
Control Type:	Pretimed
Maximum v/c Ratio:	0.66
Intersection Signal Delay:	20.4
Intersection LOS:	C
Intersection Capacity Utilization:	47.1%
ICU Level of Service:	A
Analysis Period (min):	15



Alternative 1
7: Tupper & Pearl

PM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↔		↔		↔		↔	↔
Traffic Volume (vph)	0	811	20	10	76	0	77	0	330	41	139	65
Future Volume (vph)	0	811	20	10	76	0	77	0	330	41	139	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996							0.850			0.850
Fit Protected					0.994		0.950				0.989	
Satd. Flow (prot)	0	3525	0	0	1852	0	1770	0	1583	0	1842	1583
Fit Permitted					0.889		0.551				0.989	
Satd. Flow (perm)	0	3525	0	0	1656	0	1026	0	1583	0	1842	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3							159			69
Link Speed (mph)		30			30		30				30	
Link Distance (ft)		570			351		561				440	
Travel Time (s)		13.0			8.0		12.8				10.0	
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
Adj. Flow (vph)	0	863	21	11	81	0	82	0	351	44	148	69
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	884	0	0	92	0	82	0	351	0	192	69
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0		12				12	
Link Offset(ft)		0			0		0				0	
Crosswalk Width(ft)		16			16		16				16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA		Perm	NA		D.Pm		Perm	Perm	NA	Perm
Protected Phases		1			1						3	
Permitted Phases				1			3		3	3		3
Minimum Split (s)		50.0		50.0		50.0	40.0		40.0	40.0		40.0
Total Split (s)		100.0		100.0		100.0	60.0		60.0	60.0		60.0
Total Split (%)		62.5%		62.5%		62.5%	37.5%		37.5%	37.5%		37.5%
Maximum Green (s)		94.4		94.4		94.4	54.8		54.8	54.8		54.8
Yellow Time (s)		3.2		3.2		3.2	3.2		3.2	3.2		3.2
All-Red Time (s)		2.4		2.4		2.4	2.0		2.0	2.0		2.0
Lost Time Adjust (s)		0.0		0.0		0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)		5.6		5.6		5.6	5.2		5.2	5.2		5.2
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)		7.0		7.0		7.0	7.0		7.0	7.0		7.0
Flash Dont Walk (s)		15.0		15.0		15.0	12.0		12.0	12.0		12.0
Pedestrian Calls (#/hr)		0		0		0	0		0	0		0
Act Effect Green (s)		94.4		94.4		94.4	54.8		54.8	54.8		54.8
Actuated g/C Ratio		0.59		0.59		0.59	0.34		0.34	0.34		0.34
v/c Ratio		0.42		0.09		0.23	0.54		0.54	0.30		0.12
Control Delay		18.7		7.0		39.9	25.8		25.8	40.3		7.8
Queue Delay		0.1		0.0		0.0	0.1		0.1	0.0		0.0
Total Delay		18.8		7.0		39.9	25.8		25.8	40.3		7.8

Alternative 1
7: Tupper & Pearl

PM 2045
09/14/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		B			A		D		C		D	A
Approach Delay		18.8			7.0			28.5			31.7	
Approach LOS		B			A			C			C	
Queue Length 50th (ft)		255			24		61		161		148	0
Queue Length 95th (ft)		304			39		110		267		218	37
Internal Link Dist (ft)		490			271			481			360	
Turn Bay Length (ft)												
Base Capacity (vph)		2080			977		351		646		630	587
Starvation Cap Reductn		0			0		0		0		0	0
Spillback Cap Reductn		313			0		0		13		0	0
Storage Cap Reductn		0			0		0		0		0	0
Reduced v/c Ratio		0.50			0.09		0.23		0.55		0.30	0.12

Intersection Summary	
Area Type:	Other
Cycle Length:	160
Actuated Cycle Length:	160
Offset:	0 (0%), Referenced to phase 1:EBWB, Start of Yellow, Master Intersection
Natural Cycle:	90
Control Type:	Pretimed
Maximum v/c Ratio:	0.54
Intersection Signal Delay:	22.7
Intersection LOS:	C
Intersection Capacity Utilization:	66.4%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 7: Tupper & Pearl



Alternative 1
8: Main St & Tupper

PM 2045
09/14/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕			↕		↕	↕	↕
Traffic Volume (vph)	60	1030	25	6	88	25	14	46	61	145	54	15
Future Volume (vph)	60	1030	25	6	88	25	14	46	61	145	54	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	0	0	0	0	40	0	0
Storage Lanes	0	0	0	0	0	0	0	0	0	1	0	0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.972			0.932			0.967	
Fit Protected		0.997			0.998			0.994		0.950		
Satd. Flow (prot)	0	3518	0	0	1807	0	0	1726	0	1770	1801	0
Fit Permitted		0.924			0.944			0.966		0.623		
Satd. Flow (perm)	0	3260	0	0	1709	0	0	1677	0	1160	1801	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			17			32			9	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		351			263			1174			709	
Travel Time (s)		8.0			6.0			26.7			16.1	
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
Adj. Flow (vph)	63	1084	26	6	93	26	15	48	64	153	57	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1173	0	0	125	0	0	127	0	153	73	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0	0	0	0	0	0	0	12	0	0	12	0
Link Offset(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Crosswalk Width(ft)	16	16	16	16	16	16	16	16	16	16	16	16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	9	15	15	9	15	15	9	15	15	9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		1			1			3		3		3
Permitted Phases	1			1			3			3		
Minimum Split (s)	50.0	50.0		50.0	50.0		40.0	40.0		40.0	40.0	
Total Split (s)	109.0	109.0		109.0	109.0		51.0	51.0		51.0	51.0	
Total Split (%)	68.1%	68.1%		68.1%	68.1%		31.9%	31.9%		31.9%	31.9%	
Maximum Green (s)	102.8	102.8		102.8	102.8		44.9	44.9		44.9	44.9	
Yellow Time (s)	3.2	3.2		3.2	3.2		3.2	3.2		3.2	3.2	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.9	2.9		2.9	2.9	
Lost Time Adjust (s)		0.0			0.0			0.0		0.0	0.0	
Total Lost Time (s)		6.2			6.2			6.1		6.1	6.1	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		15.0	15.0		12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		102.8			102.8			44.9		44.9	44.9	
Actuated g/C Ratio		0.64			0.64			0.28		0.28	0.28	
v/c Ratio		0.56			0.11			0.26		0.47	0.14	

Alternative 1
8: Main St & Tupper

PM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	15.3			18.5	18.5			34.6		53.4	38.7	
Queue Delay	0.3			2.7				0.0		0.1	0.0	
Total Delay	15.6			21.2				34.7		53.5	38.7	
LOS	B			C				C		D	D	
Approach Delay	15.6			21.2				34.7		53.5	38.7	
Approach LOS	B			C				C		D	D	
Queue Length 50th (ft)	435			88				76		134	50	
Queue Length 95th (ft)	529			139				137		212	95	
Internal Link Dist (ft)	271			183				1094		629		
Turn Bay Length (ft)										40		
Base Capacity (vph)	2095			1104				493		325	511	
Starvation Cap Reductn	334			874				0		0	0	
Spillback Cap Reductn	190			0				9		5	0	
Storage Cap Reductn	0			0				0		0	0	
Reduced v/c Ratio	0.67			0.54				0.26		0.48	0.14	

Intersection Summary	
Area Type:	Other
Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 18 (11%), Referenced to phase 1:EBWB, Start of Yellow	
Natural Cycle: 90	
Control Type: Pretimed	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 22.0	Intersection LOS: C
Intersection Capacity Utilization 59.3%	ICU Level of Service B
Analysis Period (min) 15	



Alternative 1
9: Washington & Tupper

PM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕	↕	↕	↕	↕
Traffic Volume (vph)	12	1174	43	0	38	1	68	92	135	115	92	11
Future Volume (vph)	12	1174	43	0	38	1	68	92	135	115	92	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		78	85		0
Storage Lanes	0		0	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.997				0.850	0.984		
Fit Protected								0.979		0.950		
Satd. Flow (prot)	0	3522	0	0	1857	0	0	1824	1583	1770	1833	0
Fit Permitted		0.953						0.811		0.487		
Satd. Flow (perm)	0	3356	0	0	1857	0	0	1511	1583	907	1833	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			1				100			4
Link Speed (mph)		30			30				30			30
Link Distance (ft)		263			328				1190			726
Travel Time (s)		6.0			7.5				27.0			16.5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	13	1304	48	0	42	1	76	102	150	128	102	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1365	0	0	43	0	0	178	150	128	114	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			0				12				12
Link Offset(ft)	0			0				0				0
Crosswalk Width(ft)	16			16				16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA			NA			Perm	NA	Perm	D.P+P	NA
Protected Phases		1			1				4		3	3 4
Permitted Phases	1			1				4		4		4
Minimum Split (s)	47.0	47.0		47.0	47.0		28.0	28.0	28.0	15.0		
Total Split (s)	103.0	103.0		103.0	103.0		40.0	40.0	40.0	17.0		
Total Split (%)	64.4%	64.4%		64.4%	64.4%		25.0%	25.0%	25.0%	10.6%		
Maximum Green (s)	97.5	97.5		97.5	97.5		34.8	34.8	34.8	11.9		
Yellow Time (s)	3.2	3.2		3.2	3.2		3.2	3.2	3.2	3.2		
All-Red Time (s)	2.3	2.3		2.3	2.3		2.0	2.0	2.0	1.9		
Lost Time Adjust (s)		0.0			0.0			0.0	0.0	0.0		
Total Lost Time (s)		5.5			5.5			5.2	5.2	5.1		
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0			
Flash Dont Walk (s)	17.0	17.0		17.0	17.0		11.0	11.0	11.0			
Pedestrian Calls (#/hr)	17	17		17	17		23	23	23			
Act Effct Green (s)		97.5			97.5			34.8	34.8	46.8	51.9	
Actuated g/C Ratio		0.61			0.61			0.22	0.22	0.29	0.32	
v/c Ratio		0.67			0.04			0.54	0.36	0.39	0.19	

Alternative 1
9: Washington & Tupper

PM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	15.2			32.9			62.6	21.4	43.5	38.6		
Queue Delay	0.2			0.0			0.0	0.0	0.0	0.0		
Total Delay	15.4			32.9			62.6	21.4	43.5	38.6		
LOS	B			C			E	C	D	D		
Approach Delay	15.4			32.9			43.8			41.2		
Approach LOS	B			C			D			D		
Queue Length 50th (ft)	596			40			167	43	98	83		
Queue Length 95th (ft)	451			83			253	112	155	136		
Internal Link Dist (ft)	183			248			1110			646		
Turn Bay Length (ft)							78	85				
Base Capacity (vph)	2046			1132			328	422	329	597		
Starvation Cap Reductn	144			0			0	0	0	0		
Spillback Cap Reductn	51			14			0	0	0	0		
Storage Cap Reductn	0			0			0	0	0	0		
Reduced v/c Ratio	0.72			0.04			0.54	0.36	0.39	0.19		

Intersection Summary	
Area Type:	Other
Cycle Length:	160
Actuated Cycle Length:	160
Offset:	14 (9%), Referenced to phase 1:EBWB, Start of Yellow
Natural Cycle:	90
Control Type:	Pretimed
Maximum v/c Ratio:	0.67
Intersection Signal Delay:	23.7
Intersection Capacity Utilization:	62.1%
Analysis Period (min):	15
Intersection LOS:	C
ICU Level of Service:	B



Alternative 1
10: Ellicott & Tupper

PM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔						↔	↔		↔↔	↔
Traffic Volume (vph)	13	1439	19	0	0	0	32	100	357	148	67	7
Future Volume (vph)	13	1439	19	0	0	0	32	100	357	148	67	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	0	0	0	0	80	0	150
Storage Lanes	0	0	0	0	0	0	0	0	1	0	0	1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998							0.850			0.850
Fit Protected								0.988			0.967	
Satd. Flow (prot)	0	3532	0	0	0	0	0	1840	1583	0	1801	1583
Fit Permitted								0.883			0.656	
Satd. Flow (perm)	0	3532	0	0	0	0	0	1645	1583	0	1222	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2							46			16
Link Speed (mph)	30				30			30			30	
Link Distance (ft)	328				387			1108			362	
Travel Time (s)	7.5				8.8			25.2			8.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	13	1484	20	0	0	0	33	103	368	153	69	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1517	0	0	0	0	0	136	368	0	222	7
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0				0			0			0	
Link Offset(ft)	0				0			0			0	
Crosswalk Width(ft)	16				16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15			9	15		9	15
Turn Type	Perm	NA						Perm	NA		Perm	Perm
Protected Phases		1						3			3	
Permitted Phases	1								3	3		3
Minimum Split (s)	50.0	50.0						40.0	40.0	40.0	40.0	40.0
Total Split (s)	106.0	106.0						54.0	54.0	54.0	54.0	54.0
Total Split (%)	66.3%	66.3%						33.8%	33.8%	33.8%	33.8%	33.8%
Maximum Green (s)	100.6	100.6						48.7	48.7	48.7	48.7	48.7
Yellow Time (s)	3.2	3.2						3.2	3.2	3.2	3.2	3.2
All-Red Time (s)	2.2	2.2						2.1	2.1	2.1	2.1	2.1
Lost Time Adjust (s)		0.0						0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.4						5.3	5.3	5.3	5.3	5.3
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0						7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	14.0	14.0						13.0	13.0	13.0	13.0	13.0
Pedestrian Calls (#/hr)	19	19						46	46	46	46	46
Act Effct Green (s)		100.6							48.7		48.7	48.7
Actuated g/C Ratio		0.63							0.30	0.30		0.30
v/c Ratio		0.68							0.27	0.72		0.60

Alternative 1
10: Ellicott & Tupper

PM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	8.4							44.1	52.1		55.3	6.3
Queue Delay	0.3							0.0	0.5		0.3	0.0
Total Delay	8.7							44.1	52.6		55.6	6.3
LOS	A							D	D		E	A
Approach Delay	8.7							50.3			54.1	
Approach LOS	A							D			D	
Queue Length 50th (ft)	141							109	304		199	0
Queue Length 95th (ft)	163							170	433		296	7
Internal Link Dist (ft)	248				307			1028			282	
Turn Bay Length (ft)												150
Base Capacity (vph)	2221							500	513		371	492
Starvation Cap Reductn	207							0	0		0	0
Spillback Cap Reductn	108							0	20		14	0
Storage Cap Reductn	0							0	0		0	0
Reduced v/c Ratio	0.75							0.27	0.75		0.62	0.01

Intersection Summary

Area Type:	Other
Cycle Length:	160
Actuated Cycle Length:	160
Offset:	16 (10%), Referenced to phase 1:EBTL, Start of Yellow
Natural Cycle:	90
Control Type:	Pretimed
Maximum v/c Ratio:	0.72
Intersection Signal Delay:	22.6
Intersection LOS:	C
Intersection Capacity Utilization:	87.9%
ICU Level of Service:	E
Analysis Period (min):	15

Splits and Phases: 10: Ellicott & Tupper



Alternative 1
11: Oak & Tupper

PM 2045
09/14/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑							↓	↑↑	
Traffic Volume (vph)	0	1663	276	0	0	0	0	0	0	216	459	0
Future Volume (vph)	0	1663	276	0	0	0	0	0	0	216	459	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	0		0	0	0	0
Storage Lanes	0		1	0		0	0		0	1	0	0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00
Fit Protected										0.950	0.998	
Satd. Flow (prot)	0	3539	1583	0	0	0	0	0	0	1610	3383	0
Fit Permitted										0.950	0.998	
Satd. Flow (perm)	0	3539	1583	0	0	0	0	0	0	1610	3383	0
Right Turn on Red			Yes			Yes			Yes	Yes	Yes	Yes
Satd. Flow (RTOR)			83							35	16	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		387			354			125			680	
Travel Time (s)		8.8			8.0			2.8			15.5	
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
Adj. Flow (vph)	0	1751	291	0	0	0	0	0	0	227	483	0
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	0	1751	291	0	0	0	0	0	0	204	506	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA	Perm							Perm	NA	
Protected Phases		1									3	
Permitted Phases			1									3
Minimum Split (s)		50.0	50.0							40.0	40.0	
Total Split (s)		115.0	115.0							45.0	45.0	
Total Split (%)		71.9%	71.9%							28.1%	28.1%	
Maximum Green (s)		109.6	109.6							39.9	39.9	
Yellow Time (s)		3.2	3.2							3.2	3.2	
All-Red Time (s)		2.2	2.2							1.9	1.9	
Lost Time Adjust (s)		0.0	0.0							0.0	0.0	
Total Lost Time (s)		5.4	5.4							5.1	5.1	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)		7.0	7.0							7.0	7.0	
Flash Dont Walk (s)		18.0	18.0							15.0	15.0	
Pedestrian Calls (#/hr)		4	4							5	5	
Act Effect Green (s)		109.6	109.6							39.9	39.9	
Actuated g/C Ratio		0.68	0.68							0.25	0.25	
v/c Ratio		0.72	0.26							0.48	0.59	

Alternative 1
11: Oak & Tupper

PM 2045
09/14/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	11.0	4.5								46.3	54.4	
Queue Delay	0.5	0.8								0.0	0.0	
Total Delay	11.5	5.3								46.3	54.4	
LOS	B	A								D	D	
Approach Delay	10.7											
Approach LOS	B											
Queue Length 50th (ft)	282	51								167	250	
Queue Length 95th (ft)	303	70								261	317	
Internal Link Dist (ft)	307			274			45				600	
Turn Bay Length (ft)		200										
Base Capacity (vph)	2424	1110								427	855	
Starvation Cap Reductn	274	542								0	0	
Spillback Cap Reductn	161	0								1	0	
Storage Cap Reductn	0	0								0	0	
Reduced v/c Ratio	0.81	0.51								0.48	0.59	

Intersection Summary

Area Type:	Other
Cycle Length:	160
Actuated Cycle Length:	160
Offset:	16 (10%), Referenced to phase 1:EBT, Start of Yellow
Natural Cycle:	90
Control Type:	Pretimed
Maximum v/c Ratio:	0.72
Intersection Signal Delay:	21.3
Intersection LOS:	C
Intersection Capacity Utilization:	67.4%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 11: Oak & Tupper



Alternative 1
12: Elm St & Tupper

PM 2045
09/14/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑						↑↑				
Traffic Volume (vph)	7	1877	0	0	0	0	0	406	52	0	0	0
Future Volume (vph)	7	1877	0	0	0	0	0	406	52	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt	0.983											
Fit Protected												
Satd. Flow (prot)	0	3539	0	0	0	0	0	3479	0	0	0	0
Fit Permitted												
Satd. Flow (perm)	0	3539	0	0	0	0	0	3479	0	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14						9				
Link Speed (mph)		30			30			30				30
Link Distance (ft)		354			313			418				586
Travel Time (s)		8.0			7.1			9.5				13.3
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	7	1955	0	0	0	0	0	423	54	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1962	0	0	0	0	0	477	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA						NA				
Protected Phases		3						1				
Permitted Phases		3										
Minimum Split (s)	30.0	30.0						60.0				
Total Split (s)	100.0	100.0						60.0				
Total Split (%)	62.5%	62.5%						37.5%				
Maximum Green (s)	94.9	94.9						54.9				
Yellow Time (s)	3.2	3.2						3.2				
All-Red Time (s)	1.9	1.9						1.9				
Lost Time Adjust (s)		0.0						0.0				
Total Lost Time (s)		5.1						5.1				
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0											
Flash Dont Walk (s)	12.0											
Pedestrian Calls (#/hr)	0											
Act Effct Green (s)	94.9							54.9				
Actuated g/C Ratio	0.59							0.34				
v/c Ratio	0.93							0.40				
Control Delay	19.6							40.4				
Queue Delay	0.1							0.0				
Total Delay	19.6							40.4				

Alternative 1
12: Elm St & Tupper

PM 2045
09/14/2022

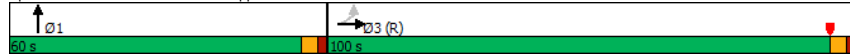


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		B						D				
Approach Delay		19.6						40.4				
Approach LOS		B						D				
Queue Length 50th (ft)		216						196				
Queue Length 95th (ft)		570						248				
Internal Link Dist (ft)		274			233			338			506	
Turn Bay Length (ft)												
Base Capacity (vph)		2104						1199				
Starvation Cap Reductn		4						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.93						0.40				

Intersection Summary

Area Type:	Other
Cycle Length:	160
Actuated Cycle Length:	160
Offset:	158 (99%), Referenced to phase 3:EBTL, Start of Yellow
Natural Cycle:	140
Control Type:	Pretimed
Maximum v/c Ratio:	0.93
Intersection Signal Delay:	23.7
Intersection LOS:	C
Intersection Capacity Utilization:	73.5%
ICU Level of Service:	D
Analysis Period (min):	15

Splits and Phases: 12: Elm St & Tupper



Alternative 1
34:

PM 2045
09/14/2022



Lane Group	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations	↑↑					↑↑
Traffic Volume (vph)	1457	0	0	0	0	1603
Future Volume (vph)	1457	0	0	0	0	1603
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	1.00	1.00	0.88
Fit						0.850
Fit Protected						
Satd. Flow (prot)	3539	0	0	0	0	2787
Fit Permitted						
Satd. Flow (perm)	3539	0	0	0	0	2787
Link Speed (mph)	30			55	55	
Link Distance (ft)	334			197	283	
Travel Time (s)	7.6			2.4	3.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1584	0	0	0	0	1742
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1584	0	0	0	0	1742
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	L NA	Right	Left	Left	Left	R NA
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization:	103.0%
ICU Level of Service:	G
Analysis Period (min):	15

Alternative 1
41: Pearl & Edward

PM 2045
09/14/2022



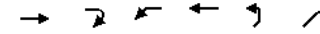
Lane Group	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations			↘	↗		
Traffic Volume (vph)	0	0	261	680	0	0
Future Volume (vph)	0	0	261	680	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr						
Fit Protected			0.950			
Satd. Flow (prot)	0	0	1770	1863	0	0
Fit Permitted			0.950			
Satd. Flow (perm)	0	0	1770	1863	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	525			127	132	
Travel Time (s)	11.9			2.9	3.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	284	739	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	284	739	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	60		15	60
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	39.1%
ICU Level of Service	A
Analysis Period (min)	15

Alternative 1
43:

PM 2045
09/14/2022



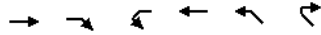
Lane Group	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations			↘	↗		
Traffic Volume (vph)	0	0	1452	524	0	0
Future Volume (vph)	0	0	1452	524	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	1.00
Fr						
Fit Protected			0.950	0.972		
Satd. Flow (prot)	0	0	1610	3295	0	0
Fit Permitted			0.950	0.972		
Satd. Flow (perm)	0	0	1610	3295	0	0
Link Speed (mph)	30			55	55	
Link Distance (ft)	208			242	179	
Travel Time (s)	4.7			3.0	2.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	1578	570	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	789	1359	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	86.7%
ICU Level of Service	E
Analysis Period (min)	15

Alternative 1
50: Goodell

PM 2045
09/14/2022



Lane Group	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations				↑↑	↑↑	
Traffic Volume (vph)	0	0	0	231	514	0
Future Volume (vph)	0	0	0	231	514	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Fr						
Fit Protected				0.950		
Satd. Flow (prot)	0	0	0	3539	3433	0
Fit Permitted				0.950		
Satd. Flow (perm)	0	0	0	3539	3433	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	246			303	185	
Travel Time (s)	5.6			6.9	4.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	251	559	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	251	559	0
Enter Blocked Intersection	No	No	No	Yes	Yes	Yes
Lane Alignment	Left	Right	Left	R NA	L NA	L NA
Median Width(ft)	0			0	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	27.7%
ICU Level of Service	A
Analysis Period (min)	15

Alternative 1
86: Oak St

PM 2045
09/14/2022



Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations				↑↑	↑↑	
Traffic Volume (vph)	0	0	0	288	1452	0
Future Volume (vph)	0	0	0	288	1452	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Fr						
Fit Protected				0.950		
Satd. Flow (prot)	0	0	0	3539	3433	0
Fit Permitted				0.950		
Satd. Flow (perm)	0	0	0	3539	3433	0
Link Speed (mph)	30			30	55	
Link Distance (ft)	195			181	212	
Travel Time (s)	4.4			4.1	2.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	313	1578	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	313	1578	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary

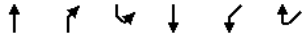
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	86.7%
ICU Level of Service	E
Analysis Period (min)	15

Alternative 1

PM 2045

89: Elm St

09/14/2022



Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations	↑↑	↑				
Traffic Volume (vph)	230	1619	0	0	0	0
Future Volume (vph)	230	1619	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.91	0.91	1.00	1.00	1.00	1.00
Frt	0.883	0.850				
Fit Protected						
Satd. Flow (prot)	2994	1441	0	0	0	0
Fit Permitted						
Satd. Flow (perm)	2994	1441	0	0	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	155			418	135	
Travel Time (s)	3.5			9.5	3.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	250	1760	0	0	0	0
Shared Lane Traffic (%)		50%				
Lane Group Flow (vph)	1130	880	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	70.2%
ICU Level of Service	C
Analysis Period (min)	15

Alternative 2
1: Michigan & Goodell

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑	↑	↑			↑↑	
Traffic Volume (vph)	0	0	0	168	1613	333	182	674	0	0	296	83
Future Volume (vph)	0	0	0	168	1613	333	182	674	0	0	296	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	250	0	0	0	0	0	0	0
Storage Lanes	0	0	0	0	1	1	0	0	0	0	0	0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	5065	1568	1752	1792	0	0	3330	0
Fit Permitted					0.995		0.371					
Satd. Flow (perm)	0	0	0	0	5065	1522	681	1792	0	0	3330	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						136						36
Link Speed (mph)		30			30			30				30
Link Distance (ft)		402			246			648				972
Travel Time (s)		9.1			5.6			14.7				22.1
Conf. Peds. (#/hr)						4	6					6
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	1%	2%	3%	3%	6%	0%	0%	5%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1855	347	190	702	0	0	394	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15			9			15	9
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	
Protected Phases					6		3	8				4
Permitted Phases				6		6	8					
Minimum Initial (s)				7.0	7.0	7.0	7.0	7.0				7.0
Minimum Split (s)				45.0	45.0	45.0	12.5	21.7				24.0
Total Split (s)				50.0	50.0	50.0	15.0	50.0				35.0
Total Split (%)				50.0%	50.0%	50.0%	15.0%	50.0%				35.0%
Maximum Green (s)				44.5	44.5	44.5	9.5	44.5				29.5
Yellow Time (s)				3.5	3.5	3.5	3.5	3.5				3.5
All-Red Time (s)				2.0	2.0	2.0	2.0	2.0				2.0
Total Lost Time (s)					5.5	5.5	5.5	5.5				5.5
Lead/Lag							Lead					Lag
Lead-Lag Optimize?												
Vehicle Extension (s)				4.0	4.0	4.0	3.0	3.0				3.0
Recall Mode				C-Max	C-Max	C-Max	None	None				None
Walk Time (s)				7.0	7.0	7.0		5.0				7.0
Flash Dont Walk (s)				14.0	14.0	14.0		10.0				11.0
Pedestrian Calls (#/hr)				6	6	6		6				6
Act Effct Green (s)					46.6	46.6	42.4	42.4				27.6
Actuated g/C Ratio					0.47	0.47	0.42	0.42				0.28
v/c Ratio					0.79	0.44	0.49	0.92				0.42

Alternative 2
1: Michigan & Goodell

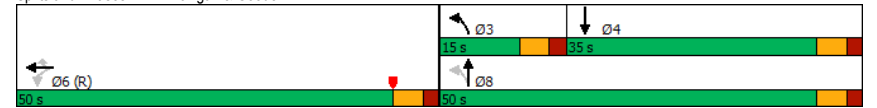
AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay					26.0	13.1	22.7	46.4				27.9
Queue Delay					0.0	0.0	0.0	0.0				0.0
Total Delay					26.0	13.1	22.7	46.4				27.9
LOS					C	B	C	D				C
Approach Delay					24.0			41.3				27.9
Approach LOS					C			D				C
Queue Length 50th (ft)					368	87	73	397				94
Queue Length 95th (ft)					434	163	121	#626				137
Internal Link Dist (ft)		322			166			568				892
Turn Bay Length (ft)						250						
Base Capacity (vph)					2358	781	390	797				1007
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					0.79	0.44	0.49	0.88				0.39

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 6:WBTL, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.92
Intersection Signal Delay:	28.9
Intersection Capacity Utilization:	79.2%
ICU Level of Service:	D
Analysis Period (min):	15
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.

Splits and Phases: 1: Michigan & Goodell



Alternative 2
2: Elm St/Bennett Ln & Goodell

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↑	↑				↑
Traffic Volume (vph)	0	0	0	0	1886	8	552	2	0	0	0	19
Future Volume (vph)	0	0	0	0	1886	8	552	2	0	0	0	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	0	5025	0	1681	1681	0	0	0	1565
Fit Permitted							0.950	0.953				
Satd. Flow (perm)	0	0	0	0	5025	0	1678	1678	0	0	0	1545
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Satd. Flow (RTOR)					1		27	27				27
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		335			402			586			380	
Travel Time (s)		7.6			9.1			13.3			8.6	
Confl. Peds. (#/hr)						5	1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	3%	25%	2%	50%	0%	0%	0%	5%
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	0	0	0	0	2037	0	297	299	0	0	0	21
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)					0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type					NA		Perm	NA				Prot
Protected Phases					6			8				4
Permitted Phases							8					4
Minimum Initial (s)					7.0		7.0	7.0				7.0
Minimum Split (s)					23.5		22.0	22.0				22.0
Total Split (s)					64.0		36.0	36.0				36.0
Total Split (%)					64.0%		36.0%	36.0%				36.0%
Maximum Green (s)					58.5		30.5	30.5				30.5
Yellow Time (s)					3.5		3.5	3.5				3.5
All-Red Time (s)					2.0		2.0	2.0				2.0
Total Lost Time (s)					5.5		5.5	5.5				5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)					3.0		3.0	3.0				3.0
Recall Mode					C-Max		Max	Max				Max
Walk Time (s)					7.0		7.0	7.0				7.0
Flash Dont Walk (s)					11.0		9.0	9.0				9.0
Pedestrian Calls (#/hr)					6		6	6				6
Act Effect Green (s)					58.5		30.5	30.5				30.5
Actuated g/C Ratio					0.58		0.30	0.30				0.30
v/c Ratio					0.69		0.56	0.56				0.04
Control Delay					8.5		16.2	16.4				7.8
Queue Delay					0.1		0.0	0.0				0.0
Total Delay					8.6		16.2	16.4				7.8

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Alternative 2
2: Elm St/Bennett Ln & Goodell

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS					A		B	B				A
Approach Delay					8.6		16.3				7.8	
Approach LOS					A		B				A	
Queue Length 50th (ft)					112		12	12				0
Queue Length 95th (ft)					179		106	108				14
Internal Link Dist (ft)		255			322		506				300	
Turn Bay Length (ft)												
Base Capacity (vph)					2940		530	530				496
Starvation Cap Reductn					117		0	0				0
Spillback Cap Reductn					0		0	0				0
Storage Cap Reductn					0		0	0				0
Reduced v/c Ratio					0.72		0.56	0.56				0.04

Intersection Summary	
Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	98.5 (99%), Referenced to phase 2: and 6:WBT, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.69
Intersection Signal Delay:	10.3
Intersection Capacity Utilization:	61.1%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 2: Elm St/Bennett Ln & Goodell



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Alternative 2
3: Oak & Goodell

AM 2025
01/17/2023

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕↕↕						↕	
Traffic Volume (vph)	0	0	0	323	2017	100	0	0	0	0	119	2
Future Volume (vph)	0	0	0	323	2017	100	0	0	0	0	119	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	0	4993	0	0	0	0	0	1876	0
Fit Permitted					0.993							
Satd. Flow (perm)	0	0	0	0	4993	0	0	0	0	0	1876	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					70						1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		385			335			680			542	
Travel Time (s)		8.8			7.6			15.5			12.3	
Confl. Peds. (#/hr)						4						6
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.92
Heavy Vehicles (%)	0%	0%	0%	3%	2%	9%	0%	0%	0%	0%	1%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	2515	0	0	0	0	0	125	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)					0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA						NA	
Protected Phases					6						4	
Permitted Phases					6							
Minimum Initial (s)					7.0	7.0					7.0	
Minimum Split (s)					58.0	58.0					27.0	
Total Split (s)					70.0	70.0					30.0	
Total Split (%)					70.0%	70.0%					30.0%	
Maximum Green (s)					64.5	64.5					24.5	
Yellow Time (s)					3.5	3.5					3.5	
All-Red Time (s)					2.0	2.0					2.0	
Total Lost Time (s)					5.5	5.5					5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)					3.0	3.0					3.0	
Recall Mode					C-Max	C-Max					None	
Walk Time (s)					7.0	7.0					7.0	
Flash Dont Walk (s)					12.0	12.0					11.0	
Pedestrian Calls (#/hr)					5	5					11	
Act Effect Green (s)					76.8	76.8					12.2	
Actuated g/C Ratio					0.77	0.77					0.12	
v/c Ratio					0.65	0.65					0.54	
Control Delay					1.7	1.7					48.9	
Queue Delay					0.0	0.0					0.0	
Total Delay					1.7	1.7					48.9	

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Alternative 2
3: Oak & Goodell

AM 2025
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	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS					A							D
Approach Delay					1.7							48.9
Approach LOS					A							D
Queue Length 50th (ft)					0							76
Queue Length 95th (ft)					129							126
Internal Link Dist (ft)		305			255			600				462
Turn Bay Length (ft)												
Base Capacity (vph)					3849							460
Starvation Cap Reductn					99							0
Spillback Cap Reductn					0							0
Storage Cap Reductn					0							0
Reduced v/c Ratio					0.67							0.27

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	6 (6%), Referenced to phase 2: and 6:WBT, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.65
Intersection Signal Delay:	4.0
Intersection Capacity Utilization:	64.9%
Intersection LOS:	A
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 3: Oak & Goodell



Lanes, Volumes, Timings
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Alternative 2
4: Ellicott & Goodell

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔↔↔	↕↕↕	↔↔↔		↕			↔	
Traffic Volume (vph)	0	0	0	83	1616	405	19	55	0	0	87	61
Future Volume (vph)	0	0	0	83	1616	405	19	55	0	0	87	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	0	4887	0	0	1875	0	0	1634	0
Fit Permitted				0.998				0.875				
Satd. Flow (perm)	0	0	0	0	4882	0	0	1662	0	0	1634	0
Right Turn on Red			Yes		Yes			Yes			Yes	
Satd. Flow (RTOR)				88							15	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		140			385			723			475	
Travel Time (s)		3.2			8.8			16.4			10.8	
Confl. Peds. (#/hr)				9								3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	4%	3%	2%	0%	0%	0%	0%	3%	18%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	2214	0	0	78	0	0	156	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)					0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type			Perm		NA		Perm		NA		NA	
Protected Phases					6			8			4	
Permitted Phases				6			8					
Minimum Initial (s)				7.0	7.0		7.0	7.0			7.0	
Minimum Split (s)				50.0	50.0		40.0	40.0			40.0	
Total Split (s)				60.0	60.0		40.0	40.0			40.0	
Total Split (%)				60.0%	60.0%		40.0%	40.0%			40.0%	
Maximum Green (s)				54.5	54.5		34.5	34.5			34.5	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		2.0	2.0			2.0	
Total Lost Time (s)					5.5			5.5			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Recall Mode				C-Max	C-Max		None	None			None	
Walk Time (s)				7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)				10.0	10.0		11.0	11.0			11.0	
Pedestrian Calls (#/hr)				0	0		21	21			21	
Act Effct Green (s)					74.6			14.4			14.4	
Actuated g/C Ratio					0.75			0.14			0.14	
v/c Ratio					0.60			0.33			0.63	
Control Delay					5.7			63.5			47.0	
Queue Delay					0.1			0.0			0.0	
Total Delay					5.8			63.5			47.0	

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C&S Engineers

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Alternative 2
4: Ellicott & Goodell

AM 2025
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS					A			E				D
Approach Delay					5.8			63.5				47.0
Approach LOS					A			E				D
Queue Length 50th (ft)					141			51				86
Queue Length 95th (ft)					143			75				143
Internal Link Dist (ft)		60			305			643				395
Turn Bay Length (ft)												
Base Capacity (vph)					3665			573				573
Starvation Cap Reductn					279			0				0
Spillback Cap Reductn					0			0				0
Storage Cap Reductn					0			0				0
Reduced v/c Ratio					0.65			0.14				0.27

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 99.5 (100%), Referenced to phase 2: and 6:WBT, Start of Yellow

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 10.3 Intersection LOS: B

Intersection Capacity Utilization 70.6% ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 4: Ellicott & Goodell



Lanes, Volumes, Timings
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Alternative 2
5: Washington & Goodell

AM 2025
01/17/2023

	←	→	↙	↘	↖	↗	↕	↔	↕	↔	↕	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↘ ↘ ↘	↖ ↖ ↖			↖ ↖ ↖			↘ ↘ ↘	
Traffic Volume (vph)	0	0	0	71	1542	66	20	23	0	0	64	6
Future Volume (vph)	0	0	0	71	1542	66	20	23	0	0	64	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	50	0	0	0	0	0	0	66	0
Storage Lanes	0	0	0	1	0	0	0	0	0	0	1	0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	1787	5002	0	0	1564	0	0	1845	1380
Fit Permitted				0.950				0.818				
Satd. Flow (perm)	0	0	0	1740	5002	0	0	1310	0	0	1845	1349
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)				13								27
Link Speed (mph)		30			30			30				30
Link Distance (ft)		278			189			726				324
Travel Time (s)		6.3			4.3			16.5				7.4
Conf. Peds. (#/hr)				9		2						6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	1%	3%	2%	40%	0%	0%	0%	3%	17%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	75	1692	0	0	45	0	0	67	6
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type			Perm	NA		Perm	NA		NA		Perm	
Protected Phases				6		6		8			4	
Permitted Phases				6		8		8			4	
Minimum Initial (s)				7.0	7.0		7.0	7.0			7.0	7.0
Minimum Split (s)				55.0	55.0		30.0	30.0			30.0	30.0
Total Split (s)				70.0	70.0		30.0	30.0			30.0	30.0
Total Split (%)				70.0%	70.0%		30.0%	30.0%			30.0%	30.0%
Maximum Green (s)				64.5	64.5		24.5	24.5			24.5	24.5
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	3.5
All-Red Time (s)				2.0	2.0		2.0	2.0			2.0	2.0
Total Lost Time (s)				5.5	5.5		5.5	5.5			5.5	5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	3.0
Recall Mode				C-Max	C-Max		None	None			None	None
Walk Time (s)				7.0	7.0		7.0	7.0			7.0	7.0
Flash Dont Walk (s)				10.0	10.0		10.0	10.0			10.0	10.0
Pedestrian Calls (#/hr)				8	8		9	9			9	9
Act Effct Green (s)				82.4	82.4		10.2	10.2			10.2	10.2
Actuated g/C Ratio				0.82	0.82		0.10	0.10			0.10	0.10
v/c Ratio				0.05	0.41		0.34	0.34			0.36	0.04

Alternative 2
5: Washington & Goodell

AM 2025
01/17/2023

	←	→	↙	↘	↖	↗	↕	↔	↕	↔	↕	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay				2.6	2.6			53.0			45.8	0.5
Queue Delay				0.0	0.1			0.0			0.0	0.0
Total Delay				2.6	2.7			53.0			45.8	0.5
LOS				A	A			D			D	A
Approach Delay				2.7				53.0			42.0	
Approach LOS				A				D			D	
Queue Length 50th (ft)				7	68			29			41	0
Queue Length 95th (ft)				m12	70			64			77	0
Internal Link Dist (ft)		198			109			646			244	
Turn Bay Length (ft)				50								66
Base Capacity (vph)				1433	4124			320			452	350
Starvation Cap Reductn				0	822			0			0	0
Spillback Cap Reductn				0	731			0			0	0
Storage Cap Reductn				0	0			0			0	0
Reduced v/c Ratio				0.05	0.51			0.14			0.15	0.02

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	99.9 (100%), Referenced to phase 2: and 6:WBT, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.41
Intersection Signal Delay:	5.4
Intersection Capacity Utilization:	58.2%
ICU Level of Service:	A
Analysis Period (min):	15
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 5: Washington & Goodell



Alternative 2
6: Main St & Pearl/Goodell

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	0	10	41	1171	412	17	62	0	0	223	137
Future Volume (vph)	165	0	10	41	1171	412	17	62	0	0	223	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	54	0	0	0	0	0	0
Storage Lanes	0	0	0	0	1	1	0	0	0	0	2	2
Taper Length (ft)	25			25		25		25		25		2
Satd. Flow (prot)	0	1800	0	0	3560	1553	1805	1792	0	0	1776	2429
Fit Permitted	0.955				0.998		0.950					
Satd. Flow (perm)	0	1800	0	0	3559	1553	1746	1792	0	0	1776	2429
Right Turn on Red	Yes			Yes			Yes			Yes		
Satd. Flow (RTOR)	147			385								
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	323			278			709			848		
Travel Time (s)	7.3			6.3			16.1			19.3		
Conf. Peds. (#/hr)	5			2			26			26		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.92
Heavy Vehicles (%)	0%	0%	0%	7%	1%	4%	0%	6%	7%	0%	7%	17%
Shared Lane Traffic (%)	0											
Lane Group Flow (vph)	0	188	0	0	1303	443	18	67	0	0	240	149
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0	0	0	0	0	12	0	12	0	0	0	12
Link Offset(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Crosswalk Width(ft)	16	16	16	16	16	16	16	16	16	16	16	16
Two way Left Turn Lane	0											
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	15	15	15	15	15	15	15	15	15	15	15
Turn Type	Split	NA	Split	NA	Prot	Prot	NA	NA	NA	NA	NA	pt+ov
Protected Phases	2	2	6	6	6	3	8	4	4	4	2	4
Permitted Phases												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	22.0	22.0	29.5	29.5	29.5	12.5	28.3	25.0	25.0	25.0	25.0	25.0
Total Split (s)	22.0	22.0	39.0	39.0	39.0	12.0	39.0	27.0	27.0	27.0	27.0	27.0
Total Split (%)	22.0%	22.0%	39.0%	39.0%	39.0%	12.0%	39.0%	27.0%	27.0%	27.0%	27.0%	27.0%
Maximum Green (s)	16.5	16.5	33.5	33.5	33.5	6.5	33.5	21.5	21.5	21.5	21.5	21.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Total Lost Time (s)	5.5			5.5			5.5			5.5		
Lead/Lag	Lead						Lag					
Lead-Lag Optimize?	Yes						Yes					
Vehicle Extension (s)	4.3	4.3	3.0	3.0	3.0	4.3	4.3	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	C-Max	C-Max	None	None	None	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	15.0	15.0	17.0	17.0	17.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)	26	26	26	26	26	0	0	0	0	0	0	0
Act Effct Green (s)	13.8	13.8	47.0	47.0	47.0	6.5	22.7	17.9	37.2	17.9	37.2	37.2
Actuated g/C Ratio	0.14	0.14	0.47	0.47	0.47	0.06	0.23	0.18	0.37	0.18	0.37	0.37
v/c Ratio	0.50	0.50	0.78	0.78	0.47	0.15	0.16	0.75	0.15	0.75	0.15	0.15

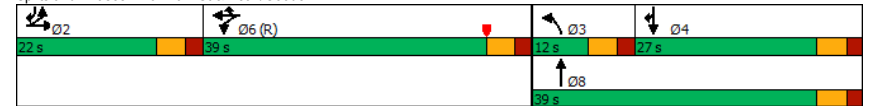
Alternative 2
6: Main St & Pearl/Goodell

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	17.0				21.6	3.9	46.4	23.2			53.8	3.2
Queue Delay	1.2				0.4	0.5	1.2	0.0			0.0	0.1
Total Delay	18.2				22.0	4.4	47.6	23.2			53.8	3.3
LOS	B				C	A	D	C			D	A
Approach Delay	18.2				17.5		28.4				34.5	
Approach LOS	B				B		C				C	
Queue Length 50th (ft)	67				238	0	11	33			145	0
Queue Length 95th (ft)	153				#623	72	34	61			223	19
Internal Link Dist (ft)	243				198		629				768	
Turn Bay Length (ft)							54					
Base Capacity (vph)	437				1671	933	117	600			381	1072
Starvation Cap Reductn	106				89	170	0	0			0	0
Spillback Cap Reductn	0				0	0	39	0			0	286
Storage Cap Reductn	0				0	0	0	0			0	0
Reduced v/c Ratio	0.57				0.82	0.58	0.23	0.11			0.63	0.19

Intersection Summary	
Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 6:WBT, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.78
Intersection Signal Delay:	20.7
Intersection Capacity Utilization:	71.2%
ICU Level of Service:	C
Analysis Period (min):	15
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 6: Main St & Pearl/Goodell



Alternative 2
7: Tupper & Pearl

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕↕				↕		↕↕			↕↕		
Traffic Volume (vph)	100	524	54	72	47	100	18	100	31	9	344	65
Future Volume (vph)	100	524	54	72	47	100	18	100	31	9	344	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3533	0	0	1735	0	1770	1815	0	1770	1804	0
Fit Permitted	0.841		0.594		0.361		0.666					
Satd. Flow (perm)	0	2992	0	0	1046	0	665	1815	0	1233	1804	0
Right Turn on Red	Yes			Yes			Yes			Yes		
Satd. Flow (RTOR)	12		55		20		12					
Link Speed (mph)	30		30		30		30					
Link Distance (ft)	753		351		561		700					
Travel Time (s)	17.1		8.0		12.8		15.9					
Confl. Peds. (#/hr)	5		5		11		4		4		11	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	2%	2%	0%	2%	0%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	738	0	0	238	0	20	143	0	10	445	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0		0		12		12					
Link Offset(ft)	0		0		0		0					
Crosswalk Width(ft)	16		16		16		16					
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9	15	9	15	9	15	9
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2		6		8		8		4		4	
Permitted Phases	2		6		8		8		4		4	
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	50.0	50.0	50.0	50.0	40.0	40.0	50.0	50.0	50.0	50.0	50.0	50.0
Total Split (s)	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Maximum Green (s)	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Total Lost Time (s)	5.5		5.5		5.5		5.5		5.5		5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	Max	Max	Max	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	15.0	15.0	11.0	11.0	10.0	10.0	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	15	15	15	15	5	5	5	5	5	5	5	5
Act Effect Green (s)	44.5		44.5		44.5		44.5		44.5		44.5	
Actuated g/C Ratio	0.44		0.44		0.44		0.44		0.44		0.44	
v/c Ratio	0.55		0.48		0.07		0.17		0.02		0.55	
Control Delay	22.0		16.7		16.8		15.0		20.9		32.3	
Queue Delay	0.0		0.5		0.0		0.0		0.0		0.0	
Total Delay	22.0		17.1		16.8		15.0		20.9		32.3	

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Alternative 2
7: Tupper & Pearl

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	C		B		B		B		C		C	
Approach Delay	22.0		17.1		15.2		32.1					
Approach LOS	C		B		B		C					
Queue Length 50th (ft)	174		114		7		45		4		293	
Queue Length 95th (ft)	231		139		22		84		m8		404	
Internal Link Dist (ft)	673		271		481		620					
Turn Bay Length (ft)												
Base Capacity (vph)	1338		495		295		818		548		809	
Starvation Cap Reductn	0		57		0		0		0		0	
Spillback Cap Reductn	0		0		0		0		0		0	
Storage Cap Reductn	0		0		0		0		0		0	
Reduced v/c Ratio	0.55		0.54		0.07		0.17		0.02		0.55	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.55

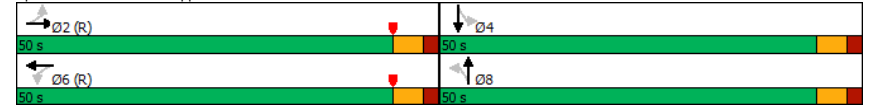
Intersection Signal Delay: 23.4 Intersection LOS: C

Intersection Capacity Utilization 67.7% ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 7: Tupper & Pearl



Lanes, Volumes, Timings
C&S Engineers

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Alternative 2
8: Main St & Tupper

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕↕			↕↕			↕↕			↕	↕	
Traffic Volume (vph)	37	545	8	55	135	11	2	22	6	146	71	49
Future Volume (vph)	37	545	8	55	135	11	2	22	6	146	71	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	0	0	0	0	40	0	0
Storage Lanes	0	0	0	0	0	0	0	0	0	1	0	0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3441	0	0	1684	0	0	1719	0	1736	1684	0
Fit Permitted	0.922			0.755			0.985			0.736		
Satd. Flow (perm)	0	3178	0	0	1280	0	0	1694	0	1267	1684	0
Right Turn on Red		Yes		Yes		Yes		Yes			Yes	
Satd. Flow (RTOR)	2			5			6			38		
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	351			263			1174			709		
Travel Time (s)	8.0			6.0			26.7			16.1		
Conf. Peds. (#/hr)	10		17	17		10	19		36	36		19
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	9%	4%	0%	25%	5%	0%	0%	8%	0%	4%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	635	0	0	216	0	0	32	0	157	129	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			0			12			12		
Link Offset(ft)	0			0			0			0		
Crosswalk Width(ft)	16			16			16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	2		6		6		8		8		4	
Permitted Phases	2		6		6		8		8		4	
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	50.0	50.0		50.0	50.0		40.0	40.0		40.0	40.0	
Total Split (s)	60.0	60.0		60.0	60.0		40.0	40.0		40.0	40.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	54.5	54.5		54.5	54.5		34.5	34.5		34.5	34.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Total Lost Time (s)	5.5		5.5		5.5		5.5		5.5		5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	5.0	5.0		12.0	12.0		11.0	11.0		10.0	10.0	
Pedestrian Calls (#/hr)	28	28		28	28		28	28		28	28	
Act Effct Green (s)	71.0		71.0		71.0		18.0		18.0		18.0	
Actuated g/C Ratio	0.71		0.71		0.71		0.18		0.18		0.18	
v/c Ratio	0.28		0.24		0.24		0.10		0.69		0.39	

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Alternative 2
8: Main St & Tupper

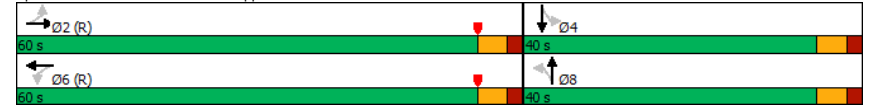
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	3.2				3.1		27.3		77.6		54.2	
Queue Delay	0.1				0.4		0.0		0.0		0.0	
Total Delay	3.3				3.5		27.3		77.6		54.2	
LOS	A				A		C		E		D	
Approach Delay	3.3				3.5		27.3		67.0			
Approach LOS	A				A		C		E			
Queue Length 50th (ft)	30				9		14		96		58	
Queue Length 95th (ft)	41				32		36		m168		m116	
Internal Link Dist (ft)	271				183		1094		629			
Turn Bay Length (ft)									40			
Base Capacity (vph)	2256				910		588		437		605	
Starvation Cap Reductn	579				326		0		0		0	
Spillback Cap Reductn	0				0		0		0		0	
Storage Cap Reductn	0				0		0		0		0	
Reduced v/c Ratio	0.38				0.37		0.05		0.36		0.21	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 19.6 Intersection LOS: B
 Intersection Capacity Utilization 60.8% ICU Level of Service B
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Main St & Tupper



Lanes, Volumes, Timings
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Alternative 2
9: Washington & Tupper

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕		↕	↕		↕	↕	
Traffic Volume (vph)	30	544	81	3	172	2	14	53	48	70	76	4
Future Volume (vph)	30	544	81	3	172	2	14	53	48	70	76	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		78	85		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3395	0	0	1750	0	1805	1604	0	1719	1863	0
Fit Permitted		0.934			0.993		0.702			0.463		
Satd. Flow (perm)	0	3173	0	0	1739	0	1278	1604	0	820	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22			1			42				3
Link Speed (mph)		30			30			30				30
Link Distance (ft)		263			328			1190				726
Travel Time (s)		6.0			7.5			27.0				16.5
Conf. Peds. (#/hr)	14		11	11		14	16		17	17		16
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	0.92
Heavy Vehicles (%)	4%	4%	0%	33%	8%	0%	0%	15%	0%	5%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	697	0	0	188	0	15	107	0	74	85	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt		NA
Protected Phases		2			6			8		7		4
Permitted Phases	2			6			8			4		
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0		7.0
Minimum Split (s)	47.0	47.0		47.0	47.0		28.0	28.0		12.5		28.0
Total Split (s)	55.0	55.0		55.0	55.0		28.0	28.0		17.0		45.0
Total Split (%)	55.0%	55.0%		55.0%	55.0%		28.0%	28.0%		17.0%		45.0%
Maximum Green (s)	49.5	49.5		49.5	49.5		22.5	22.5		11.5		39.5
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5		3.5
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0		2.0
Total Lost Time (s)		5.5			5.5			5.5		5.5		5.5
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0		3.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None		None
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0		7.0
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		10.0	10.0		10.0		10.0
Pedestrian Calls (#/hr)	17	17		17	17		23	23		23		23
Act Effct Green (s)		65.1			65.1		11.6	11.6		23.9		23.9
Actuated g/C Ratio		0.65			0.65		0.12	0.12		0.24		0.24
v/c Ratio		0.34			0.17		0.10	0.48		0.27		0.19

Lanes, Volumes, Timings
C&S Engineers

Synchro 11 Report
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Alternative 2
9: Washington & Tupper

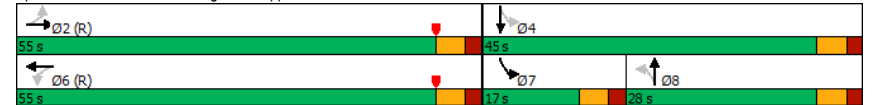
AM 2025
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	7.1				9.8		38.1	32.1		18.4	16.5	
Queue Delay	0.3				0.4		0.0	0.0		0.0	0.0	
Total Delay	7.4				10.2		38.1	32.1		18.4	16.5	
LOS	A				B		D	C		B	B	
Approach Delay	7.4				10.2			32.8			17.4	
Approach LOS	A				B			C			B	
Queue Length 50th (ft)	47				24		9	40		24	26	
Queue Length 95th (ft)	114				168		27	86		44	48	
Internal Link Dist (ft)	183				248			1110			646	
Turn Bay Length (ft)											85	
Base Capacity (vph)	2073				1132		287	393		306	737	
Starvation Cap Reductn	718				556		0	0		0	0	
Spillback Cap Reductn	0				0		0	0		0	0	
Storage Cap Reductn	0				0		0	0		0	0	
Reduced v/c Ratio	0.51				0.33		0.05	0.27		0.24	0.12	

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.48
Intersection Signal Delay:	11.9
Intersection Capacity Utilization:	53.1%
Intersection LOS:	B
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 9: Washington & Tupper



Lanes, Volumes, Timings
C&S Engineers

Synchro 11 Report
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Alternative 2
10: Ellicott & Tupper

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕	↕	↕	↕	
Traffic Volume (vph)	20	585	66	3	150	2	16	71	99	35	52	13
Future Volume (vph)	20	585	66	3	150	2	16	71	99	35	52	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	80		150
Storage Lanes	0		0	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3398	0	0	1894	0	0	1779	1583	1671	1760	0
Fit Permitted		0.944			0.992			0.934		0.696		
Satd. Flow (perm)	0	3213	0	0	1881	0	0	1667	1449	1145	1760	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			1				108			13
Link Speed (mph)		30			30				30			30
Link Distance (ft)		328			387				1108			723
Travel Time (s)		7.5			8.8				25.2			16.4
Conf. Peds. (#/hr)	7		5				12		42		42	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	10%	4%	3%	0%	0%	0%	5%	6%	2%	8%	4%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	730	0	0	168	0	0	94	108	38	71	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0				12			12
Link Offset(ft)		0			0				0			0
Crosswalk Width(ft)		16			16				16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			8		8		4
Permitted Phases		2			6			8		8		4
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0		7.0
Minimum Split (s)	50.0	50.0		50.0	50.0		22.5	22.5		22.5		22.5
Total Split (s)	65.0	65.0		65.0	65.0		35.0	35.0		35.0		35.0
Total Split (%)	65.0%	65.0%		65.0%	65.0%		35.0%	35.0%		35.0%		35.0%
Maximum Green (s)	59.5	59.5		59.5	59.5		29.5	29.5		29.5		29.5
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5		3.5
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0		2.0
Total Lost Time (s)		5.5			5.5			5.5		5.5		5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0		3.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None		None
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0		7.0
Flash Dont Walk (s)	12.0	12.0		13.0	13.0		10.0	10.0		10.0		10.0
Pedestrian Calls (#/hr)	19	19		19	19		46	46		46		46
Act Effct Green (s)		75.6			75.6			13.4		13.4		13.4
Actuated g/C Ratio		0.76			0.76			0.13		0.13		0.13
v/c Ratio		0.30			0.12			0.42		0.38		0.29

Alternative 2
10: Ellicott & Tupper

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	2.5				7.8							
Queue Delay	0.1				0.0							
Total Delay	2.6				7.8							
LOS	A				A					D	B	E
Approach Delay	2.6				7.8					26.6		50.7
Approach LOS	A				A					C		D
Queue Length 50th (ft)	30				72					53	0	22
Queue Length 95th (ft)	45				136					102	47	m47
Internal Link Dist (ft)	248				307					1028		643
Turn Bay Length (ft)												80
Base Capacity (vph)	2433				1421					491	503	337
Starvation Cap Reductn	693				0					0	0	0
Spillback Cap Reductn	0				0					0	0	0
Storage Cap Reductn	0				0					0	0	0
Reduced v/c Ratio	0.42				0.12					0.19	0.21	0.11

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.42
Intersection Signal Delay:	11.7
Intersection Capacity Utilization:	54.3%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	A
Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 10: Ellicott & Tupper



Alternative 2
11: Oak & Tupper

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑								↓	↓↓	
Traffic Volume (vph)	0	517	207	0	0	0	0	0	0	42	181	235
Future Volume (vph)	0	517	207	0	0	0	0	0	0	42	181	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3387	0	0	0	0	0	0	0	1610	3047	0
Fit Permitted										0.950	0.999	
Satd. Flow (perm)	0	3387	0	0	0	0	0	0	0	1610	3047	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)		88								43		256
Link Speed (mph)		30			30				30			30
Link Distance (ft)		387			354				125			680
Travel Time (s)		8.8			8.0				2.8			15.5
Conf. Peds. (#/hr)												2
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.92
Heavy Vehicles (%)	0%	2%	2%	0%	0%	0%	0%	0%	0%	2%	6%	0%
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	0	823	0	0	0	0	0	0	0	43	466	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0				12			12
Link Offset(ft)		0			0				0			0
Crosswalk Width(ft)		16			16				16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA								Perm	NA	
Protected Phases		2									4	
Permitted Phases										4		
Minimum Initial (s)		7.0								7.0	7.0	
Minimum Split (s)		50.0								40.0	40.0	
Total Split (s)		57.0								43.0	43.0	
Total Split (%)		57.0%								43.0%	43.0%	
Maximum Green (s)		51.5								37.5	37.5	
Yellow Time (s)		3.5								3.5	3.5	
All-Red Time (s)		2.0								2.0	2.0	
Total Lost Time (s)		5.5								5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0								3.0	3.0	
Recall Mode		C-Max								None	None	
Walk Time (s)		7.0								7.0	7.0	
Flash Dont Walk (s)		16.0								13.0	13.0	
Pedestrian Calls (#/hr)		0								2	2	
Act Effect Green (s)		75.4								13.6	13.6	
Actuated g/C Ratio		0.75								0.14	0.14	
v/c Ratio		0.32								0.17	0.73	

Alternative 2
11: Oak & Tupper

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay											16.0	27.7
Queue Delay											0.0	0.0
Total Delay											16.0	27.7
LOS											B	C
Approach Delay												26.7
Approach LOS												C
Queue Length 50th (ft)											1	64
Queue Length 95th (ft)											m16	120
Internal Link Dist (ft)						274		45				600
Turn Bay Length (ft)												
Base Capacity (vph)										2576	630	1302
Starvation Cap Reductn										723	0	0
Spillback Cap Reductn										0	0	0
Storage Cap Reductn										0	0	0
Reduced v/c Ratio										0.44	0.07	0.36

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.73
 Intersection Signal Delay: 12.7 Intersection LOS: B
 Intersection Capacity Utilization 39.9% ICU Level of Service A
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: Oak & Tupper



Alternative 2
12: Elm St & Tupper

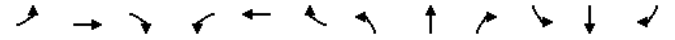
AM 2025
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔						↔↔				
Traffic Volume (vph)	9	557	0	0	0	0	0	571	4	0	0	0
Future Volume (vph)	9	557	0	0	0	0	0	571	4	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3456	0	0	0	0	0	3536	0	0	0	0
Fit Permitted		0.999										
Satd. Flow (perm)	0	3456	0	0	0	0	0	3536	0	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27						1				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		354			313			418			586	
Travel Time (s)		8.0			7.1			9.5			13.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	25%	4%	0%	0%	0%	0%	0%	2%	0%	0%	0%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	615	0	0	0	0	0	625	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		15		9	15		9	15		9	15	9
Turn Type	Perm	NA						NA				
Protected Phases		2						8				
Permitted Phases		2										
Minimum Initial (s)		7.0						7.0				
Minimum Split (s)		30.0						30.0				
Total Split (s)		50.0						50.0				
Total Split (%)		50.0%						50.0%				
Maximum Green (s)		44.5						44.5				
Yellow Time (s)		3.5						3.5				
All-Red Time (s)		2.0						2.0				
Total Lost Time (s)								5.5				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0						3.0				
Recall Mode		C-Max						C-Max				
Walk Time (s)		7.0						7.0				
Flash Dont Walk (s)		11.0						11.0				
Pedestrian Calls (#/hr)		0						0				
Act Effct Green (s)								64.4				
Actuated g/C Ratio								0.64				
v/c Ratio								0.28				
Control Delay								3.6				
Queue Delay								0.2				
Total Delay								3.8				
LOS								A				

Alternative 2
12: Elm St & Tupper

AM 2025
01/17/2023

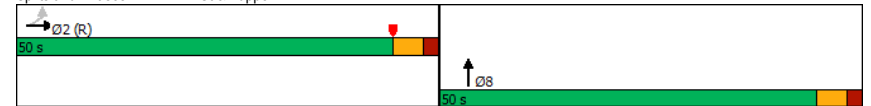


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		3.8						38.9				
Approach LOS		A						D				
Queue Length 50th (ft)		20						192				
Queue Length 95th (ft)		31						230				
Internal Link Dist (ft)		274			233			338			506	
Turn Bay Length (ft)												
Base Capacity (vph)		2234						1574				
Starvation Cap Reductn		781						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.42						0.40				

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 2:EBTL and 6:, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.72
Intersection Signal Delay:	21.5
Intersection LOS:	C
Intersection Capacity Utilization:	61.1%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 12: Elm St & Tupper



Alternative 2

AM 2025

34:

01/17/2023

	→	↘	↙	←	↗	↖
Lane Group	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations	↑↑					↑↑
Traffic Volume (vph)	549	0	0	0	0	733
Future Volume (vph)	549	0	0	0	0	733
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	3539	0	0	0	0	2787
Fit Permitted						
Satd. Flow (perm)	3539	0	0	0	0	2787
Link Speed (mph)	30			55	55	
Link Distance (ft)	334			197	283	
Travel Time (s)	7.6			2.4	3.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	597	0	0	0	0	797
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	L NA	Right	Left	Left	Left	R NA
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	47.5%			ICU Level of Service A		
Analysis Period (min)	15					

Alternative 2

AM 2025

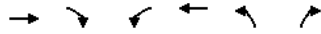
41: Pearl & Edward

01/17/2023

	→	↘	↙	←	↗	↖
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↑↑	↑↑
Traffic Volume (vph)	0	0	572	753	135	165
Future Volume (vph)	0	0	572	753	135	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	3465	1687	0
Fit Permitted				0.979	0.978	
Satd. Flow (perm)	0	0	0	3465	1687	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)					62	
Link Speed (mph)	30			30	30	
Link Distance (ft)	513			323	700	
Travel Time (s)	11.7			7.3	15.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1440	326	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type			Prot	NA	Prot	
Protected Phases			1	6	8	
Permitted Phases						
Minimum Initial (s)			7.0	7.0	7.0	
Minimum Split (s)			12.5	24.5	24.5	
Total Split (s)			65.0	65.0	35.0	
Total Split (%)			65.0%	65.0%	35.0%	
Maximum Green (s)			59.5	59.5	29.5	
Yellow Time (s)			3.5	3.5	3.5	
All-Red Time (s)			2.0	2.0	2.0	
Total Lost Time (s)			5.5	5.5		
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)			3.0	3.0	3.0	
Recall Mode			None	C-Max	None	
Walk Time (s)			7.0	7.0	7.0	
Flash Dont Walk (s)			12.0	12.0		
Pedestrian Calls (#/hr)			10	10		
Act Effect Green (s)			67.6	21.4		
Actuated g/C Ratio			0.68	0.21		
v/c Ratio			0.61	0.80		
Control Delay			11.5	36.2		
Queue Delay			0.5	0.0		
Total Delay			12.0	36.2		
LOS			B	D		
Approach Delay			12.0	36.2		

Alternative 2
41: Pearl & Edward

AM 2025
01/17/2023



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS				B	D	
Queue Length 50th (ft)				57	145	
Queue Length 95th (ft)				254	214	
Internal Link Dist (ft)	433			243	620	
Turn Bay Length (ft)						
Base Capacity (vph)				2342	541	
Starvation Cap Reductn				425	0	
Spillback Cap Reductn				0	0	
Storage Cap Reductn				0	0	
Reduced v/c Ratio				0.75	0.60	

Intersection Summary

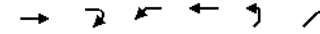
Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 6:WBT, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.80
Intersection Signal Delay:	16.4
Intersection LOS:	B
Intersection Capacity Utilization:	64.2%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 41: Pearl & Edward



Alternative 2
43:

AM 2025
01/17/2023



Lane Group	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Volume (vph)	0	0	2622	2114	0	0
Future Volume (vph)	0	0	2622	2114	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	1610	3333	0	0
Fit Permitted			0.950	0.983		
Satd. Flow (perm)	0	0	1610	3333	0	0
Link Speed (mph)	30			55	55	
Link Distance (ft)	208			2645	179	
Travel Time (s)	4.7			32.8	2.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)			41%			
Lane Group Flow (vph)	0	0	1681	3467	0	0
Enter Blocked Intersection	No	No	Yes	Yes	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization:	136.4%
ICU Level of Service:	H
Analysis Period (min):	15

Alternative 2
1: Michigan & Goodell

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑	↑	↑			↑↑	
Traffic Volume (vph)	0	0	0	168	1578	248	162	719	0	0	296	128
Future Volume (vph)	0	0	0	168	1578	248	162	719	0	0	296	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	250	0	0	0	0	0	0	0
Storage Lanes	0	0	0	0	1	1	0	0	0	0	0	0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	5065	1568	1752	1792	0	0	3290	0
Fit Permitted					0.995		0.345					
Satd. Flow (perm)	0	0	0	0	5065	1522	634	1792	0	0	3290	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						118						69
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		402			246			648			972	
Travel Time (s)		9.1			5.6			14.7			22.1	
Conf. Peds. (#/hr)						4	6					6
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	1%	2%	3%	3%	6%	0%	0%	5%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1819	258	169	749	0	0	441	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15			9			15	
Turn Type				Perm	NA	Perm	custom	NA			NA	
Protected Phases					6		3	8				4
Permitted Phases				6		6	3					
Minimum Initial (s)				7.0	7.0	7.0	7.0	7.0				7.0
Minimum Split (s)				45.0	45.0	45.0	12.5	24.0				24.0
Total Split (s)				50.0	50.0	50.0	15.0	50.0				35.0
Total Split (%)				50.0%	50.0%	50.0%	15.0%	50.0%				35.0%
Maximum Green (s)				44.5	44.5	44.5	9.5	44.5				29.5
Yellow Time (s)				3.5	3.5	3.5	3.5	3.5				3.5
All-Red Time (s)				2.0	2.0	2.0	2.0	2.0				2.0
Total Lost Time (s)					5.5	5.5	5.5	5.5				5.5
Lead/Lag							Lead					Lag
Lead-Lag Optimize?												
Vehicle Extension (s)				4.0	4.0	4.0	3.0	3.0				3.0
Recall Mode				C-Max	C-Max	C-Max	None	None				None
Walk Time (s)				7.0	7.0	7.0		7.0				7.0
Flash Dont Walk (s)				14.0	14.0	14.0		10.0				11.0
Pedestrian Calls (#/hr)				6	6	6		6				6
Act Effct Green (s)					45.3	45.3	43.7	43.7				29.0
Actuated g/C Ratio					0.45	0.45	0.44	0.44				0.29
v/c Ratio					0.79	0.34	0.44	0.96				0.44

Lanes, Volumes, Timings
C&S Engineers

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Alternative 2
1: Michigan & Goodell

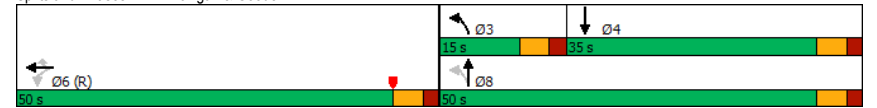
AM 2045
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay					26.8	10.9	21.3	51.5				25.6
Queue Delay					0.0	0.0	0.0	0.0				0.0
Total Delay					26.8	10.9	21.3	51.5				25.6
LOS					C	B	C	D				C
Approach Delay					24.8			46.0				25.6
Approach LOS					C			D				C
Queue Length 50th (ft)					357	53	64	442				99
Queue Length 95th (ft)					421	111	108	#691				145
Internal Link Dist (ft)		322			166			568				892
Turn Bay Length (ft)						250						
Base Capacity (vph)					2294	753	383	797				1019
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					0.79	0.34	0.44	0.94				0.43

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2: and 6:WBT, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 30.6 Intersection LOS: C
 Intersection Capacity Utilization 80.9% ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Michigan & Goodell



Lanes, Volumes, Timings
C&S Engineers

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Page 2

Alternative 2
2: Elm St/Bennett Ln & Goodell

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	1876	8	582	2	0	0	0	19
Future Volume (vph)	0	0	0	0	1876	8	582	2	0	0	0	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	0	5025	0	1681	1681	0	0	0	1611
Fit Permitted							0.950	0.953				
Satd. Flow (perm)	0	0	0	0	5025	0	1678	1678	0	0	0	1611
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Satd. Flow (RTOR)					1		27	27				27
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		335			402			586			380	
Travel Time (s)		7.6			9.1			13.3			8.6	
Confl. Peds. (#/hr)						5	1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	0%	3%	25%	2%	50%	0%	0%	0%	2%
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	0	0	0	0	2026	0	313	315	0	0	0	20
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)					0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type					NA		Perm	NA				Prot
Protected Phases					6			8				4
Permitted Phases							8					
Minimum Initial (s)					7.0		7.0	7.0				7.0
Minimum Split (s)					23.5		23.5	23.5				23.5
Total Split (s)					62.0		38.0	38.0				38.0
Total Split (%)					62.0%		38.0%	38.0%				38.0%
Maximum Green (s)					56.5		32.5	32.5				32.5
Yellow Time (s)					3.5		3.5	3.5				3.5
All-Red Time (s)					2.0		2.0	2.0				2.0
Total Lost Time (s)					5.5		5.5	5.5				5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)					3.0		3.0	3.0				3.0
Recall Mode					C-Max		Max	Max				Max
Walk Time (s)					7.0		7.0	7.0				7.0
Flash Dont Walk (s)					11.0		9.0	9.0				11.0
Pedestrian Calls (#/hr)					6		6	6				6
Act Effect Green (s)					56.5		32.5	32.5				32.5
Actuated g/C Ratio					0.56		0.32	0.32				0.32
v/c Ratio					0.71		0.56	0.56				0.04
Control Delay					8.1		9.6	9.8				7.0
Queue Delay					0.1		0.0	0.0				0.0
Total Delay					8.2		9.6	9.8				7.0

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Alternative 2
2: Elm St/Bennett Ln & Goodell

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS					A		A	A				A
Approach Delay					8.2			9.7			7.0	
Approach LOS					A			A			A	
Queue Length 50th (ft)					112		3	4				0
Queue Length 95th (ft)					161		63	65				14
Internal Link Dist (ft)		255			322			506			300	
Turn Bay Length (ft)												
Base Capacity (vph)					2839		563	563			541	
Starvation Cap Reductn					110		0	0			0	
Spillback Cap Reductn					0		0	0			0	
Storage Cap Reductn					0		0	0			0	
Reduced v/c Ratio					0.74		0.56	0.56			0.04	

Intersection Summary	
Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 2: and 6:WBT, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.71
Intersection Signal Delay:	8.6
Intersection Capacity Utilization:	61.8%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 2: Elm St/Bennett Ln & Goodell



Lanes, Volumes, Timings
C&S Engineers

Synchro 11 Report
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Alternative 2
3: Oak & Goodell

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕↕↕						↔	
Traffic Volume (vph)	0	0	0	273	2122	100	0	0	0	0	94	2
Future Volume (vph)	0	0	0	273	2122	100	0	0	0	0	94	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	0	5004	0	0	0	0	0	1875	0
Fit Permitted					0.995							
Satd. Flow (perm)	0	0	0	0	5004	0	0	0	0	0	1875	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					61						1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		385			335			680			542	
Travel Time (s)		8.8			7.6			15.5			12.3	
Confl. Peds. (#/hr)						4						6
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	3%	2%	9%	0%	0%	0%	0%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	2572	0	0	0	0	0	99	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)					0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA						NA	
Protected Phases					6						4	
Permitted Phases					6							
Minimum Initial (s)				7.0	7.0						7.0	
Minimum Split (s)				58.0	58.0						27.0	
Total Split (s)				73.0	73.0						27.0	
Total Split (%)				73.0%	73.0%						27.0%	
Maximum Green (s)				67.5	67.5						21.5	
Yellow Time (s)				3.5	3.5						3.5	
All-Red Time (s)				2.0	2.0						2.0	
Total Lost Time (s)					5.5						5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0						3.0	
Recall Mode				C-Max	C-Max						None	
Walk Time (s)				7.0	7.0						7.0	
Flash Dont Walk (s)				12.0	12.0						11.0	
Pedestrian Calls (#/hr)				5	5						11	
Act Effect Green (s)					81.3						11.3	
Actuated g/C Ratio					0.81						0.11	
v/c Ratio					0.63						0.46	
Control Delay					3.0						47.0	
Queue Delay					0.1						0.0	
Total Delay					3.1						47.0	

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Alternative 2
3: Oak & Goodell

AM 2045
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS					A							D
Approach Delay					3.1							47.0
Approach LOS					A							D
Queue Length 50th (ft)					56							60
Queue Length 95th (ft)					113							103
Internal Link Dist (ft)		305			255			600				462
Turn Bay Length (ft)												
Base Capacity (vph)					4077							403
Starvation Cap Reductn					280							0
Spillback Cap Reductn					0							0
Storage Cap Reductn					0							0
Reduced v/c Ratio					0.68							0.25

Intersection Summary	
Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 2: and 6:WBT, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.63
Intersection Signal Delay:	4.7
Intersection Capacity Utilization:	65.4%
Intersection LOS:	A
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 3: Oak & Goodell



Lanes, Volumes, Timings
C&S Engineers

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Alternative 2
4: Ellicott & Goodell

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔↔↔	↔↔↔	↔↔↔	↔↔↔	↔↔↔	↔↔↔	↔↔↔	↔↔↔	↔↔↔
Traffic Volume (vph)	0	0	0	73	1616	435	19	90	0	0	112	71
Future Volume (vph)	0	0	0	73	1616	435	19	90	0	0	112	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	0	4878	0	0	1883	0	0	1644	0
Fit Permitted				0.998			0.858					
Satd. Flow (perm)	0	0	0	0	4874	0	0	1630	0	0	1644	0
Right Turn on Red			Yes		Yes			Yes			Yes	
Satd. Flow (RTOR)					100						15	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		140			385			723			475	
Travel Time (s)		3.2			8.8			16.4			10.8	
Confl. Peds. (#/hr)				9								3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	4%	3%	2%	0%	0%	0%	0%	3%	18%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	2236	0	0	115	0	0	193	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type			Perm		NA		Perm		NA		NA	
Protected Phases					6			8			4	
Permitted Phases				6			8					
Minimum Initial (s)				7.0	7.0		7.0	7.0			7.0	
Minimum Split (s)				50.0	50.0		40.0	40.0			40.0	
Total Split (s)				60.0	60.0		40.0	40.0			40.0	
Total Split (%)				60.0%	60.0%		40.0%	40.0%			40.0%	
Maximum Green (s)				54.5	54.5		34.5	34.5			34.5	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		2.0	2.0			2.0	
Total Lost Time (s)					5.5			5.5			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Recall Mode				C-Max	C-Max		None	None			None	
Walk Time (s)				7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)				10.0	10.0		10.0	10.0			11.0	
Pedestrian Calls (#/hr)				0	0		21	21			21	
Act Effect Green (s)				72.7			16.3				16.3	
Actuated g/C Ratio				0.73			0.16				0.16	
v/c Ratio				0.63			0.43				0.69	
Control Delay				4.8			33.6				48.5	
Queue Delay				0.1			0.0				0.0	
Total Delay				4.9			33.6				48.5	

Lanes, Volumes, Timings
C&S Engineers

Synchro 11 Report
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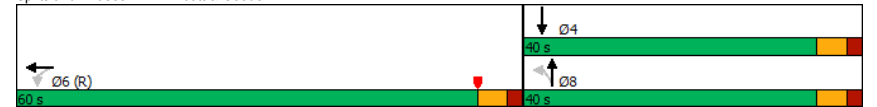
Alternative 2
4: Ellicott & Goodell

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS					A			C				D
Approach Delay					4.9			33.6				48.5
Approach LOS					A			C				D
Queue Length 50th (ft)					86			41				108
Queue Length 95th (ft)					79			39				169
Internal Link Dist (ft)		60			305			643				395
Turn Bay Length (ft)												
Base Capacity (vph)					3571			562				577
Starvation Cap Reductn					243			0				0
Spillback Cap Reductn					0			0				0
Storage Cap Reductn					0			0				0
Reduced v/c Ratio					0.67			0.20				0.33

Intersection Summary	
Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 2: and 6:WBT, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.69
Intersection Signal Delay:	9.5
Intersection LOS:	A
Intersection Capacity Utilization:	72.6%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 4: Ellicott & Goodell



Lanes, Volumes, Timings
C&S Engineers

Synchro 11 Report
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Alternative 2
5: Washington & Goodell

AM 2045
01/17/2023

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖	↖↖			↖			↖	↖
Traffic Volume (vph)	0	0	0	101	1522	66	20	23	0	0	109	6
Future Volume (vph)	0	0	0	101	1522	66	20	23	0	0	109	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	50	0	0	0	0	0	0	0	66
Storage Lanes	0	0	0	1	0	0	0	0	0	0	0	1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	1787	5006	0	0	1564	0	0	1845	1380
Fit Permitted				0.950				0.810				
Satd. Flow (perm)	0	0	0	1740	5006	0	0	1297	0	0	1845	1349
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)				12								27
Link Speed (mph)		30			30			30				30
Link Distance (ft)		278			189			726				324
Travel Time (s)		6.3			4.3			16.5				7.4
Conf. Peds. (#/hr)				9		2						6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	1%	3%	0%	40%	0%	0%	0%	3%	17%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	106	1671	0	0	45	0	0	115	6
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type			Perm	NA		Perm	NA		NA	Perm		Perm
Protected Phases				6		6		8		8		4
Permitted Phases				6		8		8		4		4
Minimum Initial (s)				7.0	7.0		7.0	7.0		7.0		7.0
Minimum Split (s)				55.0	55.0		30.0	30.0		30.0		30.0
Total Split (s)				68.0	68.0		32.0	32.0		32.0		32.0
Total Split (%)				68.0%	68.0%		32.0%	32.0%		32.0%		32.0%
Maximum Green (s)				62.5	62.5		26.5	26.5		26.5		26.5
Yellow Time (s)				3.5	3.5		3.5	3.5		3.5		3.5
All-Red Time (s)				2.0	2.0		2.0	2.0		2.0		2.0
Total Lost Time (s)				5.5	5.5		5.5	5.5		5.5		5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0		3.0		3.0
Recall Mode				C-Max	C-Max		None	None		None		None
Walk Time (s)				7.0	7.0		7.0	7.0		7.0		7.0
Flash Dont Walk (s)				10.0	10.0		10.0	10.0		10.0		10.0
Pedestrian Calls (#/hr)				8	8		9	9		9		9
Act Effct Green (s)				77.2	77.2		11.8	11.8		11.8		11.8
Actuated g/C Ratio				0.77	0.77		0.12	0.12		0.12		0.12
v/c Ratio				0.08	0.43		0.30	0.30		0.53		0.03

Alternative 2
5: Washington & Goodell

AM 2045
01/17/2023

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay				2.9	3.4			52.6			49.6	0.3
Queue Delay				0.0	0.1			0.0			0.0	0.0
Total Delay				2.9	3.5			52.6			49.6	0.3
LOS				A	A			D			D	A
Approach Delay					3.5			52.6			47.2	
Approach LOS					A			D			D	
Queue Length 50th (ft)				11	71			29			70	0
Queue Length 95th (ft)				m16	71			65			119	0
Internal Link Dist (ft)			198		109			646			244	
Turn Bay Length (ft)					50							66
Base Capacity (vph)				1343	3868			343			488	377
Starvation Cap Reductn				0	859			0			0	0
Spillback Cap Reductn				0	818			0			0	0
Storage Cap Reductn				0	0			0			0	0
Reduced v/c Ratio				0.08	0.56			0.13			0.24	0.02

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 2: and 6:WBT, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.53
Intersection Signal Delay:	7.3
Intersection Capacity Utilization:	57.8%
ICU Level of Service:	A
Analysis Period (min):	15
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 5: Washington & Goodell



Alternative 2
6: Main St & Pearl/Goodell

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔		↔			↔	↔
Traffic Volume (vph)	90	0	0	41	1201	362	17	62	0	0	188	137
Future Volume (vph)	90	0	0	41	1201	362	17	62	0	0	188	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	54	0	0	0	0	0	0
Storage Lanes	0	0	0	0	1	1	0	0	0	0	2	2
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1805	0	0	3560	1553	1805	1792	0	0	1776	2787
Fit Permitted		0.950			0.998		0.950					
Satd. Flow (perm)	0	1805	0	0	3559	1553	1742	1792	0	0	1776	2787
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						311						147
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		323			278			709			848	
Travel Time (s)		7.3			6.3			16.1			19.3	
Conf. Peds. (#/hr)				5		2	26					26
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	7%	1%	4%	0%	6%	7%	0%	7%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	97	0	0	1335	389	18	67	0	0	202	147
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Split	NA		Split	NA	Prot	Prot	NA		NA		pt+ov
Protected Phases	2	2		6	6	6	3	8			4	2 4
Permitted Phases												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0			7.0	
Minimum Split (s)	27.5	27.5		24.0	24.0	24.0	12.5	28.3			17.0	
Total Split (s)	27.0	27.0		35.0	35.0	35.0	12.0	38.0			26.0	
Total Split (%)	27.0%	27.0%		35.0%	35.0%	35.0%	12.0%	38.0%			26.0%	
Maximum Green (s)	21.5	21.5		29.5	29.5	29.5	6.5	32.5			20.5	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5			3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0			2.0	
Total Lost Time (s)		5.5			5.5	5.5	5.5	5.5			5.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)	4.3	4.3		3.2	3.2	3.2	4.3	4.3			4.3	
Recall Mode	None	None		C-Max	C-Max	C-Max	None	None			None	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0			7.0	
Flash Dont Walk (s)	15.0	15.0		17.0	17.0	17.0	10.0	10.0			10.0	
Pedestrian Calls (#/hr)	26	26		26	26	26	0	0			0	
Act Effct Green (s)		16.6			44.9	44.9	6.5	22.0			17.2	39.3
Actuated g/C Ratio		0.17			0.45	0.45	0.06	0.22			0.17	0.39
v/c Ratio		0.32			0.84	0.45	0.15	0.17			0.66	0.12

Alternative 2
6: Main St & Pearl/Goodell

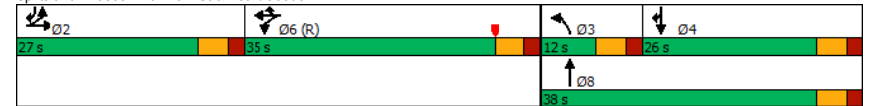
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	22.5				27.0	5.8	51.8	29.5			49.2	2.7
Queue Delay	0.0				0.5	0.5	1.2	0.0			0.0	0.0
Total Delay	22.5				27.4	6.3	53.1	29.5			49.2	2.8
LOS	C				C	A	D	C			D	A
Approach Delay	22.5				22.7		34.5				29.6	
Approach LOS	C				C		C				C	
Queue Length 50th (ft)	61				264	39	12	33			121	0
Queue Length 95th (ft)	m116				#698	104	36	62			190	17
Internal Link Dist (ft)	243				198		629				768	
Turn Bay Length (ft)							54					
Base Capacity (vph)	390				1598	868	117	582			364	1299
Starvation Cap Reductn	0				54	185	0	0			0	0
Spillback Cap Reductn	0				37	0	39	0			0	320
Storage Cap Reductn	0				0	0	0	0			0	0
Reduced v/c Ratio	0.25				0.86	0.57	0.23	0.12			0.55	0.15

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 6:WBTL, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.84
Intersection Signal Delay:	24.2
Intersection Capacity Utilization:	68.1%
ICU Level of Service:	C
Analysis Period (min):	15
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.
m	Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Main St & Pearl/Goodell



Alternative 2
7: Tupper & Pearl

AM 2045
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	499	54	57	172	50	18	120	61	9	334	60
Future Volume (vph)	100	499	54	57	172	50	18	120	61	9	334	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3529	0	0	1806	0	1770	1780	0	1770	1806	0
Fit Permitted	0.834											
Satd. Flow (perm)	0	2967	0	0	1413	0	404	1780	0	1047	1806	0
Right Turn on Red	Yes											
Satd. Flow (RTOR)	14											
Link Speed (mph)	30											
Link Distance (ft)	753											
Travel Time (s)	17.1											
Confl. Peds. (#/hr)	5											
Peak Hour Factor	0.92											
Heavy Vehicles (%)	0%											
Shared Lane Traffic (%)	0											
Lane Group Flow (vph)	0	710	0	0	303	0	20	196	0	10	428	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0											
Link Offset(ft)	0											
Crosswalk Width(ft)	16											
Two way Left Turn Lane	No											
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15											
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	2											
Permitted Phases	2											
Minimum Initial (s)	7.0											
Minimum Split (s)	50.0											
Total Split (s)	56.0											
Total Split (%)	56.0%											
Maximum Green (s)	50.5											
Yellow Time (s)	3.5											
All-Red Time (s)	2.0											
Total Lost Time (s)	5.5											
Lead/Lag	0											
Lead-Lag Optimize?	No											
Vehicle Extension (s)	3.0											
Recall Mode	C-Max											
Walk Time (s)	7.0											
Flash Dont Walk (s)	15.0											
Pedestrian Calls (#/hr)	15											
Act Effect Green (s)	60.0											
Actuated g/C Ratio	0.60											
v/c Ratio	0.40											
Control Delay	12.2											
Queue Delay	0.0											
Total Delay	12.2											

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Alternative 2
7: Tupper & Pearl

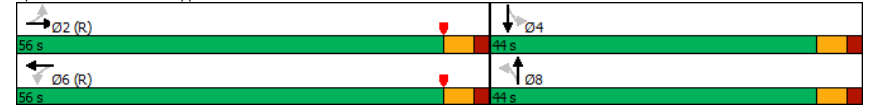
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B											
Approach Delay	12.2											
Approach LOS	B											
Queue Length 50th (ft)	113											
Queue Length 95th (ft)	190											
Internal Link Dist (ft)	673											
Turn Bay Length (ft)	271											
Base Capacity (vph)	1785											
Starvation Cap Reductn	0											
Spillback Cap Reductn	0											
Storage Cap Reductn	0											
Reduced v/c Ratio	0.40											

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 92 (92%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.81
 Intersection Signal Delay: 18.4 Intersection LOS: B
 Intersection Capacity Utilization 68.9% ICU Level of Service C
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: Tupper & Pearl



Lanes, Volumes, Timings
C&S Engineers

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Alternative 2
8: Main St & Tupper

AM 2045
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕		↕	↕	
Traffic Volume (vph)	37	495	8	5	190	11	2	22	6	146	71	54
Future Volume (vph)	37	495	8	5	190	11	2	22	6	146	71	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	0	0	0	0	40	0	0
Storage Lanes	0	0	0	0	0	0	0	0	0	1	0	0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3440	0	0	1788	0	0	1719	0	1736	1676	0
Fit Permitted		0.919			0.990			0.985		0.736		
Satd. Flow (perm)	0	3167	0	0	1770	0	0	1694	0	1267	1676	0
Right Turn on Red		Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		2			4			6			45	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		351			263			1174			709	
Travel Time (s)		8.0			6.0			26.7			16.1	
Conf. Peds. (#/hr)	10		17	17		10	19		36	36		19
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	9%	4%	0%	25%	5%	0%	0%	8%	0%	4%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	581	0	0	221	0	0	32	0	157	134	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases		2			6			8			4	
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	50.0	50.0		50.0	50.0		40.0	40.0		40.0	40.0	
Total Split (s)	55.0	55.0		55.0	55.0		45.0	45.0		45.0	45.0	
Total Split (%)	55.0%	55.0%		55.0%	55.0%		45.0%	45.0%		45.0%	45.0%	
Maximum Green (s)	49.5	49.5		49.5	49.5		39.5	39.5		39.5	39.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Total Lost Time (s)		5.5			5.5			5.5			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	5.0	5.0		12.0	12.0		11.0	11.0		10.0	10.0	
Pedestrian Calls (#/hr)	28	28		28	28		28	28		28	28	
Act Effct Green (s)		70.9			70.9			18.1			18.1	
Actuated g/C Ratio		0.71			0.71			0.18			0.18	
v/c Ratio		0.26			0.18			0.10			0.69	0.40

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Alternative 2
8: Main St & Tupper

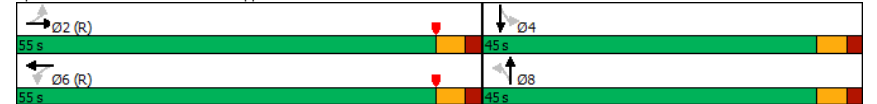
AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		2.4			4.2			27.2			74.2	48.4
Queue Delay		0.1			0.9			0.0			0.0	0.0
Total Delay		2.5			5.1			27.2			74.2	48.4
LOS		A			A			C			E	D
Approach Delay		2.5			5.1			27.2			62.3	
Approach LOS		A			A			C			E	
Queue Length 50th (ft)		22			21			14			93	50
Queue Length 95th (ft)		30			103			36			m166	m115
Internal Link Dist (ft)		271			183			1094				629
Turn Bay Length (ft)											40	
Base Capacity (vph)		2246			1256			672			500	689
Starvation Cap Reductn		623			775			0			0	0
Spillback Cap Reductn		0			0			0			0	0
Storage Cap Reductn		0			0			0			0	0
Reduced v/c Ratio		0.36			0.46			0.05			0.31	0.19

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.69
Intersection Signal Delay:	19.2
Intersection Capacity Utilization:	53.4%
ICU Level of Service:	A
Analysis Period (min):	15
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 8: Main St & Tupper



Lanes, Volumes, Timings
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Alternative 2
9: Washington & Tupper

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕		↕↕		
Traffic Volume (vph)	30	494	81	3	122	2	39	53	53	80	76	34
Future Volume (vph)	30	494	81	3	122	2	39	53	53	80	76	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		78	85		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3391	0	0	1746	0	1805	1601	0	1719	1764	0
Fit Permitted		0.936			0.991		0.652			0.670		
Satd. Flow (perm)	0	3176	0	0	1731	0	1189	1601	0	1181	1764	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29			1			52			23	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		263			328			1190			726	
Travel Time (s)		6.0			7.5			27.0			16.5	
Conf. Peds. (#/hr)	14		11	11		14	16		17	17		16
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
Heavy Vehicles (%)	4%	4%	0%	33%	8%	0%	0%	15%	0%	5%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	644	0	0	135	0	41	112	0	85	117	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases		2			6			8			4	
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	47.0	47.0		47.0	47.0		28.0	28.0		28.0	28.0	
Total Split (s)	64.0	64.0		64.0	64.0		36.0	36.0		36.0	36.0	
Total Split (%)	64.0%	64.0%		64.0%	64.0%		36.0%	36.0%		36.0%	36.0%	
Maximum Green (s)	58.5	58.5		58.5	58.5		30.5	30.5		30.5	30.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Total Lost Time (s)		5.5			5.5			5.5			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	17	17		17	17		23	23		23	23	
Act Effct Green (s)		76.1			76.1		12.9	12.9		12.9	12.9	
Actuated g/C Ratio		0.76			0.76		0.13	0.13		0.13	0.13	
v/c Ratio		0.27			0.10		0.27	0.45		0.56	0.47	

Alternative 2
9: Washington & Tupper

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		3.0			9.6		41.7	27.3		39.3	23.5	
Queue Delay		0.3			0.0		0.0	0.0		0.0	0.0	
Total Delay		3.4			9.6		41.7	27.3		39.3	23.5	
LOS		A			A		D	C		D	C	
Approach Delay		3.4			9.6		31.1			30.2		
Approach LOS		A			A		C			C		
Queue Length 50th (ft)		39			63		24	35		29	23	
Queue Length 95th (ft)		65			117		54	83		98	53	
Internal Link Dist (ft)		183			248		1110			646		
Turn Bay Length (ft)										85		
Base Capacity (vph)		2423			1317		362	524		360	554	
Starvation Cap Reductn		1124			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.50			0.10		0.11	0.21		0.24	0.21	

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	19 (19%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.56
Intersection Signal Delay:	12.6
Intersection Capacity Utilization:	50.2%
Intersection LOS:	B
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 9: Washington & Tupper



Alternative 2
10: Ellicott & Tupper

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕	↕	↕	↕	
Traffic Volume (vph)	20	505	41	0	100	0	16	106	99	60	72	13
Future Volume (vph)	20	505	41	0	100	0	16	106	99	60	72	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	80		150
Storage Lanes	0		0	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3413	0	0	1900	0	0	1784	1583	1671	1740	0
Fit Permitted		0.944						0.950		0.441		
Satd. Flow (perm)	0	3227	0	0	1900	0	0	1698	1449	736	1740	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10							108			12
Link Speed (mph)		30			30				30			30
Link Distance (ft)		328			387				1108			723
Travel Time (s)		7.5			8.8				25.2			16.4
Conf. Peds. (#/hr)	7		5				12		42		42	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	10%	4%	3%	0%	0%	0%	5%	6%	2%	8%	4%	16%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	616	0	0	109	0	0	132	108	65	92	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0				12			12
Link Offset(ft)		0			0				0			0
Crosswalk Width(ft)		16			16				16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA			NA		Perm	NA	Perm	pm+pt		NA
Protected Phases		2			6			8		7		4
Permitted Phases		2		6			8		8		4	
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0		7.0
Minimum Split (s)	24.5	24.5		25.5	25.5		40.0	40.0	40.0	12.5		40.0
Total Split (s)	47.5	47.5		47.5	47.5		40.0	40.0	40.0	12.5		52.5
Total Split (%)	47.5%	47.5%		47.5%	47.5%		40.0%	40.0%	40.0%	12.5%		52.5%
Maximum Green (s)	42.0	42.0		42.0	42.0		34.5	34.5	34.5	7.0		47.0
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5		3.5
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0		2.0
Total Lost Time (s)		5.5			5.5			5.5	5.5	5.5		5.5
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0		3.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None	None	None		None
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0		7.0
Flash Dont Walk (s)	12.0	12.0		13.0	13.0		10.0	10.0	10.0	10.0		10.0
Pedestrian Calls (#/hr)	19	19		19	19		46	46	46	46		46
Act Effct Green (s)		64.8			64.8			14.2	14.2	24.0		24.0
Actuated g/C Ratio		0.65			0.65			0.14	0.14	0.24		0.24
v/c Ratio		0.29			0.09			0.55	0.36	0.27		0.22

Lanes, Volumes, Timings
C&S Engineers

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Alternative 2
10: Ellicott & Tupper

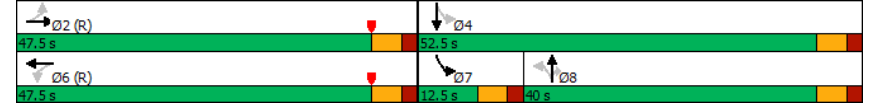
AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		4.9			3.2			47.9	10.9	46.5	41.6	
Queue Delay		0.3			0.0			0.0	0.0	0.0	0.0	
Total Delay		5.1			3.2			47.9	10.9	46.5	41.6	
LOS		A			A			D	B	D	D	
Approach Delay		5.1			3.3			31.2				43.6
Approach LOS		A			A			C				D
Queue Length 50th (ft)		48			8			76	0	38	45	
Queue Length 95th (ft)		62			11			134	46	m72	m91	
Internal Link Dist (ft)		248			307			1028				643
Turn Bay Length (ft)												80
Base Capacity (vph)		2095			1231			585	570	241	824	
Starvation Cap Reductn		820			0			0	0	0	0	
Spillback Cap Reductn		0			0			0	0	0	0	
Storage Cap Reductn		0			0			0	0	0	0	
Reduced v/c Ratio		0.48			0.09			0.23	0.19	0.27	0.11	

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	83 (83%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.55
Intersection Signal Delay:	15.9
Intersection Capacity Utilization:	51.3%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	A
Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 10: Ellicott & Tupper



Lanes, Volumes, Timings
C&S Engineers

Synchro 11 Report
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Alternative 2
11: Oak & Tupper

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑								↓	↑↑	
Traffic Volume (vph)	0	457	237	0	0	0	0	0	0	42	181	100
Future Volume (vph)	0	457	237	0	0	0	0	0	0	42	181	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	0		0	0		0
Storage Lanes	0		0			0			0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3359	0	0	0	0	0	0	0	1610	3151	0
Fit Permitted										0.950	0.999	
Satd. Flow (perm)	0	3359	0	0	0	0	0	0	0	1610	3151	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)		140								43	101	
Link Speed (mph)		30			30				30		30	
Link Distance (ft)		387			354				125		680	
Travel Time (s)		8.8			8.0				2.8		15.5	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	2%	2%	0%	0%	0%	0%	0%	0%	2%	6%	0%
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	0	788	0	0	0	0	0	0	0	43	325	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0				12		12	
Link Offset(ft)		0			0				0		0	
Crosswalk Width(ft)		16			16				16		16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA								Perm	NA	
Protected Phases		2									4	
Permitted Phases										4		
Minimum Initial (s)		7.0								7.0	7.0	
Minimum Split (s)		50.0								40.0	40.0	
Total Split (s)		58.0								42.0	42.0	
Total Split (%)		58.0%								42.0%	42.0%	
Maximum Green (s)		52.5								36.5	36.5	
Yellow Time (s)		3.5								3.5	3.5	
All-Red Time (s)		2.0								2.0	2.0	
Total Lost Time (s)		5.5								5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0								3.0	3.0	
Recall Mode		C-Max								None	None	
Walk Time (s)		7.0								7.0	7.0	
Flash Dont Walk (s)		16.0								13.0	13.0	
Pedestrian Calls (#/hr)		0								2	2	
Act Effct Green (s)		75.7								13.3	13.3	
Actuated g/C Ratio		0.76								0.13	0.13	
w/c Ratio		0.31								0.17	0.64	
Control Delay		1.9								10.1	26.1	

Alternative 2
11: Oak & Tupper

AM 2045
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.2								0.0	0.0	
Total Delay		2.1								10.1	26.1	
LOS		A								B	C	
Approach Delay		2.1									24.3	
Approach LOS		A									C	
Queue Length 50th (ft)		5								2	56	
Queue Length 95th (ft)		63								m14	97	
Internal Link Dist (ft)		307			274			45			600	
Turn Bay Length (ft)												
Base Capacity (vph)		2578								614	1214	
Starvation Cap Reductn		891								0	0	
Spillback Cap Reductn		0								0	0	
Storage Cap Reductn		0								0	0	
Reduced v/c Ratio		0.47								0.07	0.27	

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	7 (7%), Referenced to phase 2:EBT and 6:, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.64
Intersection Signal Delay:	9.1
Intersection LOS:	A
Intersection Capacity Utilization:	35.7%
ICU Level of Service:	A
Analysis Period (min):	15
m	Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: Oak & Tupper



Alternative 2
12: Elm St & Tupper

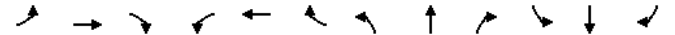
AM 2045
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕						↕↕				
Traffic Volume (vph)	9	497	0	0	0	0	0	571	4	0	0	0
Future Volume (vph)	9	497	0	0	0	0	0	571	4	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3455	0	0	0	0	0	3536	0	0	0	0
Fit Permitted		0.999										
Satd. Flow (perm)	0	3455	0	0	0	0	0	3536	0	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27						1				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		354			313			418			586	
Travel Time (s)		8.0			7.1			9.5			13.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	25%	4%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	562	0	0	0	0	0	638	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		15		9	15		9	15		9	15	9
Turn Type	Perm	NA						NA				
Protected Phases		2						8				
Permitted Phases		2										
Minimum Initial (s)		7.0						7.0				
Minimum Split (s)		30.0						60.0				
Total Split (s)		50.0						50.0				
Total Split (%)		50.0%						50.0%				
Maximum Green (s)		44.5						44.5				
Yellow Time (s)		3.5						3.5				
All-Red Time (s)		2.0						2.0				
Total Lost Time (s)								5.5				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0						3.0				
Recall Mode		C-Max						C-Max				
Walk Time (s)		7.0						7.0				
Flash Dont Walk (s)		16.0						13.0				
Pedestrian Calls (#/hr)		0						0				
Act Effct Green (s)								63.8				
Actuated g/C Ratio								0.64				
v/c Ratio								0.25				
Control Delay								4.4				
Queue Delay								0.2				
Total Delay								4.6				
LOS								A				

Alternative 2
12: Elm St & Tupper

AM 2045
01/17/2023

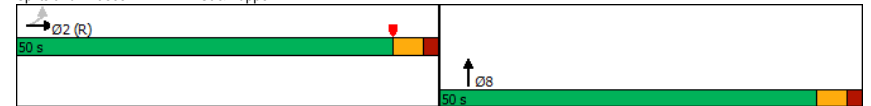


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		4.6						38.4				
Approach LOS		A						D				
Queue Length 50th (ft)		31						194				
Queue Length 95th (ft)		45						233				
Internal Link Dist (ft)		274			233			338			506	
Turn Bay Length (ft)												
Base Capacity (vph)		2214						1574				
Starvation Cap Reductn		831						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.41						0.41				

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	99 (99%), Referenced to phase 2:EBTL and 6:, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.72
Intersection Signal Delay:	22.6
Intersection LOS:	C
Intersection Capacity Utilization:	61.8%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 12: Elm St & Tupper



Alternative 2

AM 2045

34:

01/17/2023

	→	↘	↙	←	↗	↖
Lane Group	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations	↑↑					↑↑
Traffic Volume (vph)	549	0	0	0	0	733
Future Volume (vph)	549	0	0	0	0	733
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	3539	0	0	0	0	2787
Fit Permitted						
Satd. Flow (perm)	3539	0	0	0	0	2787
Link Speed (mph)	30			55	55	
Link Distance (ft)	334			197	283	
Travel Time (s)	7.6			2.4	3.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	597	0	0	0	0	797
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	L NA	Right	Left	Left	Left	R NA
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	47.5%			ICU Level of Service A		
Analysis Period (min)	15					

Alternative 2

AM 2045

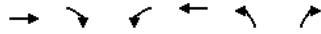
41: Pearl & Edward

01/17/2023

	→	↘	↙	←	↗	↖
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↑↑	↑↑
Traffic Volume (vph)	0	0	557	798	180	90
Future Volume (vph)	0	0	557	798	180	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	3468	1722	0
Fit Permitted				0.980	0.968	
Satd. Flow (perm)	0	0	0	3468	1722	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)					25	
Link Speed (mph)	30			30	30	
Link Distance (ft)	513			323	700	
Travel Time (s)	11.7			7.3	15.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1472	294	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type			Split	NA	Prot	
Protected Phases			6	6	8	
Permitted Phases						
Minimum Initial (s)			7.0	7.0	7.0	
Minimum Split (s)			23.5	23.5	23.5	
Total Split (s)			66.0	66.0	34.0	
Total Split (%)			66.0%	66.0%	34.0%	
Maximum Green (s)			60.5	60.5	28.5	
Yellow Time (s)			3.5	3.5	3.5	
All-Red Time (s)			2.0	2.0	2.0	
Total Lost Time (s)			5.5	5.5		
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)			3.0	3.0	3.0	
Recall Mode			C-Max	C-Max	Max	
Walk Time (s)			7.0	7.0	7.0	
Flash Dont Walk (s)			11.0	11.0	11.0	
Pedestrian Calls (#/hr)			10	10	10	
Act Effect Green (s)				60.5	28.5	
Actuated g/C Ratio				0.60	0.28	
v/c Ratio				0.70	0.58	
Control Delay				15.6	30.7	
Queue Delay				0.9	0.0	
Total Delay				16.5	30.7	
LOS				B	C	
Approach Delay				16.5	30.7	

Alternative 2
41: Pearl & Edward

AM 2045
01/17/2023

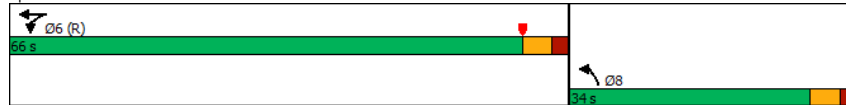


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS				B	C	
Queue Length 50th (ft)				62	117	
Queue Length 95th (ft)				315	200	
Internal Link Dist (ft)	433			243	620	
Turn Bay Length (ft)						
Base Capacity (vph)				2098	508	
Starvation Cap Reductn				326	0	
Spillback Cap Reductn				0	0	
Storage Cap Reductn				0	0	
Reduced v/c Ratio				0.83	0.58	

Intersection Summary

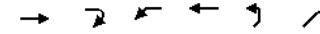
Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 6:WBTL, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.70
Intersection Signal Delay:	18.8
Intersection LOS:	B
Intersection Capacity Utilization:	62.9%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 41: Pearl & Edward



Alternative 2
43:

AM 2045
01/17/2023



Lane Group	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Volume (vph)	0	0	2622	2114	0	0
Future Volume (vph)	0	0	2622	2114	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	1610	3333	0	0
Fit Permitted			0.950	0.983		
Satd. Flow (perm)	0	0	1610	3333	0	0
Link Speed (mph)	30			55	55	
Link Distance (ft)			208	2645	179	
Travel Time (s)	4.7			32.8	2.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)			41%			
Lane Group Flow (vph)	0	0	1681	3467	0	0
Enter Blocked Intersection	No	No	Yes	Yes	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization:	136.4%
ICU Level of Service:	H
Analysis Period (min):	15

Alternative 2
1: Michigan & Goodell

PM 2025
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑	↑	↑			↑↑	
Traffic Volume (vph)	0	0	0	83	595	65	75	223	0	0	545	178
Future Volume (vph)	0	0	0	83	595	65	75	223	0	0	545	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0			250	0		0	0		0
Storage Lanes	0	0	0			1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	5067	1599	1805	1845	0	0	3360	0
Fit Permitted					0.994		0.147					
Satd. Flow (perm)	0	0	0	0	5067	1563	279	1845	0	0	3360	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						87						46
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		402			246			648			972	
Travel Time (s)		9.1			5.6			14.7			22.1	
Confl. Peds. (#/hr)						1	10					10
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	2%	1%	0%	3%	8%	0%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	692	66	77	228	0	0	738	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA	Perm	custom	NA			NA	
Protected Phases					6		3	3			4	
Permitted Phases				6		6	8					
Minimum Initial (s)				7.0	7.0	7.0	7.0				7.0	
Minimum Split (s)				45.0	45.0	45.0	12.5				23.5	
Total Split (s)				49.0	49.0	49.0	14.0				37.0	
Total Split (%)				49.0%	49.0%	49.0%	14.0%				37.0%	
Maximum Green (s)				43.5	43.5	43.5	8.5				31.5	
Yellow Time (s)				3.5	3.5	3.5	3.5				3.5	
All-Red Time (s)				2.0	2.0	2.0	2.0				2.0	
Total Lost Time (s)					5.5	5.5	5.5				5.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				4.0	4.0	4.0	3.0				3.0	
Recall Mode				Max	Max	Max	None				None	
Walk Time (s)				7.0	7.0	7.0					7.0	
Flash Dont Walk (s)				14.0	14.0	14.0					11.0	
Pedestrian Calls (#/hr)				4	4	4					8	
Act Effect Green (s)					43.6	43.6	39.8	39.8			25.8	
Actuated g/C Ratio					0.46	0.46	0.42	0.42			0.27	
v/c Ratio					0.30	0.09	0.30	0.29			0.78	

Lanes, Volumes, Timings
C&S Engineers

Synchro 11 Report
Page 1

Alternative 2
1: Michigan & Goodell

PM 2025
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Lane Group	Ø8
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Fit Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	8
Permitted Phases	
Minimum Initial (s)	7.0
Minimum Split (s)	23.5
Total Split (s)	51.0
Total Split (%)	51%
Maximum Green (s)	45.5
Yellow Time (s)	3.5
All-Red Time (s)	2.0
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	8
Act Effect Green (s)	
Actuated g/C Ratio	
v/c Ratio	

Lanes, Volumes, Timings
C&S Engineers

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Alternative 2
1: Michigan & Goodell

PM 2025
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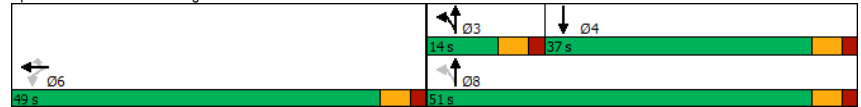


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay					16.9	2.5	19.2	18.9			35.7	
Queue Delay					0.0	0.0	0.0	0.0			0.0	
Total Delay					16.9	2.5	19.2	18.9			35.7	
LOS					B	A	B	B			D	
Approach Delay					15.6			19.0			35.7	
Approach LOS					B			B			D	
Queue Length 50th (ft)					92	0	27	88			201	
Queue Length 95th (ft)					132	16	54	140			267	
Internal Link Dist (ft)		322			166			568			892	
Turn Bay Length (ft)						250						
Base Capacity (vph)					2339	768	255	890			1153	
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	0.09	0.30	0.26			0.64	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 94.5
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 24.4 Intersection LOS: C
 Intersection Capacity Utilization 58.1% ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 1: Michigan & Goodell



Alternative 2
1: Michigan & Goodell

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Lane Group	Ø8
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 94.5
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 24.4 Intersection LOS: C
 Intersection Capacity Utilization 58.1% ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 1: Michigan & Goodell



Alternative 2
2: Elm St/Bennett Ln & Goodell

PM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↓	↓				↑
Traffic Volume (vph)	0	0	0	0	941	15	367	5	0	0	0	15
Future Volume (vph)	0	0	0	0	941	15	367	5	0	0	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	0	5077	0	1681	1689	0	0	0	1454
Fit Permitted							0.950	0.954				
Satd. Flow (perm)	0	0	0	0	5077	0	1681	1689	0	0	0	1454
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Satd. Flow (RTOR)					3		92	92				92
Link Speed (mph)		30			30			30				30
Link Distance (ft)		335			402			586				380
Travel Time (s)		7.6			9.1			13.3				8.6
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	2%	0%	2%	0%	0%	0%	0%	13%
Shared Lane Traffic (%)							49%					
Lane Group Flow (vph)	0	0	0	0	975	0	191	188	0	0	0	15
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type					NA		Perm	NA				Prot
Protected Phases					6		8					4
Permitted Phases							8					
Minimum Initial (s)					7.0		7.0	7.0				7.0
Minimum Split (s)					23.5		23.5	23.5				23.5
Total Split (s)					57.0		43.0	43.0				43.0
Total Split (%)					57.0%		43.0%	43.0%				43.0%
Maximum Green (s)					51.5		37.5	37.5				37.5
Yellow Time (s)					3.5		3.5	3.5				3.5
All-Red Time (s)					2.0		2.0	2.0				2.0
Total Lost Time (s)					5.5		5.5	5.5				5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)					3.0		3.0	3.0				3.0
Recall Mode					C-Max		None	None				None
Walk Time (s)					7.0		7.0	7.0				
Flash Dont Walk (s)					11.0		9.0	9.0				
Pedestrian Calls (#/hr)					5		5	5				
Act Effct Green (s)					76.8		12.2	12.2				12.2
Actuated g/C Ratio					0.77		0.12	0.12				0.12
v/c Ratio					0.25		0.67	0.66				0.06
Control Delay					3.9		32.7	31.8				0.4
Queue Delay					0.2		0.0	0.0				0.0
Total Delay					4.1		32.7	31.8				0.4
LOS					A		C	C				A

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Alternative 2
2: Elm St/Bennett Ln & Goodell

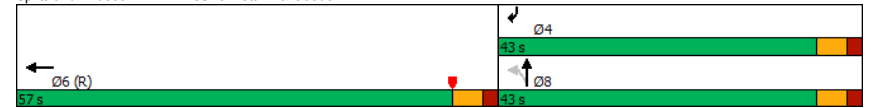
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay					4.1			32.2				0.4
Approach LOS					A			C				A
Queue Length 50th (ft)					50		63	61				0
Queue Length 95th (ft)					91		129	126				0
Internal Link Dist (ft)		255			322		506				300	
Turn Bay Length (ft)												
Base Capacity (vph)					3899		687	690				602
Starvation Cap Reductn					1989		0	0				0
Spillback Cap Reductn					72		1	1				1
Storage Cap Reductn					0		0	0				0
Reduced v/c Ratio					0.51		0.28	0.27				0.02

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 2: and 6:WBT, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.67
Intersection Signal Delay:	11.9
Intersection LOS:	B
Intersection Capacity Utilization:	70.1%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 2: Elm St/Bennett Ln & Goodell



Lanes, Volumes, Timings
C&S Engineers

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Alternative 2
3: Oak & Goodell

PM 2025
01/17/2023

	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕↕↕						↕	
Traffic Volume (vph)	0	0	0	324	917	43	0	0	0	0	380	55
Future Volume (vph)	0	0	0	324	917	43	0	0	0	0	380	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	0	5011	0	0	0	0	0	1841	0
Fit Permitted					0.988							
Satd. Flow (perm)	0	0	0	0	4921	0	0	0	0	0	1841	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					142						8	
Link Speed (mph)		30			30				30		30	
Link Distance (ft)		385			335				680		542	
Travel Time (s)		8.8			7.6				15.5		12.3	
Confl. Peds. (#/hr)				45		3						9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	2%	7%	0%	0%	0%	0%	1%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1351	0	0	0	0	0	458	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)					0				0		0	
Link Offset(ft)		0			0				0		0	
Crosswalk Width(ft)		16			16				16		16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA						NA	
Protected Phases					6						4	
Permitted Phases					6							
Minimum Initial (s)				7.0	7.0						7.0	
Minimum Split (s)				58.0	58.0						27.0	
Total Split (s)				60.0	60.0						40.0	
Total Split (%)				60.0%	60.0%						40.0%	
Maximum Green (s)				54.5	54.5						34.5	
Yellow Time (s)				3.5	3.5						3.5	
All-Red Time (s)				2.0	2.0						2.0	
Total Lost Time (s)					5.5						5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0						3.0	
Recall Mode				C-Max	C-Max						None	
Walk Time (s)				7.0	7.0						7.0	
Flash Dont Walk (s)				12.0	12.0						11.0	
Pedestrian Calls (#/hr)				45	45						16	
Act Effect Green (s)					59.9						29.1	
Actuated g/C Ratio					0.60						0.29	
v/c Ratio					0.45						0.85	
Control Delay					9.9						47.5	
Queue Delay					0.2						0.0	
Total Delay					10.1						47.5	

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Alternative 2
3: Oak & Goodell

PM 2025
01/17/2023

	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS					B							D
Approach Delay					10.1							47.5
Approach LOS					B							D
Queue Length 50th (ft)					179							267
Queue Length 95th (ft)					245							365
Internal Link Dist (ft)		305			255			600				462
Turn Bay Length (ft)												
Base Capacity (vph)					3006							640
Starvation Cap Reductn					788							0
Spillback Cap Reductn					0							0
Storage Cap Reductn					0							0
Reduced v/c Ratio					0.61							0.72

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 88.3 (88%), Referenced to phase 2: and 6:WBT, Start of Yellow

Control Type: Actuated-Coordinated

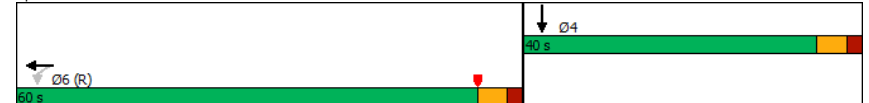
Maximum v/c Ratio: 0.85

Intersection Signal Delay: 19.6 Intersection LOS: B

Intersection Capacity Utilization 57.9% ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 3: Oak & Goodell



Lanes, Volumes, Timings
C&S Engineers

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Alternative 2
4: Ellicott & Goodell

PM 2025
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔↔↔	↕			↕			↕	
Traffic Volume (vph)	0	0	0	20	740	206	49	47	0	0	202	40
Future Volume (vph)	0	0	0	20	740	206	49	47	0	0	202	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	0	4893	0	0	1852	0	0	1838	0
Fit Permitted					0.999			0.452				
Satd. Flow (perm)	0	0	0	0	4892	0	0	859	0	0	1838	0
Right Turn on Red			Yes		Yes			Yes			Yes	
Satd. Flow (RTOR)					99						11	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		140			385			723			475	
Travel Time (s)		3.2			8.8			16.4			10.8	
Confl. Peds. (#/hr)				5								3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	6%	2%	4%	0%	0%	0%	0%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1050	0	0	104	0	0	263	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)					0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Split	NA		Perm	NA			NA	
Protected Phases				6	6			8			4	
Permitted Phases							8					
Minimum Initial (s)				7.0	7.0		7.0	7.0			7.0	
Minimum Split (s)				50.0	50.0		40.0	40.0			40.0	
Total Split (s)				56.0	56.0		44.0	44.0			44.0	
Total Split (%)				56.0%	56.0%		44.0%	44.0%			44.0%	
Maximum Green (s)				50.5	50.5		38.5	38.5			38.5	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		2.0	2.0			2.0	
Total Lost Time (s)					5.5			5.5			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Recall Mode				C-Max	C-Max		None	None			None	
Walk Time (s)				7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)				10.0	10.0		10.0	10.0			11.0	
Pedestrian Calls (#/hr)				5	5		16	16			3	
Act Effect Green (s)					69.7			19.3			19.3	
Actuated g/C Ratio					0.70			0.19			0.19	
v/c Ratio					0.31			0.63			0.72	
Control Delay					1.5			52.8			47.1	
Queue Delay					0.1			0.0			0.0	
Total Delay					1.6			52.8			47.1	

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Alternative 2
4: Ellicott & Goodell

PM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS					A			D			D	
Approach Delay					1.6			52.8			47.1	
Approach LOS					A			D			D	
Queue Length 50th (ft)					13			61			152	
Queue Length 95th (ft)					17			111			219	
Internal Link Dist (ft)			60		305			643			395	
Turn Bay Length (ft)												
Base Capacity (vph)					3438			330			714	
Starvation Cap Reductn					953			0			0	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.42			0.32			0.37	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 7.2 (7%), Referenced to phase 6:WBT, Start of Yellow

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 13.8 Intersection LOS: B

Intersection Capacity Utilization 52.2% ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 4: Ellicott & Goodell



Lanes, Volumes, Timings
C&S Engineers

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Alternative 2
5: Washington & Goodell

PM 2025
01/17/2023

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖ ↗	↖ ↗			↖ ↗			↖ ↗	↖ ↗
Traffic Volume (vph)	0	0	0	34	796	19	22	46	0	0	169	20
Future Volume (vph)	0	0	0	34	796	19	22	46	0	0	169	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	50	0	0	0	0	0	0	66	0
Storage Lanes	0	0	0	1	0	0	0	0	0	0	1	0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	1805	5021	0	0	1845	0	0	1863	1538
Fit Permitted				0.950				0.765				
Satd. Flow (perm)	0	0	0	1778	5021	0	0	1429	0	0	1863	1496
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)				6								27
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		278			189			726			324	
Travel Time (s)		6.3			4.3			16.5			7.4	
Conf. Peds. (#/hr)				5		4		9				9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	3%	0%	2%	1%	0%	0%	2%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	36	858	0	0	71	0	0	178	21
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type			Perm	NA		Perm	NA		NA	Perm		Perm
Protected Phases				6		8		8			4	
Permitted Phases				6		8		8			4	
Minimum Initial (s)				7.0	7.0		7.0	7.0			7.0	7.0
Minimum Split (s)				55.0	55.0		30.0	30.0			30.0	30.0
Total Split (s)				62.0	62.0		38.0	38.0			38.0	38.0
Total Split (%)				62.0%	62.0%		38.0%	38.0%			38.0%	38.0%
Maximum Green (s)				56.5	56.5		32.5	32.5			32.5	32.5
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	3.5
All-Red Time (s)				2.0	2.0		2.0	2.0			2.0	2.0
Total Lost Time (s)				5.5	5.5		5.5	5.5			5.5	5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	3.0
Recall Mode				C-Max	C-Max		None	None			None	None
Walk Time (s)				7.0	7.0		7.0	7.0			7.0	7.0
Flash Dont Walk (s)				10.0	10.0		10.0	10.0			10.0	10.0
Pedestrian Calls (#/hr)				9	9		3	3			9	9
Act Effct Green (s)				74.1	74.1		14.9	14.9			14.9	14.9
Actuated g/C Ratio				0.74	0.74		0.15	0.15			0.15	0.15
v/c Ratio				0.03	0.23		0.33	0.33			0.64	0.09

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Alternative 2
5: Washington & Goodell

PM 2025
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	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay				2.1	2.2			40.9			50.1	10.8
Queue Delay				0.0	0.1			0.0			0.0	0.0
Total Delay				2.1	2.3			40.9			50.1	10.8
LOS				A	A			D			D	B
Approach Delay					2.3			40.9			45.9	
Approach LOS					A			D			D	
Queue Length 50th (ft)				3	26			41			108	0
Queue Length 95th (ft)				7	31			79			168	17
Internal Link Dist (ft)			198		109			646			244	
Turn Bay Length (ft)					50							66
Base Capacity (vph)				1316	3720			464			605	504
Starvation Cap Reductn				0	1484			0			0	0
Spillback Cap Reductn				0	175			0			0	0
Storage Cap Reductn				0	0			0			0	0
Reduced v/c Ratio				0.03	0.38			0.15			0.29	0.04

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	16.1 (16%), Referenced to phase 2: and 6:WBTL, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.64
Intersection Signal Delay:	12.1
Intersection Capacity Utilization:	45.7%
Intersection LOS:	B
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 5: Washington & Goodell



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Alternative 2
6: Main St & Pearl/Goodell

PM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔		↔			↔	↔
Traffic Volume (vph)	155	0	10	28	642	179	18	73	0	0	227	94
Future Volume (vph)	155	0	10	28	642	179	18	73	0	0	227	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	54	0	0	0	0	0	0
Storage Lanes	0	0	0	0	1	1	0	0	0	0	0	2
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1796	0	0	3501	1568	1805	1827	0	0	1759	2842
Fit Permitted		0.955			0.937		0.284					
Satd. Flow (perm)	0	1780	0	0	3285	1498	535	1827	0	0	1759	2722
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		147				186						98
Link Speed (mph)		30			30			30				30
Link Distance (ft)		323			278			709				848
Travel Time (s)		7.3			6.3			16.1				19.3
Conf. Peds. (#/hr)	12		6	6		12	10					10
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	1%	3%	3%	0%	4%	0%	0%	8%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	171	0	0	698	186	19	76	0	0	236	98
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Split	NA	Perm	NA	Perm	pm+pt	NA				NA	custom
Protected Phases	2	2		6	6	3	8				4	
Permitted Phases				6		6	8					2 4
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0				7.0	
Minimum Split (s)	28.3	28.3		36.3	36.3	36.3	12.5	28.3			25.0	
Total Split (s)	23.0	23.0		38.0	38.0	38.0	14.0	39.0			25.0	
Total Split (%)	23.0%	23.0%		38.0%	38.0%	38.0%	14.0%	39.0%			25.0%	
Maximum Green (s)	17.5	17.5		32.5	32.5	32.5	8.5	33.5			19.5	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5			3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0			2.0	
Total Lost Time (s)		5.5			5.5	5.5	5.5	5.5			5.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)	4.3	4.3		3.2	3.2	3.2	3.0	4.3			3.0	
Recall Mode	None	None		C-Max	C-Max	C-Max	None	None			None	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0			7.0	
Flash Dont Walk (s)	15.0	15.0		17.0	17.0	17.0	10.0	10.0			10.0	
Pedestrian Calls (#/hr)	6	6		12	12	12		28			10	
Act Effct Green (s)		10.0			50.7	50.7	22.8	22.8			17.7	33.2
Actuated g/C Ratio		0.10			0.51	0.51	0.23	0.23			0.18	0.33
v/c Ratio		0.55			0.42	0.22	0.09	0.18			0.76	0.10

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Alternative 2
6: Main St & Pearl/Goodell

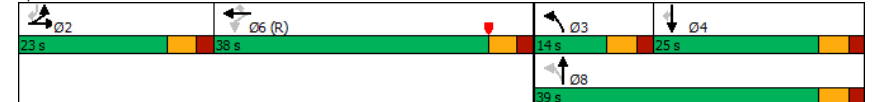
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	16.6				10.6	2.4	25.9	28.8			55.0	4.0
Queue Delay	0.0				0.4	0.4	0.0	0.0			0.0	0.0
Total Delay	16.6				11.0	2.9	25.9	28.8			55.0	4.0
LOS	B				B	A	C	C			D	A
Approach Delay	16.6				9.3		28.3				40.0	
Approach LOS	B				A		C				D	
Queue Length 50th (ft)	58				34	0	10	42			143	0
Queue Length 95th (ft)	m132				284	72	24	67			222	15
Internal Link Dist (ft)	243				198		629				768	
Turn Bay Length (ft)							54					
Base Capacity (vph)	435				1666	851	229	612			352	1130
Starvation Cap Reductn	0				488	346	0	0			0	0
Spillback Cap Reductn	0				0	0	0	0			0	0
Storage Cap Reductn	0				0	0	0	0			0	0
Reduced v/c Ratio	0.39				0.59	0.37	0.08	0.12			0.67	0.09

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 6:WBTL, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.76
 Intersection Signal Delay: 18.3 Intersection LOS: B
 Intersection Capacity Utilization 59.6% ICU Level of Service B
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Main St & Pearl/Goodell



Lanes, Volumes, Timings
C&S Engineers

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Alternative 2
7: Tupper & Pearl

PM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	711	20	0	116	90	42	200	230	41	119	15
Future Volume (vph)	100	711	20	0	116	90	42	200	230	41	119	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3568	0	0	1768	0	1770	1708	0	1770	1818	0
Fit Permitted	0.869											
Satd. Flow (perm)	0	3119	0	0	1768	0	1154	1708	0	334	1818	0
Right Turn on Red	Yes			Yes			Yes			Yes		
Satd. Flow (RTOR)	3			50			64			7		
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	753			351			561			700		
Travel Time (s)	17.1			8.0			12.8			15.9		
Confl. Peds. (#/hr)	20			20			14			6		
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
Heavy Vehicles (%)	0%	0%	0%	2%	2%	0%	2%	0%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	883	0	0	219	0	45	458	0	44	143	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			0			12			12		
Link Offset(ft)	0			0			0			0		
Crosswalk Width(ft)	16			16			16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		15	9		15	9		15	9	
Turn Type	Perm	NA	9		15	NA	Perm	NA	9		NA	9
Protected Phases	2		6		6		8		8		4	
Permitted Phases	2		6		6		8		8		4	
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	50.0	50.0	50.0	50.0	50.0	40.0	40.0	51.0	51.0	40.0	40.0	51.0
Total Split (s)	59.0	59.0	59.0	59.0	59.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0
Total Split (%)	53.6%	53.6%	53.6%	53.6%	53.6%	46.4%	46.4%	46.4%	46.4%	46.4%	46.4%	46.4%
Maximum Green (s)	53.5	53.5	53.5	53.5	53.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Total Lost Time (s)	5.5		5.5		5.5		5.5		5.5		5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	15.0	15.0	11.0	11.0	11.0	10.0	10.0	11.0	10.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	20	20	0	0	0	6	6	14	14	14	14	14
Act Effect Green (s)	66.3		66.3		32.7		32.7		32.7		32.7	
Actuated g/C Ratio	0.60		0.60		0.30		0.30		0.30		0.30	
v/c Ratio	0.47		0.20		0.13		0.83		0.44		0.26	
Control Delay	14.4		3.6		25.9		43.2		43.4		27.2	
Queue Delay	0.0		0.3		0.0		0.0		0.0		0.0	
Total Delay	14.5		3.9		25.9		43.2		43.4		27.2	

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Alternative 2
7: Tupper & Pearl

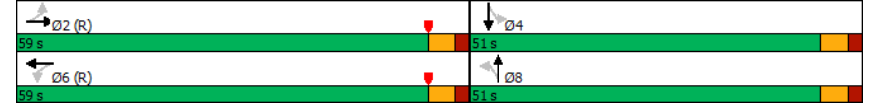
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B			A			C			D		
Approach Delay	14.5			3.9			41.7			31.0		
Approach LOS	B			A			D			C		
Queue Length 50th (ft)	171			2			23			261		
Queue Length 95th (ft)	278			29			45			337		
Internal Link Dist (ft)	673			271			481			620		
Turn Bay Length (ft)												
Base Capacity (vph)	1879			1084			477			744		
Starvation Cap Reductn	0			460			0			0		
Spillback Cap Reductn	46			0			0			0		
Storage Cap Reductn	0			0			0			0		
Reduced v/c Ratio	0.48			0.35			0.09			0.62		

Intersection Summary

Area Type:	Other
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 88.1 (80%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 22.5	Intersection LOS: C
Intersection Capacity Utilization 83.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 7: Tupper & Pearl



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Alternative 2
8: Main St & Tupper

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕			↕↕		↕	↕	
Traffic Volume (vph)	20	870	25	6	218	25	14	46	61	145	104	15
Future Volume (vph)	20	870	25	6	218	25	14	46	61	145	104	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	40		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3540	0	0	1853	0	0	1664	0	1770	1824	0
Fit Permitted		0.945			0.980			0.949		0.395		
Satd. Flow (perm)	0	3346	0	0	1818	0	0	1568	0	704	1824	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			7			48				8
Link Speed (mph)		30			30			30				30
Link Distance (ft)		351			263			1174				709
Travel Time (s)		8.0			6.0			26.7				16.1
Conf. Peds. (#/hr)	17		28	28		17	40		38	38		40
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	3%	0%	0%	4%	0%	4%	0%	2%	0%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	963	0	0	261	0	0	127	0	153	125	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt		NA
Protected Phases		2			6			8		7		4
Permitted Phases		2			6			8		7		4
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0		7.0
Minimum Split (s)	50.0	50.0		50.0	50.0		40.0	40.0		12.5		40.0
Total Split (s)	57.0	57.0		57.0	57.0		40.0	40.0		13.0		53.0
Total Split (%)	51.8%	51.8%		51.8%	51.8%		36.4%	36.4%		11.8%		48.2%
Maximum Green (s)	51.5	51.5		51.5	51.5		34.5	34.5		7.5		47.5
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5		3.5
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0		2.0
Total Lost Time (s)		5.5			5.5			5.5		5.5		5.5
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0		3.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None		None
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0		7.0
Flash Dont Walk (s)	5.0	5.0		12.0	12.0		11.0	11.0		10.0		10.0
Pedestrian Calls (#/hr)	28	28		17	17		38	38		40		40
Act Effct Green (s)		72.1			72.1			13.9		26.9		26.9
Actuated g/C Ratio		0.66			0.66			0.13		0.24		0.24
v/c Ratio		0.44			0.22			0.53		0.62		0.28

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Alternative 2
8: Main St & Tupper

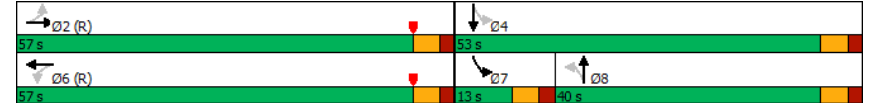
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		10.4			15.7			35.0		45.6	31.8	
Queue Delay		0.3			1.5			0.2		0.0	0.0	
Total Delay		10.7			17.2			35.1		45.6	31.8	
LOS		B			B			D		D	C	
Approach Delay		10.7			17.2			35.1			39.4	
Approach LOS		B			B			D			D	
Queue Length 50th (ft)		243			127			50		85	63	
Queue Length 95th (ft)		179			187			109		142	113	
Internal Link Dist (ft)		271			183			1094			629	
Turn Bay Length (ft)											40	
Base Capacity (vph)		2193			1193			524		245	792	
Starvation Cap Reductn		622			740			0		0	0	
Spillback Cap Reductn		243			0			82		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.61			0.58			0.29		0.62	0.16	

Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.62
Intersection Signal Delay:	18.6
Intersection Capacity Utilization:	56.7%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 8: Main St & Tupper



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Alternative 2
9: Washington & Tupper

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔ ↗ ↘ ↙ ↚ ↛ ↜ ↝ ↞ ↠ ↡ ↢ ↣											
Traffic Volume (vph)	12	1014	43	50	88	1	148	37	135	115	122	11
Future Volume (vph)	12	1014	43	50	88	1	148	37	135	115	122	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	0	0	0	78	85	0	0
Storage Lanes	0	0	0	0	0	0	1	0	0	1	0	0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3539	0	0	1863	0	1805	1585	0	1805	1827	0
Fit Permitted	0.952				0.535		0.633			0.331		
Satd. Flow (perm)	0	3371	0	0	1015	0	1130	1585	0	612	1827	0
Right Turn on Red		Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)	5						150			4		
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	263			328			1190			726		
Travel Time (s)	6.0			7.5			27.0			16.5		
Conf. Peds. (#/hr)	21		17	17		21	23		26	26		23
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	1%	2%	0%	0%	0%	0%	3%	0%	0%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1188	0	0	155	0	164	191	0	128	148	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			0			12			0		
Link Offset(ft)	0			0			0			0		
Crosswalk Width(ft)	16			16			16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	2	2		6		6	3	8		7	4	
Permitted Phases	2			6			8			4		
Minimum Initial (s)	7.0	7.0		7.0		7.0	7.0		7.0	7.0		
Minimum Split (s)	47.0	47.0		47.0		47.0	12.5	28.0		28.0	28.0	
Total Split (s)	54.0	54.0		54.0		54.0	15.0	28.0		28.0	41.0	
Total Split (%)	49.1%	49.1%		49.1%		49.1%	13.6%	25.5%		25.5%	37.3%	
Maximum Green (s)	48.5	48.5		48.5		48.5	9.5	22.5		22.5	35.5	
Yellow Time (s)	3.5	3.5		3.5		3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0		2.0	2.0	2.0		2.0	2.0	
Total Lost Time (s)	5.5	5.5		5.5		5.5	5.5	5.5		5.5	5.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0		3.0	3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max		C-Max	None	None		None	None	
Walk Time (s)	7.0	7.0		7.0		7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	13.0	13.0		13.0		13.0	10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	17	17		21		21	26	26		23	23	
Act Effct Green (s)	67.5	67.5		67.5		67.5	23.9	14.5		28.1	16.6	
Actuated g/C Ratio	0.61	0.61		0.61		0.61	0.22	0.13		0.26	0.15	
v/c Ratio	0.57	0.57		0.25		0.25	0.54	0.57		0.46	0.53	

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Alternative 2
9: Washington & Tupper

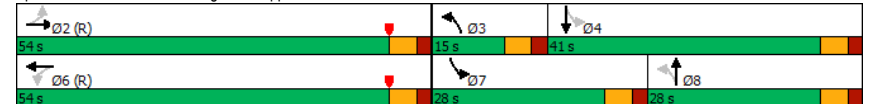
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	12.7				5.1		37.6	18.5		34.0	47.5	
Queue Delay	0.2				0.0		0.9	0.1		0.0	0.1	
Total Delay	12.8				5.1		38.5	18.6		34.0	47.7	
LOS	B				A		D	B		C	D	
Approach Delay	12.8				5.1		27.8			41.3		
Approach LOS	B				A		C			D		
Queue Length 50th (ft)	326				26		88	25		67	92	
Queue Length 95th (ft)	470				39		137	95		110	150	
Internal Link Dist (ft)	183				248		1110			646		
Turn Bay Length (ft)										85		
Base Capacity (vph)	2069				622		304	443		419	592	
Starvation Cap Reductn	154				0		0	0		0	0	
Spillback Cap Reductn	209				2		31	9		0	85	
Storage Cap Reductn	0				0		0	0		0	0	
Reduced v/c Ratio	0.64				0.25		0.60	0.44		0.31	0.29	

Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.57
Intersection Signal Delay:	18.9
Intersection Capacity Utilization:	82.6%
Intersection LOS:	B
ICU Level of Service:	E
Analysis Period (min):	15

Splits and Phases: 9: Washington & Tupper



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Alternative 2
10: Ellicott & Tupper

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕	↕	↕	↕	
Traffic Volume (vph)	13	1309	19	60	140	0	32	65	317	148	97	7
Future Volume (vph)	13	1309	19	60	140	0	32	65	317	148	97	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	80		150
Storage Lanes	0		0	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3338	0	0	1872	0	0	1821	1553	1752	1854	0
Fit Permitted		0.952			0.419				0.878		0.564	
Satd. Flow (perm)	0	3177	0	0	796	0	0	1596	1478	1012	1854	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2							87			4
Link Speed (mph)		30			30				30			30
Link Distance (ft)		328			387				1108			723
Travel Time (s)		7.5			8.8				25.2			16.4
Conf. Peds. (#/hr)	3		2	2		3	19		19	19		19
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	7%	8%	2%	0%	0%	0%	0%	4%	4%	3%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1382	0	0	206	0	0	100	327	153	107	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0				12			12
Link Offset(ft)		0			0				0			0
Crosswalk Width(ft)		16			16				16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	pm+pt		NA
Protected Phases		2			6			8		8	7	4
Permitted Phases		2			6			8		8	4	
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	50.0	50.0		50.0	50.0		23.5	23.5		23.5	12.5	40.0
Total Split (s)	58.0	58.0		58.0	58.0		39.0	39.0		39.0	13.0	52.0
Total Split (%)	52.7%	52.7%		52.7%	52.7%		35.5%	35.5%		35.5%	11.8%	47.3%
Maximum Green (s)	52.5	52.5		52.5	52.5		33.5	33.5		33.5	7.5	46.5
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	3.5
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Total Lost Time (s)		5.5			5.5			5.5		5.5	5.5	5.5
Lead/Lag							Lag	Lag		Lag	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	None
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	12.0	12.0		13.0	13.0		10.0	10.0		10.0	10.0	10.0
Pedestrian Calls (#/hr)	2	2		3	3		46	46		46	19	19
Act Effct Green (s)		61.9			61.9			24.1		24.1	37.1	37.1
Actuated g/C Ratio		0.56			0.56			0.22		0.22	0.34	0.34
v/c Ratio		0.77			0.46			0.29		0.84	0.39	0.17

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Alternative 2
10: Ellicott & Tupper

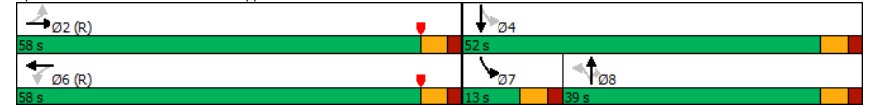
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		14.1			47.3				35.6	47.5	27.9	23.3
Queue Delay		0.0			0.0				0.0	6.8	1.0	0.0
Total Delay		14.1			47.3				35.6	54.4	28.9	23.3
LOS		B			D				D	D	C	C
Approach Delay		14.1			47.3				50.0			26.6
Approach LOS		B			D				D			C
Queue Length 50th (ft)		96			142				59	166	78	51
Queue Length 95th (ft)		#632			226				96	248	112	80
Internal Link Dist (ft)		248			307				1028			643
Turn Bay Length (ft)												80
Base Capacity (vph)		1788			447				486	510	391	786
Starvation Cap Reductn		0			0				0	0	0	0
Spillback Cap Reductn		0			0				0	136	93	0
Storage Cap Reductn		0			0				0	0	0	0
Reduced v/c Ratio		0.77			0.46				0.21	0.87	0.51	0.14

Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.84
Intersection Signal Delay:	25.3
Intersection Capacity Utilization:	83.4%
ICU Level of Service:	E
Analysis Period (min):	15
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.

Splits and Phases: 10: Ellicott & Tupper



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Alternative 2
11: Oak & Tupper

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑								↓	↓↓	
Traffic Volume (vph)	0	1518	251	0	0	0	0	0	0	216	399	160
Future Volume (vph)	0	1518	251	0	0	0	0	0	0	216	399	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3488	0	0	0	0	0	0	0	1626	3243	0
Fit Permitted										0.950	0.998	
Satd. Flow (perm)	0	3488	0	0	0	0	0	0	0	1626	3243	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)		29								27	52	
Link Speed (mph)		30			30				30		30	
Link Distance (ft)		387			354				125		680	
Travel Time (s)		8.8			8.0				2.8		15.5	
Conf. Peds. (#/hr)			1	1			10					10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	2%	0%	0%	0%	0%	0%	0%	1%	1%	0%
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	0	1862	0	0	0	0	0	0	0	204	611	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0				12		12	
Link Offset(ft)		0			0				0		0	
Crosswalk Width(ft)		16			16				16		16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA								Perm	NA	
Protected Phases		2									4	
Permitted Phases										4		
Minimum Initial (s)		7.0								7.0	7.0	
Minimum Split (s)		50.0								40.0	40.0	
Total Split (s)		70.0								40.0	40.0	
Total Split (%)		63.6%								36.4%	36.4%	
Maximum Green (s)		64.5								34.5	34.5	
Yellow Time (s)		3.5								3.5	3.5	
All-Red Time (s)		2.0								2.0	2.0	
Total Lost Time (s)		5.5								5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0								3.0	3.0	
Recall Mode		C-Max								None	None	
Walk Time (s)		7.0								7.0	7.0	
Flash Dont Walk (s)		16.0								13.0	13.0	
Pedestrian Calls (#/hr)		1								10	10	
Act Effct Green (s)		72.0								27.0	27.0	
Actuated g/C Ratio		0.65								0.25	0.25	
v/c Ratio		0.81								0.49	0.73	

Alternative 2
11: Oak & Tupper

PM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		12.6									33.7	39.8
Queue Delay		2.1									0.0	0.0
Total Delay		14.8									33.7	39.8
LOS		B									C	D
Approach Delay		14.8										38.3
Approach LOS		B										D
Queue Length 50th (ft)		181									117	201
Queue Length 95th (ft)		444									179	243
Internal Link Dist (ft)		307			274			45				600
Turn Bay Length (ft)												
Base Capacity (vph)		2294									528	1052
Starvation Cap Reductn		287									0	0
Spillback Cap Reductn		0									0	0
Storage Cap Reductn		0									0	0
Reduced v/c Ratio		0.93									0.39	0.58

Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	97.9 (89%), Referenced to phase 2:EBT and 6:, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.81
Intersection Signal Delay:	21.9
Intersection Capacity Utilization:	74.7%
Intersection LOS:	C
ICU Level of Service:	D
Analysis Period (min):	15

Splits and Phases: 11: Oak & Tupper



Alternative 2
12: Elm St & Tupper

PM 2025
01/17/2023

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕						↕↕				
Traffic Volume (vph)	7	1732	0	0	0	0	0	406	52	0	0	0
Future Volume (vph)	7	1732	0	0	0	0	0	406	52	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3574	0	0	0	0	0	3487	0	0	0	0
Fit Permitted												
Satd. Flow (perm)	0	3574	0	0	0	0	0	3487	0	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25						12				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		354			313			418			586	
Travel Time (s)		8.0			7.1			9.5			13.3	
Confl. Peds. (#/hr)	1		14					1				1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1811	0	0	0	0	0	477	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0						0			0	
Link Offset(ft)		0						0			0	
Crosswalk Width(ft)		16						16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15			9	15			9	15
Turn Type	Perm	NA						NA				
Protected Phases		2						4				
Permitted Phases		2										
Minimum Initial (s)	7.0	7.0						7.0				
Minimum Split (s)	30.0	30.0						24.0				
Total Split (s)	78.0	78.0						32.0				
Total Split (%)	70.9%	70.9%						29.1%				
Maximum Green (s)	72.5	72.5						26.5				
Yellow Time (s)	3.5	3.5						3.5				
All-Red Time (s)	2.0	2.0						2.0				
Total Lost Time (s)		5.5						5.5				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0						3.0				
Recall Mode	C-Max	C-Max						None				
Walk Time (s)	7.0	7.0						7.0				
Flash Dont Walk (s)	11.0	11.0						11.0				
Pedestrian Calls (#/hr)	14	14						1				
Act Effect Green (s)		78.4						20.6				
Actuated g/C Ratio		0.71						0.19				
v/c Ratio		0.71						0.72				
Control Delay		3.6						47.1				
Queue Delay		0.4						0.0				
Total Delay		4.1						47.1				

Alternative 2
12: Elm St & Tupper

PM 2025
01/17/2023

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		A						D				
Approach Delay		4.1						47.1				
Approach LOS		A						D				
Queue Length 50th (ft)		85						163				
Queue Length 95th (ft)		96						207				
Internal Link Dist (ft)		274				233		338				506
Turn Bay Length (ft)												
Base Capacity (vph)		2555						849				
Starvation Cap Reductn		295						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.80						0.56				

Intersection Summary	
Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	105.6 (96%), Referenced to phase 2:EBTL and 6:, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.72
Intersection Signal Delay:	13.0
Intersection LOS:	B
Intersection Capacity Utilization:	70.1%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 12: Elm St & Tupper



Alternative 2

PM 2025

34:

01/17/2023

	→	↘	↙	←	↗	↖
Lane Group	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations	↑↑					↑↑
Traffic Volume (vph)	549	0	0	0	0	733
Future Volume (vph)	549	0	0	0	0	733
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	3539	0	0	0	0	2787
Fit Permitted						
Satd. Flow (perm)	3539	0	0	0	0	2787
Link Speed (mph)	30			55	55	
Link Distance (ft)	334			197	283	
Travel Time (s)	7.6			2.4	3.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	597	0	0	0	0	797
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	L NA	Right	Left	Left	Left	R NA
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	47.5%			ICU Level of Service A		
Analysis Period (min)	15					

Alternative 2

PM 2025

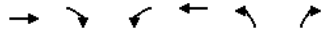
41: Pearl & Edward

01/17/2023

	→	↘	↙	←	↗	↖
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↑↑	↑↑
Traffic Volume (vph)	0	0	198	555	235	155
Future Volume (vph)	0	0	198	555	235	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	3493	1711	0
Fit Permitted				0.987	0.971	
Satd. Flow (perm)	0	0	0	3493	1711	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)					36	
Link Speed (mph)	30			30	30	
Link Distance (ft)	513			323	700	
Travel Time (s)	11.7			7.3	15.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	818	423	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type			Split	NA	Prot	
Protected Phases			6	6	8	
Permitted Phases						
Minimum Initial (s)			7.0	7.0	7.0	
Minimum Split (s)			24.5	24.5	24.5	
Total Split (s)			60.0	60.0	40.0	
Total Split (%)			60.0%	60.0%	40.0%	
Maximum Green (s)			54.5	54.5	34.5	
Yellow Time (s)			3.5	3.5	3.5	
All-Red Time (s)			2.0	2.0	2.0	
Total Lost Time (s)			5.5	5.5		
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)			3.0	3.0	3.0	
Recall Mode			C-Max	C-Max	None	
Walk Time (s)			7.0	7.0	7.0	
Flash Dont Walk (s)			12.0	12.0	12.0	
Pedestrian Calls (#/hr)			10	10	10	
Act Effect Green (s)				61.2	27.8	
Actuated g/C Ratio				0.61	0.28	
v/c Ratio				0.38	0.85	
Control Delay				4.6	46.5	
Queue Delay				0.1	0.0	
Total Delay				4.8	46.5	
LOS				A	D	
Approach Delay				4.8	46.5	

Alternative 2
41: Pearl & Edward

PM 2025
01/17/2023

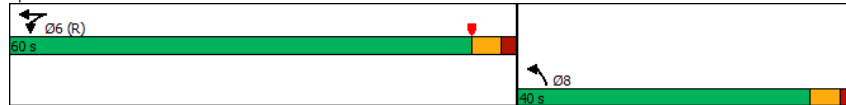


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS				A	D	
Queue Length 50th (ft)				39	232	
Queue Length 95th (ft)				64	322	
Internal Link Dist (ft)	433			243	620	
Turn Bay Length (ft)						
Base Capacity (vph)				2139	613	
Starvation Cap Reductn				449	0	
Spillback Cap Reductn				0	0	
Storage Cap Reductn				0	0	
Reduced v/c Ratio				0.48	0.69	

Intersection Summary

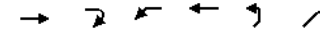
Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 6:WBTL, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.85
Intersection Signal Delay:	19.0
Intersection LOS:	B
Intersection Capacity Utilization	52.8%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 41: Pearl & Edward



Alternative 2
43:

PM 2025
01/17/2023



Lane Group	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Volume (vph)	0	0	2622	743	0	0
Future Volume (vph)	0	0	2622	743	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	1610	3285	0	0
Fit Permitted			0.950	0.969		
Satd. Flow (perm)	0	0	1610	3285	0	0
Link Speed (mph)	30			55	55	
Link Distance (ft)	208			2645	179	
Travel Time (s)	4.7			32.8	2.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)			50%			
Lane Group Flow (vph)	0	0	1425	2233	0	0
Enter Blocked Intersection	No	No	Yes	Yes	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	111.2%
ICU Level of Service	H
Analysis Period (min)	15

Alternative 2
86: Oak St

AM 2025
01/17/2023

	↑	↖	↗	↓	↙	↘
Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations				↑↑	↖↗	
Traffic Volume (vph)	0	0	0	211	2622	0
Future Volume (vph)	0	0	0	211	2622	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	3539	3433	0
Fit Permitted				0.950		
Satd. Flow (perm)	0	0	0	3539	3433	0
Link Speed (mph)	30			30	55	
Link Distance (ft)	195			181	212	
Travel Time (s)	4.4			4.1	2.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	229	2850	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	136.4%		ICU Level of Service H			
Analysis Period (min)	15					

Alternative 2
89: Elm St

AM 2025
01/17/2023

	↑	↖	↗	↓	↙	↘
Lane Group	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations	↑↖	↗				
Traffic Volume (vph)	619	755	0	0	0	0
Future Volume (vph)	619	755	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	3214	1441	0	0	0	0
Fit Permitted						
Satd. Flow (perm)	3214	1441	0	0	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1185			418	135	
Travel Time (s)	26.9			9.5	3.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)		43%				
Lane Group Flow (vph)	1026	468	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	34.5%		ICU Level of Service A			
Analysis Period (min)	15					

Alternative 2
1: Michigan & Goodell

PM 2045
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑	↑	↑	↑			↑↑	
Traffic Volume (vph)	0	0	0	83	570	65	75	223	0	0	545	178
Future Volume (vph)	0	0	0	83	570	65	75	223	0	0	545	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0			250	0		0	0		0
Storage Lanes	0	0	0			1	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	0	5067	1599	1805	1845	0	0	3368	0
Fit Permitted					0.994		0.141					
Satd. Flow (perm)	0	0	0	0	5067	1563	268	1845	0	0	3368	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						87						46
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		402			246			648			972	
Travel Time (s)		9.1			5.6			14.7			22.1	
Confl. Peds. (#/hr)						1	10		5	5		10
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	2%	1%	0%	3%	8%	0%	3%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	667	66	77	228	0	0	738	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	
Protected Phases					6		3	3			4	
Permitted Phases				6		6	3	8				
Minimum Initial (s)				7.0	7.0	7.0	7.0				7.0	
Minimum Split (s)				45.0	45.0	45.0	12.5				23.5	
Total Split (s)				49.0	49.0	49.0	15.0				36.0	
Total Split (%)				49.0%	49.0%	49.0%	15.0%				36.0%	
Maximum Green (s)				43.5	43.5	43.5	9.5				30.5	
Yellow Time (s)				3.5	3.5	3.5	3.5				3.5	
All-Red Time (s)				2.0	2.0	2.0	2.0				2.0	
Total Lost Time (s)					5.5	5.5	5.5				5.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				4.0	4.0	4.0	3.0				3.0	
Recall Mode				C-Max	C-Max	C-Max	None				None	
Walk Time (s)				7.0	7.0	7.0					7.0	
Flash Dont Walk (s)				14.0	14.0	14.0					11.0	
Pedestrian Calls (#/hr)				1	1	1					10	
Act Effect Green (s)					47.1	47.1	41.9	41.9			26.9	
Actuated g/C Ratio					0.47	0.47	0.42	0.42			0.27	
v/c Ratio					0.28	0.08	0.30	0.30			0.79	

Alternative 2
1: Michigan & Goodell

PM 2045
01/17/2023

Lane Group	Ø8
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Fit Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	8
Permitted Phases	
Minimum Initial (s)	7.0
Minimum Split (s)	22.5
Total Split (s)	51.0
Total Split (%)	51%
Maximum Green (s)	45.5
Yellow Time (s)	3.5
All-Red Time (s)	2.0
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	10.0
Pedestrian Calls (#/hr)	5
Act Effect Green (s)	
Actuated g/C Ratio	
v/c Ratio	

Alternative 2
1: Michigan & Goodell

PM 2045
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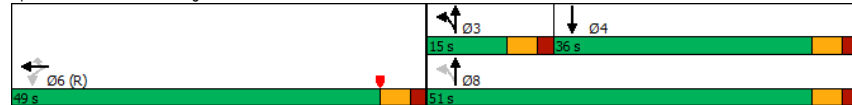


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay					17.1	2.5	19.6	19.8				38.0
Queue Delay					0.0	0.0	0.0	0.0				0.0
Total Delay					17.1	2.5	19.6	19.8				38.0
LOS					B	A	B	B				D
Approach Delay					15.7			19.7				38.0
Approach LOS					B			B				D
Queue Length 50th (ft)					93	0	29	93				214
Queue Length 95th (ft)					127	16	54	140				271
Internal Link Dist (ft)		322			166			568				892
Turn Bay Length (ft)						250						
Base Capacity (vph)					2388	782	257	839				1059
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					0.28	0.08	0.30	0.27				0.70

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 98 (98%), Referenced to phase 2: and 6:WBTL, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 25.7 Intersection LOS: C
 Intersection Capacity Utilization 58.1% ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 1: Michigan & Goodell



Alternative 2
1: Michigan & Goodell

PM 2045
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Lane Group	Ø8
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 98 (98%), Referenced to phase 2: and 6:WBTL, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 25.7 Intersection LOS: C
 Intersection Capacity Utilization 58.1% ICU Level of Service B
 Analysis Period (min) 15

Alternative 2
2: Elm St/Bennett Ln & Goodell

PM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↓	↓				↑
Traffic Volume (vph)	0	0	0	0	856	15	337	5	0	0	0	15
Future Volume (vph)	0	0	0	0	856	15	337	5	0	0	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	0	5072	0	1681	1689	0	0	0	1454
Fit Permitted							0.950	0.954				
Satd. Flow (perm)	0	0	0	0	5072	0	1681	1689	0	0	0	1454
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Satd. Flow (RTOR)					4		132	132				132
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		335			402			586			380	
Travel Time (s)		7.6			9.1			13.3			8.6	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	2%	0%	2%	0%	0%	0%	0%	13%
Shared Lane Traffic (%)							49%					
Lane Group Flow (vph)	0	0	0	0	888	0	175	174	0	0	0	15
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type					NA		Perm	NA				Prot
Protected Phases					6			8				4
Permitted Phases							8					
Minimum Initial (s)					7.0		7.0	7.0				7.0
Minimum Split (s)					23.5		23.5	23.5				23.5
Total Split (s)					60.0		40.0	40.0				40.0
Total Split (%)					60.0%		40.0%	40.0%				40.0%
Maximum Green (s)					54.5		34.5	34.5				34.5
Yellow Time (s)					3.5		3.5	3.5				3.5
All-Red Time (s)					2.0		2.0	2.0				2.0
Total Lost Time (s)					5.5		5.5	5.5				5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)					3.0		3.0	3.0				3.0
Recall Mode					C-Max		None	None				None
Walk Time (s)					7.0		7.0	7.0				
Flash Dont Walk (s)					11.0		9.0	9.0				
Pedestrian Calls (#/hr)					5		5	5				
Act Effct Green (s)					79.2		9.8	9.8				9.8
Actuated g/C Ratio					0.79		0.10	0.10				0.10
v/c Ratio					0.22		0.62	0.61				0.06
Control Delay					2.7		22.4	22.0				0.4
Queue Delay					0.0		0.0	0.0				0.0
Total Delay					2.7		22.4	22.0				0.4
LOS					A		C	C				A

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C&S Engineers

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Alternative 2
2: Elm St/Bennett Ln & Goodell

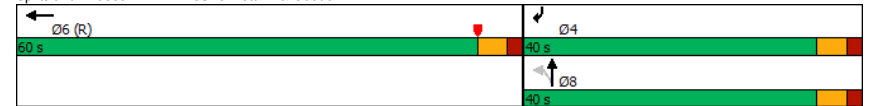
PM 2045
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay					2.7			22.2				0.4
Approach LOS					A			C				A
Queue Length 50th (ft)					36		27	27				0
Queue Length 95th (ft)					53		90	89				0
Internal Link Dist (ft)		255			322		506				300	
Turn Bay Length (ft)												
Base Capacity (vph)					4016		666	669				588
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					0.22		0.26	0.26				0.03

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	32 (32%), Referenced to phase 6:WBT, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.62
Intersection Signal Delay:	8.1
Intersection LOS:	A
Intersection Capacity Utilization:	69.3%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 2: Elm St/Bennett Ln & Goodell



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Alternative 2
3: Oak & Goodell

PM 2045
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔↔↔						↔	
Traffic Volume (vph)	0	0	0	374	792	43	0	0	0	0	380	5
Future Volume (vph)	0	0	0	374	792	43	0	0	0	0	380	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	0	5001	0	0	0	0	0	1877	0
Fit Permitted					0.985							
Satd. Flow (perm)	0	0	0	0	4891	0	0	0	0	0	1877	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)					191						1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		385			335			680			542	
Travel Time (s)		8.8			7.6			15.5			12.3	
Confl. Peds. (#/hr)				45		3						9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	2%	7%	0%	0%	0%	0%	1%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1273	0	0	0	0	0	405	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)					0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type				Perm		NA					NA	
Protected Phases					6						4	
Permitted Phases					6							
Minimum Initial (s)				7.0	7.0						7.0	
Minimum Split (s)				58.0	58.0						27.0	
Total Split (s)				61.0	61.0						39.0	
Total Split (%)				61.0%	61.0%						39.0%	
Maximum Green (s)				55.5	55.5						33.5	
Yellow Time (s)				3.5	3.5						3.5	
All-Red Time (s)				2.0	2.0						2.0	
Total Lost Time (s)					5.5						5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0						3.0	
Recall Mode				C-Max	C-Max						None	
Walk Time (s)				7.0	7.0						7.0	
Flash Dont Walk (s)				12.0	12.0						11.0	
Pedestrian Calls (#/hr)				45	45						16	
Act Effect Green (s)					62.5						26.5	
Actuated g/C Ratio					0.62						0.26	
v/c Ratio					0.41						0.81	
Control Delay					4.3						47.2	
Queue Delay					0.2						0.0	
Total Delay					4.5						47.2	

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Alternative 2
3: Oak & Goodell

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS					A							D
Approach Delay					4.5							47.2
Approach LOS					A							D
Queue Length 50th (ft)					61							240
Queue Length 95th (ft)					89							321
Internal Link Dist (ft)		305			255			600				462
Turn Bay Length (ft)												
Base Capacity (vph)					3126							629
Starvation Cap Reductn					904							0
Spillback Cap Reductn					0							0
Storage Cap Reductn					0							0
Reduced v/c Ratio					0.57							0.64

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 14 (14%), Referenced to phase 2: and 6:WBTL, Start of Yellow

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 14.8

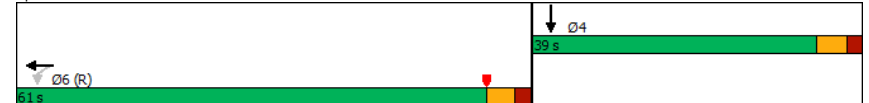
Intersection LOS: B

Intersection Capacity Utilization 53.3%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Oak & Goodell



Lanes, Volumes, Timings
C&S Engineers

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Alternative 2
4: Ellicott & Goodell

PM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↕↕↕	↕			↕			↕	
Traffic Volume (vph)	0	0	0	20	590	136	49	82	0	0	172	40
Future Volume (vph)	0	0	0	20	590	136	49	82	0	0	172	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	0	4920	0	0	1866	0	0	1832	0
Fit Permitted				0.999				0.819				
Satd. Flow (perm)	0	0	0	0	4918	0	0	1556	0	0	1832	0
Right Turn on Red			Yes		Yes		Yes		Yes		Yes	
Satd. Flow (RTOR)				79							13	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		140			385			723			475	
Travel Time (s)		3.2			8.8			16.4			10.8	
Confl. Peds. (#/hr)				5								3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	6%	2%	4%	0%	0%	0%	0%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	811	0	0	142	0	0	230	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)				0				12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type			Perm		NA		Perm		NA		NA	
Protected Phases					6			8			4	
Permitted Phases				6			8					
Minimum Initial (s)				7.0	7.0		7.0	7.0			7.0	
Minimum Split (s)				30.0	30.0		30.0	30.0			30.0	
Total Split (s)				60.0	60.0		40.0	40.0			40.0	
Total Split (%)				60.0%	60.0%		40.0%	40.0%			40.0%	
Maximum Green (s)				54.5	54.5		34.5	34.5			34.5	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		2.0	2.0			2.0	
Total Lost Time (s)					5.5			5.5			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Recall Mode				C-Max	C-Max		Max	Max			None	
Walk Time (s)				7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)				10.0	10.0		10.0	10.0			11.0	
Pedestrian Calls (#/hr)				5	5		16	16			3	
Act Effect Green (s)					54.5			34.5			34.5	
Actuated g/C Ratio					0.54			0.34			0.34	
v/c Ratio					0.30			0.26			0.36	
Control Delay					9.4			25.3			25.0	
Queue Delay					0.0			0.0			0.0	
Total Delay					9.4			25.3			25.0	

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Alternative 2
4: Ellicott & Goodell

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS					A			C				C
Approach Delay					9.4			25.3				25.0
Approach LOS					A			C				C
Queue Length 50th (ft)					136			65				102
Queue Length 95th (ft)					163			114				166
Internal Link Dist (ft)		60			305			643				395
Turn Bay Length (ft)												
Base Capacity (vph)					2716			536				640
Starvation Cap Reductn					0			0				0
Spillback Cap Reductn					0			0				0
Storage Cap Reductn					0			0				0
Reduced v/c Ratio					0.30			0.26				0.36

Intersection Summary

Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 36 (36%), Referenced to phase 2: and 6:WBTL, Start of Yellow	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.36	
Intersection Signal Delay: 14.4	Intersection LOS: B
Intersection Capacity Utilization 47.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Ellicott & Goodell



Lanes, Volumes, Timings
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Alternative 2
5: Washington & Goodell

PM 2045
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	0	0	0	79	691	19	17	71	0	0	139	20
Future Volume (vph)	0	0	0	79	691	19	17	71	0	0	139	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	50	0	0	0	0	0	0	66	0
Storage Lanes	0	0	0	1	0	0	0	0	0	0	1	0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	0	0	1805	5016	0	0	1859	0	0	1863	1538
Fit Permitted				0.950				0.913				
Satd. Flow (perm)	0	0	0	1780	5016	0	0	1711	0	0	1863	1500
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)				7								27
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		278			189			726			324	
Travel Time (s)		6.3			4.3			16.5			7.4	
Conf. Peds. (#/hr)				5		4		9				9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	3%	0%	2%	1%	0%	0%	2%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	83	747	0	0	93	0	0	146	21
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type			Perm	NA		Perm	NA		NA	Perm		Perm
Protected Phases				6		8		8		4		4
Permitted Phases				6		8		8		4		4
Minimum Initial (s)				7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)				55.0	55.0		30.0	30.0		30.0	30.0	
Total Split (s)				62.0	62.0		38.0	38.0		38.0	38.0	
Total Split (%)				62.0%	62.0%		38.0%	38.0%		38.0%	38.0%	
Maximum Green (s)				56.5	56.5		32.5	32.5		32.5	32.5	
Yellow Time (s)				3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)				2.0	2.0		2.0	2.0		2.0	2.0	
Total Lost Time (s)				5.5	5.5		5.5	5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode				C-Max	C-Max		None	None		None	None	
Walk Time (s)				7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)				11.0	11.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)				9	9		3	3		9	9	
Act Effct Green (s)				75.2	75.2		13.8	13.8		13.8	13.8	
Actuated g/C Ratio				0.75	0.75		0.14	0.14		0.14	0.14	
v/c Ratio				0.06	0.20		0.40	0.40		0.57	0.09	

Alternative 2
5: Washington & Goodell

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay				1.4	1.3			42.8			48.2	10.9
Queue Delay				0.0	0.1			0.0			0.0	0.0
Total Delay				1.4	1.5			42.8			48.2	10.9
LOS				A	A			D			D	B
Approach Delay					1.4			42.8			43.5	
Approach LOS					A			D			D	
Queue Length 50th (ft)				3	12			55			89	0
Queue Length 95th (ft)				13	30			95			139	17
Internal Link Dist (ft)			198		109			646			244	
Turn Bay Length (ft)					50							66
Base Capacity (vph)				1339	3775			556			605	505
Starvation Cap Reductn				0	1717			0			0	0
Spillback Cap Reductn				0	209			17			0	15
Storage Cap Reductn				0	0			0			0	0
Reduced v/c Ratio				0.06	0.36			0.17			0.24	0.04

Intersection Summary


Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	32 (32%), Referenced to phase 2: and 6:WBTL, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.57
Intersection Signal Delay:	11.4
Intersection Capacity Utilization:	43.4%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 5: Washington & Goodell



Alternative 2
6: Main St & Pearl/Goodell

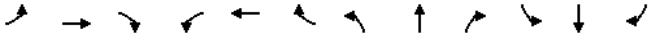
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	0	10	28	492	209	18	73	0	0	207	74
Future Volume (vph)	45	0	10	28	492	209	18	73	0	0	207	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	54	0	0	0	0	0	0
Storage Lanes	0	0	0	0	1	1	0	0	0	0	2	2
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1770	0	0	3498	1568	1805	1827	0	0	1759	2842
Fit Permitted		0.960			0.935		0.324					
Satd. Flow (perm)	0	1753	0	0	3278	1498	610	1827	0	0	1759	2722
Right Turn on Red			Yes		Yes		Yes		Yes		Yes	
Satd. Flow (RTOR)		167			218							101
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		323			278			709			848	
Travel Time (s)		7.3			6.3			16.1			19.3	
Conf. Peds. (#/hr)	12		6	6		12	10					10
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	1%	3%	3%	0%	4%	0%	0%	8%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	57	0	0	542	218	19	76	0	0	216	77
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Split	NA	Perm	NA	Perm	pm+pt	NA			NA	custom	
Protected Phases	2	2		6	6	3	8				4	
Permitted Phases				6		6	8					24
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0				7.0	
Minimum Split (s)	22.0	22.0		36.3	36.3	36.3	28.0	28.0			25.0	
Total Split (s)	22.0	22.0		31.0	31.0	31.0	12.0	47.0			35.0	
Total Split (%)	22.0%	22.0%		31.0%	31.0%	31.0%	12.0%	47.0%			35.0%	
Maximum Green (s)	16.0	16.0		24.7	24.7	24.7	6.0	41.0			29.1	
Yellow Time (s)	3.2	3.2		3.2	3.2	3.2	3.2	3.2			3.0	
All-Red Time (s)	2.8	2.8		3.1	3.1	3.1	2.8	2.8			2.9	
Total Lost Time (s)		6.0		6.3	6.3	6.0	6.0				5.9	
Lead/Lag						Lead					Lag	
Lead-Lag Optimize?						Yes					Yes	
Vehicle Extension (s)	4.3	4.3		3.2	3.2	3.2	4.3	4.3			3.0	
Recall Mode	Max	Max		C-Max	C-Max	C-Max	None	None			None	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0			7.0	
Flash Dont Walk (s)	15.0	15.0		17.0	17.0	17.0	10.0	10.0			10.0	
Pedestrian Calls (#/hr)	6	6		12	12	12	28	28			10	
Act Effct Green (s)		32.2			24.7	24.7	24.8	24.8			17.7	55.8
Actuated g/C Ratio		0.32			0.25	0.25	0.25	0.25			0.18	0.56
v/c Ratio		0.08			0.67	0.41	0.09	0.17			0.69	0.05

Alternative 2
6: Main St & Pearl/Goodell

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		1.9			45.4	14.7	23.7	26.5			49.7	1.6
Queue Delay		0.0			3.1	0.6	0.0	0.0			0.0	0.0
Total Delay		1.9			48.6	15.3	23.7	26.5			49.7	1.6
LOS		A			D	B	C	C			D	A
Approach Delay		1.9			39.0			26.0			37.1	
Approach LOS		A			D			C			D	
Queue Length 50th (ft)		2			147	0	9	36			131	0
Queue Length 95th (ft)		m12			206	76	23	63			192	7
Internal Link Dist (ft)		243			198			629			768	
Turn Bay Length (ft)							54					
Base Capacity (vph)		682			809	534	223	749			511	1555
Starvation Cap Reductn		0			171	110	0	0			0	0
Spillback Cap Reductn		0			0	0	0	0			0	0
Storage Cap Reductn		0			0	0	0	0			0	0
Reduced v/c Ratio		0.08			0.85	0.51	0.09	0.10			0.42	0.05

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 6:WBLT, Start of Yellow, Master Intersection

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 35.8

Intersection LOS: D

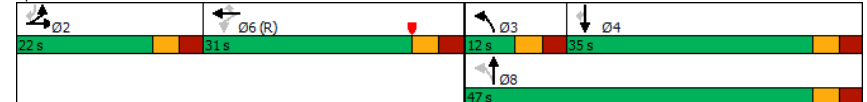
Intersection Capacity Utilization 65.6%

ICU Level of Service C

Analysis Period (min) 15

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

Phases and Phases: 6: Main St & Pearl/Goodell



Alternative 2
7: Tupper & Pearl

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔↔↔↔↔↔↔↔↔↔↔↔											
Traffic Volume (vph)	45	776	20	40	126	170	27	195	230	41	119	15
Future Volume (vph)	45	776	20	40	126	170	27	195	230	41	119	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3509	0	0	1726	0	1770	1690	0	1770	1818	0
Fit Permitted	0.910											
Satd. Flow (perm)	0	3203	0	0	1443	0	1154	1690	0	347	1818	0
Right Turn on Red	Yes Yes Yes Yes Yes Yes											
Satd. Flow (RTOR)	3 64 67 7											
Link Speed (mph)	30 30 30 30											
Link Distance (ft)	753 351 561 700											
Travel Time (s)	17.1 8.0 12.8 15.9											
Confl. Peds. (#/hr)	20 20 14 6 6 14											
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											
Shared Lane Traffic (%)	0 895 0 0 358 0 29 452 0 44 143 0											
Lane Group Flow (vph)	0 895 0 0 358 0 29 452 0 44 143 0											
Enter Blocked Intersection	No No No No No No No No No No No No											
Lane Alignment	Left Left Right Left Left Right Left Left Right Left Left Right											
Median Width(ft)	0 0 0 12 12											
Link Offset(ft)	0 0 0 0 0											
Crosswalk Width(ft)	16 16 16 16											
Two way Left Turn Lane	Headway Factor 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00											
Turning Speed (mph)	15 9 15 9 15 9 15 9 15 9											
Turn Type	Perm NA Perm NA Perm NA Perm NA											
Protected Phases	2 6 8 4											
Permitted Phases	2 6 8 4											
Minimum Initial (s)	7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0											
Minimum Split (s)	50.0 50.0 50.0 50.0 40.0 40.0 40.0 40.0											
Total Split (s)	58.0 58.0 58.0 58.0 52.0 52.0 52.0 52.0											
Total Split (%)	52.7% 52.7% 52.7% 52.7% 47.3% 47.3% 47.3% 47.3%											
Maximum Green (s)	52.5 52.5 52.5 52.5 46.5 46.5 46.5 46.5											
Yellow Time (s)	3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5											
All-Red Time (s)	2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0											
Total Lost Time (s)	5.5 5.5 5.5 5.5											
Lead/Lag	Lead-Lag Optimize?											
Vehicle Extension (s)	3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0											
Recall Mode	C-Max C-Max C-Max C-Max None None None None											
Walk Time (s)	7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0											
Flash Dont Walk (s)	15.0 15.0 11.0 11.0 10.0 10.0 11.0 11.0											
Pedestrian Calls (#/hr)	20 20 0 0 6 6 14 14											
Act Effct Green (s)	66.4 66.4 32.6 32.6 32.6 32.6											
Actuated g/C Ratio	0.60 0.60 0.30 0.30 0.30 0.30											
v/c Ratio	0.46 0.40 0.08 0.83 0.43 0.26											
Control Delay	14.3 6.7 24.9 42.8 41.9 27.3											
Queue Delay	0.0 0.4 0.0 0.0 0.0 0.0											
Total Delay	14.3 7.1 24.9 42.8 41.9 27.3											
LOS	B A C D D C											

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Alternative 2
7: Tupper & Pearl

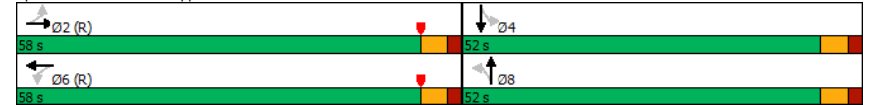
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay	14.3 7.1 41.7 30.7											
Approach LOS	B A D C											
Queue Length 50th (ft)	172 57 15 255 25 72											
Queue Length 95th (ft)	280 m83 32 330 55 107											
Internal Link Dist (ft)	673 271 481 620											
Turn Bay Length (ft)	Base Capacity (vph) 1934 896 487 753 146 772											
Starvation Cap Reductn	0 193 0 0 0 0											
Spillback Cap Reductn	0 0 0 0 0 0											
Storage Cap Reductn	0 0 0 0 0 0											
Reduced v/c Ratio	0.46 0.51 0.06 0.60 0.30 0.19											

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 4 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 21.4 Intersection LOS: C
Intersection Capacity Utilization 90.5% ICU Level of Service E
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: Tupper & Pearl



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Alternative 2
8: Main St & Tupper

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	←	→	↙	↘	↖	↗	↕	↙	↘	↖	↗	↕
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕			↕↕		↕	↕	
Traffic Volume (vph)	60	875	25	36	273	25	89	46	61	145	84	15
Future Volume (vph)	60	875	25	36	273	25	89	46	61	145	84	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	40		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3532	0	0	1857	0	0	1720	0	1770	1814	0
Fit Permitted		0.899			0.832			0.803		0.516		
Satd. Flow (perm)	0	3180	0	0	1552	0	0	1340	0	933	1814	0
Right Turn on Red		Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		4			6			18			9	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		351			263			1174			709	
Travel Time (s)		8.0			6.0			26.7			16.1	
Conf. Peds. (#/hr)	17		28	28		17	40		38	38		40
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	3%	0%	0%	4%	0%	4%	0%	2%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1010	0	0	351	0	0	206	0	153	104	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		2			6			8		7	4	
Permitted Phases		2		6			8			4		
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	30.0	30.0		50.0	50.0		23.5	23.5		12.5	22.5	
Total Split (s)	70.0	70.0		70.0	70.0		27.0	27.0		13.0	40.0	
Total Split (%)	63.6%	63.6%		63.6%	63.6%		24.5%	24.5%		11.8%	36.4%	
Maximum Green (s)	64.5	64.5		64.5	64.5		21.5	21.5		7.5	34.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Total Lost Time (s)		5.5			5.5			5.5		5.5	5.5	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	5.0	5.0		12.0	12.0		11.0	11.0			10.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		66.9			66.9			19.1		32.1	32.1	
Actuated g/C Ratio		0.61			0.61			0.17		0.29	0.29	
v/c Ratio		0.52			0.37			0.83		0.47	0.19	

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Alternative 2
8: Main St & Tupper

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	←	→	↙	↘	↖	↗	↕	↙	↘	↖	↗	↕
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		8.9			9.9			67.2		34.7	26.8	
Queue Delay		0.2			1.0			0.0		0.0	0.0	
Total Delay		9.1			10.9			67.2		34.7	26.8	
LOS		A			B			E		C	C	
Approach Delay		9.1			10.9			67.2			31.5	
Approach LOS		A			B			E		C	C	
Queue Length 50th (ft)		131			98			126		81	48	
Queue Length 95th (ft)		146			127			#238		135	91	
Internal Link Dist (ft)		271			183			1094			629	
Turn Bay Length (ft)											40	
Base Capacity (vph)		1936			946			276		328	575	
Starvation Cap Reductn		230			350			0		0	0	
Spillback Cap Reductn		259			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.60			0.59			0.75		0.47	0.18	

Intersection Summary

Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 19.1 Intersection LOS: B
 Intersection Capacity Utilization 74.4% ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 8: Main St & Tupper



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Alternative 2
9: Washington & Tupper

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	↖	→	↘	↙	←	↖	↗	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖↗			↖↗		↖↗	↖↗		↖↗	↖↗	
Traffic Volume (vph)	12	1019	43	30	208	1	113	92	135	115	137	11
Future Volume (vph)	12	1019	43	30	208	1	113	92	135	115	137	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		78	85		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3540	0	0	1886	0	1805	1650	0	1805	1821	0
Fit Permitted		0.951			0.789		0.521		0.292			
Satd. Flow (perm)	0	3369	0	0	1497	0	939	1650	0	540	1821	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5						65				3
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		263			328			1190			726	
Travel Time (s)		6.0			7.5			27.0			16.5	
Conf. Peds. (#/hr)	21		17	17		21	23		26	26		23
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	1%	2%	0%	0%	0%	0%	3%	0%	0%	2%	9%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1193	0	0	265	0	126	252	0	128	164	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		2			6		3	8		7	4	
Permitted Phases	2			6			8			4		
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	47.0	47.0		47.0	47.0		12.5	28.0		15.0	28.0	
Total Split (s)	60.0	60.0		60.0	60.0		16.0	34.0		16.0	34.0	
Total Split (%)	54.5%	54.5%		54.5%	54.5%		14.5%	30.9%		14.5%	30.9%	
Maximum Green (s)	54.5	54.5		54.5	54.5		10.5	28.5		10.5	28.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Total Lost Time (s)		5.5			5.5			5.5			5.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	17.0	17.0		17.0	17.0			11.0			11.0	
Pedestrian Calls (#/hr)	17	17		21	21			26			23	
Act Effct Green (s)		65.4			65.4		28.0	18.2		28.1	18.3	
Actuated g/C Ratio		0.59			0.59		0.25	0.17		0.26	0.17	
v/c Ratio		0.60			0.30		0.40	0.77		0.51	0.54	

Alternative 2
9: Washington & Tupper

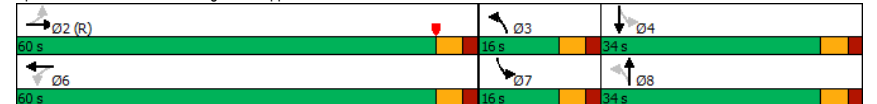
PM 2045
01/17/2023

	↖	→	↘	↙	←	↖	↗	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		11.0			9.8		30.8	47.3			34.4	46.6
Queue Delay		0.2			0.4		0.0	0.6			0.3	0.0
Total Delay		11.2			10.3		30.8	47.9			34.7	46.6
LOS		B			B		C	D			C	D
Approach Delay		11.2			10.3			42.2				41.4
Approach LOS		B			B			D				D
Queue Length 50th (ft)		177			36		66	128			67	105
Queue Length 95th (ft)		274			276		102	201			103	160
Internal Link Dist (ft)		183			248			1110				646
Turn Bay Length (ft)											85	
Base Capacity (vph)		2005			890		328	475			262	474
Starvation Cap Reductn		179			286		0	0			0	0
Spillback Cap Reductn		61			0		0	51			12	0
Storage Cap Reductn		0			0		0	0			0	0
Reduced v/c Ratio		0.65			0.44		0.38	0.59			0.51	0.35

Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	5 (5%), Referenced to phase 2:EBTL, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.77
Intersection Signal Delay:	20.7
Intersection Capacity Utilization:	71.3%
Intersection LOS:	C
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 9: Washington & Tupper



Alternative 2
10: Ellicott & Tupper

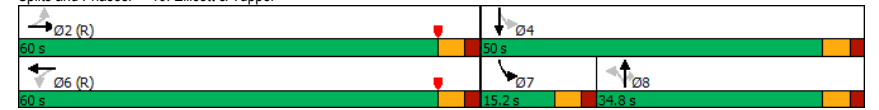
PM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖ ↗ ↘ ↙ ↚ ↛ ↜ ↝ ↞ ↠ ↡ ↢ ↣											
Traffic Volume (vph)	13	1284	49	0	200	0	32	100	357	148	67	7
Future Volume (vph)	13	1284	49	0	200	0	32	100	357	148	67	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	0	0	0	0	80	150	150
Storage Lanes	0	0	0	0	0	0	0	0	1	1	0	0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3326	0	0	1900	0	0	1822	1553	1752	1843	0
Fit Permitted	0.952											
Satd. Flow (perm)	0	3167	0	0	1900	0	0	1665	1478	930	1843	0
Right Turn on Red	Yes											
Satd. Flow (RTOR)	5											
Link Speed (mph)	30											
Link Distance (ft)	328											
Travel Time (s)	7.5											
Conf. Peds. (#/hr)	3											
Peak Hour Factor	0.97											
Heavy Vehicles (%)	7%											
Shared Lane Traffic (%)	0											
Lane Group Flow (vph)	1388											
Enter Blocked Intersection	No											
Lane Alignment	Left											
Median Width(ft)	0											
Link Offset(ft)	0											
Crosswalk Width(ft)	16											
Two way Left Turn Lane	1.00											
Headway Factor	1.00											
Turning Speed (mph)	15											
Turn Type	Perm NA											
Protected Phases	2											
Permitted Phases	2											
Minimum Initial (s)	7.0											
Minimum Split (s)	50.0											
Total Split (s)	60.0											
Total Split (%)	54.5%											
Maximum Green (s)	54.5%											
Yellow Time (s)	3.5											
All-Red Time (s)	2.0											
Total Lost Time (s)	5.5											
Lead/Lag	Lag Lag Lag Lead											
Lead-Lag Optimize?	Yes Yes Yes Yes											
Vehicle Extension (s)	3.0											
Recall Mode	C-Max C-Max C-Max C-Max None None None None											
Walk Time (s)	7.0											
Flash Dont Walk (s)	12.0											
Pedestrian Calls (#/hr)	2											
Act Effct Green (s)	58.9											
Actuated g/C Ratio	0.54											
v/c Ratio	0.82											

Alternative 2
10: Ellicott & Tupper

PM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	14.6											
Queue Delay	0.3											
Total Delay	14.9											
LOS	B											
Approach Delay	14.9											
Approach LOS	B											
Queue Length 50th (ft)	157											
Queue Length 95th (ft)	234											
Internal Link Dist (ft)	248											
Turn Bay Length (ft)	307											
Base Capacity (vph)	1697											
Starvation Cap Reductn	3											
Spillback Cap Reductn	47											
Storage Cap Reductn	0											
Reduced v/c Ratio	0.84											
Intersection Summary												
Area Type:	Other											
Cycle Length: 110												
Actuated Cycle Length: 110												
Offset: 102 (93%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.89												
Intersection Signal Delay: 25.2	Intersection LOS: C											
Intersection Capacity Utilization 86.1%	ICU Level of Service E											
Analysis Period (min) 15												
# 95th percentile volume exceeds capacity, queue may be longer.												
Queue shown is maximum after two cycles.												
Splits and Phases: 10: Ellicott & Tupper												



Alternative 2
11: Oak & Tupper

PM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑								↓	↓↓	
Traffic Volume (vph)	0	1558	226	0	0	0	0	0	0	216	409	200
Future Volume (vph)	0	1558	226	0	0	0	0	0	0	216	409	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3496	0	0	0	0	0	0	0	1626	3215	0
Fit Permitted										0.950	0.998	
Satd. Flow (perm)	0	3496	0	0	0	0	0	0	0	1626	3215	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)		25								25		68
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		387			354			125			680	
Travel Time (s)		8.8			8.0			2.8			15.5	
Conf. Peds. (#/hr)			1	1			10					10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	2%	0%	0%	0%	0%	0%	0%	1%	1%	0%
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	0	1878	0	0	0	0	0	0	0	204	665	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type		NA								Perm	NA	
Protected Phases		2									4	
Permitted Phases										4		
Minimum Initial (s)		7.0								7.0	7.0	
Minimum Split (s)		50.0								40.0	40.0	
Total Split (s)		70.0								40.0	40.0	
Total Split (%)		63.6%								36.4%	36.4%	
Maximum Green (s)		64.5								34.5	34.5	
Yellow Time (s)		3.5								3.5	3.5	
All-Red Time (s)		2.0								2.0	2.0	
Total Lost Time (s)		5.5								5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0								3.0	3.0	
Recall Mode		C-Max								None	None	
Walk Time (s)		7.0								7.0	7.0	
Flash Dont Walk (s)		16.0								13.0	13.0	
Pedestrian Calls (#/hr)		1								10	10	
Act Effct Green (s)		70.9								28.1	28.1	
Actuated g/C Ratio		0.64								0.26	0.26	
v/c Ratio		0.83								0.47	0.76	

Alternative 2
11: Oak & Tupper

PM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		10.7									32.9	39.6
Queue Delay		0.8									0.0	0.0
Total Delay		11.5									32.9	39.6
LOS		B									C	D
Approach Delay		11.5										38.0
Approach LOS		B										D
Queue Length 50th (ft)		196									116	214
Queue Length 95th (ft)		325									180	264
Internal Link Dist (ft)		307			274			45				600
Turn Bay Length (ft)												
Base Capacity (vph)		2262									527	1055
Starvation Cap Reductn		145									0	0
Spillback Cap Reductn		0									0	0
Storage Cap Reductn		0									0	0
Reduced v/c Ratio		0.89									0.39	0.63

Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	101 (92%), Referenced to phase 2:EBT and 6:, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.83
Intersection Signal Delay:	19.9
Intersection Capacity Utilization:	75.8%
Intersection LOS:	B
ICU Level of Service:	D
Analysis Period (min):	15

Splits and Phases: 11: Oak & Tupper



Alternative 2
12: Elm St & Tupper

PM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔						↔↔				
Traffic Volume (vph)	7	1772	0	0	0	0	0	336	52	0	0	0
Future Volume (vph)	7	1772	0	0	0	0	0	336	52	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3574	0	0	0	0	0	3478	0	0	0	0
Fit Permitted												
Satd. Flow (perm)	0	3574	0	0	0	0	0	3478	0	0	0	0
Right Turn on Red	Yes		Yes			Yes		Yes			Yes	
Satd. Flow (RTOR)		25						6				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		354			313			418			586	
Travel Time (s)		8.0			7.1			9.5			13.3	
Confl. Peds. (#/hr)	1		14				1					1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1853	0	0	0	0	0	404	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA					NA					
Protected Phases		2					8					
Permitted Phases		2										
Minimum Initial (s)	7.0	7.0					7.0					
Minimum Split (s)	30.0	30.0					60.0					
Total Split (s)	60.0	60.0					50.0					
Total Split (%)	54.5%	54.5%					45.5%					
Maximum Green (s)	54.5	54.5					44.5					
Yellow Time (s)	3.5	3.5					3.5					
All-Red Time (s)	2.0	2.0					2.0					
Total Lost Time (s)		5.5					5.5					
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0					3.0					
Recall Mode	C-Max	C-Max					None					
Walk Time (s)	7.0	7.0					7.0					
Flash Dont Walk (s)	11.0	11.0					11.0					
Pedestrian Calls (#/hr)	14	14					1					
Act Effect Green (s)		80.7					18.3					
Actuated g/C Ratio		0.73					0.17					
v/c Ratio		0.71					0.69					
Control Delay		3.1					48.6					
Queue Delay		0.4					0.0					
Total Delay		3.5					48.6					

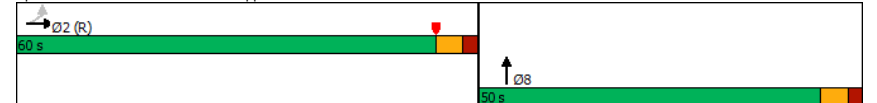
Alternative 2
12: Elm St & Tupper

PM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		A						D				
Approach Delay		3.5						48.6				
Approach LOS		A						D				
Queue Length 50th (ft)		78						141				
Queue Length 95th (ft)		90						182				
Internal Link Dist (ft)		274			233			338			506	
Turn Bay Length (ft)												
Base Capacity (vph)		2627						1410				
Starvation Cap Reductn		278						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.79						0.29				

Intersection Summary	
Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	109 (99%), Referenced to phase 2:EBTL and 6:, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.71
Intersection Signal Delay:	11.5
Intersection LOS:	B
Intersection Capacity Utilization:	69.3%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 12: Elm St & Tupper



Alternative 2

PM 2045

34:

01/17/2023

	→	↗	↖	←	↘	↙
Lane Group	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations	↑↑					↑↑
Traffic Volume (vph)	549	0	0	0	0	733
Future Volume (vph)	549	0	0	0	0	733
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	3539	0	0	0	0	2787
Fit Permitted						
Satd. Flow (perm)	3539	0	0	0	0	2787
Link Speed (mph)	30			55	55	
Link Distance (ft)	334			197	283	
Travel Time (s)	7.6			2.4	3.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	597	0	0	0	0	797
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	L NA	Right	Left	Left	Left	R NA
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	47.5%			ICU Level of Service A		
Analysis Period (min)	15					

Alternative 2

PM 2045

41: Pearl & Edward

01/17/2023

	→	↗	↖	←	↘	↙
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↑↑	↑↑
Traffic Volume (vph)	0	0	80	342	365	45
Future Volume (vph)	0	0	80	342	365	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	3507	1756	0
Fit Permitted				0.991	0.957	
Satd. Flow (perm)	0	0	0	3507	1756	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)					8	
Link Speed (mph)	30			30	30	
Link Distance (ft)	513			323	700	
Travel Time (s)	11.7			7.3	15.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	459	446	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type			Perm	NA	Prot	
Protected Phases				6	8	
Permitted Phases				6		
Minimum Initial (s)				7.0	7.0	7.0
Minimum Split (s)				24.5	24.5	24.5
Total Split (s)				50.0	50.0	50.0
Total Split (%)				50.0%	50.0%	50.0%
Maximum Green (s)				44.5	44.5	44.5
Yellow Time (s)				3.5	3.5	3.5
All-Red Time (s)				2.0	2.0	2.0
Total Lost Time (s)				5.5	5.5	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)				3.0	3.0	3.0
Recall Mode				C-Max	C-Max	Max
Walk Time (s)				7.0	7.0	7.0
Flash Dont Walk (s)				12.0	12.0	12.0
Pedestrian Calls (#/hr)				10	10	10
Act Effect Green (s)				44.5	44.5	
Actuated g/C Ratio				0.44	0.44	
v/c Ratio				0.29	0.57	
Control Delay				3.0	23.7	
Queue Delay				0.2	0.0	
Total Delay				3.3	23.7	
LOS				A	C	
Approach Delay				3.3	23.7	

Alternative 3
1: Michigan & Goodell

AM 2025
01/17/2023

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↕↕↕	↕		↕	↕			↕↕	
Traffic Volume (vph)	0	0	0	168	1508	333	182	674	0	0	296	83
Future Volume (vph)	0	0	0	168	1508	333	182	674	0	0	296	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0			200	0		0	0		0
Storage Lanes	0	0	0			0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor					1.00		1.00					
Frt				0.975							0.967	
Flt Protected				0.996			0.950					
Satd. Flow (prot)	0	0	0	0	4914	0	1703	1845	0	0	3344	0
Flt Permitted				0.996			0.361					
Satd. Flow (perm)	0	0	0	0	4914	0	644	1845	0	0	3344	0
Right Turn on Red			Yes		Yes			Yes				Yes
Satd. Flow (RTOR)				54							36	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		402			324			648			972	
Travel Time (s)		9.1			7.4			14.7			22.1	
Conf. Peds. (#/hr)					4		6					6
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	2%	3%	6%	3%	0%	11%	5%	0%
Adj. Flow (vph)	0	0	0	175	1571	347	190	702	0	0	308	86
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	2093	0	190	702	0	0	394	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0	0	0	0	0	0	0	12	0	0	12	0
Link Offset(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Crosswalk Width(ft)	16	16	16	16	16	16	16	16	16	16	16	16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	15	9	15	15	9	15	15	9	15
Number of Detectors				1	2		1	2			2	
Detector Template				Left	Thru		Left	Thru			Thru	
Leading Detector (ft)				20	100		20	100			100	
Trailing Detector (ft)				0	0		0	0			0	
Detector 1 Position(ft)				0	0		0	0			0	
Detector 1 Size(ft)				20	6		20	6			6	
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	

Alternative 3
1: Michigan & Goodell

AM 2025
01/17/2023

	↖	→	↘	↙	←	↖	↙	↑	↘	↙	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type				Split	NA		pm+pt	NA			NA	
Protected Phases				6	6		3	8			4	
Permitted Phases							8					
Detector Phase				6	6		3	8			4	
Switch Phase												
Minimum Initial (s)				7.0	7.0		7.0	7.0			7.0	
Minimum Split (s)				45.0	45.0		12.5	23.5			23.5	
Total Split (s)				50.0	50.0		16.1	50.0			33.9	
Total Split (%)				50.0%	50.0%		16.1%	50.0%			33.9%	
Maximum Green (s)				44.5	44.5		10.6	44.5			28.4	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		2.0	2.0			2.0	
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	
Total Lost Time (s)					5.5		5.5	5.5			5.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				4.0	4.0		3.0	3.0			3.0	
Recall Mode				C-Max	C-Max		None	None			None	
Walk Time (s)				7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)				14.0	14.0		10.0	10.0			11.0	
Pedestrian Calls (#/hr)				4	4		3	3			6	
Act Effect Green (s)					47.1		41.9	41.9			26.1	
Actuated g/C Ratio					0.47		0.42	0.42			0.26	
v/c Ratio				0.89	0.89		0.50	0.91			0.44	
Control Delay				30.4	30.4		23.3	44.1			29.0	
Queue Delay				0.0	0.0		0.0	0.0			0.0	
Total Delay				30.4	30.4		23.3	44.1			29.0	
LOS					C		C	D			C	
Approach Delay				30.4	30.4		39.7	39.7			29.0	
Approach LOS					C		D	D			C	
Queue Length 50th (ft)					446		74	389			96	
Queue Length 95th (ft)							#571	#610			140	
Internal Link Dist (ft)			322				244	568			892	
Turn Bay Length (ft)												
Base Capacity (vph)					2342		381	821			975	
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					0.89		0.50	0.86			0.40	
Intersection Summary												
Area Type:					Other							
Cycle Length:					100							
Actuated Cycle Length:					100							
Offset:					0 (0%), Referenced to phase 6:WBTL, Start of Yellow							
Natural Cycle:					85							
Control Type:					Actuated-Coordinated							
Maximum v/c Ratio:					0.91							
Intersection Signal Delay:					32.7						Intersection LOS: C	

Alternative 3
1: Michigan & Goodell

AM 2025
01/17/2023

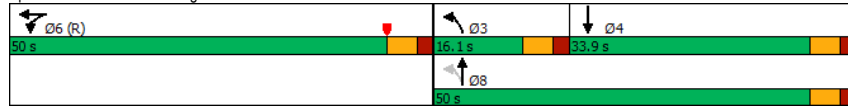
Intersection Capacity Utilization 84.7% ICU Level of Service E

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Michigan & Goodell



Alternative 3
2: Elm St/Bennett Ln & Goodell

AM 2025
01/17/2023

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↑	↑				↑
Traffic Volume (vph)	0	0	0	0	1781	8	452	2	0	0	0	19
Future Volume (vph)	0	0	0	0	1781	8	452	2	0	0	0	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00		1.00	1.00				
Frt					0.999							0.865
Flt Protected							0.950	0.953				
Satd. Flow (prot)	0	0	0	0	5025	0	1681	1680	0	0	0	1565
Flt Permitted							0.950	0.953				
Satd. Flow (perm)	0	0	0	0	5025	0	1675	1674	0	0	0	1565
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					1		27	27				27
Link Speed (mph)		30			30			30				30
Link Distance (ft)		335			402			586				382
Travel Time (s)		7.6			9.1			13.3				8.7
Confl. Peds. (#/hr)						1	2					2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	0%	3%	25%	2%	50%	0%	0%	0%	5%
Adj. Flow (vph)	0	0	0	0	1915	9	486	2	0	0	0	20
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	0	0	0	0	1924	0	243	245	0	0	0	20
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)					0			12				12
Link Offset(ft)					0			0				0
Crosswalk Width(ft)			16		16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors					2		1	2				1
Detector Template					Thru		Left	Thru				Right
Leading Detector (ft)					100		20	100				20
Trailing Detector (ft)					0		0	0				0
Detector 1 Position(ft)					0		0	0				0
Detector 1 Size(ft)					6		20	6				20
Detector 1 Type					Cl+Ex		Cl+Ex	Cl+Ex				Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)					0.0		0.0	0.0				0.0
Detector 1 Queue (s)					0.0		0.0	0.0				0.0
Detector 1 Delay (s)					0.0		0.0	0.0				0.0
Detector 2 Position(ft)					94			94				
Detector 2 Size(ft)					6			6				
Detector 2 Type					Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0				
Turn Type					NA		Perm	NA				Prot
Protected Phases					6			8				4
Permitted Phases								8				

Alternative 3
2: Elm St/Bennett Ln & Goodell

AM 2025
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase					6		8	8				4
Switch Phase												
Minimum Initial (s)					7.0		7.0	7.0				7.0
Minimum Split (s)					23.5		23.5	23.5				23.5
Total Split (s)					65.0		35.0	35.0				35.0
Total Split (%)					65.0%		35.0%	35.0%				35.0%
Maximum Green (s)					59.5		29.5	29.5				29.5
Yellow Time (s)					3.5		3.5	3.5				3.5
All-Red Time (s)					2.0		2.0	2.0				2.0
Lost Time Adjust (s)					0.0		0.0	0.0				0.0
Total Lost Time (s)					5.5		5.5	5.5				5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)					3.0		3.0	3.0				3.0
Recall Mode					C-Max		None	None				None
Walk Time (s)					7.0		7.0	7.0				
Flash Dont Walk (s)					11.0		9.0	9.0				
Pedestrian Calls (#/hr)					2		0	0				
Act Effct Green (s)					69.9		19.1	19.1				19.1
Actuated g/C Ratio					0.70		0.19	0.19				0.19
v/c Ratio					0.55		0.71	0.72				0.06
Control Delay					6.3		71.3	71.8				8.6
Queue Delay					0.2		0.1	0.1				0.0
Total Delay					6.5		71.4	71.8				8.6
LOS					A		E	E				A
Approach Delay					6.5			71.6			8.6	
Approach LOS					A			E			A	
Queue Length 50th (ft)					111		165	166				0
Queue Length 95th (ft)					168		246	247				15
Internal Link Dist (ft)		255			322			506			302	
Turn Bay Length (ft)												
Base Capacity (vph)					3510		513	512				480
Starvation Cap Reductn					702		0	0				0
Spillback Cap Reductn					108		15	15				0
Storage Cap Reductn					0		0	0				0
Reduced v/c Ratio					0.69		0.49	0.49				0.04

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 6:WBT, Start of Yellow
Natural Cycle:	55
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.72
Intersection Signal Delay:	19.6
Intersection LOS:	B
Intersection Capacity Utilization:	56.3%
ICU Level of Service:	B
Analysis Period (min):	15

Alternative 3
2: Elm St/Bennett Ln & Goodell

AM 2025
01/17/2023

Splits and Phases: 2: Elm St/Bennett Ln & Goodell



Alternative 3
3: Oak & Goodell

AM 2025
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖	↗						↘	↙
Traffic Volume (vph)	0	0	0	248	1837	100	0	0	0	0	119	2
Future Volume (vph)	0	0	0	248	1837	100	0	0	0	0	119	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00						1.00	
Frt					0.992						0.998	
Fit Protected				0.950								
Satd. Flow (prot)	0	0	0	1752	3495	0	0	0	0	0	1877	0
Fit Permitted				0.950								
Satd. Flow (perm)	0	0	0	1752	3495	0	0	0	0	0	1877	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)				256	12						1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		385			335			680			542	
Travel Time (s)		8.8			7.6			15.5			12.3	
Confl. Peds. (#/hr)						4						6
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	3%	2%	8%	0%	0%	0%	0%	1%	0%
Adj. Flow (vph)	0	0	0	256	1894	103	0	0	0	0	123	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	256	1997	0	0	0	0	0	125	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2						2	
Detector Template				Left	Thru						Thru	
Leading Detector (ft)				20	100						100	
Trailing Detector (ft)				0	0						0	
Detector 1 Position(ft)				0	0						0	
Detector 1 Size(ft)				20	6						6	
Detector 1 Type				Cl+Ex	Cl+Ex						Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0						0.0	
Detector 1 Queue (s)				0.0	0.0						0.0	
Detector 1 Delay (s)				0.0	0.0						0.0	
Detector 2 Position(ft)					94						94	
Detector 2 Size(ft)					6						6	
Detector 2 Type					Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0						0.0	
Turn Type				Perm	NA						NA	
Protected Phases					6						4	
Permitted Phases					6							

Lanes, Volumes, Timings
C&S Engineers

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Alternative 3
3: Oak & Goodell

AM 2025
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				6	6							4
Switch Phase												
Minimum Initial (s)				7.0	7.0							7.0
Minimum Split (s)				58.0	58.0							27.0
Total Split (s)				73.0	73.0							27.0
Total Split (%)				73.0%	73.0%							27.0%
Maximum Green (s)				67.5	67.5							21.5
Yellow Time (s)				3.5	3.5							3.5
All-Red Time (s)				2.0	2.0							2.0
Lost Time Adjust (s)				0.0	0.0							0.0
Total Lost Time (s)				5.5	5.5							5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0							3.0
Recall Mode				C-Max	C-Max							None
Walk Time (s)				7.0	7.0							7.0
Flash Dont Walk (s)				12.0	12.0							11.0
Pedestrian Calls (#/hr)				41	41							14
Act Effct Green (s)				76.8	76.8							12.2
Actuated g/C Ratio				0.77	0.77							0.12
v/c Ratio				0.18	0.74							0.54
Control Delay				0.9	7.5							49.0
Queue Delay				0.3	0.1							0.0
Total Delay				1.2	7.6							49.0
LOS				A	A							D
Approach Delay					6.8							49.0
Approach LOS					A							D
Queue Length 50th (ft)				3	224							76
Queue Length 95th (ft)				11	245							126
Internal Link Dist (ft)				305		255			600			462
Turn Bay Length (ft)												
Base Capacity (vph)				1404	2686							404
Starvation Cap Reductn				654	0							0
Spillback Cap Reductn				0	74							0
Storage Cap Reductn				0	0							0
Reduced v/c Ratio				0.34	0.76							0.31

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2: and 6:WBTL, Start of Yellow
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.74
 Intersection Signal Delay: 9.1
 Intersection LOS: A
 Intersection Capacity Utilization 71.1%
 ICU Level of Service C
 Analysis Period (min) 15

Lanes, Volumes, Timings
C&S Engineers

Synchro 11 Report
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Alternative 3
3: Oak & Goodell

AM 2025
01/17/2023

Splits and Phases: 3: Oak & Goodell



Alternative 3
4: Ellicott & Goodell

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕↕			↕				↕
Traffic Volume (vph)	0	0	0	63	1456	405	19	70	0	0	87	51
Future Volume (vph)	0	0	0	63	1456	405	19	70	0	0	87	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00			1.00				
Frt					0.968							0.950
Flt Protected					0.998			0.989				
Satd. Flow (prot)	0	0	0	0	3392	0	0	1879	0	0	1640	0
Flt Permitted					0.998			0.899				
Satd. Flow (perm)	0	0	0	0	3389	0	0	1706	0	0	1640	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					47							16
Link Speed (mph)		30			30			30				30
Link Distance (ft)		330			385			361				475
Travel Time (s)		7.5			8.8			8.2				10.8
Confl. Peds. (#/hr)				9			3					3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	4%	3%	2%	0%	0%	0%	0%	3%	20%
Adj. Flow (vph)	0	0	0	66	1533	426	20	74	0	0	92	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	2025	0	0	94	0	0	146	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)					0			0				0
Link Offset(ft)					0			0				0
Crosswalk Width(ft)					16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2		1	2				2
Detector Template				Left	Thru		Left	Thru				Thru
Leading Detector (ft)				20	100		20	100				100
Trailing Detector (ft)				0	0		0	0				0
Detector 1 Position(ft)				0	0		0	0				0
Detector 1 Size(ft)				20	6		20	6				6
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex				Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0				0.0
Detector 1 Queue (s)				0.0	0.0		0.0	0.0				0.0
Detector 1 Delay (s)				0.0	0.0		0.0	0.0				0.0
Detector 2 Position(ft)					94			94				94
Detector 2 Size(ft)					6			6				6
Detector 2 Type					Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0				0.0
Turn Type				Perm	NA		Perm	NA				NA
Protected Phases					6			8				4
Permitted Phases					6			8				4

Alternative 3
4: Ellicott & Goodell

AM 2025
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				6	6		8	8				4
Switch Phase												
Minimum Initial (s)				7.0	7.0		7.0	7.0				7.0
Minimum Split (s)				50.0	50.0		40.0	40.0				40.0
Total Split (s)				55.0	55.0		45.0	45.0				45.0
Total Split (%)				55.0%	55.0%		45.0%	45.0%				45.0%
Maximum Green (s)				49.5	49.5		39.5	39.5				39.5
Yellow Time (s)				3.5	3.5		3.5	3.5				3.5
All-Red Time (s)				2.0	2.0		2.0	2.0				2.0
Lost Time Adjust (s)					0.0			0.0				0.0
Total Lost Time (s)					5.5			5.5				5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0				3.0
Recall Mode				C-Max	C-Max		None	None				None
Walk Time (s)				7.0	7.0		7.0	7.0				7.0
Flash Dont Walk (s)				10.0	10.0		10.0	10.0				7.0
Pedestrian Calls (#/hr)				9	9		20	20				3
Act Effect Green (s)					75.3			13.7				13.7
Actuated g/C Ratio					0.75			0.14				0.14
v/c Ratio					0.79			0.40				0.61
Control Delay					6.2			69.4				46.5
Queue Delay					0.0			0.0				0.0
Total Delay					6.2			69.4				46.5
LOS					A			E				D
Approach Delay					6.2			69.4				46.5
Approach LOS					A			E				D
Queue Length 50th (ft)					105			65				79
Queue Length 95th (ft)					113			118				135
Internal Link Dist (ft)		250			305			281				395
Turn Bay Length (ft)												
Base Capacity (vph)					2565			673				657
Starvation Cap Reductn					0			0				0
Spillback Cap Reductn					0			0				0
Storage Cap Reductn					0			0				0
Reduced v/c Ratio					0.79			0.14				0.22

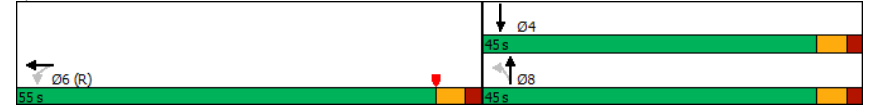
Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 2: and 6:WBTL, Start of Yellow
Natural Cycle:	100
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.79
Intersection Signal Delay:	11.4
Intersection LOS:	B
Intersection Capacity Utilization:	82.8%
ICU Level of Service:	E
Analysis Period (min):	15

Alternative 3
4: Ellicott & Goodell

AM 2025
01/17/2023

Splits and Phases: 4: Ellicott & Goodell



Alternative 3
5: Washington & Goodell

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	71	1372	66	20	23	0	0	64	6
Future Volume (vph)	0	0	0	71	1372	66	20	23	0	0	64	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	50	0	0	0	0	0	0	0	66
Storage Lanes	0	0	0	0	0	0	0	0	0	0	0	1
Taper Length (ft)	25			25				25			25	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00			1.00				
Frt					0.993							0.850
Flt Protected					0.998			0.977				
Satd. Flow (prot)	0	0	0	0	3477	0	0	1564	0	0	1845	1380
Flt Permitted					0.998			0.818				
Satd. Flow (perm)	0	0	0	0	3477	0	0	1304	0	0	1845	1349
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					9							27
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		280			330			726			324	
Travel Time (s)		6.4			7.5			16.5			7.4	
Conf. Peds. (#/hr)						2		6				6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	1%	3%	0%	40%	0%	0%	0%	3%	17%
Adj. Flow (vph)	0	0	0	75	1444	69	21	24	0	0	67	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1588	0	0	45	0	0	67	6
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)												
Link Offset(ft)												
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2			1	2		2	1
Detector Template				Left	Thru			Left	Thru		Thru	Right
Leading Detector (ft)				20	100			20	100		100	20
Trailing Detector (ft)				0	0			0	0		0	0
Detector 1 Position(ft)				0	0			0	0		0	0
Detector 1 Size(ft)				20	6			20	6		6	20
Detector 1 Type				Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0			0.0	0.0		0.0	0.0
Detector 1 Queue (s)				0.0	0.0			0.0	0.0		0.0	0.0
Detector 1 Delay (s)				0.0	0.0			0.0	0.0		0.0	0.0
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	

Alternative 3
5: Washington & Goodell

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type												
Protected Phases					Perm	NA		Perm	NA		NA	Perm
Permitted Phases					6			8				4
Detector Phase					6	6		8	8		4	4
Switch Phase												
Minimum Initial (s)					7.0	7.0		7.0	7.0		7.0	7.0
Minimum Split (s)					55.0	55.0		30.0	30.0		30.0	30.0
Total Split (s)					70.0	70.0		30.0	30.0		30.0	30.0
Total Split (%)					70.0%	70.0%		30.0%	30.0%		30.0%	30.0%
Maximum Green (s)					64.5	64.5		24.5	24.5		24.5	24.5
Yellow Time (s)					3.5	3.5		3.5	3.5		3.5	3.5
All-Red Time (s)					2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)						0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)						5.5		5.5	5.5		5.5	5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)					3.0	3.0		3.0	3.0		3.0	3.0
Recall Mode					C-Max	C-Max		None	None		None	None
Walk Time (s)					7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)					10.0	10.0		10.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)					11	11		9	9		9	9
Act Effct Green (s)						82.4			10.2			10.2
Actuated g/C Ratio						0.82			0.10			0.10
v/c Ratio						0.55			0.34			0.36
Control Delay						2.8			52.0			45.8
Queue Delay						0.2			0.0			0.0
Total Delay						3.1			52.0			45.8
LOS						A			D			D
Approach Delay						3.1			52.0			42.0
Approach LOS						A			D			D
Queue Length 50th (ft)						89			29			41
Queue Length 95th (ft)						97			65			77
Internal Link Dist (ft)						200			646			244
Turn Bay Length (ft)												66
Base Capacity (vph)						2866			319			452
Starvation Cap Reductn						522			0			0
Spillback Cap Reductn						307			0			0
Storage Cap Reductn						0			0			0
Reduced v/c Ratio						0.68			0.14			0.15
Intersection Summary												
Area Type:						Other						
Cycle Length:						100						
Actuated Cycle Length:						100						
Offset:						0 (0%), Referenced to phase 2: and 6:WBT, Start of Yellow						
Natural Cycle:						85						
Control Type:						Actuated-Coordinated						
Maximum v/c Ratio:						0.55						
Intersection Signal Delay:						6.0			Intersection LOS: A			

Alternative 3
5: Washington & Goodell

AM 2025
01/17/2023

Intersection Capacity Utilization 69.0%
Analysis Period (min) 15

ICU Level of Service C

Splits and Phases: 5: Washington & Goodell



Alternative 3
6: Main St & Edward/Goodell

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↕	↕		↕			↕	↕
Traffic Volume (vph)	120	0	0	41	1041	372	17	32	0	0	223	137
Future Volume (vph)	120	0	0	41	1041	372	17	32	0	0	223	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	80		0	0		0
Storage Lanes	0		0	0		1	1		0	0		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Ped Bike Factor		1.00			1.00		0.99					
Friction						0.850						0.850
Fit Protected		0.950			0.998		0.950					
Satd. Flow (prot)	0	1805	0	0	3493	1553	1703	1792	0	0	1810	2656
Fit Permitted		0.950			0.998		0.281					
Satd. Flow (perm)	0	1804	0	0	3491	1553	498	1792	0	0	1810	2656
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						383						147
Link Speed (mph)		30			30			30				30
Link Distance (ft)		341			280			726				848
Travel Time (s)		7.8			6.4			16.5				19.3
Confl. Peds. (#/hr)	2		5	5		2	14					14
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	7%	3%	4%	6%	6%	0%	0%	5%	7%
Adj. Flow (vph)	129	0	0	44	1119	400	18	34	0	0	240	147
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	129	0	0	1163	400	18	34	0	0	240	147
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2			2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru			Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100			100	20
Trailing Detector (ft)	0	0		0	0	0	0	0			0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0			0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6			6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Alternative 3
6: Main St & Edward/Goodell

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Split	NA		Split	NA	Prot	pm+pt	NA			NA	pt+ov
Protected Phases	2	2		6	6	6	3	8			4	4 2
Permitted Phases							8					
Detector Phase	2	2		6	6	6	3	8			4	4 2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0			7.0	
Minimum Split (s)	22.0	22.0		36.3	36.3	36.3	12.5	25.0			25.0	
Total Split (s)	22.0	22.0		38.0	38.0	38.0	13.0	40.0			27.0	
Total Split (%)	22.0%	22.0%		38.0%	38.0%	38.0%	13.0%	40.0%			27.0%	
Maximum Green (s)	16.5	16.5		32.5	32.5	32.5	7.5	34.5			21.5	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5			3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0			2.0	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0			0.0	
Total Lost Time (s)		5.5			5.5	5.5	5.5	5.5			5.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)	3.2	3.2		3.2	3.2	3.2	3.0	3.0			3.0	
Recall Mode	None	None		C-Max	C-Max	C-Max	None	None			None	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)	15.0	15.0		17.0	17.0	17.0		10.0			10.0	
Pedestrian Calls (#/hr)	5	5		2	2	2		26			14	
Act Effect Green (s)		12.4			48.1	48.1	23.0	23.0			17.9	35.8
Actuated g/C Ratio		0.12			0.48	0.48	0.23	0.23			0.18	0.36
v/c Ratio		0.58			0.69	0.42	0.09	0.08			0.74	0.14
Control Delay		29.7			18.6	3.6	28.6	29.8			52.6	3.3
Queue Delay		0.0			1.4	0.7	0.0	0.0			0.0	0.0
Total Delay		29.7			20.0	4.3	28.6	29.8			52.6	3.3
LOS		C			B	A	C	C			D	A
Approach Delay		29.7			16.0			29.4			33.9	
Approach LOS		C			B			C			C	
Queue Length 50th (ft)		71			176	0	12	21			145	0
Queue Length 95th (ft)		150			#546	95	23	36			222	19
Internal Link Dist (ft)		261			200			646			768	
Turn Bay Length (ft)							80					
Base Capacity (vph)		297			1678	945	205	618			390	1136
Starvation Cap Reductn		0			308	260	0	0			0	0
Spillback Cap Reductn		0			0	0	0	0			0	0
Storage Cap Reductn		0			0	0	0	0			0	0
Reduced v/c Ratio		0.43			0.85	0.58	0.09	0.06			0.62	0.13

Intersection Summary	
Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 6:WBTL, Start of Yellow, Master Intersection
Natural Cycle:	100
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.74
Intersection Signal Delay:	20.4
	Intersection LOS: C

Alternative 3
6: Main St & Edward/Goodell

AM 2025
01/17/2023

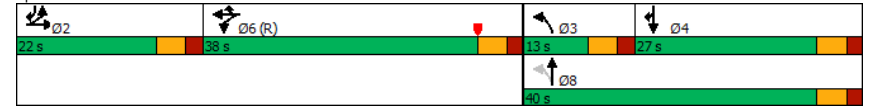
Intersection Capacity Utilization 66.3% ICU Level of Service C

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 6: Main St & Edward/Goodell



Alternative 3
7: Tupper & Pearl

AM 2025
01/17/2023

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕↕				↕		↕			↕↕		
Traffic Volume (vph)	110	514	54	162	112	120	18	75	11	9	254	5
Future Volume (vph)	110	514	54	162	112	120	18	75	11	9	254	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00			0.98			0.99			0.98		
Frt	0.988			0.959			0.981			0.997		
Fit Protected	0.992			0.980			0.950			0.950		
Satd. Flow (prot)	0	3460	0	0	1723	0	1770	1820	0	1770	1856	0
Fit Permitted	0.795			0.538			0.323			0.696		
Satd. Flow (perm)	0	2767	0	0	944	0	598	1820	0	1274	1856	0
Right Turn on Red			Yes		Yes			Yes			Yes	
Satd. Flow (RTOR)	14			35			8			1		
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	688			351			561			691		
Travel Time (s)	15.6			8.0			12.8			15.7		
Confl. Peds. (#/hr)	12		5	5		12	4		11	11		4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	559	59	176	122	130	20	82	12	10	276	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	738	0	0	428	0	20	94	0	10	281	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			0			12			12		
Link Offset(ft)	0			0			0			0		
Crosswalk Width(ft)	16			16			16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9		15		9		15		9	
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)	94			94			94			94		
Detector 2 Size(ft)	6			6			6			6		
Detector 2 Type	CI+Ex			CI+Ex			CI+Ex			CI+Ex		
Detector 2 Channel												
Detector 2 Extend (s)	0.0			0.0			0.0			0.0		
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	2			6			8			8		
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	

Alternative 3
7: Tupper & Pearl

AM 2025
01/17/2023

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	27.5	27.5		50.0	50.0		40.0	40.0		40.0	40.0	
Total Split (s)	60.0	60.0		60.0	60.0		40.0	40.0		40.0	40.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	54.5	54.5		54.5	54.5		34.5	34.5		34.5	34.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0			0.0			0.0			0.0		
Total Lost Time (s)	5.5			5.5			5.5			5.5		
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		11.0	11.0		10.0	10.0		11.0	11.0	
Pedestrian Calls (#/hr)	5	5		12	12		11	11		4	4	
Act Effect Green (s)	68.5			68.5			20.5			20.5		
Actuated g/C Ratio	0.68			0.68			0.20			0.20		
v/c Ratio	0.39			0.65			0.16			0.25		
Control Delay	8.0			10.5			33.3			30.2		
Queue Delay	0.0			0.0			0.0			0.0		
Total Delay	8.0			10.5			33.3			30.2		
LOS	A			B			C			C		
Approach Delay	8.0			10.5			30.8			41.0		
Approach LOS	A			B			C			D		
Queue Length 50th (ft)	92			80			11			46		
Queue Length 95th (ft)	156			182			30			83		
Internal Link Dist (ft)	608			271			481			611		
Turn Bay Length (ft)												
Base Capacity (vph)	1898			657			206			633		
Starvation Cap Reductn	0			1			0			0		
Spillback Cap Reductn	0			0			0			0		
Storage Cap Reductn	0			0			0			0		
Reduced v/c Ratio	0.39			0.65			0.10			0.15		
Intersection Summary												
Area Type:	Other											
Cycle Length:	100											
Actuated Cycle Length:	100											
Offset:	2 (2%), Referenced to phase 6:WBTL, Start of Yellow											
Natural Cycle:	90											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.74											
Intersection Signal Delay:	16.5						Intersection LOS: B					
Intersection Capacity Utilization:	70.4%						ICU Level of Service C					
Analysis Period (min):	15											
m	Volume for 95th percentile queue is metered by upstream signal.											

Alternative 3
7: Tupper & Pearl

AM 2025
01/17/2023

Splits and Phases: 7: Tupper & Pearl



Alternative 3
8: Main St & Tupper

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕			↕↕		↕	↕	
Traffic Volume (vph)	7	565	53	5	310	11	32	22	6	146	71	49
Future Volume (vph)	7	565	53	5	310	11	32	22	6	146	71	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	80		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			1.00			0.97		0.95		0.97
Frt		0.987			0.995			0.987			0.938	
Flt Protected		0.999			0.999			0.974		0.950		
Satd. Flow (prot)	0	3406	0	0	1794	0	0	1762	0	1736	1654	0
Flt Permitted		0.951			0.992			0.765		0.664		
Satd. Flow (perm)	0	3242	0	0	1781	0	0	1349	0	1157	1654	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			2			6				47
Link Speed (mph)		30			30			30				30
Link Distance (ft)		351			263			1174				726
Travel Time (s)		8.0			6.0			26.7				16.5
Confl. Peds. (#/hr)	10		17	17		10	19		36	36		19
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	9%	4%	0%	25%	5%	0%	0%	8%	0%	4%	2%	8%
Adj. Flow (vph)	8	608	57	5	333	12	34	24	6	157	76	53
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	673	0	0	350	0	0	64	0	157	129	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Alternative 3
8: Main St & Tupper

AM 2025
01/17/2023

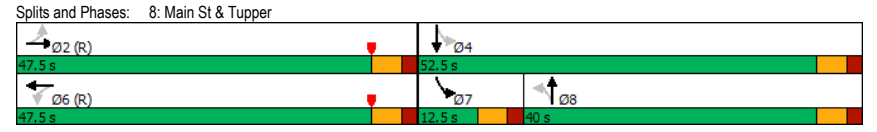
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA		
Protected Phases		2		6	6		8			7	4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	50.0	50.0		50.0	50.0		40.0	40.0		12.5	40.0	
Total Split (s)	47.5	47.5		47.5	47.5		40.0	40.0		12.5	52.5	
Total Split (%)	47.5%	47.5%		47.5%	47.5%		40.0%	40.0%		12.5%	52.5%	
Maximum Green (s)	42.0	42.0		42.0	42.0		34.5	34.5		7.0	47.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0		0.0	0.0	
Total Lost Time (s)		5.5			5.5			5.5		5.5	5.5	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	5.0	5.0		12.0	12.0		11.0	11.0			10.0	
Pedestrian Calls (#/hr)	17	17		10	10		36	36			19	
Act Effect Green (s)		65.3			65.3			13.7		23.7	23.7	
Actuated g/C Ratio		0.65			0.65			0.14		0.24	0.24	
v/c Ratio		0.32			0.30			0.34		0.50	0.30	
Control Delay		4.9			4.7			38.7		50.2	35.5	
Queue Delay		0.1			0.4			0.0		0.0	0.0	
Total Delay		5.0			5.1			38.7		50.2	35.5	
LOS		A			A			D		D	D	
Approach Delay		5.0			5.1			38.7			43.5	
Approach LOS		A			A			D			D	
Queue Length 50th (ft)		41			52			32		19	2	
Queue Length 95th (ft)		51			62			72		m163	m110	
Internal Link Dist (ft)		271			183			1094			646	
Turn Bay Length (ft)										80		
Base Capacity (vph)		2119			1162			469		315	802	
Starvation Cap Reductn		523			388			0		0	0	
Spillback Cap Reductn		27			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.42			0.45			0.14		0.50	0.16	

Intersection Summary	
Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle:	105
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.50
Intersection Signal Delay:	14.6
	Intersection LOS: B

Alternative 3
8: Main St & Tupper

AM 2025
01/17/2023

Intersection Capacity Utilization 44.0%
ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.



Alternative 3
9: Washington & Tupper

AM 2025
01/17/2023

Intersection Capacity Utilization 56.1% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: Washington & Tupper



Alternative 3
10: Ellicott & Tupper

AM 2025
01/17/2023

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕	↕↕	↕↕	↕↕	↕↕
Traffic Volume (vph)	20	605	66	0	275	0	116	106	99	35	32	13
Future Volume (vph)	20	605	66	0	275	0	116	106	99	35	32	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	0	0	0	0	80	0	150
Storage Lanes	0	0	0	0	0	0	0	0	1	1	0	0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00						0.98	0.94	0.97	0.98	
Frt		0.986							0.850		0.957	
Fit Protected		0.999						0.975		0.950		
Satd. Flow (prot)	0	2903	0	0	1863	0	0	1800	1599	1736	1743	0
Fit Permitted		0.940						0.810		0.353		
Satd. Flow (perm)	0	2731	0	0	1863	0	0	1470	1505	623	1743	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14							108		14	
Link Speed (mph)		30			30				30		30	
Link Distance (ft)		328			387				1108		362	
Travel Time (s)		7.5			8.8				25.2		8.2	
Confl. Peds. (#/hr)	7		5	5		7	12		32	32		12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	25%	1%	2%	2%	2%	1%	5%	1%	4%	3%	2%
Adj. Flow (vph)	22	658	72	0	299	0	126	115	108	38	35	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	752	0	0	299	0	0	241	108	38	49	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12		12		
Link Offset(ft)		0			0			0		0		0
Crosswalk Width(ft)		16			16			16		16		16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1		2
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20		100
Trailing Detector (ft)	0	0		0	0		0	0	0	0		0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0		0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20		6
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Alternative 3
10: Ellicott & Tupper

AM 2025
01/17/2023

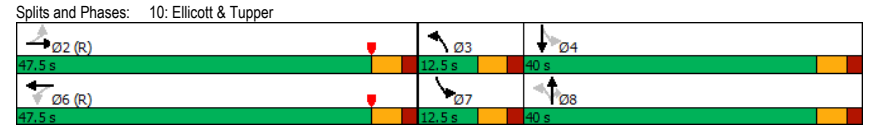
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA			NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		2			6		3	8		7	4	
Permitted Phases	2			6			8		8	4		
Detector Phase	2	2		6	6		3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0		
Minimum Split (s)	50.0	50.0		25.5	25.5		12.5	40.0	40.0	12.5	40.0	
Total Split (s)	47.5	47.5		47.5	47.5		12.5	40.0	40.0	12.5	40.0	
Total Split (%)	47.5%	47.5%		47.5%	47.5%		12.5%	40.0%	40.0%	12.5%	40.0%	
Maximum Green (s)	42.0	42.0		42.0	42.0		7.0	34.5	34.5	7.0	34.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.5			5.5			5.5	5.5	5.5	5.5	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None	None	None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0		
Flash Dont Walk (s)	12.0	12.0		13.0	13.0		13.0	13.0		10.0		
Pedestrian Calls (#/hr)	5	5		7	7		32	32		12		
Act Effect Green (s)		58.6			58.6		22.9	22.9	29.1	29.1		
Actuated g/C Ratio		0.59			0.59		0.23	0.23	0.29	0.29		
v/c Ratio		0.47			0.27		0.72	0.25	0.15	0.09		
Control Delay		8.7			11.6		46.7	6.7	16.2	11.2		
Queue Delay		0.1			0.5		0.0	0.0	0.0	0.0		
Total Delay		8.8			12.1		46.7	6.7	16.2	11.2		
LOS		A			B		D	A	B	B		
Approach Delay		8.8			12.1		34.3			13.4		
Approach LOS		A			B		C			B		
Queue Length 50th (ft)		76			67		141	0	9	5		
Queue Length 95th (ft)		97			253		198	37	m16	m13		
Internal Link Dist (ft)		248			307		1028			282		
Turn Bay Length (ft)										80		
Base Capacity (vph)		1606			1092		507	589	259	667		
Starvation Cap Reductn		198			436		0	0	0	0		
Spillback Cap Reductn		0			0		0	0	0	0		
Storage Cap Reductn		0			0		0	0	0	0		
Reduced v/c Ratio		0.53			0.46		0.48	0.18	0.15	0.07		

Intersection Summary	
Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	96 (96%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle:	105
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.72
Intersection Signal Delay:	15.7
Intersection LOS:	B

Alternative 3
10: Ellicott & Tupper

AM 2025
01/17/2023

Intersection Capacity Utilization 61.4%
ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.



Alternative 3
11: Tupper & Oak

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↓								↓	↑↓	
Traffic Volume (vph)	0	552	192	0	0	0	0	0	0	42	116	275
Future Volume (vph)	0	552	192	0	0	0	0	0	0	42	116	275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0		0		0		0
Storage Lanes	0		0	0		0		0		0	1	0
Taper Length (ft)	25			25				25				25
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	0.95
Ped Bike Factor										1.00	0.98	
Frt		0.961									0.896	
Flt Protected										0.950	0.999	
Satd. Flow (prot)	0	3359	0	0	0	0	0	0	0	1610	2973	0
Flt Permitted										0.950	0.999	
Satd. Flow (perm)	0	3359	0	0	0	0	0	0	0	1606	2973	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)		71								43	314	
Link Speed (mph)		30			30				30		30	
Link Distance (ft)		387			354				125		680	
Travel Time (s)		8.8			8.0				2.8		15.5	
Confl. Peds. (#/hr)										2		5
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	2%	7%	0%	0%	0%	0%	0%	0%	2%	6%	0%
Adj. Flow (vph)	0	627	218	0	0	0	0	0	0	48	132	313
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	0	845	0	0	0	0	0	0	0	43	450	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0				0				12		
Link Offset(ft)		0				0				0		
Crosswalk Width(ft)		16				16				16		16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2								1	2	
Detector Template		Thru								Left	Thru	
Leading Detector (ft)		100								20	100	
Trailing Detector (ft)		0								0	0	
Detector 1 Position(ft)		0								0	0	
Detector 1 Size(ft)		6								20	6	
Detector 1 Type		Cl+Ex								Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0								0.0	0.0	
Detector 1 Queue (s)		0.0								0.0	0.0	
Detector 1 Delay (s)		0.0								0.0	0.0	
Detector 2 Position(ft)		94									94	
Detector 2 Size(ft)		6									6	
Detector 2 Type		Cl+Ex									Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0									0.0	

Lanes, Volumes, Timings
C&S Engineers

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Alternative 3
11: Tupper & Oak

AM 2025
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type		NA										
Protected Phases		2										Perm NA
Permitted Phases											4	
Detector Phase		2									4	4
Switch Phase												
Minimum Initial (s)		7.0									7.0	7.0
Minimum Split (s)		50.0									40.0	40.0
Total Split (s)		57.0									43.0	43.0
Total Split (%)		57.0%									43.0%	43.0%
Maximum Green (s)		51.5									37.5	37.5
Yellow Time (s)		3.5									3.5	3.5
All-Red Time (s)		2.0									2.0	2.0
Lost Time Adjust (s)		0.0									0.0	0.0
Total Lost Time (s)		5.5									5.5	5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0									3.0	3.0
Recall Mode		C-Max									None	None
Walk Time (s)		7.0									7.0	7.0
Flash Dont Walk (s)		16.0									13.0	13.0
Pedestrian Calls (#/hr)		6									7	7
Act Effct Green (s)		76.9									12.1	12.1
Actuated g/C Ratio		0.77									0.12	0.12
v/c Ratio		0.33									0.19	0.71
Control Delay		2.4									10.7	16.4
Queue Delay		0.2									0.0	0.0
Total Delay		2.6									10.7	16.4
LOS		A									B	B
Approach Delay		2.6										15.9
Approach LOS		A										B
Queue Length 50th (ft)		13									1	51
Queue Length 95th (ft)		20									36	103
Internal Link Dist (ft)		307				274					45	600
Turn Bay Length (ft)												
Base Capacity (vph)		2600									629	1311
Starvation Cap Reductn		948									0	0
Spillback Cap Reductn		0									0	0
Storage Cap Reductn		0									0	0
Reduced v/c Ratio		0.51									0.07	0.34
Intersection Summary												
Area Type:		Other										
Cycle Length:		100										
Actuated Cycle Length:		100										
Offset:		30 (30%), Referenced to phase 2:EBT and 6:, Start of Yellow										
Natural Cycle:		90										
Control Type:		Actuated-Coordinated										
Maximum v/c Ratio:		0.71										
Intersection Signal Delay:		7.5									Intersection LOS: A	

Lanes, Volumes, Timings
C&S Engineers

Synchro 11 Report
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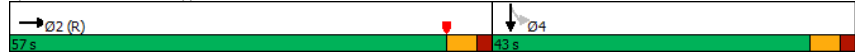
Alternative 3
11: Tupper & Oak

AM 2025
01/17/2023

Intersection Capacity Utilization 40.9%
Analysis Period (min) 15

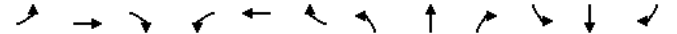
ICU Level of Service A

Splits and Phases: 11: Tupper & Oak



Alternative 3
12: Tupper & Elm St

AM 2025
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑						↑↑				
Traffic Volume (vph)	9	592	0	0	0	0	0	421	4	0	0	0
Future Volume (vph)	9	592	0	0	0	0	0	421	4	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor												
Fit Protected		0.999						0.999				
Satd. Flow (prot)	0	3457	0	0	0	0	0	3536	0	0	0	0
Fit Permitted		0.999										
Satd. Flow (perm)	0	3457	0	0	0	0	0	3536	0	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27						1				
Link Speed (mph)		30			30			30				30
Link Distance (ft)		354			313			418				586
Travel Time (s)		8.0			7.1			9.5				13.3
Confl. Peds. (#/hr)							5			5		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	25%	4%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%
Adj. Flow (vph)	10	643	0	0	0	0	0	458	4	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	653	0	0	0	0	0	462	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2						2				
Detector Template	Left	Thru						Thru				
Leading Detector (ft)	20	100						100				
Trailing Detector (ft)	0	0						0				
Detector 1 Position(ft)	0	0						0				
Detector 1 Size(ft)	20	6						6				
Detector 1 Type	CI+Ex	CI+Ex						CI+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0						0.0				
Detector 1 Queue (s)	0.0	0.0						0.0				
Detector 1 Delay (s)	0.0	0.0						0.0				
Detector 2 Position(ft)		94						94				
Detector 2 Size(ft)		6						6				
Detector 2 Type		CI+Ex						CI+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0				
Turn Type	Perm	NA						NA				
Protected Phases		2						8				
Permitted Phases		2										

Alternative 3
12: Tupper & Elm St

AM 2025
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	2	2						8				
Switch Phase												
Minimum Initial (s)	7.0	7.0						7.0				
Minimum Split (s)	30.0	30.0						60.0				
Total Split (s)	39.0	39.0						61.0				
Total Split (%)	39.0%	39.0%						61.0%				
Maximum Green (s)	33.5	33.5						55.5				
Yellow Time (s)	3.5	3.5						3.5				
All-Red Time (s)	2.0	2.0						2.0				
Lost Time Adjust (s)		0.0						0.0				
Total Lost Time (s)		5.5						5.5				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0						3.0				
Recall Mode	C-Max	C-Max						None				
Walk Time (s)	7.0	7.0						7.0				
Flash Dont Walk (s)	11.0	11.0						11.0				
Pedestrian Calls (#/hr)	0	0						5				
Act Effct Green (s)		69.8						19.2				
Actuated g/C Ratio		0.70						0.19				
v/c Ratio		0.27						0.68				
Control Delay		1.7						42.3				
Queue Delay		0.2						0.0				
Total Delay		1.9						42.3				
LOS		A						D				
Approach Delay		1.9						42.3				
Approach LOS		A						D				
Queue Length 50th (ft)		13						145				
Queue Length 95th (ft)		30						185				
Internal Link Dist (ft)		274			233			338			506	
Turn Bay Length (ft)												
Base Capacity (vph)		2419						1962				
Starvation Cap Reductn		858						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.42						0.24				

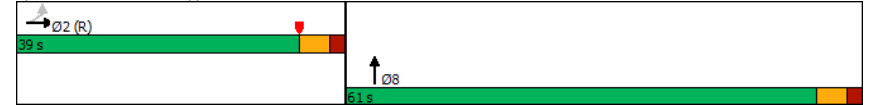
Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	22 (22%), Referenced to phase 2:EBTL and 6:, Start of Yellow
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.68
Intersection Signal Delay:	18.6
Intersection LOS:	B
Intersection Capacity Utilization:	56.3%
ICU Level of Service:	B
Analysis Period (min):	15

Alternative 3
12: Tupper & Elm St

AM 2025
01/17/2023

Splits and Phases: 12: Tupper & Elm St



Alternative 3
14: Pearl & Edward

AM 2025
01/17/2023

	→	↖	↙	←	↗	↘
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↕↑	↕↓	
Traffic Volume (vph)	0	0	432	763	185	120
Future Volume (vph)	0	0	432	763	185	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt				0.947		
Fit Protected				0.982	0.971	
Satd. Flow (prot)	0	0	0	3476	1713	0
Fit Permitted				0.982	0.971	
Satd. Flow (perm)	0	0	0	3476	1713	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)					34	
Link Speed (mph)	30			30	30	
Link Distance (ft)	289			341	691	
Travel Time (s)	6.6			7.8	15.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	470	829	201	130
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1299	331	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors			1	2	1	
Detector Template			Left	Thru	Left	
Leading Detector (ft)			20	100	20	
Trailing Detector (ft)			0	0	0	
Detector 1 Position(ft)			0	0	0	
Detector 1 Size(ft)			20	6	20	
Detector 1 Type			CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)			0.0	0.0	0.0	
Detector 1 Queue (s)			0.0	0.0	0.0	
Detector 1 Delay (s)			0.0	0.0	0.0	
Detector 2 Position(ft)				94		
Detector 2 Size(ft)				6		
Detector 2 Type				CI+Ex		
Detector 2 Channel						
Detector 2 Extend (s)				0.0		
Turn Type			Split	NA	Prot	
Protected Phases			6	6	8	
Permitted Phases						
Detector Phase			6	6	8	
Switch Phase						
Minimum Initial (s)			7.0	7.0	7.0	

Lanes, Volumes, Timings
C&S Engineers

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Alternative 3
14: Pearl & Edward

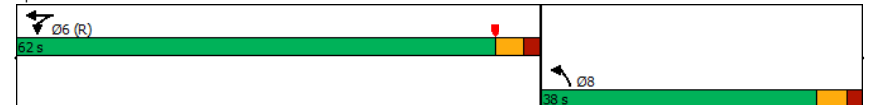
AM 2025
01/17/2023

	→	↖	↙	←	↗	↘
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)			24.5	24.5	24.5	
Total Split (s)			62.0	62.0	38.0	
Total Split (%)			62.0%	62.0%	38.0%	
Maximum Green (s)			56.5	56.5	32.5	
Yellow Time (s)			3.5	3.5	3.5	
All-Red Time (s)			2.0	2.0	2.0	
Lost Time Adjust (s)				0.0	0.0	
Total Lost Time (s)				5.5	5.5	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)			3.0	3.0	3.0	
Recall Mode			C-Max	C-Max	None	
Walk Time (s)			7.0	7.0	7.0	
Flash Dont Walk (s)			12.0	12.0	12.0	
Pedestrian Calls (#/hr)			10	10	10	
Act Effct Green (s)				66.0	23.0	
Actuated g/C Ratio				0.66	0.23	
v/c Ratio				0.57	0.79	
Control Delay				9.7	42.0	
Queue Delay				0.1	0.0	
Total Delay				9.8	42.0	
LOS				A	D	
Approach Delay				9.8	42.0	
Approach LOS				A	D	
Queue Length 50th (ft)				56	160	
Queue Length 95th (ft)				217	237	
Internal Link Dist (ft)	209			261	611	
Turn Bay Length (ft)						
Base Capacity (vph)				2295	579	
Starvation Cap Reductn				172	0	
Spillback Cap Reductn				0	0	
Storage Cap Reductn				0	0	
Reduced v/c Ratio				0.61	0.57	

Intersection Summary

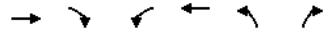
Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 16.3
 Intersection Capacity Utilization 60.4%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 14: Pearl & Edward



Alternative 2
41: Pearl & Edward

PM 2045
01/17/2023

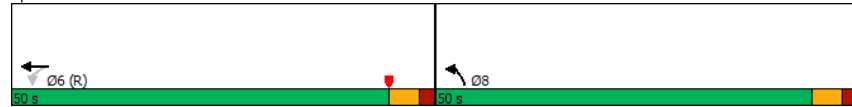


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS				A	C	
Queue Length 50th (ft)				12	202	
Queue Length 95th (ft)				21	300	
Internal Link Dist (ft)	433			243	620	
Turn Bay Length (ft)						
Base Capacity (vph)				1560	785	
Starvation Cap Reductn				475	0	
Spillback Cap Reductn				0	0	
Storage Cap Reductn				0	0	
Reduced v/c Ratio				0.42	0.57	

Intersection Summary

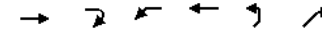
Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 15 (15%), Referenced to phase 2: and 6:WBTL, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.57
 Intersection Signal Delay: 13.3 Intersection LOS: B
 Intersection Capacity Utilization 43.9% ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 41: Pearl & Edward



Alternative 2
43:

PM 2045
01/17/2023



Lane Group	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Volume (vph)	0	0	2622	718	0	0
Future Volume (vph)	0	0	2622	718	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	1610	3285	0	0
Fit Permitted			0.950	0.969		
Satd. Flow (perm)	0	0	1610	3285	0	0
Link Speed (mph)	30			55	55	
Link Distance (ft)			208	2645	179	
Travel Time (s)	4.7			32.8	2.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)			50%			
Lane Group Flow (vph)	0	0	1425	2205	0	0
Enter Blocked Intersection	No	No	Yes	Yes	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type: Other
 Control Type: Unsignalized
 Intersection Capacity Utilization 110.7% ICU Level of Service H
 Analysis Period (min) 15

Alternative 3
1: Michigan & Goodell

AM 2045
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	168	1458	333	162	719	0	0	296	128
Future Volume (vph)	0	0	0	168	1458	333	162	719	0	0	296	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	200	0	0	0	0	0	0	0
Storage Lanes	0	0	0	0	0	1	0	0	0	0	0	0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor				1.00			1.00				0.99	
Frt				0.974							0.955	
Flt Protected				0.996			0.950					
Satd. Flow (prot)	0	0	0	0	4909	0	1703	1845	0	0	3309	0
Flt Permitted				0.996			0.342					
Satd. Flow (perm)	0	0	0	0	4909	0	611	1845	0	0	3309	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					55						69	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		402			324			648			972	
Travel Time (s)		9.1			7.4			14.7			22.1	
Conf. Peds. (#/hr)					4		6					6
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	0%	2%	3%	6%	3%	0%	11%	5%	0%
Adj. Flow (vph)	0	0	0	175	1519	347	169	749	0	0	308	133
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	2041	0	169	749	0	0	441	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)				0	0		0	12			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2		1	2			2	
Detector Template				Left	Thru		Left	Thru			Thru	
Leading Detector (ft)				20	100		20	100			100	
Trailing Detector (ft)				0	0		0	0			0	
Detector 1 Position(ft)				0	0		0	0			0	
Detector 1 Size(ft)				20	6		20	6			6	
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	

Lanes, Volumes, Timings
C&S Engineers

Syncho 11 Report
Page 1

Alternative 3
1: Michigan & Goodell

AM 2045
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type				Split	NA		pm+pt	NA			NA	
Protected Phases				6	6		3	8			4	
Permitted Phases							8					
Detector Phase				6	6		3	8			4	
Switch Phase												
Minimum Initial (s)				7.0	7.0		7.0	7.0			7.0	
Minimum Split (s)				45.0	45.0		12.5	22.5			14.6	
Total Split (s)				49.0	49.0		15.5	51.0			35.5	
Total Split (%)				49.0%	49.0%		15.5%	51.0%			35.5%	
Maximum Green (s)				43.5	43.5		10.0	45.5			30.0	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		2.0	2.0			2.0	
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	
Total Lost Time (s)					5.5		5.5	5.5			5.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				4.0	4.0		3.0	3.0			3.0	
Recall Mode				C-Max	C-Max		None	None			None	
Walk Time (s)				7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)				14.0	14.0		10.0	10.0			11.0	
Pedestrian Calls (#/hr)				4	4		3	3			6	
Act Effect Green (s)					45.2		43.8	43.8			28.6	
Actuated g/C Ratio					0.45		0.44	0.44			0.29	
v/c Ratio					0.91		0.45	0.93			0.44	
Control Delay					32.5		21.2	45.6			25.6	
Queue Delay					1.6		0.0	0.0			0.0	
Total Delay					34.1		21.2	45.6			25.6	
LOS					C		C	D			C	
Approach Delay					34.1			41.1			25.6	
Approach LOS					C			D			C	
Queue Length 50th (ft)					435		63	425			98	
Queue Length 95th (ft)							#557	#663			144	
Internal Link Dist (ft)			322			244		568			892	
Turn Bay Length (ft)												
Base Capacity (vph)					2249		376	839			1041	
Starvation Cap Reductn					0		0	0			0	
Spillback Cap Reductn					93		0	0			0	
Storage Cap Reductn					0		0	0			0	
Reduced v/c Ratio					0.95		0.45	0.89			0.42	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 67 (67%), Referenced to phase 6:WBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 34.9

Intersection LOS: C

Lanes, Volumes, Timings
C&S Engineers

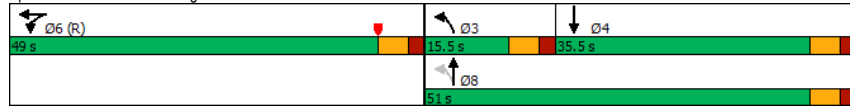
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Alternative 3
1: Michigan & Goodell

AM 2045
01/17/2023

Intersection Capacity Utilization 86.1%
ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Michigan & Goodell



Alternative 3
2: Elm St/Bennett Ln & Goodell

AM 2045
01/17/2023

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↑	↑				↑
Traffic Volume (vph)	0	0	0	0	1756	8	457	2	0	0	0	19
Future Volume (vph)	0	0	0	0	1756	8	457	2	0	0	0	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00		1.00	1.00				
Frt					0.999							0.865
Flt Protected							0.950	0.953				
Satd. Flow (prot)	0	0	0	0	5025	0	1681	1680	0	0	0	1565
Flt Permitted							0.950	0.953				
Satd. Flow (perm)	0	0	0	0	5025	0	1678	1677	0	0	0	1565
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					1		27	27				27
Link Speed (mph)		30			30			30				30
Link Distance (ft)		335			402			586				382
Travel Time (s)		7.6			9.1			13.3				8.7
Confl. Peds. (#/hr)						1	2					2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	0%	3%	25%	2%	50%	0%	0%	0%	5%
Adj. Flow (vph)	0	0	0	0	1888	9	491	2	0	0	0	20
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	0	0	0	0	1897	0	245	248	0	0	0	20
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)					0			12				12
Link Offset(ft)					0			0				0
Crosswalk Width(ft)					16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors					2		1	2				1
Detector Template					Thru		Left	Thru				Right
Leading Detector (ft)					100		20	100				20
Trailing Detector (ft)					0		0	0				0
Detector 1 Position(ft)					0		0	0				0
Detector 1 Size(ft)					6		20	6				20
Detector 1 Type					Cl+Ex		Cl+Ex	Cl+Ex				Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)					0.0		0.0	0.0				0.0
Detector 1 Queue (s)					0.0		0.0	0.0				0.0
Detector 1 Delay (s)					0.0		0.0	0.0				0.0
Detector 2 Position(ft)					94			94				
Detector 2 Size(ft)					6			6				
Detector 2 Type					Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0				
Turn Type					NA		Perm	NA				Prot
Protected Phases					6			8				4
Permitted Phases								8				

Alternative 3
2: Elm St/Bennett Ln & Goodell

AM 2045
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase					6		8	8				4
Switch Phase												
Minimum Initial (s)					7.0		7.0	7.0				7.0
Minimum Split (s)					23.5		12.5	12.5				12.5
Total Split (s)					64.0		36.0	36.0				36.0
Total Split (%)					64.0%		36.0%	36.0%				36.0%
Maximum Green (s)					58.5		30.5	30.5				30.5
Yellow Time (s)					3.5		3.5	3.5				3.5
All-Red Time (s)					2.0		2.0	2.0				2.0
Lost Time Adjust (s)					0.0		0.0	0.0				0.0
Total Lost Time (s)					5.5		5.5	5.5				5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)					3.0		3.0	3.0				3.0
Recall Mode					C-Max		None	None				None
Walk Time (s)					7.0							
Flash Dont Walk (s)					9.0							
Pedestrian Calls (#/hr)					2							
Act Effect Green (s)					69.7		19.3	19.3				14.2
Actuated g/C Ratio					0.70		0.19	0.19				0.14
v/c Ratio					0.54		0.71	0.72				0.08
Control Delay					3.7		42.5	43.6				8.8
Queue Delay					0.9		0.2	0.2				0.0
Total Delay					4.6		42.6	43.7				8.8
LOS					A		D	D				A
Approach Delay					4.6			43.2			8.8	
Approach LOS					A			D			A	
Queue Length 50th (ft)					42		70	72				0
Queue Length 95th (ft)					m226		56	61				15
Internal Link Dist (ft)		255			322			506			302	
Turn Bay Length (ft)												
Base Capacity (vph)					3501		530	530				496
Starvation Cap Reductn					1186		0	0				0
Spillback Cap Reductn					6		29	29				0
Storage Cap Reductn					0		0	0				0
Reduced v/c Ratio					0.82		0.49	0.50				0.04

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2: and 6:WBT, Start of Yellow
 Natural Cycle: 40
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 12.5 Intersection LOS: B
 Intersection Capacity Utilization 56.0% ICU Level of Service B
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Alternative 3
2: Elm St/Bennett Ln & Goodell

AM 2045
01/17/2023

Splits and Phases: 2: Elm St/Bennett Ln & Goodell



Alternative 3
3: Oak & Goodell

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔	↔						↔	
Traffic Volume (vph)	0	0	0	273	1877	100	0	0	0	0	94	2
Future Volume (vph)	0	0	0	273	1877	100	0	0	0	0	94	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				1.00							1.00	
Frt				0.992							0.997	
Fit Protected				0.950								
Satd. Flow (prot)	0	0	0	1752	3495	0	0	0	0	0	1875	0
Fit Permitted				0.950								
Satd. Flow (perm)	0	0	0	1752	3495	0	0	0	0	0	1875	0
Right Turn on Red			Yes	Yes		Yes			Yes			Yes
Satd. Flow (RTOR)				281	12						1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		385			335			680			542	
Travel Time (s)		8.8			7.6			15.5			12.3	
Confl. Peds. (#/hr)					4							6
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	3%	2%	8%	0%	0%	0%	0%	1%	0%
Adj. Flow (vph)	0	0	0	281	1935	103	0	0	0	0	97	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	281	2038	0	0	0	0	0	99	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2						2	
Detector Template				Left	Thru						Thru	
Leading Detector (ft)				20	100						100	
Trailing Detector (ft)				0	0						0	
Detector 1 Position(ft)				0	0						0	
Detector 1 Size(ft)				20	6						6	
Detector 1 Type				Cl+Ex	Cl+Ex						Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0						0.0	
Detector 1 Queue (s)				0.0	0.0						0.0	
Detector 1 Delay (s)				0.0	0.0						0.0	
Detector 2 Position(ft)					94						94	
Detector 2 Size(ft)					6						6	
Detector 2 Type					Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0						0.0	
Turn Type				Perm	NA						NA	
Protected Phases					6						4	
Permitted Phases					6							

Lanes, Volumes, Timings
C&S Engineers

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Alternative 3
3: Oak & Goodell

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				6	6							4
Switch Phase												
Minimum Initial (s)				7.0	7.0							7.0
Minimum Split (s)				58.0	58.0							27.0
Total Split (s)				73.0	73.0							27.0
Total Split (%)				73.0%	73.0%							27.0%
Maximum Green (s)				67.5	67.5							21.5
Yellow Time (s)				3.5	3.5							3.5
All-Red Time (s)				2.0	2.0							2.0
Lost Time Adjust (s)				0.0	0.0							0.0
Total Lost Time (s)				5.5	5.5							5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0							3.0
Recall Mode				C-Max	C-Max							None
Walk Time (s)				7.0	7.0							7.0
Flash Dont Walk (s)				12.0	12.0							11.0
Pedestrian Calls (#/hr)				14	14							41
Act Effct Green (s)				78.6	78.6							14.0
Actuated g/C Ratio				0.79	0.79							0.14
v/c Ratio				0.20	0.74							0.38
Control Delay				0.3	6.2							41.3
Queue Delay				0.2	0.3							0.0
Total Delay				0.5	6.5							41.3
LOS				A	A							D
Approach Delay					5.8							41.3
Approach LOS					A							D
Queue Length 50th (ft)				0	62							55
Queue Length 95th (ft)				0	212							103
Internal Link Dist (ft)			305		255				600			462
Turn Bay Length (ft)												
Base Capacity (vph)				1437	2750							403
Starvation Cap Reductn				615	196							0
Spillback Cap Reductn				0	16							0
Storage Cap Reductn				0	0							0
Reduced v/c Ratio				0.34	0.80							0.25
Intersection Summary												
Area Type:					Other							
Cycle Length:					100							
Actuated Cycle Length:					100							
Offset:					84 (84%), Referenced to phase 2: and 6:WBTL, Start of Yellow							
Natural Cycle:					85							
Control Type:					Actuated-Coordinated							
Maximum v/c Ratio:					0.74							
Intersection Signal Delay:					7.2							Intersection LOS: A
Intersection Capacity Utilization:					71.8%							ICU Level of Service C
Analysis Period (min)					15							

Lanes, Volumes, Timings
C&S Engineers

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Alternative 3
3: Oak & Goodell

AM 2045
01/17/2023

Splits and Phases: 3: Oak & Goodell



Alternative 3
4: Ellicott & Goodell

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕↕			↕				↕
Traffic Volume (vph)	0	0	0	88	1356	435	19	90	0	0	87	61
Future Volume (vph)	0	0	0	88	1356	435	19	90	0	0	87	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00			1.00				
Frt					0.965							0.945
Flt Protected					0.998			0.991				
Satd. Flow (prot)	0	0	0	0	3381	0	0	1883	0	0	1620	0
Flt Permitted					0.998			0.856				
Satd. Flow (perm)	0	0	0	0	3377	0	0	1625	0	0	1620	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					61							30
Link Speed (mph)		30			30			30				30
Link Distance (ft)		330			385			361				475
Travel Time (s)		7.5			8.8			8.2				10.8
Confl. Peds. (#/hr)				9			3					3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	4%	3%	2%	0%	0%	0%	0%	3%	20%
Adj. Flow (vph)	0	0	0	93	1427	458	20	95	0	0	92	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1978	0	0	115	0	0	156	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)					0			0				0
Link Offset(ft)					0			0				0
Crosswalk Width(ft)			16		16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2		1	2				2
Detector Template				Left	Thru		Left	Thru				Thru
Leading Detector (ft)				20	100		20	100				100
Trailing Detector (ft)				0	0		0	0				0
Detector 1 Position(ft)				0	0		0	0				0
Detector 1 Size(ft)				20	6		20	6				6
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex				Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0				0.0
Detector 1 Queue (s)				0.0	0.0		0.0	0.0				0.0
Detector 1 Delay (s)				0.0	0.0		0.0	0.0				0.0
Detector 2 Position(ft)					94			94				94
Detector 2 Size(ft)					6			6				6
Detector 2 Type					Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0				0.0
Turn Type				Perm	NA		Perm	NA				NA
Protected Phases					6			8				4
Permitted Phases					6			8				4

Alternative 3
4: Ellicott & Goodell

AM 2045
01/17/2023



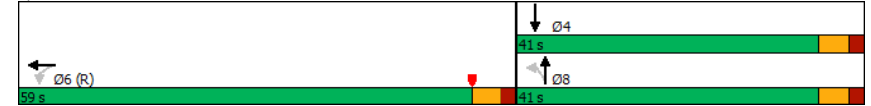
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				6	6		8	8				4
Switch Phase												
Minimum Initial (s)				7.0	7.0		7.0	7.0				7.0
Minimum Split (s)				50.0	50.0		40.0	40.0				40.0
Total Split (s)				59.0	59.0		41.0	41.0				41.0
Total Split (%)				59.0%	59.0%		41.0%	41.0%				41.0%
Maximum Green (s)				53.5	53.5		35.5	35.5				35.5
Yellow Time (s)				3.5	3.5		3.5	3.5				3.5
All-Red Time (s)				2.0	2.0		2.0	2.0				2.0
Lost Time Adjust (s)					0.0			0.0				0.0
Total Lost Time (s)					5.5			5.5				5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0				3.0
Recall Mode				C-Max	C-Max		None	None				None
Walk Time (s)				7.0	7.0		7.0	7.0				7.0
Flash Dont Walk (s)				10.0	10.0		7.0	7.0				7.0
Pedestrian Calls (#/hr)				9	9		3	3				3
Act Effect Green (s)					75.7			13.3				13.3
Actuated g/C Ratio					0.76			0.13				0.13
v/c Ratio					0.77			0.53				0.65
Control Delay					5.5			52.6				44.7
Queue Delay					0.1			0.0				0.0
Total Delay					5.5			52.6				44.7
LOS					A			D				D
Approach Delay					5.5			52.6				44.7
Approach LOS					A			D				D
Queue Length 50th (ft)					112			79				77
Queue Length 95th (ft)					146			133				134
Internal Link Dist (ft)		250			305			281				395
Turn Bay Length (ft)												
Base Capacity (vph)					2570			576				594
Starvation Cap Reductn					6			0				0
Spillback Cap Reductn					41			0				0
Storage Cap Reductn					0			0				0
Reduced v/c Ratio					0.78			0.20				0.26

Intersection Summary
 Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 80 (80%), Referenced to phase 2: and 6:WBTL, Start of Yellow
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 10.7 Intersection LOS: B
 Intersection Capacity Utilization 82.3% ICU Level of Service E
 Analysis Period (min) 15

Alternative 3
4: Ellicott & Goodell

AM 2045
01/17/2023

Splits and Phases: 4: Ellicott & Goodell



Alternative 3
5: Washington & Goodell

AM 2045
01/17/2023

	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔↔			↕			↕	↕
Traffic Volume (vph)	0	0	0	71	1282	66	20	23	0	0	109	6
Future Volume (vph)	0	0	0	71	1282	66	20	23	0	0	109	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	50	0	0	0	0	0	0	0	66
Storage Lanes	0	0	0	0	0	0	0	0	0	0	0	1
Taper Length (ft)	25			25				25			25	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00			1.00				0.98
Frt					0.993							0.850
Flt Protected					0.997			0.977				
Satd. Flow (prot)	0	0	0	0	3474	0	0	1564	0	0	1845	1380
Flt Permitted					0.997			0.810				
Satd. Flow (perm)	0	0	0	0	3474	0	0	1291	0	0	1845	1349
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					9							27
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		280			330			726			324	
Travel Time (s)		6.4			7.5			16.5			7.4	
Conf. Peds. (#/hr)					2			6				6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	1%	3%	0%	40%	0%	0%	0%	3%	17%
Adj. Flow (vph)	0	0	0	75	1349	69	21	24	0	0	115	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1493	0	0	45	0	0	115	6
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0	0	0	0	0	0	0	12	0	0	12	0
Link Offset(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Crosswalk Width(ft)	16	16	16	16	16	16	16	16	16	16	16	16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	15	15	9	15	15	9	15	15	9
Number of Detectors				1	2			1	2		2	1
Detector Template				Left	Thru			Left	Thru		Thru	Right
Leading Detector (ft)				20	100			20	100		100	20
Trailing Detector (ft)				0	0			0	0		0	0
Detector 1 Position(ft)				0	0			0	0		0	0
Detector 1 Size(ft)				20	6			20	6		6	20
Detector 1 Type				Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0			0.0	0.0		0.0	0.0
Detector 1 Queue (s)				0.0	0.0			0.0	0.0		0.0	0.0
Detector 1 Delay (s)				0.0	0.0			0.0	0.0		0.0	0.0
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	

Alternative 3
5: Washington & Goodell

AM 2045
01/17/2023

	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type					Perm	NA		Perm	NA		NA	Perm
Protected Phases						6			8			4
Permitted Phases						6		8				4
Detector Phase					6	6		8	8		4	4
Switch Phase												
Minimum Initial (s)					7.0	7.0		7.0	7.0		7.0	7.0
Minimum Split (s)					30.0	30.0		30.0	30.0		30.0	30.0
Total Split (s)					69.0	69.0		31.0	31.0		31.0	31.0
Total Split (%)					69.0%	69.0%		31.0%	31.0%		31.0%	31.0%
Maximum Green (s)					63.5	63.5		25.5	25.5		25.5	25.5
Yellow Time (s)					3.5	3.5		3.5	3.5		3.5	3.5
All-Red Time (s)					2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)						0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)						5.5		5.5	5.5		5.5	5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)					3.0	3.0		3.0	3.0		3.0	3.0
Recall Mode					C-Max	C-Max		None	None		None	None
Walk Time (s)					7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)					10.0	10.0		10.0	10.0		10.0	10.0
Pedestrian Calls (#/hr)					11	11		9	9		9	9
Act Effct Green (s)						77.2			11.8		11.8	11.8
Actuated g/C Ratio						0.77			0.12		0.12	0.12
v/c Ratio						0.56			0.30		0.53	0.03
Control Delay						2.9			54.2		49.6	0.3
Queue Delay						0.9			0.0		0.0	0.0
Total Delay						3.8			54.2		49.6	0.3
LOS						A			D		D	A
Approach Delay						3.8			54.2		47.2	
Approach LOS						A			D		D	
Queue Length 50th (ft)						85			29		70	0
Queue Length 95th (ft)									66		119	0
Internal Link Dist (ft)						200			646		244	
Turn Bay Length (ft)												66
Base Capacity (vph)						2684			329		470	364
Starvation Cap Reductn						811			0		0	0
Spillback Cap Reductn						558			0		0	0
Storage Cap Reductn						0			0		0	0
Reduced v/c Ratio						0.80			0.14		0.24	0.02
Intersection Summary												
Area Type:						Other						
Cycle Length:						100						
Actuated Cycle Length:						100						
Offset: 0 (0%), Referenced to phase 2: and 6:WBT, Start of Yellow												
Natural Cycle: 65												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.56												
Intersection Signal Delay: 8.3									Intersection LOS: A			

Alternative 3
5: Washington & Goodell

AM 2045
01/17/2023

Intersection Capacity Utilization 66.5%
Analysis Period (min) 15

ICU Level of Service C

Splits and Phases: 5: Washington & Goodell



Alternative 3
6: Main St & Edward/Goodell

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↕	↕	↕	↕			↕	↕
Traffic Volume (vph)	100	0	0	41	981	342	17	37	0	0	188	137
Future Volume (vph)	100	0	0	41	981	342	17	37	0	0	188	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	80	0	0	0	0	0	0
Storage Lanes	0	0	0	0	1	1	0	0	0	0	0	2
Taper Length (ft)	25			25		25		25		25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Ped Bike Factor	1.00				1.00	0.99						
Friction					0.850							0.850
Fit Protected		0.950			0.998	0.950						
Satd. Flow (prot)	0	1805	0	0	3492	1553	1703	1792	0	0	1810	2656
Fit Permitted		0.950			0.998	0.319						
Satd. Flow (perm)	0	1803	0	0	3491	1553	564	1792	0	0	1810	2656
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						368						147
Link Speed (mph)		30			30			30				30
Link Distance (ft)		341			280			726				848
Travel Time (s)		7.8			6.4			16.5				19.3
Confl. Peds. (#/hr)	2		5	5		2	14					14
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	7%	3%	4%	6%	0%	0%	0%	5%	7%
Adj. Flow (vph)	108	0	0	44	1055	368	18	40	0	0	202	147
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	108	0	0	1099	368	18	40	0	0	202	147
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2			2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru			Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100			100	20
Trailing Detector (ft)	0	0		0	0	0	0	0			0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0			0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6			6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Alternative 3
6: Main St & Edward/Goodell

AM 2045
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Split	NA		Split	NA	Prot	pm+pt	NA			NA	pt+ov
Protected Phases	2	2		6	6	6	3	8			4	4 2
Permitted Phases							8					
Detector Phase	2	2		6	6	6	3	8			4	4 2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0			7.0	
Minimum Split (s)	22.0	22.0		36.3	36.3	36.3	12.5	23.5			23.5	
Total Split (s)	22.0	22.0		42.0	42.0	42.0	12.5	36.0			23.5	
Total Split (%)	22.0%	22.0%		42.0%	42.0%	42.0%	12.5%	36.0%			23.5%	
Maximum Green (s)	16.5	16.5		36.5	36.5	36.5	7.0	30.5			18.0	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5			3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0			2.0	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0			0.0	
Total Lost Time (s)		5.5			5.5	5.5	5.5	5.5			5.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)	3.2	3.2		3.2	3.2	3.2	3.0	3.0			4.3	
Recall Mode	Max	Max		C-Max	C-Max	C-Max	None	None			None	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)	15.0	15.0		17.0	17.0	17.0		10.0			10.0	
Pedestrian Calls (#/hr)	5	5		2	2	2		26			14	
Act Effect Green (s)		26.0			36.5	36.5	21.0	21.0			16.0	47.5
Actuated g/C Ratio		0.26			0.36	0.36	0.21	0.21			0.16	0.48
v/c Ratio		0.23			0.86	0.46	0.09	0.11			0.70	0.11
Control Delay		10.3			31.3	6.9	31.3	32.7			52.7	3.5
Queue Delay		0.0			20.9	0.8	0.0	0.0			0.0	0.0
Total Delay		10.3			52.2	7.7	31.3	32.7			52.7	3.5
LOS		B			D	A	C	C			D	A
Approach Delay		10.3			41.0			32.2			32.0	
Approach LOS		B			D			C			C	
Queue Length 50th (ft)		7			372	36	11	25			121	0
Queue Length 95th (ft)		m85			#470	141	m24	43			196	20
Internal Link Dist (ft)		261			200			646			768	
Turn Bay Length (ft)							80					
Base Capacity (vph)		468			1274	800	198	546			325	1301
Starvation Cap Reductn		0			207	198	0	0			0	0
Spillback Cap Reductn		0			0	0	0	0			0	0
Storage Cap Reductn		0			0	0	0	0			0	0
Reduced v/c Ratio		0.23			1.03	0.61	0.09	0.07			0.62	0.11

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 6:WBTL, Start of Yellow, Master Intersection
Natural Cycle:	95
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.86
Intersection Signal Delay:	37.5
Intersection LOS:	D

Alternative 3
6: Main St & Edward/Goodell

AM 2045
01/17/2023

Intersection Capacity Utilization	74.5%	ICU Level of Service D
Analysis Period (min)	15	
# 95th percentile volume exceeds capacity, queue may be longer.		
Queue shown is maximum after two cycles.		
m Volume for 95th percentile queue is metered by upstream signal.		

Splits and Phases: 6: Main St & Edward/Goodell



Alternative 3
7: Tupper & Pearl

AM 2045
01/17/2023

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕↕				↕		↕			↕↕		
Traffic Volume (vph)	80	544	54	127	67	140	18	145	31	9	179	30
Future Volume (vph)	80	544	54	127	67	140	18	145	31	9	179	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				0.98		0.99		0.99		1.00	
Frt	0.988				0.943		0.973				0.978	
Fit Protected	0.994				0.981		0.950		0.950			
Satd. Flow (prot)	0	3467	0	0	1685	0	1770	1802	0	1770	1814	0
Fit Permitted	0.850				0.592		0.390		0.480			
Satd. Flow (perm)	0	2959	0	0	1016	0	721	1802	0	882	1814	0
Right Turn on Red			Yes				Yes				Yes	
Satd. Flow (RTOR)	14				57		12		9			
Link Speed (mph)	30				30		30		30			
Link Distance (ft)	688				351		561		691			
Travel Time (s)	15.6				8.0		12.8		15.7			
Confl. Peds. (#/hr)	12		5	5		12	4		11	11		4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	591	59	138	73	152	20	158	34	10	195	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	737	0	0	363	0	20	192	0	10	228	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0				0		12		12			
Link Offset(ft)	0				0		0		0			
Crosswalk Width(ft)	16				16		16		16			
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)	94				94		94		94			
Detector 2 Size(ft)	6				6		6		6			
Detector 2 Type	Cl+Ex				Cl+Ex		Cl+Ex		Cl+Ex			
Detector 2 Channel												
Detector 2 Extend (s)	0.0				0.0		0.0		0.0			
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	2				6		8		8		4	
Permitted Phases	2				6		8		4			
Detector Phase	2	2		6	6		8	8		4	4	

Lanes, Volumes, Timings
C&S Engineers

Synchro 11 Report
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Alternative 3
7: Tupper & Pearl

AM 2045
01/17/2023

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	27.5	27.5		50.0	50.0		40.0	40.0		40.0	40.0	
Total Split (s)	60.0	60.0		60.0	60.0		40.0	40.0		40.0	40.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	54.5	54.5		54.5	54.5		34.5	34.5		34.5	34.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0				0.0		0.0		0.0		0.0	
Total Lost Time (s)	5.5				5.5		5.5		5.5		5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		11.0	11.0		10.0	10.0		11.0	11.0	
Pedestrian Calls (#/hr)	5	5		12	12		11	11		4	4	
Act Effect Green (s)	71.4				71.4		17.6		17.6		17.6	
Actuated g/C Ratio	0.71				0.71		0.18		0.18		0.18	
v/c Ratio	0.35				0.49		0.16		0.59		0.06	
Control Delay	6.4				4.7		35.4		42.1		8.1	
Queue Delay	0.0				0.1		0.0		0.0		0.0	
Total Delay	6.4				4.8		35.4		42.1		8.1	
LOS	A				A		D		D		A	
Approach Delay	6.4				4.8		41.5		18.9			
Approach LOS	A				A		D		B			
Queue Length 50th (ft)	79				7		11		106		3	
Queue Length 95th (ft)	135				50		31		165		m4	
Internal Link Dist (ft)	608				271		481		611			
Turn Bay Length (ft)												
Base Capacity (vph)	2118				742		248		629		304	
Starvation Cap Reductn	0				21		0		0		0	
Spillback Cap Reductn	0				0		0		0		0	
Storage Cap Reductn	0				0		0		0		0	
Reduced v/c Ratio	0.35				0.50		0.08		0.31		0.03	
Intersection Summary												
Area Type:	Other											
Cycle Length:	100											
Actuated Cycle Length:	100											
Offset:	99 (99%), Referenced to phase 6:WBTL, Start of Yellow											
Natural Cycle:	90											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.70											
Intersection Signal Delay:	12.8						Intersection LOS: B					
Intersection Capacity Utilization:	67.5%						ICU Level of Service C					
Analysis Period (min):	15											
m	Volume for 95th percentile queue is metered by upstream signal.											

Lanes, Volumes, Timings
C&S Engineers

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Alternative 3
7: Tupper & Pearl

AM 2045
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Splits and Phases: 7: Tupper & Pearl



Alternative 3
8: Main St & Tupper

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕		↕↕		
Traffic Volume (vph)	12	560	8	55	245	11	2	22	6	146	71	54
Future Volume (vph)	12	560	8	55	245	11	2	22	6	146	71	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	80		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			0.99			0.98		0.95		0.97
Frt		0.998			0.995			0.975		0.935		
Flt Protected		0.999			0.991			0.997		0.950		
Satd. Flow (prot)	0	3455	0	0	1726	0	0	1719	0	1736	1643	0
Flt Permitted		0.946			0.822			0.979		0.627		
Satd. Flow (perm)	0	3271	0	0	1427	0	0	1683	0	1090	1643	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			2			6				52
Link Speed (mph)		30			30			30				30
Link Distance (ft)		351			263			1174				726
Travel Time (s)		8.0			6.0			26.7				16.5
Confl. Peds. (#/hr)	10		17	17		10	19		36	36		19
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	9%	4%	0%	25%	5%	0%	0%	8%	0%	4%	2%	8%
Adj. Flow (vph)	13	602	9	59	263	12	2	24	6	157	76	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	624	0	0	334	0	0	32	0	157	134	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12		12		
Link Offset(ft)		0			0			0		0		0
Crosswalk Width(ft)		16			16			16		16		16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Alternative 3
8: Main St & Tupper

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	17.5	17.5		24.5	24.5		40.0	40.0		12.5	40.0	
Total Split (s)	47.5	47.5		47.5	47.5		40.0	40.0		12.5	52.5	
Total Split (%)	47.5%	47.5%		47.5%	47.5%		40.0%	40.0%		12.5%	52.5%	
Maximum Green (s)	42.0	42.0		42.0	42.0		34.5	34.5		7.0	47.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0		0.0	0.0	
Total Lost Time (s)		5.5			5.5			5.5		5.5	5.5	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	5.0	5.0		12.0	12.0		11.0	11.0			10.0	
Pedestrian Calls (#/hr)	17	17		10	10		36	36			19	
Act Effect Green (s)		65.4			65.4			13.6		23.6	23.6	
Actuated g/C Ratio		0.65			0.65			0.14		0.24	0.24	
v/c Ratio		0.29			0.36			0.14		0.52	0.31	
Control Delay		5.0			7.6			31.5		49.8	33.4	
Queue Delay		0.1			0.4			0.0		0.0	0.0	
Total Delay		5.2			8.0			31.5		49.8	33.4	
LOS		A			A			C		D	C	
Approach Delay		5.2			8.0			31.5			42.3	
Approach LOS		A			A			C			D	
Queue Length 50th (ft)		86			130			14		25	4	
Queue Length 95th (ft)		42			77			40		m156	m105	
Internal Link Dist (ft)		271			183			1094			646	
Turn Bay Length (ft)										80		
Base Capacity (vph)		2139			933			584		302	799	
Starvation Cap Reductn		576			252			0		0	0	
Spillback Cap Reductn		7			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.40			0.49			0.05		0.52	0.17	

Intersection Summary

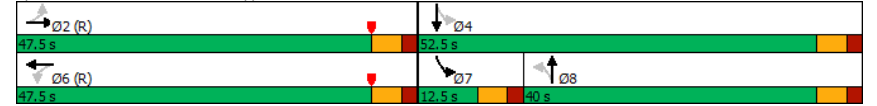
Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	99 (99%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle:	80
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.52
Intersection Signal Delay:	15.0
Intersection LOS:	B

Alternative 3
8: Main St & Tupper

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Intersection Capacity Utilization	61.3%	ICU Level of Service B
Analysis Period (min)	15	
m	Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 8: Main St & Tupper



Alternative 3
9: Washington & Tupper

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕↕			↕↕			↕↕			↕↕		
Traffic Volume (vph)	30	559	81	3	232	2	64	53	53	80	76	4
Future Volume (vph)	30	559	81	3	232	2	64	53	53	80	76	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0		0		150		78		85	
Storage Lanes	0		0		0		1		0		1	
Taper Length (ft)	25		25		25		25		25		25	
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99		0.99		0.96		0.98		0.98		1.00	
Frt	0.982		0.999		0.925		0.993		0.950		0.993	
Fit Protected	0.998		0.999		0.950		0.950		0.950		0.950	
Satd. Flow (prot)	0	3398	0	0	1751	0	1805	1601	0	1719	1863	0
Fit Permitted	0.931		0.994		0.702		0.578		0.578		0.578	
Satd. Flow (perm)	0	3167	0	0	1742	0	1278	1601	0	1021	1863	0
Right Turn on Red	Yes		Yes		Yes		Yes		Yes		Yes	
Satd. Flow (RTOR)	21		1		47		2		2		2	
Link Speed (mph)	30		30		30		30		30		30	
Link Distance (ft)	263		328		1190		726		726		726	
Travel Time (s)	6.0		7.5		27.0		16.5		16.5		16.5	
Conf. Peds. (#/hr)	14	11	11	14	16	17	17	17	17	16	16	16
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
Heavy Vehicles (%)	4%	4%	0%	33%	8%	0%	15%	0%	5%	1%	0%	0%
Adj. Flow (vph)	32	595	86	3	247	2	68	56	56	85	81	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	713	0	0	252	0	68	112	0	85	85	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0		0		12		12		12		12	
Link Offset(ft)	0		0		0		0		0		0	
Crosswalk Width(ft)	16		16		16		16		16		16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9	15	9	15	9	15	9
Number of Detectors	1	2	1	2	1	2	1	2	1	2	1	2
Detector Template	Left	Thru	Left	Thru	Left	Thru	Left	Thru	Left	Thru	Left	Thru
Leading Detector (ft)	20	100	20	100	20	100	20	100	20	100	20	100
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	6	20	6	20	6	20	6	20	6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94		94		94		94		94		94	
Detector 2 Size(ft)	6		6		6		6		6		6	
Detector 2 Type	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0		0.0		0.0		0.0		0.0		0.0	

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Alternative 3
9: Washington & Tupper

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	2		6		7		4		3		8	
Permitted Phases	2		6		4		8		3		8	
Detector Phase	2		6		7		4		3		8	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	47.0	47.0		47.0	47.0		12.5	28.0		15.0	23.5	
Total Split (s)	55.0	55.0		55.0	55.0		13.0	29.0		16.0	32.0	
Total Split (%)	55.0%	55.0%		55.0%	55.0%		13.0%	29.0%		16.0%	32.0%	
Maximum Green (s)	49.5	49.5		49.5	49.5		7.5	23.5		10.5	26.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0		0.0		0.0		0.0		0.0		0.0	
Total Lost Time (s)	5.5		5.5		5.5		5.5		5.5		5.5	
Lead/Lag	Lead						Lag					
Lead-Lag Optimize?	Yes						Yes					
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	11	11		14	14		16	16		17	17	
Act Effect Green (s)	65.3		65.3		17.6		11.6		21.1		13.4	
Actuated g/C Ratio	0.65		0.65		0.18		0.12		0.21		0.13	
v/c Ratio	0.34		0.22		0.26		0.49		0.31		0.34	
Control Delay	6.5		5.4		29.1		31.3		19.7		24.7	
Queue Delay	0.2		0.5		0.0		0.0		0.0		0.0	
Total Delay	6.6		5.8		29.1		31.3		19.7		24.7	
LOS	A		A		C		C		B		C	
Approach Delay	6.6		5.8		30.5		22.2		22.2		22.2	
Approach LOS	A		A		C		C		B		C	
Queue Length 50th (ft)	40		45		34		40		23		22	
Queue Length 95th (ft)	78		100		61		87		m41		m42	
Internal Link Dist (ft)	183		248		1110		646		646		646	
Turn Bay Length (ft)			150		85							
Base Capacity (vph)	2074		1137		265		412		302		495	
Starvation Cap Reductn	573		515		0		0		0		0	
Spillback Cap Reductn	76		0		0		1		0		0	
Storage Cap Reductn	0		0		0		0		0		0	
Reduced v/c Ratio	0.48		0.41		0.26		0.27		0.28		0.17	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 99 (99%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.49
 Intersection Signal Delay: 11.8
 Intersection LOS: B

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C&S Engineers

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Alternative 3
9: Washington & Tupper

AM 2045
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Intersection Capacity Utilization 55.4% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: Washington & Tupper



Alternative 3
10: Ellicott & Tupper

AM 2045
01/17/2023

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕	↕	↕	↕	↕
Traffic Volume (vph)	20	570	41	0	140	0	86	106	99	60	32	13
Future Volume (vph)	20	570	41	0	140	0	86	106	99	60	32	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	0	0	0	0	80	0	150
Storage Lanes	0	0	0	0	0	0	0	0	1	1	0	0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00						0.99	0.93	0.96	0.98	
Frt		0.990							0.850		0.957	
Fit Protected		0.998						0.978		0.950		
Satd. Flow (prot)	0	2899	0	0	1863	0	0	1800	1599	1736	1743	0
Fit Permitted		0.944						0.833		0.370		
Satd. Flow (perm)	0	2741	0	0	1863	0	0	1511	1491	647	1743	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8							108		14	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		328			387			1108			362	
Travel Time (s)		7.5			8.8			25.2			8.2	
Confl. Peds. (#/hr)	7		5	5		7	12		32	32		12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	25%	1%	2%	2%	2%	1%	5%	1%	4%	3%	2%
Adj. Flow (vph)	22	620	45	0	152	0	93	115	108	65	35	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	687	0	0	152	0	0	208	108	65	49	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1		2
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20		100
Trailing Detector (ft)	0	0		0	0		0	0	0	0		0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0		0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20		6
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0		0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Alternative 3
10: Ellicott & Tupper

AM 2045
01/17/2023

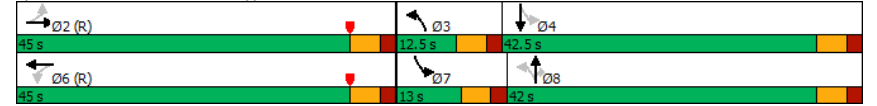
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA			NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		2			6		3	8		7	4	
Permitted Phases	2			6			8		8	4		
Detector Phase	2	2		6	6		3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0		
Minimum Split (s)	24.5	24.5		25.5	25.5		12.5	40.0	40.0	12.5	40.0	
Total Split (s)	45.0	45.0		45.0	45.0		12.5	42.0	42.0	13.0	42.5	
Total Split (%)	45.0%	45.0%		45.0%	45.0%		12.5%	42.0%	42.0%	13.0%	42.5%	
Maximum Green (s)	39.5	39.5		39.5	39.5		7.0	36.5	36.5	7.5	37.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.5			5.5			5.5	5.5	5.5	5.5	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None	None	None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0		
Flash Dont Walk (s)	12.0	12.0		13.0	13.0		10.0	10.0		10.0		
Pedestrian Calls (#/hr)	5	5		7	7		32	32		12		
Act Effect Green (s)		58.6			58.6		20.0	20.0		29.5	29.5	
Actuated g/C Ratio		0.59			0.59		0.20	0.20		0.30	0.30	
v/c Ratio		0.43			0.14		0.69	0.28		0.24	0.09	
Control Delay		8.4			23.8		48.2	7.7		17.9	11.0	
Queue Delay		0.2			0.0		0.0	0.0		0.0	0.0	
Total Delay		8.6			23.8		48.2	7.7		17.9	11.0	
LOS		A			C		D	A		B	B	
Approach Delay		8.6			23.8		34.3				14.9	
Approach LOS		A			C		C				B	
Queue Length 50th (ft)		105			77		123	0		22	9	
Queue Length 95th (ft)		245			147		180	39		m29	m14	
Internal Link Dist (ft)		248			307		1028				282	
Turn Bay Length (ft)										80		
Base Capacity (vph)		1609			1091		551	612		273	670	
Starvation Cap Reductn		272			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.51			0.14		0.38	0.18		0.24	0.07	
Intersection Summary												
Area Type:	Other											
Cycle Length:	100											
Actuated Cycle Length:	100											
Offset:	99 (99%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow											
Natural Cycle:	80											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.69											
Intersection Signal Delay:	17.4											
	Intersection LOS: B											

Alternative 3
10: Ellicott & Tupper

AM 2045
01/17/2023

Intersection Capacity Utilization 57.9%
ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: Ellicott & Tupper



Alternative 3
11: Tupper & Oak

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↓								↓	↑↓	
Traffic Volume (vph)	0	552	207	0	0	0	0	0	0	42	141	140
Future Volume (vph)	0	552	207	0	0	0	0	0	0	42	141	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	0.95
Ped Bike Factor										1.00	0.98	
Frt		0.959									0.926	
Flt Protected										0.950	0.999	
Satd. Flow (prot)	0	3349	0	0	0	0	0	0	0	1610	3057	0
Flt Permitted										0.950	0.999	
Satd. Flow (perm)	0	3349	0	0	0	0	0	0	0	1606	3057	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)		81								43	161	
Link Speed (mph)		30			30				30		30	
Link Distance (ft)		387			354				125		680	
Travel Time (s)		8.8			8.0				2.8		15.5	
Confl. Peds. (#/hr)										2		5
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	2%	7%	0%	0%	0%	0%	0%	0%	2%	6%	0%
Adj. Flow (vph)	0	627	235	0	0	0	0	0	0	48	160	159
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	0	862	0	0	0	0	0	0	0	43	324	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0				0			12		12	
Link Offset(ft)		0				0			0		0	
Crosswalk Width(ft)		16				16			16		16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2								1	2	
Detector Template		Thru								Left	Thru	
Leading Detector (ft)		100								20	100	
Trailing Detector (ft)		0								0	0	
Detector 1 Position(ft)		0								0	0	
Detector 1 Size(ft)		6								20	6	
Detector 1 Type		Cl+Ex								Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0								0.0	0.0	
Detector 1 Queue (s)		0.0								0.0	0.0	
Detector 1 Delay (s)		0.0								0.0	0.0	
Detector 2 Position(ft)		94									94	
Detector 2 Size(ft)		6									6	
Detector 2 Type		Cl+Ex									Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0									0.0	

Lanes, Volumes, Timings
C&S Engineers

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Alternative 3
11: Tupper & Oak

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type		NA									Perm	NA
Protected Phases		2										4
Permitted Phases											4	
Detector Phase		2									4	4
Switch Phase												
Minimum Initial (s)		7.0									7.0	7.0
Minimum Split (s)		50.0									40.0	40.0
Total Split (s)		58.0									42.0	42.0
Total Split (%)		58.0%									42.0%	42.0%
Maximum Green (s)		52.5									36.5	36.5
Yellow Time (s)		3.5									3.5	3.5
All-Red Time (s)		2.0									2.0	2.0
Lost Time Adjust (s)		0.0									0.0	0.0
Total Lost Time (s)		5.5									5.5	5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0									3.0	3.0
Recall Mode		C-Max									None	None
Walk Time (s)		7.0									7.0	7.0
Flash Dont Walk (s)		16.0									13.0	13.0
Pedestrian Calls (#/hr)		6									7	7
Act Effect Green (s)		77.0									12.0	12.0
Actuated g/C Ratio		0.77									0.12	0.12
v/c Ratio		0.33									0.19	0.64
Control Delay		2.2									8.3	17.7
Queue Delay		0.1									0.0	0.0
Total Delay		2.3									8.3	17.7
LOS		A									A	B
Approach Delay		2.3										16.6
Approach LOS		A										B
Queue Length 50th (ft)		41									3	41
Queue Length 95th (ft)		53									25	69
Internal Link Dist (ft)		307			274				45			600
Turn Bay Length (ft)												
Base Capacity (vph)		2597									613	1218
Starvation Cap Reductn		581									0	0
Spillback Cap Reductn		0									0	0
Storage Cap Reductn		0									0	0
Reduced v/c Ratio		0.43									0.07	0.27
Intersection Summary												
Area Type:		Other										
Cycle Length:		100										
Actuated Cycle Length:		100										
Offset:		99 (99%), Referenced to phase 2:EBT and 6:, Start of Yellow										
Natural Cycle:		90										
Control Type:		Actuated-Coordinated										
Maximum v/c Ratio:		0.64										
Intersection Signal Delay:		6.6									Intersection LOS:	A

Lanes, Volumes, Timings
C&S Engineers

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Alternative 3
11: Tupper & Oak

AM 2045
01/17/2023

Intersection Capacity Utilization 39.2%
Analysis Period (min) 15

ICU Level of Service A

Splits and Phases: 11: Tupper & Oak



Alternative 3
12: Tupper & Elm St

AM 2045
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑						↑↑				
Traffic Volume (vph)	9	592	0	0	0	0	0	381	4	0	0	0
Future Volume (vph)	9	592	0	0	0	0	0	381	4	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt								0.999				
Fit Protected		0.999										
Satd. Flow (prot)	0	3457	0	0	0	0	0	3536	0	0	0	0
Fit Permitted		0.999										
Satd. Flow (perm)	0	3457	0	0	0	0	0	3536	0	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27						1				
Link Speed (mph)		30			30			30				30
Link Distance (ft)		354			313			418				586
Travel Time (s)		8.0			7.1			9.5				13.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	25%	4%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%
Adj. Flow (vph)	10	643	0	0	0	0	0	414	4	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	653	0	0	0	0	0	418	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15			9	15		9	15	9
Number of Detectors	1	2						2				
Detector Template	Left	Thru						Thru				
Leading Detector (ft)	20	100						100				
Trailing Detector (ft)	0	0						0				
Detector 1 Position(ft)	0	0						0				
Detector 1 Size(ft)	20	6						6				
Detector 1 Type	Cl+Ex	Cl+Ex						Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0						0.0				
Detector 1 Queue (s)	0.0	0.0						0.0				
Detector 1 Delay (s)	0.0	0.0						0.0				
Detector 2 Position(ft)		94						94				
Detector 2 Size(ft)		6						6				
Detector 2 Type		Cl+Ex						Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0				
Turn Type	Perm	NA						NA				
Protected Phases		2						8				
Permitted Phases	2											
Detector Phase	2	2						8				
Switch Phase												

Alternative 3
12: Tupper & Elm St

AM 2045
01/17/2023

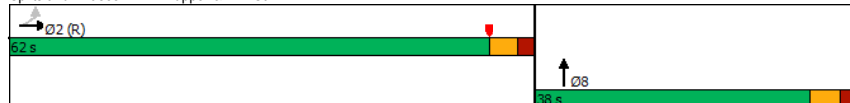


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	7.0	7.0						7.0				
Minimum Split (s)	30.0	30.0						60.0				
Total Split (s)	62.0	62.0						38.0				
Total Split (%)	62.0%	62.0%						38.0%				
Maximum Green (s)	56.5	56.5						32.5				
Yellow Time (s)	3.5	3.5						3.5				
All-Red Time (s)	2.0	2.0						2.0				
Lost Time Adjust (s)		0.0						0.0				
Total Lost Time (s)		5.5						5.5				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0						3.0				
Recall Mode	C-Max	C-Max						None				
Walk Time (s)								7.0				
Flash Dont Walk (s)								12.0				
Pedestrian Calls (#/hr)								0				
Act Effect Green (s)		71.5						17.5				
Actuated g/C Ratio		0.72						0.18				
v/c Ratio		0.26						0.68				
Control Delay		2.1						43.8				
Queue Delay		0.2						0.0				
Total Delay		2.3						43.8				
LOS		A						D				
Approach Delay		2.3						43.8				
Approach LOS		A						D				
Queue Length 50th (ft)		20						132				
Queue Length 95th (ft)		28						173				
Internal Link Dist (ft)		274				233		338			506	
Turn Bay Length (ft)												
Base Capacity (vph)		2479						1149				
Starvation Cap Reductn		894						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.41						0.36				

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	99 (99%), Referenced to phase 2:EBTL and 6:, Start of Yellow
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.68
Intersection Signal Delay:	18.5
Intersection Capacity Utilization:	56.0%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	B

Splits and Phases: 12: Tupper & Elm St



Alternative 3
14: Pearl & Edward

AM 2045
01/17/2023



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↑↑	
Traffic Volume (vph)	0	0	347	763	265	100
Future Volume (vph)	0	0	347	763	265	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt					0.963	
Fit Protected				0.985	0.965	
Satd. Flow (prot)	0	0	0	3486	1731	0
Fit Permitted				0.985	0.965	
Satd. Flow (perm)	0	0	0	3486	1731	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)					22	
Link Speed (mph)	30			30	30	
Link Distance (ft)	289			341	691	
Travel Time (s)	6.6			7.8	15.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	377	829	288	109
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1206	397	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors			1	2	1	
Detector Template			Left	Thru	Left	
Leading Detector (ft)			20	100	20	
Trailing Detector (ft)			0	0	0	
Detector 1 Position(ft)			0	0	0	
Detector 1 Size(ft)			20	6	20	
Detector 1 Type			CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)			0.0	0.0	0.0	
Detector 1 Queue (s)			0.0	0.0	0.0	
Detector 1 Delay (s)			0.0	0.0	0.0	
Detector 2 Position(ft)				94		
Detector 2 Size(ft)				6		
Detector 2 Type				CI+Ex		
Detector 2 Channel						
Detector 2 Extend (s)				0.0		
Turn Type			Perm	NA	Prot	
Protected Phases				6	8	
Permitted Phases			6			
Detector Phase			6	6	8	
Switch Phase						
Minimum Initial (s)			7.0	7.0	7.0	

Lanes, Volumes, Timings
C&S Engineers

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Alternative 3
14: Pearl & Edward

AM 2045
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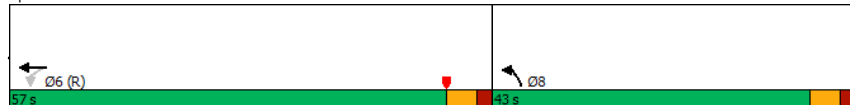


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)	24.5	24.5	24.5	24.5		
Total Split (s)			57.0	57.0	43.0	
Total Split (%)			57.0%	57.0%	43.0%	
Maximum Green (s)	51.5	51.5	37.5			
Yellow Time (s)	3.5	3.5	3.5			
All-Red Time (s)	2.0	2.0	2.0			
Lost Time Adjust (s)			0.0	0.0		
Total Lost Time (s)			5.5	5.5		
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)			3.0	3.0	3.0	
Recall Mode			C-Max	C-Max	Max	
Walk Time (s)			7.0	7.0	7.0	
Flash Dont Walk (s)			12.0	12.0	12.0	
Pedestrian Calls (#/hr)			10	10	10	
Act Effct Green (s)			51.5	37.5		
Actuated g/C Ratio			0.52	0.38		
v/c Ratio			0.67	0.60		
Control Delay			3.7	24.7		
Queue Delay			0.1	0.0		
Total Delay			3.8	24.7		
LOS			A	C		
Approach Delay			3.8	24.7		
Approach LOS			A	C		
Queue Length 50th (ft)			30	123		
Queue Length 95th (ft)			46	336		
Internal Link Dist (ft)	209		261	611		
Turn Bay Length (ft)						
Base Capacity (vph)			1795	662		
Starvation Cap Reductn			86	0		
Spillback Cap Reductn			0	0		
Storage Cap Reductn			0	0		
Reduced v/c Ratio			0.71	0.60		

Intersection Summary

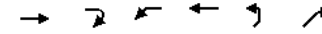
Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	9 (9%), Referenced to phase 2: and 6:WBTL, Start of Yellow
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.67
Intersection Signal Delay:	9.0
Intersection Capacity Utilization:	61.1%
Intersection LOS:	A
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 14: Pearl & Edward



Alternative 3
34:

AM 2045
01/17/2023



Lane Group	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations	↑↑					↑↑
Traffic Volume (vph)	549	0	0	0	0	733
Future Volume (vph)	549	0	0	0	0	733
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	1.00	1.00	0.88
Frt						0.850
Fit Protected						
Satd. Flow (prot)	3539	0	0	0	0	2787
Fit Permitted						
Satd. Flow (perm)	3539	0	0	0	0	2787
Link Speed (mph)	30			55	55	
Link Distance (ft)	334			197	283	
Travel Time (s)	7.6			2.4	3.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	597	0	0	0	0	797
Shared Lane Traffic (%)						
Lane Group Flow (vph)	597	0	0	0	0	797
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization:	47.5%
ICU Level of Service:	A
Analysis Period (min):	15

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Alternative 3
1: Michigan & Goodell

PM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕↕↕		↕	↕			↕↕	
Traffic Volume (vph)	0	0	0	83	510	85	75	223	0	0	575	148
Future Volume (vph)	0	0	0	83	510	85	75	223	0	0	575	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0			200	0		0	0		0
Storage Lanes	0	0	0			0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	0.91	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor				1.00							0.99	
Frt				0.981							0.969	
Flt Protected				0.994			0.950					
Satd. Flow (prot)	0	0	0	0	4963	0	1805	1845	0	0	3383	0
Flt Permitted				0.994			0.149					
Satd. Flow (perm)	0	0	0	0	4963	0	283	1845	0	0	3383	0
Right Turn on Red			Yes		Yes			Yes			Yes	
Satd. Flow (RTOR)				33							34	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		402			324			648			972	
Travel Time (s)		9.1			7.4			14.7			22.1	
Conf. Peds. (#/hr)						1	10					10
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	2%	1%	0%	3%	8%	0%	3%	2%
Adj. Flow (vph)	0	0	0	85	520	87	77	228	0	0	587	151
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	692	0	77	228	0	0	738	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2		1	2			2	
Detector Template				Left	Thru		Left	Thru			Thru	
Leading Detector (ft)				20	100		20	100			100	
Trailing Detector (ft)				0	0		0	0			0	
Detector 1 Position(ft)				0	0		0	0			0	
Detector 1 Size(ft)				20	6		20	6			6	
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	

Alternative 3
1: Michigan & Goodell

PM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type					Perm	NA		pm+pt	NA		NA	
Protected Phases					6		3	8			4	
Permitted Phases					6		8					
Detector Phase				6	6		3	8			4	
Switch Phase												
Minimum Initial (s)				7.0	7.0		7.0	7.0			7.0	
Minimum Split (s)				45.0	45.0		12.5	23.5			23.5	
Total Split (s)				48.0	48.0		13.0	52.0			39.0	
Total Split (%)				48.0%	48.0%		13.0%	52.0%			39.0%	
Maximum Green (s)				42.5	42.5		7.5	46.5			33.5	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		2.0	2.0			2.0	
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	
Total Lost Time (s)					5.5		5.5	5.5			5.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				4.0	4.0		3.0	3.0			3.0	
Recall Mode				C-Max	C-Max		None	None			None	
Walk Time (s)				7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)				14.0	14.0		10.0	10.0			11.0	
Pedestrian Calls (#/hr)				1	1		10	10			10	
Act Effect Green (s)					50.9		38.1	38.1			27.7	
Actuated g/C Ratio					0.51		0.38	0.38			0.28	
v/c Ratio				0.27	0.27		0.35	0.32			0.77	
Control Delay				15.0	15.0		21.7	21.6			36.9	
Queue Delay				0.0	0.0		0.0	0.0			0.0	
Total Delay				15.0	15.0		21.7	21.6			36.9	
LOS					B		C	C			D	
Approach Delay				15.0	15.0		21.6	21.6			36.9	
Approach LOS					B		C	C			D	
Queue Length 50th (ft)					89		30	96			216	
Queue Length 95th (ft)					130		53	137			261	
Internal Link Dist (ft)		322			244		568	568			892	
Turn Bay Length (ft)												
Base Capacity (vph)					2543		221	857			1155	
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				0.27	0.27		0.35	0.27			0.64	
Intersection Summary												
Area Type:	Other											
Cycle Length:	100											
Actuated Cycle Length:	100											
Offset:	10 (10%), Referenced to phase 2: and 6:WBTL, Start of Yellow											
Natural Cycle:	85											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.77											
Intersection Signal Delay:	25.5						Intersection LOS: C					

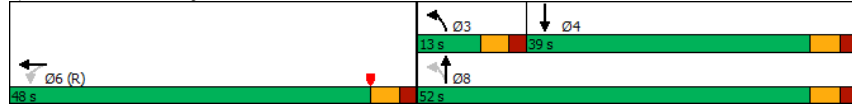
Alternative 3
1: Michigan & Goodell

PM 2025
01/17/2023

Intersection Capacity Utilization 57.9%
Analysis Period (min) 15

ICU Level of Service B

Splits and Phases: 1: Michigan & Goodell



Alternative 3
2: Elm St/Bennett Ln & Goodell

PM 2025
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↑	↑				↑
Traffic Volume (vph)	0	0	0	0	826	15	277	5	0	0	0	15
Future Volume (vph)	0	0	0	0	826	15	277	5	0	0	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91	0.95	0.95	1.00	1.00	1.00	1.00
Frt					0.997							0.865
Fit Protected							0.950	0.954				
Satd. Flow (prot)	0	0	0	0	5070	0	1681	1688	0	0	0	1611
Fit Permitted							0.950	0.954				
Satd. Flow (perm)	0	0	0	0	5070	0	1681	1688	0	0	0	1611
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Satd. Flow (RTOR)					4		131	131				131
Link Speed (mph)		30			30		30				30	
Link Distance (ft)		335			402		586				382	
Travel Time (s)		7.6			9.1		13.3				8.7	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	0	843	15	283	5	0	0	0	15
Shared Lane Traffic (%)							49%					
Lane Group Flow (vph)	0	0	0	0	858	0	144	144	0	0	0	15
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0		12				12	
Link Offset(ft)		0			0		0				0	
Crosswalk Width(ft)		16			16		16				16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60		9	15		60	15		9	60	
Number of Detectors					2		1	2				1
Detector Template					Thru		Left	Thru				Right
Leading Detector (ft)					100		20	100				20
Trailing Detector (ft)					0		0	0				0
Detector 1 Position(ft)					0		0	0				0
Detector 1 Size(ft)					6		20	6				20
Detector 1 Type					Cl+Ex		Cl+Ex	Cl+Ex				Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)					0.0		0.0	0.0				0.0
Detector 1 Queue (s)					0.0		0.0	0.0				0.0
Detector 1 Delay (s)					0.0		0.0	0.0				0.0
Detector 2 Position(ft)					94			94				
Detector 2 Size(ft)					6			6				
Detector 2 Type					Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0				
Turn Type					NA		Perm	NA				Prot
Protected Phases					6			8				4
Permitted Phases							8					
Detector Phase					6		8	8				4
Switch Phase												
Minimum Initial (s)					7.0		7.0	7.0				7.0

Alternative 3
2: Elm St/Bennett Ln & Goodell

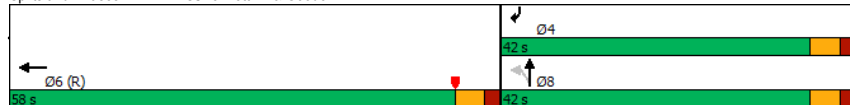
PM 2025
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)					23.5	23.5	23.5	23.5				23.5
Total Split (s)					58.0	42.0	42.0	42.0				42.0
Total Split (%)					58.0%	42.0%	42.0%	42.0%				42.0%
Maximum Green (s)					52.5	36.5	36.5	36.5				36.5
Yellow Time (s)					3.5	3.5	3.5	3.5				3.5
All-Red Time (s)					2.0	2.0	2.0	2.0				2.0
Lost Time Adjust (s)					0.0	0.0	0.0	0.0				0.0
Total Lost Time (s)					5.5	5.5	5.5	5.5				5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)					3.0	3.0	3.0	3.0				3.0
Recall Mode					C-Max	Min	Min	Min				None
Walk Time (s)					7.0	7.0	7.0	7.0				7.0
Flash Dont Walk (s)					11.0	11.0	11.0	11.0				11.0
Pedestrian Calls (#/hr)					5	5	5	5				5
Act Effct Green (s)					79.5	9.5	9.5	9.5				9.5
Actuated g/C Ratio					0.80	0.10	0.10	0.10				0.10
v/c Ratio					0.21	0.52	0.52	0.52				0.06
Control Delay					1.8	18.4	18.3	18.3				0.4
Queue Delay					0.0	0.0	0.0	0.0				0.0
Total Delay					1.8	18.4	18.3	18.3				0.4
LOS					A	B	B	B				A
Approach Delay					1.8		18.3	18.3			0.4	
Approach LOS					A		B	B			A	
Queue Length 50th (ft)					13	88	88	88				0
Queue Length 95th (ft)					48	m153	m153	m153				0
Internal Link Dist (ft)		255			322		506	506			302	
Turn Bay Length (ft)												
Base Capacity (vph)					4029	696	699	699				671
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	0.21	0.21	0.21				0.02

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 28 (28%), Referenced to phase 2: and 6:WBT, Start of Yellow
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.52
 Intersection Signal Delay: 5.9 Intersection LOS: A
 Intersection Capacity Utilization 67.5% ICU Level of Service C
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Elm St/Bennett Ln & Goodell



Alternative 3
3: Oak & Goodell

PM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔	↔							↔
Traffic Volume (vph)	0	0	0	254	782	43	0	0	0	0	380	55
Future Volume (vph)	0	0	0	254	782	43	0	0	0	0	380	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.93	1.00						1.00	
Flt Protected					0.950							0.983
Satd. Flow (prot)	0	0	0	1805	3497	0	0	0	0	0	1841	0
Flt Permitted					0.950							0.983
Satd. Flow (perm)	0	0	0	1677	3497	0	0	0	0	0	1841	0
Right Turn on Red				Yes	Yes	Yes			Yes		Yes	Yes
Satd. Flow (RTOR)				262	8						8	
Link Speed (mph)				30	30			30			30	
Link Distance (ft)				385	335			680			542	
Travel Time (s)				8.8	7.6			15.5			12.3	
Confl. Peds. (#/hr)				45	3			9			9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	2%	7%	0%	0%	0%	0%	1%	2%
Adj. Flow (vph)	0	0	0	267	823	45	0	0	0	0	400	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	267	868	0	0	0	0	0	458	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)				12	12			0			0	
Link Offset(ft)				0	0			0			0	
Crosswalk Width(ft)				16	16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	15	9	15	9	15	9	15	9	15
Number of Detectors				1	2						2	
Detector Template				Left	Thru						Thru	
Leading Detector (ft)				20	100						100	
Trailing Detector (ft)				0	0						0	
Detector 1 Position(ft)				0	0						0	
Detector 1 Size(ft)				20	6						6	
Detector 1 Type				CI+Ex	CI+Ex						CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0						0.0	
Detector 1 Queue (s)				0.0	0.0						0.0	
Detector 1 Delay (s)				0.0	0.0						0.0	
Detector 2 Position(ft)					94						94	
Detector 2 Size(ft)					6						6	
Detector 2 Type					CI+Ex						CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0						0.0	
Turn Type					Perm						NA	
Protected Phases					6						4	
Permitted Phases					6						4	

Lanes, Volumes, Timings
C&S Engineers

Synchro 11 Report
Page 6

Alternative 3
3: Oak & Goodell

PM 2025
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				6	6							4
Switch Phase												
Minimum Initial (s)				7.0	7.0						7.0	
Minimum Split (s)				58.0	58.0						27.7	
Total Split (s)				58.0	58.0						42.0	
Total Split (%)				58.0%	58.0%						42.0%	
Maximum Green (s)				52.5	52.5						36.5	
Yellow Time (s)				3.5	3.5						3.5	
All-Red Time (s)				2.0	2.0						2.0	
Lost Time Adjust (s)				0.0	0.0						0.0	
Total Lost Time (s)				5.5	5.5						5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0						3.0	
Recall Mode				C-Max	C-Max						None	
Walk Time (s)				7.0	7.0						7.0	
Flash Dont Walk (s)				12.0	12.0						11.0	
Pedestrian Calls (#/hr)				45	45						16	
Act Effect Green (s)				59.4	59.4						29.6	
Actuated g/C Ratio				0.59	0.59						0.30	
v/c Ratio				0.24	0.42						0.83	
Control Delay				1.2	8.6						45.4	
Queue Delay				0.3	0.3						0.0	
Total Delay				1.6	8.9						45.4	
LOS				A	A						D	
Approach Delay					7.2						45.4	
Approach LOS					A						D	
Queue Length 50th (ft)				0	131						266	
Queue Length 95th (ft)				26	153						352	
Internal Link Dist (ft)		305			255			600			462	
Turn Bay Length (ft)												
Base Capacity (vph)				1102	2079						677	
Starvation Cap Reductn				396	609						0	
Spillback Cap Reductn				0	0						0	
Storage Cap Reductn				0	0						0	
Reduced v/c Ratio				0.38	0.59						0.68	

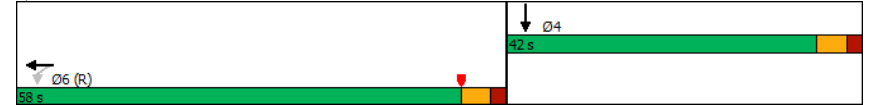
Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	6 (6%), Referenced to phase 2: and 6:WBTL, Start of Yellow
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.83
Intersection Signal Delay:	18.2
Intersection LOS:	B
Intersection Capacity Utilization:	55.6%
ICU Level of Service:	B
Analysis Period (min):	15

Alternative 3
3: Oak & Goodell

PM 2025
01/17/2023

Splits and Phases: 3: Oak & Goodell



Alternative 3
4: Ellicott & Goodell

PM 2025
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	20	625	181	49	52	0	0	202	40
Future Volume (vph)	0	0	0	20	625	181	49	52	0	0	202	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00						1.00	
Frt					0.967						0.978	
Fit Protected					0.999			0.976				
Satd. Flow (prot)	0	0	0	0	3401	0	0	1854	0	0	1837	0
Fit Permitted					0.999			0.458				
Satd. Flow (perm)	0	0	0	0	3400	0	0	870	0	0	1837	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					53						11	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		330			385			361			475	
Travel Time (s)		7.5			8.8			8.2			10.8	
Confl. Peds. (#/hr)				5								3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	6%	2%	4%	0%	0%	0%	0%	1%	0%
Adj. Flow (vph)	0	0	0	22	679	197	53	57	0	0	220	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	898	0	0	110	0	0	263	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2			1	2			2
Detector Template				Left	Thru			Left	Thru			Thru
Leading Detector (ft)				20	100			20	100			100
Trailing Detector (ft)				0	0			0	0			0
Detector 1 Position(ft)				0	0			0	0			0
Detector 1 Size(ft)				20	6			20	6			6
Detector 1 Type				Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0			0.0	0.0			0.0
Detector 1 Queue (s)				0.0	0.0			0.0	0.0			0.0
Detector 1 Delay (s)				0.0	0.0			0.0	0.0			0.0
Detector 2 Position(ft)					94				94			94
Detector 2 Size(ft)					6				6			6
Detector 2 Type					Cl+Ex				Cl+Ex			Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)					0.0				0.0			0.0
Turn Type				Perm	NA			Perm	NA			NA
Protected Phases					6				8			4
Permitted Phases					6				8			

Lanes, Volumes, Timings
C&S Engineers

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Alternative 3
4: Ellicott & Goodell

PM 2025
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase					6	6		8	8			4
Switch Phase												
Minimum Initial (s)				7.0	7.0		7.0	7.0			7.0	
Minimum Split (s)				50.0	50.0		40.0	40.0			40.0	
Total Split (s)				57.0	57.0		43.0	43.0			43.0	
Total Split (%)				57.0%	57.0%		43.0%	43.0%			43.0%	
Maximum Green (s)				51.5	51.5		37.5	37.5			37.5	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		2.0	2.0			2.0	
Lost Time Adjust (s)					0.0			0.0			0.0	
Total Lost Time (s)					5.5			5.5			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Recall Mode				C-Max	C-Max		None	None			None	
Walk Time (s)				7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)				10.0	10.0		10.0	10.0			10.0	
Pedestrian Calls (#/hr)				5	5		16	16			3	
Act Effct Green (s)					69.7			19.3			19.3	
Actuated g/C Ratio					0.70			0.19			0.19	
v/c Ratio					0.38			0.65			0.72	
Control Delay					1.5			35.2			47.2	
Queue Delay					0.1			0.0			0.0	
Total Delay					1.6			35.2			47.2	
LOS					A			D			D	
Approach Delay					1.6			35.2			47.2	
Approach LOS					A			D			D	
Queue Length 50th (ft)					14			27			152	
Queue Length 95th (ft)					18			m47			219	
Internal Link Dist (ft)					250			305			281	
Turn Bay Length (ft)												
Base Capacity (vph)					2385			326			695	
Starvation Cap Reductn					466			0			0	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.47			0.34			0.38	
Intersection Summary												
Area Type:					Other							
Cycle Length:					100							
Actuated Cycle Length:					100							
Offset:					24 (24%), Referenced to phase 2: and 6:WBTL, Start of Yellow							
Natural Cycle:					90							
Control Type:					Actuated-Coordinated							
Maximum v/c Ratio:					0.72							
Intersection Signal Delay:					14.0			Intersection LOS: B				
Intersection Capacity Utilization:					56.3%			ICU Level of Service B				
Analysis Period (min)					15							
m					Volume for 95th percentile queue is metered by upstream signal.							

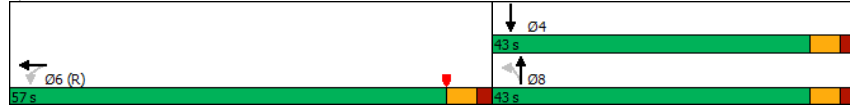
Lanes, Volumes, Timings
C&S Engineers

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Alternative 3
4: Ellicott & Goodell

PM 2025
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Splits and Phases: 4: Ellicott & Goodell



Alternative 3
5: Washington & Goodell

PM 2025
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔↔			↕			↕	↕
Traffic Volume (vph)	0	0	0	59	656	19	12	71	0	0	169	20
Future Volume (vph)	0	0	0	59	656	19	12	71	0	0	169	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	50	0	0	0	0	0	0	0	66
Storage Lanes	0	0	0	0	0	0	0	0	0	0	0	1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00			1.00				
Flt					0.996							0.850
Flt Protected					0.996			0.993				
Satd. Flow (prot)	0	0	0	0	3485	0	0	1865	0	0	1863	1538
Flt Permitted					0.996			0.935				
Satd. Flow (perm)	0	0	0	0	3481	0	0	1753	0	0	1863	1496
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					4							27
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		280			330			726			324	
Travel Time (s)		6.4			7.5			16.5			7.4	
Confl. Peds. (#/hr)				5		4	9					9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	3%	0%	2%	1%	0%	0%	2%	5%
Adj. Flow (vph)	0	0	0	62	691	20	13	75	0	0	178	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	773	0	0	88	0	0	178	21
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)					0			12			12	
Link Offset(ft)					0			0			0	
Crosswalk Width(ft)			16		16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2		1	2			2	1
Detector Template				Left	Thru		Left	Thru			Thru	Right
Leading Detector (ft)				20	100		20	100			100	20
Trailing Detector (ft)				0	0		0	0			0	0
Detector 1 Position(ft)				0	0		0	0			0	0
Detector 1 Size(ft)				20	6		20	6			6	20
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	0.0
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	

Alternative 3
5: Washington & Goodell

PM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type				Perm	NA		Perm	NA			NA	Perm
Protected Phases				6	6		8				4	
Permitted Phases				6			8				4	4
Detector Phase				6	6		8	8			4	4
Switch Phase												
Minimum Initial (s)				7.0	7.0		7.0	7.0			7.0	7.0
Minimum Split (s)				55.0	55.0		30.0	30.0			30.0	30.0
Total Split (s)				64.0	64.0		36.0	36.0			36.0	36.0
Total Split (%)				64.0%	64.0%		36.0%	36.0%			36.0%	36.0%
Maximum Green (s)				58.5	58.5		30.5	30.5			30.5	30.5
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	3.5
All-Red Time (s)				2.0	2.0		2.0	2.0			2.0	2.0
Lost Time Adjust (s)					0.0			0.0			0.0	0.0
Total Lost Time (s)					5.5			5.5			5.5	5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	3.0
Recall Mode				C-Max	C-Max		Min	Min			Min	Min
Walk Time (s)				7.0	7.0		7.0	7.0			7.0	7.0
Flash Dont Walk (s)				10.0	10.0		10.0	10.0			10.0	10.0
Pedestrian Calls (#/hr)				9	9		3	3			9	9
Act Effect Green (s)					74.1			14.9			14.9	14.9
Actuated g/C Ratio					0.74			0.15			0.15	0.15
v/c Ratio					0.30			0.34			0.64	0.09
Control Delay					1.3			31.1			50.2	10.9
Queue Delay					0.1			0.0			0.0	0.0
Total Delay					1.4			31.1			50.2	10.9
LOS					A			C			D	B
Approach Delay					1.4			31.1			46.0	
Approach LOS					A			C			D	
Queue Length 50th (ft)					21			36			108	0
Queue Length 95th (ft)					31			m58			168	17
Internal Link Dist (ft)		200			250			646			244	
Turn Bay Length (ft)												66
Base Capacity (vph)					2580			534			568	475
Starvation Cap Reductn					759			0			0	0
Spillback Cap Reductn					0			0			0	0
Storage Cap Reductn					0			0			0	0
Reduced v/c Ratio					0.42			0.16			0.31	0.04
Intersection Summary												
Area Type:	Other											
Cycle Length:	100											
Actuated Cycle Length:	100											
Offset:	22 (22%), Referenced to phase 2: and 6:WBTL, Start of Yellow											
Natural Cycle:	85											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.64											
Intersection Signal Delay:	12.3											
	Intersection LOS: B											

Alternative 3
5: Washington & Goodell

PM 2025
01/17/2023

Intersection Capacity Utilization 48.0%
ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Washington & Goodell



Alternative 3
6: Main St & Edward/Goodell

PM 2025
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↕	↕		↕			↕	↕
Traffic Volume (vph)	110	0	0	28	497	204	18	63	0	0	177	144
Future Volume (vph)	110	0	0	28	497	204	18	63	0	0	177	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	80	0	0	0	0	0	0
Storage Lanes	0	0	0	0	1	1	0	0	0	0	0	2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Ped Bike Factor		0.99			1.00	0.96		0.99				
Frt						0.850						0.850
Flt Protected		0.950			0.997		0.950					
Satd. Flow (prot)	0	1805	0	0	3498	1568	1805	1827	0	0	1759	2842
Flt Permitted		0.950			0.936		0.950					
Satd. Flow (perm)	0	1784	0	0	3282	1498	1780	1827	0	0	1759	2842
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						213						150
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		341			280			726			848	
Travel Time (s)		7.8			6.4			16.5			19.3	
Conf. Peds. (#/hr)	12		6	6		12	10					10
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	1%	3%	3%	0%	4%	0%	0%	8%	0%
Adj. Flow (vph)	115	0	0	29	518	213	19	66	0	0	184	150
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	115	0	0	547	213	19	66	0	0	184	150
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0				0			12				
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2			2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru			Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100			100	20
Trailing Detector (ft)	0	0		0	0	0	0	0			0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0			0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6			6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
C&S Engineers

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Alternative 3
6: Main St & Edward/Goodell

PM 2025
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Split	NA			Perm	NA	Perm	Prot	NA		NA	pt+ov
Protected Phases	2	2			6	6	3	8			4	4 2
Permitted Phases					6	6	3	8			4	4 2
Detector Phase	2	2			6	6	3	8			4	4 2
Switch Phase												
Minimum Initial (s)	7.0	7.0			7.0	7.0	7.0	7.0			7.0	
Minimum Split (s)	22.0	22.0			29.5	29.5	29.5	27.5			22.5	
Total Split (s)	23.5	23.5			33.5	33.5	33.5	43.0			23.5	
Total Split (%)	23.5%	23.5%			33.5%	33.5%	33.5%	19.5%			23.5%	
Maximum Green (s)	18.0	18.0			28.0	28.0	28.0	14.0			37.5	18.0
Yellow Time (s)	3.5	3.5			3.5	3.5	3.5	3.5			3.5	
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0	2.0			2.0	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0			0.0	
Total Lost Time (s)		5.5			5.5	5.5	5.5	5.5			5.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)	3.0	3.0			3.2	3.2	3.2	3.0	3.0			3.0
Recall Mode	None	None			C-Max	C-Max	C-Max	None	None			None
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0			7.0	
Flash Dont Walk (s)	15.0	15.0			17.0	17.0	17.0	10.0			10.0	
Pedestrian Calls (#/hr)	6	6			12	12	12	28			10	
Act Effect Green (s)		12.4			49.8	49.8	7.3	21.3			16.0	33.9
Actuated g/C Ratio		0.12			0.50	0.50	0.07	0.21			0.16	0.34
v/c Ratio		0.52			0.33	0.25	0.15	0.17			0.65	0.14
Control Delay		26.2			11.5	1.1	48.0	44.0			49.8	3.1
Queue Delay		0.0			0.3	0.4	0.0	0.0			0.0	0.0
Total Delay		26.2			11.8	1.5	48.0	44.0			49.8	3.1
LOS		C			B	A	D	D			D	A
Approach Delay		26.2			8.9			44.9			28.8	
Approach LOS		C			A			D			C	
Queue Length 50th (ft)		39			51	0	13	44			110	0
Queue Length 95th (ft)		m75			102	3	m26	m77			171	18
Internal Link Dist (ft)		261			200		646	768			768	
Turn Bay Length (ft)							80					
Base Capacity (vph)		330			1633	852	252	685			330	1195
Starvation Cap Reductn		0			533	282	0	0			0	0
Spillover Cap Reductn		0			0	0	0	0			0	0
Storage Cap Reductn		0			0	0	0	0			0	0
Reduced v/c Ratio		0.35			0.50	0.37	0.08	0.10			0.56	0.13

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 6:WBTL, Start of Yellow, Master Intersection
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.65
Intersection Signal Delay:	18.0
Intersection LOS:	B

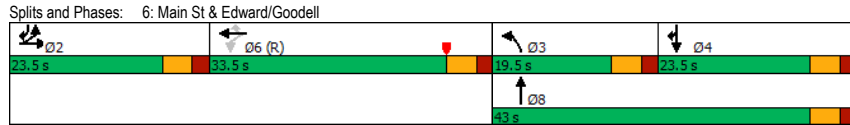
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Alternative 3
6: Main St & Edward/Goodell

PM 2025
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Intersection Capacity Utilization 57.0% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.



Alternative 3
7: Tupper & Pearl

PM 2025
01/17/2023

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↕	↕		↕	↕	↕
Traffic Volume (vph)	100	761	20	35	201	200	77	150	180	41	104	15
Future Volume (vph)	100	761	20	35	201	200	77	150	180	41	104	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.97	0.99			0.99
Frt		0.997			0.938			0.918				0.981
Flt Protected		0.994			0.996			0.950			0.950	
Satd. Flow (prot)	0	3572	0	0	1756	0	1770	1704	0	1770	1814	0
Flt Permitted		0.813			0.880			0.676			0.183	
Satd. Flow (perm)	0	2922	0	0	1551	0	1218	1704	0	341	1814	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			58			61			9	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		688			351			561			691	
Travel Time (s)		15.6			8.0			12.8			15.7	
Confl. Peds. (#/hr)			20	20			14		6	6		14
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
Heavy Vehicles (%)	0%	0%	0%	2%	2%	0%	2%	0%	2%	2%	2%	2%
Adj. Flow (vph)	106	810	21	37	214	213	82	160	191	44	111	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	937	0	0	464	0	82	351	0	44	127	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		2			6			8			7	4
Permitted Phases		2			6			8			4	

Alternative 3
7: Tupper & Pearl

PM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	2	2		6	6		8	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	27.5	27.5		50.0	50.0		23.5	23.5		12.5	40.0	
Total Split (s)	52.5	52.5		52.5	52.5		35.0	35.0		12.5	47.5	
Total Split (%)	52.5%	52.5%		52.5%	52.5%		35.0%	35.0%		12.5%	47.5%	
Maximum Green (s)	47.0	47.0		47.0	47.0		29.5	29.5		7.0	42.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.5			5.5		5.5	5.5		5.5	5.5	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		11.0	11.0		10.0	10.0		11.0	11.0	
Pedestrian Calls (#/hr)	20	20		0	0		6	6			14	
Act Effect Green (s)		58.9			58.9		22.6	22.6		30.1	30.1	
Actuated g/C Ratio		0.59			0.59		0.23	0.23		0.30	0.30	
v/c Ratio		0.54			0.50		0.30	0.81		0.22	0.23	
Control Delay		16.4			3.6		33.0	44.6		20.3	19.9	
Queue Delay		0.0			0.1		0.0	0.0		0.0	0.0	
Total Delay		16.4			3.6		33.0	44.6		20.3	19.9	
LOS		B			A		C	D		C	B	
Approach Delay		16.4			3.6			42.4			20.0	
Approach LOS		B			A			D			C	
Queue Length 50th (ft)		203			36		43	177		21	60	
Queue Length 95th (ft)		309			46		79	260		34	83	
Internal Link Dist (ft)		608			271			481			611	
Turn Bay Length (ft)												
Base Capacity (vph)		1721			937		359	545		202	767	
Starvation Cap Reductn		0			26		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.54			0.51		0.23	0.64		0.22	0.17	

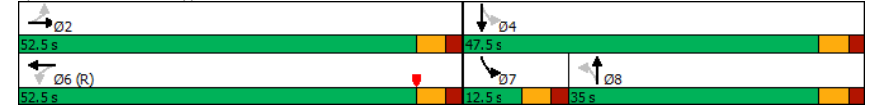
Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 6:WBTL, Start of Yellow
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.81
Intersection Signal Delay:	19.3
Intersection Capacity Utilization:	92.6%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	F

Alternative 3
7: Tupper & Pearl

PM 2025
01/17/2023

Splits and Phases: 7: Tupper & Pearl

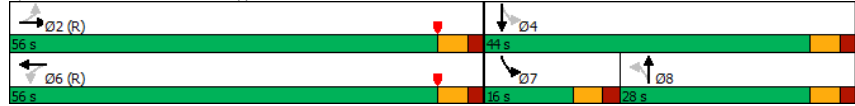


Alternative 3
8: Main St & Tupper

PM 2025
01/17/2023

Intersection Capacity Utilization 56.3% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Main St & Tupper



Alternative 3
9: Washington & Tupper

PM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕	↕		↕	↕
Traffic Volume (vph)	12	1024	43	25	193	1	143	52	135	115	147	11
Future Volume (vph)	12	1024	43	25	193	1	143	52	135	115	147	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	0	150		78	85		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.96		0.97		0.99
Frt		0.994			0.999			0.892				0.990
Fit Protected		0.999			0.994			0.950		0.950		
Satd. Flow (prot)	0	3539	0	0	1886	0	1805	1612	0	1805	1833	0
Fit Permitted		0.951			0.813			0.363		0.623		
Satd. Flow (perm)	0	3368	0	0	1543	0	662	1612	0	1143	1833	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5						92				3
Link Speed (mph)		30			30			30				30
Link Distance (ft)		263			328			1190				726
Travel Time (s)		6.0			7.5			27.0				16.5
Confl. Peds. (#/hr)	21		17	17		21	23		26	26		23
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	1%	2%	0%	0%	0%	0%	3%	0%	0%	2%	2%
Adj. Flow (vph)	13	1138	48	28	214	1	159	58	150	128	163	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1199	0	0	243	0	159	208	0	128	175	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Alternative 3
9: Washington & Tupper

PM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA	NA	NA
Protected Phases		2		6	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	47.0	47.0		47.0	47.0		28.0	28.0		12.5	28.0	
Total Split (s)	46.0	46.0		46.0	46.0		27.0	41.4		12.6	27.0	
Total Split (%)	46.0%	46.0%		46.0%	46.0%		27.0%	41.4%		12.6%	27.0%	
Maximum Green (s)	40.5	40.5		40.5	40.5		21.5	35.9		7.1	21.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.5			5.5		5.5	5.5		5.5	5.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0			10.0			10.0	
Pedestrian Calls (#/hr)	17	17		21	21			26			23	
Act Effect Green (s)		56.8			56.8		30.8	19.6		21.7	14.6	
Actuated g/C Ratio		0.57			0.57		0.31	0.20		0.22	0.15	
v/c Ratio		0.63			0.28		0.47	0.53		0.43	0.65	
Control Delay		8.6			11.4		28.3	23.4		47.5	70.0	
Queue Delay		0.4			0.8		0.1	0.0		0.0	0.7	
Total Delay		9.0			12.2		28.4	23.4		47.5	70.7	
LOS		A			B		C	C		D	E	
Approach Delay		9.0			12.2			25.6			60.9	
Approach LOS		A			B			C			E	
Queue Length 50th (ft)		103			96		75	64		79	114	
Queue Length 95th (ft)		244			147		109	122		117	164	
Internal Link Dist (ft)		183			248			1110			646	
Turn Bay Length (ft)							150			85		
Base Capacity (vph)		1915			876		458	637		295	396	
Starvation Cap Reductn		32			383		0	0		0	0	
Spillback Cap Reductn		263			84		19	7		0	62	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.73			0.49		0.36	0.33		0.43	0.52	

Intersection Summary	
Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle:	105
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.65
Intersection Signal Delay:	19.7
	Intersection LOS: B

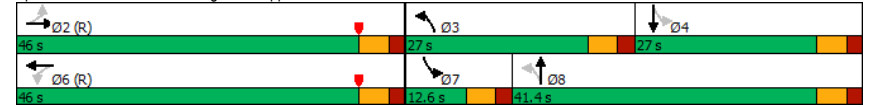
Alternative 3
9: Washington & Tupper

PM 2025
01/17/2023

Intersection Capacity Utilization 64.9%
Analysis Period (min) 15

ICU Level of Service C

Splits and Phases: 9: Washington & Tupper

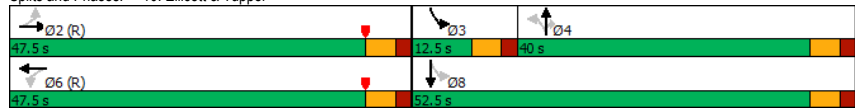


Alternative 3
10: Ellicott & Tupper

PM 2025
01/17/2023

Intersection Capacity Utilization 83.7% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 10: Ellicott & Tupper



Alternative 3
11: Tupper & Oak

PM 2025
01/17/2023

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑								↖	↗	
Traffic Volume (vph)	0	1553	226	0	0	0	0	0	0	216	399	90
Future Volume (vph)	0	1553	226	0	0	0	0	0	0	216	399	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	0.95
Ped Bike Factor		1.00									0.99	
Frt		0.981									0.974	
Fit Protected										0.950	0.998	
Satd. Flow (prot)	0	3496	0	0	0	0	0	0	0	1626	3308	0
Fit Permitted										0.950	0.998	
Satd. Flow (perm)	0	3496	0	0	0	0	0	0	0	1626	3308	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)		25								27	31	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		387			354			125			680	
Travel Time (s)		8.8			8.0			2.8			15.5	
Confl. Peds. (#/hr)			1	1			10					10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	2%	0%	0%	0%	0%	0%	0%	1%	1%	0%
Adj. Flow (vph)	0	1635	238	0	0	0	0	0	0	227	420	95
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	0	1873	0	0	0	0	0	0	0	204	538	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			0			12			12		
Link Offset(ft)	0			0			0			0		
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15			9	15		9	15	9
Number of Detectors		2								1	2	
Detector Template		Thru								Left	Thru	
Leading Detector (ft)		100								20	100	
Trailing Detector (ft)		0								0	0	
Detector 1 Position(ft)		0								0	0	
Detector 1 Size(ft)		6								20	6	
Detector 1 Type		CI+Ex								CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0								0.0	0.0	
Detector 1 Queue (s)		0.0								0.0	0.0	
Detector 1 Delay (s)		0.0								0.0	0.0	
Detector 2 Position(ft)		94									94	
Detector 2 Size(ft)		6									6	
Detector 2 Type		CI+Ex									CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0									0.0	

Alternative 3
11: Tupper & Oak

PM 2025
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type		NA								Perm	NA	
Protected Phases		2									4	
Permitted Phases										4		
Detector Phase		2								4	4	
Switch Phase												
Minimum Initial (s)		7.0								7.0	7.0	
Minimum Split (s)		50.0								40.0	40.0	
Total Split (s)		60.0								40.0	40.0	
Total Split (%)		60.0%								40.0%	40.0%	
Maximum Green (s)		54.5								34.5	34.5	
Yellow Time (s)		3.5								3.5	3.5	
All-Red Time (s)		2.0								2.0	2.0	
Lost Time Adjust (s)		0.0								0.0	0.0	
Total Lost Time (s)		5.5								5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0								3.0	3.0	
Recall Mode		C-Max								None	None	
Walk Time (s)		7.0								7.0	7.0	
Flash Dont Walk (s)		16.0								13.0	13.0	
Pedestrian Calls (#/hr)		1								10	10	
Act Effect Green (s)		66.4								22.6	22.6	
Actuated g/C Ratio		0.66								0.23	0.23	
v/c Ratio		0.80								0.53	0.70	
Control Delay		9.6								47.0	52.2	
Queue Delay		0.4								0.0	0.0	
Total Delay		10.0								47.0	52.2	
LOS		A								D	D	
Approach Delay		10.0									50.8	
Approach LOS		A									D	
Queue Length 50th (ft)		167								127	182	
Queue Length 95th (ft)		308								m171	203	
Internal Link Dist (ft)		307			274			45			600	
Turn Bay Length (ft)												
Base Capacity (vph)		2329								578	1161	
Starvation Cap Reductn		115								0	0	
Spillback Cap Reductn		0								0	0	
Storage Cap Reductn		0								0	0	
Reduced v/c Ratio		0.85								0.35	0.46	

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 2:EBT and 6:, Start of Yellow
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.80
Intersection Signal Delay:	21.6
Intersection LOS:	C

Alternative 3
11: Tupper & Oak

PM 2025
01/17/2023

Intersection Capacity Utilization 73.8%	ICU Level of Service D
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 11: Tupper & Oak



Alternative 3
12: Tupper & Elm St

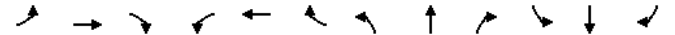
PM 2025
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕						↕↕				
Traffic Volume (vph)	7	1767	0	0	0	0	0	276	52	0	0	0
Future Volume (vph)	7	1767	0	0	0	0	0	276	52	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor		1.00										
Frt								0.976				
Fit Protected												
Satd. Flow (prot)	0	3574	0	0	0	0	0	3465	0	0	0	0
Fit Permitted												
Satd. Flow (perm)	0	3574	0	0	0	0	0	3465	0	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27										
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		354			313			418			586	
Travel Time (s)		8.0			7.1			9.5			13.3	
Confl. Peds. (#/hr)	1		14				1					1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%
Adj. Flow (vph)	7	1841	0	0	0	0	0	288	54	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1848	0	0	0	0	0	342	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0						0			0	
Link Offset(ft)		0						0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2						2				
Detector Template	Left	Thru						Thru				
Leading Detector (ft)	20	100						100				
Trailing Detector (ft)	0	0						0				
Detector 1 Position(ft)	0	0						0				
Detector 1 Size(ft)	20	6						6				
Detector 1 Type	CI+Ex	CI+Ex						CI+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0						0.0				
Detector 1 Queue (s)	0.0	0.0						0.0				
Detector 1 Delay (s)	0.0	0.0						0.0				
Detector 2 Position(ft)		94						94				
Detector 2 Size(ft)		6						6				
Detector 2 Type		CI+Ex						CI+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0				
Turn Type	Perm	NA						NA				
Protected Phases		2						8				
Permitted Phases		2										

Alternative 3
12: Tupper & Elm St

PM 2025
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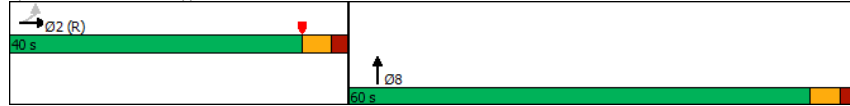


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	2	2										8
Switch Phase												
Minimum Initial (s)	7.0	7.0										7.0
Minimum Split (s)	30.0	30.0										60.0
Total Split (s)	40.0	40.0										60.0
Total Split (%)	40.0%	40.0%										60.0%
Maximum Green (s)	34.5	34.5										54.5
Yellow Time (s)	3.5	3.5										3.5
All-Red Time (s)	2.0	2.0										2.0
Lost Time Adjust (s)		0.0										0.0
Total Lost Time (s)		5.5										5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0										3.0
Recall Mode	C-Max	C-Max										None
Walk Time (s)	7.0	7.0										7.0
Flash Dont Walk (s)	1.0	1.0										1.0
Pedestrian Calls (#/hr)	14	14										1
Act Effct Green (s)		73.3										15.7
Actuated g/C Ratio		0.73										0.16
v/c Ratio		0.70										0.63
Control Delay		4.8										44.3
Queue Delay		0.3										0.0
Total Delay		5.2										44.3
LOS		A										D
Approach Delay		5.2										44.3
Approach LOS		A										D
Queue Length 50th (ft)		120										108
Queue Length 95th (ft)		166										146
Internal Link Dist (ft)		274				233					338	506
Turn Bay Length (ft)												
Base Capacity (vph)		2627										1888
Starvation Cap Reductn		268										0
Spillback Cap Reductn		0										0
Storage Cap Reductn		0										0
Reduced v/c Ratio		0.78										0.18
Intersection Summary												
Area Type:	Other											
Cycle Length:	100											
Actuated Cycle Length:	100											
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:, Start of Yellow												
Natural Cycle:	130											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.70											
Intersection Signal Delay:	11.3						Intersection LOS: B					
Intersection Capacity Utilization 67.5%							ICU Level of Service C					
Analysis Period (min)	15											

Alternative 3
12: Tupper & Elm St

PM 2025
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Splits and Phases: 12: Tupper & Elm St



Alternative 3
14: Pearl & Edward

PM 2025
01/17/2023

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↕↕	↕↕	
Traffic Volume (vph)	0	0	75	307	340	110
Future Volume (vph)	0	0	75	307	340	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt					0.967	
Fit Protected				0.990	0.964	
Satd. Flow (prot)	0	0	0	3504	1736	0
Fit Permitted				0.990	0.964	
Satd. Flow (perm)	0	0	0	3504	1736	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)					17	
Link Speed (mph)	30			30	30	
Link Distance (ft)	289			341	691	
Travel Time (s)	6.6			7.8	15.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	82	334	370	120
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	416	490	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60	60		60	60
Number of Detectors			1	2	1	
Detector Template			Left	Thru	Left	
Leading Detector (ft)			20	100	20	
Trailing Detector (ft)			0	0	0	
Detector 1 Position(ft)			0	0	0	
Detector 1 Size(ft)			20	6	20	
Detector 1 Type			CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)			0.0	0.0	0.0	
Detector 1 Queue (s)			0.0	0.0	0.0	
Detector 1 Delay (s)			0.0	0.0	0.0	
Detector 2 Position(ft)					94	
Detector 2 Size(ft)					6	
Detector 2 Type					CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)					0.0	
Turn Type			Perm	NA	Prot	
Protected Phases				6	8	
Permitted Phases				6		
Detector Phase				6	8	
Switch Phase						
Minimum Initial (s)				7.0	7.0	7.0

Alternative 3
1: Michigan & Goodell

PM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕↕↕		↕	↕			↕↕	
Traffic Volume (vph)	0	0	0	148	485	80	75	223	0	0	545	178
Future Volume (vph)	0	0	0	148	485	80	75	223	0	0	545	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	200	0	0	0	0	0	0	0
Storage Lanes	0	0	0	0	0	1	0	0	0	0	0	0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor				1.00			1.00				0.99	
Frt				0.983							0.963	
Flt Protected				0.990			0.950					
Satd. Flow (prot)	0	0	0	0	4962	0	1805	1845	0	0	3360	0
Flt Permitted				0.990			0.148					
Satd. Flow (perm)	0	0	0	0	4962	0	281	1845	0	0	3360	0
Right Turn on Red			Yes		Yes			Yes			Yes	
Satd. Flow (RTOR)				28							48	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		402			324			648			972	
Travel Time (s)		9.1			7.4			14.7			22.1	
Conf. Peds. (#/hr)					1		10					10
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	2%	1%	0%	3%	8%	0%	3%	2%
Adj. Flow (vph)	0	0	0	151	495	82	77	228	0	0	556	182
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	728	0	77	228	0	0	738	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2		1	2			2	
Detector Template				Left	Thru		Left	Thru			Thru	
Leading Detector (ft)				20	100		20	100			100	
Trailing Detector (ft)				0	0		0	0			0	
Detector 1 Position(ft)				0	0		0	0			0	
Detector 1 Size(ft)				20	6		20	6			6	
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	

Alternative 3
1: Michigan & Goodell

PM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type					Perm		NA		pm+pt		NA	
Protected Phases						6		3	8			4
Permitted Phases								8				
Detector Phase					6	6		3	8			4
Switch Phase												
Minimum Initial (s)					7.0	7.0		7.0	7.0			7.0
Minimum Split (s)					45.0	45.0		12.5	14.6			14.6
Total Split (s)					48.0	48.0		13.0	52.0			39.0
Total Split (%)					48.0%	48.0%		13.0%	52.0%			39.0%
Maximum Green (s)					42.5	42.5		7.5	46.5			33.5
Yellow Time (s)					3.5	3.5		3.5	3.5			3.5
All-Red Time (s)					2.0	2.0		2.0	2.0			2.0
Lost Time Adjust (s)						0.0		0.0	0.0			0.0
Total Lost Time (s)						5.5		5.5	5.5			5.5
Lead/Lag								Lead				Lag
Lead-Lag Optimize?								Yes				Yes
Vehicle Extension (s)					4.0	4.0		3.0	3.0			3.0
Recall Mode					C-Max	C-Max		None	None			None
Walk Time (s)					7.0	7.0		7.0	7.0			7.0
Flash Dont Walk (s)					14.0	14.0		10.0	10.0			11.0
Pedestrian Calls (#/hr)					1	1		10	10			10
Act Effect Green (s)						51.0		38.0	38.0			27.6
Actuated g/C Ratio						0.51		0.38	0.38			0.28
v/c Ratio						0.29		0.35	0.33			0.77
Control Delay						15.2		21.8	21.7			36.4
Queue Delay						0.0		0.0	0.0			0.0
Total Delay						15.2		21.8	21.7			36.4
LOS						B		C	C			D
Approach Delay						15.2		21.7				36.4
Approach LOS						B		C				D
Queue Length 50th (ft)						94		30	96			213
Queue Length 95th (ft)								138	137			257
Internal Link Dist (ft)							322		244		568	892
Turn Bay Length (ft)												
Base Capacity (vph)							2546		220		857	1157
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							0.29		0.35		0.27	0.64
Intersection Summary												
Area Type:								Other				
Cycle Length:								100				
Actuated Cycle Length:								100				
Offset:								5 (5%), Referenced to phase 2: and 6:WBT, Start of Yellow				
Natural Cycle:								80				
Control Type:								Actuated-Coordinated				
Maximum v/c Ratio:								0.77				
Intersection Signal Delay:								25.2				Intersection LOS: C

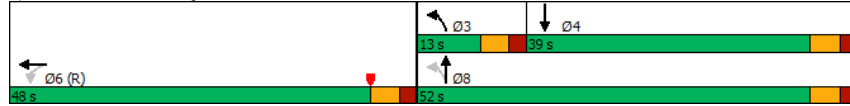
Alternative 3
1: Michigan & Goodell

PM 2045
01/17/2023

Intersection Capacity Utilization 58.1%
Analysis Period (min) 15

ICU Level of Service B

Splits and Phases: 1: Michigan & Goodell



Alternative 3
2: Elm St/Bennett Ln & Goodell

PM 2045
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↑	↑				↑
Traffic Volume (vph)	0	0	0	0	771	15	257	5	0	0	0	15
Future Volume (vph)	0	0	0	0	771	15	257	5	0	0	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91	0.95	0.95	1.00	1.00	1.00	1.00
Frt					0.997							0.865
Fit Protected							0.950	0.954				
Satd. Flow (prot)	0	0	0	0	5070	0	1681	1688	0	0	0	1611
Fit Permitted							0.950	0.954				
Satd. Flow (perm)	0	0	0	0	5070	0	1681	1688	0	0	0	1611
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Satd. Flow (RTOR)					4		134	128				152
Link Speed (mph)		30			30		30				30	
Link Distance (ft)		335			402		586				382	
Travel Time (s)		7.6			9.1		13.3				8.7	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	0	787	15	262	5	0	0	0	15
Shared Lane Traffic (%)							49%					
Lane Group Flow (vph)	0	0	0	0	802	0	134	133	0	0	0	15
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0		12				12	
Link Offset(ft)		0			0		0				0	
Crosswalk Width(ft)		16			16		16				16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60		9	15		60	15		9	60	
Number of Detectors					2		1	2				1
Detector Template					Thru		Left	Thru				Right
Leading Detector (ft)					100		20	100				20
Trailing Detector (ft)					0		0	0				0
Detector 1 Position(ft)					0		0	0				0
Detector 1 Size(ft)					6		20	6				20
Detector 1 Type					Cl+Ex		Cl+Ex	Cl+Ex				Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)					0.0		0.0	0.0				0.0
Detector 1 Queue (s)					0.0		0.0	0.0				0.0
Detector 1 Delay (s)					0.0		0.0	0.0				0.0
Detector 2 Position(ft)					94		94					
Detector 2 Size(ft)					6		6					
Detector 2 Type					Cl+Ex		Cl+Ex					
Detector 2 Channel												
Detector 2 Extend (s)					0.0		0.0					
Turn Type					NA		Perm	NA				Prot
Protected Phases					6		8					4
Permitted Phases							8					
Detector Phase					6		8	8				4
Switch Phase												
Minimum Initial (s)					7.0		7.0	7.0				7.0

Alternative 3
2: Elm St/Bennett Ln & Goodell

PM 2045
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)					23.5	23.5	23.5	23.5				23.5
Total Split (s)					58.0	42.0	42.0	42.0				42.0
Total Split (%)					58.0%	42.0%	42.0%	42.0%				42.0%
Maximum Green (s)					52.5	36.5	36.5	36.5				36.5
Yellow Time (s)					3.5	3.5	3.5	3.5				3.5
All-Red Time (s)					2.0	2.0	2.0	2.0				2.0
Lost Time Adjust (s)					0.0	0.0	0.0	0.0				0.0
Total Lost Time (s)					5.5	5.5	5.5	5.5				5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)					3.0	3.0	3.0	3.0				3.0
Recall Mode					C-Max	Max	Max	Max				None
Walk Time (s)					7.0	7.0	7.0	7.0				7.0
Flash Dont Walk (s)					11.0	11.0	11.0	11.0				11.0
Pedestrian Calls (#/hr)					5	5	5	5				5
Act Effct Green (s)					52.5	36.5	36.5	36.5				36.5
Actuated g/C Ratio					0.52	0.36	0.36	0.36				0.36
v/c Ratio					0.30	0.19	0.19	0.19				0.19
Control Delay					9.5	2.4	2.5	2.5				0.1
Queue Delay					0.0	0.0	0.0	0.0				0.0
Total Delay					9.5	2.4	2.5	2.5				0.1
LOS					A	A	A	A				A
Approach Delay					9.5	2.4	2.4	2.4				0.1
Approach LOS					A	A	A	A				A
Queue Length 50th (ft)					71	0	0	0				0
Queue Length 95th (ft)					78	m31	m31	m31				0
Internal Link Dist (ft)		255			322		506	506			302	
Turn Bay Length (ft)												
Base Capacity (vph)					2663	698	697	697				684
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	0.19	0.19	0.19				0.02

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 98 (98%), Referenced to phase 6:WBT, Start of Yellow
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.30
 Intersection Signal Delay: 7.6
 Intersection Capacity Utilization 67.5%
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Elm St/Bennett Ln & Goodell



Alternative 3
3: Oak & Goodell

PM 2045
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	294	707	43	0	0	0	0	405	55
Future Volume (vph)	0	0	0	294	707	43	0	0	0	0	405	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.93	1.00						1.00	
Flt Protected					0.950							
Satd. Flow (prot)	0	0	0	1805	3492	0	0	0	0	0	1843	0
Flt Permitted					0.950							
Satd. Flow (perm)	0	0	0	1677	3492	0	0	0	0	0	1843	0
Right Turn on Red				Yes	Yes	Yes			Yes			Yes
Satd. Flow (RTOR)				238	9						8	
Link Speed (mph)				30	30			30			30	
Link Distance (ft)				385	335			680			542	
Travel Time (s)				8.8	7.6			15.5			12.3	
Confl. Peds. (#/hr)				45	3							9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	2%	7%	0%	0%	0%	0%	1%	2%
Adj. Flow (vph)	0	0	0	309	744	45	0	0	0	0	426	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	309	789	0	0	0	0	0	484	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)				12	12			0			0	
Link Offset(ft)				0	0			0			0	
Crosswalk Width(ft)				16	16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2							2
Detector Template				Left	Thru							Thru
Leading Detector (ft)				20	100							100
Trailing Detector (ft)				0	0							0
Detector 1 Position(ft)				0	0							0
Detector 1 Size(ft)				20	6							6
Detector 1 Type				CI+Ex	CI+Ex							CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0							0.0
Detector 1 Queue (s)				0.0	0.0							0.0
Detector 1 Delay (s)				0.0	0.0							0.0
Detector 2 Position(ft)					94							94
Detector 2 Size(ft)					6							6
Detector 2 Type					CI+Ex							CI+Ex
Detector 2 Channel												
Detector 2 Extend (s)					0.0							0.0
Turn Type					Perm							NA
Protected Phases					6							4
Permitted Phases					6							

Lanes, Volumes, Timings
C&S Engineers

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Alternative 3
3: Oak & Goodell

PM 2045
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase				6	6							4
Switch Phase												
Minimum Initial (s)				7.0	7.0							7.0
Minimum Split (s)				58.0	58.0							27.7
Total Split (s)				58.0	58.0							42.0
Total Split (%)				58.0%	58.0%							42.0%
Maximum Green (s)				52.5	52.5							36.5
Yellow Time (s)				3.5	3.5							3.5
All-Red Time (s)				2.0	2.0							2.0
Lost Time Adjust (s)				0.0	0.0							0.0
Total Lost Time (s)				5.5	5.5							5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0							3.0
Recall Mode				C-Max	C-Max							None
Walk Time (s)				7.0	7.0							7.0
Flash Dont Walk (s)				12.0	12.0							11.0
Pedestrian Calls (#/hr)				45	45							16
Act Effect Green (s)				58.2	58.2							30.8
Actuated g/C Ratio				0.58	0.58							0.31
v/c Ratio				0.29	0.39							0.85
Control Delay				0.7	3.5							45.7
Queue Delay				0.2	0.2							0.1
Total Delay				0.9	3.7							45.8
LOS				A	A							D
Approach Delay					2.9							45.8
Approach LOS					A							D
Queue Length 50th (ft)				0	21							278
Queue Length 95th (ft)				0	27							378
Internal Link Dist (ft)		305			255		600					462
Turn Bay Length (ft)												
Base Capacity (vph)				1076	2037							677
Starvation Cap Reductn				269	433							0
Spillback Cap Reductn				0	29							10
Storage Cap Reductn				0	0							0
Reduced v/c Ratio				0.38	0.49							0.73

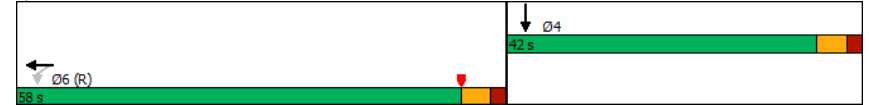
Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	94 (94%), Referenced to phase 2: and 6:WBTL, Start of Yellow
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.85
Intersection Signal Delay:	16.0
Intersection LOS:	B
Intersection Capacity Utilization:	54.9%
ICU Level of Service:	A
Analysis Period (min):	15

Alternative 3
3: Oak & Goodell

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Splits and Phases: 3: Oak & Goodell



Alternative 3
4: Ellicott & Goodell

PM 2045
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↕				↔
Traffic Volume (vph)	0	0	0	20	550	136	49	82	0	0	172	40
Future Volume (vph)	0	0	0	20	550	136	49	82	0	0	172	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00						1.00	
Frt					0.971						0.975	
Fit Protected					0.999			0.982				
Satd. Flow (prot)	0	0	0	0	3416	0	0	1866	0	0	1831	0
Fit Permitted					0.999			0.503				
Satd. Flow (perm)	0	0	0	0	3415	0	0	956	0	0	1831	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					46						13	
Link Speed (mph)		30				30		30				30
Link Distance (ft)		330			385			361			475	
Travel Time (s)		7.5			8.8			8.2			10.8	
Confl. Peds. (#/hr)				5								3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	6%	2%	4%	0%	0%	0%	0%	1%	0%
Adj. Flow (vph)	0	0	0	22	598	148	53	89	0	0	187	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	768	0	0	142	0	0	230	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2			1	2			2
Detector Template				Left	Thru			Left	Thru			Thru
Leading Detector (ft)				20	100			20	100			100
Trailing Detector (ft)				0	0			0	0			0
Detector 1 Position(ft)				0	0			0	0			0
Detector 1 Size(ft)				20	6			20	6			6
Detector 1 Type				Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex			Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0			0.0	0.0			0.0
Detector 1 Queue (s)				0.0	0.0			0.0	0.0			0.0
Detector 1 Delay (s)				0.0	0.0			0.0	0.0			0.0
Detector 2 Position(ft)					94				94			94
Detector 2 Size(ft)					6				6			6
Detector 2 Type					Cl+Ex				Cl+Ex			Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)					0.0				0.0			0.0
Turn Type				Perm	NA			Perm	NA			NA
Protected Phases					6				8			4
Permitted Phases					6				8			4

Lanes, Volumes, Timings
C&S Engineers

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Alternative 3
4: Ellicott & Goodell

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase					6	6		8	8			4
Switch Phase												
Minimum Initial (s)					7.0	7.0		7.0	7.0			7.0
Minimum Split (s)					50.0	50.0		40.0	40.0			40.0
Total Split (s)					60.0	60.0		40.0	40.0			40.0
Total Split (%)					60.0%	60.0%		40.0%	40.0%			40.0%
Maximum Green (s)					54.5	54.5		34.5	34.5			34.5
Yellow Time (s)					3.5	3.5		3.5	3.5			3.5
All-Red Time (s)					2.0	2.0		2.0	2.0			2.0
Lost Time Adjust (s)						0.0			0.0			0.0
Total Lost Time (s)						5.5			5.5			5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)					3.0	3.0		3.0	3.0			3.0
Recall Mode					C-Max	C-Max		None	None			None
Walk Time (s)					7.0	7.0		7.0	7.0			7.0
Flash Dont Walk (s)					10.0	10.0		10.0	10.0			7.0
Pedestrian Calls (#/hr)					5	5		16	16			3
Act Effct Green (s)						71.6			17.4			17.4
Actuated g/C Ratio						0.72			0.17			0.17
v/c Ratio						0.31			0.86			0.70
Control Delay						14.4			60.6			47.6
Queue Delay						1.1			0.0			0.0
Total Delay						15.5			60.6			47.6
LOS						B			E			D
Approach Delay						15.5			60.6			47.6
Approach LOS						B			E			D
Queue Length 50th (ft)						134			90			131
Queue Length 95th (ft)						311			m#149			197
Internal Link Dist (ft)						250			305			281
Turn Bay Length (ft)												
Base Capacity (vph)						2459			329			640
Starvation Cap Reductn						1367			0			0
Spillback Cap Reductn						0			0			0
Storage Cap Reductn						0			0			0
Reduced v/c Ratio						0.70			0.43			0.36
Intersection Summary												
Area Type:						Other						
Cycle Length:						100						
Actuated Cycle Length:						100						
Offset:						50 (50%), Referenced to phase 2: and 6:WBTL, Start of Yellow						
Natural Cycle:						90						
Control Type:						Actuated-Coordinated						
Maximum v/c Ratio:						0.86						
Intersection Signal Delay:						27.6			Intersection LOS: C			
Intersection Capacity Utilization:						52.5%			ICU Level of Service A			
Analysis Period (min):						15						
#						95th percentile volume exceeds capacity, queue may be longer.						

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C&S Engineers

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Alternative 3
4: Ellicott & Goodell

PM 2045
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Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Ellicott & Goodell



Alternative 3
5: Washington & Goodell

PM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔↔			↕			↕	↕
Traffic Volume (vph)	0	0	0	34	606	19	27	71	0	0	139	20
Future Volume (vph)	0	0	0	34	606	19	27	71	0	0	139	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	50	0	0	0	0	0	0	0	66
Storage Lanes	0	0	0	0	0	0	0	0	0	0	0	1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00			1.00				
Flt					0.996							0.850
Flt Protected					0.997			0.987				
Satd. Flow (prot)	0	0	0	0	3485	0	0	1852	0	0	1863	1538
Flt Permitted					0.997			0.776				
Satd. Flow (perm)	0	0	0	0	3483	0	0	1451	0	0	1863	1496
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					5							27
Link Speed (mph)		30			30			30				30
Link Distance (ft)		280			330			726				324
Travel Time (s)		6.4			7.5			16.5				7.4
Confl. Peds. (#/hr)				5		4	9					9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	3%	0%	2%	1%	0%	0%	2%	5%
Adj. Flow (vph)	0	0	0	36	638	20	28	75	0	0	146	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	694	0	0	103	0	0	146	21
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)					0			12				12
Link Offset(ft)					0			0				0
Crosswalk Width(ft)			16		16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors				1	2		1	2			2	1
Detector Template				Left	Thru		Left	Thru			Thru	Right
Leading Detector (ft)				20	100		20	100			100	20
Trailing Detector (ft)				0	0		0	0			0	0
Detector 1 Position(ft)				0	0		0	0			0	0
Detector 1 Size(ft)				20	6		20	6			6	20
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0			0.0	0.0
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	0.0
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	0.0
Detector 2 Position(ft)					94			94				94
Detector 2 Size(ft)					6			6				6
Detector 2 Type					Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0				0.0

Alternative 3
5: Washington & Goodell

PM 2045
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type				Perm	NA		Perm	NA			NA	Perm
Protected Phases					6			8			4	
Permitted Phases				6			8				4	4
Detector Phase				6	6		8	8			4	4
Switch Phase												
Minimum Initial (s)				7.0	7.0		7.0	7.0			7.0	7.0
Minimum Split (s)				55.0	55.0		30.0	30.0			30.0	30.0
Total Split (s)				64.0	64.0		36.0	36.0			36.0	36.0
Total Split (%)				64.0%	64.0%		36.0%	36.0%			36.0%	36.0%
Maximum Green (s)				58.5	58.5		30.5	30.5			30.5	30.5
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	3.5
All-Red Time (s)				2.0	2.0		2.0	2.0			2.0	2.0
Lost Time Adjust (s)					0.0			0.0			0.0	0.0
Total Lost Time (s)					5.5			5.5			5.5	5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	3.0
Recall Mode				C-Max	C-Max		None	None			None	None
Walk Time (s)				7.0	7.0		7.0	7.0			7.0	7.0
Flash Dont Walk (s)				10.0	10.0		10.0	10.0			10.0	10.0
Pedestrian Calls (#/hr)				9	9		3	3			9	9
Act Effect Green (s)					75.9			13.1			13.1	13.1
Actuated g/C Ratio					0.76			0.13			0.13	0.13
v/c Ratio					0.26			0.54			0.60	0.10
Control Delay					7.7			53.8			50.5	11.7
Queue Delay					0.4			0.0			0.0	0.0
Total Delay					8.1			53.8			50.5	11.7
LOS					A			D			D	B
Approach Delay					8.1			53.8			45.7	
Approach LOS					A			D			D	
Queue Length 50th (ft)					41			64			89	0
Queue Length 95th (ft)					194			m116			145	17
Internal Link Dist (ft)		200			250			646			244	
Turn Bay Length (ft)												66
Base Capacity (vph)					2643			442			568	475
Starvation Cap Reductn					1337			0			0	0
Spillback Cap Reductn					0			0			0	0
Storage Cap Reductn					0			0			0	0
Reduced v/c Ratio					0.53			0.23			0.26	0.04

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 99 (99%), Referenced to phase 2: and 6:WBTL, Start of Yellow
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.60
 Intersection Signal Delay: 19.5 Intersection LOS: B

Alternative 3
5: Washington & Goodell

PM 2045
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Intersection Capacity Utilization 47.0% ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 5: Washington & Goodell



Alternative 3
6: Main St & Edward/Goodell

PM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↕	↕		↕			↕	↕
Traffic Volume (vph)	25	0	0	73	337	254	18	88	0	0	207	114
Future Volume (vph)	25	0	0	73	337	254	18	88	0	0	207	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	0	80	0	0	0	0	0
Storage Lanes	0	0	0	0	1	1	0	0	0	0	0	2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Ped Bike Factor	0.99			1.00	0.96	0.99						
Frt					0.850							0.850
Flt Protected	0.950				0.991	0.950						
Satd. Flow (prot)	0	1805	0	0	3485	1568	1805	1827	0	0	1759	2842
Flt Permitted	0.950				0.889	0.950						
Satd. Flow (perm)	0	1780	0	0	3119	1498	1781	1827	0	0	1759	2842
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						265						119
Link Speed (mph)	30			30			30				30	
Link Distance (ft)	341			280			726				848	
Travel Time (s)	7.8			6.4			16.5				19.3	
Conf. Peds. (#/hr)	12		6	6		12	10					10
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	1%	3%	3%	0%	4%	0%	0%	8%	0%
Adj. Flow (vph)	26	0	0	76	351	265	19	92	0	0	216	119
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	0	0	427	265	19	92	0	0	216	119
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			0			12				12	
Link Offset(ft)	0			0			0				0	
Crosswalk Width(ft)	16			16			16				16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2			2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru			Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100			100	20
Trailing Detector (ft)	0	0		0	0	0	0	0			0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0			0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6			6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0			0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
C&S Engineers

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Alternative 3
6: Main St & Edward/Goodell

PM 2045
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Split	NA		Perm	NA	Perm	Prot	NA			NA	pt+ov
Protected Phases	2	2			6		3	8			4	4 2
Permitted Phases					6	6						
Detector Phase	2	2			6	6	3	8			4	4 2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0			7.0	
Minimum Split (s)	22.0	22.0		35.5	35.5	35.5	12.5	22.5			23.5	
Total Split (s)	22.0	22.0		38.0	38.0	38.0	13.0	40.0			27.0	
Total Split (%)	22.0%	22.0%		38.0%	38.0%	38.0%	13.0%	40.0%			27.0%	
Maximum Green (s)	16.5	16.5		32.5	32.5	32.5	7.5	34.5			21.5	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5			3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0			2.0	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0			0.0	
Total Lost Time (s)		5.5			5.5	5.5	5.5	5.5			5.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)	3.2	3.2		3.2	3.2	3.2	3.0	3.0			3.0	
Recall Mode	Max	Max		C-Max	C-Max	C-Max	None	None			None	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0			7.0	
Flash Dont Walk (s)	15.0	15.0		17.0	17.0	17.0	10.0	10.0			10.0	
Pedestrian Calls (#/hr)	6	6		12	12	12	28	28			10	
Act Effect Green (s)		28.9			32.5	32.5	7.1	22.1			17.0	51.4
Actuated g/C Ratio		0.29			0.32	0.32	0.07	0.22			0.17	0.51
v/c Ratio		0.05			0.42	0.40	0.15	0.23			0.72	0.08
Control Delay		57.2			27.5	9.4	34.4	23.5			52.9	3.3
Queue Delay		0.0			0.6	0.5	0.0	0.0			0.0	0.0
Total Delay		57.2			28.2	10.0	34.4	23.5			52.9	3.3
LOS		E			C	A	C	C			D	A
Approach Delay		57.2			21.2		25.4				35.3	
Approach LOS		E			C		C				D	
Queue Length 50th (ft)		15			90	0	10	48			131	0
Queue Length 95th (ft)		m26			181	130	m20	79			201	17
Internal Link Dist (ft)		261			200		646				768	
Turn Bay Length (ft)							80					
Base Capacity (vph)		520			1013	665	135	630			378	1488
Starvation Cap Reductn		0			283	142	0	0			0	0
Spillback Cap Reductn		0			0	0	0	0			0	0
Storage Cap Reductn		0			0	0	0	0			0	0
Reduced v/c Ratio		0.05			0.58	0.51	0.14	0.15			0.57	0.08
Intersection Summary												
Area Type:	Other											
Cycle Length:	100											
Actuated Cycle Length:	100											
Offset: 0 (0%), Referenced to phase 6:WBTL, Start of Yellow, Master Intersection												
Natural Cycle:	95											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.72											
Intersection Signal Delay:	26.4						Intersection LOS: C					

Lanes, Volumes, Timings
C&S Engineers

Synchro 11 Report
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Alternative 3
6: Main St & Edward/Goodell

PM 2045
01/17/2023

Intersection Capacity Utilization 57.9% ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 6: Main St & Edward/Goodell



Alternative 3
7: Tupper & Pearl

PM 2045
01/17/2023

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↕	↕		↕	↕	
Traffic Volume (vph)	50	761	20	40	126	100	77	300	180	41	79	15
Future Volume (vph)	50	761	20	40	126	100	77	300	180	41	79	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.97	0.99		0.99	
Frt		0.996			0.949			0.944			0.976	
Flt Protected		0.997			0.992		0.950		0.950			
Satd. Flow (prot)	0	3579	0	0	1767	0	1770	1765	0	1770	1801	0
Flt Permitted		0.912			0.799		0.661		0.152			
Satd. Flow (perm)	0	3274	0	0	1421	0	1190	1765	0	283	1801	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			37			33			10	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		688			351			561			691	
Travel Time (s)		15.6			8.0			12.8			15.7	
Confl. Peds. (#/hr)			20	20			14		6	6		14
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
Heavy Vehicles (%)	0%	0%	0%	2%	2%	0%	2%	0%	2%	2%	2%	2%
Adj. Flow (vph)	53	810	21	43	134	106	82	319	191	44	84	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	884	0	0	283	0	82	510	0	44	100	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		2			6			3		8		7
Permitted Phases		2			6			8		4		4

Alternative 3
7: Tupper & Pearl

PM 2045
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	2	2		6	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	27.5	27.5		23.5	23.5		12.5	23.5		12.5	40.0	
Total Split (s)	47.5	47.5		47.5	47.5		12.5	40.0		12.5	40.0	
Total Split (%)	47.5%	47.5%		47.5%	47.5%		12.5%	40.0%		12.5%	40.0%	
Maximum Green (s)	42.0	42.0		42.0	42.0		7.0	34.5		7.0	34.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.5			5.5		5.5	5.5		5.5	5.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		11.0	11.0		10.0	10.0		10.0	11.0	
Pedestrian Calls (#/hr)	20	20		0	0			6			14	
Act Effct Green (s)		50.3			50.3		35.4	31.2		34.3	28.7	
Actuated g/C Ratio		0.50			0.50		0.35	0.31		0.34	0.29	
v/c Ratio		0.54			0.39		0.18	0.89		0.22	0.19	
Control Delay		20.4			5.1		17.9	49.2		13.0	17.9	
Queue Delay		0.0			0.2		0.0	0.0		0.0	0.0	
Total Delay		20.4			5.4		17.9	49.2		13.0	17.9	
LOS		C			A		B	D		B	B	
Approach Delay		20.4			5.4			44.9			16.4	
Approach LOS		C			A			D			B	
Queue Length 50th (ft)		226			24		29	279		9	46	
Queue Length 95th (ft)		296			39		55	#446		21	88	
Internal Link Dist (ft)		608			271			481			611	
Turn Bay Length (ft)												
Base Capacity (vph)		1648			733		461	630		201	627	
Starvation Cap Reductn		0			106		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.54			0.45		0.18	0.81		0.22	0.16	

Intersection Summary

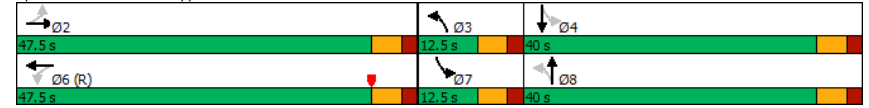
Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 11.5 (12%), Referenced to phase 6:WBTL, Start of Yellow
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 25.5
 Intersection LOS: C
 Intersection Capacity Utilization 85.9%
 ICU Level of Service E
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.

Alternative 3
7: Tupper & Pearl

PM 2045
01/17/2023

Queue shown is maximum after two cycles.

Splits and Phases: 7: Tupper & Pearl



Alternative 3
8: Main St & Tupper

PM 2045
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕↕			↕				↕↕		↕	↕	
Traffic Volume (vph)	60	840	25	41	378	25	70	21	61	145	84	15
Future Volume (vph)	60	840	25	41	378	25	70	21	61	145	84	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	0	0	0	0	80	0	0
Storage Lanes	0	0	0	0	0	0	0	0	0	1	0	0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00			1.00			0.92			0.97		0.98
Fit	0.996			0.992			0.946			0.977		0.977
Fit Protected	0.997			0.995			0.977			0.950		
Satd. Flow (prot)	0	3532	0	0	1865	0	0	1695	0	1770	1812	0
Fit Permitted	0.884			0.853			0.801			0.545		
Satd. Flow (perm)	0	3129	0	0	1598	0	0	1324	0	981	1812	0
Right Turn on Red		Yes			Yes		Yes			Yes		Yes
Satd. Flow (RTOR)	4			4			31			10		
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	351			263			1174			726		
Travel Time (s)	8.0			6.0			26.7			16.5		
Conf. Peds. (#/hr)	17		28	28		17	40		38	38		40
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	3%	0%	0%	4%	0%	4%	0%	2%	0%	2%
Adj. Flow (vph)	63	884	26	43	398	26	74	22	64	153	88	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	973	0	0	467	0	0	160	0	153	104	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			0			12			12		
Link Offset(ft)	0			0			0			0		
Crosswalk Width(ft)	16			16			16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
C&S Engineers

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Alternative 3
8: Main St & Tupper

PM 2045
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	50.0	50.0		50.0	50.0		23.5	23.5		12.5	40.0	
Total Split (s)	57.0	57.0		57.0	57.0		28.0	28.0		15.0	43.0	
Total Split (%)	57.0%	57.0%		57.0%	57.0%		28.0%	28.0%		15.0%	43.0%	
Maximum Green (s)	51.5	51.5		51.5	51.5		22.5	22.5		9.5	37.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.5			5.5			5.5			5.5	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	5.0	5.0		12.0	12.0		11.0	11.0			10.0	
Pedestrian Calls (#/hr)	28	28		17	17		38	38			4	
Act Effect Green (s)		58.4			58.4			15.7		30.6	30.6	
Actuated g/C Ratio		0.58			0.58			0.16		0.31	0.31	
v/c Ratio		0.53			0.50			0.68		0.41	0.19	
Control Delay		6.6			14.0			45.9		10.0	6.5	
Queue Delay		0.1			0.9			0.0		0.0	0.0	
Total Delay		6.6			14.9			45.9		10.0	6.5	
LOS		A			B			D		A	A	
Approach Delay		6.6			14.9			45.9			8.6	
Approach LOS		A			B			D			A	
Queue Length 50th (ft)		79			193			76		24	12	
Queue Length 95th (ft)		97			262			138		46	m30	
Internal Link Dist (ft)		271			183			1094			646	
Turn Bay Length (ft)										80		
Base Capacity (vph)		1830			935			321		374	685	
Starvation Cap Reductn		104			227			0		0	0	
Spillback Cap Reductn		55			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.56			0.66			0.50		0.41	0.15	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 11.5 (12%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.68
 Intersection Signal Delay: 12.4
 Intersection LOS: B

Lanes, Volumes, Timings
C&S Engineers

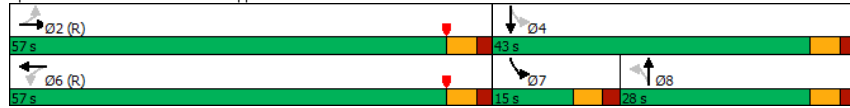
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Alternative 3
8: Main St & Tupper

PM 2045
01/17/2023

Intersection Capacity Utilization 80.0% ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Main St & Tupper



Alternative 3
9: Washington & Tupper

PM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕	↕		↕	↕
Traffic Volume (vph)	12	984	43	25	258	1	138	67	135	115	92	11
Future Volume (vph)	12	984	43	25	258	1	138	67	135	115	92	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	150		78	85		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00		0.95	0.96		0.97	0.99	
Frt		0.994						0.900			0.984	
Flt Protected		0.999			0.996		0.950			0.950		
Satd. Flow (prot)	0	3539	0	0	1892	0	1805	1629	0	1805	1816	0
Flt Permitted		0.950			0.852		0.561			0.397		
Satd. Flow (perm)	0	3365	0	0	1618	0	1014	1629	0	729	1816	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5					108				5	
Link Speed (mph)		30			30		30		30		30	
Link Distance (ft)		263			328		1190		726		726	
Travel Time (s)		6.0			7.5		27.0		16.5		16.5	
Confl. Peds. (#/hr)	21		17	17		21	23		26	26		23
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	1%	2%	0%	0%	0%	0%	3%	0%	0%	2%	2%
Adj. Flow (vph)	13	1093	48	28	287	1	153	74	150	128	102	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1154	0	0	316	0	153	224	0	128	114	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0		12		12		12	
Link Offset(ft)		0			0		0		0		0	
Crosswalk Width(ft)		16			16		16		16		16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Alternative 3
9: Washington & Tupper

PM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA	NA	NA
Protected Phases		2		6		6	3	8		7	4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	47.0	47.0		47.0	47.0		28.0	28.0		12.5	28.0	
Total Split (s)	46.0	46.0		46.0	46.0		27.0	37.8		16.2	27.0	
Total Split (%)	46.0%	46.0%		46.0%	46.0%		27.0%	37.8%		16.2%	27.0%	
Maximum Green (s)	40.5	40.5		40.5	40.5		21.5	32.3		10.7	21.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.5			5.5		5.5	5.5		5.5	5.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0			10.0			10.0	
Pedestrian Calls (#/hr)	17	17		21	21			26			23	
Act Effect Green (s)		59.1			59.1		26.6	14.6		22.1	12.4	
Actuated g/C Ratio		0.59			0.59		0.27	0.15		0.22	0.12	
v/c Ratio		0.58			0.33		0.42	0.68		0.48	0.50	
Control Delay		7.6			7.4		28.9	30.3		16.4	28.5	
Queue Delay		0.8			0.5		0.0	0.1		0.0	0.0	
Total Delay		8.4			7.9		28.9	30.4		16.4	28.5	
LOS		A			A		C	C		B	C	
Approach Delay		8.4			7.9			29.8			22.1	
Approach LOS		A			A			C			C	
Queue Length 50th (ft)		100			70		75	70		25	72	
Queue Length 95th (ft)		130			110		112	138		43	121	
Internal Link Dist (ft)		183			248			1110			646	
Turn Bay Length (ft)							150			85		
Base Capacity (vph)		1992			956		474	599		283	394	
Starvation Cap Reductn		196			301		0	0		0	0	
Spillback Cap Reductn		487			135		0	27		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.77			0.48		0.32	0.39		0.45	0.29	

Intersection Summary	
Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	11.5 (12%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle:	105
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.68
Intersection Signal Delay:	13.7
	Intersection LOS: B

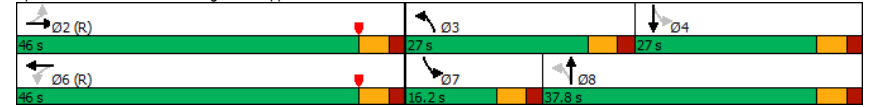
Alternative 3
9: Washington & Tupper

PM 2045
01/17/2023

Intersection Capacity Utilization 68.4%
Analysis Period (min) 15

ICU Level of Service C

Splits and Phases: 9: Washington & Tupper

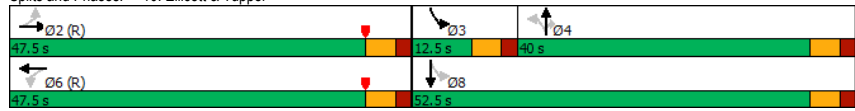


Alternative 3
10: Ellicott & Tupper

PM 2045
01/17/2023

Intersection Capacity Utilization 88.3% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 10: Ellicott & Tupper



Alternative 3
11: Tupper & Oak

PM 2045
01/17/2023

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑								↖	↗	
Traffic Volume (vph)	0	1573	226	0	0	0	0	0	0	216	384	170
Future Volume (vph)	0	1573	226	0	0	0	0	0	0	216	384	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	0.95
Ped Bike Factor		1.00									0.99	
Frt		0.981									0.956	
Fit Protected										0.950	0.998	
Satd. Flow (prot)	0	3496	0	0	0	0	0	0	0	1626	3233	0
Fit Permitted										0.950	0.998	
Satd. Flow (perm)	0	3496	0	0	0	0	0	0	0	1626	3233	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)		25								27	68	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		387			354			125			680	
Travel Time (s)		8.8			8.0			2.8			15.5	
Confl. Peds. (#/hr)			1	1			10					10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	2%	0%	0%	0%	0%	0%	0%	1%	1%	0%
Adj. Flow (vph)	0	1656	238	0	0	0	0	0	0	227	404	179
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	0	1894	0	0	0	0	0	0	0	204	606	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	0			0			12			12		
Link Offset(ft)	0			0			0			0		
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15			9	15		9	15	9
Number of Detectors		2								1	2	
Detector Template		Thru								Left	Thru	
Leading Detector (ft)		100								20	100	
Trailing Detector (ft)		0								0	0	
Detector 1 Position(ft)		0								0	0	
Detector 1 Size(ft)		6								20	6	
Detector 1 Type		CI+Ex								CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0								0.0	0.0	
Detector 1 Queue (s)		0.0								0.0	0.0	
Detector 1 Delay (s)		0.0								0.0	0.0	
Detector 2 Position(ft)		94									94	
Detector 2 Size(ft)		6									6	
Detector 2 Type		CI+Ex									CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0									0.0	

Alternative 3
11: Tupper & Oak

PM 2045
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type		NA								Perm	NA	
Protected Phases		2									4	
Permitted Phases										4		
Detector Phase		2								4	4	
Switch Phase												
Minimum Initial (s)		7.0								7.0	7.0	
Minimum Split (s)		50.0								40.0	40.0	
Total Split (s)		60.0								40.0	40.0	
Total Split (%)		60.0%								40.0%	40.0%	
Maximum Green (s)		54.5								34.5	34.5	
Yellow Time (s)		3.5								3.5	3.5	
All-Red Time (s)		2.0								2.0	2.0	
Lost Time Adjust (s)		0.0								0.0	0.0	
Total Lost Time (s)		5.5								5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0								3.0	3.0	
Recall Mode		C-Max								None	None	
Walk Time (s)		7.0								7.0	7.0	
Flash Dont Walk (s)		16.0								13.0	13.0	
Pedestrian Calls (#/hr)		1								10	10	
Act Effect Green (s)		64.1								24.9	24.9	
Actuated g/C Ratio		0.64								0.25	0.25	
v/c Ratio		0.84								0.48	0.71	
Control Delay		12.4								19.4	22.4	
Queue Delay		1.2								0.0	0.0	
Total Delay		13.6								19.4	22.4	
LOS		B								B	C	
Approach Delay		13.6									21.6	
Approach LOS		B									C	
Queue Length 50th (ft)		266								60	117	
Queue Length 95th (ft)		#751								m104	153	
Internal Link Dist (ft)		307		274			45				600	
Turn Bay Length (ft)												
Base Capacity (vph)		2250								578	1159	
Starvation Cap Reductn		169								0	0	
Spillback Cap Reductn		0								0	0	
Storage Cap Reductn		0								0	0	
Reduced v/c Ratio		0.91								0.35	0.52	

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	11.5 (12%), Referenced to phase 2:EBT and 6.; Start of Yellow
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.84
Intersection Signal Delay:	16.0
Intersection LOS:	B

Alternative 3
11: Tupper & Oak

PM 2045
01/17/2023

Intersection Capacity Utilization 75.4%	ICU Level of Service D
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 11: Tupper & Oak



Alternative 3
12: Tupper & Elm St

PM 2045
01/17/2023



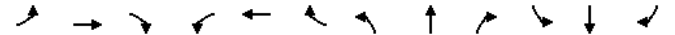
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕						↕↕				
Traffic Volume (vph)	7	1787	0	0	0	0	0	256	52	0	0	0
Future Volume (vph)	7	1787	0	0	0	0	0	256	52	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor		1.00										
Frt								0.975				
Fit Protected												
Satd. Flow (prot)	0	3574	0	0	0	0	0	3462	0	0	0	0
Fit Permitted												
Satd. Flow (perm)	0	3574	0	0	0	0	0	3462	0	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27						3				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		354			313			418			586	
Travel Time (s)		8.0			7.1			9.5			13.3	
Confl. Peds. (#/hr)	1		14				1					1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%
Adj. Flow (vph)	7	1861	0	0	0	0	0	267	54	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1868	0	0	0	0	0	321	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0						0			0	
Link Offset(ft)		0				0		0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2						2				
Detector Template	Left	Thru						Thru				
Leading Detector (ft)	20	100						100				
Trailing Detector (ft)	0	0						0				
Detector 1 Position(ft)	0	0						0				
Detector 1 Size(ft)	20	6						6				
Detector 1 Type	CI+Ex	CI+Ex						CI+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0						0.0				
Detector 1 Queue (s)	0.0	0.0						0.0				
Detector 1 Delay (s)	0.0	0.0						0.0				
Detector 2 Position(ft)		94						94				
Detector 2 Size(ft)		6						6				
Detector 2 Type		CI+Ex						CI+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0				
Turn Type	Perm	NA						NA				
Protected Phases		2						8				
Permitted Phases		2										

Lanes, Volumes, Timings
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Alternative 3
12: Tupper & Elm St

PM 2045
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	2	2										8
Switch Phase												
Minimum Initial (s)	7.0	7.0										7.0
Minimum Split (s)	30.0	30.0										23.5
Total Split (s)	50.0	50.0										50.0
Total Split (%)	50.0%	50.0%										50.0%
Maximum Green (s)	44.5	44.5										44.5
Yellow Time (s)	3.5	3.5										3.5
All-Red Time (s)	2.0	2.0										2.0
Lost Time Adjust (s)		0.0										0.0
Total Lost Time (s)		5.5										5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0										3.0
Recall Mode	C-Max	C-Max										None
Walk Time (s)	7.0	7.0										7.0
Flash Dont Walk (s)	11.0	11.0										11.0
Pedestrian Calls (#/hr)	14	14										1
Act Effct Green (s)		74.4										14.6
Actuated g/C Ratio		0.74										0.15
v/c Ratio		0.70										0.63
Control Delay		4.7										45.3
Queue Delay		0.4										0.0
Total Delay		5.0										45.3
LOS		A										D
Approach Delay		5.0										45.3
Approach LOS		A										D
Queue Length 50th (ft)		145										101
Queue Length 95th (ft)		165										141
Internal Link Dist (ft)		274				233					338	506
Turn Bay Length (ft)												
Base Capacity (vph)		2665										1542
Starvation Cap Reductn		295										0
Spillback Cap Reductn		0										0
Storage Cap Reductn		0										0
Reduced v/c Ratio		0.79										0.21
Intersection Summary												
Area Type:	Other											
Cycle Length:	100											
Actuated Cycle Length:	100											
Offset:	11.5 (12%), Referenced to phase 2:EBTL and 6.; Start of Yellow											
Natural Cycle:	65											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.70											
Intersection Signal Delay:	10.9						Intersection LOS: B					
Intersection Capacity Utilization:	67.5%						ICU Level of Service C					
Analysis Period (min)	15											

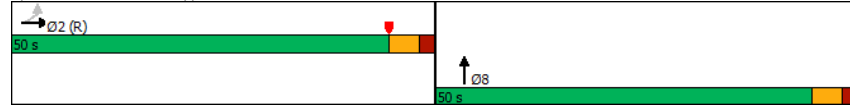
Lanes, Volumes, Timings
C&S Engineers

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Alternative 3
12: Tupper & Elm St

PM 2045
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Splits and Phases: 12: Tupper & Elm St



Alternative 3
14: Pearl & Edward

PM 2045
01/17/2023

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↕↕	↕↕	
Traffic Volume (vph)	0	0	50	257	425	25
Future Volume (vph)	0	0	50	257	425	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt					0.993	
Fit Protected				0.992	0.955	
Satd. Flow (prot)	0	0	0	3511	1766	0
Fit Permitted				0.992	0.955	
Satd. Flow (perm)	0	0	0	3511	1766	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)					4	
Link Speed (mph)	30			30	30	
Link Distance (ft)	289			341	691	
Travel Time (s)	6.6			7.8	15.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	54	279	462	27
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	333	489	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60	60		60	60
Number of Detectors			1	2	1	
Detector Template			Left	Thru	Left	
Leading Detector (ft)			20	100	20	
Trailing Detector (ft)			0	0	0	
Detector 1 Position(ft)			0	0	0	
Detector 1 Size(ft)			20	6	20	
Detector 1 Type			CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)			0.0	0.0	0.0	
Detector 1 Queue (s)			0.0	0.0	0.0	
Detector 1 Delay (s)			0.0	0.0	0.0	
Detector 2 Position(ft)					94	
Detector 2 Size(ft)					6	
Detector 2 Type					CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)					0.0	
Turn Type			Perm	NA	Prot	
Protected Phases				6	8	
Permitted Phases				6		
Detector Phase				6	8	
Switch Phase						
Minimum Initial (s)				7.0	7.0	7.0

Alternative 3
14: Pearl & Edward

PM 2045
01/17/2023

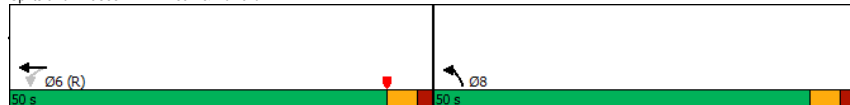


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)		23.5	23.5	23.5		
Total Split (s)		50.0	50.0	50.0		
Total Split (%)		50.0%	50.0%	50.0%		
Maximum Green (s)		44.5	44.5	44.5		
Yellow Time (s)		3.5	3.5	3.5		
All-Red Time (s)		2.0	2.0	2.0		
Lost Time Adjust (s)			0.0	0.0		
Total Lost Time (s)			5.5	5.5		
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)			3.0	3.0	3.0	
Recall Mode			C-Max	C-Max	Max	
Walk Time (s)			7.0	7.0	7.0	
Flash Dont Walk (s)			11.0	11.0	11.0	
Pedestrian Calls (#/hr)			0	0	0	
Act Effct Green (s)			44.5	44.5		
Actuated g/C Ratio			0.44	0.44		
v/c Ratio			0.21	0.62		
Control Delay			17.9	17.2		
Queue Delay			0.0	0.0		
Total Delay			17.9	17.2		
LOS			B	B		
Approach Delay			17.9	17.2		
Approach LOS			B	B		
Queue Length 50th (ft)			80	158		
Queue Length 95th (ft)			135	m273		
Internal Link Dist (ft)	209		261	611		
Turn Bay Length (ft)						
Base Capacity (vph)			1562	788		
Starvation Cap Reductn			0	0		
Spillback Cap Reductn			0	0		
Storage Cap Reductn			0	0		
Reduced v/c Ratio			0.21	0.62		

Intersection Summary

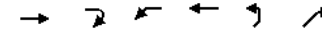
Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 44.5 (45%), Referenced to phase 6:WBTL, Start of Yellow
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.62
 Intersection Signal Delay: 17.4 Intersection LOS: B
 Intersection Capacity Utilization 42.8% ICU Level of Service A
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: Pearl & Edward



Alternative 3
34:

PM 2045
01/17/2023



Lane Group	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations	↑↑					↑↑
Traffic Volume (vph)	1457	0	0	0	0	1603
Future Volume (vph)	1457	0	0	0	0	1603
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	1.00	1.00	0.88
Frt						0.850
Fit Protected						
Satd. Flow (prot)	3539	0	0	0	0	2787
Fit Permitted						
Satd. Flow (perm)	3539	0	0	0	0	2787
Link Speed (mph)	30			55	55	
Link Distance (ft)	334			197	283	
Travel Time (s)	7.6			2.4	3.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1584	0	0	0	0	1742
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1584	0	0	0	0	1742
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type: Other
 Control Type: Unsignalized
 Intersection Capacity Utilization 103.0% ICU Level of Service G
 Analysis Period (min) 15

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Alternative 3
14: Pearl & Edward

PM 2025
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Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)	24.5	24.5	24.5	24.5	24.5	24.5
Total Split (s)	63.0	63.0	63.0	63.0	37.0	37.0
Total Split (%)	63.0%	63.0%	63.0%	63.0%	37.0%	37.0%
Maximum Green (s)	57.5	57.5	57.5	57.5	31.5	31.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)			3.0	3.0	3.0	3.0
Recall Mode			C-Max	C-Max	Max	Max
Walk Time (s)			7.0	7.0	7.0	7.0
Flash Dont Walk (s)			12.0	12.0	12.0	12.0
Pedestrian Calls (#/hr)			10	10	10	10
Act Effct Green (s)			57.5	57.5	31.5	31.5
Actuated g/C Ratio			0.58	0.58	0.32	0.32
v/c Ratio			0.21	0.21	0.88	0.88
Control Delay			3.9	3.9	53.2	53.2
Queue Delay			0.0	0.0	0.0	0.0
Total Delay			3.9	3.9	53.2	53.2
LOS			A	A	D	D
Approach Delay			3.9	3.9	53.2	53.2
Approach LOS			A	A	D	D
Queue Length 50th (ft)			17	17	270	270
Queue Length 95th (ft)			28	28	#469	#469
Internal Link Dist (ft)	209		261	261	611	611
Turn Bay Length (ft)						
Base Capacity (vph)			2014	2014	558	558
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			0.21	0.21	0.88	0.88

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 7.5 (8%), Referenced to phase 2: and 6:WBT, Start of Yellow
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 30.5
 Intersection Capacity Utilization 45.4%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Alternative 3
14: Pearl & Edward

PM 2025
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Splits and Phases: 14: Pearl & Edward



Alternative 4
1: Michigan & Goodell

AM 2025
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔↔↔	↔↔↔	↔↔↔	↔↔↔	↔↔↔	↔↔↔	↔↔↔	↔↔↔	↔↔↔
Traffic Volume (vph)	0	0	0	218	1433	333	182	674	0	0	296	48
Future Volume (vph)	0	0	0	218	1433	333	182	674	0	0	296	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	0	4904	0	1752	1792	0	0	3369	0
Fit Permitted				0.995	0.390							
Satd. Flow (perm)	0	0	0	0	4904	0	716	1792	0	0	3369	0
Right Turn on Red			Yes		Yes			Yes			Yes	
Satd. Flow (RTOR)				50							16	
Link Speed (mph)		30		30			30			30		
Link Distance (ft)		402		274			648			972		
Travel Time (s)		9.1		6.2			14.7			22.1		
Confl. Peds. (#/hr)					4	6						6
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	1%	2%	3%	3%	6%	0%	0%	5%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	2067	0	190	702	0	0	358	0
Number of Detectors				1	2		1	2			2	
Detector Template				Left	Thru		Left	Thru			Thru	
Leading Detector (ft)				20	100		20	100			100	
Trailing Detector (ft)				0	0		0	0			0	
Detector 1 Position(ft)				0	0		0	0			0	
Detector 1 Size(ft)				20	6		20	6			6	
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Split	NA		pm+pt	NA			NA	
Protected Phases				6	6		3	8			4	
Permitted Phases							8					
Detector Phase				6	6		3	8			4	
Switch Phase												
Minimum Initial (s)				7.0	7.0		7.0	7.0			7.0	
Minimum Split (s)				45.0	45.0		12.5	26.5			23.5	
Total Split (s)				55.0	55.0		19.4	55.0			35.6	
Total Split (%)				50.0%	50.0%		17.6%	50.0%			32.4%	
Maximum Green (s)				49.5	49.5		13.9	49.5			30.1	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		2.0	2.0			2.0	
Lost Time Adjust (s)					0.0			0.0			0.0	
Total Lost Time (s)					5.5			5.5			5.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	

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Alternative 4
1: Michigan & Goodell

AM 2025
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)				4.0	4.0		3.0	3.0			3.0	
Recall Mode				C-Max	C-Max		None	None			None	
Walk Time (s)				7.0	7.0		7.0				7.0	
Flash Dont Walk (s)				10.0	10.0		14.0				11.0	
Pedestrian Calls (#/hr)				4	4		3				6	
Act Effct Green (s)					52.2		46.8	46.8			28.9	
Actuated g/C Ratio					0.47		0.43	0.43			0.26	
v/c Ratio					0.88		0.45	0.92			0.40	
Control Delay					31.5		23.4	48.2			33.0	
Queue Delay					0.0		0.0	0.0			0.0	
Total Delay					31.5		23.4	48.2			33.0	
LOS					C		C	D			C	
Approach Delay					31.5		42.9				33.0	
Approach LOS					C		D				C	
90th %ile Green (s)				49.5	49.5		13.9	49.5			30.1	
90th %ile Term Code				Coord	Coord		Max	Max			Hold	
70th %ile Green (s)				49.5	49.5		13.9	49.5			30.1	
70th %ile Term Code				Coord	Coord		Max	Max			Hold	
50th %ile Green (s)				49.5	49.5		12.8	49.5			31.2	
50th %ile Term Code				Coord	Coord		Gap	Max			Hold	
30th %ile Green (s)				53.0	53.0		11.8	46.0			28.7	
30th %ile Term Code				Coord	Coord		Gap	Gap			Hold	
10th %ile Green (s)					59.3		9.6	39.7			24.6	
10th %ile Term Code				Coord	Coord		Gap	Gap			Hold	
Queue Length 50th (ft)					482		81	437			101	
Queue Length 95th (ft)					#567		131	#667			146	
Internal Link Dist (ft)				322		194		568			892	
Turn Bay Length (ft)												
Base Capacity (vph)					2351		436	806			940	
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					0.88		0.44	0.87			0.38	

Intersection Summary

Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 93 (85%), Referenced to phase 6:WBTL, Start of Yellow
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 34.8
 Intersection Capacity Utilization 84.3%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

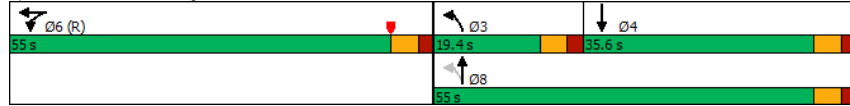
Lanes, Volumes, Timings
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Alternative 4
1: Michigan & Goodell

AM 2025
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Splits and Phases: 1: Michigan & Goodell



Alternative 4
2: Elm St/Bennett Ln & Goodell

AM 2025
01/17/2023

	←	→	↙	↘	↖	↗	↑	↙	↘	↓	↖	↗
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↑	↑				↑
Traffic Volume (vph)	0	0	0	0	1671	8	452	2	0	0	0	19
Future Volume (vph)	0	0	0	0	1671	8	452	2	0	0	0	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	0	5025	0	1681	1680	0	0	0	1565
Fit Permitted							0.950	0.953				
Satd. Flow (perm)	0	0	0	0	5025	0	1674	1673	0	0	0	1565
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Satd. Flow (RTOR)					1		25	25				25
Link Speed (mph)		30			30			30				30
Link Distance (ft)		335			402			586				382
Travel Time (s)		7.6			9.1			13.3				8.7
Confl. Peds. (#/hr)						1	2					2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	0%	3%	25%	2%	50%	0%	0%	0%	5%
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	0	0	0	0	1806	0	243	245	0	0	0	20
Number of Detectors					2		1	2				1
Detector Template					Thru		Left	Thru				Right
Leading Detector (ft)					100		20	100				20
Trailing Detector (ft)					0		0	0				0
Detector 1 Position(ft)					0		0	0				0
Detector 1 Size(ft)					6		20	6				20
Detector 1 Type					CI+Ex		CI+Ex	CI+Ex				CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)					0.0		0.0	0.0				0.0
Detector 1 Queue (s)					0.0		0.0	0.0				0.0
Detector 1 Delay (s)					0.0		0.0	0.0				0.0
Detector 2 Position(ft)					94			94				
Detector 2 Size(ft)					6			6				
Detector 2 Type					CI+Ex			CI+Ex				
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0				
Turn Type					NA		Perm	NA				Prot
Protected Phases					6			8				4
Permitted Phases							8					
Detector Phase					6		8	8				4
Switch Phase												
Minimum Initial (s)					7.0		7.0	7.0				7.0
Minimum Split (s)					23.5		23.5	23.5				23.5
Total Split (s)					71.0		39.0	39.0				39.0
Total Split (%)					64.5%		35.5%	35.5%				35.5%
Maximum Green (s)					65.5		33.5	33.5				33.5
Yellow Time (s)					3.5		3.5	3.5				3.5
All-Red Time (s)					2.0		2.0	2.0				2.0
Lost Time Adjust (s)					0.0		0.0	0.0				0.0
Total Lost Time (s)					5.5		5.5	5.5				5.5
Lead/Lag												
Lead-Lag Optimize?												

Alternative 4
2: Elm St/Bennett Ln & Goodell

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)					3.0		3.0	3.0				3.0
Recall Mode					C-Max		Min	Min				None
Walk Time (s)					7.0		7.0	7.0				
Flash Dont Walk (s)					11.0		9.0	9.0				
Pedestrian Calls (#/hr)					2		0	0				
Act Effect Green (s)					78.3		20.7	20.7				20.7
Actuated g/C Ratio					0.71		0.19	0.19				0.19
v/c Ratio					0.50		0.73	0.73				0.06
Control Delay					2.0		49.5	50.0				10.3
Queue Delay					0.5		0.0	0.0				0.0
Total Delay					2.4		49.5	50.0				10.3
LOS					A		D	D				B
Approach Delay					2.4		49.7				10.3	
Approach LOS					A		D				B	
90th %ile Green (s)					69.9		29.1	29.1				29.1
90th %ile Term Code					Coord		Gap	Gap				Hold
70th %ile Green (s)					75.0		24.0	24.0				24.0
70th %ile Term Code					Coord		Gap	Gap				Hold
50th %ile Green (s)					78.1		20.9	20.9				20.9
50th %ile Term Code					Coord		Gap	Gap				Hold
30th %ile Green (s)					82.1		16.9	16.9				16.9
30th %ile Term Code					Coord		Gap	Gap				Hold
10th %ile Green (s)					86.6		12.4	12.4				12.4
10th %ile Term Code					Coord		Gap	Gap				Hold
Queue Length 50th (ft)					34		153	155				0
Queue Length 95th (ft)					44		224	226				16
Internal Link Dist (ft)		255			322		506			302		
Turn Bay Length (ft)												
Base Capacity (vph)					3579		527	526				494
Starvation Cap Reductn					1120		0	0				0
Spillback Cap Reductn					10		0	0				0
Storage Cap Reductn					0		0	0				0
Reduced v/c Ratio					0.73		0.46	0.47				0.04

Intersection Summary

Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 13 (12%), Referenced to phase 6:WBT, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.73
 Intersection Signal Delay: 12.5 Intersection LOS: B
 Intersection Capacity Utilization 54.2% ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 2: Elm St/Bennett Ln & Goodell



Alternative 4
3: Oak & Goodell

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔							↔
Traffic Volume (vph)	100	0	440	298	1677	100	0	0	0	0	54	2
Future Volume (vph)	100	0	440	298	1677	100	0	0	0	0	54	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	1676	0	1752	3493	0	0	0	0	0	1871	0
Fit Permitted		0.461		0.420								
Satd. Flow (perm)	0	780	0	775	3493	0	0	0	0	0	1871	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		341		13							1	
Link Speed (mph)		30		30			30				30	
Link Distance (ft)		385		335			680				542	
Travel Time (s)		8.8		7.6			15.5				12.3	
Confl. Peds. (#/hr)						4						6
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	3%	2%	8%	2%	0%	0%	0%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	557	0	307	1832	0	0	0	0	0	58	0
Number of Detectors	1	2		1	2						2	
Detector Template	Left	Thru		Left	Thru						Thru	
Leading Detector (ft)	20	100		20	100						100	
Trailing Detector (ft)	0	0		0	0						0	
Detector 1 Position(ft)	0	0		0	0						0	
Detector 1 Size(ft)	20	6		20	6						6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex						CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0						0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0						0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0						0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		CI+Ex			CI+Ex						CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type	Perm	NA		pm+pt	NA						NA	
Protected Phases		2		1	6						4	
Permitted Phases	2			6								
Detector Phase	2	2		1	6						4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0						7.0	
Minimum Split (s)	23.5	23.5		12.5	58.0						27.0	
Total Split (s)	69.0	69.0		14.0	83.0						27.0	
Total Split (%)	62.7%	62.7%		12.7%	75.5%						24.5%	
Maximum Green (s)	63.5	63.5		8.5	77.5						21.5	
Yellow Time (s)	3.5	3.5		3.5	3.5						3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0						2.0	
Lost Time Adjust (s)		0.0		0.0	0.0						0.0	
Total Lost Time (s)		5.5		5.5	5.5						5.5	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?												

Lanes, Volumes, Timings
C&S Engineers

Synchro 11 Report
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Alternative 4
3: Oak & Goodell

AM 2025
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	3.0	3.0		3.0	3.0						3.0	
Recall Mode	None	None		None	C-Max						None	
Walk Time (s)	7.0	7.0		7.0	7.0						7.0	
Flash Dont Walk (s)	11.0	11.0		12.0	12.0						14.0	
Pedestrian Calls (#/hr)	0	0		41	41						14	
Act Effect Green (s)		74.3		88.5	89.6						13.0	
Actuated g/C Ratio		0.68		0.80	0.81						0.12	
v/c Ratio		0.87		0.44	0.64						0.26	
Control Delay		22.6		3.1	2.9						43.5	
Queue Delay		0.8		0.3	0.1						0.0	
Total Delay		23.4		3.4	3.1						43.5	
LOS		C		A	A						D	
Approach Delay		23.4		3.1	3.1						43.5	
Approach LOS		C		A	A						D	
90th %ile Green (s)	63.5	63.5		9.0	78.0						21.0	
90th %ile Term Code	Coord	Coord		Max	Coord						Ped	
70th %ile Green (s)	63.5	63.5		9.0	78.0						21.0	
70th %ile Term Code	Coord	Coord		Max	Coord						Ped	
50th %ile Green (s)	75.2	75.2		9.6	90.3						8.7	
50th %ile Term Code	Coord	Coord		Gap	Coord						Gap	
30th %ile Green (s)	77.5	77.5		8.6	91.6						7.4	
30th %ile Term Code	Coord	Coord		Gap	Coord						Gap	
10th %ile Green (s)	92.0	92.0		7.0	104.5						0.0	
10th %ile Term Code	Coord	Coord		Min	Coord						Skip	
Queue Length 50th (ft)		92		15	48						39	
Queue Length 95th (ft)		#573		30	130						71	
Internal Link Dist (ft)		305		255	600						462	
Turn Bay Length (ft)												
Base Capacity (vph)		637		702	2846						366	
Starvation Cap Reductn		11		89	216						0	
Spillback Cap Reductn		0		0	47						0	
Storage Cap Reductn		0		0	0						0	
Reduced v/c Ratio		0.89		0.50	0.70						0.16	

Intersection Summary

Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 6:WBTL, Start of Yellow, Master Intersection
 Natural Cycle: 135
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.87
 Intersection Signal Delay: 8.1
 Intersection Capacity Utilization 103.9%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Alternative 4
3: Oak & Goodell

AM 2025
01/17/2023

Splits and Phases: 3: Oak & Goodell



Alternative 4
4: Ellicott & Goodell

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Volume (vph)	40	310	20	63	1351	350	19	90	0	130	37	11
Future Volume (vph)	40	310	20	63	1351	350	19	90	0	130	37	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	1877	0	0	3398	0	0	1883	0	1805	1714	0
Fit Permitted	0.518		0.917		0.935		0.426					
Satd. Flow (perm)	0	977	0	0	3121	0	0	1774	0	809	1714	0
Right Turn on Red	Yes			Yes			Yes			Yes		
Satd. Flow (RTOR)	4		39				12					
Link Speed (mph)	30		30		30		30		30			
Link Distance (ft)	330		385		723		475					
Travel Time (s)	7.5		8.8		16.4		10.8					
Confl. Peds. (#/hr)	9			3								
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	4%	3%	2%	0%	0%	0%	0%	3%	20%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	389	0	0	1856	0	0	115	0	137	51	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)	94		94		94		94		94			
Detector 2 Size(ft)	6		6		6		6		6			
Detector 2 Type	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex			
Detector 2 Channel												
Detector 2 Extend (s)	0.0		0.0		0.0		0.0		0.0			
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases	2		6		6		8		7			
Permitted Phases	2		6		6		8		4			
Detector Phase	2	2		6	6		8	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	23.5	23.5		50.0	50.0		40.0	40.0		12.5	40.0	
Total Split (s)	59.0	59.0		59.0	59.0		36.0	36.0		15.0	51.0	
Total Split (%)	53.6%	53.6%		53.6%	53.6%		32.7%	32.7%		13.6%	46.4%	
Maximum Green (s)	53.5	53.5		53.5	53.5		30.5	30.5		9.5	45.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0		0.0		0.0		0.0		0.0			
Total Lost Time (s)	5.5		5.5		5.5		5.5		5.5			
Lead/Lag							Lag	Lag	Lead			
Lead-Lag Optimize?							Yes	Yes	Yes			

Alternative 4
4: Ellicott & Goodell

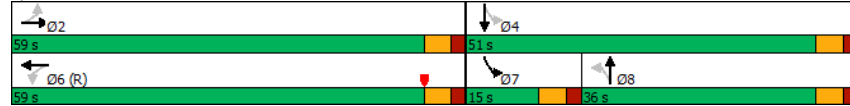
AM 2025
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		9	9		20	20		3	3	
Act Effect Green (s)	71.3		71.3		12.9		27.7		27.7			
Actuated g/C Ratio	0.65		0.65		0.12		0.25		0.25			
v/c Ratio	0.61		0.91		0.56		0.48		0.12			
Control Delay	19.7		13.0		55.3		38.2		24.8			
Queue Delay	1.0		0.0		0.0		0.0		0.0			
Total Delay	20.7		13.0		55.3		38.2		24.8			
LOS	C		B		E		D		C			
Approach Delay	20.7		13.0		55.3		34.5					
Approach LOS	C		B		E		C					
90th %ile Green (s)	67.0	67.0		67.0	67.0		17.0	17.0		9.5	32.0	
90th %ile Term Code	Coord	Coord		Coord	Coord		Ped	Ped		Max	Hold	
70th %ile Green (s)	67.0	67.0		67.0	67.0		17.0	17.0		9.5	32.0	
70th %ile Term Code	Coord	Coord		Coord	Coord		Ped	Ped		Max	Hold	
50th %ile Green (s)	71.7	71.7		71.7	71.7		12.3	12.3		9.5	27.3	
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Max	Hold	
30th %ile Green (s)	73.6	73.6		73.6	73.6		10.4	10.4		9.5	25.4	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Max	Hold	
10th %ile Green (s)	77.4	77.4		77.4	77.4		7.6	7.6		8.5	21.6	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Gap	Hold	
Queue Length 50th (ft)	212		206		78		79		21			
Queue Length 95th (ft)	376		#813		132		127		50			
Internal Link Dist (ft)	250		305		643		395					
Turn Bay Length (ft)												
Base Capacity (vph)	635		2037		491		289		716			
Starvation Cap Reductn	84		0		0		0		0			
Spillback Cap Reductn	26		0		0		0		0			
Storage Cap Reductn	0		0		0		0		0			
Reduced v/c Ratio	0.71		0.91		0.23		0.47		0.07			
Intersection Summary												
Area Type:	Other											
Cycle Length: 110												
Actuated Cycle Length: 110												
Offset: 8 (7%), Referenced to phase 6:WBTL, Start of Yellow												
Natural Cycle: 135												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.91												
Intersection Signal Delay: 17.7	Intersection LOS: B											
Intersection Capacity Utilization 76.7%	ICU Level of Service D											
Analysis Period (min) 15												
# 95th percentile volume exceeds capacity, queue may be longer.												
Queue shown is maximum after two cycles.												

Alternative 4
4: Ellicott & Goodell

AM 2025
01/17/2023

Splits and Phases: 4: Ellicott & Goodell



Alternative 4
5: Washington & Goodell

AM 2025
01/17/2023

	←	→	↙	↘	↖	↗	↕	↙	↘	↖	↗	↕
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Volume (vph)	40	235	20	21	1277	66	20	23	0	75	39	6
Future Volume (vph)	40	235	20	21	1277	66	20	23	0	75	39	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	50		0	0		0	0		66
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1870	0	0	3478	0	0	1564	0	1805	1773	0
Fit Permitted		0.717			0.947			0.828		0.862		
Satd. Flow (perm)	0	1350	0	0	3297	0	0	1319	0	1638	1773	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			10							6
Link Speed (mph)		30			30			30				30
Link Distance (ft)		280			330			726				324
Travel Time (s)		6.4			7.5			16.5				7.4
Confl. Peds. (#/hr)						2	6					6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	1%	3%	0%	40%	0%	0%	0%	3%	17%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	310	0	0	1435	0	0	45	0	79	47	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			8	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	23.5	23.5		55.0	55.0		30.0	30.0		30.0	30.0	
Total Split (s)	79.0	79.0		79.0	79.0		31.0	31.0		31.0	31.0	
Total Split (%)	71.8%	71.8%		71.8%	71.8%		28.2%	28.2%		28.2%	28.2%	
Maximum Green (s)	73.5	73.5		73.5	73.5		25.5	25.5		25.5	25.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	

Alternative 4
5: Washington & Goodell

AM 2025
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Lost Time (s)	5.5			5.5			5.5			5.5		
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		11	11		9	9		9	9	
Act Effct Green (s)	90.8			90.8			11.8			11.8		
Actuated g/C Ratio	0.83			0.83			0.11			0.11		
v/c Ratio	0.28			0.53			0.32			0.45		
Control Delay	5.8			0.7			49.9			53.2		
Queue Delay	1.4			0.2			0.0			0.0		
Total Delay	7.2			1.0			49.9			53.2		
LOS	A			A			D			D		
Approach Delay	7.2			1.0			49.9			48.9		
Approach LOS	A			A			D			D		
90th %ile Green (s)	82.0	82.0		82.0	82.0		17.0	17.0		17.0	17.0	
90th %ile Term Code	Coord	Coord		Coord	Coord		Ped	Ped		Ped	Ped	
70th %ile Green (s)	85.3	85.3		85.3	85.3		13.7	13.7		13.7	13.7	
70th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
50th %ile Green (s)	87.4	87.4		87.4	87.4		11.6	11.6		11.6	11.6	
50th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
30th %ile Green (s)	89.5	89.5		89.5	89.5		9.5	9.5		9.5	9.5	
30th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
10th %ile Green (s)	104.5	104.5		104.5	104.5		0.0	0.0		0.0	0.0	
10th %ile Term Code	Coord	Coord		Coord	Coord		Skip	Skip		Skip	Skip	
Queue Length 50th (ft)	137			7			30			53		
Queue Length 95th (ft)	m200			m17			63			98		
Internal Link Dist (ft)	200			250			646			244		
Turn Bay Length (ft)												
Base Capacity (vph)	1116			2724			305			379		
Starvation Cap Reductn	603			527			0			0		
Spillback Cap Reductn	85			329			0			0		
Storage Cap Reductn	0			0			0			0		
Reduced v/c Ratio	0.60			0.65			0.15			0.21		

Intersection Summary

Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 14 (13%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.53
 Intersection Signal Delay: 6.3 Intersection LOS: A
 Intersection Capacity Utilization 65.9% ICU Level of Service C
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Alternative 4
5: Washington & Goodell

AM 2025
01/17/2023

Splits and Phases: 5: Washington & Goodell



Alternative 4
6: Main St & Pearl/Goodell

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	80	10	41	871	447	17	62	10	155	68	172
Future Volume (vph)	65	80	10	41	871	447	17	62	10	155	68	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	80	0	0	0	0	0	0
Storage Lanes	0	0	0	0	1	1	0	1	0	1	1	1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1839	0	0	3492	1553	1703	1769	0	1805	1810	1509
Fit Permitted		0.979			0.998		0.950			0.950		
Satd. Flow (perm)	0	1839	0	0	3490	1553	1661	1769	0	1805	1810	1509
Right Turn on Red			Yes			Yes		Yes				Yes
Satd. Flow (RTOR)		3				481		7				185
Link Speed (mph)		30			30			30				30
Link Distance (ft)		322			280			726				848
Travel Time (s)		7.3			6.4			16.5				19.3
Confl. Peds. (#/hr)	2		5	5		2	14					14
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	7%	3%	4%	6%	6%	0%	0%	5%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	167	0	0	981	481	18	78	0	167	73	185
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Split	NA		Split	NA	Prot	Prot	NA		Prot	NA	pt+ov
Protected Phases	2	2		6	6	6	3	8		7	4	4 2
Permitted Phases												
Detector Phase	2	2		6	6	6	3	8		7	4	4 2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	23.0	23.0		36.3	36.3	36.3	12.5	28.3		12.5	25.0	
Total Split (s)	23.0	23.0		39.0	39.0	39.0	19.0	29.0		19.0	29.0	
Total Split (%)	20.9%	20.9%		35.5%	35.5%	35.5%	17.3%	26.4%		17.3%	26.4%	
Maximum Green (s)	17.5	17.5		33.5	33.5	33.5	13.5	23.5		13.5	23.5	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	

Alternative 4
6: Main St & Pearl/Goodell

AM 2025
01/17/2023

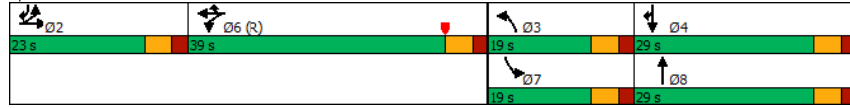
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Lost Time (s)	5.5											
Lead/Lag							Lead	Lag			Lead	Lag
Lead-Lag Optimize?							Yes	Yes			Yes	Yes
Vehicle Extension (s)	4.3	4.3	3.2			3.2	3.2	4.3	3.0			3.0
Recall Mode	Min	Min	C-Max			C-Max	C-Max	None	None			None
Walk Time (s)	7.0	7.0	7.0			7.0	7.0	7.0			7.0	
Flash Dont Walk (s)	15.0	15.0	17.0			17.0	17.0	10.0			10.0	
Pedestrian Calls (#/hr)	5	5	2			2	2	26			14	
Act Effect Green (s)	16.7			47.4			47.4	8.1	13.5			12.9
Actuated g/C Ratio	0.15			0.43			0.43	0.07	0.12			0.12
v/c Ratio	0.59			0.65			0.51	0.14	0.35			0.79
Control Delay	50.7			16.9			5.1	49.8	43.1			73.4
Queue Delay	0.6			1.0			0.6	0.0	0.2			0.0
Total Delay	51.3			17.9			5.7	49.8	43.3			73.4
LOS	D			B			A	D	D			E
Approach Delay	51.3			13.9			44.5			36.6		
Approach LOS	D			B			D			D		
90th %ile Green (s)	23.3	23.3	34.2			34.2	34.2	9.8	17.0			13.5
90th %ile Term Code	Gap	Gap	Coord			Coord	Coord	Gap	Ped			Max
70th %ile Green (s)	19.3	19.3	38.2			38.2	38.2	8.7	17.0			13.5
70th %ile Term Code	Gap	Gap	Coord			Coord	Coord	Gap	Ped			Max
50th %ile Green (s)	16.2	16.2	41.3			41.3	41.3	0.0	17.0			13.5
50th %ile Term Code	Gap	Gap	Coord			Coord	Coord	Skip	Ped			Max
30th %ile Green (s)	14.0	14.0	51.1			51.1	51.1	0.0	9.4			13.5
30th %ile Term Code	Gap	Gap	Coord			Coord	Coord	Skip	Gap			Max
10th %ile Green (s)	10.7	10.7	72.4			72.4	72.4	0.0	0.0			10.4
10th %ile Term Code	Gap	Gap	Coord			Coord	Coord	Skip	Skip			Gap
Queue Length 50th (ft)	110			283			54	12	45			116
Queue Length 95th (ft)	168			#461			159	35	91			#220
Internal Link Dist (ft)	242			200			646			768		
Turn Bay Length (ft)	80											
Base Capacity (vph)	320			1506			943	209	383			221
Starvation Cap Reductn	27			272			174	0	0			0
Spillback Cap Reductn	0			0			0	0	57			0
Storage Cap Reductn	0			0			0	0	0			0
Reduced v/c Ratio	0.57			0.79			0.63	0.09	0.24			0.76
Intersection Summary												
Area Type:	Other											
Cycle Length:	110											
Actuated Cycle Length:	110											
Offset:	20 (18%), Referenced to phase 6:WBTL, Start of Yellow											
Natural Cycle:	105											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.79											
Intersection Signal Delay:	22.6						Intersection LOS: C					
Intersection Capacity Utilization:	64.2%						ICU Level of Service C					
Analysis Period (min):	15											
#	95th percentile volume exceeds capacity, queue may be longer.											

Alternative 4
6: Main St & Pearl/Goodell

AM 2025
01/17/2023

Queue shown is maximum after two cycles.

Splits and Phases: 6: Main St & Pearl/Goodell



Alternative 4
7: Tupper & Pearl

AM 2025
01/17/2023

	↖	→	↘	↙	←	↖	↙	↗	↘	↖	↙	↗	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕↕			↕↕			↕↕	↕↕		↕↕	↕↕	
Traffic Volume (vph)	210	414	54	187	102	145	18	70	41	109	74	5	
Future Volume (vph)	210	414	54	187	102	145	18	70	41	109	74	5	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Satd. Flow (prot)	0	3436	0	0	1711	0	0	1844	1583	0	1809	1583	
Flt Permitted		0.687			0.506			0.913				0.762	
Satd. Flow (perm)	0	2387	0	0	883	0	0	1698	1534	0	1407	1534	
Right Turn on Red			Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		14			40				87			27	
Link Speed (mph)		30			30			30			30		
Link Distance (ft)		699			351			561			703		
Travel Time (s)		15.9			8.0			12.8			16.0		
Confl. Peds. (#/hr)	12		5	5		12	4		11	11		4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	737	0	0	472	0	0	96	45	0	198	5	
Number of Detectors	1	2		1	2		1	2	1	1	2	1	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel													
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94		
Detector 2 Size(ft)		6			6			6			6		
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex		
Detector 2 Channel													
Detector 2 Extend (s)		0.0			0.0			0.0			0.0		
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	
Protected Phases		2			6			8		7		4	
Permitted Phases	2			6			8		8	4		4	
Detector Phase	2	2		6	6		8	8	8	7	4	4	
Switch Phase													
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	27.5	27.5		50.0	50.0		23.5	23.5	23.5	12.5	40.0	40.0	
Total Split (s)	60.0	60.0		60.0	60.0		27.5	27.5	27.5	12.5	40.0	40.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		27.5%	27.5%	27.5%	12.5%	40.0%	40.0%	
Maximum Green (s)	54.5	54.5		54.5	54.5		22.0	22.0	22.0	7.0	34.5	34.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.5			5.5			5.5	5.5		5.5	5.5	
Lead/Lag							Lag	Lag	Lag	Lead			
Lead-Lag Optimize?							Yes	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	

Alternative 4
7: Tupper & Pearl

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	None	None		C-Max	C-Max		None	None	None	None	None	None
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0		7.0	7.0
Flash Dont Walk (s)	15.0	15.0		11.0	11.0		10.0	10.0	10.0		11.0	11.0
Pedestrian Calls (#/hr)	5	5		12	12		11	11	11		4	4
Act Effct Green (s)		66.2		66.2			22.8	22.8			22.8	22.8
Actuated g/C Ratio		0.66		0.66			0.23	0.23			0.23	0.23
v/c Ratio		0.46		0.79			0.25	0.11			0.62	0.01
Control Delay		10.4		20.7			30.9	1.5			42.0	0.0
Queue Delay		0.0		0.0			0.0	0.0			0.0	0.0
Total Delay		10.4		20.7			30.9	1.5			42.0	0.0
LOS		B		C			C	A			D	A
Approach Delay		10.4		20.7			21.6				40.9	
Approach LOS		B		C			C				D	
90th %ile Green (s)	57.0	57.0		57.0	57.0		32.0	32.0	32.0	0.0	32.0	32.0
90th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold	Hold	Skip	Gap	Gap
70th %ile Green (s)	62.2	62.2		62.2	62.2		26.8	26.8	26.8	0.0	26.8	26.8
70th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold	Hold	Skip	Gap	Gap
50th %ile Green (s)	66.1	66.1		66.1	66.1		22.9	22.9	22.9	0.0	22.9	22.9
50th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold	Hold	Skip	Gap	Gap
30th %ile Green (s)	70.0	70.0		70.0	70.0		19.0	19.0	19.0	0.0	19.0	19.0
30th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold	Hold	Skip	Gap	Gap
10th %ile Green (s)	75.7	75.7		75.7	75.7		13.3	13.3	13.3	0.0	13.3	13.3
10th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold	Hold	Skip	Gap	Gap
Queue Length 50th (ft)		106			147			50	0		114	0
Queue Length 95th (ft)		193			#479			83	6		166	0
Internal Link Dist (ft)		619			271			481			623	
Turn Bay Length (ft)												
Base Capacity (vph)		1585			598			426	450		485	546
Starvation Cap Reductn		0			0			0	0		0	0
Spillback Cap Reductn		0			0			0	0		0	0
Storage Cap Reductn		0			0			0	0		0	0
Reduced v/c Ratio		0.46			0.79			0.23	0.10		0.41	0.01

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 92 (92%), Referenced to phase 6:WBTL, Start of Yellow

Natural Cycle: 100

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 18.6

Intersection LOS: B

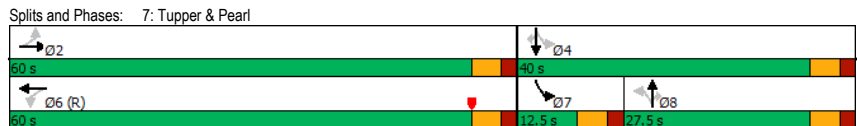
Intersection Capacity Utilization 74.6%

ICU Level of Service D

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.



Alternative 4
8: Main St & Tupper

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔↔			↔↔		↔↔		↔↔
Traffic Volume (vph)	37	450	73	5	350	11	2	22	6	146	71	49
Future Volume (vph)	37	450	73	5	350	11	2	22	6	146	71	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	80		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3362	0	0	1796	0	0	1719	0	1736	1654	0
Fit Permitted		0.904			0.994			0.980		0.627		
Satd. Flow (perm)	0	3046	0	0	1787	0	0	1685	0	1090	1654	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			2			6				47
Link Speed (mph)		30			30			30				30
Link Distance (ft)		351			263			1174				726
Travel Time (s)		8.0			6.0			26.7				16.5
Confl. Peds. (#/hr)	10		17	17		10	19		36	36		19
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	9%	4%	0%	25%	5%	0%	0%	8%	0%	4%	2%	8%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	602	0	0	393	0	0	32	0	157	129	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	50.0	50.0		50.0	50.0		40.0	40.0		12.5	40.0	
Total Split (s)	47.5	47.5		47.5	47.5		40.0	40.0		12.5	52.5	
Total Split (%)	47.5%	47.5%		47.5%	47.5%		40.0%	40.0%		12.5%	52.5%	
Maximum Green (s)	42.0	42.0		42.0	42.0		34.5	34.5		7.0	47.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
C&S Engineers

Synchro 11 Report
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Alternative 4
8: Main St & Tupper

AM 2025
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Lost Time (s)	5.5			5.5			Lag		Lag		Lead	
Lead/Lag							Yes		Yes		Yes	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	5.0	5.0		12.0	12.0		11.0	11.0		10.0	10.0	
Pedestrian Calls (#/hr)	17	17		10	10		36	36		19	19	
Act Effct Green (s)	65.4			65.4			13.6		23.6		23.6	
Actuated g/C Ratio	0.65			0.65			0.14		0.24		0.24	
v/c Ratio	0.30			0.34			0.14		0.52		0.30	
Control Delay	6.5			3.5			31.5		36.4		19.3	
Queue Delay	0.2			0.6			0.0		0.0		0.0	
Total Delay	6.6			4.1			31.5		36.4		19.3	
LOS	A			A			C		D		B	
Approach Delay	6.6			4.1			31.5		28.7			
Approach LOS	A			A			C		C			
90th %ile Green (s)	58.5	58.5		58.5	58.5		18.0	18.0		7.0	30.5	
90th %ile Term Code	Coord	Coord		Coord	Coord		Ped	Ped		Max	Hold	
70th %ile Green (s)	58.5	58.5		58.5	58.5		18.0	18.0		7.0	30.5	
70th %ile Term Code	Coord	Coord		Coord	Coord		Ped	Ped		Max	Hold	
50th %ile Green (s)	58.5	58.5		58.5	58.5		18.0	18.0		7.0	30.5	
50th %ile Term Code	Coord	Coord		Coord	Coord		Ped	Ped		Max	Hold	
30th %ile Green (s)	69.5	69.5		69.5	69.5		7.0	7.0		7.0	19.5	
30th %ile Term Code	Coord	Coord		Coord	Coord		Min	Min		Max	Hold	
10th %ile Green (s)	82.0	82.0		82.0	82.0		0.0	0.0		7.0	7.0	
10th %ile Term Code	Coord	Coord		Coord	Coord		Skip	Skip		Max	Min	
Queue Length 50th (ft)	66			27			14		76		38	
Queue Length 95th (ft)	82			31			40		131		84	
Internal Link Dist (ft)	271			183			1094		646			
Turn Bay Length (ft)									80			
Base Capacity (vph)	1999			1169			585		302		802	
Starvation Cap Reductn	577			440			0		0		0	
Spillback Cap Reductn	0			64			0		0		1	
Storage Cap Reductn	0			0			0		0		0	
Reduced v/c Ratio	0.42			0.54			0.05		0.52		0.16	

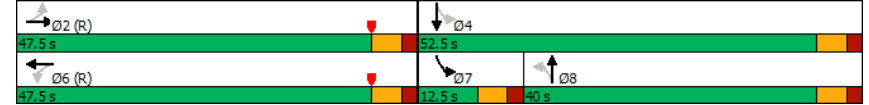
Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	88 (88%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle:	105
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.52
Intersection Signal Delay:	11.3
Intersection LOS:	B
Intersection Capacity Utilization:	58.8%
ICU Level of Service:	B
Analysis Period (min):	15

Alternative 4
8: Main St & Tupper

AM 2025
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Splits and Phases: 8: Main St & Tupper



Alternative 4
9: Washington & Tupper

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕↕				↕		↕↕			↕↕		
Traffic Volume (vph)	30	394	81	3	297	2	54	53	48	45	26	4
Future Volume (vph)	30	394	81	3	297	2	54	53	48	45	26	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		78	85		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3376	0	0	1754	0	1805	1606	0	1719	1833	0
Fit Permitted		0.919			0.997		0.736			0.685		
Satd. Flow (perm)	0	3108	0	0	1749	0	1339	1606	0	1209	1833	0
Right Turn on Red		Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)	39				1		47				4	
Link Speed (mph)	30				30		30				30	
Link Distance (ft)	263				328		1190				726	
Travel Time (s)	6.0				7.5		27.0				16.5	
Conf. Peds. (#/hr)	14		11 11		14 16		17 17				16	
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
Heavy Vehicles (%)	4%	4%	0%	33%	8%	0%	0%	15%	0%	5%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	537	0	0	321	0	57	107	0	48	32	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)	94				94		94				94	
Detector 2 Size(ft)	6				6		6				6	
Detector 2 Type	Cl+Ex				Cl+Ex		Cl+Ex				Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0				0.0		0.0				0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	2				6		8				4	
Permitted Phases	2				6		8				4	
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	47.0	47.0		47.0	47.0		28.0	28.0		28.0	28.0	
Total Split (s)	65.0	65.0		65.0	65.0		35.0	35.0		35.0	35.0	
Total Split (%)	65.0%	65.0%		65.0%	65.0%		35.0%	35.0%		35.0%	35.0%	
Maximum Green (s)	59.5	59.5		59.5	59.5		29.5	29.5		29.5	29.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0				0.0		0.0				0.0	

Alternative 4
9: Washington & Tupper

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Lost Time (s)	5.5				5.5		5.5		5.5		5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	17.0	17.0		17.0	17.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	11	11		14	14		17	17		16	16	
Act Effect Green (s)	76.9				76.9		12.1 12.1				12.1 12.1	
Actuated g/C Ratio	0.77				0.77		0.12 0.12				0.12 0.12	
v/c Ratio	0.22				0.24		0.35 0.46				0.33 0.14	
Control Delay	2.3				4.8		44.4 29.0				44.2 34.4	
Queue Delay	0.3				0.5		0.0 0.0				0.0 0.0	
Total Delay	2.6				5.3		44.4 29.0				44.2 34.4	
LOS	A				A		D C				D C	
Approach Delay	2.6				5.3		34.4				40.3	
Approach LOS	A				A		C				D	
90th %ile Green (s)	71.0	71.0		71.0	71.0		18.0	18.0		18.0	18.0	
90th %ile Term Code	Coord	Coord		Coord	Coord		Ped	Ped		Ped	Ped	
70th %ile Green (s)	71.0	71.0		71.0	71.0		18.0	18.0		18.0	18.0	
70th %ile Term Code	Coord	Coord		Coord	Coord		Ped	Ped		Ped	Ped	
50th %ile Green (s)	79.4	79.4		79.4	79.4		9.6	9.6		9.6	9.6	
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	81.1	81.1		81.1	81.1		7.9	7.9		7.9	7.9	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	82.0	82.0		82.0	82.0		7.0	7.0		7.0	7.0	
10th %ile Term Code	Coord	Coord		Coord	Coord		Min	Min		Hold	Hold	
Queue Length 50th (ft)	3				58		35 37				29 17	
Queue Length 95th (ft)	65				86		69 82				60 41	
Internal Link Dist (ft)	183				248		1110				646	
Turn Bay Length (ft)												
Base Capacity (vph)	2398				1345		395 506				356 543	
Starvation Cap Reductn	1199				652		0 0				0 0	
Spillback Cap Reductn	0				0		0 0				0 0	
Storage Cap Reductn	0				0		0 0				0 0	
Reduced v/c Ratio	0.45				0.46		0.14 0.21				0.13 0.06	
Intersection Summary												
Area Type:	Other											
Cycle Length:	100											
Actuated Cycle Length:	100											
Offset:	16 (16%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow											
Natural Cycle:	75											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.46											
Intersection Signal Delay:	10.8						Intersection LOS: B					
Intersection Capacity Utilization:	52.3%						ICU Level of Service A					
Analysis Period (min)	15											

Alternative 4
9: Washington & Tupper

AM 2025
01/17/2023

Splits and Phases: 9: Washington & Tupper



Alternative 4
10: Ellicott & Tupper

AM 2025
01/17/2023

	←	→	↙	↘	↖	↗	↕	↙	↘	↖	↗	↕
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕	↕↕	↕↕	↕↕	
Traffic Volume (vph)	20	410	66	0	210	0	81	106	99	35	32	13
Future Volume (vph)	20	410	66	0	210	0	81	106	99	35	32	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	80		150
Storage Lanes	0		0	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	2907	0	0	1863	0	0	1801	1599	1736	1745	0
Fit Permitted		0.938						0.837		0.366		
Satd. Flow (perm)	0	2731	0	0	1863	0	0	1521	1505	649	1745	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21							108		14	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		328			387			1108			723	
Travel Time (s)		7.5			8.8			25.2			16.4	
Confl. Peds. (#/hr)	7		5	5		7	12		32	32		12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	25%	1%	2%	2%	2%	1%	5%	1%	4%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	540	0	0	228	0	0	203	108	38	49	0
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA			NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8		8	4		
Detector Phase	2	2		6	6		8	8	8	7	4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	50.0	50.0		23.5	23.5		40.0	40.0	40.0	12.5	40.0	
Total Split (s)	47.5	47.5		47.5	47.5		40.0	40.0	40.0	12.5	52.5	
Total Split (%)	47.5%	47.5%		47.5%	47.5%		40.0%	40.0%	40.0%	12.5%	52.5%	
Maximum Green (s)	42.0	42.0		42.0	42.0		34.5	34.5	34.5	7.0	47.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0	0.0	0.0	0.0	

Alternative 4
10: Ellicott & Tupper

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Lost Time (s)	5.5		5.5				Lag		Lag		Lag	
Lead/Lag							Lag		Lag		Lag	
Lead-Lag Optimize?							Yes		Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0		3.0		3.0	
Recall Mode	C-Max	C-Max	C-Max		C-Max		None		None		None	
Walk Time (s)	7.0	7.0	7.0		7.0		7.0		7.0		7.0	
Flash Dont Walk (s)	14.0	14.0	11.0		11.0		13.0		13.0		13.0	
Pedestrian Calls (#/hr)	19	19	0		0		46		46		46	
Act Effct Green (s)	62.5		62.5		62.5		19.0		19.0		25.6	
Actuated g/C Ratio	0.62		0.62		0.62		0.19		0.19		0.26	
v/c Ratio	0.31		0.20		0.20		0.70		0.29		0.16	
Control Delay	8.5		7.3		7.3		50.4		8.1		24.1	
Queue Delay	0.2		0.0		0.0		0.0		0.0		0.0	
Total Delay	8.7		7.3		7.3		50.4		8.1		24.1	
LOS	A		A		A		D		A		C	
Approach Delay	8.7		7.3		7.3		35.7		35.7		20.5	
Approach LOS	A		A		A		D		D		C	
90th %ile Green (s)	50.0	50.0	50.0		50.0		26.5		26.5		39.0	
90th %ile Term Code	Coord	Coord	Coord		Coord		Gap		Gap		Max	
70th %ile Green (s)	55.2	55.2	55.2		55.2		21.3		21.3		33.8	
70th %ile Term Code	Coord	Coord	Coord		Coord		Gap		Gap		Max	
50th %ile Green (s)	56.5	56.5	56.5		56.5		20.0		20.0		32.5	
50th %ile Term Code	Coord	Coord	Coord		Coord		Ped		Ped		Max	
30th %ile Green (s)	73.3	73.3	73.3		73.3		15.7		15.7		15.7	
30th %ile Term Code	Coord	Coord	Coord		Coord		Gap		Gap		Skip	
10th %ile Green (s)	77.6	77.6	77.6		77.6		11.4		11.4		0.0	
10th %ile Term Code	Coord	Coord	Coord		Coord		Gap		Gap		Skip	
Queue Length 50th (ft)	73		73		35		120		0		17	
Queue Length 95th (ft)	98		98		182		183		41		37	
Internal Link Dist (ft)	248		248		307		1028		1028		643	
Turn Bay Length (ft)											80	
Base Capacity (vph)	1715		1715		1164		524		589		827	
Starvation Cap Reductn	490		490		0		0		0		0	
Spillback Cap Reductn	0		0		0		0		0		0	
Storage Cap Reductn	0		0		0		0		0		0	
Reduced v/c Ratio	0.44		0.44		0.20		0.39		0.18		0.16	

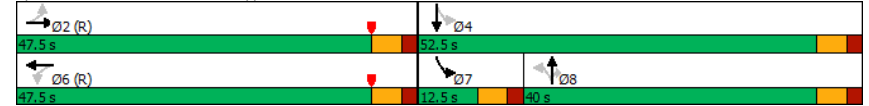
Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	95 (95%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle:	105
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.70
Intersection Signal Delay:	16.5
Intersection LOS:	B
Intersection Capacity Utilization:	54.7%
ICU Level of Service:	A
Analysis Period (min):	15

Alternative 4
10: Ellicott & Tupper

AM 2025
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Splits and Phases: 10: Ellicott & Tupper



Alternative 4
11: Tupper & Oak

AM 2025
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↓								↑↓	↑↓	
Traffic Volume (vph)	0	307	242	0	0	0	0	0	0	317	136	210
Future Volume (vph)	0	307	242	0	0	0	0	0	0	317	136	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3236	0	0	0	0	0	0	0	1610	3058	0
Fit Permitted										0.950	0.990	
Satd. Flow (perm)	0	3236	0	0	0	0	0	0	0	1606	3056	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)		275							Yes	259		274
Link Speed (mph)		30			30			30				30
Link Distance (ft)		387			354			125				680
Travel Time (s)		8.8			8.0			2.8				15.5
Conf. Peds. (#/hr)										2		5
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	2%	7%	0%	0%	0%	0%	0%	0%	2%	6%	0%
Shared Lane Traffic (%)										28%		
Lane Group Flow (vph)	0	624	0	0	0	0	0	0	0	259	495	0
Number of Detectors		2								1	2	
Detector Template		Thru								Left	Thru	
Leading Detector (ft)		100								20	100	
Trailing Detector (ft)		0								0	0	
Detector 1 Position(ft)		0								0	0	
Detector 1 Size(ft)		6								20	6	
Detector 1 Type		Cl+Ex								Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0								0.0	0.0	
Detector 1 Queue (s)		0.0								0.0	0.0	
Detector 1 Delay (s)		0.0								0.0	0.0	
Detector 2 Position(ft)		94									94	
Detector 2 Size(ft)		6									6	
Detector 2 Type		Cl+Ex									Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0									0.0	
Turn Type		NA								Perm	NA	
Protected Phases		2									4	
Permitted Phases										4		
Detector Phase		2								4	4	
Switch Phase												
Minimum Initial (s)		7.0								7.0	7.0	
Minimum Split (s)		50.0								40.0	40.0	
Total Split (s)		56.0								44.0	44.0	
Total Split (%)		56.0%								44.0%	44.0%	
Maximum Green (s)		50.5								38.5	38.5	
Yellow Time (s)		3.5								3.5	3.5	
All-Red Time (s)		2.0								2.0	2.0	
Lost Time Adjust (s)		0.0								0.0	0.0	

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Alternative 4
11: Tupper & Oak

AM 2025
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Lost Time (s)		5.5									5.5	5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)			3.0								3.0	3.0
Recall Mode			C-Max								None	None
Walk Time (s)			7.0								7.0	7.0
Flash Dont Walk (s)			16.0								13.0	13.0
Pedestrian Calls (#/hr)			6								7	7
Act Effct Green (s)			73.5								15.5	15.5
Actuated g/C Ratio			0.74								0.16	0.16
v/c Ratio			0.25								0.55	0.70
Control Delay			2.2								9.1	22.3
Queue Delay			0.2								0.0	0.0
Total Delay			2.4								9.1	22.3
LOS			A								A	C
Approach Delay			2.4									17.8
Approach LOS			A									B
90th %ile Green (s)			65.2								23.8	23.8
90th %ile Term Code			Coord								Gap	Gap
70th %ile Green (s)			70.4								18.6	18.6
70th %ile Term Code			Coord								Gap	Gap
50th %ile Green (s)			73.8								15.2	15.2
50th %ile Term Code			Coord								Gap	Gap
30th %ile Green (s)			76.3								12.7	12.7
30th %ile Term Code			Coord								Gap	Gap
10th %ile Green (s)			81.8								7.2	7.2
10th %ile Term Code			Coord								Gap	Gap
Queue Length 50th (ft)			0								0	71
Queue Length 95th (ft)			0								62	112
Internal Link Dist (ft)			307			274					45	600
Turn Bay Length (ft)												
Base Capacity (vph)			2451								777	1345
Starvation Cap Reductn			959								0	0
Spillback Cap Reductn			0								0	0
Storage Cap Reductn			0								0	0
Reduced v/c Ratio			0.42								0.33	0.37
Intersection Summary												
Area Type:	Other											
Cycle Length:	100											
Actuated Cycle Length:	100											
Offset:	24 (24%), Referenced to phase 2:EBT and 6:, Start of Yellow											
Natural Cycle:	90											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.70											
Intersection Signal Delay:	10.8						Intersection LOS: B					
Intersection Capacity Utilization	39.2%						ICU Level of Service A					
Analysis Period (min)	15											

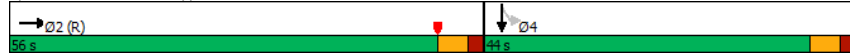
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Alternative 4
11: Tupper & Oak

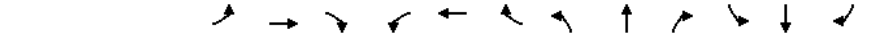
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Splits and Phases: 11: Tupper & Oak



Alternative 4
12: Tupper & Elm St

AM 2025
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑						↑↑				
Traffic Volume (vph)	9	622	0	0	0	0	0	421	4	0	0	0
Future Volume (vph)	9	622	0	0	0	0	0	421	4	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3458	0	0	0	0	0	3536	0	0	0	0
Fit Permitted		0.999										
Satd. Flow (perm)	0	3458	0	0	0	0	0	3536	0	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27						1				
Link Speed (mph)		30			30			30				30
Link Distance (ft)		354			313			418				586
Travel Time (s)		8.0			7.1			9.5				13.3
Confl. Peds. (#/hr)							5			5		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	25%	4%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	686	0	0	0	0	0	462	0	0	0	0
Number of Detectors	1	2						2				
Detector Template	Left	Thru						Thru				
Leading Detector (ft)	20	100						100				
Trailing Detector (ft)	0	0						0				
Detector 1 Position(ft)	0	0						0				
Detector 1 Size(ft)	20	6						6				
Detector 1 Type	Cl+Ex	Cl+Ex						Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0						0.0				
Detector 1 Queue (s)	0.0	0.0						0.0				
Detector 1 Delay (s)	0.0	0.0						0.0				
Detector 2 Position(ft)		94						94				
Detector 2 Size(ft)		6						6				
Detector 2 Type		Cl+Ex						Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0				
Turn Type	Perm	NA						NA				
Protected Phases		2						4				
Permitted Phases	2											
Detector Phase	2	2						4				
Switch Phase												
Minimum Initial (s)	7.0	7.0						7.0				
Minimum Split (s)	30.0	30.0						60.0				
Total Split (s)	60.0	60.0						40.0				
Total Split (%)	60.0%	60.0%						40.0%				
Maximum Green (s)	54.5	54.5						34.5				
Yellow Time (s)	3.5	3.5						3.5				
All-Red Time (s)	2.0	2.0						2.0				
Lost Time Adjust (s)		0.0						0.0				
Total Lost Time (s)		5.5						5.5				
Lead/Lag												
Lead-Lag Optimize?												

Alternative 4
12: Tupper & Elm St

AM 2025
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	3.0	3.0						3.0				
Recall Mode	C-Max	C-Max						None				
Walk Time (s)	7.0	7.0						7.0				
Flash Dont Walk (s)	11.0	11.0						11.0				
Pedestrian Calls (#/hr)	0	0						5				
Act Effect Green (s)		70.2						18.8				
Actuated g/C Ratio		0.70						0.19				
v/c Ratio		0.28						0.69				
Control Delay		3.9						43.2				
Queue Delay		0.3						0.0				
Total Delay		4.2						43.2				
LOS		A						D				
Approach Delay		4.2						43.2				
Approach LOS		A						D				
90th %ile Green (s)	65.0	65.0						24.0				
90th %ile Term Code	Coord	Coord						Gap				
70th %ile Green (s)	67.7	67.7						21.3				
70th %ile Term Code	Coord	Coord						Gap				
50th %ile Green (s)	70.5	70.5						18.5				
50th %ile Term Code	Coord	Coord						Gap				
30th %ile Green (s)	72.5	72.5						16.5				
30th %ile Term Code	Coord	Coord						Gap				
10th %ile Green (s)	75.3	75.3						13.7				
10th %ile Term Code	Coord	Coord						Gap				
Queue Length 50th (ft)		49						146				
Queue Length 95th (ft)		57						187				
Internal Link Dist (ft)		274			233			338			506	
Turn Bay Length (ft)												
Base Capacity (vph)		2435						1220				
Starvation Cap Reductn		1087						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.51						0.38				

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 99 (99%), Referenced to phase 2:EBTL and 6:, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 19.9
 Intersection Capacity Utilization 54.2%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 12: Tupper & Elm St



Lanes, Volumes, Timings
C&S Engineers

Synchro 11 Report
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Alternative 4
14: Pearl

AM 2025
01/17/2023



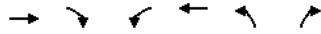
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↑↑	
Traffic Volume (vph)	0	0	317	708	280	145
Future Volume (vph)	0	0	317	708	280	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	3486	1720	0
Fit Permitted				0.985	0.968	
Satd. Flow (perm)	0	0	0	3486	1720	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)					59	
Link Speed (mph)	30			30	30	
Link Distance (ft)	276			322	703	
Travel Time (s)	6.3			7.3	16.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1115	462	0
Number of Detectors			1	2	1	
Detector Template			Left	Thru	Left	
Leading Detector (ft)			20	100	20	
Trailing Detector (ft)			0	0	0	
Detector 1 Position(ft)			0	0	0	
Detector 1 Size(ft)			20	6	20	
Detector 1 Type			CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)			0.0	0.0	0.0	
Detector 1 Queue (s)			0.0	0.0	0.0	
Detector 1 Delay (s)			0.0	0.0	0.0	
Detector 2 Position(ft)				94		
Detector 2 Size(ft)				6		
Detector 2 Type				CI+Ex		
Detector 2 Channel						
Detector 2 Extend (s)				0.0		
Turn Type			Perm	NA	Prot	
Protected Phases				6	8	
Permitted Phases				6		
Detector Phase				6	8	
Switch Phase						
Minimum Initial (s)				7.0	7.0	7.0
Minimum Split (s)				23.5	23.5	23.5
Total Split (s)				26.0	26.0	24.0
Total Split (%)				52.0%	52.0%	48.0%
Maximum Green (s)				20.5	20.5	18.5
Yellow Time (s)				3.5	3.5	3.5
All-Red Time (s)				2.0	2.0	2.0
Lost Time Adjust (s)				0.0	0.0	0.0
Total Lost Time (s)				5.5	5.5	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)				3.0	3.0	3.0
Recall Mode				None	None	Max

Lanes, Volumes, Timings
C&S Engineers

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Alternative 4
14: Pearl

AM 2025
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Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Walk Time (s)			7.0	7.0	7.0	7.0
Flash Dont Walk (s)			11.0	11.0	11.0	
Pedestrian Calls (#/hr)			0	0	0	
Act Effect Green (s)				19.7	18.5	
Actuated g/C Ratio				0.40	0.38	
v/c Ratio				0.80	0.68	
Control Delay				18.6	17.7	
Queue Delay				0.5	0.0	
Total Delay				19.0	17.7	
LOS				B	B	
Approach Delay				19.0	17.7	
Approach LOS				B	B	
90th %ile Green (s)			20.5	20.5	18.5	
90th %ile Term Code			Max	Max	MaxR	
70th %ile Green (s)			20.5	20.5	18.5	
70th %ile Term Code			Max	Max	MaxR	
50th %ile Green (s)			20.5	20.5	18.5	
50th %ile Term Code			Max	Max	MaxR	
30th %ile Green (s)			20.5	20.5	18.5	
30th %ile Term Code			Max	Max	MaxR	
10th %ile Green (s)			16.5	16.5	18.5	
10th %ile Term Code			Gap	Gap	MaxR	
Queue Length 50th (ft)				141	94	
Queue Length 95th (ft)				206	#188	
Internal Link Dist (ft)	196			242	623	
Turn Bay Length (ft)						
Base Capacity (vph)				1454	684	
Starvation Cap Reductn				85	0	
Spillback Cap Reductn				0	0	
Storage Cap Reductn				0	0	
Reduced v/c Ratio				0.81	0.68	

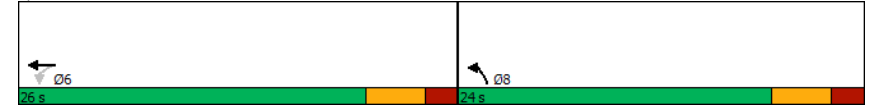
Intersection Summary

Area Type: Other
 Cycle Length: 50
 Actuated Cycle Length: 49.2
 Natural Cycle: 55
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 18.7 Intersection LOS: B
 Intersection Capacity Utilization 62.3% ICU Level of Service B
 Analysis Period (min) 15
 90th %ile Actuated Cycle: 50
 70th %ile Actuated Cycle: 50
 50th %ile Actuated Cycle: 50
 30th %ile Actuated Cycle: 50
 10th %ile Actuated Cycle: 46
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Alternative 4
14: Pearl

AM 2025
01/17/2023

Splits and Phases: 14: Pearl



Alternative 4
1: Michigan & Goodell

AM 2045
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↕↕↕	↕		↕	↕			↕↕	
Traffic Volume (vph)	0	0	0	223	1463	303	162	719	0	0	296	93
Future Volume (vph)	0	0	0	223	1463	303	162	719	0	0	296	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	0	4912	0	1752	1792	0	0	3319	0
Fit Permitted				0.994	0.378							
Satd. Flow (perm)	0	0	0	0	4912	0	694	1792	0	0	3319	0
Right Turn on Red			Yes		Yes			Yes			Yes	
Satd. Flow (RTOR)				42							40	
Link Speed (mph)		30		30			30			30		
Link Distance (ft)		402		274			648			972		
Travel Time (s)		9.1		6.2			14.7			22.1		
Confl. Peds. (#/hr)					4	6						6
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	1%	2%	3%	3%	6%	0%	0%	5%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	2072	0	169	749	0	0	405	0
Number of Detectors				1	2		1	2			2	
Detector Template				Left	Thru		Left	Thru			Thru	
Leading Detector (ft)				20	100		20	100			100	
Trailing Detector (ft)				0	0		0	0			0	
Detector 1 Position(ft)				0	0		0	0			0	
Detector 1 Size(ft)				20	6		20	6			6	
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Split	NA		pm+pt	NA			NA	
Protected Phases				6	6		3	8			4	
Permitted Phases							8					
Detector Phase				6	6		3	8			4	
Switch Phase												
Minimum Initial (s)				7.0	7.0		7.0	7.0			7.0	
Minimum Split (s)				45.0	45.0		12.5	26.5			23.5	
Total Split (s)				55.0	55.0		15.0	55.0			40.0	
Total Split (%)				50.0%	50.0%		13.6%	50.0%			36.4%	
Maximum Green (s)				49.5	49.5		9.5	49.5			34.5	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		2.0	2.0			2.0	
Lost Time Adjust (s)					0.0			0.0			0.0	
Total Lost Time (s)					5.5			5.5			5.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	

Alternative 4
1: Michigan & Goodell

AM 2045
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)				4.0	4.0		3.0	3.0			3.0	
Recall Mode				C-Max	C-Max		None	None			None	
Walk Time (s)				7.0	7.0		7.0				7.0	
Flash Dont Walk (s)				10.0	10.0		14.0				11.0	
Pedestrian Calls (#/hr)				4	4		3				6	
Act Effct Green (s)				50.7	48.3		48.3				33.5	
Actuated g/C Ratio				0.46	0.44		0.44				0.30	
v/c Ratio				0.91	0.43		0.95				0.39	
Control Delay				34.3	22.4		52.6				28.0	
Queue Delay				0.0	0.0		0.0				0.0	
Total Delay				34.3	22.4		52.6				28.0	
LOS				C	C		D				C	
Approach Delay				34.3			47.1				28.0	
Approach LOS				C			D				C	
90th %ile Green (s)				49.5	49.5		9.5	49.5			34.5	
90th %ile Term Code				Coord	Coord		Max	Max			Hold	
70th %ile Green (s)				49.5	49.5		9.5	49.5			34.5	
70th %ile Term Code				Coord	Coord		Max	Max			Hold	
50th %ile Green (s)				49.5	49.5		9.5	49.5			34.5	
50th %ile Term Code				Coord	Coord		Max	Max			Hold	
30th %ile Green (s)				49.5	49.5		9.5	49.5			34.5	
30th %ile Term Code				Coord	Coord		Max	Max			Hold	
10th %ile Green (s)				55.3	55.3		8.6	43.7			29.6	
10th %ile Term Code				Coord	Coord		Gap	Gap			Hold	
Queue Length 50th (ft)					485		71	487			104	
Queue Length 95th (ft)					#572		117	#741			148	
Internal Link Dist (ft)		322			194			568			892	
Turn Bay Length (ft)												
Base Capacity (vph)					2284		396	806			1068	
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					0.91		0.43	0.93			0.38	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 95 (86%), Referenced to phase 6:WBTL, Start of Yellow

Natural Cycle: 85

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.95

Intersection Signal Delay: 37.0

Intersection LOS: D

Intersection Capacity Utilization 86.6%

ICU Level of Service E

Analysis Period (min) 15

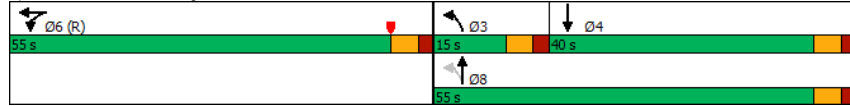
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Alternative 4
1: Michigan & Goodell

AM 2045
01/17/2023

Splits and Phases: 1: Michigan & Goodell



Alternative 4
2: Elm St/Bennett Ln & Goodell

AM 2045
01/17/2023

	←	→	↙	↘	↖	↗	↑	↙	↘	↓	↖	↗
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↑	↑				↑
Traffic Volume (vph)	0	0	0	0	1726	8	497	2	0	0	0	19
Future Volume (vph)	0	0	0	0	1726	8	497	2	0	0	0	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	0	5025	0	1681	1681	0	0	0	1565
Fit Permitted							0.950	0.953				
Satd. Flow (perm)	0	0	0	0	5025	0	1674	1674	0	0	0	1565
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Satd. Flow (RTOR)					1		25	25				25
Link Speed (mph)		30			30			30				30
Link Distance (ft)		335			402			586				382
Travel Time (s)		7.6			9.1			13.3				8.7
Confl. Peds. (#/hr)						1	2					2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	0%	3%	25%	2%	50%	0%	0%	0%	5%
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	0	0	0	0	1865	0	267	269	0	0	0	20
Number of Detectors					2		1	2				1
Detector Template					Thru		Left	Thru				Right
Leading Detector (ft)					100		20	100				20
Trailing Detector (ft)					0		0	0				0
Detector 1 Position(ft)					0		0	0				0
Detector 1 Size(ft)					6		20	6				20
Detector 1 Type					CI+Ex		CI+Ex	CI+Ex				CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)					0.0		0.0	0.0				0.0
Detector 1 Queue (s)					0.0		0.0	0.0				0.0
Detector 1 Delay (s)					0.0		0.0	0.0				0.0
Detector 2 Position(ft)					94			94				
Detector 2 Size(ft)					6			6				
Detector 2 Type					CI+Ex			CI+Ex				
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0				
Turn Type					NA		Perm	NA				Prot
Protected Phases					6			8				4
Permitted Phases							8					
Detector Phase					6		8	8				4
Switch Phase												
Minimum Initial (s)					7.0		7.0	7.0				7.0
Minimum Split (s)					23.5		23.5	23.5				23.5
Total Split (s)					70.0		40.0	40.0				40.0
Total Split (%)					63.6%		36.4%	36.4%				36.4%
Maximum Green (s)					64.5		34.5	34.5				34.5
Yellow Time (s)					3.5		3.5	3.5				3.5
All-Red Time (s)					2.0		2.0	2.0				2.0
Lost Time Adjust (s)					0.0		0.0	0.0				0.0
Total Lost Time (s)					5.5		5.5	5.5				5.5
Lead/Lag												
Lead-Lag Optimize?												

Alternative 4
2: Elm St/Bennett Ln & Goodell

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)					3.0	3.0	3.0	3.0				3.0
Recall Mode					C-Max	None	None	None				None
Walk Time (s)					7.0	7.0	7.0	7.0				
Flash Dont Walk (s)					11.0	9.0	9.0	9.0				
Pedestrian Calls (#/hr)					2	0	0	0				
Act Effect Green (s)					76.5	22.5	22.5	22.5				15.8
Actuated g/C Ratio					0.70	0.20	0.20	0.20				0.14
v/c Ratio					0.53	0.74	0.74	0.74				0.08
Control Delay					6.3	48.4	48.8	48.8				9.9
Queue Delay					0.3	0.0	0.0	0.0				0.0
Total Delay					6.6	48.4	48.8	48.8				9.9
LOS					A	D	D	D				A
Approach Delay					6.6						9.9	
Approach LOS					A						A	
90th %ile Green (s)					67.3	31.7	31.7	31.7				31.7
90th %ile Term Code					Coord	Gap	Gap	Gap				Hold
70th %ile Green (s)					72.5	26.5	26.5	26.5				26.5
70th %ile Term Code					Coord	Gap	Gap	Gap				Hold
50th %ile Green (s)					76.5	22.5	22.5	22.5				0.0
50th %ile Term Code					Coord	Gap	Gap	Gap				Skip
30th %ile Green (s)					80.6	18.4	18.4	18.4				0.0
30th %ile Term Code					Coord	Gap	Gap	Gap				Skip
10th %ile Green (s)					85.4	13.6	13.6	13.6				0.0
10th %ile Term Code					Coord	Gap	Gap	Gap				Skip
Queue Length 50th (ft)					108	170	171	171				0
Queue Length 95th (ft)					168	241	242	242				16
Internal Link Dist (ft)		255			322			506			302	
Turn Bay Length (ft)												
Base Capacity (vph)					3493	542	542	542				508
Starvation Cap Reductn					772	0	0	0				0
Spillback Cap Reductn					240	1	1	1				0
Storage Cap Reductn					0	0	0	0				0
Reduced v/c Ratio					0.69	0.49	0.50	0.50				0.04

Intersection Summary

Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 95 (86%), Referenced to phase 6:WBT, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.74
 Intersection Signal Delay: 15.9 Intersection LOS: B
 Intersection Capacity Utilization 56.5% ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 2: Elm St/Bennett Ln & Goodell



Alternative 4
3: Oak & Goodell

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔						↔	
Traffic Volume (vph)	85	0	300	298	1862	100	0	0	0	0	29	2
Future Volume (vph)	85	0	300	298	1862	100	0	0	0	0	29	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	1682	0	1752	3495	0	0	0	0	0	1865	0
Fit Permitted		0.403		0.506								
Satd. Flow (perm)	0	685	0	933	3495	0	0	0	0	0	1865	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		262		11							2	
Link Speed (mph)		30		30			30				30	
Link Distance (ft)		385		335			680				542	
Travel Time (s)		8.8		7.6			15.5				12.3	
Confl. Peds. (#/hr)						4						6
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	0%	3%	2%	8%	0%	0%	0%	0%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	397	0	307	2023	0	0	0	0	0	32	0
Number of Detectors	1	2		1	2						2	
Detector Template	Left	Thru		Left	Thru						Thru	
Leading Detector (ft)	20	100		20	100						100	
Trailing Detector (ft)	0	0		0	0						0	
Detector 1 Position(ft)	0	0		0	0						0	
Detector 1 Size(ft)	20	6		20	6						6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex						CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0						0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0						0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0						0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		CI+Ex			CI+Ex						CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type	Perm	NA		pm+pt	NA						NA	
Protected Phases		2		1	6						4	
Permitted Phases		2		6								
Detector Phase		2	2	1	6						4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0						7.0	
Minimum Split (s)	23.5	23.5		12.5	58.0						27.0	
Total Split (s)	67.2	67.2		12.8	80.0						30.0	
Total Split (%)	61.1%	61.1%		11.6%	72.7%						27.3%	
Maximum Green (s)	61.7	61.7		7.3	74.5						24.5	
Yellow Time (s)	3.5	3.5		3.5	3.5						3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0						2.0	
Lost Time Adjust (s)		0.0		0.0	0.0						0.0	
Total Lost Time (s)		5.5		5.5	5.5						5.5	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?												

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Alternative 4
3: Oak & Goodell

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	3.0	3.0		3.0	3.0							3.0
Recall Mode	None	None		None	C-Max						None	
Walk Time (s)	7.0	7.0		7.0	7.0						7.0	
Flash Dont Walk (s)	11.0	11.0			12.0						14.0	
Pedestrian Calls (#/hr)	0	0			5						11	
Act Effect Green (s)		79.5		93.9	96.1						10.1	
Actuated g/C Ratio		0.72		0.85	0.87						0.09	
v/c Ratio		0.70		0.36	0.66						0.19	
Control Delay		12.5		3.6	7.0						43.9	
Queue Delay		0.2		0.7	0.6						0.0	
Total Delay		12.7		4.3	7.6						43.9	
LOS		B		A	A						D	
Approach Delay		12.7			7.1						43.9	
Approach LOS		B			A						D	
90th %ile Green (s)	61.7	61.7		10.8	78.0						21.0	
90th %ile Term Code	Coord	Coord		Max	Coord						Ped	
70th %ile Green (s)	74.9	74.9		10.4	90.8						8.2	
70th %ile Term Code	Coord	Coord		Gap	Coord						Gap	
50th %ile Green (s)	77.0	77.0		9.3	91.8						7.2	
50th %ile Term Code	Coord	Coord		Gap	Coord						Gap	
30th %ile Green (s)	92.0	92.0		7.0	104.5						0.0	
30th %ile Term Code	Coord	Coord		Min	Coord						Skip	
10th %ile Green (s)	92.0	92.0		7.0	104.5						0.0	
10th %ile Term Code	Coord	Coord		Min	Coord						Skip	
Queue Length 50th (ft)		84		5	17						21	
Queue Length 95th (ft)		#303		116	795						45	
Internal Link Dist (ft)		305			255			600			462	
Turn Bay Length (ft)												
Base Capacity (vph)		567		863	3055						416	
Starvation Cap Reductn		13		282	553						0	
Spillback Cap Reductn		0		0	409						0	
Storage Cap Reductn		0		0	0						0	
Reduced v/c Ratio		0.72		0.53	0.81						0.08	

Intersection Summary

Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 39 (35%), Referenced to phase 6:WBTL, Start of Yellow
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 8.4
 Intersection Capacity Utilization 99.6%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Alternative 4
3: Oak & Goodell

AM 2045
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Splits and Phases: 3: Oak & Goodell



Alternative 4
4: Ellicott & Goodell

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔↔			↔			↔↔		
Traffic Volume (vph)	40	255	20	63	1366	435	19	90	0	130	62	11
Future Volume (vph)	40	255	20	63	1366	435	19	90	0	130	62	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	1872	0	0	3382	0	0	1883	0	1805	1752	0
Fit Permitted	0.473		0.924		0.929		0.426					
Satd. Flow (perm)	0	891	0	0	3130	0	0	1763	0	809	1752	0
Right Turn on Red	Yes			Yes			Yes			Yes		
Satd. Flow (RTOR)	5		63				9					
Link Speed (mph)	30		30				30					
Link Distance (ft)	330		385				723		475			
Travel Time (s)	7.5		8.8				16.4		10.8			
Confl. Peds. (#/hr)	9			3			3					
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	4%	3%	2%	0%	0%	0%	0%	3%	20%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	331	0	0	1962	0	0	115	0	137	77	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)	94		94		94		94		94			
Detector 2 Size(ft)	6		6		6		6		6			
Detector 2 Type	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex			
Detector 2 Channel												
Detector 2 Extend (s)	0.0		0.0		0.0		0.0		0.0			
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases	2		6		6		8		7			
Permitted Phases	2		6		6		8		4			
Detector Phase	2	2		6	6		8	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	23.5	23.5		50.0	50.0		40.0	40.0		12.5	40.0	
Total Split (s)	70.0	70.0		70.0	70.0		27.0	27.0		13.0	40.0	
Total Split (%)	63.6%	63.6%		63.6%	63.6%		24.5%	24.5%		11.8%	36.4%	
Maximum Green (s)	64.5	64.5		64.5	64.5		21.5	21.5		7.5	34.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0		0.0		0.0		0.0		0.0			
Total Lost Time (s)	5.5		5.5		5.5		5.5		5.5			
Lead/Lag							Lag	Lag	Lead			
Lead-Lag Optimize?							Yes	Yes	Yes			

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Alternative 4
4: Ellicott & Goodell

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		9	9		20	20		20	20	
Act Effct Green (s)	73.1		73.1		12.9		25.9		25.9			
Actuated g/C Ratio	0.66		0.66		0.12		0.24		0.24			
v/c Ratio	0.56		0.93		0.56		0.53		0.18			
Control Delay	18.4		20.1		55.4		41.9		29.4			
Queue Delay	1.0		0.0		0.0		0.0		0.0			
Total Delay	19.4		20.1		55.4		41.9		29.4			
LOS	B		C		E		D		C			
Approach Delay	19.4		20.1		55.4		37.4					
Approach LOS	B		C		E		D					
90th %ile Green (s)	68.9	68.9		68.9	68.9		17.1	17.1		7.5	30.1	
90th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Max	Hold	
70th %ile Green (s)	69.0	69.0		69.0	69.0		17.0	17.0		7.5	30.0	
70th %ile Term Code	Coord	Coord		Coord	Coord		Ped	Ped		Max	Hold	
50th %ile Green (s)	73.6	73.6		73.6	73.6		12.4	12.4		7.5	25.4	
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Max	Hold	
30th %ile Green (s)	75.6	75.6		75.6	75.6		10.4	10.4		7.5	23.4	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Max	Hold	
10th %ile Green (s)	78.4	78.4		78.4	78.4		7.6	7.6		7.5	20.6	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Max	Hold	
Queue Length 50th (ft)	124		650		78		81		39			
Queue Length 95th (ft)	161		#903		132		130		75			
Internal Link Dist (ft)	250		305		643		395					
Turn Bay Length (ft)												
Base Capacity (vph)	593		2101		344		258		555			
Starvation Cap Reductn	98		1		0		0		0			
Spillback Cap Reductn	2		0		0		0		0			
Storage Cap Reductn	0		0		0		0		0			
Reduced v/c Ratio	0.67		0.93		0.33		0.53		0.14			
Intersection Summary												
Area Type:	Other											
Cycle Length:	110											
Actuated Cycle Length:	110											
Offset:	45 (41%), Referenced to phase 6:WBTL, Start of Yellow											
Natural Cycle:	145											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.93											
Intersection Signal Delay:	23.0						Intersection LOS: C					
Intersection Capacity Utilization:	78.1%						ICU Level of Service D					
Analysis Period (min):	15											
#	95th percentile volume exceeds capacity, queue may be longer.											
	Queue shown is maximum after two cycles.											

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Alternative 4
4: Ellicott & Goodell

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Splits and Phases: 4: Ellicott & Goodell



Alternative 4
5: Washington & Goodell

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Volume (vph)	40	180	20	71	1242	66	20	23	0	75	59	6
Future Volume (vph)	40	180	20	71	1242	66	20	23	0	75	59	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	50		0	0		0	0		66
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1864	0	0	3474	0	0	1564	0	1805	1795	0
Flt Permitted		0.678			0.915			0.817		0.862		
Satd. Flow (perm)	0	1274	0	0	3188	0	0	1302	0	1638	1795	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			8						5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		280			330			726			324	
Travel Time (s)		6.4			7.5			16.5			7.4	
Confl. Peds. (#/hr)						2	6					6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	1%	3%	0%	40%	0%	0%	0%	3%	17%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	252	0	0	1451	0	0	45	0	79	68	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	23.5	23.5		55.0	55.0		30.0	30.0		30.0	30.0	
Total Split (s)	70.0	70.0		70.0	70.0		40.0	40.0		40.0	40.0	
Total Split (%)	63.6%	63.6%		63.6%	63.6%		36.4%	36.4%		36.4%	36.4%	
Maximum Green (s)	64.5	64.5		64.5	64.5		34.5	34.5		34.5	34.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	

Alternative 4
5: Washington & Goodell

AM 2045
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Lost Time (s)	5.5			5.5			5.5			5.5		
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		11	11		9	9		9	9	
Act Effct Green (s)	90.8			90.8			11.8			11.8		
Actuated g/C Ratio	0.83			0.83			0.11			0.11		
v/c Ratio	0.24			0.55			0.32			0.45		
Control Delay	7.4			1.7			50.1			53.2		
Queue Delay	0.5			0.3			0.5			0.0		
Total Delay	8.0			2.0			50.6			53.2		
LOS	A			A			D			D		
Approach Delay	8.0			2.0			50.6			49.7		
Approach LOS	A			A			D			D		
90th %ile Green (s)	82.0	82.0		82.0	82.0		17.0	17.0		17.0	17.0	
90th %ile Term Code	Coord	Coord		Coord	Coord		Ped	Ped		Ped	Ped	
70th %ile Green (s)	85.2	85.2		85.2	85.2		13.8	13.8		13.8	13.8	
70th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
50th %ile Green (s)	87.4	87.4		87.4	87.4		11.6	11.6		11.6	11.6	
50th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
30th %ile Green (s)	89.5	89.5		89.5	89.5		9.5	9.5		9.5	9.5	
30th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
10th %ile Green (s)	104.5	104.5		104.5	104.5		0.0	0.0		0.0	0.0	
10th %ile Term Code	Coord	Coord		Coord	Coord		Skip	Skip		Skip	Skip	
Queue Length 50th (ft)	72			48			30			53		
Queue Length 95th (ft)	108			m54			63			98		
Internal Link Dist (ft)	200			250			646			244		
Turn Bay Length (ft)												
Base Capacity (vph)	1053			2633			408			513		
Starvation Cap Reductn	471			512			0			0		
Spillback Cap Reductn	0			417			187			0		
Storage Cap Reductn	0			0			0			0		
Reduced v/c Ratio	0.43			0.68			0.20			0.15		

Intersection Summary

Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 47 (43%), Referenced to phase 6:WBTL, Start of Yellow
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.55
 Intersection Signal Delay: 7.7 Intersection LOS: A
 Intersection Capacity Utilization 63.5% ICU Level of Service B
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Alternative 4
5: Washington & Goodell

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Splits and Phases: 5: Washington & Goodell



Alternative 4
6: Main St & Pearl/Goodell

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	80	10	41	866	417	17	62	10	100	88	172
Future Volume (vph)	65	80	10	41	866	417	17	62	10	100	88	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	80	0	0	0	0	0	0
Storage Lanes	0	0	0	0	1	1	0	1	0	1	1	1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1839	0	0	3492	1553	1703	1769	0	1805	1810	1509
Fit Permitted		0.979			0.931		0.695			0.533		
Satd. Flow (perm)	0	1839	0	0	3256	1553	1216	1769	0	1013	1810	1509
Right Turn on Red			Yes			Yes		Yes			Yes	
Satd. Flow (RTOR)		3				448		7				184
Link Speed (mph)		30			30			30				30
Link Distance (ft)		322			280			726				848
Travel Time (s)		7.3			6.4			16.5				19.3
Conf. Peds. (#/hr)	2		5	5		2	14					14
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	7%	3%	4%	6%	6%	0%	0%	5%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	167	0	0	975	448	18	78	0	108	95	185
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Split	NA		Perm	NA	Prot	pm+pt	NA		pm+pt	NA	pt+ov
Protected Phases	2	2			6	6	3	8		7	4	4
Permitted Phases				6			8			4		
Detector Phase	2	2		6	6	6	3	8		7	4	4
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	22.0	22.0		36.3	36.3	36.3	12.5	28.3		12.5	25.0	
Total Split (s)	23.0	23.0		45.0	45.0	45.0	13.0	29.0		13.0	29.0	
Total Split (%)	20.9%	20.9%		40.9%	40.9%	40.9%	11.8%	26.4%		11.8%	26.4%	
Maximum Green (s)	17.5	17.5		39.5	39.5	39.5	7.5	23.5		7.5	23.5	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	

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Alternative 4
6: Main St & Pearl/Goodell

AM 2045
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Lost Time (s)												
Lead/Lag	5.5						5.5			5.5		
Lead-Lag Optimize?							Yes			Yes		
Vehicle Extension (s)	4.3	4.3		3.2	3.2	3.2				3.0	4.3	3.0
Recall Mode	None	None		C-Max	C-Max	C-Max	None	None		None	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0				7.0		7.0
Flash Dont Walk (s)	15.0	15.0		17.0	17.0	17.0				10.0		10.0
Pedestrian Calls (#/hr)	5	5		2	2	2				26		14
Act Effect Green (s)	16.7			52.9			19.2			13.5		
Actuated g/C Ratio	0.15			0.48			0.17			0.12		
v/c Ratio	0.59			0.62			0.46			0.35		
Control Delay	32.7			33.8			10.7			43.1		
Queue Delay	0.4			0.8			0.4			0.0		
Total Delay	33.1			34.6			11.1			43.1		
LOS	C			C			B			D		
Approach Delay	33.1			27.2						40.8		
Approach LOS	C			C						D		
90th %ile Green (s)	23.3	23.3		40.2	40.2	40.2	7.5	17.0		7.5	17.0	
90th %ile Term Code	Gap	Gap		Coord	Coord	Coord	Max	Ped		Max	Ped	
70th %ile Green (s)	19.3	19.3		44.2	44.2	44.2	7.0	17.0		7.5	17.5	
70th %ile Term Code	Gap	Gap		Coord	Coord	Coord	Min	Ped		Max	Hold	
50th %ile Green (s)	16.2	16.2		47.3	47.3	47.3	0.0	17.0		7.5	30.0	
50th %ile Term Code	Gap	Gap		Coord	Coord	Coord	Skip	Ped		Max	Hold	
30th %ile Green (s)	14.0	14.0		57.1	57.1	57.1	0.0	9.4		7.5	22.4	
30th %ile Term Code	Gap	Gap		Coord	Coord	Coord	Skip	Gap		Max	Hold	
10th %ile Green (s)	10.7	10.7		75.5	75.5	75.5	0.0	0.0		7.3	7.3	
10th %ile Term Code	Gap	Gap		Coord	Coord	Coord	Skip	Skip		Gap	Hold	
Queue Length 50th (ft)	109			306			69			9		
Queue Length 95th (ft)	m136			395			162			28		
Internal Link Dist (ft)	242			200						646		
Turn Bay Length (ft)	80											
Base Capacity (vph)	320			1564			979			250		
Starvation Cap Reductn	21			297			178			0		
Spillback Cap Reductn	0			0			0			0		
Storage Cap Reductn	0			0			0			0		
Reduced v/c Ratio	0.56			0.77			0.56			0.07		
Intersection Summary												
Area Type:	Other											
Cycle Length:	110											
Actuated Cycle Length:	110											
Offset:	0 (0%), Referenced to phase 6:WBLT, Start of Yellow, Master Intersection											
Natural Cycle:	100											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.62											
Intersection Signal Delay:	27.5						Intersection LOS: C					
Intersection Capacity Utilization:	61.8%						ICU Level of Service B					
Analysis Period (min):	15											
m Volume for 95th percentile queue is metered by upstream signal.												

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Alternative 4
6: Main St & Pearl/Goodell

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Splits and Phases: 6: Main St & Pearl/Goodell



Alternative 4
7: Tupper & Pearl

AM 2045
01/17/2023

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕	↕↕			↕↕
Traffic Volume (vph)	60	564	54	102	112	110	47	270	11	9	139	10
Future Volume (vph)	60	564	54	102	112	110	47	270	11	9	139	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3474	0	0	1719	0	0	1850	1583	0	1857	1583
Flt Permitted		0.881			0.647			0.924				0.917
Satd. Flow (perm)	0	3068	0	0	1128	0	0	1719	1534	0	1707	1534
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			46				27			27
Link Speed (mph)		30			30			30				30
Link Distance (ft)		699			351			561				703
Travel Time (s)		15.9			8.0			12.8				16.0
Confl. Peds. (#/hr)	12		5	5		12	4		11	11		4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	737	0	0	353	0	0	344	12	0	161	11
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			8				4
Permitted Phases	2			6			8		8	4		4
Detector Phase	2	2		6	6		8	8	8	4		4
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0		7.0
Minimum Split (s)	27.5	27.5		50.0	50.0		23.5	23.5	23.5	40.0		40.0
Total Split (s)	65.0	65.0		65.0	65.0		35.0	35.0	35.0	35.0		35.0
Total Split (%)	65.0%	65.0%		65.0%	65.0%		35.0%	35.0%	35.0%	35.0%		35.0%
Maximum Green (s)	59.5	59.5		59.5	59.5		29.5	29.5	29.5	29.5		29.5
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5		3.5
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0		2.0
Lost Time Adjust (s)		0.0			0.0			0.0	0.0			0.0
Total Lost Time (s)		5.5			5.5			5.5	5.5			5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0		3.0

Alternative 4
7: Tupper & Pearl

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None	None	None	None	None
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	15.0	15.0		11.0	11.0		10.0	10.0	10.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	5	5		12	12		11	11	11	4	4	4
Act Effct Green (s)	64.7			64.7			24.3	24.3		24.3	24.3	
Actuated g/C Ratio	0.65			0.65			0.24	0.24		0.24	0.24	
v/c Ratio	0.37			0.47			0.82	0.03		0.39	0.03	
Control Delay	9.3			7.1			51.9	4.2		33.4	3.7	
Queue Delay	0.0			0.4			0.0	0.0		0.0	0.0	
Total Delay	9.3			7.5			51.9	4.2		33.4	3.7	
LOS	A			A			D	A		C	A	
Approach Delay	9.3			7.5			50.3			31.5		
Approach LOS	A			A			D			C		
90th %ile Green (s)	59.5	59.5		59.5	59.5		29.5	29.5	29.5	29.5	29.5	29.5
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max	Max	Hold	Hold	Hold
70th %ile Green (s)	60.8	60.8		60.8	60.8		28.2	28.2	28.2	28.2	28.2	28.2
70th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap	Gap	Hold	Hold	Hold
50th %ile Green (s)	63.9	63.9		63.9	63.9		25.1	25.1	25.1	25.1	25.1	25.1
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap	Gap	Hold	Hold	Hold
30th %ile Green (s)	67.1	67.1		67.1	67.1		21.9	21.9	21.9	21.9	21.9	21.9
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap	Gap	Hold	Hold	Hold
10th %ile Green (s)	72.0	72.0		72.0	72.0		17.0	17.0	17.0	17.0	17.0	17.0
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap	Gap	Hold	Hold	Hold
Queue Length 50th (ft)		103			34		206	0		85	0	
Queue Length 95th (ft)		158			137		293	6		136	6	
Internal Link Dist (ft)		619			271		481			623		
Turn Bay Length (ft)												
Base Capacity (vph)		1989			745		507	471		503	471	
Starvation Cap Reductn		0			109		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.37			0.56		0.68	0.03		0.32	0.02	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 20.3
 Intersection LOS: C
 Intersection Capacity Utilization 81.6%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 7: Tupper & Pearl



Alternative 4
8: Main St & Tupper

AM 2045
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔↔			↔↔		↔↔	↔↔	↔↔
Traffic Volume (vph)	37	535	8	55	235	11	2	22	6	46	71	54
Future Volume (vph)	37	535	8	55	235	11	2	22	6	46	71	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	0	0	0	0	80	0	0
Storage Lanes	0	0	0	0	0	0	0	0	0	1	0	0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3441	0	0	1724	0	0	1719	0	1736	1643	0
Fit Permitted		0.912			0.821			0.982		0.736		
Satd. Flow (perm)	0	3144	0	0	1422	0	0	1689	0	1267	1643	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			3			6			39	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		351			263			1174			726	
Travel Time (s)		8.0			6.0			26.7			16.5	
Confl. Peds. (#/hr)	10		17	17		10	19		36	36		19
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	9%	4%	0%	25%	5%	0%	0%	8%	0%	4%	2%	8%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	624	0	0	324	0	0	32	0	49	134	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	50.0	50.0		50.0	50.0		40.0	40.0		40.0	40.0	
Total Split (s)	65.0	65.0		65.0	65.0		35.0	35.0		35.0	35.0	
Total Split (%)	65.0%	65.0%		65.0%	65.0%		35.0%	35.0%		35.0%	35.0%	
Maximum Green (s)	59.5	59.5		59.5	59.5		29.5	29.5		29.5	29.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	

Alternative 4
8: Main St & Tupper

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Lost Time (s)	5.5			5.5			5.5			5.5		
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	5.0	5.0		12.0	12.0		11.0	11.0		10.0	10.0	
Pedestrian Calls (#/hr)	17	17		10	10		36	36		19	19	
Act Effct Green (s)	75.0			75.0			14.0			14.0		
Actuated g/C Ratio	0.75			0.75			0.14			0.14		
v/c Ratio	0.26			0.30			0.13			0.28		
Control Delay	2.3			5.2			31.3			40.4		
Queue Delay	0.1			0.5			0.0			0.0		
Total Delay	2.3			5.7			31.3			40.4		
LOS	A			A			C			D		
Approach Delay	2.3			5.7			31.3			35.5		
Approach LOS	A			A			C			D		
90th %ile Green (s)	71.0	71.0		71.0	71.0		18.0	18.0		18.0	18.0	
90th %ile Term Code	Coord	Coord		Coord	Coord		Ped	Ped		Hold	Hold	
70th %ile Green (s)	71.0	71.0		71.0	71.0		18.0	18.0		18.0	18.0	
70th %ile Term Code	Coord	Coord		Coord	Coord		Ped	Ped		Hold	Hold	
50th %ile Green (s)	71.0	71.0		71.0	71.0		18.0	18.0		18.0	18.0	
50th %ile Term Code	Coord	Coord		Coord	Coord		Ped	Ped		Hold	Hold	
30th %ile Green (s)	79.9	79.9		79.9	79.9		9.1	9.1		9.1	9.1	
30th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
10th %ile Green (s)	82.0	82.0		82.0	82.0		7.0	7.0		7.0	7.0	
10th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Min	Min	
Queue Length 50th (ft)	22			64			14			27		
Queue Length 95th (ft)	28			83			40			111		
Internal Link Dist (ft)	271			183			1094			646		
Turn Bay Length (ft)	80											
Base Capacity (vph)	2358			1066			502			373		
Starvation Cap Reductn	579			390			0			0		
Spillback Cap Reductn	0			1			0			0		
Storage Cap Reductn	0			0			0			0		
Reduced v/c Ratio	0.35			0.48			0.06			0.13		

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.51
Intersection Signal Delay:	9.3
Intersection LOS:	A
Intersection Capacity Utilization:	58.2%
ICU Level of Service:	B
Analysis Period (min):	15

Alternative 4
8: Main St & Tupper

AM 2045
01/17/2023

Splits and Phases: 8: Main St & Tupper



Alternative 4
9: Washington & Tupper

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	479	151	3	202	2	84	53	53	30	76	4
Future Volume (vph)	30	479	151	3	202	2	84	53	53	30	76	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		78	85		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3343	0	0	1751	0	1805	1602	0	1719	1863	0
Fit Permitted		0.933			0.994		0.484			0.685		
Satd. Flow (perm)	0	3123	0	0	1742	0	889	1602	0	1209	1863	0
Right Turn on Red	Yes			Yes			Yes			Yes		
Satd. Flow (RTOR)	56			1			56			2		
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	263			328			1190			726		
Travel Time (s)	6.0			7.5			27.0			16.5		
Confl. Peds. (#/hr)	14			11			14			16		
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
Heavy Vehicles (%)	4%	4%	0%	33%	8%	0%	0%	15%	0%	5%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	703	0	0	220	0	89	112	0	32	85	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)	94			94			94			94		
Detector 2 Size(ft)	6			6			6			6		
Detector 2 Type	Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex		
Detector 2 Channel												
Detector 2 Extend (s)	0.0			0.0			0.0			0.0		
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases	2			6			3			4		
Permitted Phases	2			6			3			4		
Detector Phase	2	2		6	6		3	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	47.0	47.0		47.0	47.0		12.5	28.0		28.0	28.0	
Total Split (s)	56.0	56.0		56.0	56.0		15.0	44.0		29.0	29.0	
Total Split (%)	56.0%	56.0%		56.0%	56.0%		15.0%	44.0%		29.0%	29.0%	
Maximum Green (s)	50.5	50.5		50.5	50.5		9.5	38.5		23.5	23.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0			0.0			0.0			0.0		

Alternative 4
9: Washington & Tupper

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Lost Time (s)	5.5						5.5					
Lead/Lag	Lead						Lag					
Lead-Lag Optimize?	Yes						Yes					
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	17.0	17.0		17.0	17.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	11	11		14	14		17	17		16	16	
Act Effct Green (s)	65.1			65.1			23.9	23.9		12.2	12.2	
Actuated g/C Ratio	0.65			0.65			0.24	0.24		0.12	0.12	
v/c Ratio	0.34			0.19			0.30	0.26		0.22	0.37	
Control Delay	4.8			5.1			29.8	15.5		40.6	42.3	
Queue Delay	0.2			0.4			0.0	0.0		0.0	0.0	
Total Delay	5.1			5.6			29.8	15.5		40.6	42.3	
LOS	A			A			C	B		D	D	
Approach Delay	5.1			5.6			21.8			41.8		
Approach LOS	A			A			C			D		
90th %ile Green (s)	56.0	56.0		56.0	56.0		9.5	33.0		18.0	18.0	
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Hold		Ped	Ped	
70th %ile Green (s)	56.0	56.0		56.0	56.0		9.5	33.0		18.0	18.0	
70th %ile Term Code	Coord	Coord		Coord	Coord		Max	Hold		Ped	Ped	
50th %ile Green (s)	64.3	64.3		64.3	64.3		9.4	24.7		9.8	9.8	
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Hold		Gap	Gap	
30th %ile Green (s)	67.1	67.1		67.1	67.1		8.1	21.9		8.3	8.3	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Hold		Gap	Gap	
10th %ile Green (s)	82.0	82.0		82.0	82.0		0.0	7.0		7.0	7.0	
10th %ile Term Code	Coord	Coord		Coord	Coord		Skip	Min		Hold	Hold	
Queue Length 50th (ft)	33			39			45	28		19	51	
Queue Length 95th (ft)	71			88			76	64		45	90	
Internal Link Dist (ft)	183			248			1110			646		
Turn Bay Length (ft)	85											
Base Capacity (vph)	2051			1133			304	651		284	439	
Starvation Cap Reductn	647			547			0	0		0	0	
Spillback Cap Reductn	0			0			0	0		0	0	
Storage Cap Reductn	0			0			0	0		0	0	
Reduced v/c Ratio	0.50			0.38			0.29	0.17		0.11	0.19	
Intersection Summary												
Area Type:	Other											
Cycle Length:	100											
Actuated Cycle Length:	100											
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow												
Natural Cycle:	90											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.37											
Intersection Signal Delay:	11.3						Intersection LOS: B					
Intersection Capacity Utilization 55.7%							ICU Level of Service B					
Analysis Period (min)	15											

Alternative 4
9: Washington & Tupper

AM 2045
01/17/2023

Splits and Phases: 9: Washington & Tupper



Alternative 4
10: Ellicott & Tupper

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	350	131	0	125	0	71	106	99	60	82	13
Future Volume (vph)	20	350	131	0	125	0	71	106	99	60	82	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	80		150
Storage Lanes	0		0	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	2913	0	0	1863	0	0	1801	1599	1736	1798	0
Fit Permitted		0.941						0.823		0.379		
Satd. Flow (perm)	0	2745	0	0	1863	0	0	1497	1505	672	1798	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		70							108			9
Link Speed (mph)		30			30			30				30
Link Distance (ft)		328			387			1108				723
Travel Time (s)		7.5			8.8			25.2				16.4
Confl. Peds. (#/hr)	7		5	5		7	12		32	32		12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	25%	1%	2%	2%	2%	1%	5%	1%	4%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	544	0	0	136	0	0	192	108	65	103	0
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA			NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8		8	4		
Detector Phase	2	2		6	6		8	8	8	7	4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	50.0	50.0		23.5	23.5		40.0	40.0	40.0	12.5	40.0	
Total Split (s)	55.0	55.0		55.0	55.0		32.5	32.5	32.5	12.5	45.0	
Total Split (%)	55.0%	55.0%		55.0%	55.0%		32.5%	32.5%	32.5%	12.5%	45.0%	
Maximum Green (s)	49.5	49.5		49.5	49.5		27.0	27.0	27.0	7.0	39.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0	0.0	0.0	0.0	

Alternative 4
10: Ellicott & Tupper

AM 2045
01/17/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Total Lost Time (s)	5.5			5.5			Lag		Lag		Lag		Lag
Lead-Lag							Yes		Yes		Yes		
Lead-Lag Optimize?							Yes		Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None	None	None	None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	14.0	14.0		11.0	11.0		13.0	13.0	13.0		13.0	13.0	
Pedestrian Calls (#/hr)	19	19		0	0		46	46	46		46	46	
Act Effct Green (s)	60.5			60.5			18.5		18.5		27.7		
Actuated g/C Ratio	0.60			0.60			0.18		0.18		0.28		
v/c Ratio	0.32			0.12			0.70		0.30		0.20		
Control Delay	4.7			23.1			50.8		8.4		25.3		
Queue Delay	0.1			0.0			0.0		0.0		0.0		
Total Delay	4.8			23.1			50.8		8.4		25.3		
LOS	A			C			D		A		C		
Approach Delay	4.8			23.1			35.5				23.8		
Approach LOS	A			C			D				C		
90th %ile Green (s)	51.0	51.0		51.0	51.0		25.5	25.5	25.5	7.0	38.0		
90th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap	Gap	Max	Hold		
70th %ile Green (s)	55.8	55.8		55.8	55.8		20.7	20.7	20.7	7.0	33.2		
70th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap	Gap	Max	Hold		
50th %ile Green (s)	56.5	56.5		56.5	56.5		20.0	20.0	20.0	7.0	32.5		
50th %ile Term Code	Coord	Coord		Coord	Coord		Ped	Ped	Ped	Max	Hold		
30th %ile Green (s)	61.4	61.4		61.4	61.4		15.1	15.1	15.1	7.0	27.6		
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap	Gap	Max	Hold		
10th %ile Green (s)	78.0	78.0		78.0	78.0		11.0	11.0	11.0	0.0	0.0		
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap	Gap	Skip	Skip		
Queue Length 50th (ft)	29			84			113		0		29		
Queue Length 95th (ft)	42			146			175		41		75		
Internal Link Dist (ft)	248			307			1028				643		
Turn Bay Length (ft)									80				
Base Capacity (vph)	1689			1127			404		485		260		
Starvation Cap Reductn	385			0			0		0		0		
Spillback Cap Reductn	0			0			0		0		0		
Storage Cap Reductn	0			0			0		0		0		
Reduced v/c Ratio	0.42			0.12			0.48		0.22		0.14		

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle:	105
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.70
Intersection Signal Delay:	17.8
Intersection LOS:	B
Intersection Capacity Utilization:	54.9%
ICU Level of Service:	A
Analysis Period (min):	15

Alternative 4
10: Ellicott & Tupper

AM 2045
01/17/2023

Splits and Phases: 10: Ellicott & Tupper



Alternative 4
11: Tupper & Oak

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑								↓	↓↓	
Traffic Volume (vph)	0	377	162	0	0	0	0	0	0	307	216	125
Future Volume (vph)	0	377	162	0	0	0	0	0	0	307	216	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3331	0	0	0	0	0	0	0	1610	3135	0
Flt Permitted										0.950	0.990	
Satd. Flow (perm)	0	3331	0	0	0	0	0	0	0	1606	3133	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)		97							Yes	248	101	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		387			354			125			680	
Travel Time (s)		8.8			8.0			2.8			15.5	
Conf. Peds. (#/hr)										2		5
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	2%	7%	0%	0%	0%	0%	0%	0%	2%	6%	0%
Shared Lane Traffic (%)										29%		
Lane Group Flow (vph)	0	612	0	0	0	0	0	0	0	248	488	0
Number of Detectors		2								1	2	
Detector Template		Thru								Left	Thru	
Leading Detector (ft)		100								20	100	
Trailing Detector (ft)		0								0	0	
Detector 1 Position(ft)		0								0	0	
Detector 1 Size(ft)		6								20	6	
Detector 1 Type		Cl+Ex								Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0								0.0	0.0	
Detector 1 Queue (s)		0.0								0.0	0.0	
Detector 1 Delay (s)		0.0								0.0	0.0	
Detector 2 Position(ft)		94									94	
Detector 2 Size(ft)		6									6	
Detector 2 Type		Cl+Ex									Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0									0.0	
Turn Type		NA								Perm	NA	
Protected Phases		2									4	
Permitted Phases										4		
Detector Phase		2								4	4	
Switch Phase												
Minimum Initial (s)		7.0								7.0	7.0	
Minimum Split (s)		50.0								40.0	40.0	
Total Split (s)		56.0								44.0	44.0	
Total Split (%)		56.0%								44.0%	44.0%	
Maximum Green (s)		50.5								38.5	38.5	
Yellow Time (s)		3.5								3.5	3.5	
All-Red Time (s)		2.0								2.0	2.0	
Lost Time Adjust (s)		0.0								0.0	0.0	

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C&S Engineers

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Alternative 4
11: Tupper & Oak

AM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Lost Time (s)		5.5									5.5	5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)			3.0							3.0	3.0	
Recall Mode			C-Max							None	None	
Walk Time (s)			7.0							7.0	7.0	
Flash Dont Walk (s)			16.0							13.0	13.0	
Pedestrian Calls (#/hr)			6							7	7	
Act Efect Green (s)			68.9							20.1	20.1	
Actuated g/C Ratio			0.69							0.20	0.20	
v/c Ratio			0.26							0.48	0.69	
Control Delay			4.4							7.1	33.7	
Queue Delay			0.1							0.0	0.0	
Total Delay			4.5							7.1	33.7	
LOS			A							A	C	
Approach Delay			4.5								24.7	
Approach LOS			A								C	
90th %ile Green (s)			61.1							27.9	27.9	
90th %ile Term Code			Coord							Gap	Gap	
70th %ile Green (s)			65.9							23.1	23.1	
70th %ile Term Code			Coord							Gap	Gap	
50th %ile Green (s)			69.0							20.0	20.0	
50th %ile Term Code			Coord							Gap	Gap	
30th %ile Green (s)			72.2							16.8	16.8	
30th %ile Term Code			Coord							Gap	Gap	
10th %ile Green (s)			76.5							12.5	12.5	
10th %ile Term Code			Coord							Gap	Gap	
Queue Length 50th (ft)			40							0	126	
Queue Length 95th (ft)			67							58	160	
Internal Link Dist (ft)			307			274			45		600	
Turn Bay Length (ft)												
Base Capacity (vph)			2326							770	1268	
Starvation Cap Reductn			753							0	0	
Spillback Cap Reductn			0							0	0	
Storage Cap Reductn			0							0	0	
Reduced v/c Ratio			0.39							0.32	0.38	
Intersection Summary												
Area Type:	Other											
Cycle Length:	100											
Actuated Cycle Length:	100											
Offset:	0 (0%), Referenced to phase 2:EBT and 6:, Start of Yellow											
Natural Cycle:	90											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.69											
Intersection Signal Delay:	15.6						Intersection LOS: B					
Intersection Capacity Utilization:	38.1%						ICU Level of Service A					
Analysis Period (min):	15											

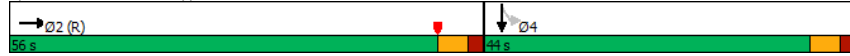
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Alternative 4
11: Tupper & Oak

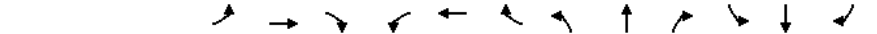
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Splits and Phases: 11: Tupper & Oak



Alternative 4
12: Tupper & Elm St

AM 2045
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑						↑↑				
Traffic Volume (vph)	9	682	0	0	0	0	0	446	4	0	0	0
Future Volume (vph)	9	682	0	0	0	0	0	446	4	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3458	0	0	0	0	0	3536	0	0	0	0
Fit Permitted		0.999										
Satd. Flow (perm)	0	3458	0	0	0	0	0	3536	0	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27						1				
Link Speed (mph)		30			30			30				30
Link Distance (ft)		354			313			418				586
Travel Time (s)		8.0			7.1			9.5				13.3
Confl. Peds. (#/hr)							5			5		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	25%	4%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	751	0	0	0	0	0	489	0	0	0	0
Number of Detectors	1	2						2				
Detector Template	Left	Thru						Thru				
Leading Detector (ft)	20	100						100				
Trailing Detector (ft)	0	0						0				
Detector 1 Position(ft)	0	0						0				
Detector 1 Size(ft)	20	6						6				
Detector 1 Type	Cl+Ex	Cl+Ex						Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0						0.0				
Detector 1 Queue (s)	0.0	0.0						0.0				
Detector 1 Delay (s)	0.0	0.0						0.0				
Detector 2 Position(ft)		94						94				
Detector 2 Size(ft)		6						6				
Detector 2 Type		Cl+Ex						Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0				
Turn Type	Perm	NA						NA				
Protected Phases		2						4				
Permitted Phases	2											
Detector Phase	2	2						4				
Switch Phase												
Minimum Initial (s)	7.0	7.0						7.0				
Minimum Split (s)	30.0	30.0						60.0				
Total Split (s)	70.0	70.0						30.0				
Total Split (%)	70.0%	70.0%						30.0%				
Maximum Green (s)	64.5	64.5						24.5				
Yellow Time (s)	3.5	3.5						3.5				
All-Red Time (s)	2.0	2.0						2.0				
Lost Time Adjust (s)		0.0						0.0				
Total Lost Time (s)		5.5						5.5				
Lead/Lag												
Lead-Lag Optimize?												

Alternative 4
12: Tupper & Elm St

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	3.0	3.0						3.0				
Recall Mode	C-Max	C-Max						None				
Walk Time (s)	7.0	7.0						7.0				
Flash Dont Walk (s)	11.0	11.0						11.0				
Pedestrian Calls (#/hr)	0	0						5				
Act Effect Green (s)		69.5						19.5				
Actuated g/C Ratio		0.70						0.20				
v/c Ratio		0.31						0.71				
Control Delay		5.5						43.2				
Queue Delay		0.3						0.0				
Total Delay		5.8						43.2				
LOS		A						D				
Approach Delay		5.8						43.2				
Approach LOS		A						D				
90th %ile Green (s)	64.5	64.5						24.5				
90th %ile Term Code	Coord	Coord						Max				
70th %ile Green (s)	67.3	67.3						21.7				
70th %ile Term Code	Coord	Coord						Gap				
50th %ile Green (s)	69.2	69.2						19.8				
50th %ile Term Code	Coord	Coord						Gap				
30th %ile Green (s)	71.9	71.9						17.1				
30th %ile Term Code	Coord	Coord						Gap				
10th %ile Green (s)	74.7	74.7						14.3				
10th %ile Term Code	Coord	Coord						Gap				
Queue Length 50th (ft)		67						153				
Queue Length 95th (ft)		114						196				
Internal Link Dist (ft)		274			233			338			506	
Turn Bay Length (ft)												
Base Capacity (vph)		2412						867				
Starvation Cap Reductn		941						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.51						0.56				

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 20.5
 Intersection Capacity Utilization 56.5%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 12: Tupper & Elm St



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Alternative 4
14: Pearl

AM 2045
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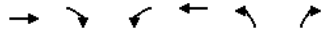
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↑↑	
Traffic Volume (vph)	0	0	312	743	330	110
Future Volume (vph)	0	0	312	743	330	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	3486	1735	0
Fit Permitted				0.985	0.964	
Satd. Flow (perm)	0	0	0	3486	1735	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)					19	
Link Speed (mph)	30			30	30	
Link Distance (ft)	276			322	703	
Travel Time (s)	6.3			7.3	16.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1147	479	0
Number of Detectors			1	2	1	
Detector Template			Left	Thru	Left	
Leading Detector (ft)			20	100	20	
Trailing Detector (ft)			0	0	0	
Detector 1 Position(ft)			0	0	0	
Detector 1 Size(ft)			20	6	20	
Detector 1 Type			CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)			0.0	0.0	0.0	
Detector 1 Queue (s)			0.0	0.0	0.0	
Detector 1 Delay (s)			0.0	0.0	0.0	
Detector 2 Position(ft)				94		
Detector 2 Size(ft)				6		
Detector 2 Type				CI+Ex		
Detector 2 Channel						
Detector 2 Extend (s)				0.0		
Turn Type			Perm	NA	Prot	
Protected Phases				6	8	
Permitted Phases				6		
Detector Phase				6	8	
Switch Phase						
Minimum Initial (s)				7.0	7.0	7.0
Minimum Split (s)				23.5	23.5	23.5
Total Split (s)				59.0	59.0	51.0
Total Split (%)				53.6%	53.6%	46.4%
Maximum Green (s)				53.5	53.5	45.5
Yellow Time (s)				3.5	3.5	3.5
All-Red Time (s)				2.0	2.0	2.0
Lost Time Adjust (s)				0.0	0.0	0.0
Total Lost Time (s)				5.5	5.5	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)			3.0	3.0	3.0	
Recall Mode			C-Max	C-Max	Max	

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Alternative 4
14: Pearl

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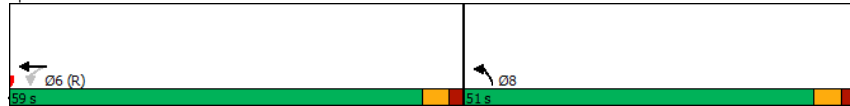


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Walk Time (s)		7.0	7.0	7.0	7.0	
Flash Dont Walk (s)		11.0	11.0	11.0		
Pedestrian Calls (#/hr)		0	0	0		
Act Effect Green (s)			53.5	45.5		
Actuated g/C Ratio			0.49	0.41		
v/c Ratio			0.68	0.66		
Control Delay			8.3	30.1		
Queue Delay			0.2	0.0		
Total Delay			8.5	30.1		
LOS			A	C		
Approach Delay			8.5	30.1		
Approach LOS			A	C		
90th %ile Green (s)			53.5	53.5	45.5	
90th %ile Term Code			Coord	Coord	MaxR	
70th %ile Green (s)			53.5	53.5	45.5	
70th %ile Term Code			Coord	Coord	MaxR	
50th %ile Green (s)			53.5	53.5	45.5	
50th %ile Term Code			Coord	Coord	MaxR	
30th %ile Green (s)			53.5	53.5	45.5	
30th %ile Term Code			Coord	Coord	MaxR	
10th %ile Green (s)			53.5	53.5	45.5	
10th %ile Term Code			Coord	Coord	MaxR	
Queue Length 50th (ft)			46	257		
Queue Length 95th (ft)			67	376		
Internal Link Dist (ft)	196		242	623		
Turn Bay Length (ft)						
Base Capacity (vph)			1695	728		
Starvation Cap Reductn			100	0		
Spillback Cap Reductn			0	0		
Storage Cap Reductn			0	0		
Reduced v/c Ratio			0.72	0.66		

Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	64 (58%), Referenced to phase 2: and 6:WBTL, Start of Green
Natural Cycle:	55
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.68
Intersection Signal Delay:	14.9
Intersection LOS:	B
Intersection Capacity Utilization:	63.8%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 14: Pearl

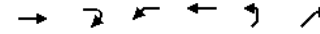


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Alternative 4
34:

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Lane Group	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations	↑↑					↑↑
Traffic Volume (vph)	549	0	0	0	0	733
Future Volume (vph)	549	0	0	0	0	733
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	3539	0	0	0	0	2787
Fit Permitted						
Satd. Flow (perm)	3539	0	0	0	0	2787
Link Speed (mph)	30			55	55	
Link Distance (ft)	334			197	283	
Travel Time (s)	7.6			2.4	3.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	597	0	0	0	0	797
Sign Control	Free			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization:	47.5%
ICU Level of Service:	A
Analysis Period (min):	15

Lanes, Volumes, Timings
C&S Engineers

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Alternative 4
1: Michigan & Goodell

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↔↔↔	↔	↔	↔	↔			↔	
Traffic Volume (vph)	0	0	0	138	480	80	75	223	0	0	545	113
Future Volume (vph)	0	0	0	138	480	80	75	223	0	0	545	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	0	4961	0	1805	1845	0	0	3403	0
Fit Permitted				0.990	0.160							
Satd. Flow (perm)	0	0	0	0	4961	0	303	1845	0	0	3403	0
Right Turn on Red			Yes		Yes			Yes			Yes	
Satd. Flow (RTOR)				30							25	
Link Speed (mph)		30		30			30			30		
Link Distance (ft)		402		274			648			972		
Travel Time (s)		9.1		6.2			14.7			22.1		
Confl. Peds. (#/hr)						1	10					10
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	2%	1%	0%	3%	8%	0%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	713	0	77	228	0	0	671	0
Number of Detectors				1	2		1	2			2	
Detector Template				Left	Thru		Left	Thru			Thru	
Leading Detector (ft)				20	100		20	100			100	
Trailing Detector (ft)				0	0		0	0			0	
Detector 1 Position(ft)				0	0		0	0			0	
Detector 1 Size(ft)				20	6		20	6			6	
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					6		3	8			4	
Permitted Phases					6			8				
Detector Phase					6	6		3	8			4
Switch Phase												
Minimum Initial (s)				7.0	7.0		7.0	7.0			7.0	
Minimum Split (s)				45.0	45.0		12.5	23.5			23.5	
Total Split (s)				50.0	50.0		15.0	50.0			35.0	
Total Split (%)				50.0%	50.0%		15.0%	50.0%			35.0%	
Maximum Green (s)				44.5	44.5		9.5	44.5			29.5	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		2.0	2.0			2.0	
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	
Total Lost Time (s)					5.5		5.5	5.5			5.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	

Lanes, Volumes, Timings
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Alternative 4
1: Michigan & Goodell

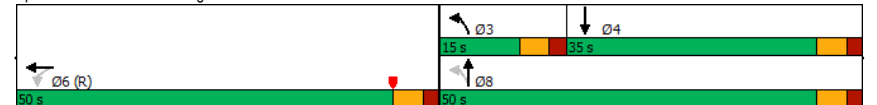
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)				4.0	4.0		3.0	3.0			3.0	
Recall Mode				C-Max	C-Max		None	None			None	
Walk Time (s)				7.0	7.0		7.0			7.0		
Flash Dont Walk (s)				14.0	14.0		10.0			11.0		
Pedestrian Calls (#/hr)				1	1		10			10		
Act Effct Green (s)				52.7			36.3	36.3			25.1	
Actuated g/C Ratio				0.53			0.36	0.36			0.25	
v/c Ratio				0.27			0.33	0.34			0.77	
Control Delay				14.2			22.2	23.0			39.5	
Queue Delay				0.0			0.0	0.0			0.0	
Total Delay				14.2			22.2	23.0			39.5	
LOS				B			C	C			D	
Approach Delay				14.2			22.8			39.5		
Approach LOS				B			C			D		
90th %ile Green (s)				44.5	44.5		9.5	44.5			29.5	
90th %ile Term Code				Coord	Coord		Max	Hold			Max	
70th %ile Green (s)				46.4	46.4		9.0	42.6			28.1	
70th %ile Term Code				Coord	Coord		Gap	Hold			Gap	
50th %ile Green (s)				49.5	49.5		8.2	39.5			25.8	
50th %ile Term Code				Coord	Coord		Gap	Hold			Gap	
30th %ile Green (s)				53.4	53.4		7.3	35.6			22.8	
30th %ile Term Code				Coord	Coord		Gap	Hold			Gap	
10th %ile Green (s)				69.6	69.6		0.0	19.4			19.4	
10th %ile Term Code				Coord	Coord		Skip	Hold			Gap	
Queue Length 50th (ft)					89		30	99			200	
Queue Length 95th (ft)					129		55	143			252	
Internal Link Dist (ft)		322			194			568			892	
Turn Bay Length (ft)												
Base Capacity (vph)					2627		252	821			1021	
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					0.27		0.31	0.28			0.66	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 11 (11%), Referenced to phase 6:WBTL, Start of Yellow
 Natural Cycle: 85
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 25.8
 Intersection Capacity Utilization 55.9%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 1: Michigan & Goodell



Alternative 4
2: Elm St/Bennett Ln & Goodell

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↑	↑				↑
Traffic Volume (vph)	0	0	0	0	761	15	282	5	0	0	0	15
Future Volume (vph)	0	0	0	0	761	15	282	5	0	0	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	0	5070	0	1681	1688	0	0	0	1611
Fit Permitted					0.950		0.954					
Satd. Flow (perm)	0	0	0	0	5070	0	1681	1688	0	0	0	1611
Right Turn on Red			Yes		Yes	Yes		Yes				Yes
Satd. Flow (RTOR)					4		144	141				144
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		335			402			586			382	
Travel Time (s)		7.6			9.1			13.3			8.7	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Shared Lane Traffic (%)							49%					
Lane Group Flow (vph)	0	0	0	0	792	0	147	146	0	0	0	15
Number of Detectors					2		1	2				1
Detector Template					Thru		Left	Thru				Right
Leading Detector (ft)					100		20	100				20
Trailing Detector (ft)					0		0	0				0
Detector 1 Position(ft)					0		0	0				0
Detector 1 Size(ft)					6		20	6				20
Detector 1 Type					Cl+Ex		Cl+Ex	Cl+Ex				Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)					0.0		0.0	0.0				0.0
Detector 1 Queue (s)					0.0		0.0	0.0				0.0
Detector 1 Delay (s)					0.0		0.0	0.0				0.0
Detector 2 Position(ft)					94			94				
Detector 2 Size(ft)					6			6				
Detector 2 Type					Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0				
Turn Type					NA		Perm	NA				Perm
Protected Phases					6			8				
Permitted Phases							8					4
Detector Phase					6		8	8				4
Switch Phase												
Minimum Initial (s)					7.0		7.0	7.0				7.0
Minimum Split (s)					23.5		23.5	23.5				23.5
Total Split (s)					56.0		44.0	44.0				44.0
Total Split (%)					56.0%		44.0%	44.0%				44.0%
Maximum Green (s)					50.5		38.5	38.5				38.5
Yellow Time (s)					3.5		3.5	3.5				3.5
All-Red Time (s)					2.0		2.0	2.0				2.0
Lost Time Adjust (s)					0.0		0.0	0.0				0.0
Total Lost Time (s)					5.5		5.5	5.5				5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)					3.0		3.0	3.0				3.0
Recall Mode					C-Max		Max	Max				Max

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Alternative 4
2: Elm St/Bennett Ln & Goodell

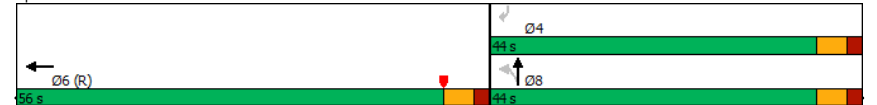
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Walk Time (s)					7.0		7.0	7.0				7.0
Flash Dont Walk (s)					11.0		11.0	11.0				11.0
Pedestrian Calls (#/hr)					0		0	0				0
Act Effct Green (s)					50.5		38.5	38.5				38.5
Actuated g/C Ratio					0.50		0.38	0.38				0.38
v/c Ratio					0.31		0.20	0.20				0.02
Control Delay					10.9		4.4	4.6				0.1
Queue Delay					0.0		0.0	0.0				0.0
Total Delay					11.0		4.4	4.6				0.1
LOS					B		A	A				A
Approach Delay					11.0			4.5				0.1
Approach LOS					B		A	A				A
90th %ile Green (s)					50.5		38.5	38.5				38.5
90th %ile Term Code					Coord		MaxR	MaxR				MaxR
70th %ile Green (s)					50.5		38.5	38.5				38.5
70th %ile Term Code					Coord		MaxR	MaxR				MaxR
50th %ile Green (s)					50.5		38.5	38.5				38.5
50th %ile Term Code					Coord		MaxR	MaxR				MaxR
30th %ile Green (s)					50.5		38.5	38.5				38.5
30th %ile Term Code					Coord		MaxR	MaxR				MaxR
10th %ile Green (s)					50.5		38.5	38.5				38.5
10th %ile Term Code					Coord		MaxR	MaxR				MaxR
Queue Length 50th (ft)					66		1	2				0
Queue Length 95th (ft)					79		41	42				0
Internal Link Dist (ft)		255			322			506			302	
Turn Bay Length (ft)												
Base Capacity (vph)					2562		735	736				708
Starvation Cap Reductn					0		0	0				0
Spillback Cap Reductn					94		2	2				2
Storage Cap Reductn					0		0	0				0
Reduced v/c Ratio					0.32		0.20	0.20				0.02

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 18 (18%), Referenced to phase 6:WBT, Start of Yellow
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.31
 Intersection Signal Delay: 9.1 Intersection LOS: A
 Intersection Capacity Utilization 68.6% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: Elm St/Bennett Ln & Goodell



Lanes, Volumes, Timings
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Alternative 4
3: Oak & Goodell

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔						↔	
Traffic Volume (vph)	100	0	445	364	612	43	0	0	0	0	305	55
Future Volume (vph)	100	0	445	364	612	43	0	0	0	0	305	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	1676	0	1805	3486	0	0	0	0	0	1831	0
Fit Permitted		0.771		0.435								
Satd. Flow (perm)	0	1304	0	806	3486	0	0	0	0	0	1831	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		204		14							9	
Link Speed (mph)		30		30			30				30	
Link Distance (ft)		385		335			680				542	
Travel Time (s)		8.8		7.6			15.5				12.3	
Confl. Peds. (#/hr)				45		3						9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	2%	7%	0%	0%	0%	0%	1%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	573	0	383	689	0	0	0	0	0	379	0
Number of Detectors	1	2		1	2						2	
Detector Template	Left	Thru		Left	Thru						Thru	
Leading Detector (ft)	20	100		20	100						100	
Trailing Detector (ft)	0	0		0	0						0	
Detector 1 Position(ft)	0	0		0	0						0	
Detector 1 Size(ft)	20	6		20	6						6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex						Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0						0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0						0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0						0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type	Perm	NA		Perm	NA						NA	
Protected Phases		2			6						4	
Permitted Phases		2			6						4	
Detector Phase	2	2		6	6						4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0						7.0	
Minimum Split (s)	24.5	24.5		58.0	58.0						27.7	
Total Split (s)	68.0	68.0		68.0	68.0						32.0	
Total Split (%)	68.0%	68.0%		68.0%	68.0%						32.0%	
Maximum Green (s)	62.5	62.5		62.5	62.5						26.5	
Yellow Time (s)	3.5	3.5		3.5	3.5						3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0						2.0	
Lost Time Adjust (s)		0.0		0.0	0.0						0.0	
Total Lost Time (s)		5.5		5.5	5.5						5.5	
Lead/Lag												
Lead-Lag Optimize?												

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Alternative 4
3: Oak & Goodell

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	3.0	3.0		3.0	3.0						3.0	
Recall Mode	None	None		C-Max	C-Max						None	
Walk Time (s)	7.0	7.0		7.0	7.0						7.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0						11.0	
Pedestrian Calls (#/hr)	0	0		45	45						16	
Act Effct Green (s)		65.2		65.2	65.2						23.8	
Actuated g/C Ratio		0.65		0.65	0.65						0.24	
v/c Ratio		0.62		0.73	0.30						0.86	
Control Delay		12.9		17.7	2.9						54.4	
Queue Delay		0.2		0.1	0.1						0.0	
Total Delay		13.1		17.8	3.0						54.4	
LOS		B		B	A						D	
Approach Delay		13.1			8.3						54.4	
Approach LOS		B			A						D	
90th %ile Green (s)	62.5	62.5		62.5	62.5						26.5	
90th %ile Term Code	Coord	Coord		Coord	Coord						Max	
70th %ile Green (s)	62.5	62.5		62.5	62.5						26.5	
70th %ile Term Code	Coord	Coord		Coord	Coord						Max	
50th %ile Green (s)	63.3	63.3		63.3	63.3						25.7	
50th %ile Term Code	Coord	Coord		Coord	Coord						Gap	
30th %ile Green (s)	66.4	66.4		66.4	66.4						22.6	
30th %ile Term Code	Coord	Coord		Coord	Coord						Gap	
10th %ile Green (s)	71.1	71.1		71.1	71.1						17.9	
10th %ile Term Code	Coord	Coord		Coord	Coord						Gap	
Queue Length 50th (ft)		307		108	22						221	
Queue Length 95th (ft)		143		#360	48						#354	
Internal Link Dist (ft)		305			255			600			462	
Turn Bay Length (ft)												
Base Capacity (vph)		920		525	2276						491	
Starvation Cap Reductn		42		3	619						0	
Spillback Cap Reductn		0		0	0						0	
Storage Cap Reductn		0		0	0						0	
Reduced v/c Ratio		0.65		0.73	0.42						0.77	
Intersection Summary												
Area Type:	Other											
Cycle Length:	100											
Actuated Cycle Length:	100											
Offset:	26 (26%), Referenced to phase 6:WBTL, Start of Yellow											
Natural Cycle:	90											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.86											
Intersection Signal Delay:	18.3						Intersection LOS: B					
Intersection Capacity Utilization:	86.4%						ICU Level of Service E					
Analysis Period (min):	15											
#	95th percentile volume exceeds capacity, queue may be longer.											
	Queue shown is maximum after two cycles.											

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Alternative 4
3: Oak & Goodell

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Splits and Phases: 3: Oak & Goodell



Alternative 4
4: Ellicott & Goodell

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↕			↕			↕		
Traffic Volume (vph)	50	295	0	20	485	156	49	82	0	150	132	110
Future Volume (vph)	50	295	0	20	485	156	49	82	0	150	132	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	1887	0	0	3389	0	0	1866	0	1805	1747	0
Flt Permitted	0.833			0.937			0.767			0.509		
Satd. Flow (perm)	0	1583	0	0	3181	0	0	1457	0	967	1747	0
Right Turn on Red	Yes			Yes			Yes			Yes		
Satd. Flow (RTOR)				58						50		
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	330			385			723			475		
Travel Time (s)	7.5			8.8			16.4			10.8		
Confl. Peds. (#/hr)				5						3		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	6%	2%	4%	0%	0%	0%	0%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	375	0	0	719	0	0	142	0	163	263	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)	94			94			94			94		
Detector 2 Size(ft)	6			6			6			6		
Detector 2 Type	Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex		
Detector 2 Channel												
Detector 2 Extend (s)	0.0			0.0			0.0			0.0		
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases	2			6			8			7		
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	23.5	23.5		50.0	50.0		40.0	40.0		12.5	40.0	
Total Split (s)	55.0	55.0		55.0	55.0		31.0	31.0		14.0	45.0	
Total Split (%)	55.0%	55.0%		55.0%	55.0%		31.0%	31.0%		14.0%	45.0%	
Maximum Green (s)	49.5	49.5		49.5	49.5		25.5	25.5		8.5	39.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0			0.0			0.0			0.0		
Total Lost Time (s)	5.5			5.5			5.5			5.5		
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		

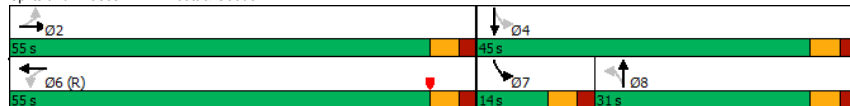
Alternative 4
4: Ellicott & Goodell

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		7.0	7.0	
Pedestrian Calls (#/hr)	0	0		5	5		16	16		3	3	
Act Effect Green (s)	60.3	60.3		60.3	60.3		14.7	14.7		28.7	28.7	
Actuated g/C Ratio	0.60	0.60		0.60	0.60		0.15	0.15		0.29	0.29	
v/c Ratio	0.39	0.39		0.37	0.37		0.66	0.66		0.47	0.49	
Control Delay	24.7	24.7		4.5	4.5		54.6	54.6		31.6	26.2	
Queue Delay	0.8	0.8		0.1	0.1		0.0	0.0		0.0	0.0	
Total Delay	25.5	25.5		4.6	4.6		54.6	54.6		31.6	26.2	
LOS	C	C		A	A		D	D		C	C	
Approach Delay	25.5	25.5		4.6	4.6		54.6	54.6		28.3	28.3	
Approach LOS	C	C		A	A		D	D		C	C	
90th %ile Green (s)	54.3	54.3		54.3	54.3		20.7	20.7		8.5	34.7	
90th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Max	Hold	
70th %ile Green (s)	57.8	57.8		57.8	57.8		17.2	17.2		8.5	31.2	
70th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Max	Hold	
50th %ile Green (s)	60.3	60.3		60.3	60.3		14.7	14.7		8.5	28.7	
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Max	Hold	
30th %ile Green (s)	62.8	62.8		62.8	62.8		12.2	12.2		8.5	26.2	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Max	Hold	
10th %ile Green (s)	66.3	66.3		66.3	66.3		8.7	8.7		8.5	22.7	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Max	Hold	
Queue Length 50th (ft)	178	178		38	38		87	87		81	111	
Queue Length 95th (ft)	312	312		45	45		142	142		125	172	
Internal Link Dist (ft)	250	250		305	305		643	643		395	395	
Turn Bay Length (ft)												
Base Capacity (vph)	954	954		1941	1941		371	371		348	720	
Starvation Cap Reductn	313	313		351	351		0	0		0	0	
Spillback Cap Reductn	104	104		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.59	0.59		0.45	0.45		0.38	0.38		0.47	0.37	

Intersection Summary	
Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	21 (21%), Referenced to phase 6:WBTL, Start of Yellow
Natural Cycle:	105
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.66
Intersection Signal Delay:	19.7
Intersection Capacity Utilization:	76.4%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	D

Splits and Phases: 4: Ellicott & Goodell



Alternative 4
5: Washington & Goodell

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔↔			↔		↔	↔	
Traffic Volume (vph)	20	225	0	34	611	19	52	71	0	70	99	20
Future Volume (vph)	20	225	0	34	611	19	52	71	0	70	99	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	50	0	0	0	0	0	0	1	66
Storage Lanes	0	0	0	0	0	0	0	0	0	0	1	0
Taper Length (ft)	25	25		25	25		25	25		25	25	
Satd. Flow (prot)	0	1892	0	0	3485	0	0	1834	0	1805	1799	0
Fit Permitted		0.929			0.926			0.750		0.615		
Satd. Flow (perm)	0	1765	0	0	3236	0	0	1397	0	1168	1799	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					6						10	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		280			330			726			324	
Travel Time (s)		6.4			7.5			16.5			7.4	
Confl. Peds. (#/hr)				5	4		9					9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	3%	0%	2%	1%	0%	0%	2%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	258	0	0	699	0	0	130	0	74	125	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			4	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	23.5	23.5		55.0	55.0		30.0	30.0		30.0	30.0	
Total Split (s)	70.0	70.0		70.0	70.0		30.0	30.0		30.0	30.0	
Total Split (%)	70.0%	70.0%		70.0%	70.0%		30.0%	30.0%		30.0%	30.0%	
Maximum Green (s)	64.5	64.5		64.5	64.5		24.5	24.5		24.5	24.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	

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Alternative 4
5: Washington & Goodell

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Lost Time (s)	5.5			5.5			5.5			5.5		
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		9	9		9	9		3	3	
Act Effct Green (s)	75.3			75.3			13.7			13.7		
Actuated g/C Ratio	0.75			0.75			0.14			0.14		
v/c Ratio	0.19			0.29			0.68			0.46		
Control Delay	3.4			3.2			57.9			47.8		
Queue Delay	0.5			0.2			0.0			0.3		
Total Delay	4.0			3.4			57.9			48.1		
LOS	A			A			E			D		
Approach Delay	4.0			3.4			57.9			44.3		
Approach LOS	A			A			E			D		
90th %ile Green (s)	69.6	69.6		69.6	69.6		19.4	19.4		19.4	19.4	
90th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
70th %ile Green (s)	72.9	72.9		72.9	72.9		16.1	16.1		16.1	16.1	
70th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
50th %ile Green (s)	75.3	75.3		75.3	75.3		13.7	13.7		13.7	13.7	
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	77.6	77.6		77.6	77.6		11.4	11.4		11.4	11.4	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	80.9	80.9		80.9	80.9		8.1	8.1		8.1	8.1	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
Queue Length 50th (ft)	38			40			80			44		
Queue Length 95th (ft)	60			60			135			84		
Internal Link Dist (ft)	200			250			646			244		
Turn Bay Length (ft)												
Base Capacity (vph)	1328			2437			342			286		
Starvation Cap Reductn	715			904			0			0		
Spillback Cap Reductn	61			0			0			40		
Storage Cap Reductn	0			0			0			0		
Reduced v/c Ratio	0.42			0.46			0.38			0.30		

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	41 (41%), Referenced to phase 6:WBTL, Start of Yellow
Natural Cycle:	85
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.68
Intersection Signal Delay:	15.4
Intersection LOS:	B
Intersection Capacity Utilization:	50.9%
ICU Level of Service:	A
Analysis Period (min):	15

Alternative 4
5: Washington & Goodell

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Splits and Phases: 5: Washington & Goodell



Alternative 4
6: Main St & Pearl/Goodell

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	50	0	28	447	219	18	113	0	175	122	144
Future Volume (vph)	60	50	0	28	447	219	18	113	0	175	122	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	0	80	0	0	0	0	0
Storage Lanes	0	0	0	0	1	1	0	1	0	1	1	1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1849	0	0	3498	1568	1805	1827	0	1805	1759	1615
Fit Permitted		0.973			0.997		0.950			0.950		
Satd. Flow (perm)	0	1836	0	0	3496	1498	1778	1827	0	1805	1759	1568
Right Turn on Red			Yes			Yes		Yes			Yes	
Satd. Flow (RTOR)						228						150
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		322			280			726			848	
Travel Time (s)		7.3			6.4			16.5			19.3	
Conf. Peds. (#/hr)	12		6	6		12	10					10
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	1%	3%	3%	0%	4%	0%	0%	8%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	115	0	0	495	228	19	118	0	182	127	150
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)	94			94			94			94		
Detector 2 Size(ft)	6			6			6			6		
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	custom
Protected Phases	2	2		6	6		3	8		7	4	4 2
Permitted Phases						6						4
Detector Phase	2	2		6	6	6	3	8		7	4	4 2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0			7.0	7.0	
Minimum Split (s)	23.0	23.0		35.5	35.5	35.5	12.5	17.0		12.5	26.0	
Total Split (s)	23.0	23.0		37.0	37.0	37.0	12.0	17.0		23.0	28.0	
Total Split (%)	23.0%	23.0%		37.0%	37.0%	37.0%	12.0%	17.0%		23.0%	28.0%	
Maximum Green (s)	17.5	17.5		31.5	31.5	31.5	6.5	11.5		17.5	22.5	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	

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Alternative 4
6: Main St & Pearl/Goodell

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Lost Time (s)					5.5	5.5	5.5	5.5		5.5	5.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.3	4.3		3.2	3.2	3.2				3.0	3.0	
Recall Mode	Max	Max		C-Max	C-Max	C-Max	None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0				7.0	7.0	
Flash Dont Walk (s)	15.0	15.0		17.0	17.0	17.0				10.0	10.0	
Pedestrian Calls (#/hr)	6	6		12	12	12				28	10	
Act Effect Green (s)		21.1			31.5	31.5	6.5	10.8		14.6	26.1	52.7
Actuated g/C Ratio		0.21			0.32	0.32	0.06	0.11		0.15	0.26	0.53
v/c Ratio		0.29			0.45	0.36	0.16	0.60		0.69	0.28	0.16
Control Delay		21.3			29.2	6.3	47.6	55.4		54.2	31.9	3.2
Queue Delay		0.0			0.9	0.4	0.0	0.0		0.0	0.0	0.0
Total Delay		21.3			30.1	6.7	47.6	55.4		54.2	31.9	3.2
LOS		C			C	A	D	E		D	C	A
Approach Delay		21.3			22.7		54.4				31.3	
Approach LOS		C			C		D				C	
90th %ile Green (s)	17.5	17.5		31.5	31.5	31.5	6.5	11.5		17.5	22.5	
90th %ile Term Code	Ped	Ped		Coord	Coord	Coord	Max	Ped		Max	Hold	
70th %ile Green (s)	17.5	17.5		31.5	31.5	31.5	6.5	11.5		17.5	22.5	
70th %ile Term Code	Ped	Ped		Coord	Coord	Coord	Max	Ped		Max	Hold	
50th %ile Green (s)	17.5	17.5		31.5	31.5	31.5	0.0	13.7		15.3	34.5	
50th %ile Term Code	Ped	Ped		Coord	Coord	Coord	Skip	Ped		Gap	Hold	
30th %ile Green (s)	23.6	23.6		31.5	31.5	31.5	0.0	9.9		13.0	28.4	
30th %ile Term Code	MaxR	MaxR		Coord	Coord	Coord	Skip	Gap		Gap	Hold	
10th %ile Green (s)	29.5	29.5		31.5	31.5	31.5	0.0	7.3		9.7	22.5	
10th %ile Term Code	MaxR	MaxR		Coord	Coord	Coord	Skip	Gap		Gap	Hold	
Queue Length 50th (ft)		65			104	4	12	70		111	57	0
Queue Length 95th (ft)		119			127	25	35	131		179	121	34
Internal Link Dist (ft)		242			200		646			768		
Turn Bay Length (ft)						80						
Base Capacity (vph)		390			1101	628	117	218		315	458	922
Starvation Cap Reductn		0			341	127	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		0.29			0.65	0.46	0.16	0.54		0.58	0.28	0.16
Intersection Summary												
Area Type:							Other					
Cycle Length:							100					
Actuated Cycle Length:							100					
Offset: 0 (0%), Referenced to phase 6:WBTL, Start of Yellow, Master Intersection												
Natural Cycle:							100					
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.69												
Intersection Signal Delay: 28.4										Intersection LOS: C		
Intersection Capacity Utilization 68.4%										ICU Level of Service C		
Analysis Period (min) 15												

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Alternative 4
6: Main St & Pearl/Goodell

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Splits and Phases: 6: Main St & Pearl/Goodell



Alternative 4
7: Tupper & Pearl

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	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕	↕↕		↕↕	↕↕
Traffic Volume (vph)	60	751	20	70	121	110	47	270	180	41	44	10
Future Volume (vph)	60	751	20	70	121	110	47	270	180	41	44	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3575	0	0	1765	0	0	1881	1583	0	1818	1583
Flt Permitted		0.895			0.694			0.937			0.477	
Satd. Flow (perm)	0	3213	0	0	1235	0	0	1765	1546	0	886	1485
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			46				167			25
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		699			351			561			703	
Travel Time (s)		15.9			8.0			12.8			16.0	
Confl. Peds. (#/hr)			20	20			14		6	6		14
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
Heavy Vehicles (%)	0%	0%	0%	2%	2%	0%	2%	0%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	884	0	0	320	0	0	337	191	0	91	11
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8		8	4		4
Detector Phase	2	2		6	6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	27.5	27.5		50.0	50.0		40.0	40.0	40.0	40.0	40.0	40.0
Total Split (s)	70.0	70.0		70.0	70.0		40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	63.6%	63.6%		63.6%	63.6%		36.4%	36.4%	36.4%	36.4%	36.4%	36.4%
Maximum Green (s)	64.5	64.5		64.5	64.5		34.5	34.5	34.5	34.5	34.5	34.5
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.5			5.5			5.5			5.5	
Lead/Lag												
Lead-Lag Optimize?												

Alternative 4
7: Tupper & Pearl

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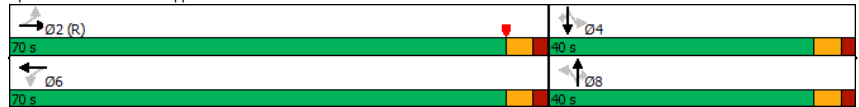


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max		Max	Max		None	None	None	None	None	None
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	15.0	15.0		11.0	11.0		10.0	10.0	10.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	20	20		0	0		6	6	6	14	14	14
Act Effect Green (s)		72.5			72.5			26.5	26.5		26.5	26.5
Actuated g/C Ratio		0.66			0.66			0.24	0.24		0.24	0.24
v/c Ratio		0.42			0.39			0.79	0.38		0.43	0.03
Control Delay		10.3			2.1			52.4	8.8		40.0	4.0
Queue Delay		0.0			0.2			0.0	0.0		0.0	0.0
Total Delay		10.3			2.3			52.4	8.8		40.0	4.0
LOS		B			A			D	A		D	A
Approach Delay		10.3			2.3			36.6			36.1	
Approach LOS		B			A			D			D	
90th %ile Green (s)	64.5	64.5		64.5	64.5		34.5	34.5	34.5	34.5	34.5	34.5
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max	Max	Hold	Hold	Hold
70th %ile Green (s)	68.7	68.7		68.7	68.7		30.3	30.3	30.3	30.3	30.3	30.3
70th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap	Gap	Hold	Hold	Hold
50th %ile Green (s)	72.0	72.0		72.0	72.0		27.0	27.0	27.0	27.0	27.0	27.0
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap	Gap	Hold	Hold	Hold
30th %ile Green (s)	76.1	76.1		76.1	76.1		22.9	22.9	22.9	22.9	22.9	22.9
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap	Gap	Hold	Hold	Hold
10th %ile Green (s)	81.1	81.1		81.1	81.1		17.9	17.9	17.9	17.9	17.9	17.9
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap	Gap	Hold	Hold	Hold
Queue Length 50th (ft)		142			0			223	13		54	0
Queue Length 95th (ft)		223			10			299	64		97	6
Internal Link Dist (ft)		619			271			481			623	
Turn Bay Length (ft)												
Base Capacity (vph)		2118			829			553	599		277	482
Starvation Cap Reductn		0			103			0	0		0	0
Spillback Cap Reductn		0			0			0	0		0	0
Storage Cap Reductn		0			0			0	0		0	0
Reduced v/c Ratio		0.42			0.44			0.61	0.32		0.33	0.02

Intersection Summary

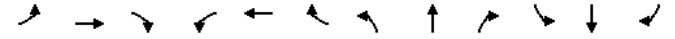
Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 108 (98%), Referenced to phase 2:EBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 17.9
 Intersection Capacity Utilization 84.5%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service E

Splits and Phases: 7: Tupper & Pearl



Alternative 4
8: Main St & Tupper

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕		↕↕	↕↕	↕↕
Traffic Volume (vph)	60	820	25	56	313	25	14	46	61	90	54	15
Future Volume (vph)	60	820	25	56	313	25	14	46	61	90	54	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	80		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3531	0	0	1859	0	0	1664	0	1770	1770	0
Fit Permitted		0.888			0.779			0.956		0.395		
Satd. Flow (perm)	0	3141	0	0	1458	0	0	1578	0	704	1770	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			4			47			15	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		351			263			1174			726	
Travel Time (s)		8.0			6.0			26.7			16.5	
Confl. Peds. (#/hr)	17		28	28		17	40		38	38		40
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	3%	0%	0%	4%	0%	4%	0%	2%	0%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	952	0	0	414	0	0	127	0	95	73	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	50.0	50.0		50.0	50.0		40.0	40.0		12.5	40.0	
Total Split (s)	60.0	60.0		60.0	60.0		37.0	37.0		13.0	50.0	
Total Split (%)	54.5%	54.5%		54.5%	54.5%		33.6%	33.6%		11.8%	45.5%	
Maximum Green (s)	54.5	54.5		54.5	54.5		31.5	31.5		7.5	44.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
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Alternative 4
8: Main St & Tupper

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Lost Time (s)	5.5			5.5			Lag		Lag		Lead	
Lead/Lag							Lag		Lag		Lead	
Lead-Lag Optimize?							Yes		Yes		Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	5.0	5.0		12.0	12.0		11.0	11.0		10.0	10.0	
Pedestrian Calls (#/hr)	28	28		17	17		38	38		40	40	
Act Effct Green (s)	72.2			72.2			13.9		26.8		26.8	
Actuated g/C Ratio	0.66			0.66			0.13		0.24		0.24	
v/c Ratio	0.46			0.43			0.53		0.39		0.17	
Control Delay	6.2			8.4			35.2		36.6		25.6	
Queue Delay	0.1			0.5			0.0		0.0		0.0	
Total Delay	6.3			8.9			35.2		36.6		25.6	
LOS	A			A			D		D		C	
Approach Delay	6.3			8.9			35.2				31.8	
Approach LOS	A			A			D				C	
90th %ile Green (s)	68.0	68.0		68.0	68.0		18.0	18.0		7.5	31.0	
90th %ile Term Code	Coord	Coord		Coord	Coord		Ped	Ped		Max	Hold	
70th %ile Green (s)	68.0	68.0		68.0	68.0		18.0	18.0		7.5	31.0	
70th %ile Term Code	Coord	Coord		Coord	Coord		Ped	Ped		Max	Hold	
50th %ile Green (s)	68.0	68.0		68.0	68.0		18.0	18.0		7.5	31.0	
50th %ile Term Code	Coord	Coord		Coord	Coord		Ped	Ped		Max	Hold	
30th %ile Green (s)	77.4	77.4		77.4	77.4		8.6	8.6		7.5	21.6	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Max	Hold	
10th %ile Green (s)	79.5	79.5		79.5	79.5		7.0	7.0		7.0	19.5	
10th %ile Term Code	Coord	Coord		Coord	Coord		Min	Min		Min	Hold	
Queue Length 50th (ft)	75			84			50		51		30	
Queue Length 95th (ft)	103			111			110		94		67	
Internal Link Dist (ft)	271			183			1094				646	
Turn Bay Length (ft)											80	
Base Capacity (vph)	2062			957			485		244		724	
Starvation Cap Reductn	290			222			0		0		0	
Spillback Cap Reductn	89			0			7		0		0	
Storage Cap Reductn	0			0			0		0		0	
Reduced v/c Ratio	0.54			0.56			0.27		0.39		0.10	

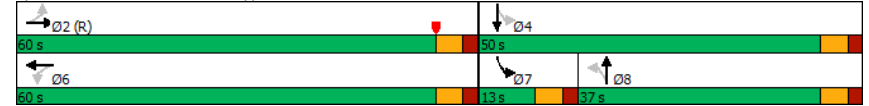
Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	106 (96%), Referenced to phase 2:EBTL, Start of Yellow
Natural Cycle:	105
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.53
Intersection Signal Delay:	11.7
Intersection LOS:	B
Intersection Capacity Utilization:	75.5%
ICU Level of Service:	D
Analysis Period (min):	15

Alternative 4
8: Main St & Tupper

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Splits and Phases: 8: Main St & Tupper



Alternative 4
9: Washington & Tupper

PM 2025
01/17/2023

	↖	→	↘	↙	←	↖	↙	↘	↗	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕↕			↕↕			↕↕			↕↕		
Traffic Volume (vph)	12	839	113	0	243	1	68	92	135	45	122	11
Future Volume (vph)	12	839	113	0	243	1	68	92	135	45	122	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		78	85		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3476	0	0	1899	0	1805	1648	0	1805	1827	0
Fit Permitted		0.950					0.663			0.227		
Satd. Flow (perm)	0	3304	0	0	1899	0	1183	1648	0	422	1827	0
Right Turn on Red		Yes			Yes			Yes				Yes
Satd. Flow (RTOR)	19						65				5	
Link Speed (mph)	30			30			30				30	
Link Distance (ft)	263			328			1190				726	
Travel Time (s)	6.0			7.5			27.0				16.5	
Conf. Peds. (#/hr)	21		17	17		21	23		26	26		23
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	1%	2%	0%	0%	0%	0%	3%	0%	0%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1071	0	0	271	0	76	252	0	50	148	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)	94			94			94			94		
Detector 2 Size(ft)	6			6			6			6		
Detector 2 Type	Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex		
Detector 2 Channel												
Detector 2 Extend (s)	0.0			0.0			0.0			0.0		
Turn Type	Perm	NA		NA		Perm	NA		pm+pt	NA		NA
Protected Phases	2	2		6	6		8	8		7	4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	47.0	47.0		47.0	47.0		23.5	23.5		12.5	23.5	
Total Split (s)	62.0	62.0		62.0	62.0		34.0	34.0		14.0	48.0	
Total Split (%)	56.4%	56.4%		56.4%	56.4%		30.9%	30.9%		12.7%	43.6%	
Maximum Green (s)	56.5	56.5		56.5	56.5		28.5	28.5		8.5	42.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	

Alternative 4
9: Washington & Tupper

PM 2025
01/17/2023

	↖	→	↘	↙	←	↖	↙	↘	↗	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Lost Time (s)	5.5			5.5			5.5			5.5		
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		10.0	10.0			10.0	
Pedestrian Calls (#/hr)	17	17		21	21		26	26			23	
Act Effect Green (s)		69.7			69.7		18.4	18.4		29.3	29.3	
Actuated g/C Ratio		0.63			0.63		0.17	0.17		0.27	0.27	
v/c Ratio		0.51			0.23		0.38	0.76		0.24	0.30	
Control Delay		7.8			4.3		44.4	46.6		28.6	30.0	
Queue Delay		0.1			0.4		0.0	0.0		0.0	0.0	
Total Delay		7.9			4.7		44.4	46.6		28.6	30.0	
LOS		A			A		D	D		C	C	
Approach Delay		7.9			4.7		46.1				29.7	
Approach LOS		A			A		D				C	
90th %ile Green (s)	58.1	58.1		58.1	58.1		26.9	26.9		8.5	40.9	
90th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Max	Hold	
70th %ile Green (s)	63.4	63.4		63.4	63.4		21.6	21.6		8.5	35.6	
70th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Max	Hold	
50th %ile Green (s)	67.0	67.0		67.0	67.0		18.3	18.3		8.2	32.0	
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Gap	Hold	
30th %ile Green (s)	71.4	71.4		71.4	71.4		15.0	15.0		7.1	27.6	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Gap	Hold	
10th %ile Green (s)	88.7	88.7		88.7	88.7		10.3	10.3		0.0	10.3	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Skip	Hold	
Queue Length 50th (ft)		90			37		48	128		26	78	
Queue Length 95th (ft)		207			53		86	200		49	116	
Internal Link Dist (ft)		183			248		1110			646		
Turn Bay Length (ft)										85		
Base Capacity (vph)		2101			1203		306	475		219	708	
Starvation Cap Reductn		200			524		0	0		0	0	
Spillback Cap Reductn		14			32		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.56			0.40		0.25	0.53		0.23	0.21	
Intersection Summary												
Area Type:	Other											
Cycle Length:	110											
Actuated Cycle Length:	110											
Offset:	103 (94%), Referenced to phase 2:EBTL, Start of Yellow											
Natural Cycle:	85											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.76											
Intersection Signal Delay:	16.5						Intersection LOS: B					
Intersection Capacity Utilization:	69.7%						ICU Level of Service C					
Analysis Period (min):	15											

Alternative 4
9: Washington & Tupper

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Splits and Phases: 9: Washington & Tupper



Alternative 4
10: Ellicott & Tupper

PM 2025
01/17/2023

	←	→	↙	↘	↖	↗	↕	↙	↘	↖	↗	↕
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕	↕↕	↕↕	↕↕	↕↕
Traffic Volume (vph)	13	974	109	0	205	0	32	100	317	148	97	7
Future Volume (vph)	13	974	109	0	205	0	32	100	317	148	97	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	80		150
Storage Lanes	0		0	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3299	0	0	1900	0	0	1822	1553	1752	1854	0
Fit Permitted		0.951						0.907		0.630		
Satd. Flow (perm)	0	3141	0	0	1900	0	0	1651	1478	1127	1854	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17							92			4
Link Speed (mph)		30			30			30				30
Link Distance (ft)		328			387			1108				723
Travel Time (s)		7.5			8.8			25.2				16.4
Confl. Peds. (#/hr)	3		2	2		3	19		19	19		19
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	7%	8%	2%	0%	0%	0%	0%	4%	4%	3%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1129	0	0	211	0	0	136	327	153	107	0
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA			NA			Perm	NA	Perm	Perm	NA
Protected Phases		2			6			8		8		4
Permitted Phases	2			6			8		8	4		
Detector Phase	2	2		6	6		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	50.0	50.0		25.5	25.5		40.0	40.0	40.0	40.0	40.0	
Total Split (s)	65.0	65.0		65.0	65.0		45.0	45.0	45.0	45.0	45.0	
Total Split (%)	59.1%	59.1%		59.1%	59.1%		40.9%	40.9%	40.9%	40.9%	40.9%	
Maximum Green (s)	59.5	59.5		59.5	59.5		39.5	39.5	39.5	39.5	39.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0	0.0	0.0	0.0	

Alternative 4
10: Ellicott & Tupper

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Lost Time (s)	5.5			5.5			5.5		5.5		5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max		Max	Max		None	None	None	None	None	None
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	12.0	12.0		13.0	13.0		10.0	10.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)	2	2		3	3		46	46	46	19	19	19
Act Effct Green (s)	74.4			74.4			24.6		24.6		24.6	
Actuated g/C Ratio	0.68			0.68			0.22		0.22		0.22	
v/c Ratio	0.53			0.16			0.37		0.82		0.61	
Control Delay	4.1			27.5			36.9		44.0		47.1	
Queue Delay	0.1			0.0			0.0		0.1		0.0	
Total Delay	4.2			27.5			36.9		44.1		47.1	
LOS	A			C			D		D		D	
Approach Delay	4.2			27.5			42.0				41.3	
Approach LOS	A			C			D				D	
90th %ile Green (s)	63.1	63.1		63.1	63.1		35.9	35.9	35.9	35.9	35.9	35.9
90th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap	Gap	Hold	Hold	Hold
70th %ile Green (s)	69.7	69.7		69.7	69.7		29.3	29.3	29.3	29.3	29.3	29.3
70th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap	Gap	Hold	Hold	Hold
50th %ile Green (s)	74.7	74.7		74.7	74.7		24.3	24.3	24.3	24.3	24.3	24.3
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap	Gap	Hold	Hold	Hold
30th %ile Green (s)	79.1	79.1		79.1	79.1		19.9	19.9	19.9	19.9	19.9	19.9
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap	Gap	Hold	Hold	Hold
10th %ile Green (s)	85.5	85.5		85.5	85.5		13.5	13.5	13.5	13.5	13.5	13.5
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap	Gap	Hold	Hold	Hold
Queue Length 50th (ft)	70			151			82		162		98	
Queue Length 95th (ft)	87			m222			121		235		146	
Internal Link Dist (ft)	248			307			1028				643	
Turn Bay Length (ft)	80											
Base Capacity (vph)	2130			1285			592		589		404	
Starvation Cap Reductn	110			0			0		0		0	
Spillback Cap Reductn	141			0			0		8		3	
Storage Cap Reductn	0			0			0		0		0	
Reduced v/c Ratio	0.57			0.16			0.23		0.56		0.38	

Intersection Summary

Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 19.7 Intersection LOS: B
 Intersection Capacity Utilization 77.0% ICU Level of Service D
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Alternative 4
10: Ellicott & Tupper

PM 2025
01/17/2023

Splits and Phases: 10: Ellicott & Tupper



Alternative 4
11: Tupper & Oak

PM 2025
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑								↘	↘↘	
Traffic Volume (vph)	0	1228	201	0	0	0	0	0	0	576	394	205
Future Volume (vph)	0	1228	201	0	0	0	0	0	0	576	394	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3488	0	0	0	0	0	0	0	1626	3219	0
Flt Permitted										0.950	0.988	
Satd. Flow (perm)	0	3488	0	0	0	0	0	0	0	1626	3219	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)		27								46	84	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		387			354			125			680	
Travel Time (s)		8.8			8.0			2.8			15.5	
Conf. Peds. (#/hr)			1	1			10					10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	2%	0%	0%	0%	0%	0%	0%	1%	1%	0%
Shared Lane Traffic (%)										32%		
Lane Group Flow (vph)	0	1505	0	0	0	0	0	0	0	412	825	0
Number of Detectors		2								1	2	
Detector Template		Thru								Left	Thru	
Leading Detector (ft)		100								20	100	
Trailing Detector (ft)		0								0	0	
Detector 1 Position(ft)		0								0	0	
Detector 1 Size(ft)		6								20	6	
Detector 1 Type		Cl+Ex								Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0								0.0	0.0	
Detector 1 Queue (s)		0.0								0.0	0.0	
Detector 1 Delay (s)		0.0								0.0	0.0	
Detector 2 Position(ft)		94									94	
Detector 2 Size(ft)		6									6	
Detector 2 Type		Cl+Ex									Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0									0.0	
Turn Type		NA								Perm	NA	
Protected Phases		2									4	
Permitted Phases										4		
Detector Phase		2								4	4	
Switch Phase												
Minimum Initial (s)		7.0								7.0	7.0	
Minimum Split (s)		50.0								40.0	40.0	
Total Split (s)		66.0								44.0	44.0	
Total Split (%)		60.0%								40.0%	40.0%	
Maximum Green (s)		60.5								38.5	38.5	
Yellow Time (s)		3.5								3.5	3.5	
All-Red Time (s)		2.0								2.0	2.0	
Lost Time Adjust (s)		0.0								0.0	0.0	

Lanes, Volumes, Timings
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Alternative 4
11: Tupper & Oak

PM 2025
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Lost Time (s)		5.5									5.5	5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)			3.0							3.0	3.0	
Recall Mode			C-Max							None	None	
Walk Time (s)			7.0							7.0	7.0	
Flash Dont Walk (s)			16.0							13.0	13.0	
Pedestrian Calls (#/hr)			1							10	10	
Act Efect Green (s)			64.4							34.6	34.6	
Actuated g/C Ratio			0.59							0.31	0.31	
v/c Ratio			0.73							0.76	0.77	
Control Delay			13.5							39.3	35.5	
Queue Delay			0.5							0.4	0.1	
Total Delay			14.0							39.7	35.6	
LOS			B							D	D	
Approach Delay			14.0								37.0	
Approach LOS			B								D	
90th %ile Green (s)			60.5							38.5	38.5	
90th %ile Term Code			Coord							Max	Max	
70th %ile Green (s)			60.5							38.5	38.5	
70th %ile Term Code			Coord							Max	Max	
50th %ile Green (s)			62.7							36.3	36.3	
50th %ile Term Code			Coord							Gap	Gap	
30th %ile Green (s)			66.0							33.0	33.0	
30th %ile Term Code			Coord							Gap	Gap	
10th %ile Green (s)			72.4							26.6	26.6	
10th %ile Term Code			Coord							Gap	Gap	
Queue Length 50th (ft)			302							250	254	
Queue Length 95th (ft)			272							370	322	
Internal Link Dist (ft)			307			274			45		600	
Turn Bay Length (ft)												
Base Capacity (vph)			2053							599	1181	
Starvation Cap Reductn			205							0	0	
Spillback Cap Reductn			18							23	22	
Storage Cap Reductn			0							0	0	
Reduced v/c Ratio			0.81							0.72	0.71	
Intersection Summary												
Area Type:	Other											
Cycle Length:	110											
Actuated Cycle Length:	110											
Offset:	97 (88%), Referenced to phase 2:EBT, Start of Yellow											
Natural Cycle:	90											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.77											
Intersection Signal Delay:	24.4						Intersection LOS: C					
Intersection Capacity Utilization:	72.5%						ICU Level of Service C					
Analysis Period (min):	15											

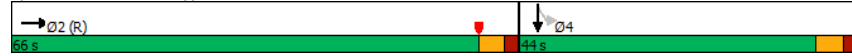
Lanes, Volumes, Timings
C&S Engineers

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Alternative 4
11: Tupper & Oak

PM 2025
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Splits and Phases: 11: Tupper & Oak



Alternative 4
12: Tupper & Elm St

PM 2025
01/17/2023

	↖	→	↘	↙	←	↗	↖	↗	↘	↙	↘	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑						↑↑				
Traffic Volume (vph)	7	1802	0	0	0	0	0	281	52	0	0	0
Future Volume (vph)	7	1802	0	0	0	0	0	281	52	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3574	0	0	0	0	0	3468	0	0	0	0
Fit Permitted												
Satd. Flow (perm)	0	3574	0	0	0	0	0	3468	0	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25						1				
Link Speed (mph)		30			30			30				30
Link Distance (ft)		354			313			418				586
Travel Time (s)		8.0			7.1			9.5				13.3
Confl. Peds. (#/hr)	1		14				1					1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1884	0	0	0	0	0	347	0	0	0	0
Number of Detectors	1	2						2				
Detector Template	Left	Thru						Thru				
Leading Detector (ft)	20	100						100				
Trailing Detector (ft)	0	0						0				
Detector 1 Position(ft)	0	0						0				
Detector 1 Size(ft)	20	6						6				
Detector 1 Type	Cl+Ex	Cl+Ex						Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0						0.0				
Detector 1 Queue (s)	0.0	0.0						0.0				
Detector 1 Delay (s)	0.0	0.0						0.0				
Detector 2 Position(ft)		94						94				
Detector 2 Size(ft)		6						6				
Detector 2 Type		Cl+Ex						Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0				
Turn Type	Perm	NA						NA				
Protected Phases		2						8				
Permitted Phases	2											
Detector Phase	2	2						8				
Switch Phase												
Minimum Initial (s)	7.0	7.0						7.0				
Minimum Split (s)	30.0	30.0						60.0				
Total Split (s)	50.0	50.0						60.0				
Total Split (%)	45.5%	45.5%						54.5%				
Maximum Green (s)	44.5	44.5						54.5				
Yellow Time (s)	3.5	3.5						3.5				
All-Red Time (s)	2.0	2.0						2.0				
Lost Time Adjust (s)		0.0						0.0				
Total Lost Time (s)		5.5						5.5				
Lead/Lag												
Lead-Lag Optimize?												

Alternative 4
12: Tupper & Elm St

PM 2025
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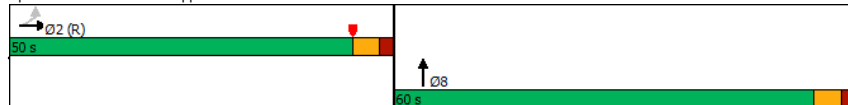


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	3.0	3.0						3.0				
Recall Mode	C-Max	C-Max						None				
Walk Time (s)								7.0				
Flash Dont Walk (s)								12.0				
Pedestrian Calls (#/hr)								0				
Act Effect Green (s)		82.2						16.8				
Actuated g/C Ratio		0.75						0.15				
v/c Ratio		0.70						0.65				
Control Delay		6.3						49.4				
Queue Delay		0.5						0.0				
Total Delay		6.8						49.4				
LOS		A						D				
Approach Delay		6.8						49.4				
Approach LOS		A						D				
90th %ile Green (s)	76.9	76.9						22.1				
90th %ile Term Code	Coord	Coord						Gap				
70th %ile Green (s)	80.5	80.5						18.5				
70th %ile Term Code	Coord	Coord						Gap				
50th %ile Green (s)	82.4	82.4						16.6				
50th %ile Term Code	Coord	Coord						Gap				
30th %ile Green (s)	84.3	84.3						14.7				
30th %ile Term Code	Coord	Coord						Gap				
10th %ile Green (s)	86.9	86.9						12.1				
10th %ile Term Code	Coord	Coord						Gap				
Queue Length 50th (ft)		220						122				
Queue Length 95th (ft)		267						162				
Internal Link Dist (ft)		274			233			338			506	
Turn Bay Length (ft)												
Base Capacity (vph)		2677						1718				
Starvation Cap Reductn		333						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.80						0.20				

Intersection Summary

Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 103 (94%), Referenced to phase 2:EBTL, Start of Yellow
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 13.4
 Intersection Capacity Utilization 68.6%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 12: Tupper & Elm St



Alternative 4
14: Pearl

PM 2025
01/17/2023



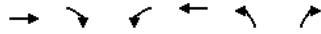
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↑↑	
Traffic Volume (vph)	0	0	118	490	330	110
Future Volume (vph)	0	0	118	490	330	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	3504	1735	0
Fit Permitted				0.990	0.964	
Satd. Flow (perm)	0	0	0	3504	1735	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)					25	
Link Speed (mph)	30			30	30	
Link Distance (ft)	276			322	703	
Travel Time (s)	6.3			7.3	16.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	661	479	0
Number of Detectors			1	2	1	
Detector Template			Left	Thru	Left	
Leading Detector (ft)			20	100	20	
Trailing Detector (ft)			0	0	0	
Detector 1 Position(ft)			0	0	0	
Detector 1 Size(ft)			20	6	20	
Detector 1 Type		CI+Ex	CI+Ex	CI+Ex		
Detector 1 Channel						
Detector 1 Extend (s)			0.0	0.0	0.0	
Detector 1 Queue (s)			0.0	0.0	0.0	
Detector 1 Delay (s)			0.0	0.0	0.0	
Detector 2 Position(ft)				94		
Detector 2 Size(ft)				6		
Detector 2 Type				CI+Ex		
Detector 2 Channel						
Detector 2 Extend (s)				0.0		
Turn Type			Perm	NA	Prot	
Protected Phases				6	8	
Permitted Phases				6		
Detector Phase				6	8	
Switch Phase						
Minimum Initial (s)				7.0	7.0	7.0
Minimum Split (s)				23.5	23.5	23.5
Total Split (s)				43.0	43.0	57.0
Total Split (%)				43.0%	43.0%	57.0%
Maximum Green (s)				37.5	37.5	51.5
Yellow Time (s)				3.5	3.5	3.5
All-Red Time (s)				2.0	2.0	2.0
Lost Time Adjust (s)				0.0	0.0	0.0
Total Lost Time (s)				5.5	5.5	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)				3.0	3.0	3.0
Recall Mode				C-Max	C-Max	Max

Lanes, Volumes, Timings
C&S Engineers

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Alternative 4
14: Pearl

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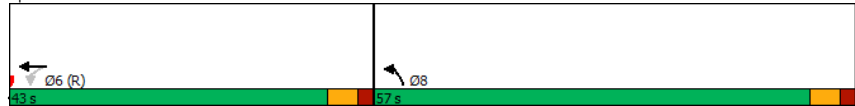


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Walk Time (s)			7.0	7.0		7.0
Flash Dont Walk (s)			11.0	11.0	11.0	
Pedestrian Calls (#/hr)			0	0	0	
Act Effect Green (s)				37.5	51.5	
Actuated g/C Ratio				0.38	0.52	
v/c Ratio				0.50	0.53	
Control Delay				9.0	17.9	
Queue Delay				0.1	0.0	
Total Delay				9.1	17.9	
LOS				A	B	
Approach Delay				9.1	17.9	
Approach LOS				A	B	
90th %ile Green (s)			37.5	37.5	51.5	
90th %ile Term Code			Coord	Coord	MaxR	
70th %ile Green (s)			37.5	37.5	51.5	
70th %ile Term Code			Coord	Coord	MaxR	
50th %ile Green (s)			37.5	37.5	51.5	
50th %ile Term Code			Coord	Coord	MaxR	
30th %ile Green (s)			37.5	37.5	51.5	
30th %ile Term Code			Coord	Coord	MaxR	
10th %ile Green (s)			37.5	37.5	51.5	
10th %ile Term Code			Coord	Coord	MaxR	
Queue Length 50th (ft)				45	184	
Queue Length 95th (ft)				67	276	
Internal Link Dist (ft)	196			242	623	
Turn Bay Length (ft)						
Base Capacity (vph)				1314	905	
Starvation Cap Reductn				101	0	
Spillback Cap Reductn				0	0	
Storage Cap Reductn				0	0	
Reduced v/c Ratio				0.54	0.53	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 70 (70%), Referenced to phase 2: and 6:WBTL, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.53
 Intersection Signal Delay: 12.8 Intersection LOS: B
 Intersection Capacity Utilization 51.1% ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 14: Pearl

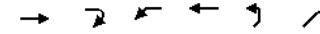


Lanes, Volumes, Timings
C&S Engineers

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Alternative 4
34:

PM 2025
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Lane Group	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations	↑↑					↑↑
Traffic Volume (vph)	1854	0	0	0	0	1603
Future Volume (vph)	1854	0	0	0	0	1603
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	3539	0	0	0	0	2787
Fit Permitted						
Satd. Flow (perm)	3539	0	0	0	0	2787
Link Speed (mph)	30			55	55	
Link Distance (ft)	334			197	283	
Travel Time (s)	7.6			2.4	3.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2015	0	0	0	0	1742
Sign Control	Free			Free	Free	

Intersection Summary

Area Type: Other
 Control Type: Unsignalized
 Intersection Capacity Utilization 114.0% ICU Level of Service H
 Analysis Period (min) 15

Lanes, Volumes, Timings
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Synchro 11 Report
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Alternative 4
1: Michigan & Goodell

PM 2045
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	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↕↕↕	↕		↕	↕			↕↕	
Traffic Volume (vph)	0	0	0	148	485	80	75	223	0	0	545	178
Future Volume (vph)	0	0	0	148	485	80	75	223	0	0	545	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	0	4962	0	1805	1845	0	0	3360	0
Fit Permitted				0.990	0.141							
Satd. Flow (perm)	0	0	0	0	4962	0	268	1845	0	0	3360	0
Right Turn on Red			Yes		Yes			Yes			Yes	
Satd. Flow (RTOR)				29							46	
Link Speed (mph)		30		30			30			30		
Link Distance (ft)		402		274			648			972		
Travel Time (s)		9.1		6.2			14.7			22.1		
Confl. Peds. (#/hr)						1	10					10
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	2%	1%	0%	3%	8%	0%	3%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	728	0	77	228	0	0	738	0
Number of Detectors				1	2		1	2			2	
Detector Template				Left	Thru		Left	Thru			Thru	
Leading Detector (ft)				20	100		20	100			100	
Trailing Detector (ft)				0	0		0	0			0	
Detector 1 Position(ft)				0	0		0	0			0	
Detector 1 Size(ft)				20	6		20	6			6	
Detector 1 Type				Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)				0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)				0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)					94			94			94	
Detector 2 Size(ft)					6			6			6	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type			Perm		NA		pm+pt	NA			NA	
Protected Phases					6		3	8			4	
Permitted Phases					6		8				4	
Detector Phase					6	6	3	8			4	
Switch Phase												
Minimum Initial (s)				7.0	7.0		7.0	7.0			7.0	
Minimum Split (s)				45.0	45.0		12.5	14.6			14.6	
Total Split (s)				50.0	50.0		14.0	50.0			36.0	
Total Split (%)				50.0%	50.0%		14.0%	50.0%			36.0%	
Maximum Green (s)				44.5	44.5		8.5	44.5			30.5	
Yellow Time (s)				3.5	3.5		3.5	3.5			3.5	
All-Red Time (s)				2.0	2.0		2.0	2.0			2.0	
Lost Time Adjust (s)					0.0		0.0	0.0			0.0	
Total Lost Time (s)					5.5		5.5	5.5			5.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?							Yes				Yes	

Lanes, Volumes, Timings
C&S Engineers

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Alternative 4
1: Michigan & Goodell

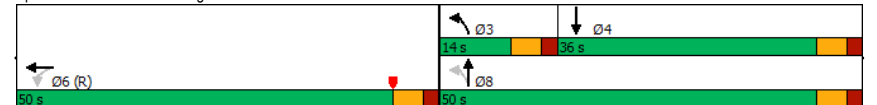
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	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)				4.0	4.0		3.0	3.0			3.0	
Recall Mode				C-Max	C-Max		None	None			None	
Walk Time (s)				7.0	7.0		7.0	7.0			7.0	
Flash Dont Walk (s)				14.0	14.0		10.0	10.0			11.0	
Pedestrian Calls (#/hr)				1	1		10	10			10	
Act Effct Green (s)					51.3		37.7	37.7			26.9	
Actuated g/C Ratio					0.51		0.38	0.38			0.27	
v/c Ratio					0.28		0.35	0.33			0.79	
Control Delay					15.0		22.0	22.0			38.1	
Queue Delay					0.0		0.0	0.0			0.0	
Total Delay					15.0		22.0	22.0			38.1	
LOS					B		C	C			D	
Approach Delay					15.0		22.0	22.0			38.1	
Approach LOS					B		C	C			D	
90th %ile Green (s)				44.5	44.5		8.5	44.5			30.5	
90th %ile Term Code				Coord	Coord		Max	Hold			Max	
70th %ile Green (s)				44.5	44.5		8.5	44.5			30.5	
70th %ile Term Code				Coord	Coord		Max	Hold			Max	
50th %ile Green (s)				47.9	47.9		8.1	41.1			27.5	
50th %ile Term Code				Coord	Coord		Gap	Hold			Gap	
30th %ile Green (s)				51.2	51.2		7.2	37.8			25.1	
30th %ile Term Code				Coord	Coord		Gap	Hold			Gap	
10th %ile Green (s)				68.3	68.3		0.0	20.7			20.7	
10th %ile Term Code				Coord	Coord		Skip	Hold			Gap	
Queue Length 50th (ft)					95		30	96			214	
Queue Length 95th (ft)					132		55	143			271	
Internal Link Dist (ft)		322			194		568				892	
Turn Bay Length (ft)												
Base Capacity (vph)					2558		231	821			1056	
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					0.28		0.33	0.28			0.70	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 97 (97%), Referenced to phase 6:WBTL, Start of Yellow
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 25.8
 Intersection Capacity Utilization 58.1%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 1: Michigan & Goodell



Alternative 4
2: Elm St/Bennett Ln & Goodell

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↑	↑				↑
Traffic Volume (vph)	0	0	0	0	771	15	257	5	0	0	0	15
Future Volume (vph)	0	0	0	0	771	15	257	5	0	0	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	0	5070	0	1681	1688	0	0	0	1611
Fit Permitted					0.950		0.954					
Satd. Flow (perm)	0	0	0	0	5070	0	1681	1688	0	0	0	1611
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Satd. Flow (RTOR)					4		134	128				152
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		335			402			586			382	
Travel Time (s)		7.6			9.1			13.3			8.7	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Shared Lane Traffic (%)							49%					
Lane Group Flow (vph)	0	0	0	0	802	0	134	133	0	0	0	15
Number of Detectors					2		1	2				1
Detector Template					Thru		Left	Thru				Right
Leading Detector (ft)					100		20	100				20
Trailing Detector (ft)					0		0	0				0
Detector 1 Position(ft)					0		0	0				0
Detector 1 Size(ft)					6		20	6				20
Detector 1 Type					Cl+Ex		Cl+Ex	Cl+Ex				Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)					0.0		0.0	0.0				0.0
Detector 1 Queue (s)					0.0		0.0	0.0				0.0
Detector 1 Delay (s)					0.0		0.0	0.0				0.0
Detector 2 Position(ft)					94			94				
Detector 2 Size(ft)					6			6				
Detector 2 Type					Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0				
Turn Type					NA		Perm	NA				Prot
Protected Phases					6			8				4
Permitted Phases							8					
Detector Phase					6		8	8				4
Switch Phase												
Minimum Initial (s)					7.0		7.0	7.0				7.0
Minimum Split (s)					23.5		23.5	23.5				23.5
Total Split (s)					58.0		42.0	42.0				42.0
Total Split (%)					58.0%		42.0%	42.0%				42.0%
Maximum Green (s)					52.5		36.5	36.5				36.5
Yellow Time (s)					3.5		3.5	3.5				3.5
All-Red Time (s)					2.0		2.0	2.0				2.0
Lost Time Adjust (s)					0.0		0.0	0.0				0.0
Total Lost Time (s)					5.5		5.5	5.5				5.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)					3.0		3.0	3.0				3.0
Recall Mode					C-Max		Max	Max				Max

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Alternative 4
2: Elm St/Bennett Ln & Goodell

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Walk Time (s)					7.0		7.0	7.0				7.0
Flash Dont Walk (s)					11.0		11.0	11.0				11.0
Pedestrian Calls (#/hr)					0		0	0				0
Act Effct Green (s)					52.5		36.5	36.5				36.5
Actuated g/C Ratio					0.52		0.36	0.36				0.36
v/c Ratio					0.30		0.19	0.19				0.02
Control Delay					8.9		4.6	5.1				0.1
Queue Delay					0.0		0.0	0.0				0.0
Total Delay					8.9		4.6	5.1				0.1
LOS					A		A	A				A
Approach Delay					8.9			4.8				0.1
Approach LOS					A			A				A
90th %ile Green (s)					52.5		36.5	36.5				36.5
90th %ile Term Code					Coord		MaxR	MaxR				MaxR
70th %ile Green (s)					52.5		36.5	36.5				36.5
70th %ile Term Code					Coord		MaxR	MaxR				MaxR
50th %ile Green (s)					52.5		36.5	36.5				36.5
50th %ile Term Code					Coord		MaxR	MaxR				MaxR
30th %ile Green (s)					52.5		36.5	36.5				36.5
30th %ile Term Code					Coord		MaxR	MaxR				MaxR
10th %ile Green (s)					52.5		36.5	36.5				36.5
10th %ile Term Code					Coord		MaxR	MaxR				MaxR
Queue Length 50th (ft)					56		0	2				0
Queue Length 95th (ft)					68		40	42				0
Internal Link Dist (ft)		255			322			506			302	
Turn Bay Length (ft)												
Base Capacity (vph)					2663		698	697				684
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					0.30		0.19	0.19				0.02

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 28 (28%), Referenced to phase 2: and 6:WBT, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.30
 Intersection Signal Delay: 7.8 Intersection LOS: A
 Intersection Capacity Utilization 68.6% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: Elm St/Bennett Ln & Goodell



Lanes, Volumes, Timings
C&S Engineers

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Alternative 4
3: Oak & Goodell

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔						↔	
Traffic Volume (vph)	100	0	300	294	707	43	0	0	0	0	405	55
Future Volume (vph)	100	0	300	294	707	43	0	0	0	0	405	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	1688	0	1805	3492	0	0	0	0	0	1843	0
Fit Permitted		0.665		0.501								
Satd. Flow (perm)	0	1136	0	923	3492	0	0	0	0	0	1843	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		202		10							7	
Link Speed (mph)		30		30			30			30		
Link Distance (ft)		385		335			680			542		
Travel Time (s)		8.8		7.6			15.5			12.3		
Confl. Peds. (#/hr)				45		3						9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	2%	7%	0%	0%	0%	0%	1%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	421	0	309	789	0	0	0	0	0	484	0
Number of Detectors	1	2		1	2						2	
Detector Template	Left	Thru		Left	Thru						Thru	
Leading Detector (ft)	20	100		20	100						100	
Trailing Detector (ft)	0	0		0	0						0	
Detector 1 Position(ft)	0	0		0	0						0	
Detector 1 Size(ft)	20	6		20	6						6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex						Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0						0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0						0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0						0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type	Perm	NA		Perm	NA						NA	
Protected Phases		2			6						4	
Permitted Phases		2			6						4	
Detector Phase		2			6						4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0						7.0	
Minimum Split (s)	24.5	24.5		58.0	58.0						27.7	
Total Split (s)	60.0	60.0		60.0	60.0						40.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%						40.0%	
Maximum Green (s)	54.5	54.5		54.5	54.5						34.5	
Yellow Time (s)	3.5	3.5		3.5	3.5						3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0						2.0	
Lost Time Adjust (s)		0.0			0.0						0.0	
Total Lost Time (s)		5.5			5.5						5.5	
Lead/Lag												
Lead-Lag Optimize?												

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Alternative 4
3: Oak & Goodell

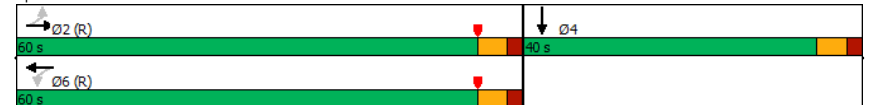
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	3.0	3.0		3.0	3.0						3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max						None	
Walk Time (s)	7.0	7.0		7.0	7.0						7.0	
Flash Dont Walk (s)	12.0	12.0		12.0	12.0						11.0	
Pedestrian Calls (#/hr)	0	0		45	45						16	
Act Effct Green (s)		58.8		58.8	58.8						30.2	
Actuated g/C Ratio		0.59		0.59	0.59						0.30	
v/c Ratio		0.56		0.57	0.38						0.86	
Control Delay		6.5		10.4	4.5						48.1	
Queue Delay		0.3		0.0	0.2						0.0	
Total Delay		6.8		10.4	4.7						48.1	
LOS		A		B	A						D	
Approach Delay		6.8		6.3							48.1	
Approach LOS		A		A							D	
90th %ile Green (s)	54.5	54.5		54.5	54.5						34.5	
90th %ile Term Code	Coord	Coord		Coord	Coord						Max	
70th %ile Green (s)	54.5	54.5		54.5	54.5						34.5	
70th %ile Term Code	Coord	Coord		Coord	Coord						Max	
50th %ile Green (s)	57.1	57.1		57.1	57.1						31.9	
50th %ile Term Code	Coord	Coord		Coord	Coord						Gap	
30th %ile Green (s)	61.2	61.2		61.2	61.2						27.8	
30th %ile Term Code	Coord	Coord		Coord	Coord						Gap	
10th %ile Green (s)	66.6	66.6		66.6	66.6						22.4	
10th %ile Term Code	Coord	Coord		Coord	Coord						Gap	
Queue Length 50th (ft)		33		26	32						279	
Queue Length 95th (ft)		51		164	62						392	
Internal Link Dist (ft)		305		255			600				462	
Turn Bay Length (ft)												
Base Capacity (vph)		751		542	2056						640	
Starvation Cap Reductn		56		5	442						0	
Spillback Cap Reductn		0		0	0						0	
Storage Cap Reductn		0		0	0						0	
Reduced v/c Ratio		0.61		0.58	0.49						0.76	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 88 (88%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 16.5
 Intersection Capacity Utilization 83.5%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service E

Splits and Phases: 3: Oak & Goodell



Alternative 4
4: Ellicott & Goodell

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Volume (vph)	0	395	0	20	550	136	49	82	0	95	112	40
Future Volume (vph)	0	395	0	20	550	136	49	82	0	95	112	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	1900	0	0	3416	0	0	1866	0	1805	1804	0
Fit Permitted			0.936				0.630		0.582			
Satd. Flow (perm)	0	1900	0	0	3200	0	0	1197	0	1106	1804	0
Right Turn on Red	Yes			Yes			Yes			Yes		
Satd. Flow (RTOR)				59						17		
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	330			385			723			475		
Travel Time (s)	7.5			8.8			16.4			10.8		
Confl. Peds. (#/hr)				5						3		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	6%	2%	4%	0%	0%	0%	0%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	429	0	0	768	0	0	142	0	103	165	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)	94		94		94		94		94		94	
Detector 2 Size(ft)	6		6		6		6		6		6	
Detector 2 Type	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0		0.0		0.0		0.0		0.0		0.0	
Turn Type	NA		Perm		NA		Perm		NA		Perm	
Protected Phases	2		6		6		8		8		4	
Permitted Phases	2		6		6		8		8		4	
Detector Phase	2	2	6	6	8	8	8	8	4	4	4	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	23.5	23.5	50.0	50.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (s)	70.0	70.0	70.0	70.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	70.0%	70.0%	70.0%	70.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Maximum Green (s)	64.5	64.5	64.5	64.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0		0.0		0.0		0.0		0.0	
Total Lost Time (s)	5.5		5.5		5.5		5.5		5.5		5.5	
Lead/Lag												
Lead-Lag Optimize?												

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Alternative 4
4: Ellicott & Goodell

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		5	5		16	16		3	3	
Act Effct Green (s)	74.7		74.7		14.3		14.3		14.3		14.3	
Actuated g/C Ratio	0.75		0.75		0.14		0.14		0.14		0.14	
v/c Ratio	0.30		0.32		0.83		0.65		0.60			
Control Delay	1.7		0.8		76.1		58.5		44.6			
Queue Delay	0.5		0.0		0.0		0.0		0.0			
Total Delay	2.2		0.8		76.1		58.5		44.6			
LOS	A		A		E		E		D			
Approach Delay	2.2		0.8		76.1		49.9					
Approach LOS	A		A		E		D					
90th %ile Green (s)	69.0	69.0		69.0	69.0		20.0	20.0		20.0	20.0	
90th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Gap	Gap	
70th %ile Green (s)	72.0	72.0		72.0	72.0		17.0	17.0		17.0	17.0	
70th %ile Term Code	Coord	Coord		Coord	Coord		Ped	Ped		Hold	Hold	
50th %ile Green (s)	74.7	74.7		74.7	74.7		14.3	14.3		14.3	14.3	
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	77.1	77.1		77.1	77.1		11.9	11.9		11.9	11.9	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	80.5	80.5		80.5	80.5		8.5	8.5		8.5	8.5	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
Queue Length 50th (ft)	2		8		89		63		89			
Queue Length 95th (ft)	98		11		150		113		147			
Internal Link Dist (ft)	250		305		643		395					
Turn Bay Length (ft)												
Base Capacity (vph)	1418		2404		293		270		454			
Starvation Cap Reductn	572		315		0		0		0			
Spillback Cap Reductn	0		0		0		0		0			
Storage Cap Reductn	0		0		0		0		0			
Reduced v/c Ratio	0.51		0.37		0.48		0.38		0.36			

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 97 (97%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 16.0
 Intersection Capacity Utilization 63.9%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 4: Ellicott & Goodell



Alternative 4
5: Washington & Goodell

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↔		↔		↔		↔		↔	
Traffic Volume (vph)	0	330	0	34	606	19	27	71	0	65	94	20
Future Volume (vph)	0	330	0	34	606	19	27	71	0	65	94	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			50			0			0		
Storage Lanes	0			0			0			1		
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1900	0	0	3485	0	0	1852	0	1805	1796	0
Fit Permitted	0.920			0.920			0.817			0.645		
Satd. Flow (perm)	0	1900	0	0	3215	0	0	1527	0	1226	1796	0
Right Turn on Red	Yes				Yes				Yes			
Satd. Flow (RTOR)					5				11			
Link Speed (mph)	30			30			30			30		
Link Distance (ft)	280			330			726			324		
Travel Time (s)	6.4			7.5			16.5			7.4		
Conf. Peds. (#/hr)				5			4			9		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	0%	3%	0%	2%	1%	0%	0%	2%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	347	0	0	694	0	0	103	0	68	120	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)	94			94			94			94		
Detector 2 Size(ft)	6			6			6			6		
Detector 2 Type	Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex		
Detector 2 Channel												
Detector 2 Extend (s)	0.0			0.0			0.0			0.0		
Turn Type	NA		Perm		NA		Perm		NA		Perm	
Protected Phases	2		6		6		4		4		8	
Permitted Phases	2		6		6		4		4		8	
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	23.5	23.5		55.0	55.0		30.0	30.0		30.0	30.0	
Total Split (s)	64.0	64.0		64.0	64.0		36.0	36.0		36.0	36.0	
Total Split (%)	64.0%	64.0%		64.0%	64.0%		36.0%	36.0%		36.0%	36.0%	
Maximum Green (s)	58.5	58.5		58.5	58.5		30.5	30.5		30.5	30.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0				0.0				0.0		0.0	

Lanes, Volumes, Timings
C&S Engineers

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Alternative 4
5: Washington & Goodell

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Lost Time (s)	5.5			5.5			5.5			5.5		
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Pedestrian Calls (#/hr)	0	0		9	9		9	9		3	3	
Act Effect Green (s)	77.3			77.3			11.7			11.7		
Actuated g/C Ratio	0.77			0.77			0.12			0.12		
v/c Ratio	0.24			0.28			0.58			0.48		
Control Delay	2.2			1.6			53.9			51.2		
Queue Delay	1.3			0.2			0.0			0.0		
Total Delay	3.5			1.8			53.9			51.2		
LOS	A			A			D			D		
Approach Delay	3.5			1.8			53.9			48.1		
Approach LOS	A			A			D			D		
90th %ile Green (s)	72.0	72.0		72.0	72.0		17.0	17.0		17.0	17.0	
90th %ile Term Code	Coord	Coord		Coord	Coord		Ped	Ped		Ped	Ped	
70th %ile Green (s)	75.6	75.6		75.6	75.6		13.4	13.4		13.4	13.4	
70th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
50th %ile Green (s)	77.5	77.5		77.5	77.5		11.5	11.5		11.5	11.5	
50th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Gap	Gap	
30th %ile Green (s)	79.4	79.4		79.4	79.4		9.6	9.6		9.6	9.6	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	82.0	82.0		82.0	82.0		7.0	7.0		7.0	7.0	
10th %ile Term Code	Coord	Coord		Coord	Coord		Hold	Hold		Min	Min	
Queue Length 50th (ft)	18			15			63			41		
Queue Length 95th (ft)	34			32			111			80		
Internal Link Dist (ft)	200			250			646			244		
Turn Bay Length (ft)												
Base Capacity (vph)	1468			2486			465			373		
Starvation Cap Reductn	891			1011			0			0		
Spillback Cap Reductn	0			0			0			0		
Storage Cap Reductn	0			0			0			0		
Reduced v/c Ratio	0.60			0.47			0.22			0.18		
Intersection Summary												
Area Type:	Other											
Cycle Length:	100											
Actuated Cycle Length:	100											
Offset:	21 (21%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow											
Natural Cycle:	85											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.58											
Intersection Signal Delay:	12.8						Intersection LOS: B					
Intersection Capacity Utilization:	61.4%						ICU Level of Service B					
Analysis Period (min)	15											

Lanes, Volumes, Timings
C&S Engineers

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Alternative 4
5: Washington & Goodell

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Splits and Phases: 5: Washington & Goodell



Alternative 4
6: Main St & Pearl/Goodell

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	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕		↕		↕	↕	↕
Traffic Volume (vph)	25	200	0	28	382	254	18	88	0	130	77	144
Future Volume (vph)	25	200	0	28	382	254	18	88	0	130	77	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	80		0	0		0
Storage Lanes	0		0	0		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1889	0	0	3499	1568	1805	1827	0	1805	1759	1615
Fit Permitted		0.994			0.918		0.705			0.479		
Satd. Flow (perm)	0	1886	0	0	3220	1498	1318	1827	0	910	1759	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						265						150
Link Speed (mph)		30			30			30				30
Link Distance (ft)		322			280			726				848
Travel Time (s)		7.3			6.4			16.5				19.3
Confl. Peds. (#/hr)	12		6	6		12	10					10
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	1%	3%	3%	0%	4%	0%	0%	8%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	234	0	0	427	265	19	92	0	135	80	150
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Split	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	custom
Protected Phases	2	2			6		3	8		7	4	4 2
Permitted Phases				6		6	8			4		4
Detector Phase	2	2		6	6	6	3	8		7	4	4 2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	22.5	22.5		35.5	35.5	35.5	12.5	22.5		12.5	27.5	
Total Split (s)	23.0	23.0		37.0	37.0	37.0	13.0	20.0		20.0	27.0	
Total Split (%)	23.0%	23.0%		37.0%	37.0%	37.0%	13.0%	20.0%		20.0%	27.0%	
Maximum Green (s)	17.5	17.5		31.5	31.5	31.5	7.5	14.5		14.5	21.5	
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	

Alternative 4
6: Main St & Pearl/Goodell

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Lost Time (s)		5.5			5.5	5.5				5.5	5.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.3	4.3		3.2	3.2	3.2			3.0	3.0		3.0
Recall Mode	Max	Max		C-Max	C-Max	C-Max	None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0	7.0			7.0			7.0
Flash Dont Walk (s)	15.0	15.0		17.0	17.0	17.0			10.0			10.0
Pedestrian Calls (#/hr)	6	6		12	12	12			28			28
Act Effect Green (s)		26.0			31.5	31.5	17.0	11.3		26.0	21.0	52.4
Actuated g/C Ratio		0.26			0.32	0.32	0.17	0.11		0.26	0.21	0.52
v/c Ratio		0.48			0.42	0.41	0.07	0.45		0.39	0.22	0.16
Control Delay		29.2			22.3	5.6	24.2	47.5		30.4	32.9	3.2
Queue Delay		0.4			0.7	0.5	0.0	0.0		0.0	0.0	0.0
Total Delay		29.6			22.9	6.1	24.2	47.5		30.4	32.9	3.2
LOS		C			C	A	C	D		C	C	A
Approach Delay		29.6			16.5			43.5			19.8	
Approach LOS		C			B			D			B	
90th %ile Green (s)	17.5	17.5		31.5	31.5	31.5	7.4	14.5		14.5	21.6	
90th %ile Term Code	Ped	Ped		Coord	Coord	Coord	Gap	Ped		Max	Hold	
70th %ile Green (s)	17.5	17.5		31.5	31.5	31.5	7.0	16.1		12.9	22.0	
70th %ile Term Code	Ped	Ped		Coord	Coord	Coord	Min	Ped		Gap	Hold	
50th %ile Green (s)	23.7	23.7		31.5	31.5	31.5	0.0	10.0		12.8	28.3	
50th %ile Term Code	MaxR	MaxR		Coord	Coord	Coord	Skip	Gap		Gap	Hold	
30th %ile Green (s)	27.0	27.0		31.5	31.5	31.5	0.0	8.8		10.7	25.0	
30th %ile Term Code	MaxR	MaxR		Coord	Coord	Coord	Skip	Gap		Gap	Hold	
10th %ile Green (s)	44.1	44.1		31.5	31.5	31.5	0.0	0.0		7.9	7.9	
10th %ile Term Code	MaxR	MaxR		Coord	Coord	Coord	Skip	Skip		Gap	Hold	
Queue Length 50th (ft)		131			124	51	9	57		67	38	0
Queue Length 95th (ft)		#243			175	131	24	102		106	83	34
Internal Link Dist (ft)		242			200			646			768	
Turn Bay Length (ft)							80					
Base Capacity (vph)		490			1014	653	265	270		378	416	918
Starvation Cap Reductn		49			292	133	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		0.53			0.59	0.51	0.07	0.34		0.36	0.19	0.16

Intersection Summary

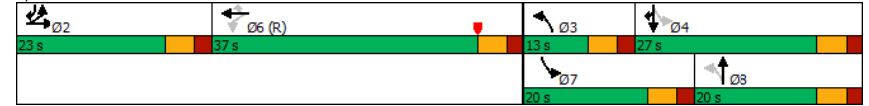
Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 6:WBTL, Start of Yellow, Master Intersection
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.48
 Intersection Signal Delay: 21.7 Intersection LOS: C
 Intersection Capacity Utilization 57.9% ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.

Alternative 4
6: Main St & Pearl/Goodell

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Queue shown is maximum after two cycles.

Splits and Phases: 6: Main St & Pearl/Goodell



Alternative 4
7: Tupper & Pearl

PM 2045
01/17/2023

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕↕			↕↕				↕	↕		↕	↕
Traffic Volume (vph)	50	761	20	50	151	100	77	300	180	41	64	20
Future Volume (vph)	50	761	20	50	151	100	77	300	180	41	64	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3579	0	0	1776	0	0	1873	1583	0	1827	1583
Fit Permitted	0.907		0.775		0.903		0.515					
Satd. Flow (perm)	0	3256	0	0	1385	0	0	1695	1547	0	958	1481
Right Turn on Red	Yes			Yes			Yes			Yes		
Satd. Flow (RTOR)	3		35		132		25					
Link Speed (mph)	30		30		30		30		30		30	
Link Distance (ft)	699		351		561		703					
Travel Time (s)	15.9		8.0		12.8		16.0					
Confl. Peds. (#/hr)	20		20		14		6		6		14	
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
Heavy Vehicles (%)	0%	0%	0%	2%	2%	0%	2%	0%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	884	0	0	320	0	0	401	191	0	112	21
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94		94		94		94		94		94	
Detector 2 Size(ft)	6		6		6		6		6		6	
Detector 2 Type	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0		0.0		0.0		0.0		0.0		0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	2		6		6		4		8		8	
Permitted Phases	2		6		6		4		4		8	
Detector Phase	2		2		6		6		4		4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	27.5	27.5		50.0	50.0		40.0	40.0	40.0	40.0	40.0	40.0
Total Split (s)	64.0	64.0		64.0	64.0		46.0	46.0	46.0	46.0	46.0	46.0
Total Split (%)	58.2%	58.2%		58.2%	58.2%		41.8%	41.8%	41.8%	41.8%	41.8%	41.8%
Maximum Green (s)	58.5	58.5		58.5	58.5		40.5	40.5	40.5	40.5	40.5	40.5
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0		0.0		0.0		0.0		0.0	
Total Lost Time (s)	5.5		5.5		5.5		5.5		5.5		5.5	
Lead/Lag												
Lead-Lag Optimize?												

Lanes, Volumes, Timings
C&S Engineers

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Alternative 4
7: Tupper & Pearl


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	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None		C-Max		C-Max		None		None		None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	15.0	15.0		11.0	11.0		11.0	11.0	11.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)	20	20		0	0		14	14	14	6	6	6
Act Effect Green (s)	67.0		67.0		32.0		32.0		32.0		32.0	
Actuated g/C Ratio	0.61		0.61		0.29		0.29		0.29		0.29	
v/c Ratio	0.45		0.37		0.82		0.35		0.40		0.05	
Control Delay	13.4		4.1		49.3		11.0		34.2		8.0	
Queue Delay	0.0		0.6		0.0		0.0		0.0		0.0	
Total Delay	13.4		4.7		49.3		11.0		34.2		8.0	
LOS	B		A		D		B		C		A	
Approach Delay	13.4		4.7		36.9		30.0					
Approach LOS	B		A		D		C					
90th %ile Green (s)	58.5	58.5		58.5	58.5		40.5	40.5	40.5	40.5	40.5	40.5
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max	Max	Hold	Hold	Hold
70th %ile Green (s)	62.5	62.5		62.5	62.5		36.5	36.5	36.5	36.5	36.5	36.5
70th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap	Gap	Hold	Hold	Hold
50th %ile Green (s)	66.7	66.7		66.7	66.7		32.3	32.3	32.3	32.3	32.3	32.3
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap	Gap	Hold	Hold	Hold
30th %ile Green (s)	70.5	70.5		70.5	70.5		28.5	28.5	28.5	28.5	28.5	28.5
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap	Gap	Hold	Hold	Hold
10th %ile Green (s)	77.0	77.0		77.0	77.0		22.0	22.0	22.0	22.0	22.0	22.0
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap	Gap	Hold	Hold	Hold
Queue Length 50th (ft)	164		52		262		31		63		0	
Queue Length 95th (ft)	256		82		340		79		105		15	
Internal Link Dist (ft)	619		271		481		623					
Turn Bay Length (ft)												
Base Capacity (vph)	1985		857		624		652		352		561	
Starvation Cap Reductn	0		239		0		0		0		0	
Spillback Cap Reductn	0		0		0		0		0		0	
Storage Cap Reductn	0		0		0		0		0		0	
Reduced v/c Ratio	0.45		0.52		0.64		0.29		0.32		0.04	
Intersection Summary												
Area Type:	Other											
Cycle Length:	110											
Actuated Cycle Length:	110											
Offset: 90 (82%), Referenced to phase 6:WBTL, Start of Yellow												
Natural Cycle:	90											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.82											
Intersection Signal Delay:	20.3						Intersection LOS: C					
Intersection Capacity Utilization:	87.3%						ICU Level of Service E					
Analysis Period (min):	15											
Splits and Phases:	7: Tupper & Pearl											



Alternative 4
8: Main St & Tupper


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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑		↓	↓	
Traffic Volume (vph)	60	830	25	41	313	25	84	21	61	45	54	15
Future Volume (vph)	60	830	25	41	313	25	84	21	61	45	54	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0	0	0	0	0	0	0	80	0	0
Storage Lanes	0	0	0	0	0	0	0	0	0	1	0	0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3531	0	0	1860	0	0	1699	0	1770	1770	0
Fit Permitted		0.891			0.837			0.802		0.585		
Satd. Flow (perm)	0	3151	0	0	1565	0	0	1315	0	1041	1770	0
Right Turn on Red		Yes			Yes			Yes			Yes	
Satd. Flow (RTOR)		4			6			28			13	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		351			263			1174			726	
Travel Time (s)		8.0			6.0			26.7			16.5	
Conf. Peds. (#/hr)	17		28	28		17	40		38	38		40
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	1%	3%	0%	0%	4%	0%	4%	0%	2%	0%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	963	0	0	398	0	0	174	0	47	73	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases		2			6			8			4	
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	50.0	50.0		50.0	50.0		40.0	40.0		40.0	40.0	
Total Split (s)	70.0	70.0		70.0	70.0		40.0	40.0		40.0	40.0	
Total Split (%)	63.6%	63.6%		63.6%	63.6%		36.4%	36.4%		36.4%	36.4%	
Maximum Green (s)	64.5	64.5		64.5	64.5		34.5	34.5		34.5	34.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	

Alternative 4
8: Main St & Tupper

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Lost Time (s)		5.5			5.5			5.5		5.5	5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		Max	Max		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	5.0	5.0		12.0	12.0		11.0	11.0		10.0	10.0	
Pedestrian Calls (#/hr)	28	28		17	17		38	38		40	40	
Act Effect Green (s)		81.2			81.2			17.8			17.8	
Actuated g/C Ratio		0.74			0.74			0.16			0.16	
v/c Ratio		0.41			0.34			0.74			0.28	0.25
Control Delay		2.1			16.2			54.2			42.2	33.0
Queue Delay		0.2			1.4			0.1			0.0	0.0
Total Delay		2.2			17.7			54.3			42.2	33.0
LOS		A			B			D			D	C
Approach Delay		2.2			17.7			54.3				36.6
Approach LOS		A			B			D				D
90th %ile Green (s)	73.1	73.1		73.1	73.1		25.9	25.9		25.9	25.9	
90th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
70th %ile Green (s)	77.9	77.9		77.9	77.9		21.1	21.1		21.1	21.1	
70th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
50th %ile Green (s)	81.0	81.0		81.0	81.0		18.0	18.0		18.0	18.0	
50th %ile Term Code	Coord	Coord		Coord	Coord		Ped	Ped		Hold	Hold	
30th %ile Green (s)	84.7	84.7		84.7	84.7		14.3	14.3		14.3	14.3	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	89.5	89.5		89.5	89.5		9.5	9.5		9.5	9.5	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
Queue Length 50th (ft)		24			265			99			29	37
Queue Length 95th (ft)		46			364			162			61	73
Internal Link Dist (ft)		271			183			1094				646
Turn Bay Length (ft)											80	
Base Capacity (vph)		2328			1157			431			326	564
Starvation Cap Reductn		485			550			0			0	0
Spillback Cap Reductn		52			0			13			10	0
Storage Cap Reductn		0			0			0			0	0
Reduced v/c Ratio		0.52			0.66			0.42			0.15	0.13
Intersection Summary												
Area Type:	Other											
Cycle Length:	110											
Actuated Cycle Length:	110											
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Yellow, Master Intersection												
Natural Cycle:	90											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.74											
Intersection Signal Delay:	13.9						Intersection LOS: B					
Intersection Capacity Utilization	77.0%						ICU Level of Service D					
Analysis Period (min)	15											

Alternative 4
8: Main St & Tupper

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Splits and Phases: 8: Main St & Tupper



Alternative 4
9: Washington & Tupper

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕		↕↕	↕↕	↕↕
Traffic Volume (vph)	12	874	43	0	158	1	168	67	135	115	92	11
Future Volume (vph)	12	874	43	0	158	1	168	67	135	115	92	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		78	85		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3534	0	0	1897	0	1805	1624	0	1805	1815	0
Flt Permitted		0.951					0.501			0.414		
Satd. Flow (perm)	0	3362	0	0	1897	0	899	1624	0	759	1815	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6						90			5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		263			328			1190			726	
Travel Time (s)		6.0			7.5			27.0			16.5	
Confl. Peds. (#/hr)	21		17	17		21	23		26	26		23
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	1%	2%	0%	0%	0%	0%	3%	0%	0%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1032	0	0	177	0	187	224	0	128	114	0
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA			NA		pm+pt	NA		pm+pt	NA	
Protected Phases		2			6		3	8		7	4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	47.0	47.0		47.0	47.0		12.5	28.0		12.5	28.0	
Total Split (s)	60.0	60.0		60.0	60.0		20.0	34.0		16.0	30.0	
Total Split (%)	54.5%	54.5%		54.5%	54.5%		18.2%	30.9%		14.5%	27.3%	
Maximum Green (s)	54.5	54.5		54.5	54.5		14.5	28.5		10.5	24.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	

Alternative 4
9: Washington & Tupper

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Lost Time (s)	5.5		5.5				5.5	5.5		5.5	5.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0		3.0			3.0	3.0			3.0
Recall Mode	C-Max	C-Max	Max		Max	None		None	None		None	
Walk Time (s)	7.0	7.0	7.0		7.0			7.0			7.0	
Flash Dont Walk (s)	13.0	13.0	13.0		13.0			10.0			10.0	
Pedestrian Calls (#/hr)	17	17	21		21			26			23	
Act Effect Green (s)	67.1		67.1		67.1		29.9	16.6	23.0		13.2	
Actuated g/C Ratio	0.61		0.61		0.61		0.27	0.15	0.21		0.12	
v/c Ratio	0.50		0.15		0.15		0.53	0.70	0.51		0.51	
Control Delay	8.1		22.2		22.2		35.4	37.1	36.0		50.5	
Queue Delay	0.3		0.6		0.6		0.2	0.0	0.0		0.5	
Total Delay	8.3		22.8		22.8		35.6	37.1	36.0		50.9	
LOS	A		C		C		D	D	D		D	
Approach Delay	8.3		22.8		22.8		36.4				43.0	
Approach LOS	A		C		C		D				D	
90th %ile Green (s)	60.3	60.3	60.3		60.3	14.5		22.7	10.5		18.7	
90th %ile Term Code	Coord	Coord	Coord		Coord	Max		Gap	Max		Hold	
70th %ile Green (s)	62.0	62.0	62.0		62.0	14.5		21.0	10.5		17.0	
70th %ile Term Code	Coord	Coord	Coord		Coord	Max		Hold	Max		Ped	
50th %ile Green (s)	66.0	66.0	66.0		66.0	14.5		17.0	10.5		13.0	
50th %ile Term Code	Coord	Coord	Coord		Coord	Max		Ped	Max		Hold	
30th %ile Green (s)	70.7	70.7	70.7		70.7	12.8		12.9	9.9		10.0	
30th %ile Term Code	Coord	Coord	Coord		Coord	Gap		Hold	Gap		Gap	
10th %ile Green (s)	76.3	76.3	76.3		76.3	9.9		9.5	7.7		7.3	
10th %ile Term Code	Coord	Coord	Coord		Coord	Gap		Hold	Gap		Gap	
Queue Length 50th (ft)	100		133		133		103	90	68		73	
Queue Length 95th (ft)	116		204		204		153	165	108		124	
Internal Link Dist (ft)	183		248		248		1110				646	
Turn Bay Length (ft)											85	
Base Capacity (vph)	2051		1156		1156		371	487	263		408	
Starvation Cap Reductn	382		690		690		0	0	0		0	
Spillback Cap Reductn	0		130		130		16	0	0		93	
Storage Cap Reductn	0		0		0		0	0	0		0	
Reduced v/c Ratio	0.62		0.38		0.38		0.53	0.46	0.49		0.36	

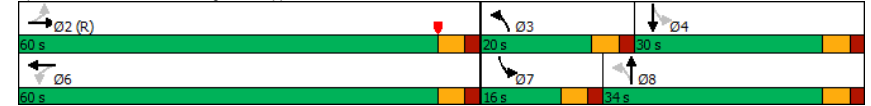
Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	96 (87%), Referenced to phase 2:EBTL, Start of Yellow
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.70
Intersection Signal Delay:	20.4
Intersection LOS:	C
Intersection Capacity Utilization:	68.1%
ICU Level of Service:	C
Analysis Period (min):	15

Alternative 4
9: Washington & Tupper

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Splits and Phases: 9: Washington & Tupper



Alternative 4
10: Ellicott & Tupper

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Splits and Phases: 10: Ellicott & Tupper



Alternative 4
11: Tupper & Oak

PM 2045
01/17/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑								↓	↓↑	
Traffic Volume (vph)	0	1438	201	0	0	0	0	0	0	516	424	105
Future Volume (vph)	0	1438	201	0	0	0	0	0	0	516	424	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	3500	0	0	0	0	0	0	0	1626	3286	0
Fit Permitted										0.950	0.988	
Satd. Flow (perm)	0	3500	0	0	0	0	0	0	0	1626	3286	0
Right Turn on Red			Yes			Yes			Yes	Yes		Yes
Satd. Flow (RTOR)		22								26	45	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		387			354			125			680	
Travel Time (s)		8.8			8.0			2.8			15.5	
Confl. Peds. (#/hr)			1	1			10					10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	2%	0%	0%	0%	0%	0%	0%	1%	1%	0%
Shared Lane Traffic (%)										33%		
Lane Group Flow (vph)	0	1726	0	0	0	0	0	0	0	364	736	0
Number of Detectors		2								1	2	
Detector Template		Thru								Left	Thru	
Leading Detector (ft)		100								20	100	
Trailing Detector (ft)		0								0	0	
Detector 1 Position(ft)		0								0	0	
Detector 1 Size(ft)		6								20	6	
Detector 1 Type		Cl+Ex								Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0								0.0	0.0	
Detector 1 Queue (s)		0.0								0.0	0.0	
Detector 1 Delay (s)		0.0								0.0	0.0	
Detector 2 Position(ft)		94									94	
Detector 2 Size(ft)		6									6	
Detector 2 Type		Cl+Ex									Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0									0.0	
Turn Type		NA								Perm	NA	
Protected Phases		2									4	
Permitted Phases											4	
Detector Phase		2									4	4
Switch Phase												
Minimum Initial (s)		7.0								7.0	7.0	
Minimum Split (s)		50.0								40.0	40.0	
Total Split (s)		66.0								44.0	44.0	
Total Split (%)		60.0%								40.0%	40.0%	
Maximum Green (s)		60.5								38.5	38.5	
Yellow Time (s)		3.5								3.5	3.5	
All-Red Time (s)		2.0								2.0	2.0	
Lost Time Adjust (s)		0.0								0.0	0.0	

Alternative 4
11: Tupper & Oak

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Total Lost Time (s)	5.5						5.5						5.5
Lead/Lag													
Lead-Lag Optimize?													
Vehicle Extension (s)	3.0						3.0						3.0
Recall Mode	C-Max						None						None
Walk Time (s)	7.0												
Flash Dont Walk (s)	16.0						13.0						13.0
Pedestrian Calls (#/hr)	1												
Act Effct Green (s)	66.5						32.5						32.5
Actuated g/C Ratio	0.60						0.30						0.30
v/c Ratio	0.81						0.73						0.73
Control Delay	15.4						40.7						36.8
Queue Delay	0.7						0.0						0.0
Total Delay	16.1						40.7						36.8
LOS	B						D						D
Approach Delay	16.1												38.1
Approach LOS	B												D
90th %ile Green (s)	60.5						38.5						38.5
90th %ile Term Code	Coord						Max						Max
70th %ile Green (s)	61.7						37.3						37.3
70th %ile Term Code	Coord						Gap						Gap
50th %ile Green (s)	65.6						33.4						33.4
50th %ile Term Code	Coord						Gap						Gap
30th %ile Green (s)	69.6						29.4						29.4
30th %ile Term Code	Coord						Gap						Gap
10th %ile Green (s)	75.1						23.9						23.9
10th %ile Term Code	Coord						Gap						Gap
Queue Length 50th (ft)	384						232						238
Queue Length 95th (ft)	466						330						289
Internal Link Dist (ft)	307						274						45
Turn Bay Length (ft)													
Base Capacity (vph)	2124						586						1179
Starvation Cap Reductn	148						0						0
Spillback Cap Reductn	4						0						0
Storage Cap Reductn	0						0						0
Reduced v/c Ratio	0.87						0.62						0.62

Intersection Summary

Area Type:	Other
Cycle Length:	110
Actuated Cycle Length:	110
Offset:	81 (74%), Referenced to phase 2:EBT, Start of Yellow
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.81
Intersection Signal Delay:	24.7
Intersection LOS:	C
Intersection Capacity Utilization:	75.5%
ICU Level of Service:	D
Analysis Period (min):	15

Alternative 4
11: Tupper & Oak

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Splits and Phases: 11: Tupper & Oak



Alternative 4
12: Tupper & Elm St

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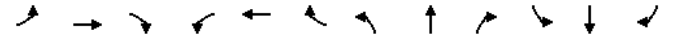
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕						↕↕				
Traffic Volume (vph)	7	1802	0	0	0	0	0	281	52	0	0	0
Future Volume (vph)	7	1802	0	0	0	0	0	281	52	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3574	0	0	0	0	0	3468	0	0	0	0
Fit Permitted												
Satd. Flow (perm)	0	3574	0	0	0	0	0	3468	0	0	0	0
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25						1				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		354			313			418			586	
Travel Time (s)		8.0			7.1			9.5			13.3	
Confl. Peds. (#/hr)	1		14					1				1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1884	0	0	0	0	0	347	0	0	0	0
Number of Detectors	1	2						2				
Detector Template	Left	Thru						Thru				
Leading Detector (ft)	20	100						100				
Trailing Detector (ft)	0	0						0				
Detector 1 Position(ft)	0	0						0				
Detector 1 Size(ft)	20	6						6				
Detector 1 Type	Cl+Ex	Cl+Ex						Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0						0.0				
Detector 1 Queue (s)	0.0	0.0						0.0				
Detector 1 Delay (s)	0.0	0.0						0.0				
Detector 2 Position(ft)		94						94				
Detector 2 Size(ft)		6						6				
Detector 2 Type		Cl+Ex						Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0				
Turn Type	Perm	NA						NA				
Protected Phases		2						8				
Permitted Phases	2											
Detector Phase	2	2						8				
Switch Phase												
Minimum Initial (s)	7.0	7.0						7.0				
Minimum Split (s)	30.0	30.0						60.0				
Total Split (s)	50.0	50.0						60.0				
Total Split (%)	45.5%	45.5%						54.5%				
Maximum Green (s)	44.5	44.5						54.5				
Yellow Time (s)	3.5	3.5						3.5				
All-Red Time (s)	2.0	2.0						2.0				
Lost Time Adjust (s)		0.0						0.0				
Total Lost Time (s)		5.5						5.5				
Lead/Lag												
Lead-Lag Optimize?												

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C&S Engineers

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Alternative 4
12: Tupper & Elm St

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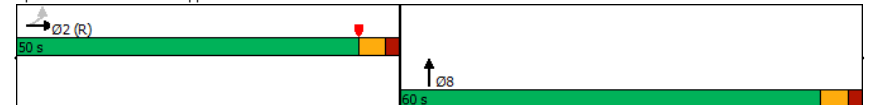


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	3.0	3.0						3.0				
Recall Mode	C-Max	C-Max						None				
Walk Time (s)								7.0				
Flash Dont Walk (s)								12.0				
Pedestrian Calls (#/hr)								0				
Act Effct Green (s)		82.2						16.8				
Actuated g/C Ratio		0.75						0.15				
v/c Ratio		0.70						0.65				
Control Delay		5.4						49.4				
Queue Delay		0.7						0.0				
Total Delay		6.1						49.4				
LOS		A						D				
Approach Delay		6.1						49.4				
Approach LOS		A						D				
90th %ile Green (s)	76.9	76.9						22.1				
90th %ile Term Code	Coord	Coord						Gap				
70th %ile Green (s)	80.5	80.5						18.5				
70th %ile Term Code	Coord	Coord						Gap				
50th %ile Green (s)	82.4	82.4						16.6				
50th %ile Term Code	Coord	Coord						Gap				
30th %ile Green (s)	84.3	84.3						14.7				
30th %ile Term Code	Coord	Coord						Gap				
10th %ile Green (s)	86.9	86.9						12.1				
10th %ile Term Code	Coord	Coord						Gap				
Queue Length 50th (ft)		185						122				
Queue Length 95th (ft)		210						162				
Internal Link Dist (ft)		274			233			338			506	
Turn Bay Length (ft)												
Base Capacity (vph)		2677						1718				
Starvation Cap Reductn		404						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.83						0.20				

Intersection Summary

Area Type: Other
 Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 89 (81%), Referenced to phase 2:EBTL, Start of Yellow
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 12.8
 Intersection Capacity Utilization 68.6%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 12: Tupper & Elm St



Alternative 4
14: Pearl

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	→	↖	↙	←	↘	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↕↕	↕	
Traffic Volume (vph)	0	0	20	362	225	225
Future Volume (vph)	0	0	20	362	225	225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	0	3529	1694	0
Fit Permitted				0.997	0.976	
Satd. Flow (perm)	0	0	0	3529	1694	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)					89	
Link Speed (mph)	30			30	30	
Link Distance (ft)	276			322	703	
Travel Time (s)	6.3			7.3	16.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	415	490	0
Number of Detectors			1	2	1	
Detector Template			Left	Thru	Left	
Leading Detector (ft)			20	100	20	
Trailing Detector (ft)			0	0	0	
Detector 1 Position(ft)			0	0	0	
Detector 1 Size(ft)			20	6	20	
Detector 1 Type			Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)			0.0	0.0	0.0	
Detector 1 Queue (s)			0.0	0.0	0.0	
Detector 1 Delay (s)			0.0	0.0	0.0	
Detector 2 Position(ft)				94		
Detector 2 Size(ft)				6		
Detector 2 Type				Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)				0.0		
Turn Type			Perm	NA	Prot	
Protected Phases				6	8	
Permitted Phases			6			
Detector Phase			6	6	8	
Switch Phase						
Minimum Initial (s)			7.0	7.0	7.0	
Minimum Split (s)			23.5	23.5	23.5	
Total Split (s)			35.0	35.0	65.0	
Total Split (%)			35.0%	35.0%	65.0%	
Maximum Green (s)			29.5	29.5	59.5	
Yellow Time (s)			3.5	3.5	3.5	
All-Red Time (s)			2.0	2.0	2.0	
Lost Time Adjust (s)				0.0	0.0	
Total Lost Time (s)				5.5	5.5	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)			3.0	3.0	3.0	
Recall Mode			C-Max	C-Max	Max	

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Alternative 4
14: Pearl

PM 2045
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	→	↖	↙	←	↘	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Walk Time (s)			7.0	7.0	7.0	
Flash Dont Walk (s)			11.0	11.0	11.0	
Pedestrian Calls (#/hr)			0	0	0	
Act Effct Green (s)				29.5	59.5	
Actuated g/C Ratio				0.30	0.60	
v/c Ratio				0.40	0.47	
Control Delay				12.8	10.8	
Queue Delay				0.0	0.1	
Total Delay				12.8	10.9	
LOS				B	B	
Approach Delay				12.8	10.9	
Approach LOS				B	B	
90th %ile Green (s)				29.5	59.5	
90th %ile Term Code			Coord	Coord	MaxR	
70th %ile Green (s)				29.5	59.5	
70th %ile Term Code			Coord	Coord	MaxR	
50th %ile Green (s)				29.5	59.5	
50th %ile Term Code			Coord	Coord	MaxR	
30th %ile Green (s)				29.5	59.5	
30th %ile Term Code			Coord	Coord	MaxR	
10th %ile Green (s)				29.5	59.5	
10th %ile Term Code			Coord	Coord	MaxR	
Queue Length 50th (ft)				38	130	
Queue Length 95th (ft)				57	204	
Internal Link Dist (ft)	196			242	623	
Turn Bay Length (ft)						
Base Capacity (vph)				1041	1043	
Starvation Cap Reductn				0	0	
Spillback Cap Reductn				0	44	
Storage Cap Reductn				0	0	
Reduced v/c Ratio				0.40	0.49	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2: and 6:WBT, Start of Yellow
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.47
 Intersection Signal Delay: 11.8
 Intersection Capacity Utilization 46.0%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 14: Pearl



Lanes, Volumes, Timings
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