APPENDIX

MANUAL TURNING MOVEMENT COUNTS
PUBLIC TRANSPORTATION INFORMATION AND SCHEDULES
MASSDOT CRASH RATE WORKSHEETS
TRIP-GENERATION CALCULATIONS
TRIP-GENERATION SUMMARY TABLES
CMU DEVELOPMENT-GENERATED TRAFFIC-VOLUME NETWORKS
CAPACITY ANALYSIS WORKSHEETS

MANUAL TURNING MOVEMENT COUNTS

Accurate Counts

978-664-2565

N/S Street : Central St / Oak Hill Rd
E/W Street : Route 9
City/State : Southborough, MA
Weather : Clear

File Name : 73240001
Site Code : 73240001
Start Date : 6/22/2016
Page No : 1

Groups Printed- Cars - Trucks

	Central St From North			Route 9 From East				Oak Hill Rd From South			Route 9 From West				
Start Time	Left	Thru	Right	Left	Thru	Right	U-TR	Left	Thru	Right	Left	Thru	Right	U-TR	Int. Total
07:00 AM	29	23	33	22	543	12	2	19	21	1	9	376	20	2	1112
07:15 AM	41	37	43	15	519	22	1	11	21	3	15	398	11	2	1139
07:30 AM	69	32	60	26	527	18	1	18	18	6	7	529	19	15	1345
07:45 AM	41	33	49	22	489	14	1	14	23	1	12	542	12	5	1258
Total	180	125	185	85	2078	66	5	62	83	11	43	1845	62	24	4854
08:00 AM	59	28	73	9	505	18	3	14	25	4	10	523	14	6	1291
08:15 AM	61	26	67	17	547	11	3	24	13	0	7	527	21	7	1331
08:30 AM	45	23	57	9	540	16	5	35	23	7	8	476	19	6	1269
08:45 AM	60	27	74	8	427	11	5	32	16	6	10	430	19	19	1144
Total	225	104	271	43	2019	56	16	105	77	17	35	1956	73	38	5035
Grand Total	405	229	456	128	4097	122	21	167	160	28	78	3801	135	62	9889
Apprch %	37.2	21	41.8	2.9	93.8	2.8	0.5	47	45.1	7.9	1.9	93.3	3.3	1.5	
Total %	4.1	2.3	4.6	1.3	41.4	1.2	0.2	1.7	1.6	0.3	0.8	38.4	1.4	0.6	
Cars	394	227	454	127	4031	113	21	165	157	27	73	3724	133	62	9708
% Cars	97.3	99.1	99.6	99.2	98.4	92.6	100	98.8	98.1	96.4	93.6	98	98.5	100	98.2
Trucks	11	2	2	1	66	9	0	2	3	1	5	77	2	0	181
% Trucks	2.7	0.9	0.4	0.8	1.6	7.4	0	1.2	1.9	3.6	6.4	2	1.5	0	1.8

Accurate Counts
978-664-2565

N/S Street : Central St / Oak Hill Rd
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File Name : 73240001
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Start Date : 6/22/2016
Page No : 2

	Central St From North				Route 9 From East					Oak Hill Rd From South				Route 9 From West					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	U-TR	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	U-TR	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 07:30 AM																			
07:30 AM	69	32	60	161	26	527	18	1	572	18	18	6	42	7	529	19	15	570	1345
07:45 AM	41	33	49	123	22	489	14	1	526	14	23	1	38	12	542	12	5	571	1258
08:00 AM	59	28	73	160	9	505	18	3	535	14	25	4	43	10	523	14	6	553	1291
08:15 AM	61	26	67	154	17	547	11	3	578	24	13	0	37	7	527	21	7	562	1331
Total Volume	230	119	249	598	74	2068	61	8	2211	70	79	11	160	36	2121	66	33	2256	5225
% App. Total	38.5	19.9	41.6		3.3	93.5	2.8	0.4		43.8	49.4	6.9		1.6	94	2.9	1.5		
PHF	.833	.902	.853	.929	.712	.945	.847	.667	.956	.729	.790	.458	.930	.750	.978	.786	.550	.988	.971
Cars	226	117	247	590	73	2038	55	8	2174	68	76	10	154	34	2077	65	33	2209	5127
% Cars	98.3	98.3	99.2	98.7	98.6	98.5	90.2	100	98.3	97.1	96.2	90.9	96.3	94.4	97.9	98.5	100	97.9	98.1
Trucks	4	2	2	8	1	30	6	0	37	2	3	1	6	2	44	1	0	47	98
% Trucks	1.7	1.7	0.8	1.3	1.4	1.5	9.8	0	1.7	2.9	3.8	9.1	3.8	5.6	2.1	1.5	0	2.1	1.9

Accurate Counts

978-664-2565

N/S Street : Central St / Oak Hill Rd
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Weather : Clear

File Name : 73240001
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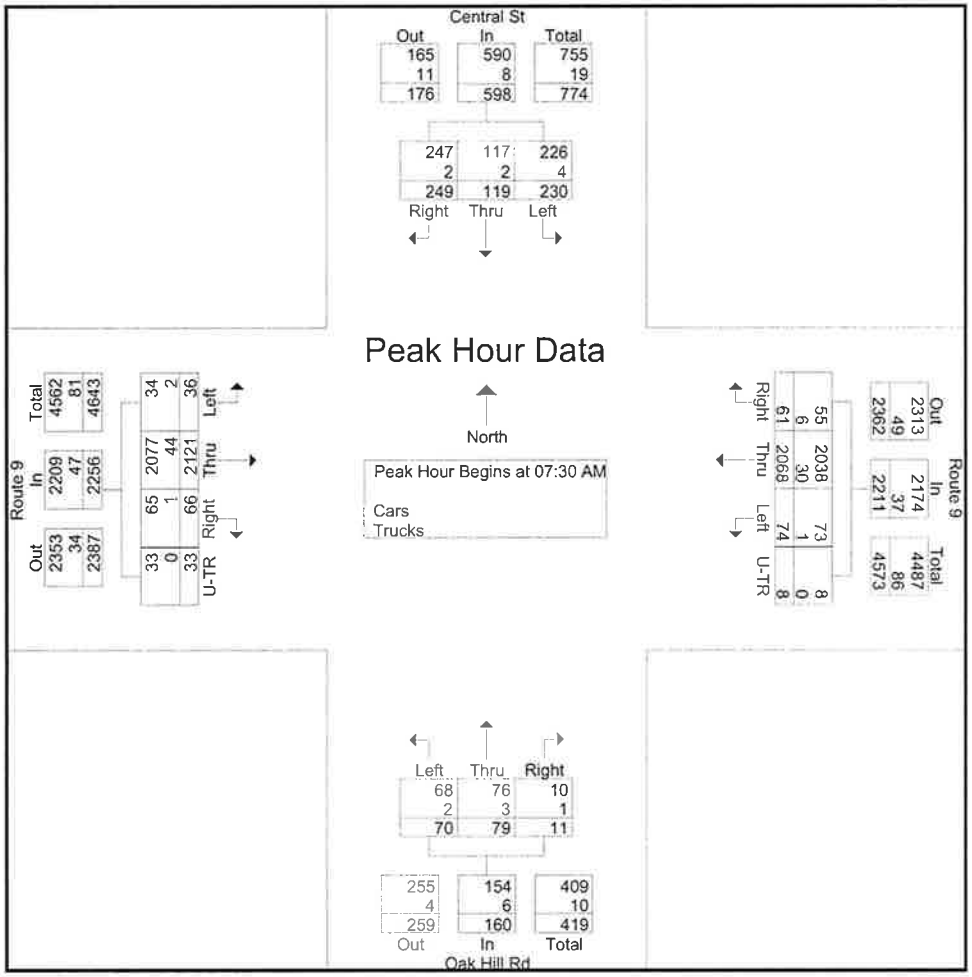

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM				07:00 AM					08:00 AM				07:30 AM				
+0 mins.	59	28	73	160	22	543	12	2	579	14	25	4	43	7	529	19	15	570
+15 mins.	61	26	67	154	15	519	22	1	557	24	13	0	37	12	542	12	5	571
+30 mins.	45	23	57	125	26	527	18	1	572	35	23	7	65	10	523	14	6	553
+45 mins.	60	27	74	161	22	489	14	1	526	32	16	6	54	7	527	21	7	562
Total Volume	225	104	271	600	85	2078	66	5	2234	105	77	17	199	36	2121	66	33	2256

Accurate Counts
978-664-2565

N/S Street : Central St / Oak Hill Rd
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File Name : 73240001
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Start Date : 6/22/2016
Page No : 1

Groups Printed- Cars

	Central St From North			Route 9 From East				Oak Hill Rd From South			Route 9 From West				
Start Time	Left	Thru	Right	Left	Thru	Right	U-TR	Left	Thru	Right	Left	Thru	Right	U-TR	Int. Total
07:00 AM	27	23	33	22	536	12	2	19	21	1	7	368	20	2	1093
07:15 AM	40	37	43	15	509	21	1	11	21	3	14	390	11	2	1118
07:30 AM	66	31	59	26	518	18	1	18	18	5	6	517	19	15	1317
07:45 AM	41	33	49	21	480	12	1	14	21	1	12	530	12	5	1232
Total	174	124	184	84	2043	63	5	62	81	10	39	1805	62	24	4760
08:00 AM	58	27	72	9	500	17	3	13	25	4	10	513	14	6	1271
08:15 AM	61	26	67	17	540	8	3	23	12	0	6	517	20	7	1307
08:30 AM	42	23	57	9	529	15	5	35	23	7	8	467	18	6	1244
08:45 AM	59	27	74	8	419	10	5	32	16	6	10	422	19	19	1126
Total	220	103	270	43	1988	50	16	103	76	17	34	1919	71	38	4948
Grand Total	394	227	454	127	4031	113	21	165	157	27	73	3724	133	62	9708
Apprch %	36.7	21.1	42.2	3	93.9	2.6	0.5	47.3	45	7.7	1.8	93.3	3.3	1.6	
Total %	4.1	2.3	4.7	1.3	41.5	1.2	0.2	1.7	1.6	0.3	0.8	38.4	1.4	0.6	

Accurate Counts
978-664-2565

N/S Street : Central St / Oak Hill Rd
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City/State : Southborough, MA
Weather : Clear

File Name : 73240001
Site Code : 73240001
Start Date : 6/22/2016
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	Central St From North				Route 9 From East					Oak Hill Rd From South				Route 9 From West					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	U-TR	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	U-TR	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 07:30 AM																			
07:30 AM	66	31	59	156	26	518	18	1	563	18	18	5	41	6	517	19	15	557	1317
07:45 AM	41	33	49	123	21	480	12	1	514	14	21	1	36	12	530	12	5	559	1232
08:00 AM	58	27	72	157	9	500	17	3	529	13	25	4	42	10	513	14	6	543	1271
08:15 AM	61	26	67	154	17	540	8	3	568	23	12	0	35	6	517	20	7	550	1307
Total Volume	226	117	247	590	73	2038	55	8	2174	68	76	10	154	34	2077	65	33	2209	5127
% App. Total	38.3	19.8	41.9		3.4	93.7	2.5	0.4		44.2	49.4	6.5		1.5	94	2.9	1.5		
PHF	.856	.886	.858	.939	.702	.944	.764	.667	.957	.739	.760	.500	.917	.708	.980	.813	.550	.988	.973

Accurate Counts
978-664-2565

N/S Street : Central St / Oak Hill Rd
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File Name : 73240001
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Start Date : 6/22/2016
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Groups Printed- Trucks

	Central St From North			Route 9 From East				Oak Hill Rd From South			Route 9 From West				
Start Time	Left	Thru	Right	Left	Thru	Right	U-TR	Left	Thru	Right	Left	Thru	Right	U-TR	Int. Total
07:00 AM	2	0	0	0	7	0	0	0	0	0	2	8	0	0	19
07:15 AM	1	0	0	0	10	1	0	0	0	0	1	8	0	0	21
07:30 AM	3	1	1	0	9	0	0	0	0	1	1	12	0	0	28
07:45 AM	0	0	0	1	9	2	0	0	2	0	0	12	0	0	26
Total	6	1	1	1	35	3	0	0	2	1	4	40	0	0	94
08:00 AM	1	1	1	0	5	1	0	1	0	0	0	10	0	0	20
08:15 AM	0	0	0	0	7	3	0	1	1	0	1	10	1	0	24
08:30 AM	3	0	0	0	11	1	0	0	0	0	0	9	1	0	25
08:45 AM	1	0	0	0	8	1	0	0	0	0	0	8	0	0	18
Total	5	1	1	0	31	6	0	2	1	0	1	37	2	0	87
Grand Total	11	2	2	1	66	9	0	2	3	1	5	77	2	0	181
Apprch %	73.3	13.3	13.3	1.3	86.8	11.8	0	33.3	50	16.7	6	91.7	2.4	0	
Total %	6.1	1.1	1.1	0.6	36.5	5	0	1.1	1.7	0.6	2.8	42.5	1.1	0	

Accurate Counts
978-664-2565

N/S Street : Central St / Oak Hill Rd
E/W Street : Route 9
City/State : Southborough, MA
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File Name : 73240001
Site Code : 73240001
Start Date : 6/22/2016
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	Central St From North				Route 9 From East					Oak Hill Rd From South				Route 9 From West					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	U-TR	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	U-TR	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 07:30 AM																			
07:30 AM	3	1	1	5	0	9	0	0	9	0	0	1	1	1	12	0	0	13	28
07:45 AM	0	0	0	0	1	9	2	0	12	0	2	0	2	0	12	0	0	12	26
08:00 AM	1	1	1	3	0	5	1	0	6	1	0	0	1	0	10	0	0	10	20
08:15 AM	0	0	0	0	0	7	3	0	10	1	1	0	2	1	10	1	0	12	24
Total Volume	4	2	2	8	1	30	6	0	37	2	3	1	6	2	44	1	0	47	98
% App. Total	50	25	25		2.7	81.1	16.2	0		33.3	50	16.7		4.3	93.6	2.1	0		
PHF	.333	.500	.500	.400	.250	.833	.500	.000	.771	.500	.375	.250	.750	.500	.917	.250	.000	.904	.875

Accurate Counts
978-664-2565

N/S Street : Central St / Oak Hill Rd
E/W Street : Route 9
City/State : Southborough, MA
Weather : Clear

File Name : 73240001
Site Code : 73240001
Start Date : 6/22/2016
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Groups Printed- Bikes Peds

	Central St From North				Route 9 From East				Oak Hill Rd From South				Route 9 From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	1	2	3
Total	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	1	1	3	4
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Grand Total	0	0	0	0	0	1	1	0	0	0	0	0	0	2	0	1	1	4	5
Apprch %	0	0	0		0	50	50		0	0	0		0	100	0				
Total %	0	0	0		0	25	25		0	0	0		0	50	0		20	80	

Accurate Counts
978-664-2565

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	Central St From North				Route 9 From East				Oak Hill Rd From South				Route 9 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
Total Volume	0	0	0	0	0	1	1	2	0	0	0	0	0	1	0	1	3
% App. Total	0	0	0		0	50	50		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.250	.250	.500	.000	.000	.000	.000	.000	.250	.000	.250	.375

Accurate Counts
978-664-2565

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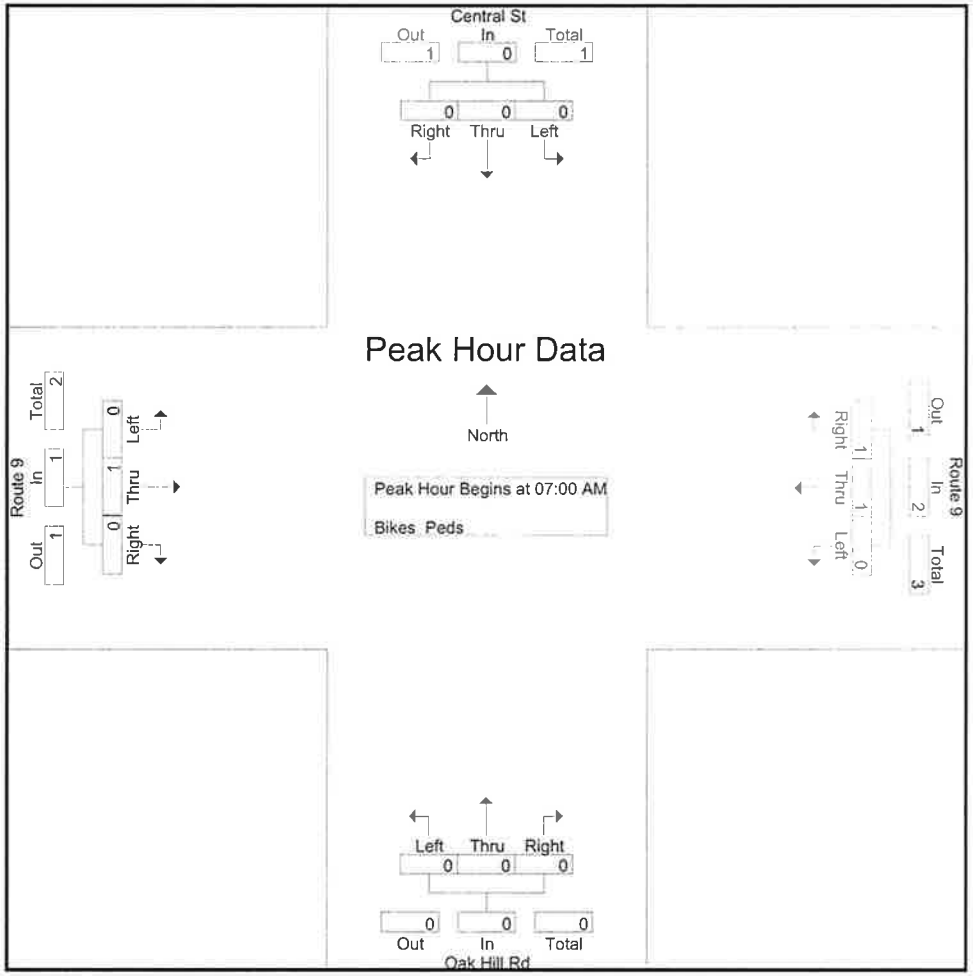

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:45 AM			
+0 mins.	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	1
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1
Total Volume	0	0	0	0	0	1	1	2	0	0	0	0	0	2	0	2

Accurate Counts
978-664-2565

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Groups Printed- Cars - Trucks

	Central St From North			Route 9 From East				Oak Hill Rd From South			Route 9 From West				
Start Time	Left	Thru	Right	Left	Thru	Right	U-TR	Left	Thru	Right	Left	Thru	Right	U-TR	Int. Total
04:00 PM	38	28	16	13	356	29	37	21	25	5	30	671	35	17	1321
04:15 PM	38	42	22	21	407	35	25	20	38	4	29	585	39	17	1322
04:30 PM	37	40	25	21	464	21	18	21	24	7	29	611	34	19	1371
04:45 PM	38	44	15	17	415	26	19	29	34	8	42	502	30	8	1227
Total	151	154	78	72	1642	111	99	91	121	24	130	2369	138	61	5241
05:00 PM	31	26	18	13	435	31	28	21	21	8	41	618	39	9	1339
05:15 PM	42	39	15	19	423	38	34	24	32	2	37	548	36	19	1308
05:30 PM	34	49	13	20	443	24	22	17	32	6	45	597	35	14	1351
05:45 PM	53	61	15	16	488	27	27	21	30	2	30	480	25	11	1286
Total	160	175	61	68	1789	120	111	83	115	18	153	2243	135	53	5284
Grand Total	311	329	139	140	3431	231	210	174	236	42	283	4612	273	114	10525
Apprch %	39.9	42.2	17.8	3.5	85.5	5.8	5.2	38.5	52.2	9.3	5.4	87.3	5.2	2.2	
Total %	3	3.1	1.3	1.3	32.6	2.2	2	1.7	2.2	0.4	2.7	43.8	2.6	1.1	
Cars	307	328	136	140	3395	230	210	174	236	42	283	4570	273	114	10438
% Cars	98.7	99.7	97.8	100	99	99.6	100	100	100	100	100	99.1	100	100	99.2
Trucks	4	1	3	0	36	1	0	0	0	0	0	42	0	0	87
% Trucks	1.3	0.3	2.2	0	1	0.4	0	0	0	0	0	0.9	0	0	0.8

Accurate Counts
978-664-2565

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	Central St From North				Route 9 From East					Oak Hill Rd From South				Route 9 From West					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	U-TR	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	U-TR	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 05:00 PM																			
05:00 PM	31	26	18	75	13	435	31	28	507	21	21	8	50	41	618	39	9	707	1339
05:15 PM	42	39	15	96	19	423	38	34	514	24	32	2	58	37	548	36	19	640	1308
05:30 PM	34	49	13	96	20	443	24	22	509	17	32	6	55	45	597	35	14	691	1351
05:45 PM	53	61	15	129	16	488	27	27	558	21	30	2	53	30	480	25	11	546	1286
Total Volume	160	175	61	396	68	1789	120	111	2088	83	115	18	216	153	2243	135	53	2584	5284
% App. Total	40.4	44.2	15.4		3.3	85.7	5.7	5.3		38.4	53.2	8.3		5.9	86.8	5.2	2.1		
PHF	.755	.717	.847	.767	.850	.916	.789	.816	.935	.865	.898	.563	.931	.850	.907	.865	.697	.914	.978
Cars	157	174	60	391	68	1777	120	111	2076	83	115	18	216	153	2227	135	53	2568	5251
% Cars	98.1	99.4	98.4	98.7	100	99.3	100	100	99.4	100	100	100	100	100	99.3	100	100	99.4	99.4
Trucks	3	1	1	5	0	12	0	0	12	0	0	0	0	0	16	0	0	16	33
% Trucks	1.9	0.6	1.6	1.3	0	0.7	0	0	0.6	0	0	0	0	0	0.7	0	0	0.6	0.6

Accurate Counts
978-664-2565

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Start Date : 6/22/2016
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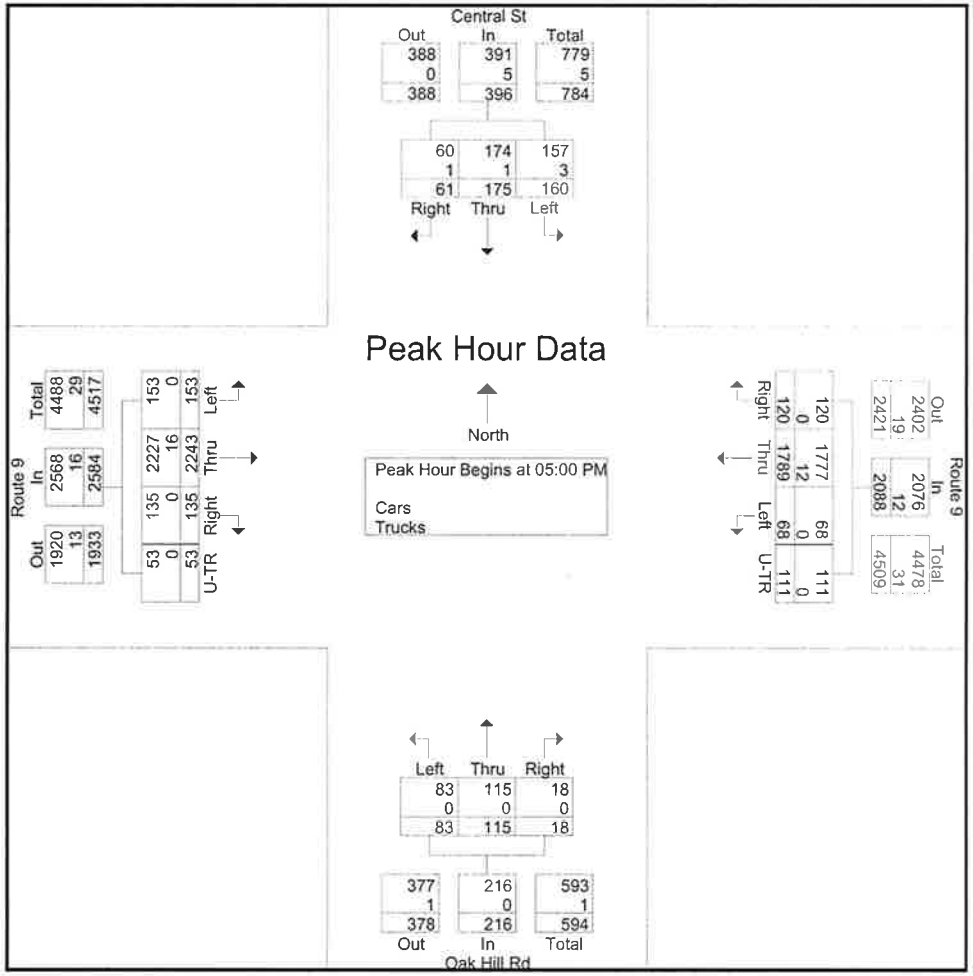


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM					04:00 PM				04:00 PM				
+0 mins.	31	26	18	75	13	435	31	28	507	21	25	5	51	30	671	35	17	753
+15 mins.	42	39	15	96	19	423	38	34	514	20	38	4	62	29	585	39	17	670
+30 mins.	34	49	13	96	20	443	24	22	509	21	24	7	52	29	611	34	19	693
+45 mins.	53	61	15	129	16	488	27	27	558	29	34	8	71	42	502	30	8	582
Total Volume	160	175	61	396	68	1789	120	111	2088	91	121	24	236	130	2369	138	61	2698

Accurate Counts

978-664-2565

N/S Street : Central St / Oak Hill Rd
E/W Street : Route 9
City/State : Southborough, MA
Weather : Clear

File Name : 73240001
Site Code : 73240001
Start Date : 6/22/2016
Page No : 1

Groups Printed- Cars

	Central St From North			Route 9 From East				Oak Hill Rd From South			Route 9 From West				
Start Time	Left	Thru	Right	Left	Thru	Right	U-TR	Left	Thru	Right	Left	Thru	Right	U-TR	Int. Total
04:00 PM	38	28	16	13	350	28	37	21	25	5	30	662	35	17	1305
04:15 PM	38	42	22	21	400	35	25	20	38	4	29	579	39	17	1309
04:30 PM	36	40	24	21	458	21	18	21	24	7	29	604	34	19	1356
04:45 PM	38	44	14	17	410	26	19	29	34	8	42	498	30	8	1217
Total	150	154	76	72	1618	110	99	91	121	24	130	2343	138	61	5187
05:00 PM	30	26	17	13	431	31	28	21	21	8	41	611	39	9	1326
05:15 PM	42	39	15	19	422	38	34	24	32	2	37	545	36	19	1304
05:30 PM	32	49	13	20	439	24	22	17	32	6	45	594	35	14	1342
05:45 PM	53	60	15	16	485	27	27	21	30	2	30	477	25	11	1279
Total	157	174	60	68	1777	120	111	83	115	18	153	2227	135	53	5251
Grand Total	307	328	136	140	3395	230	210	174	236	42	283	4570	273	114	10438
Apprch %	39.8	42.5	17.6	3.5	85.4	5.8	5.3	38.5	52.2	9.3	5.4	87.2	5.2	2.2	
Total %	2.9	3.1	1.3	1.3	32.5	2.2	2	1.7	2.3	0.4	2.7	43.8	2.6	1.1	

Accurate Counts
978-664-2565

N/S Street : Central St / Oak Hill Rd
E/W Street : Route 9
City/State : Southborough, MA
Weather : Clear

File Name : 73240001
Site Code : 73240001
Start Date : 6/22/2016
Page No : 2

	Central St From North				Route 9 From East					Oak Hill Rd From South				Route 9 From West					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	U-TR	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	U-TR	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 05:00 PM																			
05:00 PM	30	26	17	73	13	431	31	28	503	21	21	8	50	41	611	39	9	700	1326
05:15 PM	42	39	15	96	19	422	38	34	513	24	32	2	58	37	545	36	19	637	1304
05:30 PM	32	49	13	94	20	439	24	22	505	17	32	6	55	45	594	35	14	688	1342
05:45 PM	53	60	15	128	16	485	27	27	555	21	30	2	53	30	477	25	11	543	1279
Total Volume	157	174	60	391	68	1777	120	111	2076	83	115	18	216	153	2227	135	53	2568	5251
% App. Total	40.2	44.5	15.3		3.3	85.6	5.8	5.3		38.4	53.2	8.3		6	86.7	5.3	2.1		
PHF	.741	.725	.882	.764	.850	.916	.789	.816	.935	.865	.898	.563	.931	.850	.911	.865	.697	.917	.978

Accurate Counts
978-664-2565

N/S Street : Central St / Oak Hill Rd
E/W Street : Route 9
City/State : Southborough, MA
Weather : Clear

File Name : 73240001
Site Code : 73240001
Start Date : 6/22/2016
Page No : 1

Groups Printed- Trucks

	Central St From North			Route 9 From East				Oak Hill Rd From South			Route 9 From West				
Start Time	Left	Thru	Right	Left	Thru	Right	U-TR	Left	Thru	Right	Left	Thru	Right	U-TR	Int. Total
04:00 PM	0	0	0	0	6	1	0	0	0	0	0	9	0	0	16
04:15 PM	0	0	0	0	7	0	0	0	0	0	0	6	0	0	13
04:30 PM	1	0	1	0	6	0	0	0	0	0	0	7	0	0	15
04:45 PM	0	0	1	0	5	0	0	0	0	0	0	4	0	0	10
Total	1	0	2	0	24	1	0	0	0	0	0	26	0	0	54
05:00 PM	1	0	1	0	4	0	0	0	0	0	0	7	0	0	13
05:15 PM	0	0	0	0	1	0	0	0	0	0	0	3	0	0	4
05:30 PM	2	0	0	0	4	0	0	0	0	0	0	3	0	0	9
05:45 PM	0	1	0	0	3	0	0	0	0	0	0	3	0	0	7
Total	3	1	1	0	12	0	0	0	0	0	0	16	0	0	33
Grand Total	4	1	3	0	36	1	0	0	0	0	0	42	0	0	87
Apprch %	50	12.5	37.5	0	97.3	2.7	0	0	0	0	0	100	0	0	
Total %	4.6	1.1	3.4	0	41.4	1.1	0	0	0	0	0	48.3	0	0	

Accurate Counts

978-664-2565

N/S Street : Central St / Oak Hill Rd
E/W Street : Route 9
City/State : Southborough, MA
Weather : Clear

File Name : 73240001
Site Code : 73240001
Start Date : 6/22/2016
Page No : 2

	Central St From North				Route 9 From East					Oak Hill Rd From South				Route 9 From West					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	U-TR	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	U-TR	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 04:00 PM																			
04:00 PM	0	0	0	0	0	6	1	0	7	0	0	0	0	0	9	0	0	9	16
04:15 PM	0	0	0	0	0	7	0	0	7	0	0	0	0	0	6	0	0	6	13
04:30 PM	1	0	1	2	0	6	0	0	6	0	0	0	0	0	7	0	0	7	15
04:45 PM	0	0	1	1	0	5	0	0	5	0	0	0	0	0	4	0	0	4	10
Total Volume	1	0	2	3	0	24	1	0	25	0	0	0	0	0	26	0	0	26	54
% App. Total	33.3	0	66.7		0	96	4	0		0	0	0		0	100	0	0		
PHF	.250	.000	.500	.375	.000	.857	.250	.000	.893	.000	.000	.000	.000	.000	.722	.000	.000	.722	.844

Accurate Counts

978-664-2565

N/S Street : Central St / Oak Hill Rd
E/W Street : Route 9
City/State : Southborough, MA
Weather : Clear

File Name : 73240001
Site Code : 73240001
Start Date : 6/22/2016
Page No : 1

Groups Printed- Bikes Peds

	Central St From North				Route 9 From East				Oak Hill Rd From South				Route 9 From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0				
Total %																	100	0	

Accurate Counts
978-664-2565

N/S Street : Central St / Oak Hill Rd
E/W Street : Route 9
City/State : Southborough, MA
Weather : Clear

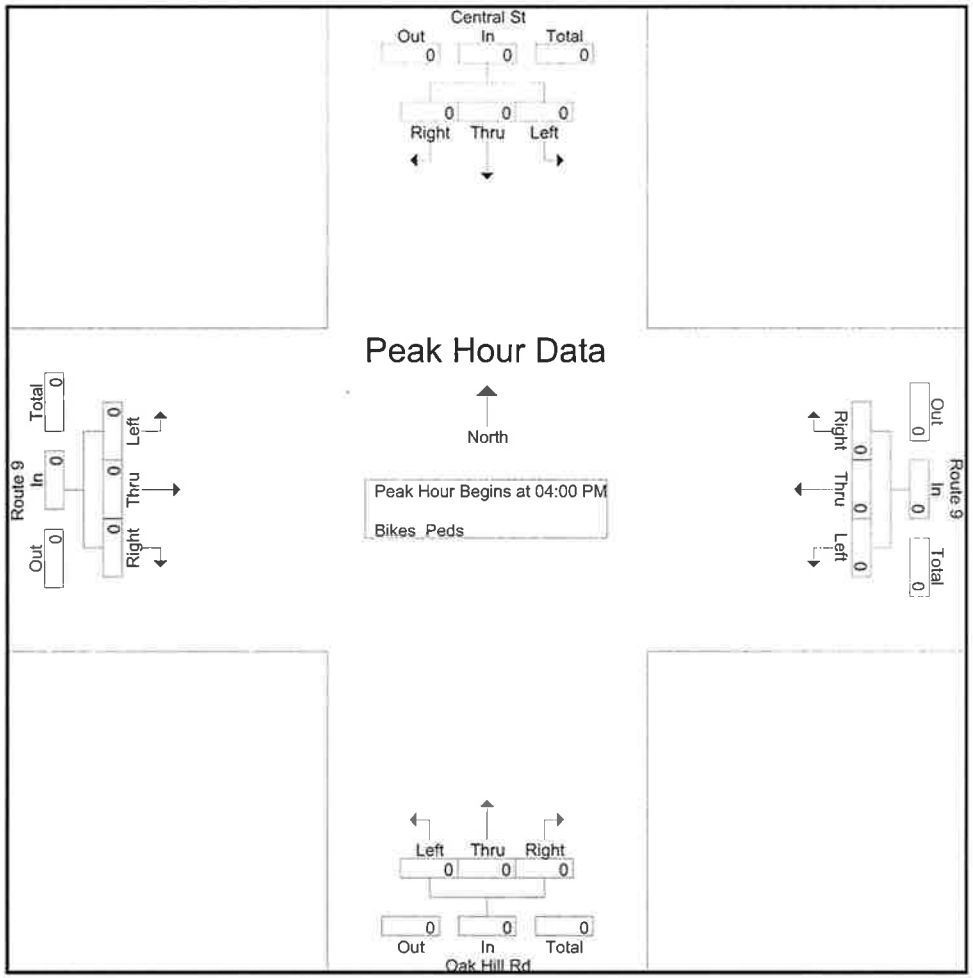
File Name : 73240001
Site Code : 73240001
Start Date : 6/22/2016
Page No : 2

	Central St From North				Route 9 From East				Oak Hill Rd From South				Route 9 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts
978-664-2565

N/S Street : Central St / Oak Hill Rd
E/W Street : Route 9
City/State : Southborough, MA
Weather : Clear

File Name : 73240001
Site Code : 73240001
Start Date : 6/22/2016
Page No : 3



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Accurate Counts

978-664-2565

N/S Street : Boston Rd / Willow St
E/W Street : Connector / Boston Rd
City/State : Southborough, MA
Weather : Clear

File Name : 73240002
Site Code : 73240002
Start Date : 6/22/2016
Page No : 1

Groups Printed- Cars - Trucks

	Boston Rd From North				Connector From East				Willow St From South				Boston Rd From West				Valley Rd From Northwest				
Start Time	Left	Thru	Right	Hd Rt	Left	Thru	Br Rt	Right	Left	Br Lt	Thru	Right	Hd Lt	Left	Thru	Right	Hd Lt	Br Lt	Br Rt	Hd Rt	Int. Total
07:00 AM	20	44	30	0	9	33	1	36	0	0	0	3	0	174	120	11	2	0	0	0	483
07:15 AM	21	40	42	0	15	44	0	31	1	0	2	0	0	155	121	10	0	2	1	0	485
07:30 AM	16	56	49	2	19	66	0	22	1	0	2	5	0	181	106	21	2	1	1	0	550
07:45 AM	16	46	59	0	22	63	0	41	2	0	2	1	0	150	99	34	1	1	0	1	538
Total	73	186	180	2	65	206	1	130	4	0	6	9	0	660	446	76	5	4	2	1	2056
08:00 AM	21	70	61	1	23	68	1	41	4	0	1	4	0	157	123	22	2	3	1	0	603
08:15 AM	25	67	70	1	12	63	0	23	1	1	3	3	0	127	92	20	0	3	0	0	511
08:30 AM	30	50	70	0	13	51	0	29	1	0	1	1	0	109	100	11	1	0	1	0	468
08:45 AM	30	46	78	2	21	51	0	27	2	0	8	13	0	130	115	26	1	2	0	0	552
Total	106	233	279	4	69	233	1	120	8	1	13	21	0	523	430	79	4	8	2	0	2134
Grand Total	179	419	459	6	134	439	2	250	12	1	19	30	0	1183	876	155	9	12	4	1	4190
Apprch %	16.8	39.4	43.2	0.6	16.2	53.2	0.2	30.3	19.4	1.6	30.6	48.4	0	53.4	39.6	7	34.6	46.2	15.4	3.8	
Total %	4.3	10	11	0.1	3.2	10.5	0	6	0.3	0	0.5	0.7	0	28.2	20.9	3.7	0.2	0.3	0.1	0	
Cars	178	419	457	5	131	434	2	249	11	1	19	24	0	1181	874	155	9	12	4	1	4166
% Cars	99.4	100	99.6	83.3	97.8	98.9	100	99.6	91.7	100	100	80	0	99.8	99.8	100	100	100	100	100	99.4
Trucks	1	0	2	1	3	5	0	1	1	0	0	6	0	2	2	0	0	0	0	0	24
% Trucks	0.6	0	0.4	16.7	2.2	1.1	0	0.4	8.3	0	0	20	0	0.2	0.2	0	0	0	0	0	0.6

Accurate Counts
978-664-2565

N/S Street : Boston Rd / Willow St
E/W Street : Connector / Boston Rd
City/State : Southborough, MA
Weather : Clear

File Name : 73240002
Site Code : 73240002
Start Date : 6/22/2016
Page No : 2

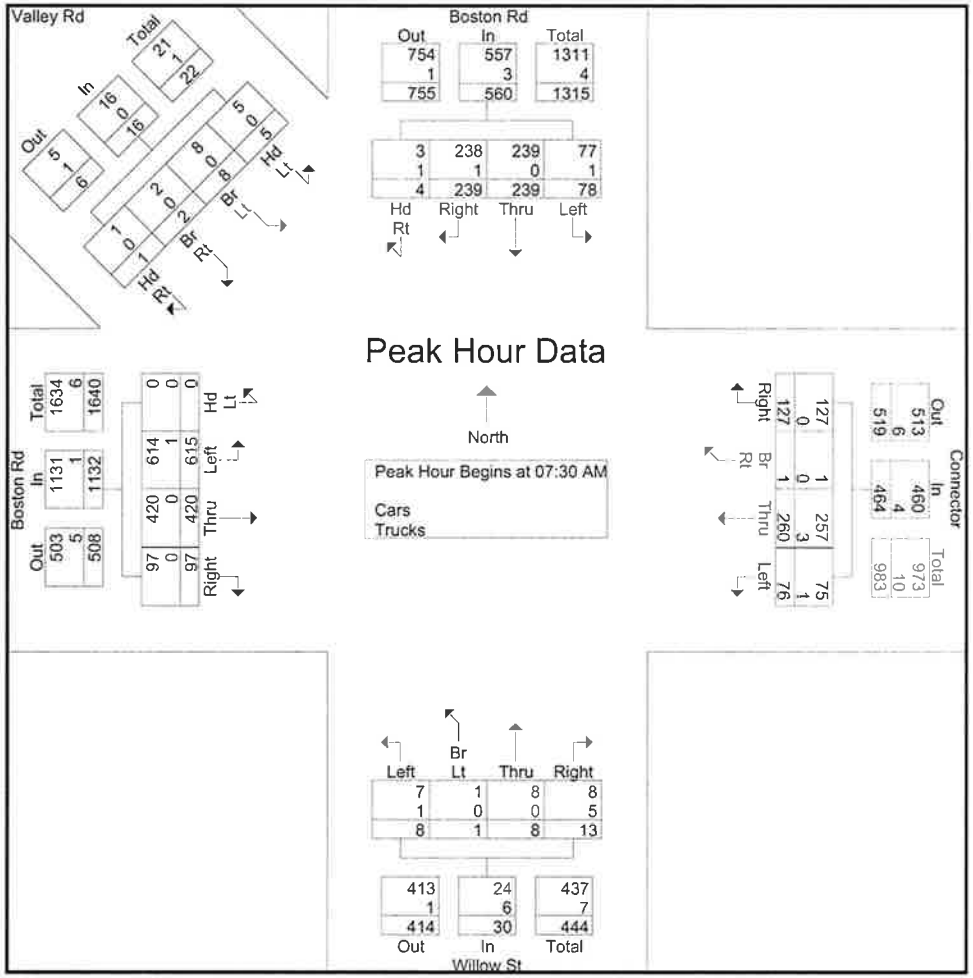
	Boston Rd From North					Connector From East					Willow St From South					Boston Rd From West					Valley Rd From Northwest					
Start Time	Left	Thru	Right	Hd Rt	App. Total	Left	Thru	Br Rt	Right	App. Total	Left	Br Lt	Thru	Right	App. Total	Hd Lt	Left	Thru	Right	App. Total	Hd Lt	Br Lt	Br Rt	Hd Rt	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 07:30 AM																										
07:30 AM	16	56	49	2	123	19	66	0	22	107	1	0	2	5	8	0	181	106	21	308	2	1	1	0	4	550
07:45 AM	16	46	59	0	121	22	63	0	41	126	2	0	2	1	5	0	150	99	34	283	1	1	0	1	3	538
08:00 AM	21	70	61	1	153	23	68	1	41	133	4	0	1	4	9	0	157	123	22	302	2	3	1	0	6	603
08:15 AM	25	67	70	1	163	12	63	0	23	98	1	1	3	3	8	0	127	92	20	239	0	3	0	0	3	511
Total Volume	78	239	239	4	560	76	260	1	127	464	8	1	8	13	30	0	615	420	97	1132	5	8	2	1	16	2202
% App. Total	13.9	42.7	42.7	0.7		16.4	56	0.2	27.4		26.7	3.3	26.7	43.3		0	54.3	37.1	8.6		31.2	50	12.5	6.2		
PHF	.780	.854	.854	.500	.859	.826	.956	.250	.774	.872	.500	.250	.667	.650	.833	.000	.849	.854	.713	.919	.625	.667	.500	.250	.667	.913
Cars	77	239	238	3	557	75	257	1	127	460	7	1	8	8	24	0	614	420	97	1131	5	8	2	1	16	2188
% Cars	98.7	100	99.6	75.0	99.5	98.7	98.8	100	100	99.1	87.5	100	100	61.5	80.0	0	99.8	100	100	99.9	100	100	100	100	100	99.4
Trucks	1	0	1	1	3	1	3	0	0	4	1	0	0	5	6	0	1	0	0	1	0	0	0	0	0	14
% Trucks	1.3	0	0.4	25.0	0.5	1.3	1.2	0	0	0.9	12.5	0	0	38.5	20.0	0	0.2	0	0	0.1	0	0	0	0	0	0.6

Accurate Counts

978-664-2565

N/S Street : Boston Rd / Willow St
E/W Street : Connector / Boston Rd
City/State : Southborough, MA
Weather : Clear

File Name : 73240002
Site Code : 73240002
Start Date : 6/22/2016
Page No : 3



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:00 AM					07:30 AM					08:00 AM					07:00 AM					07:15 AM				
+0 mins.	21	70	61	1	153	19	66	0	22	107	4	0	1	4	9	0	174	120	11	305	0	2	1	0	3
+15 mins.	25	67	70	1	163	22	63	0	41	126	1	1	3	3	8	0	155	121	10	286	2	1	1	0	4
+30 mins.	30	50	70	0	150	23	68	1	41	133	1	0	1	1	3	0	181	106	21	308	1	1	0	1	3
+45 mins.	30	46	78	2	156	12	63	0	23	98	2	0	8	13	23	0	150	99	34	283	2	3	1	0	6
Total Volume	106	233	279	4	622	76	260	1	127	464	8	1	13	21	43	0	660	446	76	1182	5	7	3	1	16

Accurate Counts
978-664-2565

N/S Street : Boston Rd / Willow St
E/W Street : Connector / Boston Rd
City/State : Southborough, MA
Weather : Clear

File Name : 73240002
Site Code : 73240002
Start Date : 6/22/2016
Page No : 5

Groups Printed- Cars

	Boston Rd From North				Connector From East				Willow St From South				Boston Rd From West				Valley Rd From Northwest				
Start Time	Left	Thru	Right	Hd Rt	Left	Thru	Br Rt	Right	Left	Br Lt	Thru	Right	Hd Lt	Left	Thru	Right	Hd Lt	Br Lt	Br Rt	Hd Rt	Int. Total
07:00 AM	20	44	30	0	8	33	1	36	0	0	0	3	0	173	120	11	2	0	0	0	481
07:15 AM	21	40	41	0	15	44	0	30	1	0	2	0	0	155	121	10	0	2	1	0	483
07:30 AM	16	56	49	1	19	66	0	22	1	0	2	3	0	181	106	21	2	1	1	0	547
07:45 AM	16	46	59	0	22	62	0	41	2	0	2	1	0	149	99	34	1	1	0	1	536
Total	73	186	179	1	64	205	1	129	4	0	6	7	0	658	446	76	5	4	2	1	2047
08:00 AM	20	70	61	1	23	66	1	41	3	0	1	2	0	157	123	22	2	3	1	0	597
08:15 AM	25	67	69	1	11	63	0	23	1	1	3	2	0	127	92	20	0	3	0	0	508
08:30 AM	30	50	70	0	12	50	0	29	1	0	1	1	0	109	100	11	1	0	1	0	466
08:45 AM	30	46	78	2	21	50	0	27	2	0	8	12	0	130	113	26	1	2	0	0	548
Total	105	233	278	4	67	229	1	120	7	1	13	17	0	523	428	79	4	8	2	0	2119
Grand Total	178	419	457	5	131	434	2	249	11	1	19	24	0	1181	874	155	9	12	4	1	4166
Apprch %	16.8	39.6	43.2	0.5	16.1	53.2	0.2	30.5	20	1.8	34.5	43.6	0	53.4	39.5	7	34.6	46.2	15.4	3.8	
Total %	4.3	10.1	11	0.1	3.1	10.4	0	6	0.3	0	0.5	0.6	0	28.3	21	3.7	0.2	0.3	0.1	0	

Accurate Counts

978-664-2565

N/S Street : Boston Rd / Willow St
E/W Street : Connector / Boston Rd
City/State : Southborough, MA
Weather : Clear

File Name : 73240002
Site Code : 73240002
Start Date : 6/22/2016
Page No : 6

	Boston Rd From North					Connector From East					Willow St From South					Boston Rd From West					Valley Rd From Northwest					
Start Time	Left	Thru	Right	Hd Rt	App. Total	Left	Thru	Br Rt	Right	App. Total	Left	Br Lt	Thru	Right	App. Total	Hd Lt	Left	Thru	Right	App. Total	Hd Lt	Br Lt	Br Rt	Hd Rt	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 07:30 AM																										
07:30 AM	16	56	49	1	122	19	66	0	22	107	1	0	2	3	6	0	181	106	21	308	2	1	1	0	4	547
07:45 AM	16	46	59	0	121	22	62	0	41	125	2	0	2	1	5	0	149	99	34	282	1	1	0	1	3	536
08:00 AM	20	70	61	1	152	23	66	1	41	131	3	0	1	2	6	0	157	123	22	302	2	3	1	0	6	597
08:15 AM	25	67	69	1	162	11	63	0	23	97	1	1	3	2	7	0	127	92	20	239	0	3	0	0	3	508
Total Volume	77	239	238	3	557	75	257	1	127	460	7	1	8	8	24	0	614	420	97	1131	5	8	2	1	16	2188
% App. Total	13.8	42.9	42.7	0.5		16.3	55.9	0.2	27.6		29.2	4.2	33.3	33.3		0	54.3	37.1	8.6		31.2	50	12.5	6.2		
PHF	.770	.854	.862	.750	.860	.815	.973	.250	.774	.878	.583	.250	.667	.667	.857	.000	.848	.854	.713	.918	.625	.667	.500	.250	.667	.916

Accurate Counts
978-664-2565

N/S Street : Boston Rd / Willow St
E/W Street : Connector / Boston Rd
City/State : Southborough, MA
Weather : Clear

File Name : 73240002
Site Code : 73240002
Start Date : 6/22/2016
Page No : 9

Groups Printed- Trucks

	Boston Rd From North				Connector From East				Willow St From South				Boston Rd From West				Valley Rd From Northwest				
Start Time	Left	Thru	Right	Hd Rt	Left	Thru	Br Rt	Right	Left	Br Lt	Thru	Right	Hd Lt	Left	Thru	Right	Hd Lt	Br Lt	Br Rt	Hd Rt	Int. Total
07:00 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
07:15 AM	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
07:30 AM	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	3
07:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
Total	0	0	1	1	1	1	0	1	0	0	0	2	0	2	0	0	0	0	0	0	9
08:00 AM	1	0	0	0	0	2	0	0	1	0	0	2	0	0	0	0	0	0	0	0	6
08:15 AM	0	0	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3
08:30 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
08:45 AM	0	0	0	0	0	1	0	0	0	0	0	1	0	0	2	0	0	0	0	0	4
Total	1	0	1	0	2	4	0	0	1	0	0	4	0	0	2	0	0	0	0	0	15
Grand Total	1	0	2	1	3	5	0	1	1	0	0	6	0	2	2	0	0	0	0	0	24
Apprch %	25	0	50	25	33.3	55.6	0	11.1	14.3	0	0	85.7	0	50	50	0	0	0	0	0	
Total %	4.2	0	8.3	4.2	12.5	20.8	0	4.2	4.2	0	0	25	0	8.3	8.3	0	0	0	0	0	

Accurate Counts
978-664-2565

N/S Street : Boston Rd / Willow St
E/W Street : Connector / Boston Rd
City/State : Southborough, MA
Weather : Clear

File Name : 73240002
Site Code : 73240002
Start Date : 6/22/2016
Page No : 10

	Boston Rd From North					Connector From East					Willow St From South					Boston Rd From West					Valley Rd From Northwest					
Start Time	Left	Thru	Right	Hd Rt	App. Total	Left	Thru	Br Rt	Right	App. Total	Left	Br Lt	Thru	Right	App. Total	Hd Lt	Left	Thru	Right	App. Total	Hd Lt	Br Lt	Br Rt	Hd Rt	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 08:00 AM																										
08:00 AM	1	0	0	0	1	0	2	0	0	2	1	0	0	2	3	0	0	0	0	0	0	0	0	0	0	6
08:15 AM	0	0	1	0	1	1	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	3
08:30 AM	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
08:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	1	1	0	0	2	0	2	0	0	0	0	0	4
Total Volume	1	0	1	0	2	2	4	0	0	6	1	0	0	4	5	0	0	2	0	2	0	0	0	0	0	15
% App. Total	50	0	50	0		33.3	66.7	0	0		20	0	0	80		0	0	100	0		0	0	0	0		
PHF	.250	.000	.250	.000	.500	.500	.500	.000	.000	.750	.250	.000	.000	.500	.417	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.625

Accurate Counts
978-664-2565

N/S Street : Boston Rd / Willow St
E/W Street : Connector / Boston Rd
City/State : Southborough, MA
Weather : Clear

File Name : 73240002
Site Code : 73240002
Start Date : 6/22/2016
Page No : 13

Groups Printed- Bikes Peds

	Boston Rd From North					Connector From East					Willow St From South					Boston Rd From West					Valley Rd From Northwest							
Start Time	Left	Thru	Right	Hd Rt	Peds	Left	Thru	Br Rt	Right	Peds	Left	Br Lt	Thru	Right	Peds	Hd Lt	Left	Thru	Right	Peds	Hd Lt	Br Lt	Br Rt	Hd Rt	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	2
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	6	6
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	8	8
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3	3
08:15 AM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	3	3
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1
Total	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	7	7
Grand Total	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	15	15
Apprch %	0	0	100	0		0	0	0	0		0	0	0	0		0	100	0	0		0	0	0	0				
Total %	0	0	13.3	0		0	0	0	0		0	0	0	0		0	86.7	0	0		0	0	0	0		0	100	

Accurate Counts
978-664-2565

N/S Street : Boston Rd / Willow St
E/W Street : Connector / Boston Rd
City/State : Southborough, MA
Weather : Clear

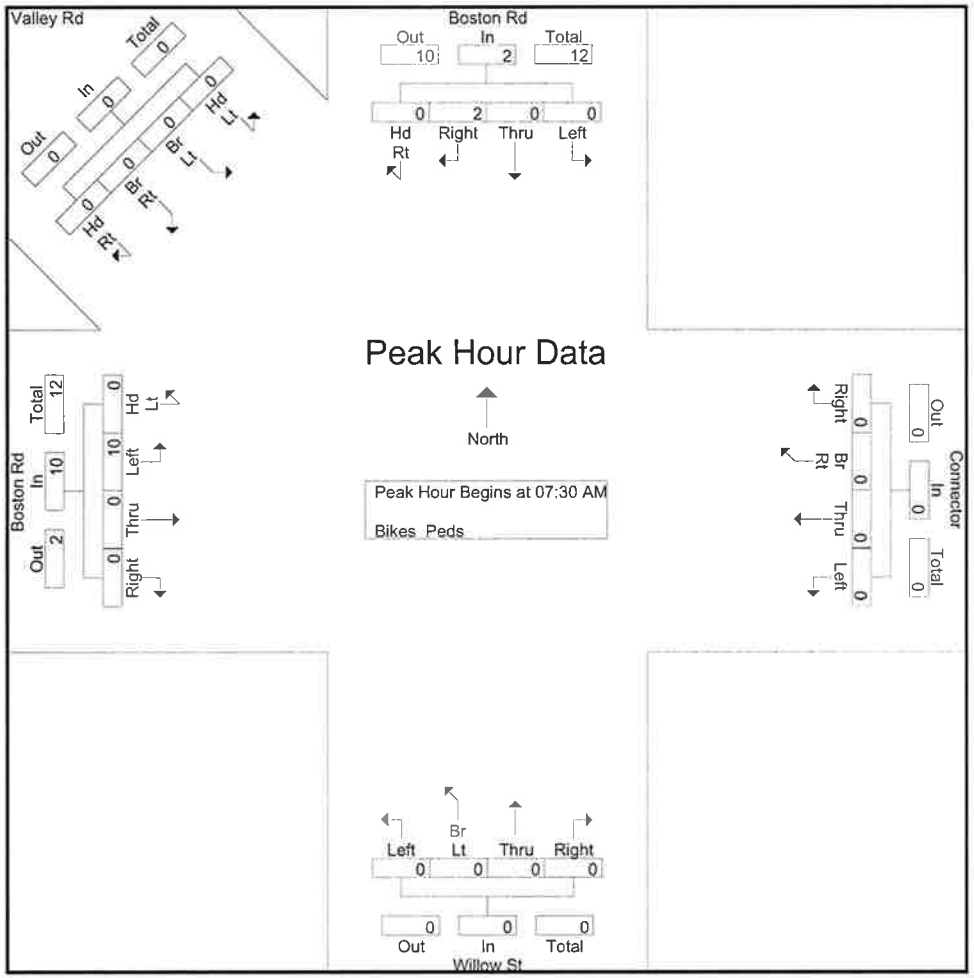
File Name : 73240002
Site Code : 73240002
Start Date : 6/22/2016
Page No : 14

	Boston Rd From North					Connector From East					Willow St From South					Boston Rd From West					Valley Rd From Northwest					
Start Time	Left	Thru	Right	Hd Rt	App. Total	Left	Thru	Br Rt	Right	App. Total	Left	Br Lt	Thru	Right	App. Total	Hd Lt	Left	Thru	Right	App. Total	Hd Lt	Br Lt	Br Rt	Hd Rt	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 07:30 AM																										
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	6
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	3
08:15 AM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
Total Volume	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	12
% App. Total	0	0	100	0		0	0	0	0		0	0	0	0		0	100	0	0		0	0	0	0		
PHF	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.417	.000	.000	.417	.000	.000	.000	.000	.000	.500

Accurate Counts
978-664-2565

N/S Street : Boston Rd / Willow St
E/W Street : Connector / Boston Rd
City/State : Southborough, MA
Weather : Clear

File Name : 73240002
Site Code : 73240002
Start Date : 6/22/2016
Page No : 15



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM					07:00 AM					07:00 AM					07:15 AM					07:00 AM				
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0
+45 mins.	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0
Total Volume	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	11	0	0	11	0	0	0	0	0

Accurate Counts
978-664-2565

N/S Street : Boston Rd / Willow St
E/W Street : Connector / Boston Rd
City/State : Southborough, MA
Weather : Clear

File Name : 73240002
Site Code : 73240002
Start Date : 6/22/2016
Page No : 1

Groups Printed- Cars - Trucks

	Boston Rd From North				Connector From East				Willow St From South				Boston Rd From West				Valley Rd From Northwest				
Start Time	Left	Thru	Right	Hd Rt	Left	Thru	Br Rt	Right	Left	Br Lt	Thru	Right	Hd Lt	Left	Thru	Right	Hd Lt	Br Lt	Br Rt	Hd Rt	Int. Total
04:00 PM	16	49	134	1	10	86	1	21	6	0	9	8	0	50	62	6	0	0	0	0	459
04:15 PM	13	34	151	3	11	104	1	21	5	0	6	10	0	59	83	6	1	0	0	0	508
04:30 PM	14	46	156	0	6	94	0	24	11	0	5	13	0	75	86	7	2	2	0	0	541
04:45 PM	13	45	118	0	8	82	0	38	4	0	10	7	0	75	100	3	2	1	0	0	506
Total	56	174	559	4	35	366	2	104	26	0	30	38	0	259	331	22	5	3	0	0	2014
05:00 PM	22	22	135	1	5	85	0	42	14	0	6	10	0	90	123	3	2	2	1	0	563
05:15 PM	12	41	146	0	5	109	0	49	4	0	5	2	0	114	129	4	1	0	0	0	621
05:30 PM	14	31	107	1	2	107	0	44	2	0	6	6	0	118	118	4	1	1	0	0	562
05:45 PM	8	24	86	2	3	92	1	39	2	1	4	4	0	92	108	1	0	1	0	0	468
Total	56	118	474	4	15	393	1	174	22	1	21	22	0	414	478	12	4	4	1	0	2214
Grand Total	112	292	1033	8	50	759	3	278	48	1	51	60	0	673	809	34	9	7	1	0	4228
Apprch %	7.8	20.2	71.5	0.6	4.6	69.6	0.3	25.5	30	0.6	31.9	37.5	0	44.4	53.4	2.2	52.9	41.2	5.9	0	
Total %	2.6	6.9	24.4	0.2	1.2	18	0.1	6.6	1.1	0	1.2	1.4	0	15.9	19.1	0.8	0.2	0.2	0	0	
Cars	111	292	1033	8	49	750	3	277	48	1	51	58	0	672	807	34	9	7	1	0	4211
% Cars	99.1	100	100	100	98	98.8	100	99.6	100	100	100	96.7	0	99.9	99.8	100	100	100	100	0	99.6
Trucks	1	0	0	0	1	9	0	1	0	0	0	2	0	1	2	0	0	0	0	0	17
% Trucks	0.9	0	0	0	2	1.2	0	0.4	0	0	0	3.3	0	0.1	0.2	0	0	0	0	0	0.4

Accurate Counts

978-664-2565

N/S Street : Boston Rd / Willow St
E/W Street : Connector / Boston Rd
City/State : Southborough, MA
Weather : Clear

File Name : 73240002
Site Code : 73240002
Start Date : 6/22/2016
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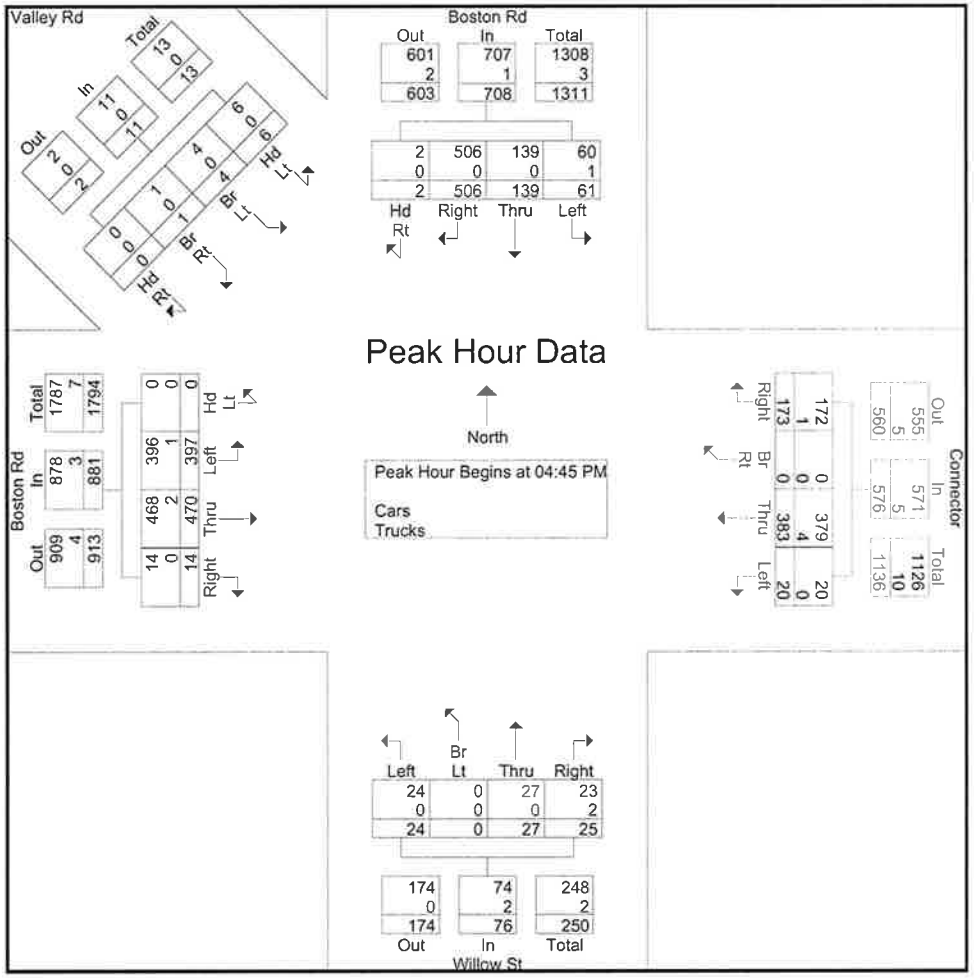
	Boston Rd From North					Connector From East					Willow St From South					Boston Rd From West					Valley Rd From Northwest					
Start Time	Left	Thru	Right	Hd Rt	App. Total	Left	Thru	Br Rt	Right	App. Total	Left	Br Lt	Thru	Right	App. Total	Hd Lt	Left	Thru	Right	App. Total	Hd Lt	Br Lt	Br Rt	Hd Rt	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 04:45 PM																										
04:45 PM	13	45	118	0	176	8	82	0	38	128	4	0	10	7	21	0	75	100	3	178	2	1	0	0	3	506
05:00 PM	22	22	135	1	180	5	85	0	42	132	14	0	6	10	30	0	90	123	3	216	2	2	1	0	5	563
05:15 PM	12	41	146	0	199	5	109	0	49	163	4	0	5	2	11	0	114	129	4	247	1	0	0	0	1	621
05:30 PM	14	31	107	1	153	2	107	0	44	153	2	0	6	6	14	0	118	118	4	240	1	1	0	0	2	562
Total Volume	61	139	506	2	708	20	383	0	173	576	24	0	27	25	76	0	397	470	14	881	6	4	1	0	11	2252
% App. Total	8.6	19.6	71.5	0.3		3.5	66.5	0	30		31.6	0	35.5	32.9		0	45.1	53.3	1.6		54.5	36.4	9.1	0		
PHF	.693	.772	.866	.500	.889	.625	.878	.000	.883	.883	.429	.000	.675	.625	.633	.000	.841	.911	.875	.892	.750	.500	.250	.000	.550	.907
Cars	60	139	506	2	707	20	379	0	172	571	24	0	27	23	74	0	396	468	14	878	6	4	1	0	11	2241
% Cars	98.4	100	100	100	99.9	100	99.0	0	99.4	99.1	100	0	100	92.0	97.4	0	99.7	99.6	100	99.7	100	100	100	0	100	99.5
Trucks	1	0	0	0	1	0	4	0	1	5	0	0	0	2	2	0	1	2	0	3	0	0	0	0	0	11
% Trucks	1.6	0	0	0	0.1	0	1.0	0	0.6	0.9	0	0	0	8.0	2.6	0	0.3	0.4	0	0.3	0	0	0	0	0	0.5

Accurate Counts
978-664-2565

N/S Street : Boston Rd / Willow St
E/W Street : Connector / Boston Rd
City/State : Southborough, MA
Weather : Clear

File Name : 73240002
Site Code : 73240002
Start Date : 6/22/2016
Page No : 3



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM					05:00 PM					04:15 PM					05:00 PM					04:15 PM				
+0 mins.	16	49	134	1	200	5	85	0	42	132	5	0	6	10	21	0	90	123	3	216	1	0	0	0	1
+15 mins.	13	34	151	3	201	5	109	0	49	163	11	0	5	13	29	0	114	129	4	247	2	2	0	0	4
+30 mins.	14	46	156	0	216	2	107	0	44	153	4	0	10	7	21	0	118	118	4	240	2	1	0	0	3
+45 mins.	13	45	118	0	176	3	92	1	39	135	14	0	6	10	30	0	92	108	1	201	2	2	1	0	5
Total Volume	56	174	559	4	793	15	393	1	174	583	34	0	27	40	101	0	414	478	12	904	7	5	1	0	13

Accurate Counts
978-664-2565

N/S Street : Boston Rd / Willow St
E/W Street : Connector / Boston Rd
City/State : Southborough, MA
Weather : Clear

File Name : 73240002
Site Code : 73240002
Start Date : 6/22/2016
Page No : 5

Groups Printed- Cars

	Boston Rd From North				Connector From East				Willow St From South				Boston Rd From West				Valley Rd From Northwest				
Start Time	Left	Thru	Right	Hd Rt	Left	Thru	Br Rt	Right	Left	Br Lt	Thru	Right	Hd Lt	Left	Thru	Right	Hd Lt	Br Lt	Br Rt	Hd Rt	Int. Total
04:00 PM	16	49	134	1	10	84	1	21	6	0	9	8	0	50	62	6	0	0	0	0	457
04:15 PM	13	34	151	3	11	104	1	21	5	0	6	10	0	59	83	6	1	0	0	0	508
04:30 PM	14	46	156	0	5	93	0	24	11	0	5	13	0	75	86	7	2	2	0	0	539
04:45 PM	13	45	118	0	8	80	0	37	4	0	10	6	0	75	100	3	2	1	0	0	502
Total	56	174	559	4	34	361	2	103	26	0	30	37	0	259	331	22	5	3	0	0	2006
05:00 PM	21	22	135	1	5	84	0	42	14	0	6	9	0	90	123	3	2	2	1	0	560
05:15 PM	12	41	146	0	5	108	0	49	4	0	5	2	0	114	128	4	1	0	0	0	619
05:30 PM	14	31	107	1	2	107	0	44	2	0	6	6	0	117	117	4	1	1	0	0	560
05:45 PM	8	24	86	2	3	90	1	39	2	1	4	4	0	92	108	1	0	1	0	0	466
Total	55	118	474	4	15	389	1	174	22	1	21	21	0	413	476	12	4	4	1	0	2205
Grand Total	111	292	1033	8	49	750	3	277	48	1	51	58	0	672	807	34	9	7	1	0	4211
Apprch %	7.7	20.2	71.5	0.6	4.5	69.5	0.3	25.7	30.4	0.6	32.3	36.7	0	44.4	53.3	2.2	52.9	41.2	5.9	0	
Total %	2.6	6.9	24.5	0.2	1.2	17.8	0.1	6.6	1.1	0	1.2	1.4	0	16	19.2	0.8	0.2	0.2	0	0	

Accurate Counts
978-664-2565

N/S Street : Boston Rd / Willow St
E/W Street : Connector / Boston Rd
City/State : Southborough, MA
Weather : Clear

File Name : 73240002
Site Code : 73240002
Start Date : 6/22/2016
Page No : 6

	Boston Rd From North					Connector From East					Willow St From South					Boston Rd From West					Valley Rd From Northwest					
Start Time	Left	Thru	Right	Hd Rt	App. Total	Left	Thru	Br Rt	Right	App. Total	Left	Br Lt	Thru	Right	App. Total	Hd Lt	Left	Thru	Right	App. Total	Hd Lt	Br Lt	Br Rt	Hd Rt	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 04:45 PM																										
04:45 PM	13	45	118	0	176	8	80	0	37	125	4	0	10	6	20	0	75	100	3	178	2	1	0	0	3	502
05:00 PM	21	22	135	1	179	5	84	0	42	131	14	0	6	9	29	0	90	123	3	216	2	2	1	0	5	560
05:15 PM	12	41	146	0	199	5	108	0	49	162	4	0	5	2	11	0	114	128	4	246	1	0	0	0	1	619
05:30 PM	14	31	107	1	153	2	107	0	44	153	2	0	6	6	14	0	117	117	4	238	1	1	0	0	2	560
Total Volume	60	139	506	2	707	20	379	0	172	571	24	0	27	23	74	0	396	468	14	878	6	4	1	0	11	2241
% App. Total	8.5	19.7	71.6	0.3		3.5	66.4	0	30.1		32.4	0	36.5	31.1		0	45.1	53.3	1.6		54.5	36.4	9.1	0		
PHF	.714	.772	.866	.500	.888	.625	.877	.000	.878	.881	.429	.000	.675	.639	.638	.000	.846	.914	.875	.892	.750	.500	.250	.000	.550	.905

Accurate Counts
978-664-2565

N/S Street : Boston Rd / Willow St
E/W Street : Connector / Boston Rd
City/State : Southborough, MA
Weather : Clear

File Name : 73240002
Site Code : 73240002
Start Date : 6/22/2016
Page No : 9

Groups Printed- Trucks

	Boston Rd From North				Connector From East				Willow St From South				Boston Rd From West				Valley Rd From Northwest				
Start Time	Left	Thru	Right	Hd Rt	Left	Thru	Br Rt	Right	Left	Br Lt	Thru	Right	Hd Lt	Left	Thru	Right	Hd Lt	Br Lt	Br Rt	Hd Rt	Int. Total
04:00 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
04:45 PM	0	0	0	0	0	2	0	1	0	0	0	1	0	0	0	0	0	0	0	0	4
Total	0	0	0	0	1	5	0	1	0	0	0	1	0	0	0	0	0	0	0	0	8
05:00 PM	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3
05:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
05:45 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	1	0	0	0	0	4	0	0	0	0	0	1	0	1	2	0	0	0	0	0	9
Grand Total	1	0	0	0	1	9	0	1	0	0	0	2	0	1	2	0	0	0	0	0	17
Apprch %	100	0	0	0	9.1	81.8	0	9.1	0	0	0	100	0	33.3	66.7	0	0	0	0	0	
Total %	5.9	0	0	0	5.9	52.9	0	5.9	0	0	0	11.8	0	5.9	11.8	0	0	0	0	0	

Accurate Counts
978-664-2565

N/S Street : Boston Rd / Willow St
E/W Street : Connector / Boston Rd
City/State : Southborough, MA
Weather : Clear

File Name : 73240002
Site Code : 73240002
Start Date : 6/22/2016
Page No : 10

	Boston Rd From North					Connector From East					Willow St From South					Boston Rd From West					Valley Rd From Northwest					
Start Time	Left	Thru	Right	Hd Rt	App. Total	Left	Thru	Br Rt	Right	App. Total	Left	Br Lt	Thru	Right	App. Total	Hd Lt	Left	Thru	Right	App. Total	Hd Lt	Br Lt	Br Rt	Hd Rt	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 04:30 PM																										
04:30 PM	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
04:45 PM	0	0	0	0	0	0	2	0	1	3	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	4
05:00 PM	1	0	0	0	1	0	1	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	3
05:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2
Total Volume	1	0	0	0	1	1	5	0	1	7	0	0	0	2	2	0	0	1	0	1	0	0	0	0	0	11
% App. Total	100	0	0	0		14.3	71.4	0	14.3		0	0	0	100		0	0	100	0		0	0	0	0		
PHF	.250	.000	.000	.000	.250	.250	.625	.000	.250	.583	.000	.000	.000	.500	.500	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.688

Accurate Counts
978-664-2565

N/S Street : Boston Rd / Willow St
E/W Street : Connector / Boston Rd
City/State : Southborough, MA
Weather : Clear

File Name : 73240002
Site Code : 73240002
Start Date : 6/22/2016
Page No : 13

Groups Printed- Bikes Peds

	Boston Rd From North					Connector From East					Willow St From South					Boston Rd From West					Valley Rd From Northwest							
Start Time	Left	Thru	Right	Hd Rt	Peds	Left	Thru	Br Rt	Right	Peds	Left	Br Lt	Thru	Right	Peds	Hd Lt	Left	Thru	Right	Peds	Hd Lt	Br Lt	Br Rt	Hd Rt	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	2
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
05:45 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
Total	0	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5
Grand Total	0	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	7	7
Apprch %	0	0	100	0		0	100	0	0		0	0	0	0		0	100	0	0		0	0	0	0				
Total %	0	0	42.9	0		0	28.6	0	0		0	0	0	0		0	28.6	0	0		0	0	0	0		0	100	

Accurate Counts
978-664-2565

N/S Street : Boston Rd / Willow St
E/W Street : Connector / Boston Rd
City/State : Southborough, MA
Weather : Clear

File Name : 73240002
Site Code : 73240002
Start Date : 6/22/2016
Page No : 14

	Boston Rd From North					Connector From East					Willow St From South					Boston Rd From West					Valley Rd From Northwest					
Start Time	Left	Thru	Right	Hd Rt	App. Total	Left	Thru	Br Rt	Right	App. Total	Left	Br Lt	Thru	Right	App. Total	Hd Lt	Left	Thru	Right	App. Total	Hd Lt	Br Lt	Br Rt	Hd Rt	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 05:00 PM																										
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	1	0	1	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
05:45 PM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total Volume	0	0	3	0	3	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
% App. Total	0	0	100	0		0	100	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.375	.000	.375	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.417

Accurate Counts
978-664-2565

N/S Street : Boston Rd / Willow St
E/W Street : Connector / Boston Rd
City/State : Southborough, MA
Weather : Clear

File Name : 73240002
Site Code : 73240002
Start Date : 6/22/2016
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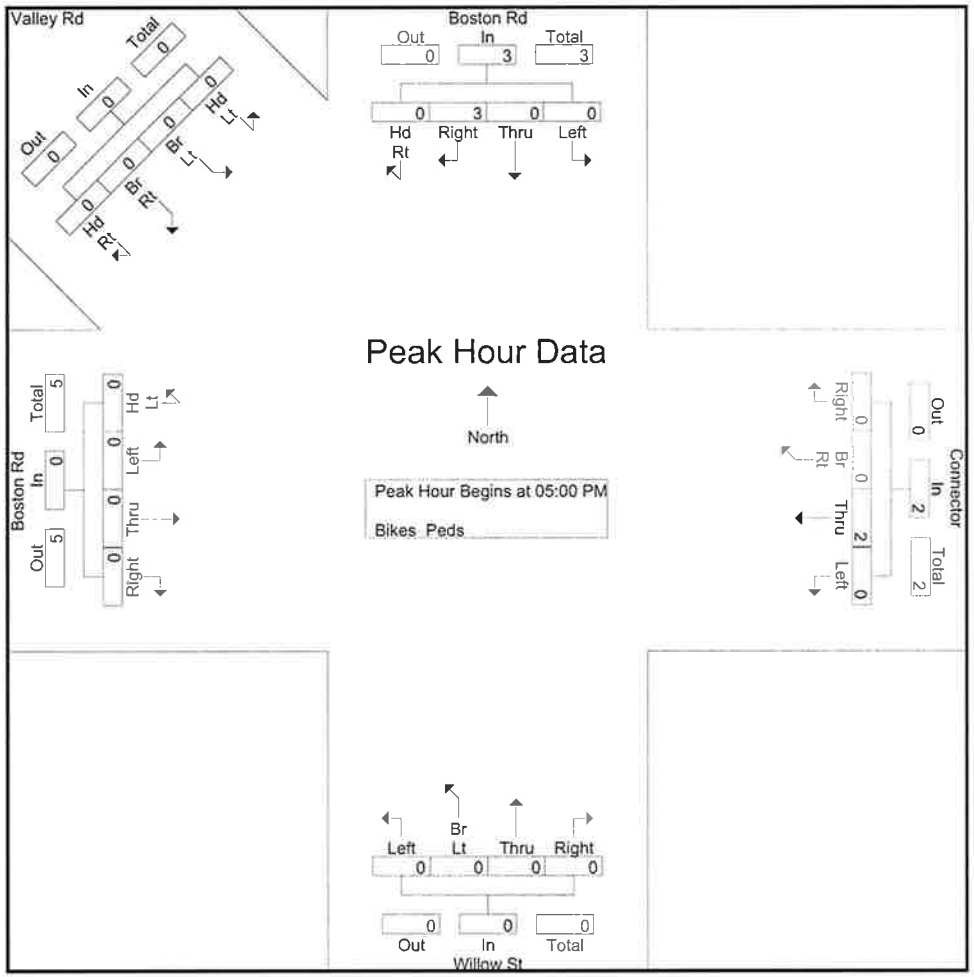


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM					04:45 PM					04:00 PM					04:00 PM					04:00 PM				
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0
+30 mins.	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	2	0	2	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	3	0	3	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Pleasant Street Connector
City/State : Framingham, MA
Weather : Clear

File Name : 73240003
Site Code : 73240003
Start Date : 6/22/2016
Page No : 1

Groups Printed- Cars - Trucks

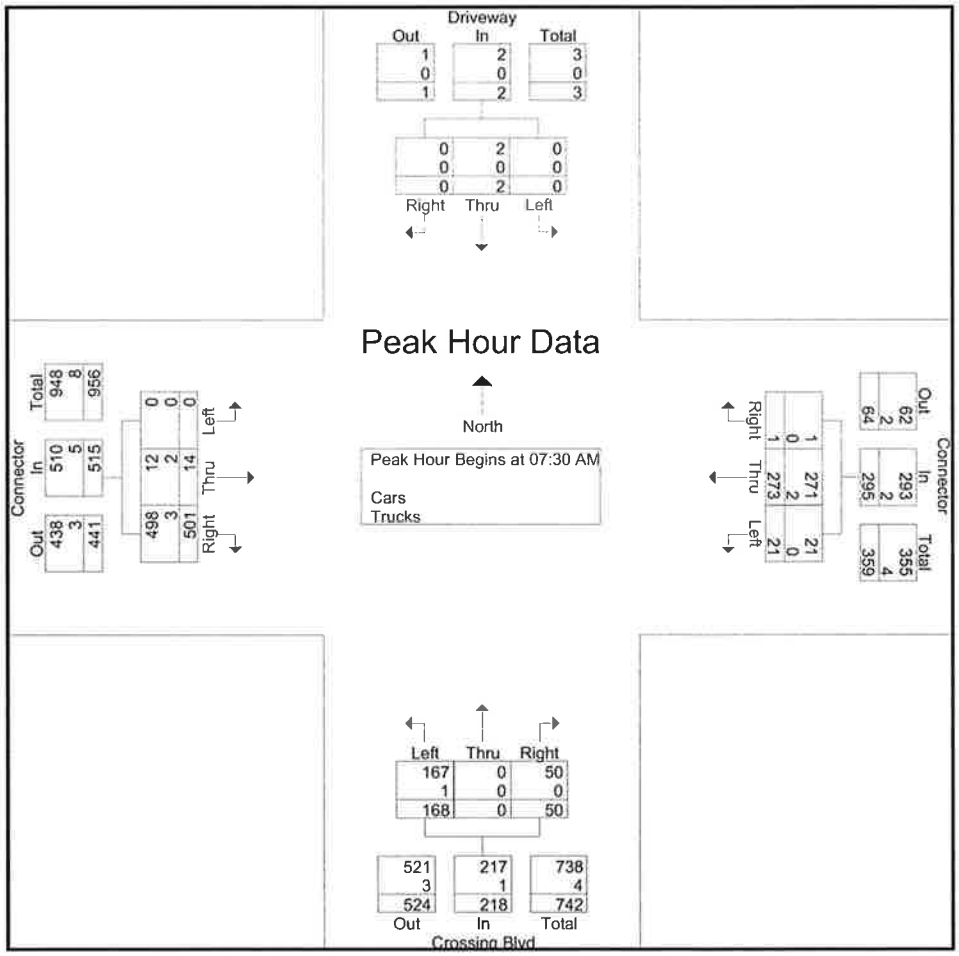
	Driveway From North			Connector From East			Crossing Blvd From South			Connector From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	7	44	0	39	0	14	0	3	131	238
07:15 AM	0	0	1	3	44	1	36	0	12	0	4	127	228
07:30 AM	0	1	0	3	60	1	43	0	13	0	4	131	256
07:45 AM	0	0	0	11	72	0	47	0	13	0	2	107	252
Total	0	1	1	24	220	2	165	0	52	0	13	496	974
08:00 AM	0	1	0	2	75	0	50	0	9	0	6	146	289
08:15 AM	0	0	0	5	66	0	28	0	15	0	2	117	233
08:30 AM	0	1	0	5	56	0	34	0	7	0	4	129	236
08:45 AM	1	1	0	6	52	0	39	1	21	0	8	127	256
Total	1	3	0	18	249	0	151	1	52	0	20	519	1014
Grand Total	1	4	1	42	469	2	316	1	104	0	33	1015	1988
Apprch %	16.7	66.7	16.7	8.2	91.4	0.4	75.1	0.2	24.7	0	3.1	96.9	
Total %	0.1	0.2	0.1	2.1	23.6	0.1	15.9	0.1	5.2	0	1.7	51.1	
Cars	1	4	1	42	464	2	313	1	104	0	30	1010	1972
% Cars	100	100	100	100	98.9	100	99.1	100	100	0	90.9	99.5	99.2
Trucks	0	0	0	0	5	0	3	0	0	0	3	5	16
% Trucks	0	0	0	0	1.1	0	0.9	0	0	0	9.1	0.5	0.8

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Pleasant Street Connector
City/State : Framingham, MA
Weather : Clear

File Name : 73240003
Site Code : 73240003
Start Date : 6/22/2016
Page No : 2

	Driveway From North				Connector From East				Crossing Blvd From South				Connector From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	1	0	1	3	60	1	64	43	0	13	56	0	4	131	135	256
07:45 AM	0	0	0	0	11	72	0	83	47	0	13	60	0	2	107	109	252
08:00 AM	0	1	0	1	2	75	0	77	50	0	9	59	0	6	146	152	289
08:15 AM	0	0	0	0	5	66	0	71	28	0	15	43	0	2	117	119	233
Total Volume	0	2	0	2	21	273	1	295	168	0	50	218	0	14	501	515	1030
% App. Total	0	100	0		7.1	92.5	0.3		77.1	0	22.9		0	2.7	97.3		
PHF	.000	.500	.000	.500	.477	.910	.250	.889	.840	.000	.833	.908	.000	.583	.858	.847	.891
Cars	0	2	0	2	21	271	1	293	167	0	50	217	0	12	498	510	1022
% Cars	0	100	0	100	100	99.3	100	99.3	99.4	0	100	99.5	0	85.7	99.4	99.0	99.2
Trucks	0	0	0	0	0	2	0	2	1	0	0	1	0	2	3	5	8
% Trucks	0	0	0	0	0	0.7	0	0.7	0.6	0	0	0.5	0	14.3	0.6	1.0	0.8



Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Pleasant Street Connector
City/State : Framingham, MA
Weather : Clear

File Name : 73240003
Site Code : 73240003
Start Date : 6/22/2016
Page No : 4

Groups Printed- Cars

	Driveway From North			Connector From East			Crossing Blvd From South			Connector From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	7	44	0	38	0	14	0	2	130	235
07:15 AM	0	0	1	3	44	1	35	0	12	0	4	127	227
07:30 AM	0	1	0	3	60	1	43	0	13	0	4	129	254
07:45 AM	0	0	0	11	72	0	47	0	13	0	2	107	252
Total	0	1	1	24	220	2	163	0	52	0	12	493	968
08:00 AM	0	1	0	2	73	0	50	0	9	0	4	145	284
08:15 AM	0	0	0	5	66	0	27	0	15	0	2	117	232
08:30 AM	0	1	0	5	54	0	34	0	7	0	4	129	234
08:45 AM	1	1	0	6	51	0	39	1	21	0	8	126	254
Total	1	3	0	18	244	0	150	1	52	0	18	517	1004
Grand Total	1	4	1	42	464	2	313	1	104	0	30	1010	1972
Apprch %	16.7	66.7	16.7	8.3	91.3	0.4	74.9	0.2	24.9	0	2.9	97.1	
Total %	0.1	0.2	0.1	2.1	23.5	0.1	15.9	0.1	5.3	0	1.5	51.2	

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Pleasant Street Connector
City/State : Framingham, MA
Weather : Clear

File Name : 73240003
Site Code : 73240003
Start Date : 6/22/2016
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Groups Printed- Trucks

	Driveway From North			Connector From East			Crossing Blvd From South			Connector From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	0	0	0	1	0	0	0	1	1	3
07:15 AM	0	0	0	0	0	0	1	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	2	2
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	2	0	0	0	1	3	6
08:00 AM	0	0	0	0	2	0	0	0	0	0	2	1	5
08:15 AM	0	0	0	0	0	0	1	0	0	0	0	0	1
08:30 AM	0	0	0	0	2	0	0	0	0	0	0	0	2
08:45 AM	0	0	0	0	1	0	0	0	0	0	0	1	2
Total	0	0	0	0	5	0	1	0	0	0	2	2	10
Grand Total	0	0	0	0	5	0	3	0	0	0	3	5	16
Apprch %	0	0	0	0	100	0	100	0	0	0	37.5	62.5	
Total %	0	0	0	0	31.2	0	18.8	0	0	0	18.8	31.2	

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Pleasant Street Connector
City/State : Framingham, MA
Weather : Clear

File Name : 73240003
Site Code : 73240003
Start Date : 6/22/2016
Page No : 10

Groups Printed- Bikes Peds

	Driveway From North				Connector From East				Crossing Blvd From South				Connector From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0				
Total %																	0	0	

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Pleasant Street Connector
City/State : Framingham, MA
Weather : Clear

File Name : 73240003
Site Code : 73240003
Start Date : 6/22/2016
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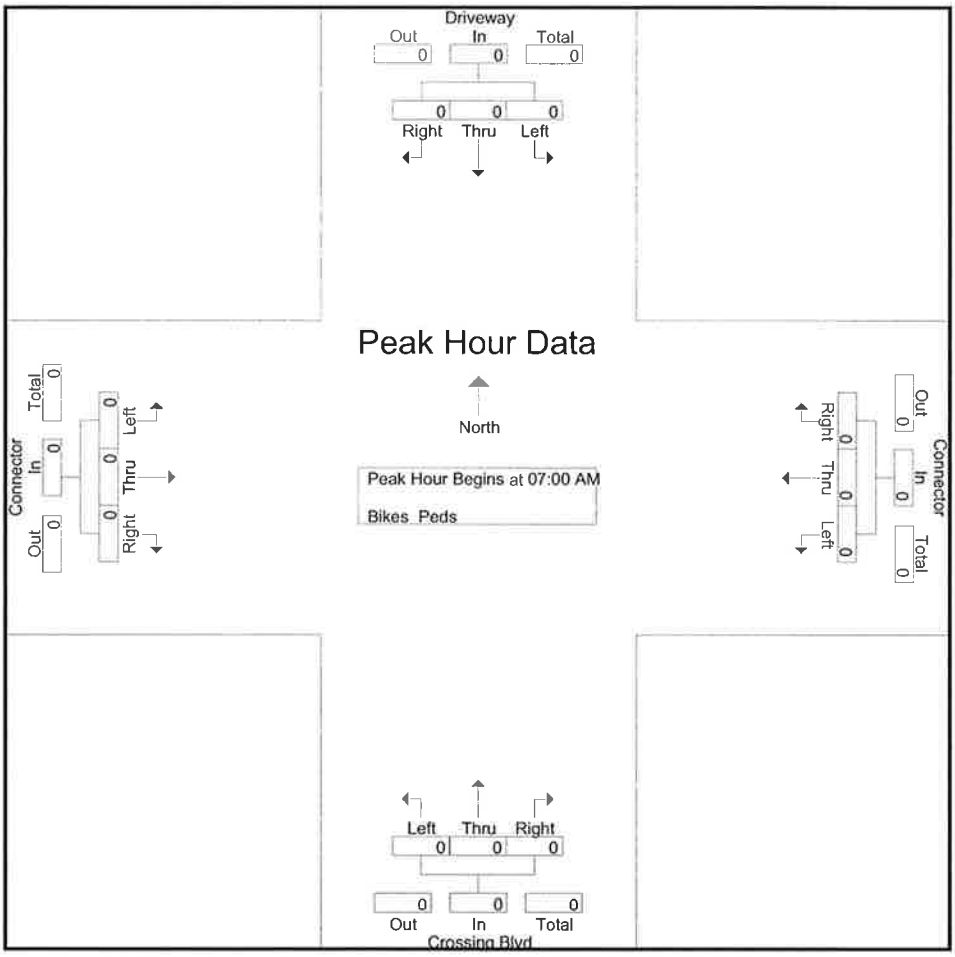
	Driveway From North				Connector From East				Crossing Blvd From South				Connector From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000



Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Pleasant Street Connector
City/State : Framingham, MA
Weather : Clear

File Name : 73240003
Site Code : 73240003
Start Date : 6/22/2016
Page No : 1

Groups Printed- Cars - Trucks

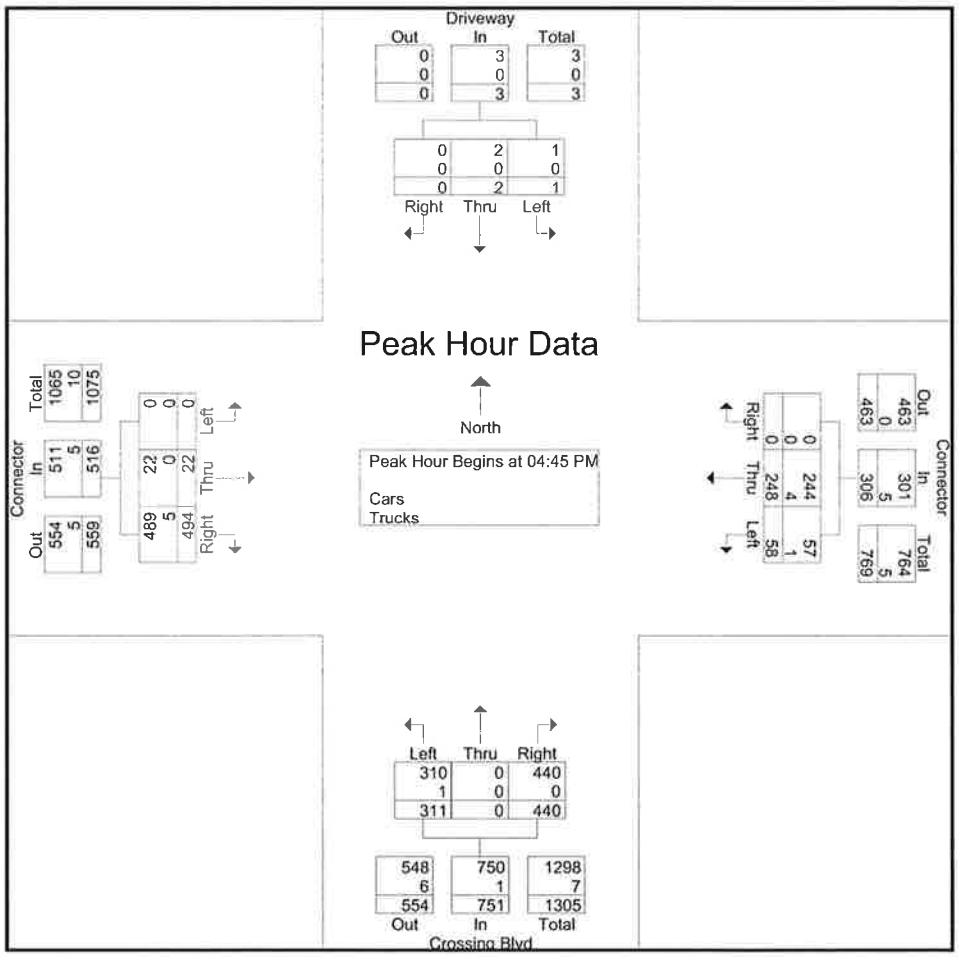
	Driveway From North			Connector From East			Crossing Blvd From South			Connector From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	2	0	12	58	0	53	0	89	0	5	87	306
04:15 PM	0	1	0	14	83	0	39	1	57	0	6	97	298
04:30 PM	0	2	2	17	69	0	53	0	111	2	13	96	365
04:45 PM	0	1	0	13	56	0	58	0	97	0	6	99	330
Total	0	6	2	56	266	0	203	1	354	2	30	379	1299
05:00 PM	1	1	0	20	45	0	97	0	143	0	3	145	455
05:15 PM	0	0	0	18	83	0	84	0	101	0	8	119	413
05:30 PM	0	0	0	7	64	0	72	0	99	0	5	131	378
05:45 PM	0	0	0	4	72	0	55	0	68	0	3	123	325
Total	1	1	0	49	264	0	308	0	411	0	19	518	1571
Grand Total	1	7	2	105	530	0	511	1	765	2	49	897	2870
Apprch %	10	70	20	16.5	83.5	0	40	0.1	59.9	0.2	5.2	94.6	
Total %	0	0.2	0.1	3.7	18.5	0	17.8	0	26.7	0.1	1.7	31.3	
Cars	1	7	2	104	523	0	508	1	765	2	49	892	2854
% Cars	100	100	100	99	98.7	0	99.4	100	100	100	100	99.4	99.4
Trucks	0	0	0	1	7	0	3	0	0	0	0	5	16
% Trucks	0	0	0	1	1.3	0	0.6	0	0	0	0	0.6	0.6

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Pleasant Street Connector
City/State : Framingham, MA
Weather : Clear

File Name : 73240003
Site Code : 73240003
Start Date : 6/22/2016
Page No : 2

	Driveway From North				Connector From East				Crossing Blvd From South				Connector From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	1	0	1	13	56	0	69	58	0	97	155	0	6	99	105	330
05:00 PM	1	1	0	2	20	45	0	65	97	0	143	240	0	3	145	148	455
05:15 PM	0	0	0	0	18	83	0	101	84	0	101	185	0	8	119	127	413
05:30 PM	0	0	0	0	7	64	0	71	72	0	99	171	0	5	131	136	378
Total Volume	1	2	0	3	58	248	0	306	311	0	440	751	0	22	494	516	1576
% App. Total	33.3	66.7	0		19	81	0		41.4	0	58.6		0	4.3	95.7		
PHF	.250	.500	.000	.375	.725	.747	.000	.757	.802	.000	.769	.782	.000	.688	.852	.872	.866
Cars	1	2	0	3	57	244	0	301	310	0	440	750	0	22	489	511	1565
% Cars	100	100	0	100	98.3	98.4	0	98.4	99.7	0	100	99.9	0	100	99.0	99.0	99.3
Trucks	0	0	0	0	1	4	0	5	1	0	0	1	0	0	5	5	11
% Trucks	0	0	0	0	1.7	1.6	0	1.6	0.3	0	0	0.1	0	0	1.0	1.0	0.7



Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Pleasant Street Connector
City/State : Framingham, MA
Weather : Clear

File Name : 73240003
Site Code : 73240003
Start Date : 6/22/2016
Page No : 4

Groups Printed- Cars

	Driveway From North			Connector From East			Crossing Blvd From South			Connector From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	2	0	12	57	0	53	0	89	0	5	87	305
04:15 PM	0	1	0	14	83	0	39	1	57	0	6	97	298
04:30 PM	0	2	2	17	69	0	51	0	111	2	13	96	363
04:45 PM	0	1	0	12	53	0	58	0	97	0	6	98	325
Total	0	6	2	55	262	0	201	1	354	2	30	378	1291
05:00 PM	1	1	0	20	45	0	96	0	143	0	3	143	452
05:15 PM	0	0	0	18	82	0	84	0	101	0	8	118	411
05:30 PM	0	0	0	7	64	0	72	0	99	0	5	130	377
05:45 PM	0	0	0	4	70	0	55	0	68	0	3	123	323
Total	1	1	0	49	261	0	307	0	411	0	19	514	1563
Grand Total	1	7	2	104	523	0	508	1	765	2	49	892	2854
Apprch %	10	70	20	16.6	83.4	0	39.9	0.1	60	0.2	5.2	94.6	
Total %	0	0.2	0.1	3.6	18.3	0	17.8	0	26.8	0.1	1.7	31.3	

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Pleasant Street Connector
City/State : Framingham, MA
Weather : Clear

File Name : 73240003
Site Code : 73240003
Start Date : 6/22/2016
Page No : 7

Groups Printed- Trucks

	Driveway From North			Connector From East			Crossing Blvd From South			Connector From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	2	0	0	0	0	0	2
04:45 PM	0	0	0	1	3	0	0	0	0	0	0	1	5
Total	0	0	0	1	4	0	2	0	0	0	0	1	8
05:00 PM	0	0	0	0	0	0	1	0	0	0	0	2	3
05:15 PM	0	0	0	0	1	0	0	0	0	0	0	1	2
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	1
05:45 PM	0	0	0	0	2	0	0	0	0	0	0	0	2
Total	0	0	0	0	3	0	1	0	0	0	0	4	8
Grand Total	0	0	0	1	7	0	3	0	0	0	0	5	16
Apprch %	0	0	0	12.5	87.5	0	100	0	0	0	0	100	
Total %	0	0	0	6.2	43.8	0	18.8	0	0	0	0	31.2	

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Pleasant Street Connector
City/State : Framingham, MA
Weather : Clear

File Name : 73240003
Site Code : 73240003
Start Date : 6/22/2016
Page No : 10

Groups Printed- Bikes Peds

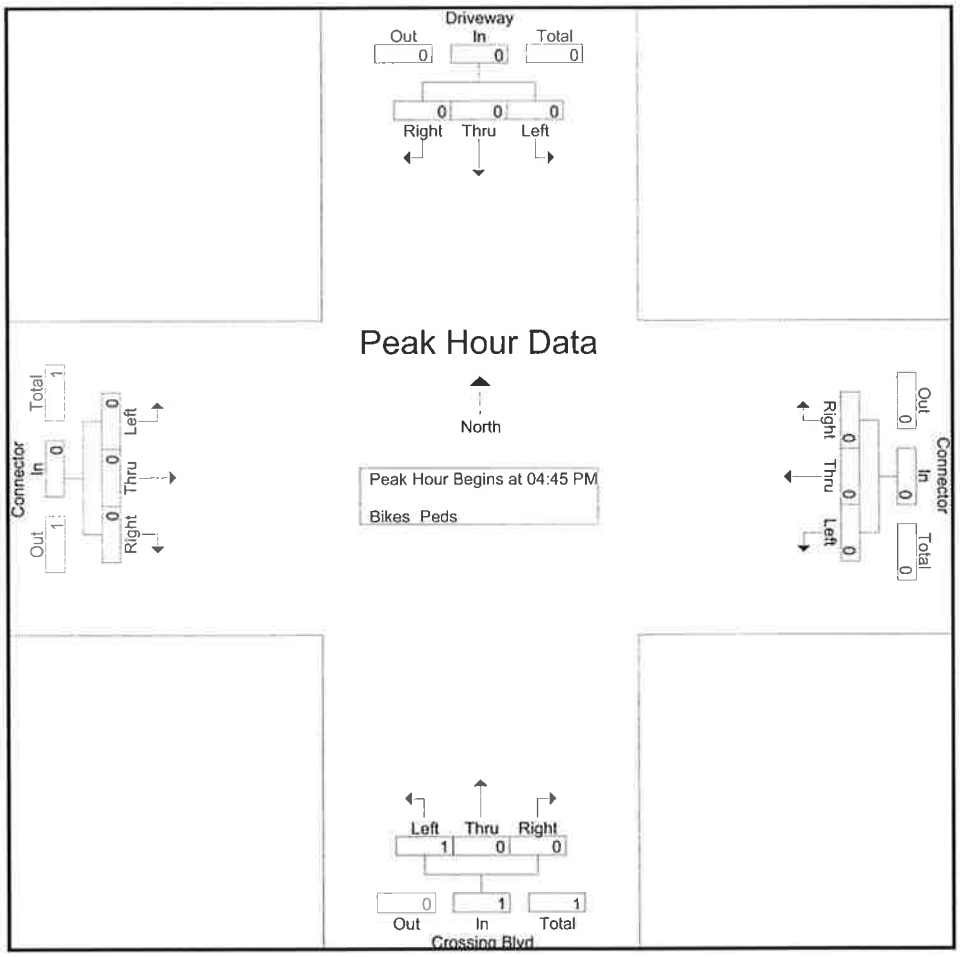
	Driveway From North				Connector From East				Crossing Blvd From South				Connector From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1
Grand Total	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1
Apprch %	0	0	0		0	0	0		100	0	0		0	0	0				
Total %	0	0	0		0	0	0		100	0	0		0	0	0		0	100	

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Pleasant Street Connector
City/State : Framingham, MA
Weather : Clear

File Name : 73240003
Site Code : 73240003
Start Date : 6/22/2016
Page No : 11

	Driveway From North				Connector From East				Crossing Blvd From South				Connector From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
Total Volume	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
% App. Total	0	0	0		0	0	0		100	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.000	.000	.000	.000	.250



Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Route 9 EB Ramps
City/State : Framingham, MA
Weather : Clear

File Name : 73240004
Site Code : 73240004
Start Date : 6/22/2016
Page No : 1

Groups Printed- Cars - Trucks

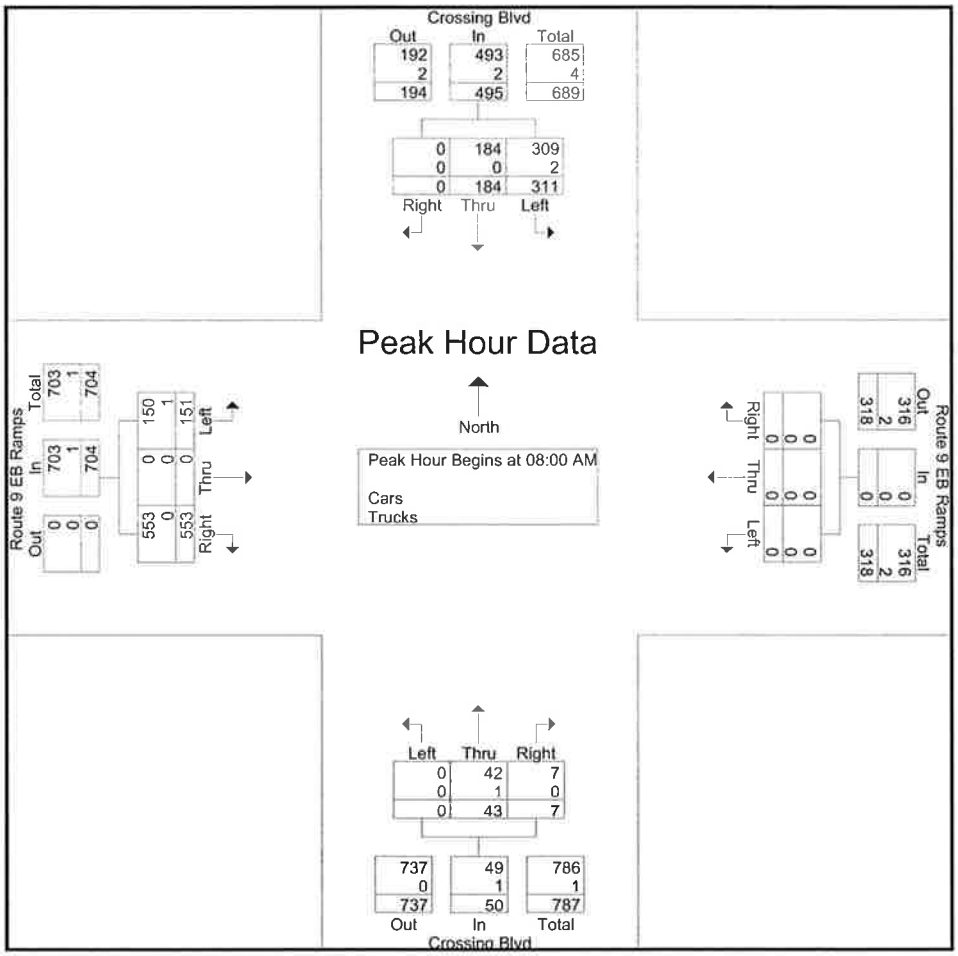
	Crossing Blvd From North			Route 9 EB Ramps From East			Crossing Blvd From South			Route 9 EB Ramps From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	119	21	0	0	0	0	0	4	1	36	0	68	249
07:15 AM	106	27	0	0	0	0	0	12	1	42	0	65	253
07:30 AM	83	34	0	0	0	0	0	6	0	45	0	75	243
07:45 AM	91	38	0	0	0	0	0	11	1	51	2	102	296
Total	399	120	0	0	0	0	0	33	3	174	2	310	1041
08:00 AM	81	45	0	0	0	0	0	7	0	49	0	111	293
08:15 AM	77	38	0	0	0	0	0	15	2	32	0	146	310
08:30 AM	82	55	0	0	0	0	0	10	2	31	0	163	343
08:45 AM	71	46	0	0	0	0	0	11	3	39	0	133	303
Total	311	184	0	0	0	0	0	43	7	151	0	553	1249
Grand Total	710	304	0	0	0	0	0	76	10	325	2	863	2290
Apprch %	70	30	0	0	0	0	0	88.4	11.6	27.3	0.2	72.5	
Total %	31	13.3	0	0	0	0	0	3.3	0.4	14.2	0.1	37.7	
Cars	706	304	0	0	0	0	0	75	10	322	2	863	2282
% Cars	99.4	100	0	0	0	0	0	98.7	100	99.1	100	100	99.7
Trucks	4	0	0	0	0	0	0	1	0	3	0	0	8
% Trucks	0.6	0	0	0	0	0	0	1.3	0	0.9	0	0	0.3

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Route 9 EB Ramps
City/State : Framingham, MA
Weather : Clear

File Name : 73240004
Site Code : 73240004
Start Date : 6/22/2016
Page No : 2

	Crossing Blvd From North				Route 9 EB Ramps From East				Crossing Blvd From South				Route 9 EB Ramps From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	81	45	0	126	0	0	0	0	0	7	0	7	49	0	111	160	293
08:15 AM	77	38	0	115	0	0	0	0	0	15	2	17	32	0	146	178	310
08:30 AM	82	55	0	137	0	0	0	0	0	10	2	12	31	0	163	194	343
08:45 AM	71	46	0	117	0	0	0	0	0	11	3	14	39	0	133	172	303
Total Volume	311	184	0	495	0	0	0	0	0	43	7	50	151	0	553	704	1249
% App. Total	62.8	37.2	0		0	0	0		0	86	14		21.4	0	78.6		
PHF	.948	.836	.000	.903	.000	.000	.000	.000	.000	.717	.583	.735	.770	.000	.848	.907	.910
Cars	309	184	0	493	0	0	0	0	0	42	7	49	150	0	553	703	1245
% Cars	99.4	100	0	99.6	0	0	0	0	0	97.7	100	98.0	99.3	0	100	99.9	99.7
Trucks	2	0	0	2	0	0	0	0	0	1	0	1	1	0	0	1	4
% Trucks	0.6	0	0	0.4	0	0	0	0	0	2.3	0	2.0	0.7	0	0	0.1	0.3



Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Route 9 EB Ramps
City/State : Framingham, MA
Weather : Clear

File Name : 73240004
Site Code : 73240004
Start Date : 6/22/2016
Page No : 4

Groups Printed- Cars

	Crossing Blvd From North			Route 9 EB Ramps From East			Crossing Blvd From South			Route 9 EB Ramps From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	119	21	0	0	0	0	0	4	1	35	0	68	248
07:15 AM	106	27	0	0	0	0	0	12	1	42	0	65	253
07:30 AM	82	34	0	0	0	0	0	6	0	44	0	75	241
07:45 AM	90	38	0	0	0	0	0	11	1	51	2	102	295
Total	397	120	0	0	0	0	0	33	3	172	2	310	1037
08:00 AM	80	45	0	0	0	0	0	7	0	49	0	111	292
08:15 AM	77	38	0	0	0	0	0	14	2	31	0	146	308
08:30 AM	82	55	0	0	0	0	0	10	2	31	0	163	343
08:45 AM	70	46	0	0	0	0	0	11	3	39	0	133	302
Total	309	184	0	0	0	0	0	42	7	150	0	553	1245
Grand Total	706	304	0	0	0	0	0	75	10	322	2	863	2282
Apprch %	69.9	30.1	0	0	0	0	0	88.2	11.8	27.1	0.2	72.7	
Total %	30.9	13.3	0	0	0	0	0	3.3	0.4	14.1	0.1	37.8	

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Route 9 EB Ramps
City/State : Framingham, MA
Weather : Clear

File Name : 73240004
Site Code : 73240004
Start Date : 6/22/2016
Page No : 7

Groups Printed- Trucks

	Crossing Blvd From North			Route 9 EB Ramps From East			Crossing Blvd From South			Route 9 EB Ramps From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	1	0	0	0	0	0	0	0	0	1	0	0	2
07:45 AM	1	0	0	0	0	0	0	0	0	0	0	0	1
Total	2	0	0	0	0	0	0	0	0	2	0	0	4
08:00 AM	1	0	0	0	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	1	0	1	0	0	2
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	1	0	0	0	0	0	0	0	0	0	0	0	1
Total	2	0	0	0	0	0	0	1	0	1	0	0	4
Grand Total	4	0	0	0	0	0	0	1	0	3	0	0	8
Apprch %	100	0	0	0	0	0	0	100	0	100	0	0	
Total %	50	0	0	0	0	0	0	12.5	0	37.5	0	0	

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Route 9 EB Ramps
City/State : Framingham, MA
Weather : Clear

File Name : 73240004
Site Code : 73240004
Start Date : 6/22/2016
Page No : 10

Groups Printed- Bikes Peds

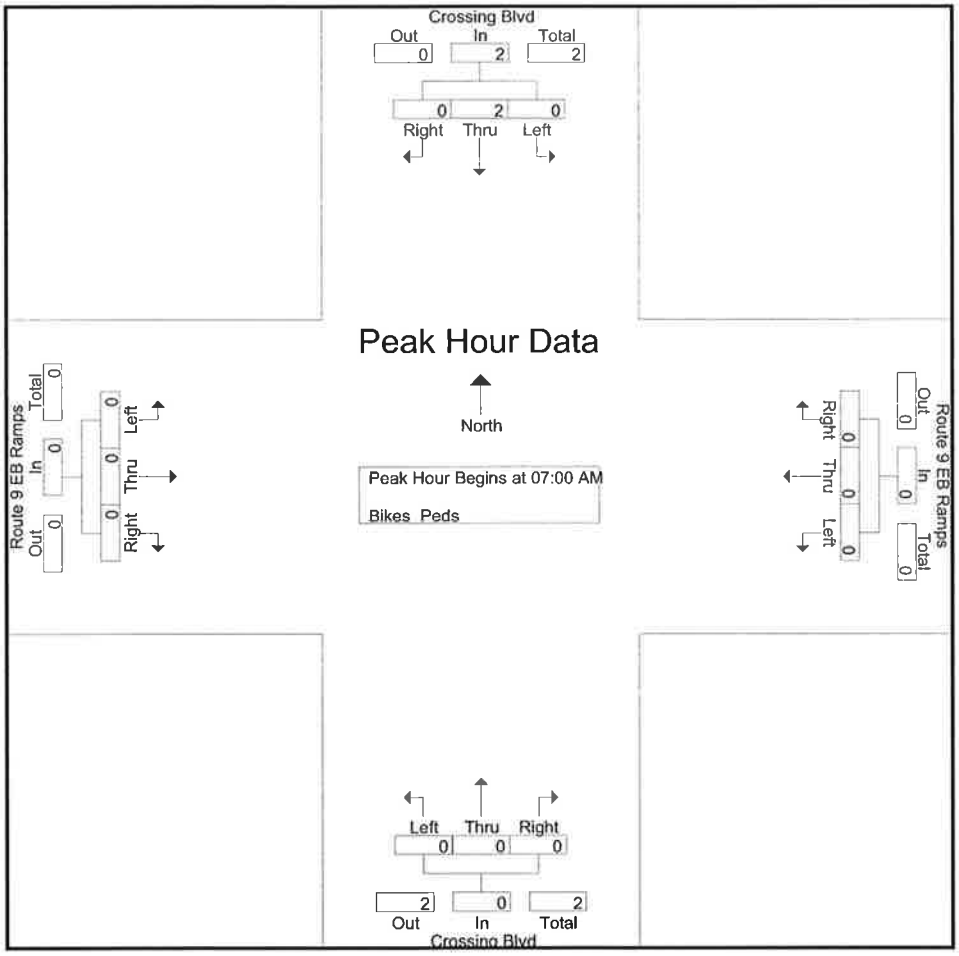
	Crossing Blvd From North				Route 9 EB Ramps From East				Crossing Blvd From South				Route 9 EB Ramps From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
Apprch %	0	100	0		0	0	0		0	0	0		0	0	0				
Total %	0	100	0		0	0	0		0	0	0		0	0	0		0	100	

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Route 9 EB Ramps
City/State : Framingham, MA
Weather : Clear

File Name : 73240004
Site Code : 73240004
Start Date : 6/22/2016
Page No : 11

	Crossing Blvd From North				Route 9 EB Ramps From East				Crossing Blvd From South				Route 9 EB Ramps From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
% App. Total	0	100	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250



Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Route 9 EB Ramps
City/State : Framingham, MA
Weather : Clear

File Name : 73240004
Site Code : 73240004
Start Date : 6/22/2016
Page No : 1

Groups Printed- Cars - Trucks

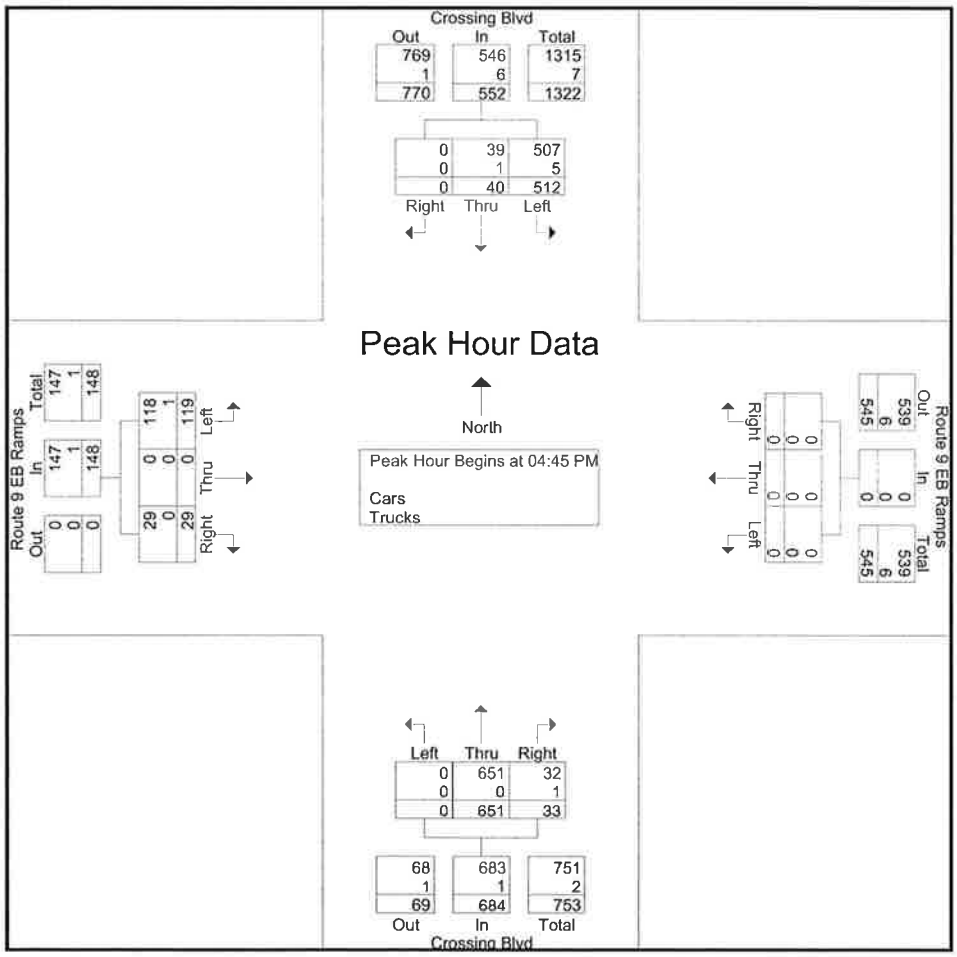
	Crossing Blvd From North			Route 9 EB Ramps From East			Crossing Blvd From South			Route 9 EB Ramps From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	98	4	0	0	0	0	0	97	10	26	2	7	244
04:15 PM	95	11	0	0	0	0	0	84	3	35	2	2	232
04:30 PM	113	8	0	0	0	0	0	118	7	27	0	9	282
04:45 PM	106	5	0	0	0	0	0	129	6	22	0	7	275
Total	412	28	0	0	0	0	0	428	26	110	4	25	1033
05:00 PM	153	11	0	0	0	0	0	206	10	24	0	3	407
05:15 PM	137	10	0	0	0	0	0	184	6	34	0	9	380
05:30 PM	116	14	0	0	0	0	0	132	11	39	0	10	322
05:45 PM	123	6	0	0	0	0	0	101	1	35	0	8	274
Total	529	41	0	0	0	0	0	623	28	132	0	30	1383
Grand Total	941	69	0	0	0	0	0	1051	54	242	4	55	2416
Apprch %	93.2	6.8	0	0	0	0	0	95.1	4.9	80.4	1.3	18.3	
Total %	38.9	2.9	0	0	0	0	0	43.5	2.2	10	0.2	2.3	
Cars	936	68	0	0	0	0	0	1051	53	239	4	55	2406
% Cars	99.5	98.6	0	0	0	0	0	100	98.1	98.8	100	100	99.6
Trucks	5	1	0	0	0	0	0	0	1	3	0	0	10
% Trucks	0.5	1.4	0	0	0	0	0	0	1.9	1.2	0	0	0.4

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Route 9 EB Ramps
City/State : Framingham, MA
Weather : Clear

File Name : 73240004
Site Code : 73240004
Start Date : 6/22/2016
Page No : 2

	Crossing Blvd From North				Route 9 EB Ramps From East				Crossing Blvd From South				Route 9 EB Ramps From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	106	5	0	111	0	0	0	0	0	129	6	135	22	0	7	29	275
05:00 PM	153	11	0	164	0	0	0	0	0	206	10	216	24	0	3	27	407
05:15 PM	137	10	0	147	0	0	0	0	0	184	6	190	34	0	9	43	380
05:30 PM	116	14	0	130	0	0	0	0	0	132	11	143	39	0	10	49	322
Total Volume	512	40	0	552	0	0	0	0	0	651	33	684	119	0	29	148	1384
% App. Total	92.8	7.2	0		0	0	0		0	95.2	4.8		80.4	0	19.6		
PHF	.837	.714	.000	.841	.000	.000	.000	.000	.000	.790	.750	.792	.763	.000	.725	.755	.850
Cars	507	39	0	546	0	0	0	0	0	651	32	683	118	0	29	147	1376
% Cars	99.0	97.5	0	98.9	0	0	0	0	0	100	97.0	99.9	99.2	0	100	99.3	99.4
Trucks	5	1	0	6	0	0	0	0	0	0	1	1	1	0	0	1	8
% Trucks	1.0	2.5	0	1.1	0	0	0	0	0	0	3.0	0.1	0.8	0	0	0.7	0.6



Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Route 9 EB Ramps
City/State : Framingham, MA
Weather : Clear

File Name : 73240004
Site Code : 73240004
Start Date : 6/22/2016
Page No : 4

Groups Printed- Cars

	Crossing Blvd From North			Route 9 EB Ramps From East			Crossing Blvd From South			Route 9 EB Ramps From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	98	4	0	0	0	0	0	97	10	26	2	7	244
04:15 PM	95	11	0	0	0	0	0	84	3	35	2	2	232
04:30 PM	113	8	0	0	0	0	0	118	7	25	0	9	280
04:45 PM	105	5	0	0	0	0	0	129	6	22	0	7	274
Total	411	28	0	0	0	0	0	428	26	108	4	25	1030
05:00 PM	151	11	0	0	0	0	0	206	10	23	0	3	404
05:15 PM	136	10	0	0	0	0	0	184	6	34	0	9	379
05:30 PM	115	13	0	0	0	0	0	132	10	39	0	10	319
05:45 PM	123	6	0	0	0	0	0	101	1	35	0	8	274
Total	525	40	0	0	0	0	0	623	27	131	0	30	1376
Grand Total	936	68	0	0	0	0	0	1051	53	239	4	55	2406
Apprch %	93.2	6.8	0	0	0	0	0	95.2	4.8	80.2	1.3	18.5	
Total %	38.9	2.8	0	0	0	0	0	43.7	2.2	9.9	0.2	2.3	

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Route 9 EB Ramps
City/State : Framingham, MA
Weather : Clear

File Name : 73240004
Site Code : 73240004
Start Date : 6/22/2016
Page No : 7

Groups Printed- Trucks

	Crossing Blvd From North			Route 9 EB Ramps From East			Crossing Blvd From South			Route 9 EB Ramps From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	2	0	0	2
04:45 PM	1	0	0	0	0	0	0	0	0	0	0	0	1
Total	1	0	0	0	0	0	0	0	0	2	0	0	3
05:00 PM	2	0	0	0	0	0	0	0	0	1	0	0	3
05:15 PM	1	0	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	1	1	0	0	0	0	0	0	1	0	0	0	3
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	4	1	0	0	0	0	0	0	1	1	0	0	7
Grand Total	5	1	0	0	0	0	0	0	1	3	0	0	10
Apprch %	83.3	16.7	0	0	0	0	0	0	100	100	0	0	
Total %	50	10	0	0	0	0	0	0	10	30	0	0	

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Route 9 EB Ramps
City/State : Framingham, MA
Weather : Clear

File Name : 73240004
Site Code : 73240004
Start Date : 6/22/2016
Page No : 10

Groups Printed- Bikes Peds

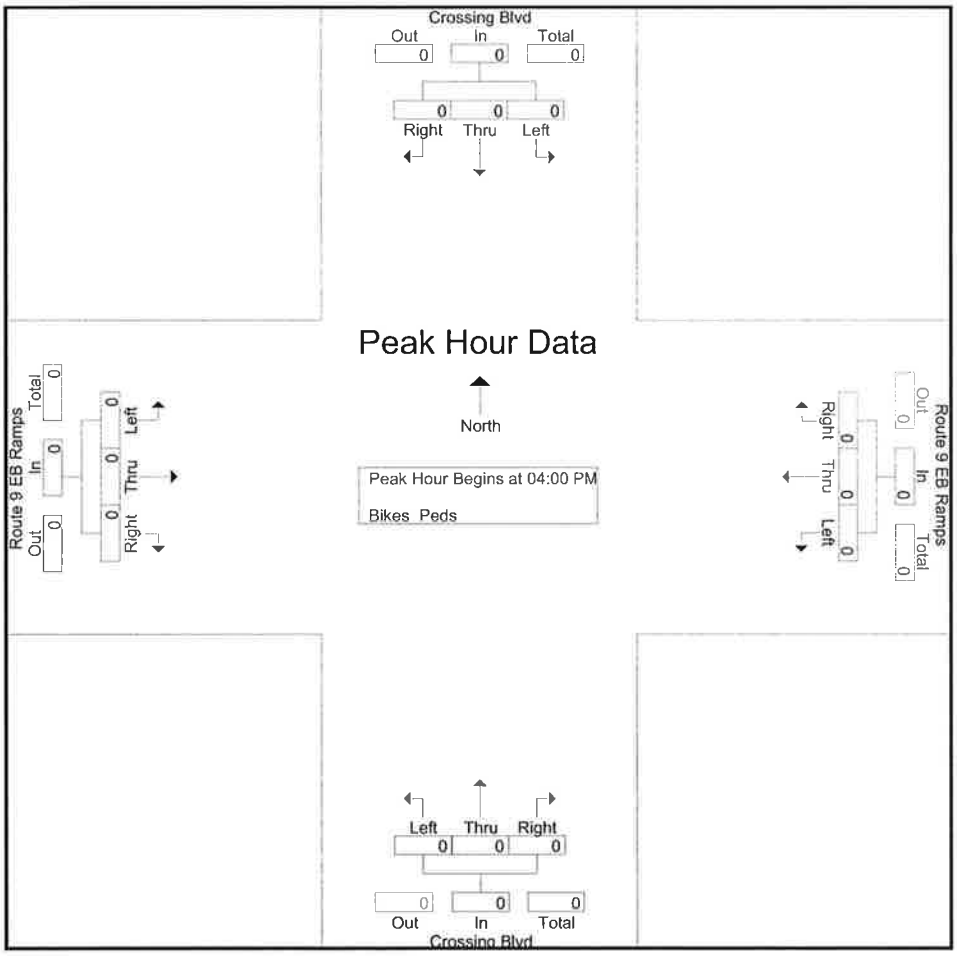
	Crossing Blvd From North				Route 9 EB Ramps From East				Crossing Blvd From South				Route 9 EB Ramps From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
Grand Total	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	2
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0				
Total %																	100	0	

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Route 9 EB Ramps
City/State : Framingham, MA
Weather : Clear

File Name : 73240004
Site Code : 73240004
Start Date : 6/22/2016
Page No : 11

	Crossing Blvd From North				Route 9 EB Ramps From East				Crossing Blvd From South				Route 9 EB Ramps From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000



Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street: Staples Drive
City/State : Framingham, MA
Weather : Clear

File Name : 73240006
Site Code : 73240006
Start Date : 6/22/2016
Page No : 1

Groups Printed- Cars - Trucks - Rte9EB OFF

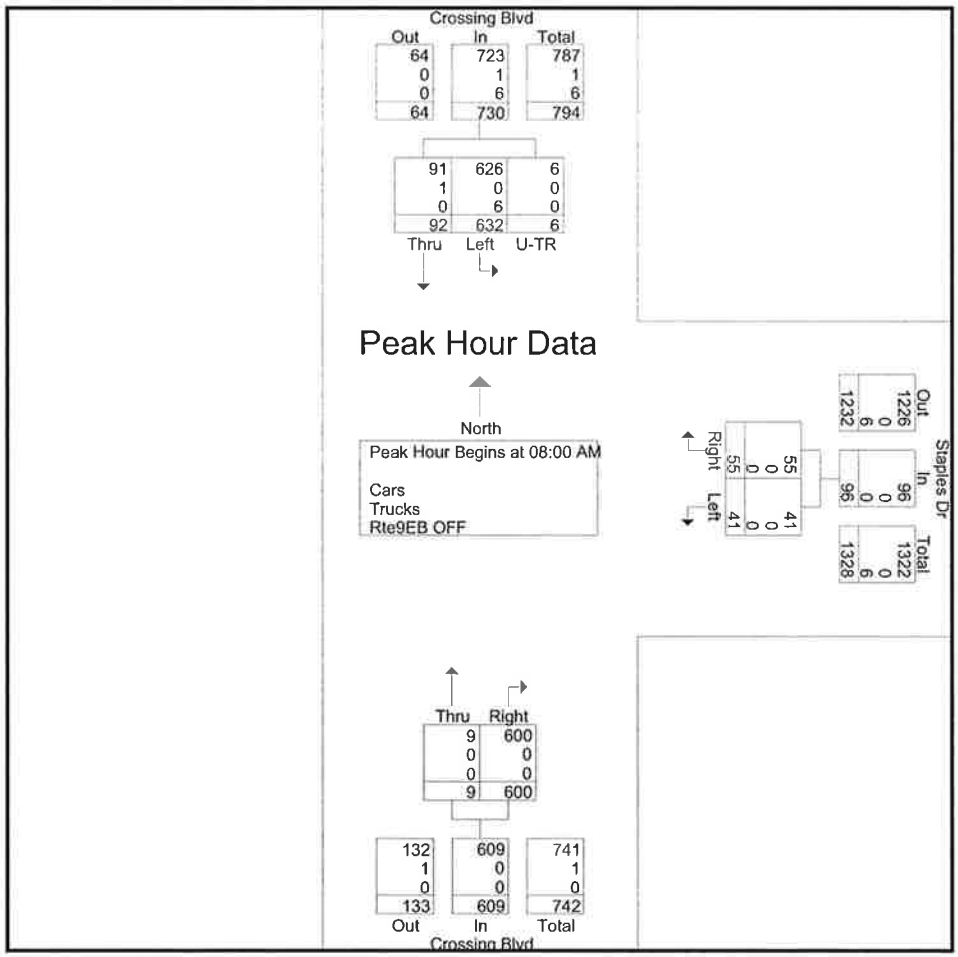
	Crossing Blvd From North			Staples Dr From East		Crossing Blvd From South		
Start Time	Left	Thru	U-TR	Left	Right	Thru	Right	Int. Total
07:00 AM	48	20	2	7	11	1	60	149
07:15 AM	45	13	0	9	5	0	71	143
07:30 AM	88	25	0	3	13	0	76	205
07:45 AM	92	25	0	8	8	0	117	250
Total	273	83	2	27	37	1	324	747
08:00 AM	151	16	1	9	9	2	121	309
08:15 AM	156	19	2	11	14	2	146	350
08:30 AM	158	19	2	6	15	2	179	381
08:45 AM	167	38	1	15	17	3	154	395
Total	632	92	6	41	55	9	600	1435
Grand Total	905	175	8	68	92	10	924	2182
Apprch %	83.2	16.1	0.7	42.5	57.5	1.1	98.9	
Total %	41.5	8	0.4	3.1	4.2	0.5	42.3	
Cars	891	174	8	68	91	10	924	2166
% Cars	98.5	99.4	100	100	98.9	100	100	99.3
Trucks	1	1	0	0	1	0	0	3
% Trucks	0.1	0.6	0	0	1.1	0	0	0.1
Rte9EB OFF	13	0	0	0	0	0	0	13
% Rte9EB OFF	1.4	0	0	0	0	0	0	0.6

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street: Staples Drive
City/State : Framingham, MA
Weather : Clear

File Name : 73240006
Site Code : 73240006
Start Date : 6/22/2016
Page No : 2

	Crossing Blvd From North				Staples Dr From East			Crossing Blvd From South			
Start Time	Left	Thru	U-TR	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1											
Peak Hour for Entire Intersection Begins at 08:00 AM											
08:00 AM	151	16	1	168	9	9	18	2	121	123	309
08:15 AM	156	19	2	177	11	14	25	2	146	148	350
08:30 AM	158	19	2	179	6	15	21	2	179	181	381
08:45 AM	167	38	1	206	15	17	32	3	154	157	395
Total Volume	632	92	6	730	41	55	96	9	600	609	1435
% App. Total	86.6	12.6	0.8		42.7	57.3		1.5	98.5		
PHF	.946	.605	.750	.886	.683	.809	.750	.750	.838	.841	.908
Cars	626	91	6	723	41	55	96	9	600	609	1428
% Cars	99.1	98.9	100	99.0	100	100	100	100	100	100	99.5
Trucks	0	1	0	1	0	0	0	0	0	0	1
% Trucks	0	1.1	0	0.1	0	0	0	0	0	0	0.1
Rte9EB OFF	6	0	0	6	0	0	0	0	0	0	6
% Rte9EB OFF	0.9	0	0	0.8	0	0	0	0	0	0	0.4



Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street: Staples Drive
City/State : Framingham, MA
Weather : Clear

File Name : 73240006
Site Code : 73240006
Start Date : 6/22/2016
Page No : 1

Groups Printed- Cars

	Crossing Blvd From North			Staples Dr From East		Crossing Blvd From South		
Start Time	Left	Thru	U-TR	Left	Right	Thru	Right	Int. Total
07:00 AM	46	20	2	7	11	1	60	147
07:15 AM	43	13	0	9	5	0	71	141
07:30 AM	86	25	0	3	12	0	76	202
07:45 AM	90	25	0	8	8	0	117	248
Total	265	83	2	27	36	1	324	738
08:00 AM	150	16	1	9	9	2	121	308
08:15 AM	155	18	2	11	14	2	146	348
08:30 AM	158	19	2	6	15	2	179	381
08:45 AM	163	38	1	15	17	3	154	391
Total	626	91	6	41	55	9	600	1428
Grand Total	891	174	8	68	91	10	924	2166
Apprch %	83	16.2	0.7	42.8	57.2	1.1	98.9	
Total %	41.1	8	0.4	3.1	4.2	0.5	42.7	

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street: Staples Drive
City/State : Framingham, MA
Weather : Clear

File Name : 73240006
Site Code : 73240006
Start Date : 6/22/2016
Page No : 1

Groups Printed- Rte9EB OFF

	Crossing Blvd From North			Staples Dr From East		Crossing Blvd From South		
Start Time	Left	Thru	U-TR	Left	Right	Thru	Right	Int. Total
07:00 AM	1	0	0	0	0	0	0	1
07:15 AM	2	0	0	0	0	0	0	2
07:30 AM	2	0	0	0	0	0	0	2
07:45 AM	2	0	0	0	0	0	0	2
Total	7	0	0	0	0	0	0	7
08:00 AM	1	0	0	0	0	0	0	1
08:15 AM	1	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	0
08:45 AM	4	0	0	0	0	0	0	4
Total	6	0	0	0	0	0	0	6
Grand Total	13	0	0	0	0	0	0	13
Apprch %	100	0	0	0	0	0	0	
Total %	100	0	0	0	0	0	0	

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street: Staples Drive
City/State : Framingham, MA
Weather : Clear

File Name : 73240006
Site Code : 73240006
Start Date : 6/22/2016
Page No : 1

Groups Printed- Trucks

	Crossing Blvd From North			Staples Dr From East		Crossing Blvd From South		
Start Time	Left	Thru	U-TR	Left	Right	Thru	Right	Int. Total
07:00 AM	1	0	0	0	0	0	0	1
07:15 AM	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	1	0	0	1
07:45 AM	0	0	0	0	0	0	0	0
Total	1	0	0	0	1	0	0	2
08:00 AM	0	0	0	0	0	0	0	0
08:15 AM	0	1	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	0	1
Grand Total	1	1	0	0	1	0	0	3
Apprch %	50	50	0	0	100	0	0	
Total %	33.3	33.3	0	0	33.3	0	0	

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street: Staples Drive
City/State : Framingham, MA
Weather : Clear

File Name : 73240006
Site Code : 73240006
Start Date : 6/22/2016
Page No : 1

Groups Printed- Bikes Peds

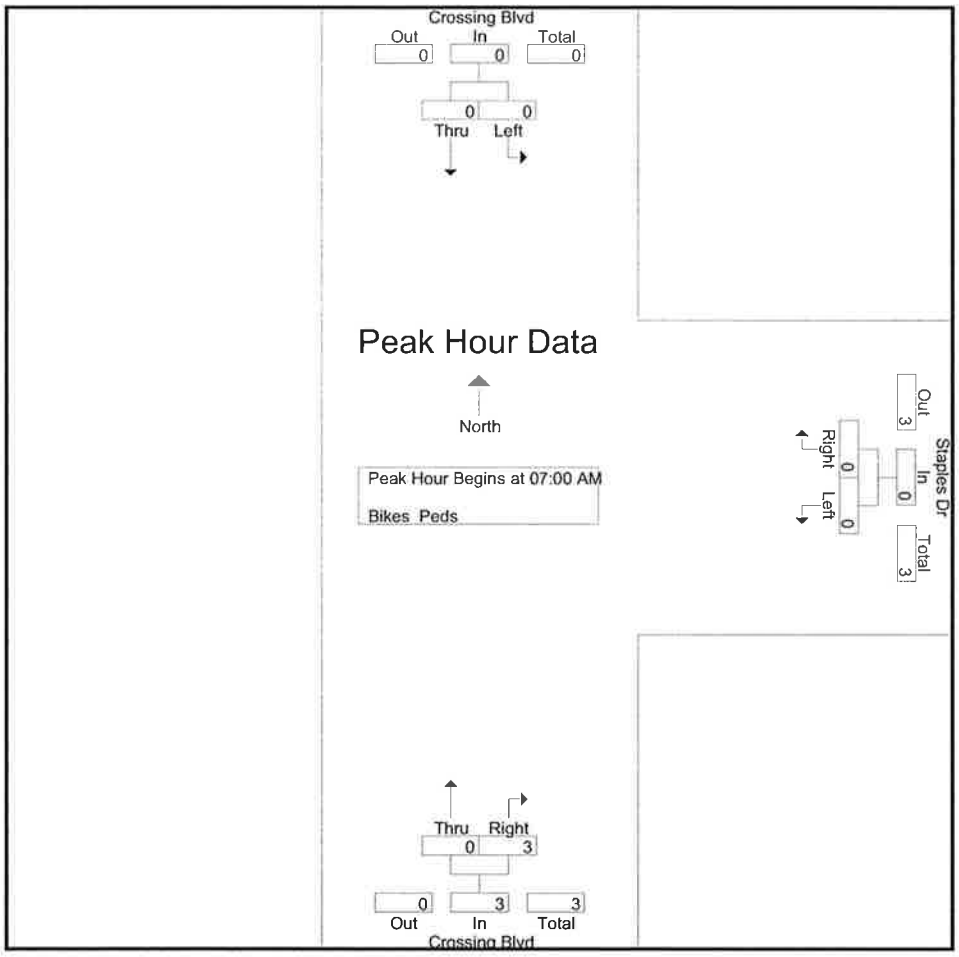
	Crossing Blvd From North			Staples Dr From East			Crossing Blvd From South					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	2	0	0	2	2
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	0	0	0	0	0	3	0	0	3	3
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	1	0	0	0	1	0	1
08:30 AM	0	0	0	0	0	1	0	0	0	1	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	2	0	0	0	2	0	2
Grand Total	0	0	0	0	0	2	0	3	0	2	3	5
Apprch %	0	0		0	0		0	100				
Total %	0	0		0	0		0	100		40	60	

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street: Staples Drive
City/State : Framingham, MA
Weather : Clear

File Name : 73240006
Site Code : 73240006
Start Date : 6/22/2016
Page No : 2

	Crossing Blvd From North			Staples Dr From East			Crossing Blvd From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	2	2	2
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	1	1	1
Total Volume	0	0	0	0	0	0	0	3	3	3
% App. Total	0	0		0	0		0	100		
PHF	.000	.000	.000	.000	.000	.000	.000	.375	.375	.375



Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street: Staples Drive
City/State : Framingham, MA
Weather : Clear

File Name : 73240006
Site Code : 73240006
Start Date : 6/22/2016
Page No : 1

Groups Printed- Cars - Trucks - Rte9EB OFF

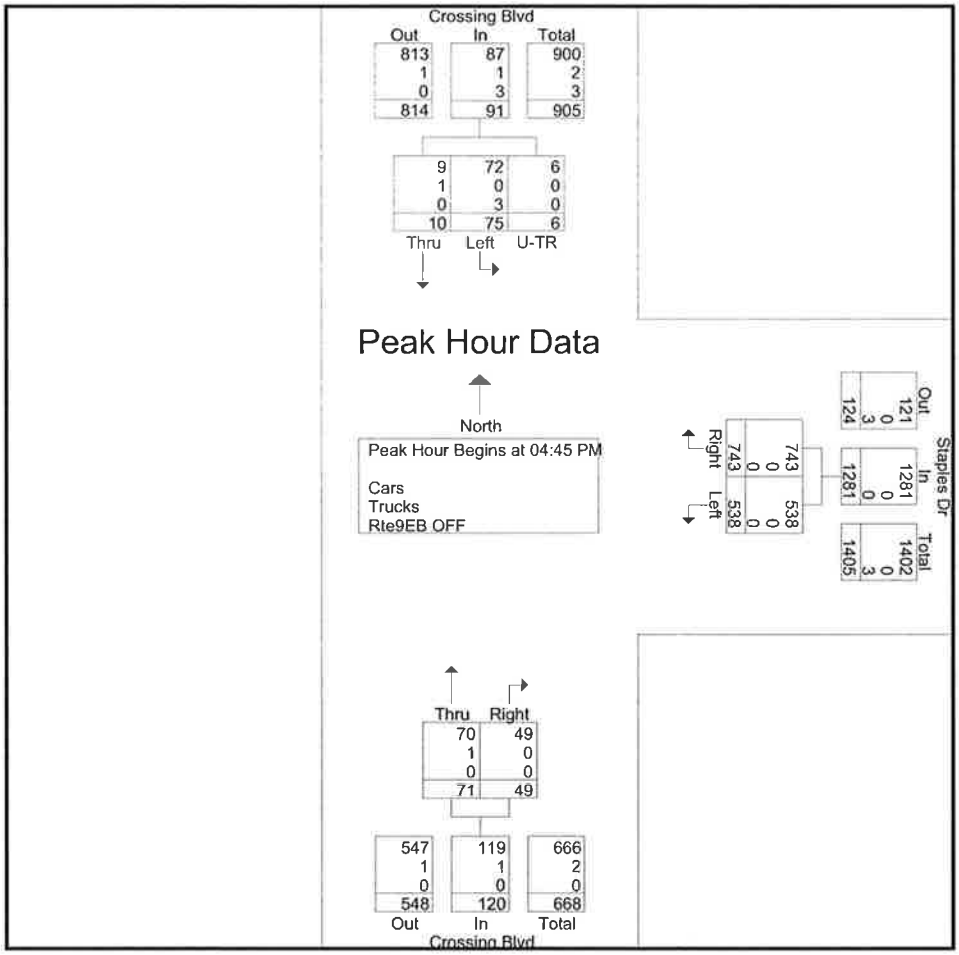
	Crossing Blvd From North			Staples Dr From East		Crossing Blvd From South		
Start Time	Left	Thru	U-TR	Left	Right	Thru	Right	Int. Total
04:00 PM	11	2	2	77	73	14	9	188
04:15 PM	11	3	0	66	99	11	6	196
04:30 PM	18	4	0	104	113	15	12	266
04:45 PM	13	2	2	110	134	16	8	285
Total	53	11	4	357	419	56	35	935
05:00 PM	26	1	0	143	225	21	9	425
05:15 PM	17	4	0	164	207	18	18	428
05:30 PM	19	3	4	121	177	16	14	354
05:45 PM	6	2	2	88	106	12	7	223
Total	68	10	6	516	715	67	48	1430
Grand Total	121	21	10	873	1134	123	83	2365
Apprch %	79.6	13.8	6.6	43.5	56.5	59.7	40.3	
Total %	5.1	0.9	0.4	36.9	47.9	5.2	3.5	
Cars	115	20	10	873	1134	121	83	2356
% Cars	95	95.2	100	100	100	98.4	100	99.6
Trucks	0	1	0	0	0	2	0	3
% Trucks	0	4.8	0	0	0	1.6	0	0.1
Rte9EB OFF	6	0	0	0	0	0	0	6
% Rte9EB OFF	5	0	0	0	0	0	0	0.3

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street: Staples Drive
City/State : Framingham, MA
Weather : Clear

File Name : 73240006
Site Code : 73240006
Start Date : 6/22/2016
Page No : 2

	Crossing Blvd From North				Staples Dr From East			Crossing Blvd From South			
Start Time	Left	Thru	U-TR	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1											
Peak Hour for Entire Intersection Begins at 04:45 PM											
04:45 PM	13	2	2	17	110	134	244	16	8	24	285
05:00 PM	26	1	0	27	143	225	368	21	9	30	425
05:15 PM	17	4	0	21	164	207	371	18	18	36	428
05:30 PM	19	3	4	26	121	177	298	16	14	30	354
Total Volume	75	10	6	91	538	743	1281	71	49	120	1492
% App. Total	82.4	11	6.6		42	58		59.2	40.8		
PHF	.721	.625	.375	.843	.820	.826	.863	.845	.681	.833	.871
Cars	72	9	6	87	538	743	1281	70	49	119	1487
% Cars	96.0	90.0	100	95.6	100	100	100	98.6	100	99.2	99.7
Trucks	0	1	0	1	0	0	0	1	0	1	2
% Trucks	0	10.0	0	1.1	0	0	0	1.4	0	0.8	0.1
Rte9EB OFF	3	0	0	3	0	0	0	0	0	0	3
% Rte9EB OFF	4.0	0	0	3.3	0	0	0	0	0	0	0.2



Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street: Staples Drive
City/State : Framingham, MA
Weather : Clear

File Name : 73240006
Site Code : 73240006
Start Date : 6/22/2016
Page No : 1

Groups Printed- Cars

	Crossing Blvd From North			Staples Dr From East		Crossing Blvd From South		
Start Time	Left	Thru	U-TR	Left	Right	Thru	Right	Int. Total
04:00 PM	11	2	2	77	73	14	9	188
04:15 PM	11	3	0	66	99	11	6	196
04:30 PM	16	4	0	104	113	15	12	264
04:45 PM	12	2	2	110	134	16	8	284
Total	50	11	4	357	419	56	35	932
05:00 PM	26	1	0	143	225	21	9	425
05:15 PM	17	4	0	164	207	18	18	428
05:30 PM	17	2	4	121	177	15	14	350
05:45 PM	5	2	2	88	106	11	7	221
Total	65	9	6	516	715	65	48	1424
Grand Total	115	20	10	873	1134	121	83	2356
Apprch %	79.3	13.8	6.9	43.5	56.5	59.3	40.7	
Total %	4.9	0.8	0.4	37.1	48.1	5.1	3.5	

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street: Staples Drive
City/State : Framingham, MA
Weather : Clear

File Name : 73240006
Site Code : 73240006
Start Date : 6/22/2016
Page No : 1

Groups Printed- Rte9EB OFF

	Crossing Blvd From North			Staples Dr From East		Crossing Blvd From South		
Start Time	Left	Thru	U-TR	Left	Right	Thru	Right	Int. Total
04:00 PM	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0
04:30 PM	2	0	0	0	0	0	0	2
04:45 PM	1	0	0	0	0	0	0	1
Total	3	0	0	0	0	0	0	3
05:00 PM	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0
05:30 PM	2	0	0	0	0	0	0	2
05:45 PM	1	0	0	0	0	0	0	1
Total	3	0	0	0	0	0	0	3
Grand Total	6	0	0	0	0	0	0	6
Apprch %	100	0	0	0	0	0	0	
Total %	100	0	0	0	0	0	0	

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street: Staples Drive
City/State : Framingham, MA
Weather : Clear

File Name : 73240006
Site Code : 73240006
Start Date : 6/22/2016
Page No : 1

Groups Printed- Trucks

	Crossing Blvd From North			Staples Dr From East		Crossing Blvd From South		
Start Time	Left	Thru	U-TR	Left	Right	Thru	Right	Int. Total
04:00 PM	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0
05:30 PM	0	1	0	0	0	1	0	2
05:45 PM	0	0	0	0	0	1	0	1
Total	0	1	0	0	0	2	0	3
Grand Total	0	1	0	0	0	2	0	3
Apprch %	0	100	0	0	0	100	0	
Total %	0	33.3	0	0	0	66.7	0	

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street: Staples Drive
City/State : Framingham, MA
Weather : Clear

File Name : 73240006
Site Code : 73240006
Start Date : 6/22/2016
Page No : 1

Groups Printed- Bikes Peds

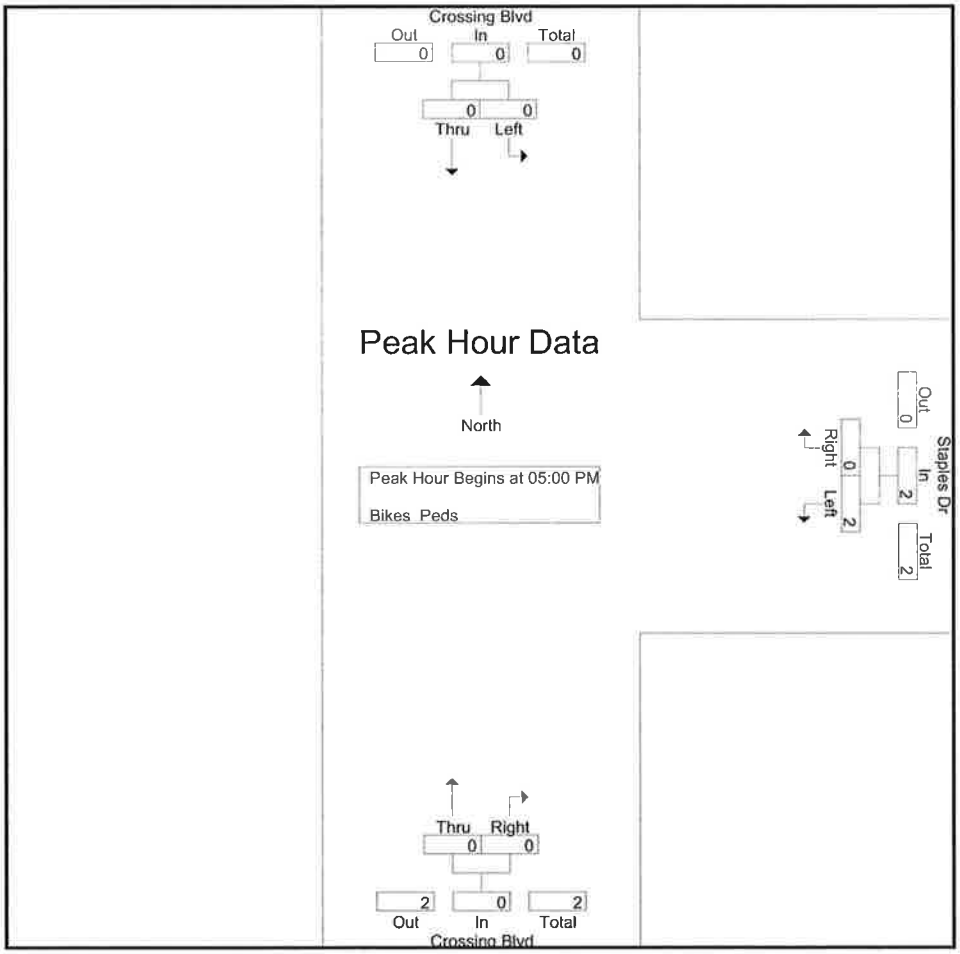
	Crossing Blvd From North			Staples Dr From East			Crossing Blvd From South					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	2	0	0	0	2	0	2
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	2	0	0	0	2	0	2
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	1	0	0	0	1	0	1
05:45 PM	0	0	0	2	0	0	0	0	0	0	2	2
Total	0	0	0	2	0	1	0	0	0	1	2	3
Grand Total	0	0	0	2	0	3	0	0	0	3	2	5
Apprch %	0	0		100	0		0	0				
Total %	0	0		100	0		0	0		60	40	

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street: Staples Drive
City/State : Framingham, MA
Weather : Clear

File Name : 73240006
Site Code : 73240006
Start Date : 6/22/2016
Page No : 2

	Crossing Blvd From North			Staples Dr From East			Crossing Blvd From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	2	0	2	0	0	0	2
Total Volume	0	0	0	2	0	2	0	0	0	2
% App. Total	0	0		100	0		0	0		
PHF	.000	.000	.000	.250	.000	.250	.000	.000	.000	.250



Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 73240007
Site Code : 73420007
Start Date : 6/22/2016
Page No : 1

Groups Printed- Cars - Trucks

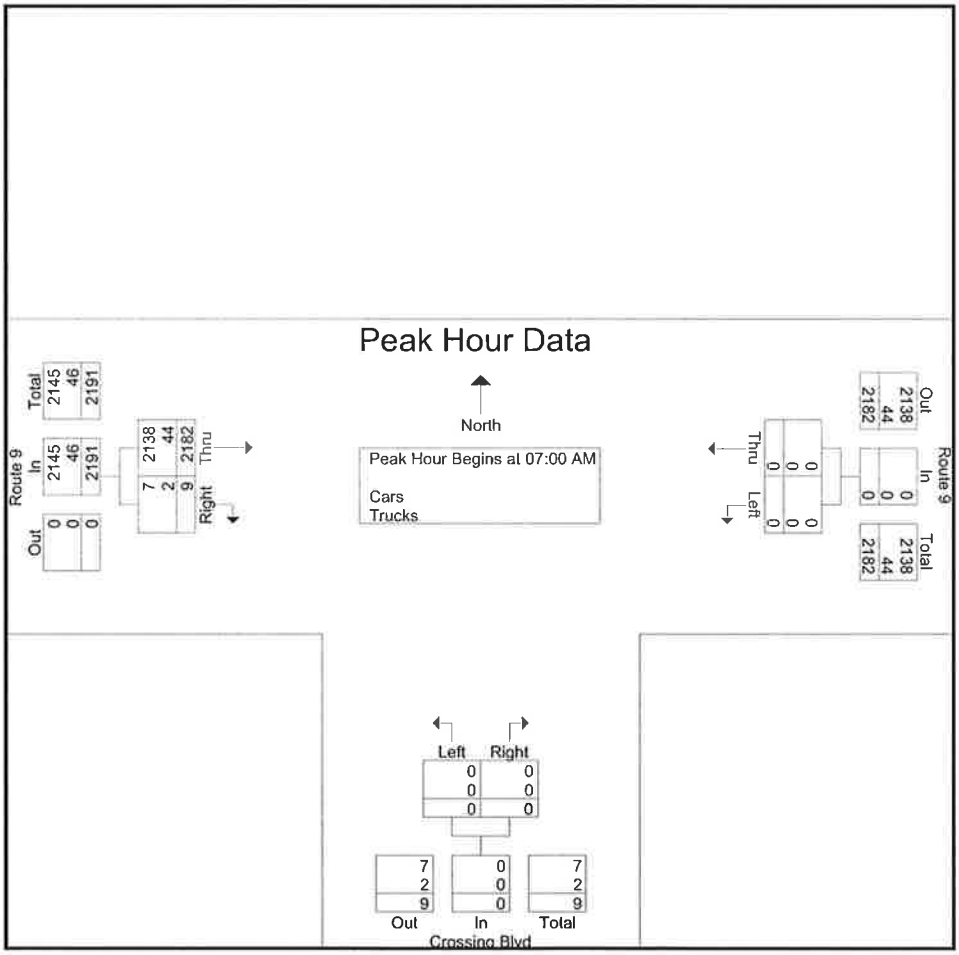
	Route 9 From East		Crossing Blvd From South		Route 9 From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	0	0	0	0	557	1	558
07:15 AM	0	0	0	0	562	4	566
07:30 AM	0	0	0	0	550	2	552
07:45 AM	0	0	0	0	513	2	515
Total	0	0	0	0	2182	9	2191
08:00 AM	0	0	0	0	524	1	525
08:15 AM	0	0	0	0	530	1	531
08:30 AM	0	0	0	0	536	0	536
08:45 AM	0	0	0	0	503	4	507
Total	0	0	0	0	2093	6	2099
Grand Total	0	0	0	0	4275	15	4290
Apprch %	0	0	0	0	99.7	0.3	
Total %	0	0	0	0	99.7	0.3	
Cars	0	0	0	0	4180	13	4193
% Cars	0	0	0	0	97.8	86.7	97.7
Trucks	0	0	0	0	95	2	97
% Trucks	0	0	0	0	2.2	13.3	2.3

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 73240007
Site Code : 73420007
Start Date : 6/22/2016
Page No : 2

	Route 9 From East			Crossing Blvd From South			Route 9 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	557	1	558	558
07:15 AM	0	0	0	0	0	0	562	4	566	566
07:30 AM	0	0	0	0	0	0	550	2	552	552
07:45 AM	0	0	0	0	0	0	513	2	515	515
Total Volume	0	0	0	0	0	0	2182	9	2191	2191
% App. Total	0	0		0	0		99.6	0.4		
PHF	.000	.000	.000	.000	.000	.000	.971	.563	.968	.968
Cars	0	0	0	0	0	0	2138	7	2145	2145
% Cars	0	0	0	0	0	0	98.0	77.8	97.9	97.9
Trucks	0	0	0	0	0	0	44	2	46	46
% Trucks	0	0	0	0	0	0	2.0	22.2	2.1	2.1



Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 73240007
Site Code : 73420007
Start Date : 6/22/2016
Page No : 4

Groups Printed- Cars

	Route 9 From East		Crossing Blvd From South		Route 9 From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	0	0	0	0	549	1	550
07:15 AM	0	0	0	0	550	2	552
07:30 AM	0	0	0	0	536	2	538
07:45 AM	0	0	0	0	503	2	505
Total	0	0	0	0	2138	7	2145
08:00 AM	0	0	0	0	510	1	511
08:15 AM	0	0	0	0	516	1	517
08:30 AM	0	0	0	0	529	0	529
08:45 AM	0	0	0	0	487	4	491
Total	0	0	0	0	2042	6	2048
Grand Total	0	0	0	0	4180	13	4193
Apprch %	0	0	0	0	99.7	0.3	
Total %	0	0	0	0	99.7	0.3	

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 73240007
Site Code : 73420007
Start Date : 6/22/2016
Page No : 7

Groups Printed- Trucks

	Route 9 From East		Crossing Blvd From South		Route 9 From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	0	0	0	0	8	0	8
07:15 AM	0	0	0	0	12	2	14
07:30 AM	0	0	0	0	14	0	14
07:45 AM	0	0	0	0	10	0	10
Total	0	0	0	0	44	2	46
08:00 AM	0	0	0	0	14	0	14
08:15 AM	0	0	0	0	14	0	14
08:30 AM	0	0	0	0	7	0	7
08:45 AM	0	0	0	0	16	0	16
Total	0	0	0	0	51	0	51
Grand Total	0	0	0	0	95	2	97
Apprch %	0	0	0	0	97.9	2.1	
Total %	0	0	0	0	97.9	2.1	

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 73240007
Site Code : 73420007
Start Date : 6/22/2016
Page No : 10

Groups Printed- Bikes Peds

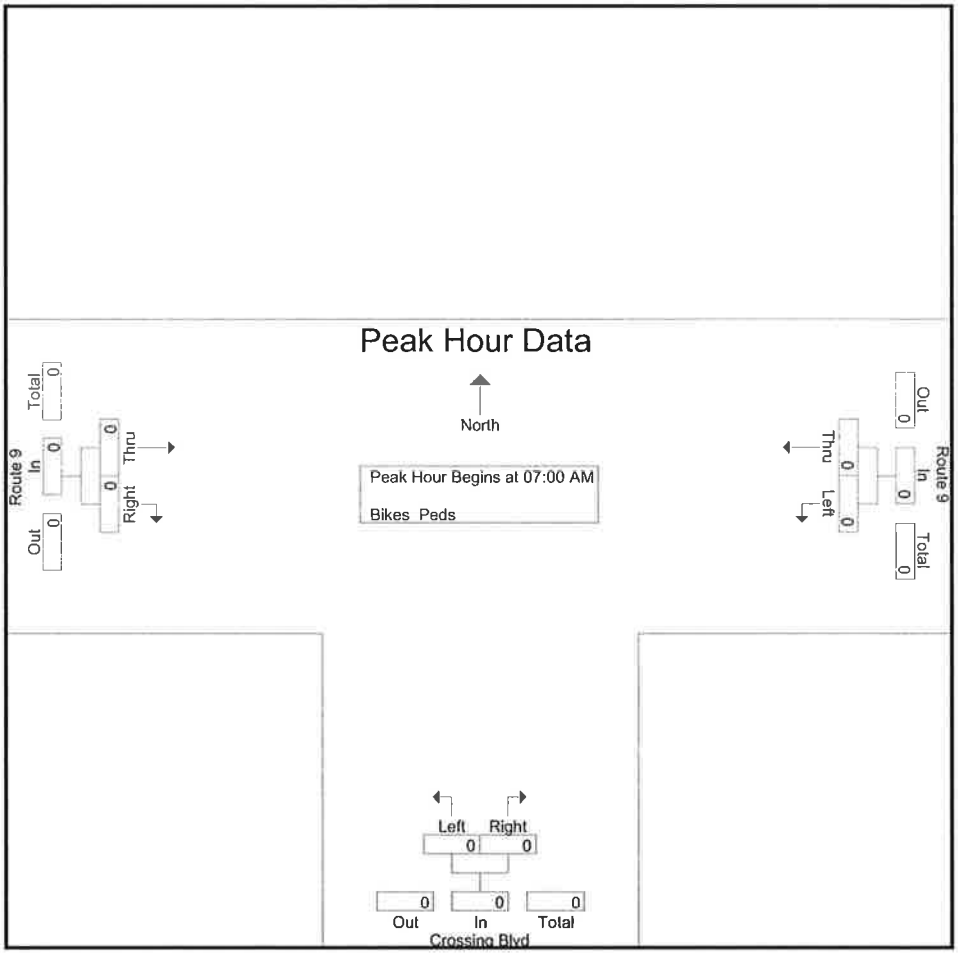
	Route 9 From East			Crossing Blvd From South			Route 9 From West					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0		0	0				
Total %										0	0	

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 73240007
Site Code : 73420007
Start Date : 6/22/2016
Page No : 11

	Route 9 From East			Crossing Blvd From South			Route 9 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000



Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 73240007
Site Code : 73420007
Start Date : 6/22/2016
Page No : 1

Groups Printed- Cars - Trucks - Bikes Peds

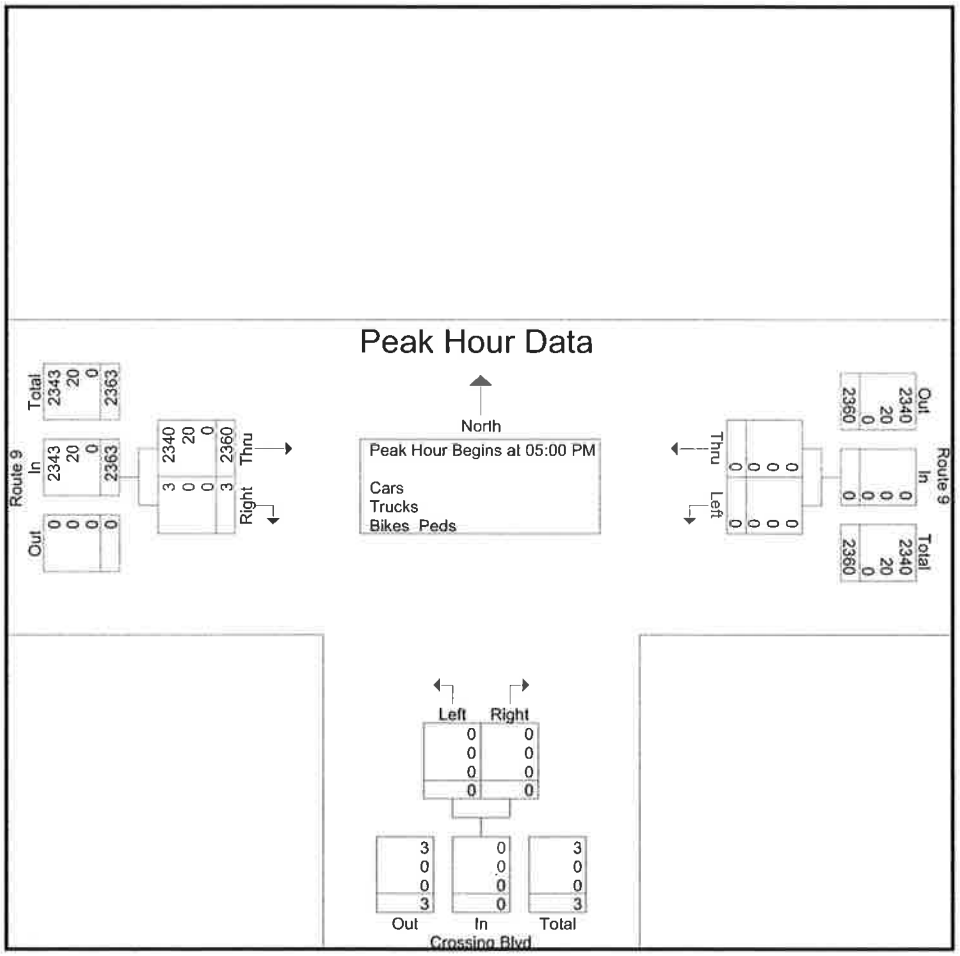
	Route 9 From East		Crossing Blvd From South		Route 9 From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	0	0	0	0	461	0	461
04:15 PM	0	0	0	0	534	1	535
04:30 PM	0	0	0	0	595	3	598
04:45 PM	0	0	0	0	598	0	598
Total	0	0	0	0	2188	4	2192
05:00 PM	0	0	0	0	611	0	611
05:15 PM	0	0	0	0	537	0	537
05:30 PM	0	0	0	0	611	2	613
05:45 PM	0	0	0	0	601	1	602
Total	0	0	0	0	2360	3	2363
Grand Total	0	0	0	0	4548	7	4555
Apprch %	0	0	0	0	99.8	0.2	
Total %	0	0	0	0	99.8	0.2	
Cars	0	0	0	0	4500	7	4507
% Cars	0	0	0	0	98.9	100	98.9
Trucks	0	0	0	0	48	0	48
% Trucks	0	0	0	0	1.1	0	1.1
Bikes Peds	0	0	0	0	0	0	0
% Bikes Peds	0	0	0	0	0	0	0

Accurate Counts
978-664-2565

N/S Street : Crossing Boulevard
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 73240007
Site Code : 73420007
Start Date : 6/22/2016
Page No : 2

	Route 9 From East			Crossing Blvd From South			Route 9 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	0	0	0	0	0	0	611	0	611	611
05:15 PM	0	0	0	0	0	0	537	0	537	537
05:30 PM	0	0	0	0	0	0	611	2	613	613
05:45 PM	0	0	0	0	0	0	601	1	602	602
Total Volume	0	0	0	0	0	0	2360	3	2363	2363
% App. Total	0	0		0	0		99.9	0.1		
PHF	.000	.000	.000	.000	.000	.000	.966	.375	.964	.964
Cars	0	0	0	0	0	0	2340	3	2343	2343
% Cars	0	0	0	0	0	0	99.2	100	99.2	99.2
Trucks	0	0	0	0	0	0	20	0	20	20
% Trucks	0	0	0	0	0	0	0.8	0	0.8	0.8
Bikes Peds	0	0	0	0	0	0	0	0	0	0
% Bikes Peds	0	0	0	0	0	0	0	0	0	0



Accurate Counts
978-664-2565

N/S Street : California Avenue
E/W Street : New York Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 73240009
Site Code : 73240009
Start Date : 6/22/2016
Page No : 1

Groups Printed- Cars - Trucks

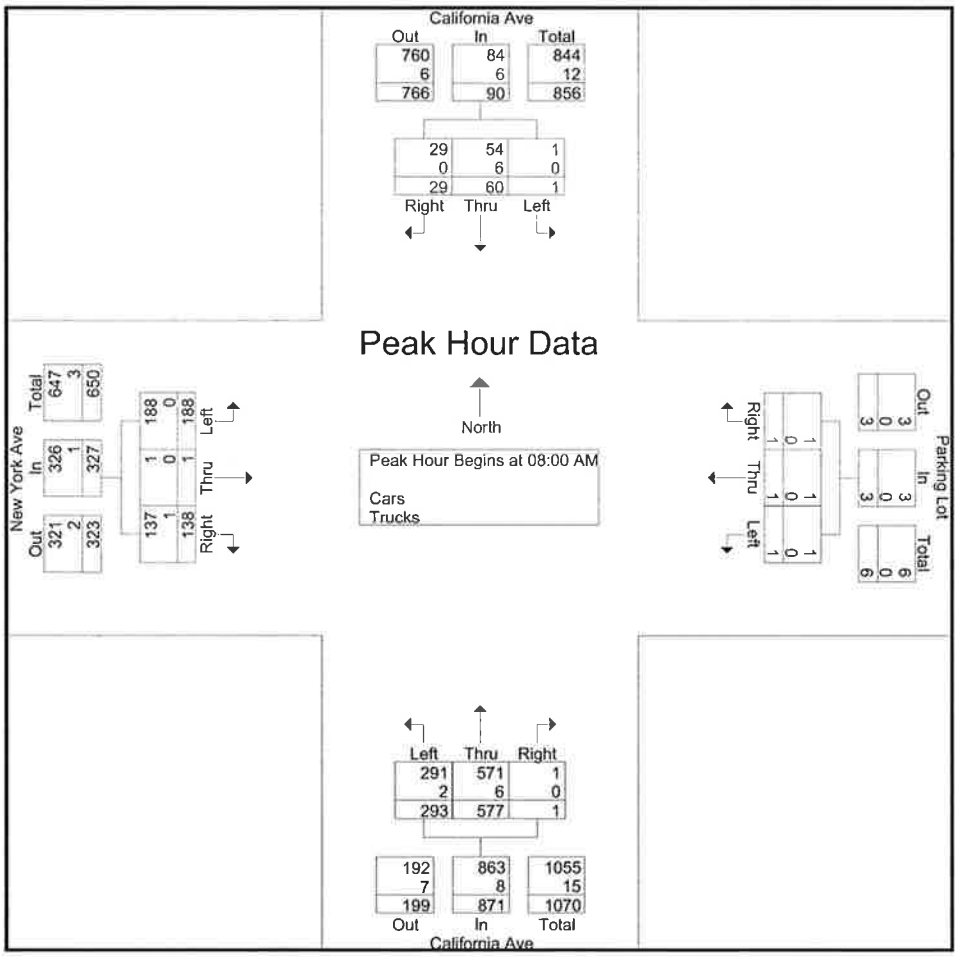
	California Ave From North			Parking Lot From East			California Ave From South			New York Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	11	7	0	0	0	75	69	0	25	0	38	225
07:15 AM	0	9	3	0	0	0	65	78	0	38	0	38	231
07:30 AM	0	13	6	0	1	0	80	98	1	43	0	26	268
07:45 AM	0	20	9	0	0	0	78	135	0	41	0	24	307
Total	0	53	25	0	1	0	298	380	1	147	0	126	1031
08:00 AM	0	12	8	0	0	0	79	142	0	42	0	33	316
08:15 AM	0	17	4	0	0	0	73	157	0	44	0	34	329
08:30 AM	0	17	9	0	1	0	76	140	1	49	1	30	324
08:45 AM	1	14	8	1	0	1	65	138	0	53	0	41	322
Total	1	60	29	1	1	1	293	577	1	188	1	138	1291
Grand Total	1	113	54	1	2	1	591	957	2	335	1	264	2322
Apprch %	0.6	67.3	32.1	25	50	25	38.1	61.7	0.1	55.8	0.2	44	
Total %	0	4.9	2.3	0	0.1	0	25.5	41.2	0.1	14.4	0	11.4	
Cars	1	101	54	1	2	1	585	945	2	335	1	259	2287
% Cars	100	89.4	100	100	100	100	99	98.7	100	100	100	98.1	98.5
Trucks	0	12	0	0	0	0	6	12	0	0	0	5	35
% Trucks	0	10.6	0	0	0	0	1	1.3	0	0	0	1.9	1.5

Accurate Counts
978-664-2565

N/S Street : California Avenue
E/W Street : New York Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 73240009
Site Code : 73240009
Start Date : 6/22/2016
Page No : 2

	California Ave From North				Parking Lot From East				California Ave From South				New York Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	12	8	20	0	0	0	0	79	142	0	221	42	0	33	75	316
08:15 AM	0	17	4	21	0	0	0	0	73	157	0	230	44	0	34	78	329
08:30 AM	0	17	9	26	0	1	0	1	76	140	1	217	49	1	30	80	324
08:45 AM	1	14	8	23	1	0	1	2	65	138	0	203	53	0	41	94	322
Total Volume	1	60	29	90	1	1	1	3	293	577	1	871	188	1	138	327	1291
% App. Total	1.1	66.7	32.2		33.3	33.3	33.3		33.6	66.2	0.1		57.5	0.3	42.2		
PHF	.250	.882	.806	.865	.250	.250	.250	.375	.927	.919	.250	.947	.887	.250	.841	.870	.981
Cars	1	54	29	84	1	1	1	3	291	571	1	863	188	1	137	326	1276
% Cars	100	90.0	100	93.3	100	100	100	100	99.3	99.0	100	99.1	100	100	99.3	99.7	98.8
Trucks	0	6	0	6	0	0	0	0	2	6	0	8	0	0	1	1	15
% Trucks	0	10.0	0	6.7	0	0	0	0	0.7	1.0	0	0.9	0	0	0.7	0.3	1.2



Accurate Counts
978-664-2565

N/S Street : California Avenue
E/W Street : New York Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 73240009
Site Code : 73240009
Start Date : 6/22/2016
Page No : 4

Groups Printed- Cars

	California Ave From North			Parking Lot From East			California Ave From South			New York Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	8	7	0	0	0	75	67	0	25	0	37	219
07:15 AM	0	8	3	0	0	0	65	75	0	38	0	37	226
07:30 AM	0	11	6	0	1	0	78	98	1	43	0	26	264
07:45 AM	0	20	9	0	0	0	76	134	0	41	0	22	302
Total	0	47	25	0	1	0	294	374	1	147	0	122	1011
08:00 AM	0	11	8	0	0	0	78	140	0	42	0	33	312
08:15 AM	0	16	4	0	0	0	73	155	0	44	0	34	326
08:30 AM	0	14	9	0	1	0	75	140	1	49	1	30	320
08:45 AM	1	13	8	1	0	1	65	136	0	53	0	40	318
Total	1	54	29	1	1	1	291	571	1	188	1	137	1276
Grand Total	1	101	54	1	2	1	585	945	2	335	1	259	2287
Apprch %	0.6	64.7	34.6	25	50	25	38.2	61.7	0.1	56.3	0.2	43.5	
Total %	0	4.4	2.4	0	0.1	0	25.6	41.3	0.1	14.6	0	11.3	

Accurate Counts
978-664-2565

N/S Street : California Avenue
E/W Street : New York Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 73240009
Site Code : 73240009
Start Date : 6/22/2016
Page No : 7

Groups Printed- Trucks

	California Ave From North			Parking Lot From East			California Ave From South			New York Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	3	0	0	0	0	0	2	0	0	0	1	6
07:15 AM	0	1	0	0	0	0	0	3	0	0	0	1	5
07:30 AM	0	2	0	0	0	0	2	0	0	0	0	0	4
07:45 AM	0	0	0	0	0	0	2	1	0	0	0	2	5
Total	0	6	0	0	0	0	4	6	0	0	0	4	20
08:00 AM	0	1	0	0	0	0	1	2	0	0	0	0	4
08:15 AM	0	1	0	0	0	0	0	2	0	0	0	0	3
08:30 AM	0	3	0	0	0	0	1	0	0	0	0	0	4
08:45 AM	0	1	0	0	0	0	0	2	0	0	0	1	4
Total	0	6	0	0	0	0	2	6	0	0	0	1	15
Grand Total	0	12	0	0	0	0	6	12	0	0	0	5	35
Apprch %	0	100	0	0	0	0	33.3	66.7	0	0	0	100	
Total %	0	34.3	0	0	0	0	17.1	34.3	0	0	0	14.3	

Accurate Counts
978-664-2565

N/S Street : California Avenue
E/W Street : New York Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 73240009
Site Code : 73240009
Start Date : 6/22/2016
Page No : 10

Groups Printed- Bikes Peds

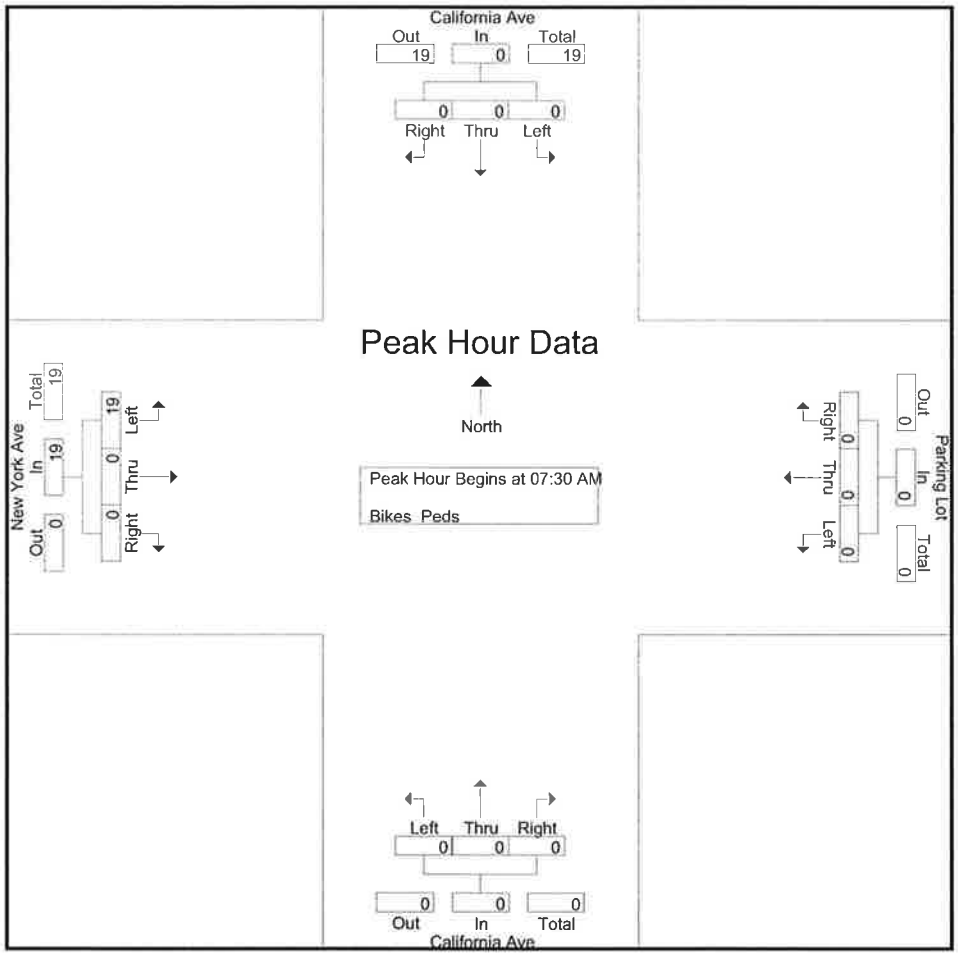
	California Ave From North				Parking Lot From East				California Ave From South				New York Ave From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	1	3
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	1	2
Total	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3	3	2	5
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	4	4	16	20
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	3	0	3
08:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Total	0	0	0	1	0	0	0	0	0	0	0	1	18	0	0	6	8	18	26
Grand Total	0	0	0	1	0	0	0	0	0	0	0	1	19	0	1	9	11	20	31
Apprch %	0	0	0		0	0	0		0	0	0		95	0	5				
Total %	0	0	0		0	0	0		0	0	0		95	0	5		35.5	64.5	

Accurate Counts
978-664-2565

N/S Street : California Avenue
E/W Street : New York Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 73240009
Site Code : 73240009
Start Date : 6/22/2016
Page No : 11

	California Ave From North				Parking Lot From East				California Ave From South				New York Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	16	16
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	19	0	0	19	19
% App. Total	0	0	0		0	0	0		0	0	0		100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.297	.000	.000	.297	.297



Accurate Counts
978-664-2565

N/S Street : California Avenue
E/W Street : New York Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 73240009
Site Code : 73240009
Start Date : 6/22/2016
Page No : 1

Groups Printed- Cars - Trucks

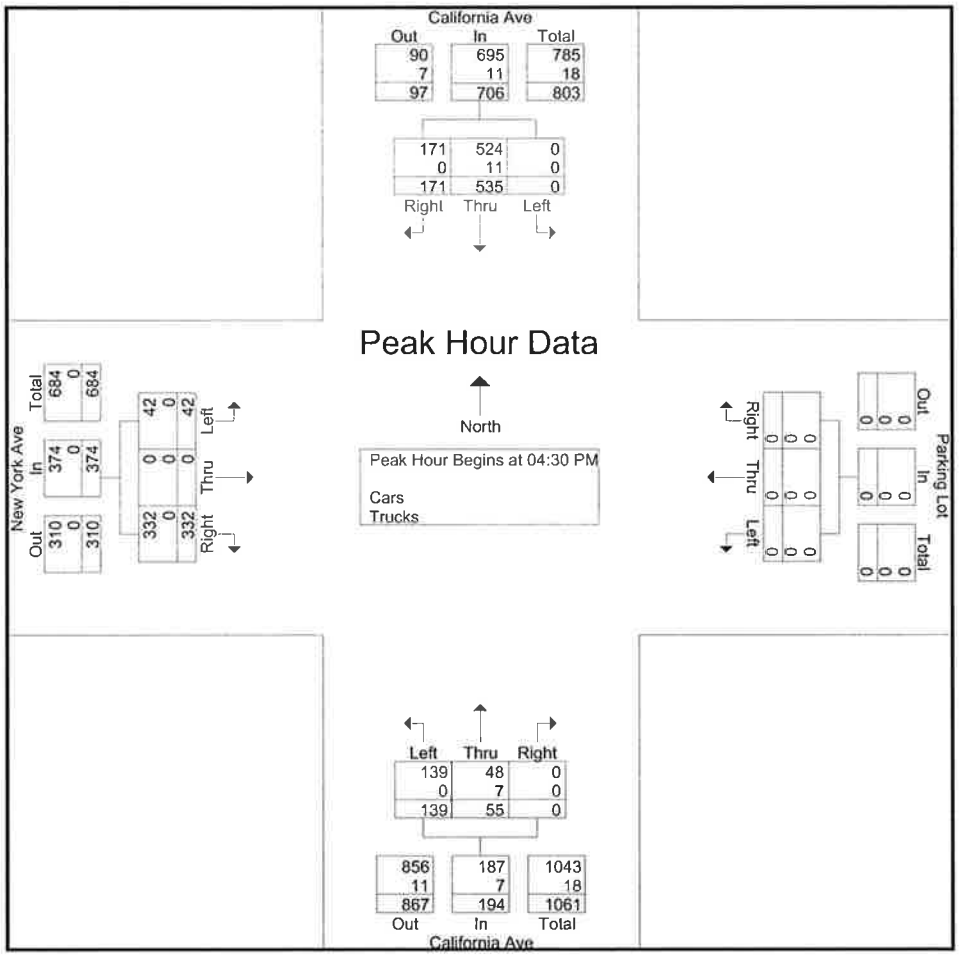
	California Ave From North			Parking Lot From East			California Ave From South			New York Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	115	30	0	0	0	30	23	0	13	0	85	296
04:15 PM	0	98	39	0	0	0	26	15	0	11	0	85	274
04:30 PM	0	124	50	0	0	0	31	17	0	11	0	79	312
04:45 PM	0	111	24	0	0	0	29	10	0	9	0	103	286
Total	0	448	143	0	0	0	116	65	0	44	0	352	1168
05:00 PM	0	147	53	0	0	0	38	18	0	14	0	82	352
05:15 PM	0	153	44	0	0	0	41	10	0	8	0	68	324
05:30 PM	0	128	25	0	0	0	34	8	0	2	0	64	261
05:45 PM	0	79	19	0	0	0	30	18	0	10	0	53	209
Total	0	507	141	0	0	0	143	54	0	34	0	267	1146
Grand Total	0	955	284	0	0	0	259	119	0	78	0	619	2314
Apprch %	0	77.1	22.9	0	0	0	68.5	31.5	0	11.2	0	88.8	
Total %	0	41.3	12.3	0	0	0	11.2	5.1	0	3.4	0	26.8	
Cars	0	938	284	0	0	0	259	101	0	78	0	618	2278
% Cars	0	98.2	100	0	0	0	100	84.9	0	100	0	99.8	98.4
Trucks	0	17	0	0	0	0	0	18	0	0	0	1	36
% Trucks	0	1.8	0	0	0	0	0	15.1	0	0	0	0.2	1.6

Accurate Counts
978-664-2565

N/S Street : California Avenue
E/W Street : New York Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 73240009
Site Code : 73240009
Start Date : 6/22/2016
Page No : 2

	California Ave From North				Parking Lot From East				California Ave From South				New York Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	124	50	174	0	0	0	0	31	17	0	48	11	0	79	90	312
04:45 PM	0	111	24	135	0	0	0	0	29	10	0	39	9	0	103	112	286
05:00 PM	0	147	53	200	0	0	0	0	38	18	0	56	14	0	82	96	352
05:15 PM	0	153	44	197	0	0	0	0	41	10	0	51	8	0	68	76	324
Total Volume	0	535	171	706	0	0	0	0	139	55	0	194	42	0	332	374	1274
% App. Total	0	75.8	24.2		0	0	0		71.6	28.4	0		11.2	0	88.8		
PHF	.000	.874	.807	.883	.000	.000	.000	.000	.848	.764	.000	.866	.750	.000	.806	.835	.905
Cars	0	524	171	695	0	0	0	0	139	48	0	187	42	0	332	374	1256
% Cars	0	97.9	100	98.4	0	0	0	0	100	87.3	0	96.4	100	0	100	100	98.6
Trucks	0	11	0	11	0	0	0	0	0	7	0	7	0	0	0	0	18
% Trucks	0	2.1	0	1.6	0	0	0	0	0	12.7	0	3.6	0	0	0	0	1.4



Accurate Counts
978-664-2565

N/S Street : California Avenue
E/W Street : New York Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 73240009
Site Code : 73240009
Start Date : 6/22/2016
Page No : 4

Groups Printed- Cars

	California Ave From North			Parking Lot From East			California Ave From South			New York Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	114	30	0	0	0	30	21	0	13	0	84	292
04:15 PM	0	95	39	0	0	0	26	10	0	11	0	85	266
04:30 PM	0	121	50	0	0	0	31	16	0	11	0	79	308
04:45 PM	0	106	24	0	0	0	29	8	0	9	0	103	279
Total	0	436	143	0	0	0	116	55	0	44	0	351	1145
05:00 PM	0	146	53	0	0	0	38	16	0	14	0	82	349
05:15 PM	0	151	44	0	0	0	41	8	0	8	0	68	320
05:30 PM	0	127	25	0	0	0	34	7	0	2	0	64	259
05:45 PM	0	78	19	0	0	0	30	15	0	10	0	53	205
Total	0	502	141	0	0	0	143	46	0	34	0	267	1133
Grand Total	0	938	284	0	0	0	259	101	0	78	0	618	2278
Apprch %	0	76.8	23.2	0	0	0	71.9	28.1	0	11.2	0	88.8	
Total %	0	41.2	12.5	0	0	0	11.4	4.4	0	3.4	0	27.1	

Accurate Counts
978-664-2565

N/S Street : California Avenue
E/W Street : New York Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 73240009
Site Code : 73240009
Start Date : 6/22/2016
Page No : 7

Groups Printed- Trucks

	California Ave From North			Parking Lot From East			California Ave From South			New York Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	1	0	0	0	0	0	2	0	0	0	1	4
04:15 PM	0	3	0	0	0	0	0	5	0	0	0	0	8
04:30 PM	0	3	0	0	0	0	0	1	0	0	0	0	4
04:45 PM	0	5	0	0	0	0	0	2	0	0	0	0	7
Total	0	12	0	0	0	0	0	10	0	0	0	1	23
05:00 PM	0	1	0	0	0	0	0	2	0	0	0	0	3
05:15 PM	0	2	0	0	0	0	0	2	0	0	0	0	4
05:30 PM	0	1	0	0	0	0	0	1	0	0	0	0	2
05:45 PM	0	1	0	0	0	0	0	3	0	0	0	0	4
Total	0	5	0	0	0	0	0	8	0	0	0	0	13
Grand Total	0	17	0	0	0	0	0	18	0	0	0	1	36
Apprch %	0	100	0	0	0	0	0	100	0	0	0	100	
Total %	0	47.2	0	0	0	0	0	50	0	0	0	2.8	

Accurate Counts
978-664-2565

N/S Street : California Avenue
E/W Street : New York Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 73240009
Site Code : 73240009
Start Date : 6/22/2016
Page No : 10

Groups Printed- Bikes Peds

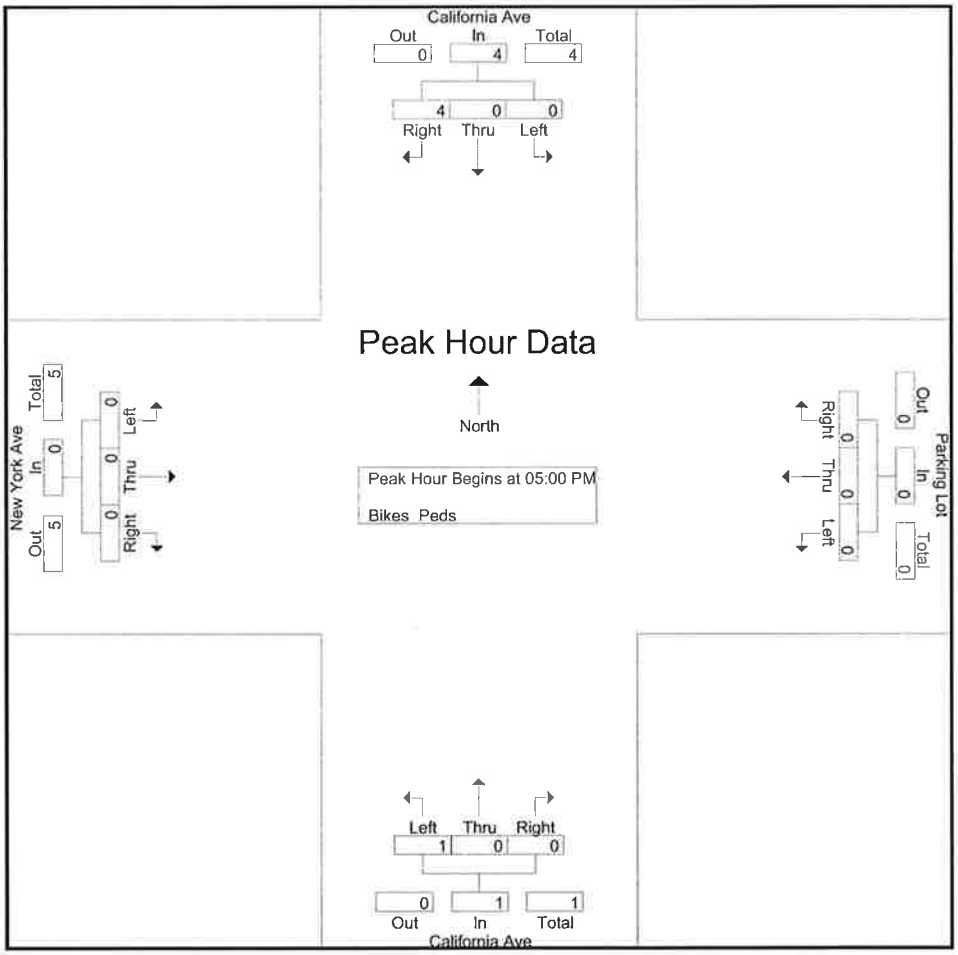
	California Ave From North				Parking Lot From East				California Ave From South				New York Ave From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	2
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
05:15 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
05:30 PM	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	2
05:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	0	0	4	0	0	0	0	0	1	0	0	0	0	0	0	1	1	5	6
Grand Total	0	0	4	0	0	0	0	0	1	0	0	0	0	0	0	3	3	5	8
Apprch %	0	0	100		0	0	0		100	0	0		0	0	0				
Total %	0	0	80		0	0	0		20	0	0		0	0	0		37.5	62.5	

Accurate Counts
978-664-2565

N/S Street : California Avenue
E/W Street : New York Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 73240009
Site Code : 73240009
Start Date : 6/22/2016
Page No : 11

	California Ave From North				Parking Lot From East				California Ave From South				New York Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2
05:30 PM	0	0	1	1	0	0	0	0	1	0	0	1	0	0	0	0	2
05:45 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	4	4	0	0	0	0	1	0	0	1	0	0	0	0	5
% App. Total	0	0	100		0	0	0		100	0	0		0	0	0		
PHF	.000	.000	.500	.500	.000	.000	.000	.000	.250	.000	.000	.250	.000	.000	.000	.000	.625



Accurate Counts
978-664-2565

N/S Street : Route 30
E/W Street: New York Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 73240011
Site Code : 73240011
Start Date : 6/22/2016
Page No : 1

Groups Printed- Cars - Trucks

	Route 30 From North		New York Ave From East		Route 30 From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	24	80	10	13	117	72	316
07:15 AM	29	89	8	13	132	58	329
07:30 AM	36	110	7	14	134	52	353
07:45 AM	37	105	11	16	116	68	353
Total	126	384	36	56	499	250	1351
08:00 AM	32	138	7	7	121	60	365
08:15 AM	48	133	6	11	74	60	332
08:30 AM	39	139	5	14	80	54	331
08:45 AM	45	116	27	25	97	38	348
Total	164	526	45	57	372	212	1376
Grand Total	290	910	81	113	871	462	2727
Apprch %	24.2	75.8	41.8	58.2	65.3	34.7	
Total %	10.6	33.4	3	4.1	31.9	16.9	
Cars	289	905	78	110	858	457	2697
% Cars	99.7	99.5	96.3	97.3	98.5	98.9	98.9
Trucks	1	5	3	3	13	5	30
% Trucks	0.3	0.5	3.7	2.7	1.5	1.1	1.1

Accurate Counts
978-664-2565

N/S Street : Route 30
E/W Street: New York Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 73240011
Site Code : 73240011
Start Date : 6/22/2016
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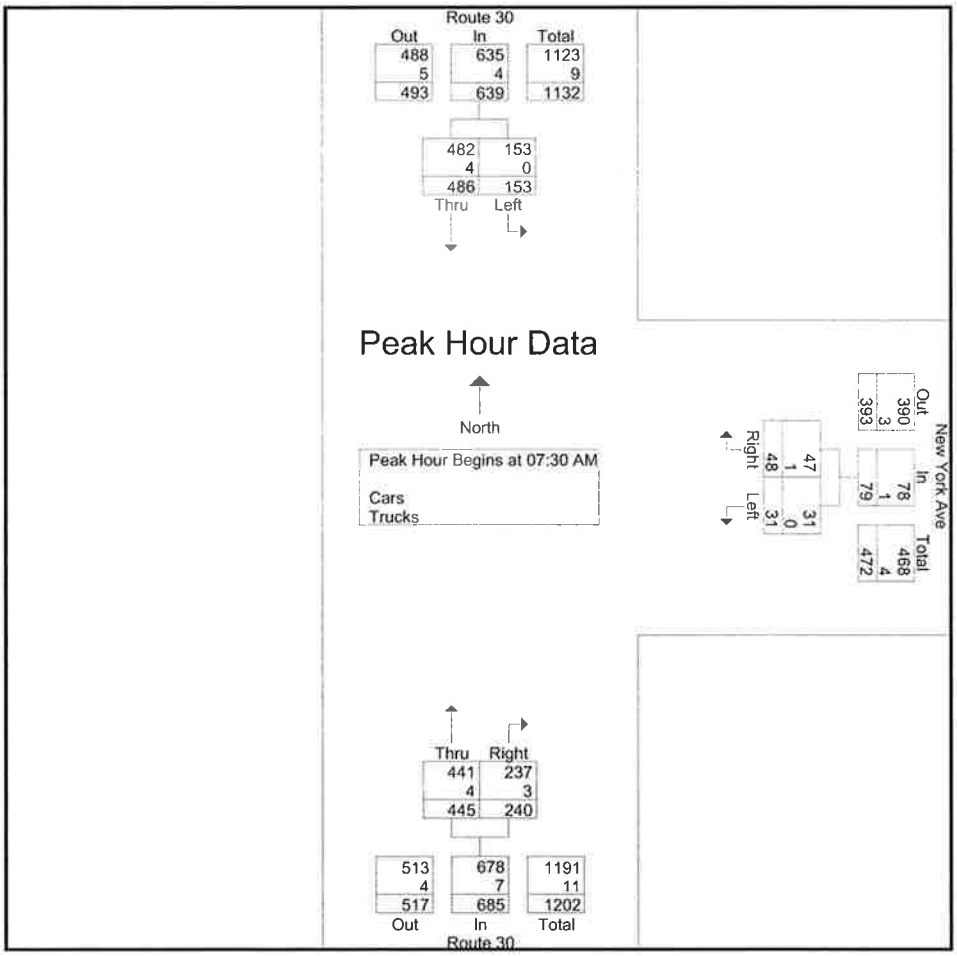
	Route 30 From North			New York Ave From East			Route 30 From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	36	110	146	7	14	21	134	52	186	353
07:45 AM	37	105	142	11	16	27	116	68	184	353
08:00 AM	32	138	170	7	7	14	121	60	181	365
08:15 AM	48	133	181	6	11	17	74	60	134	332
Total Volume	153	486	639	31	48	79	445	240	685	1403
% App. Total	23.9	76.1		39.2	60.8		65	35		
PHF	.797	.880	.883	.705	.750	.731	.830	.882	.921	.961
Cars	153	482	635	31	47	78	441	237	678	1391
% Cars	100	99.2	99.4	100	97.9	98.7	99.1	98.8	99.0	99.1
Trucks	0	4	4	0	1	1	4	3	7	12
% Trucks	0	0.8	0.6	0	2.1	1.3	0.9	1.3	1.0	0.9



Accurate Counts
978-664-2565

N/S Street : Route 30
E/W Street: New York Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 73240011
Site Code : 73240011
Start Date : 6/22/2016
Page No : 4

Groups Printed- Cars

	Route 30 From North		New York Ave From East		Route 30 From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	24	80	10	11	115	72	312
07:15 AM	28	88	7	13	129	58	323
07:30 AM	36	109	7	14	134	51	351
07:45 AM	37	104	11	16	116	67	351
Total	125	381	35	54	494	248	1337
08:00 AM	32	137	7	7	117	59	359
08:15 AM	48	132	6	10	74	60	330
08:30 AM	39	139	3	14	80	52	327
08:45 AM	45	116	27	25	93	38	344
Total	164	524	43	56	364	209	1360
Grand Total	289	905	78	110	858	457	2697
Apprch %	24.2	75.8	41.5	58.5	65.2	34.8	
Total %	10.7	33.6	2.9	4.1	31.8	16.9	

Accurate Counts
978-664-2565

N/S Street : Route 30
E/W Street: New York Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 73240011
Site Code : 73240011
Start Date : 6/22/2016
Page No : 7

Groups Printed- Trucks

	Route 30 From North		New York Ave From East		Route 30 From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	0	0	0	2	2	0	4
07:15 AM	1	1	1	0	3	0	6
07:30 AM	0	1	0	0	0	1	2
07:45 AM	0	1	0	0	0	1	2
Total	1	3	1	2	5	2	14
08:00 AM	0	1	0	0	4	1	6
08:15 AM	0	1	0	1	0	0	2
08:30 AM	0	0	2	0	0	2	4
08:45 AM	0	0	0	0	4	0	4
Total	0	2	2	1	8	3	16
Grand Total	1	5	3	3	13	5	30
Apprch %	16.7	83.3	50	50	72.2	27.8	
Total %	3.3	16.7	10	10	43.3	16.7	

Accurate Counts
978-664-2565

N/S Street : Route 30
E/W Street: New York Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 73240011
Site Code : 73240011
Start Date : 6/22/2016
Page No : 10

Groups Printed- Bikes Peds

	Route 30 From North			New York Ave From East			Route 30 From South					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	1	0	0	0	0	1	0	0	0	1	1	2
07:15 AM	2	1	0	0	0	0	2	2	0	0	7	7
07:30 AM	0	1	0	0	0	0	0	0	0	0	1	1
07:45 AM	5	1	0	0	0	0	0	7	0	0	13	13
Total	8	3	0	0	0	1	2	9	0	1	22	23
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	1	0	0	2	0	0	0	3	0	0	6	6
08:30 AM	0	3	1	0	0	0	0	0	0	1	3	4
08:45 AM	2	1	0	0	0	1	0	0	0	1	3	4
Total	3	4	1	2	0	1	0	3	0	2	12	14
Grand Total	11	7	1	2	0	2	2	12	0	3	34	37
Apprch %	61.1	38.9		100	0		14.3	85.7				
Total %	32.4	20.6		5.9	0		5.9	35.3		8.1	91.9	

Accurate Counts
978-664-2565

N/S Street : Route 30
E/W Street: New York Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 73240011
Site Code : 73240011
Start Date : 6/22/2016
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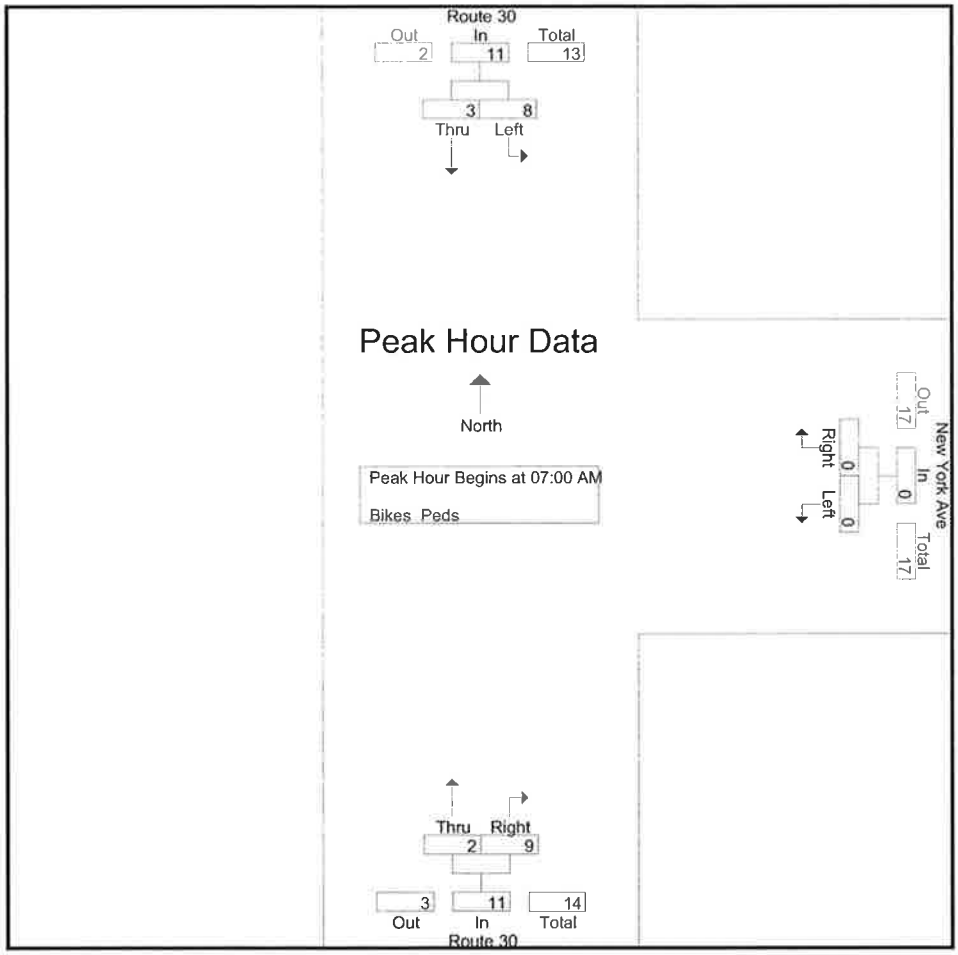
	Route 30 From North			New York Ave From East			Route 30 From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	1	0	1	0	0	0	0	0	0	1
07:15 AM	2	1	3	0	0	0	2	2	4	7
07:30 AM	0	1	1	0	0	0	0	0	0	1
07:45 AM	5	1	6	0	0	0	0	7	7	13
Total Volume	8	3	11	0	0	0	2	9	11	22
% App. Total	72.7	27.3		0	0		18.2	81.8		
PHF	.400	.750	.458	.000	.000	.000	.250	.321	.393	.423



Accurate Counts
978-664-2565

N/S Street : Route 30
E/W Street: New York Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 73240011
Site Code : 73240011
Start Date : 6/22/2016
Page No : 1

Groups Printed- Cars - Trucks

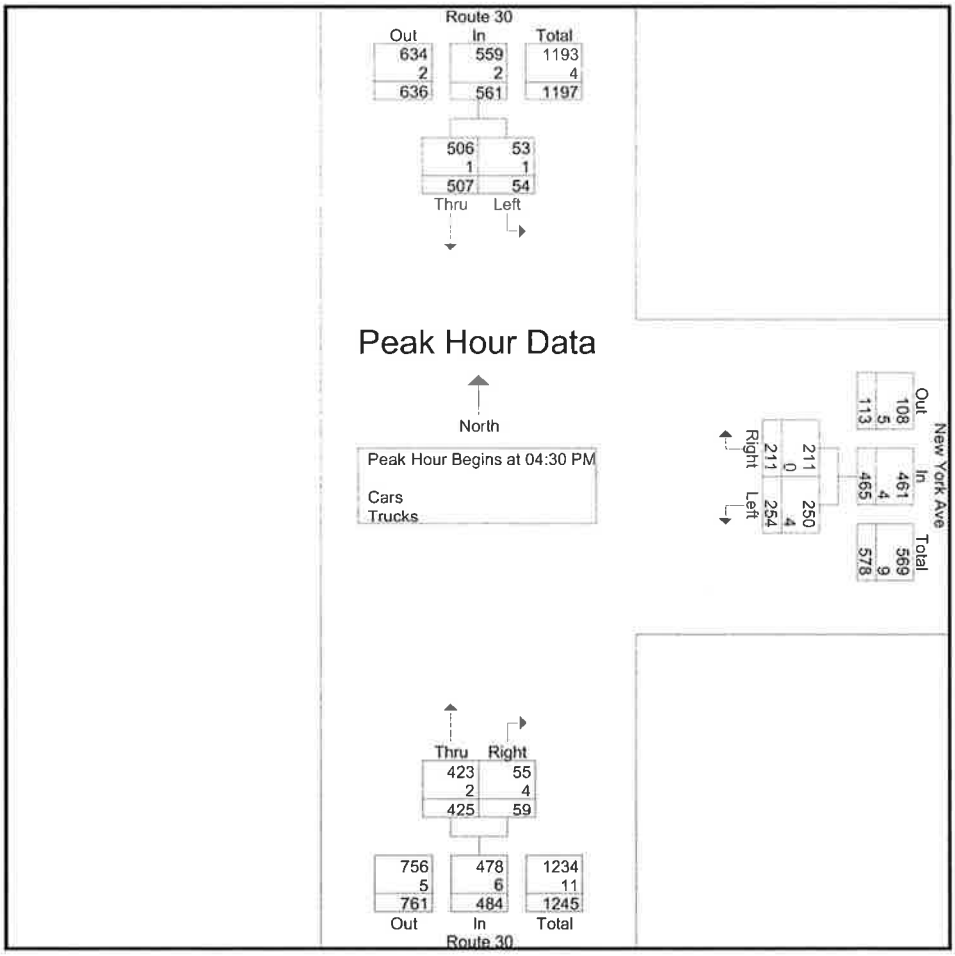
	Route 30 From North		New York Ave From East		Route 30 From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	13	132	49	26	58	9	287
04:15 PM	12	140	61	25	71	14	323
04:30 PM	15	130	75	56	82	10	368
04:45 PM	15	118	49	40	98	22	342
Total	55	520	234	147	309	55	1320
05:00 PM	12	127	65	64	110	17	395
05:15 PM	12	132	65	51	135	10	405
05:30 PM	19	118	38	36	141	15	367
05:45 PM	16	103	23	28	117	20	307
Total	59	480	191	179	503	62	1474
Grand Total	114	1000	425	326	812	117	2794
Apprch %	10.2	89.8	56.6	43.4	87.4	12.6	
Total %	4.1	35.8	15.2	11.7	29.1	4.2	
Cars	113	998	418	326	809	113	2777
% Cars	99.1	99.8	98.4	100	99.6	96.6	99.4
Trucks	1	2	7	0	3	4	17
% Trucks	0.9	0.2	1.6	0	0.4	3.4	0.6

Accurate Counts
978-664-2565

N/S Street : Route 30
E/W Street: New York Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 73240011
Site Code : 73240011
Start Date : 6/22/2016
Page No : 2

	Route 30 From North			New York Ave From East			Route 30 From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	15	130	145	75	56	131	82	10	92	368
04:45 PM	15	118	133	49	40	89	98	22	120	342
05:00 PM	12	127	139	65	64	129	110	17	127	395
05:15 PM	12	132	144	65	51	116	135	10	145	405
Total Volume	54	507	561	254	211	465	425	59	484	1510
% App. Total	9.6	90.4		54.6	45.4		87.8	12.2		
PHF	.900	.960	.967	.847	.824	.887	.787	.670	.834	.932
Cars	53	506	559	250	211	461	423	55	478	1498
% Cars	98.1	99.8	99.6	98.4	100	99.1	99.5	93.2	98.8	99.2
Trucks	1	1	2	4	0	4	2	4	6	12
% Trucks	1.9	0.2	0.4	1.6	0	0.9	0.5	6.8	1.2	0.8



Accurate Counts
978-664-2565

N/S Street : Route 30
E/W Street: New York Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 73240011
Site Code : 73240011
Start Date : 6/22/2016
Page No : 4

Groups Printed- Cars

	Route 30 From North		New York Ave From East		Route 30 From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	13	132	47	26	58	9	285
04:15 PM	12	140	61	25	71	14	323
04:30 PM	15	130	74	56	81	8	364
04:45 PM	14	118	49	40	98	20	339
Total	54	520	231	147	308	51	1311
05:00 PM	12	127	64	64	109	17	393
05:15 PM	12	131	63	51	135	10	402
05:30 PM	19	118	37	36	140	15	365
05:45 PM	16	102	23	28	117	20	306
Total	59	478	187	179	501	62	1466
Grand Total	113	998	418	326	809	113	2777
Apprch %	10.2	89.8	56.2	43.8	87.7	12.3	
Total %	4.1	35.9	15.1	11.7	29.1	4.1	

Accurate Counts
978-664-2565

N/S Street : Route 30
E/W Street: New York Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 73240011
Site Code : 73240011
Start Date : 6/22/2016
Page No : 7

Groups Printed- Trucks

	Route 30 From North		New York Ave From East		Route 30 From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	0	0	2	0	0	0	2
04:15 PM	0	0	0	0	0	0	0
04:30 PM	0	0	1	0	1	2	4
04:45 PM	1	0	0	0	0	2	3
Total	1	0	3	0	1	4	9
05:00 PM	0	0	1	0	1	0	2
05:15 PM	0	1	2	0	0	0	3
05:30 PM	0	0	1	0	1	0	2
05:45 PM	0	1	0	0	0	0	1
Total	0	2	4	0	2	0	8
Grand Total	1	2	7	0	3	4	17
Apprch %	33.3	66.7	100	0	42.9	57.1	
Total %	5.9	11.8	41.2	0	17.6	23.5	

Accurate Counts
978-664-2565

N/S Street : Route 30
E/W Street: New York Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 73240011
Site Code : 73240011
Start Date : 6/22/2016
Page No : 10

Groups Printed- Bikes Peds

	Route 30 From North			New York Ave From East			Route 30 From South					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	2	0	0	2	0	0	0	4	4
04:15 PM	0	0	0	0	0	0	2	0	0	0	2	2
04:30 PM	0	0	0	1	0	0	1	0	0	0	2	2
04:45 PM	0	0	0	0	1	0	0	0	0	0	1	1
Total	0	0	0	3	1	0	5	0	0	0	9	9
05:00 PM	0	0	0	1	0	0	0	0	0	0	1	1
05:15 PM	0	0	0	0	0	0	3	0	0	0	3	3
05:30 PM	0	1	0	0	0	0	3	0	0	0	4	4
05:45 PM	0	0	0	1	0	0	1	0	0	0	2	2
Total	0	1	0	2	0	0	7	0	0	0	10	10
Grand Total	0	1	0	5	1	0	12	0	0	0	19	19
Apprch %	0	100		83.3	16.7		100	0				
Total %	0	5.3		26.3	5.3		63.2	0		0	100	

Accurate Counts
978-664-2565

N/S Street : Route 30
E/W Street: New York Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 73240011
Site Code : 73240011
Start Date : 6/22/2016
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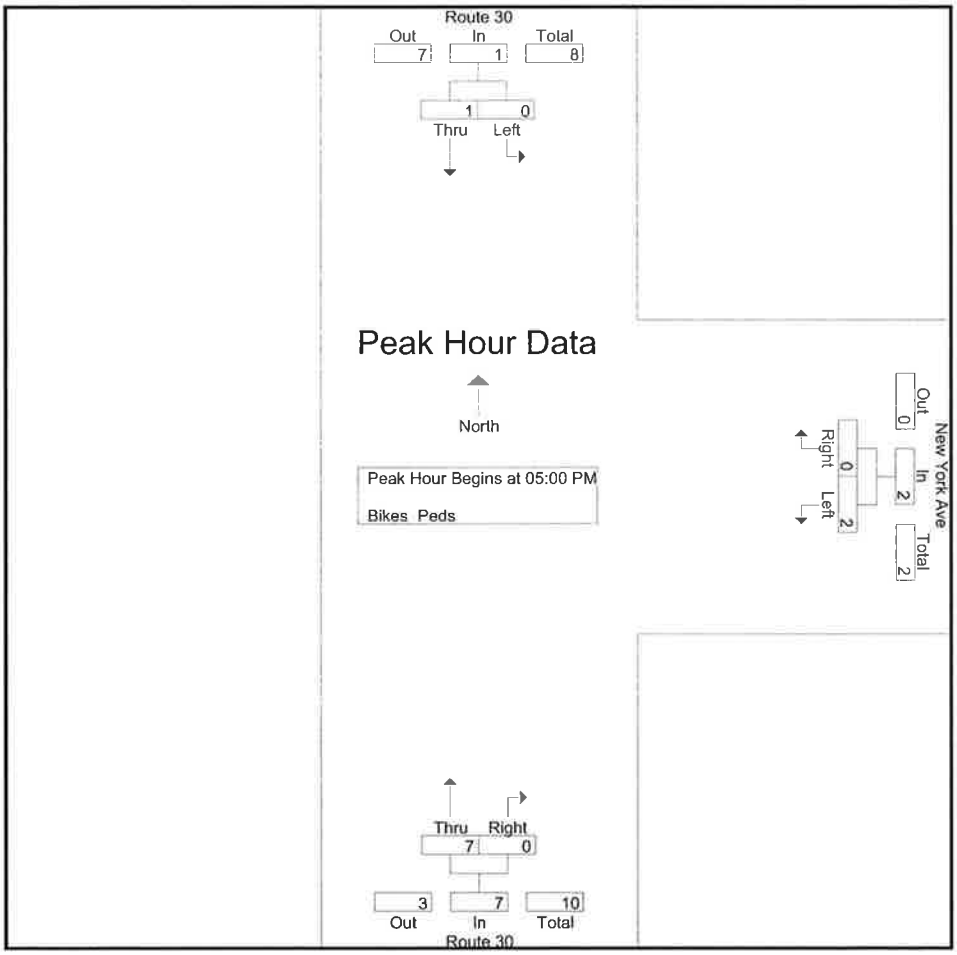
	Route 30 From North			New York Ave From East			Route 30 From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	0	0	0	1	0	1	0	0	0	1
05:15 PM	0	0	0	0	0	0	3	0	3	3
05:30 PM	0	1	1	0	0	0	3	0	3	4
05:45 PM	0	0	0	1	0	1	1	0	1	2
Total Volume	0	1	1	2	0	2	7	0	7	10
% App. Total	0	100		100	0		100	0		
PHF	.000	.250	.250	.500	.000	.500	.583	.000	.583	.625



Accurate Counts
978-664-2565

N/S Street : Country Club Lane
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 73240012
Site Code : 73240012
Start Date : 6/22/2016
Page No : 1

Groups Printed- Cars - Trucks

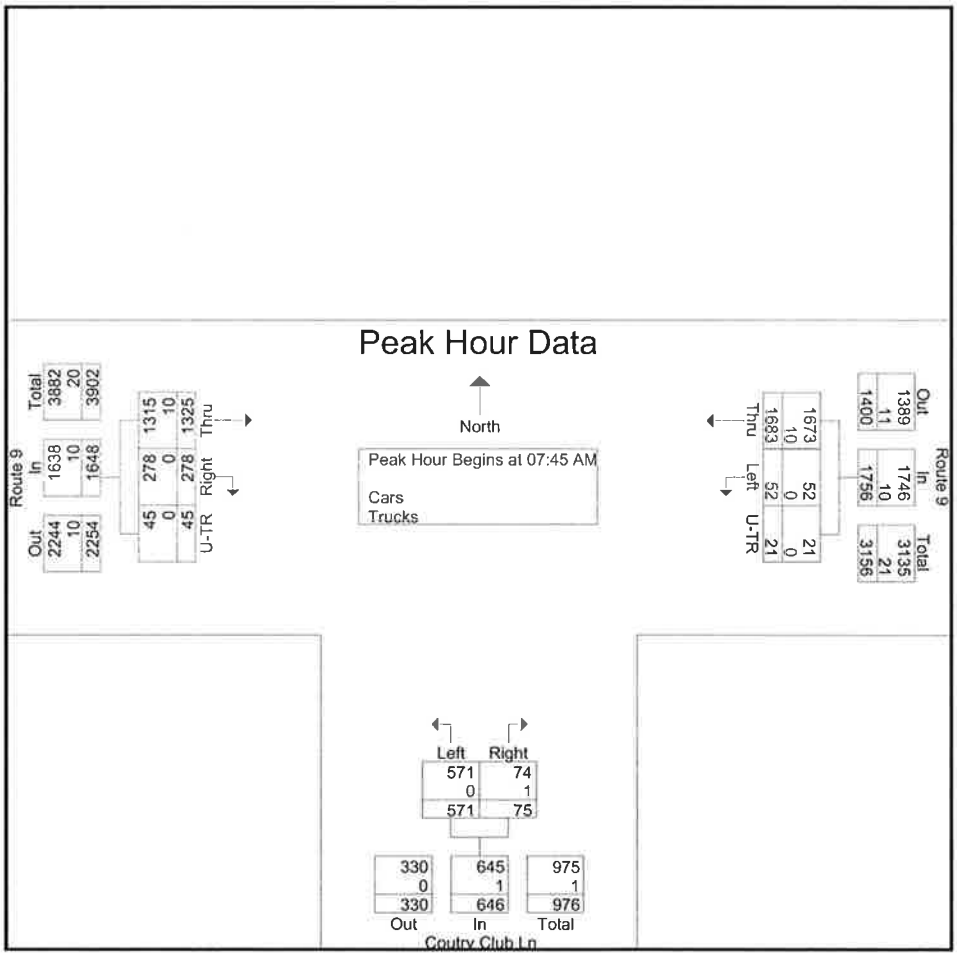
	Route 9 From East			Coutry Club Ln From South		Route 9 From West			
Start Time	Left	Thru	U-TR	Left	Right	Thru	Right	U-TR	Int. Total
07:00 AM	7	262	5	76	21	407	79	4	861
07:15 AM	14	305	6	117	19	374	76	10	921
07:30 AM	9	362	3	119	17	417	101	12	1040
07:45 AM	15	427	6	135	19	327	86	11	1026
Total	45	1356	20	447	76	1525	342	37	3848
08:00 AM	14	385	2	125	16	313	67	16	938
08:15 AM	14	446	2	157	27	321	62	6	1035
08:30 AM	9	425	11	154	13	364	63	12	1051
08:45 AM	13	309	7	125	17	332	63	11	877
Total	50	1565	22	561	73	1330	255	45	3901
Grand Total	95	2921	42	1008	149	2855	597	82	7749
Apprch %	3.1	95.5	1.4	87.1	12.9	80.8	16.9	2.3	
Total %	1.2	37.7	0.5	13	1.9	36.8	7.7	1.1	
Cars	95	2895	42	1008	148	2818	595	82	7683
% Cars	100	99.1	100	100	99.3	98.7	99.7	100	99.1
Trucks	0	26	0	0	1	37	2	0	66
% Trucks	0	0.9	0	0	0.7	1.3	0.3	0	0.9

Accurate Counts
978-664-2565

N/S Street : Country Club Lane
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 73240012
Site Code : 73240012
Start Date : 6/22/2016
Page No : 2

	Route 9 From East				Coutry Club Ln From South			Route 9 From West				
Start Time	Left	Thru	U-TR	App. Total	Left	Right	App. Total	Thru	Right	U-TR	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1												
Peak Hour for Entire Intersection Begins at 07:45 AM												
07:45 AM	15	427	6	448	135	19	154	327	86	11	424	1026
08:00 AM	14	385	2	401	125	16	141	313	67	16	396	938
08:15 AM	14	446	2	462	157	27	184	321	62	6	389	1035
08:30 AM	9	425	11	445	154	13	167	364	63	12	439	1051
Total Volume	52	1683	21	1756	571	75	646	1325	278	45	1648	4050
% App. Total	3	95.8	1.2		88.4	11.6		80.4	16.9	2.7		
PHF	.867	.943	.477	.950	.909	.694	.878	.910	.808	.703	.938	.963
Cars	52	1673	21	1746	571	74	645	1315	278	45	1638	4029
% Cars	100	99.4	100	99.4	100	98.7	99.8	99.2	100	100	99.4	99.5
Trucks	0	10	0	10	0	1	1	10	0	0	10	21
% Trucks	0	0.6	0	0.6	0	1.3	0.2	0.8	0	0	0.6	0.5



Accurate Counts
978-664-2565

N/S Street : Country Club Lane
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 73240012
Site Code : 73240012
Start Date : 6/22/2016
Page No : 1

Groups Printed- Cars

	Route 9 From East			Coutry Club Ln From South		Route 9 From West			
Start Time	Left	Thru	U-TR	Left	Right	Thru	Right	U-TR	Int. Total
07:00 AM	7	259	5	76	21	397	79	4	848
07:15 AM	14	300	6	117	19	369	75	10	910
07:30 AM	9	358	3	119	17	411	101	12	1030
07:45 AM	15	424	6	135	19	326	86	11	1022
Total	45	1341	20	447	76	1503	341	37	3810
08:00 AM	14	382	2	125	16	311	67	16	933
08:15 AM	14	442	2	157	26	317	62	6	1026
08:30 AM	9	425	11	154	13	361	63	12	1048
08:45 AM	13	305	7	125	17	326	62	11	866
Total	50	1554	22	561	72	1315	254	45	3873
Grand Total	95	2895	42	1008	148	2818	595	82	7683
Apprch %	3.1	95.5	1.4	87.2	12.8	80.6	17	2.3	
Total %	1.2	37.7	0.5	13.1	1.9	36.7	7.7	1.1	

Accurate Counts
978-664-2565

N/S Street : Country Club Lane
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 73240012
Site Code : 73240012
Start Date : 6/22/2016
Page No : 1

Groups Printed- Trucks

	Route 9 From East			Coutry Club Ln From South		Route 9 From West			
Start Time	Left	Thru	U-TR	Left	Right	Thru	Right	U-TR	Int. Total
07:00 AM	0	3	0	0	0	10	0	0	13
07:15 AM	0	5	0	0	0	5	1	0	11
07:30 AM	0	4	0	0	0	6	0	0	10
07:45 AM	0	3	0	0	0	1	0	0	4
Total	0	15	0	0	0	22	1	0	38
08:00 AM	0	3	0	0	0	2	0	0	5
08:15 AM	0	4	0	0	1	4	0	0	9
08:30 AM	0	0	0	0	0	3	0	0	3
08:45 AM	0	4	0	0	0	6	1	0	11
Total	0	11	0	0	1	15	1	0	28
Grand Total	0	26	0	0	1	37	2	0	66
Apprch %	0	100	0	0	100	94.9	5.1	0	
Total %	0	39.4	0	0	1.5	56.1	3	0	

Accurate Counts
978-664-2565

N/S Street : Country Club Lane
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 73240012
Site Code : 73240012
Start Date : 6/22/2016
Page No : 1

Groups Printed- Bikes Peds

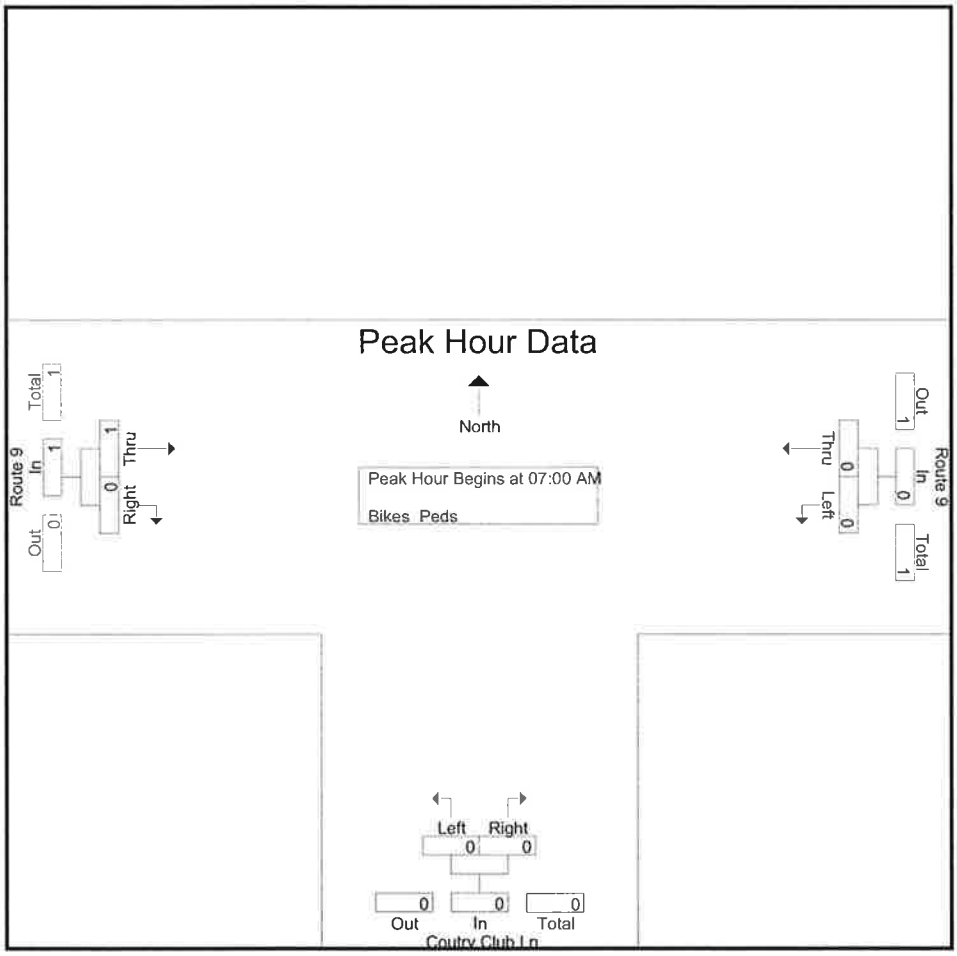
	Route 9 From East			Coutry Club Ln From South			Route 9 From West					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	1	0	0	0	1	1
Total	0	0	0	0	0	0	1	0	0	0	1	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	1	0	0	0	1	1
Apprch %	0	0		0	0		100	0				
Total %	0	0		0	0		100	0		0	100	

Accurate Counts
978-664-2565

N/S Street : Country Club Lane
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 73240012
Site Code : 73240012
Start Date : 6/22/2016
Page No : 2

	Route 9 From East			Coutry Club Ln From South			Route 9 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	1	0	1	1
Total Volume	0	0	0	0	0	0	1	0	1	1
% App. Total	0	0		0	0		100	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250



Accurate Counts
978-664-2565

N/S Street : Country Club Lane
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 73240012
Site Code : 73240012
Start Date : 6/22/2016
Page No : 1

Groups Printed- Cars - Trucks

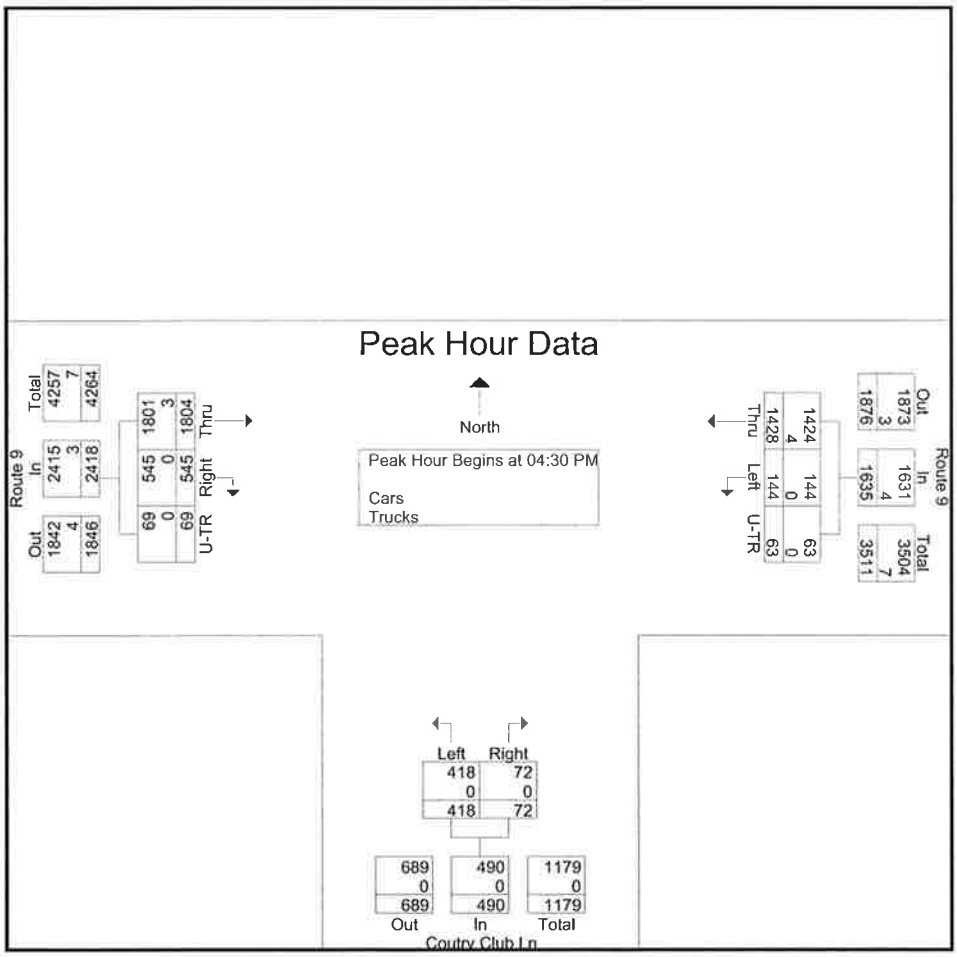
	Route 9 From East			Coutry Club Ln From South		Route 9 From West			
Start Time	Left	Thru	U-TR	Left	Right	Thru	Right	U-TR	Int. Total
04:00 PM	18	390	8	110	11	359	104	17	1017
04:15 PM	35	425	15	113	15	427	112	14	1156
04:30 PM	32	394	18	93	14	460	135	16	1162
04:45 PM	31	333	19	109	22	452	126	19	1111
Total	116	1542	60	425	62	1698	477	66	4446
05:00 PM	22	346	17	106	19	440	142	13	1105
05:15 PM	59	355	9	110	17	452	142	21	1165
05:30 PM	31	370	8	104	19	459	136	8	1135
05:45 PM	24	342	12	76	18	432	136	24	1064
Total	136	1413	46	396	73	1783	556	66	4469
Grand Total	252	2955	106	821	135	3481	1033	132	8915
Apprch %	7.6	89.2	3.2	85.9	14.1	74.9	22.2	2.8	
Total %	2.8	33.1	1.2	9.2	1.5	39	11.6	1.5	
Cars	252	2947	106	821	135	3473	1033	132	8899
% Cars	100	99.7	100	100	100	99.8	100	100	99.8
Trucks	0	8	0	0	0	8	0	0	16
% Trucks	0	0.3	0	0	0	0.2	0	0	0.2

Accurate Counts
978-664-2565

N/S Street : Country Club Lane
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 73240012
Site Code : 73240012
Start Date : 6/22/2016
Page No : 2

	Route 9 From East				Coutry Club Ln From South			Route 9 From West				
Start Time	Left	Thru	U-TR	App. Total	Left	Right	App. Total	Thru	Right	U-TR	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1												
Peak Hour for Entire Intersection Begins at 04:30 PM												
04:30 PM	32	394	18	444	93	14	107	460	135	16	611	1162
04:45 PM	31	333	19	383	109	22	131	452	126	19	597	1111
05:00 PM	22	346	17	385	106	19	125	440	142	13	595	1105
05:15 PM	59	355	9	423	110	17	127	452	142	21	615	1165
Total Volume	144	1428	63	1635	418	72	490	1804	545	69	2418	4543
% App. Total	8.8	87.3	3.9		85.3	14.7		74.6	22.5	2.9		
PHF	.610	.906	.829	.921	.950	.818	.935	.980	.960	.821	.983	.975
Cars	144	1424	63	1631	418	72	490	1801	545	69	2415	4536
% Cars	100	99.7	100	99.8	100	100	100	99.8	100	100	99.9	99.8
Trucks	0	4	0	4	0	0	0	3	0	0	3	7
% Trucks	0	0.3	0	0.2	0	0	0	0.2	0	0	0.1	0.2



Accurate Counts
978-664-2565

N/S Street : Country Club Lane
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 73240012
Site Code : 73240012
Start Date : 6/22/2016
Page No : 1

Groups Printed- Cars

	Route 9 From East			Coutry Club Ln From South		Route 9 From West			
Start Time	Left	Thru	U-TR	Left	Right	Thru	Right	U-TR	Int. Total
04:00 PM	18	390	8	110	11	358	104	17	1016
04:15 PM	35	424	15	113	15	425	112	14	1153
04:30 PM	32	393	18	93	14	459	135	16	1160
04:45 PM	31	333	19	109	22	452	126	19	1111
Total	116	1540	60	425	62	1694	477	66	4440
05:00 PM	22	343	17	106	19	439	142	13	1101
05:15 PM	59	355	9	110	17	451	142	21	1164
05:30 PM	31	369	8	104	19	458	136	8	1133
05:45 PM	24	340	12	76	18	431	136	24	1061
Total	136	1407	46	396	73	1779	556	66	4459
Grand Total	252	2947	106	821	135	3473	1033	132	8899
Apprch %	7.6	89.2	3.2	85.9	14.1	74.9	22.3	2.8	
Total %	2.8	33.1	1.2	9.2	1.5	39	11.6	1.5	

Accurate Counts
978-664-2565

N/S Street : Country Club Lane
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 73240012
Site Code : 73240012
Start Date : 6/22/2016
Page No : 1

Groups Printed- Trucks

	Route 9 From East			Coutry Club Ln From South		Route 9 From West			
Start Time	Left	Thru	U-TR	Left	Right	Thru	Right	U-TR	Int. Total
04:00 PM	0	0	0	0	0	1	0	0	1
04:15 PM	0	1	0	0	0	2	0	0	3
04:30 PM	0	1	0	0	0	1	0	0	2
04:45 PM	0	0	0	0	0	0	0	0	0
Total	0	2	0	0	0	4	0	0	6
05:00 PM	0	3	0	0	0	1	0	0	4
05:15 PM	0	0	0	0	0	1	0	0	1
05:30 PM	0	1	0	0	0	1	0	0	2
05:45 PM	0	2	0	0	0	1	0	0	3
Total	0	6	0	0	0	4	0	0	10
Grand Total	0	8	0	0	0	8	0	0	16
Apprch %	0	100	0	0	0	100	0	0	
Total %	0	50	0	0	0	50	0	0	

Accurate Counts
978-664-2565

N/S Street : Country Club Lane
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 73240012
Site Code : 73240012
Start Date : 6/22/2016
Page No : 1

Groups Printed- Bikes Peds

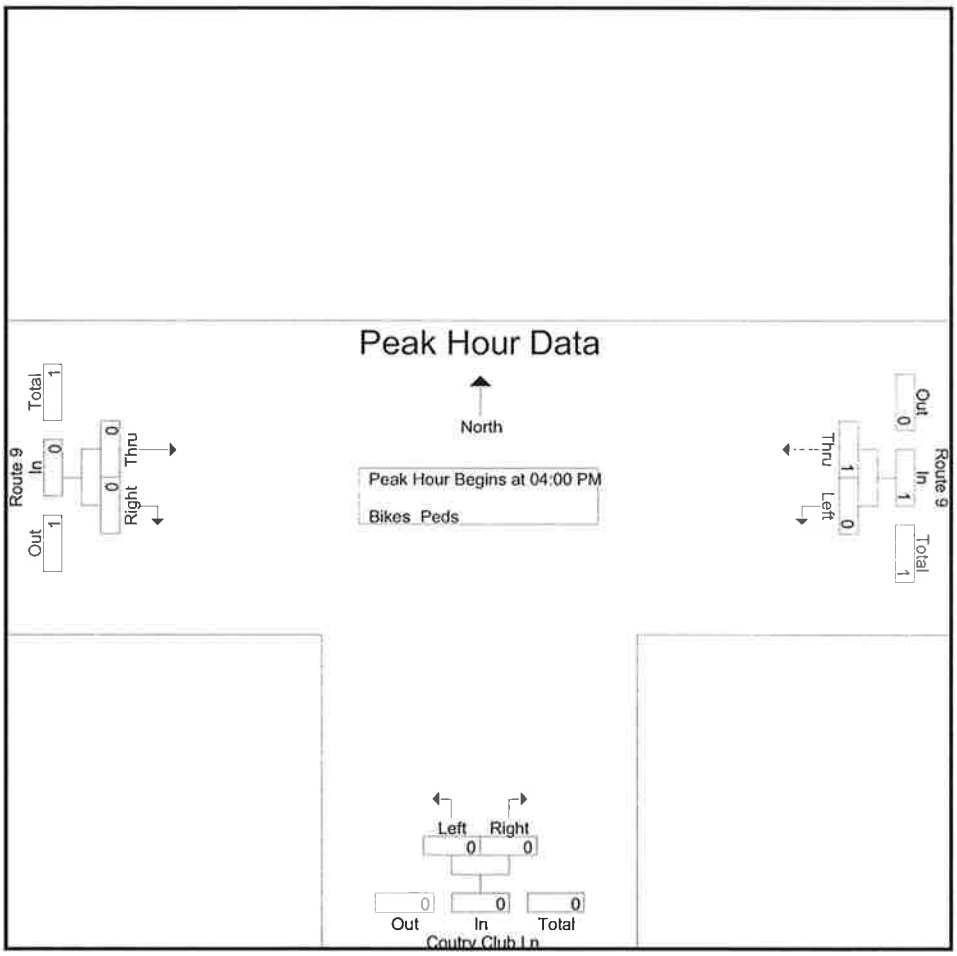
	Route 9 From East			Coutry Club Ln From South			Route 9 From West					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	1	0	0	0	0	0	0	0	0	1	1
04:15 PM	0	0	0	0	0	1	0	0	0	1	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	1	0	0	0	1	1	2
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	1	0	0	0	1	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	0	0	1	0	1
Grand Total	0	1	0	0	0	2	0	0	0	2	1	3
Apprch %	0	100		0	0		0	0				
Total %	0	100		0	0		0	0		66.7	33.3	

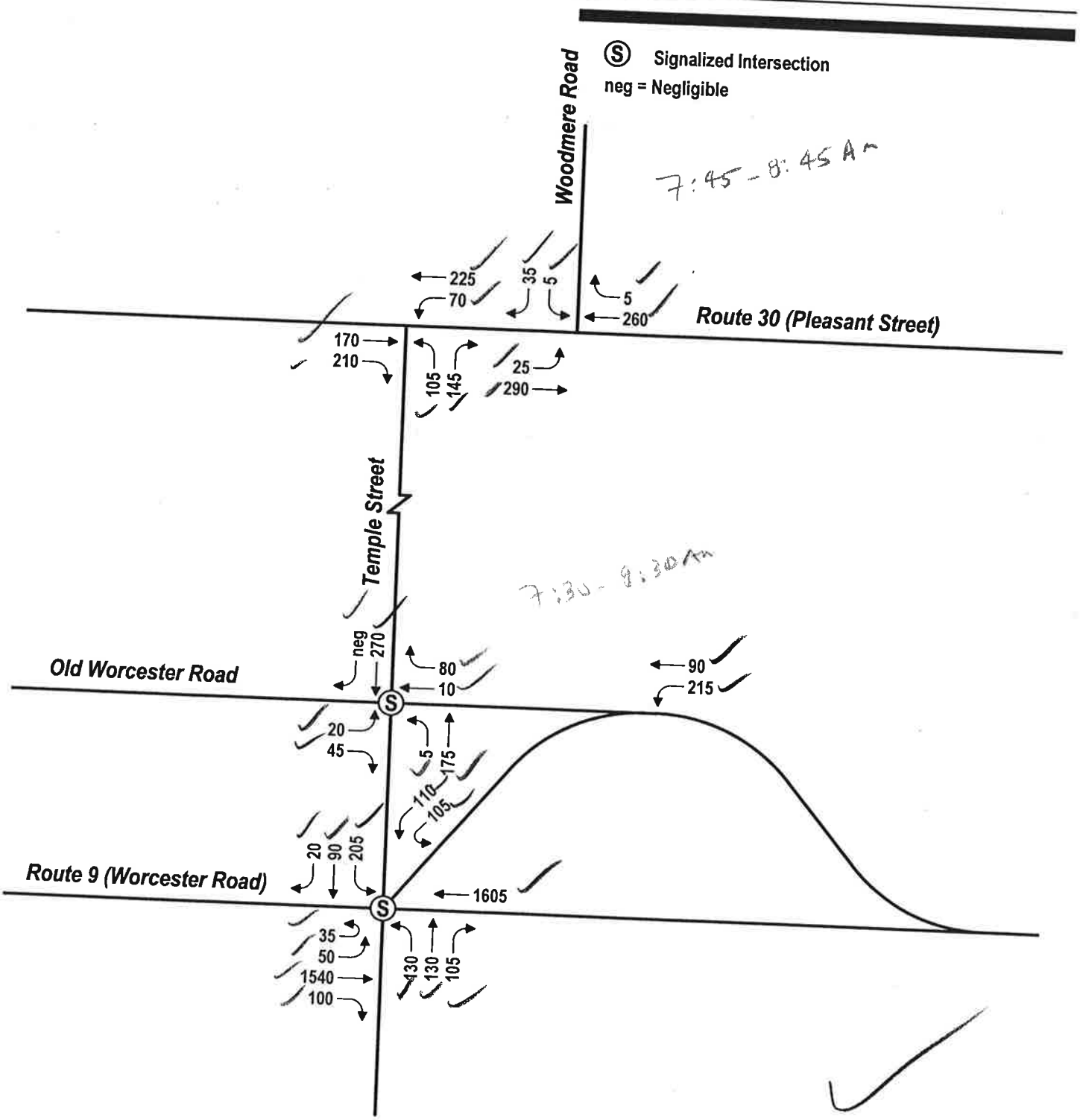
Accurate Counts
978-664-2565

N/S Street : Country Club Lane
E/W Street : Route 9
City/State : Framingham, MA
Weather : Clear

File Name : 73240012
Site Code : 73240012
Start Date : 6/22/2016
Page No : 2

	Route 9 From East			Coutry Club Ln From South			Route 9 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	1	1	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	1	0	0	0	0	0	0	1
% App. Total	0	100		0	0		0	0		
PHF	.000	.250	.250	.000	.000	.000	.000	.000	.000	.250





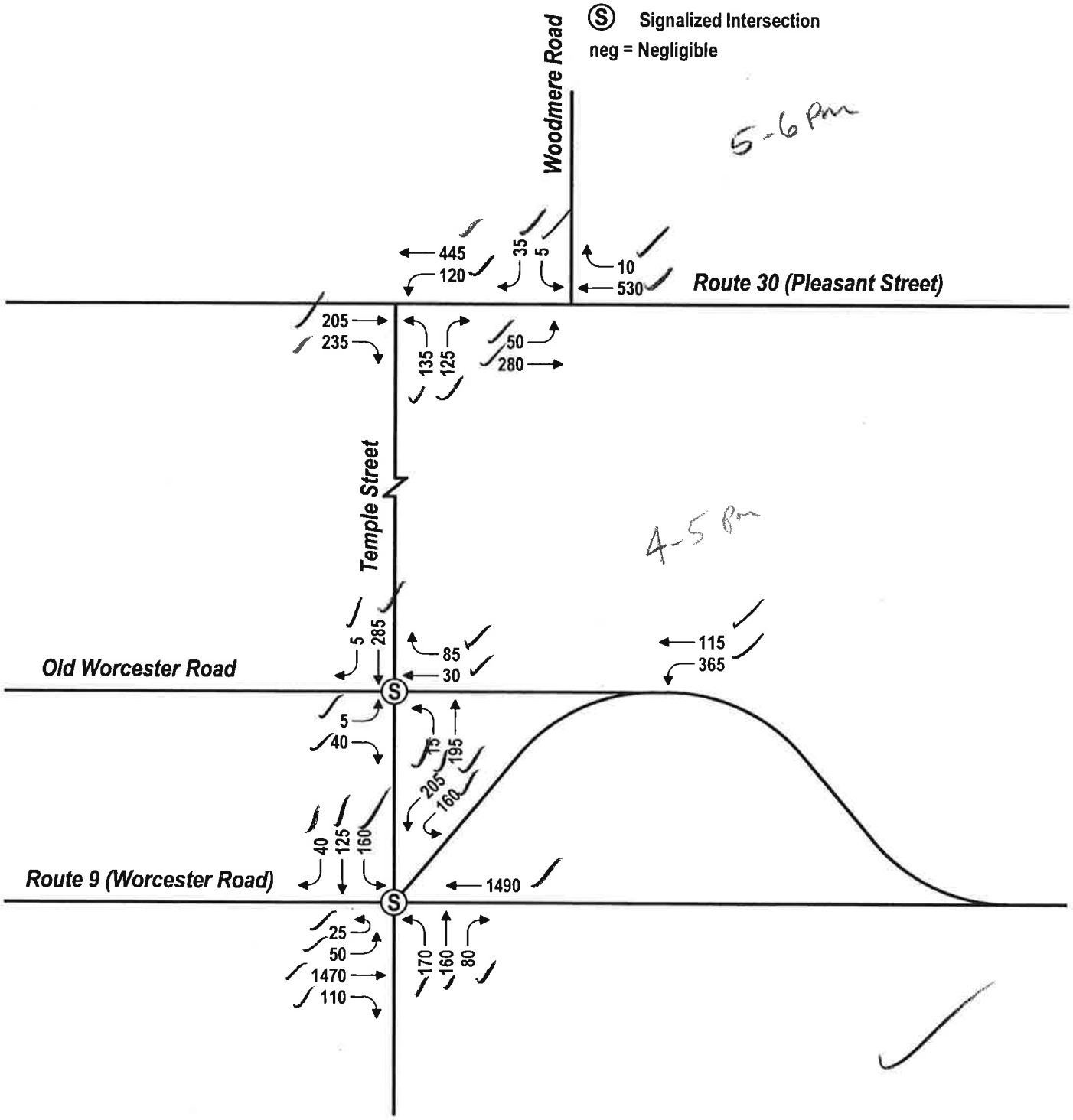
Not to Scale

vhb

2015 Existing Conditions
Weekday Morning Peak Hour Traffic Volumes
Northside Meadows
Framingham, Massachusetts

Figure 3

December 2015



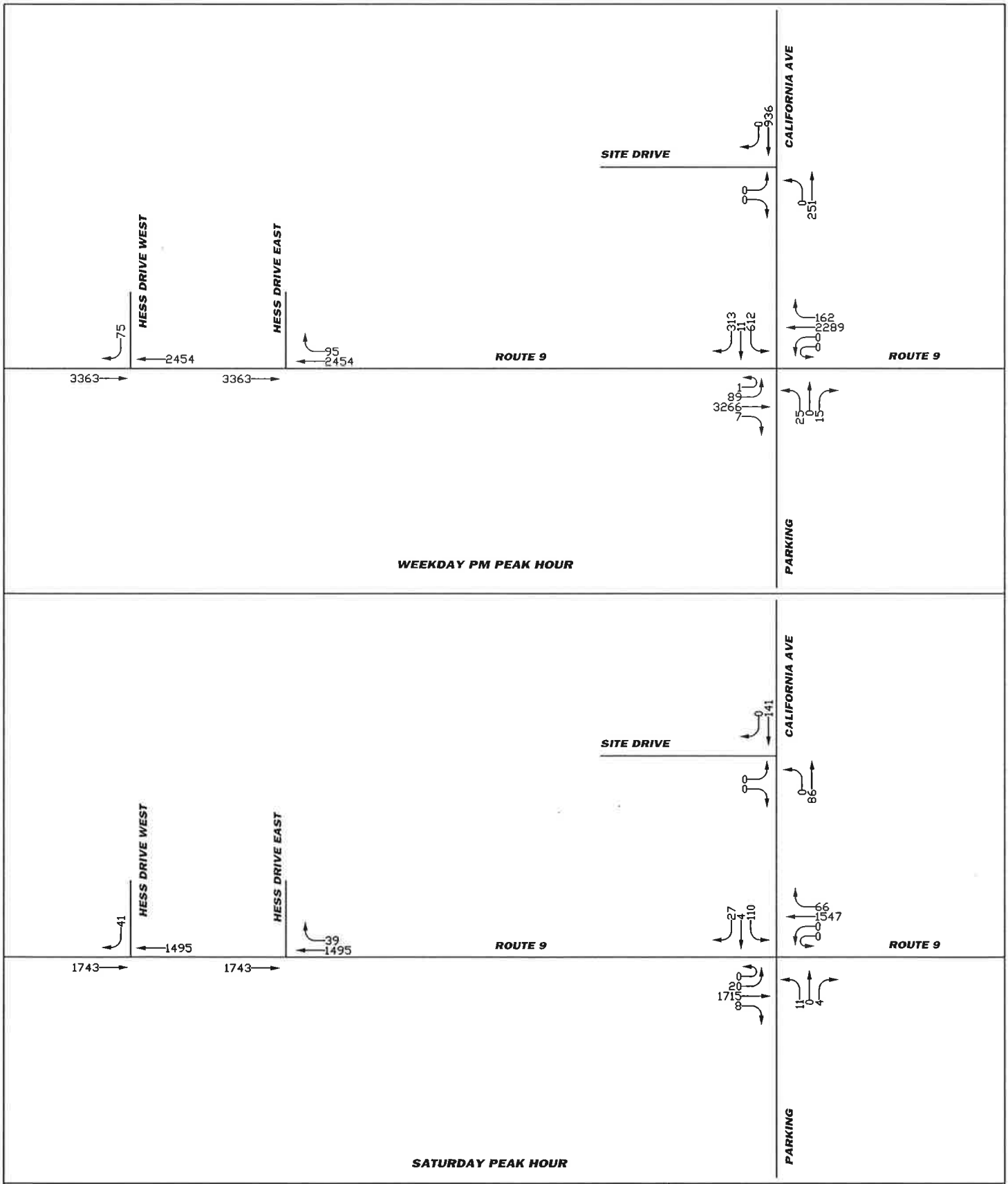
Not to Scale

vhb

2015 Existing Conditions
Weekday Evening Peak Hour Traffic Volumes
Northside Meadows
Framingham, Massachusetts

Figure 4

December 2015



CONLEY ASSOCIATES

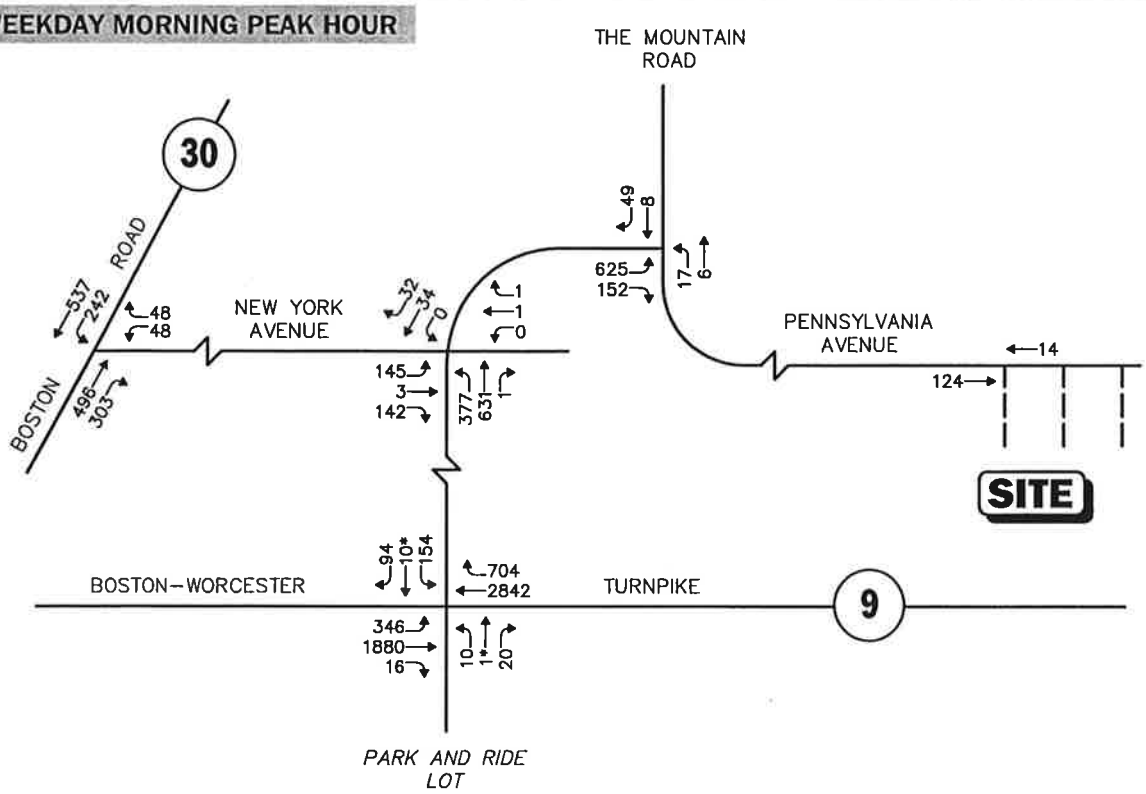
40 Warren St, #346
Boston, MA 02129
(617) 742-5111
www.ConleyAssociates.com

1521\cad\Networks.dwg

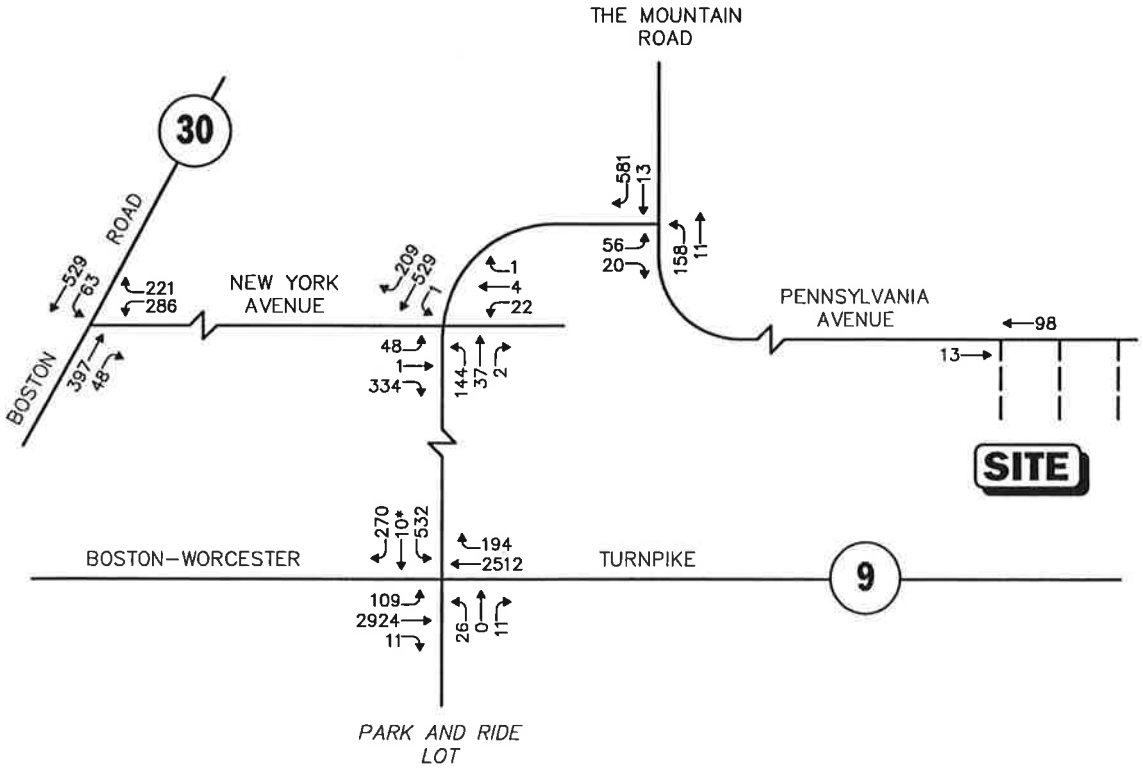
FIGURE 1
EXISTING CONDITIONS
PEAK HOUR TRAFFIC VOLUMES
WENDY'S FRAMINGHAM

PROJ. NO. 1521 DATE: DECEMBER 2014 NOT TO SCALE

WEEKDAY MORNING PEAK HOUR



WEEKDAY EVENING PEAK HOUR



* Illegal Movement

Not To Scale

Figure 3

2009 Existing Peak Hour Traffic Volumes

Vanasse & Associates, Inc.
Transportation Engineers & Planners

R:\5483\5483ntl.dwg 6/18/2009 10:10:01 AM EDT

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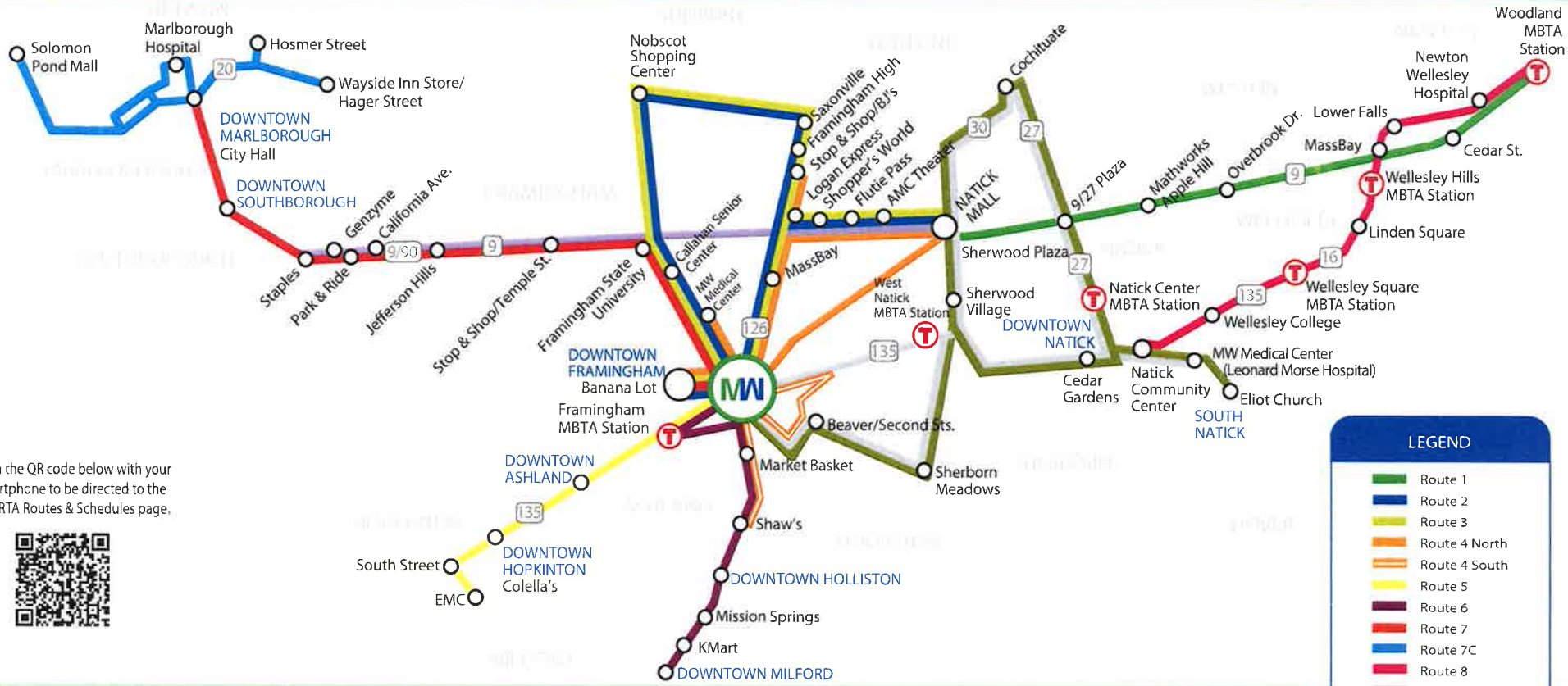
PUBLIC TRANSPORTATION INFORMATION AND SCHEDULES

METROWEST REGIONAL TRANSIT AUTHORITY

Public Transportation System



Scan the QR code below with your smartphone to be directed to the MWRTA Routes & Schedules page.

LEGEND

- Route 1
- Route 2
- Route 3
- Route 4 North
- Route 4 South
- Route 5
- Route 6
- Route 7
- Route 7C
- Route 8
- Route 9
- Route 10
- Route 11
- Scheduled Stop
- Blandin Hub
- The MWRTA uses the "flag down" system.

MetroWest Regional Transit Authority

From Solomon Pond Mall in Marlborough to Woodland Station in Newton—We've got you covered.

MetroWest Regional Transit Authority (MWTRA) provides public transportation along twelve different bus routes connecting the entire MetroWest community.

We provide access to all major area employers, medical facilities, and shopping locations. MWRTA also connects commuters with the Massachusetts Bay Transportation Authority (MBTA) system. The commuter rail connection can take you eastbound or westbound to Boston or Worcester.

Go Green! Be friendly to our environment and be mindful of your carbon footprint.

Customer Service & Travel Information
Please call 508.935.2222 or visit us online at mwrta.com.

Blandin Hub is located at 15 Blandin Avenue in Framingham.

www.mwrta.com 508.935.2222

@mwrta

Express Commuter Service ONLY

FCS

MetroWest Regional Transit Authority
Route FCS: Framingham Commuter Shuttle

MW

Effective: May 23, 2016

This schedule is subject to revision.

This route is designed specifically for commuters going to or from the train station and to designated work areas in Framingham during regular work hours.

Scan the QR code below with your smartphone to be directed to the MWRTA Routes and Schedules website.

For up to the minute bus information call the MWRTA at 508.935.2222 or 888.996.9782, or visit www.mwrta.com for GPS tracking.

Please visit our website: www.mwrta.com

Follow Us: @mwrta

Framingham Commuter Shuttle (Monday-Friday Service)

Effective: May 23, 2016

AM Framingham Commuter Shuttle

Blandin Hub (15 Blandin Ave.)	6:10 AM
Framingham Center	6:28 AM
McCarthy Center (FSU tube map)	6:33 AM
Banana Lot (Northside Fram. MBTA Commuter Lot)	IB 6:46 AM Train (bus drops off @ 6:40 am)
Framingham Center	6:55 AM
McCarthy Center (FSU tube map)	7:00 AM
Banana Lot (Northside Fram. MBTA Commuter Lot)	IB 7:11 AM*
	IB 7:42 AM*
	OB 7:46 AM*
McCarthy Center (FSU tube map)	7:56 AM
Jefferson Hills	8:04 AM
Staples (Bike Rack)	8:09 AM
California Ave. via NY Ave.	8:12 AM
Banana Lot (Northside Fram. MBTA Commuter Lot)	IB 8:40 AM* Train
McCarthy Center (FSU tube map)	8:43 AM
Jefferson Hills	8:51 AM
Staples (Bike Rack)	8:56 AM
California Ave. via NY Ave.	8:59 AM
Blandin Hub (15 Blandin Ave.)	9:25 AM

PM Framingham Commuter Shuttle

Blandin Hub (15 Blandin Ave.)	4:15 PM
Staples (Bike Rack)	4:45 PM
California Ave. via NY Ave.	4:48 PM
Jefferson Hills	4:55 PM
McCarthy Center (FSU tube map)	5:00 PM
Banana Lot (Northside Fram. MBTA Commuter Lot)	OB 5:27 PM Train (bus drops off @ 5:12 pm)
	IB 5:40 PM Train
Staples (Bike Rack)	5:30 PM
California Ave. via NY Ave.	5:33 PM
Jefferson Hills	5:40 PM
McCarthy Center (FSU tube map)	5:50 PM
Banana Lot (Northside Fram. MBTA Commuter Lot)	OB 6:07 PM Train*
Framingham Center	6:20 PM
Banana Lot (Northside Fram. MBTA Commuter Lot)	OB 6:44 PM Train
	IB 6:46 PM Train
Blandin Hub (15 Blandin Ave.)	7:25 PM

*** Waits for late train**

Information

-Scheduled times are only approximate.
-The MWRTA will **NOT** be using the Flag Down System on this Framingham Commuter Shuttle. This shuttle runs express between stops.
-This shuttle is intended to meet the above MBTA Commuter Rail arrivals and departures. This shuttle WILL wait for late train arrivals where indicated *. Buses subjected to train delays may cause changes in above destination times.
- This shuttle's only designated stop at Staples is at the bike rack. However, the shuttle will pickup a rider at the Staples bus shelter as long as the rider is there waiting as the shuttle approaches.
-For commuters traveling to the MetroWest area, this shuttle is designed for travelers coming from the Boston area. For commuters coming from the Worcester area, please refer to the BSCS Commuter Shuttle schedule.

No service provided on the following Holidays:

New Year's Day
Patriot's Day
Memorial Day
Independence Day
Thanksgiving Day
Christmas Day

-Service could be limited on other holidays based on demand.

ROUTE 7: Southborough/Marlborough

MetroWest Regional Transportation Authority

ROUTE 7 (Monday-Friday Service)

Cash Fare Information

Adult fare: $1.50 / $1.25 with a Charlie Card
Student fare:$1.00 with valid Student ID.
Children under 6 ride free when accompanied by an adult.
Children under 12 may not ride unaccompanied.
Elderly (65 years of age or older)- $0.75 with photo ID indicating date of birth or a MWRTA senior TAP Pass or $0.70 with a Charlie Card
Individuals with disabilities- Valid MBTA Access Card, Medicare Card or MWRTA Disabled TAP Pass are accepted as proof of eligibility for the MWRTA reduced-fare program.
Charlie Cards are available free of charge at the Waverly Hub or on the bus. Value can be added to existing cards onboard, online at mbta.com, or at an MBTA kiosk.

No service provided on the following Holidays:

New Year's Day
Patriot's Day
Memorial Day
Independence Day
Thanksgiving Day
Christmas Day

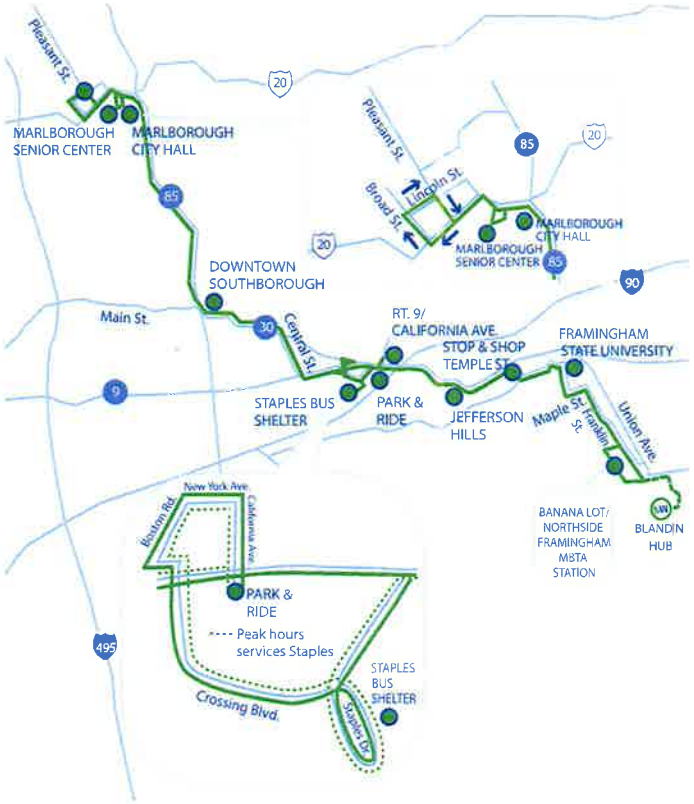
Transfer/Connections

Transfer coupons are available on all buses and are good for transfers within the MWRTA system only. Transfers are not compatable within the MBTA system. Riders wishing to transfer, (free of charge), from one route to another must ask the driver for a transfer coupon and present it to the next driver within 90 minutes.

Riders can access MBTA Commuter Rail Service in Downtown Framingham, at the West Natick Commuter Rail Station, as well as in Downtown Natick. For MBTA schedule and service information call 617.222.3200.

Scan the QR code below with your smartphone to be directed to the MWRTA Routes and Schedules website.

Route 7 (Monday-Friday Service)



MWRTA Customer Service: (508) 935-2222

MWRTA Website: www.mwrta.com

Follow Us: @mwrta

MetroWest Regional Transit Authority
Public Transportation System

7 ROUTE 7 Weekday (Monday-Friday Service) 7

v 7.16

AM

Outbound							
Blandin Hub	5:30	6:15	6:45				
Banana Lot	5:37	6:22	6:50	7:40	8:35	9:50	10:50
FSU/McCarthy Center (Tube Map)*	5:43	6:28	6:56	7:46	8:41	9:56	10:56
Stop & Shop / Temple St.	5:49	6:34	7:01	7:52	8:47	10:02	11:02
Jefferson Hills Complex8	5:55	6:40	EXP	7:58	8:53	10:08	11:08
Staples (Bus Shelter)	6:01	6:46	EXP	8:04	8:59	10:14	11:14
Rt 9 Park and Ride	6:11	6:56	EXP	8:14	9:09	10:24	11:24
Downtown Southborough	6:21	7:06	--	8:24	9:19	10:34	11:34
Main St. (Marlborough)	6:29	7:14	--	8:32	9:27	10:42	11:42
Seven 11 on Broad St**	6:35	7:20	--	8:38	9:33	10:48	11:48
Marlborough Senior Center		7:25		8:43	9:38	10:53	11:53

Inbound							
Marlborough Senior Center		7:30		8:48	9:43	10:58	11:58
Bolton Bus Shelter	6:40	7:35		8:53	9:48	11:03	12:03
Downtown Southborough	6:49	7:44		9:02	9:57	11:12	12:12
Staples (Bus Shelter)	7:00	7:55		9:13	10:08	11:23	12:23
Rt 9 Park & Ride	7:09	8:04		9:22	10:17	11:32	12:32
Jefferson Hills Complex*	7:15	8:10		9:28	10:23	11:38	12:38
Chapel Hill	7:17	8:12		9:30	10:25	11:40	12:40
Stop and Shop / Temple St.	7:22	8:17		9:35	10:30	11:45	12:45
FSU/McCarthy Center (Tube Map)*	7:28	8:23		9:41	10:36	11:51	12:51
Banana Lot	7:35	8:30		9:48	10:43	11:58	12:57
Howard St at Casa Del Carne						12:01	12:58
Blandin Hub						12:05	1:00

PM

Outbound								
Blandin Hub		12:25	1:00	1:45				
Banana Lot		12:30	1:02	1:50	3:15	4:05	5:25	6:20
FSU/McCarthy Center (Tube Map)*		12:36	1:08	1:56	3:21	4:11	5:31	6:26
Stop & Shop / Temple St.		12:40	1:14	2:02	3:27	4:17	5:37	6:32
Jefferson Hills Complex8		12:45	1:20	2:08	3:33	4:23	5:43	6:38
Staples (Bus Shelter)		12:52	1:26	2:14	3:39	4:29	5:49	6:44
Rt 9 Park and Ride		12:55	1:36	2:24	3:49	4:39	5:59	6:52
Downtown Southborough		--	1:46	2:34	3:59	4:49	6:09	7:02
Main St. (Marlborough)		--	1:54	2:42	4:07	4:57	6:17	7:10
Seven 11 on Broad St**	1:20	--	2:00	2:48	4:13	5:03	6:23	7:16
Marlborough Senior Center			2:05	2:53	4:18	5:08	6:28	7:21

Inbound								
Marlborough Senior Center		2:10	2:58	4:23	5:13	6:33	7:26	
Bolton Bus Shelter	1:25	2:15	3:03	4:28	5:18	6:38	7:31	8:06
Downtown Southborough	1:42	2:24	3:12	4:37	5:27	6:47	7:40	--
Staples (Bus Shelter)	1:54	2:35	3:23	4:48	5:38	6:58	7:51	--
Rt 9 Park & Ride	2:03	2:44	3:32	4:57	5:47	7:07	8:00	8:25
Jefferson Hills Complex*	2:07	2:50	3:38	5:03	5:53	7:13	8:06	8:27
Chapel Hill	2:09	2:52	3:40	5:05	5:55	7:16	8:08	8:29
Stop and Shop / Temple St.	2:14	2:57	3:45	5:10	6:00	7:20	8:13	8:31
FSU/McCarthy Center (Tube Map)*	2:18	3:03	3:51	5:16	6:06	7:26	8:19	8:35
Banana Lot	2:24	3:10	3:58	5:23	6:13	7:33	8:26	8:40
Howard St at Casa Del Carne	2:26					7:38	8:28	8:41
Blandin Hub	2:30					7:43	8:30	8:45

Scheduled Times

Scheduled times are only approximate; please wait for the MWRTA ten minutes in advance of scheduled times to assure not missing the bus.

For up to the minute bus information call the MWRTA at 508.935.2222 or 888.996.9782, or visit www.mwrta.com for GPS tracking.

The MWRTA uses the Flag Down System which allows buses to stop anywhere along their routes to pick up passengers, where it is safe to do so. Passengers can hail MWRTA buses by waving.

Buses will only stop where express (EXP) is indicated for drop-offs only. Any scheduled times shown in red continue on as the 7C after arriving at the Main Street stop. Both inbound scheduled times listed in red (previously the 7C) will continue on as the Route 7 into Framingham.

Banana Lot is the Framingham MBTA Commuter Rail Station Northside Parking Lot

** Make connections to the 7C at Main Street, Marlborough Senior Center or the Seven 11 on Broad St.

Hub Info: Blandin Hub-15 Blandin Ave.

Transfers

Route 7 passengers can make the following transfers: Routes 2, 3, 4N at the Banana Lot; Route 7C at Main St. in Marlborough and the Marlborough Senior Center and Route 9 at Jefferson Hills, Rte. 9 Park & Ride and Staples Bus Shelter.

***To request a deviation please call Customer Service at (508)-935-2222.

*Stop may NOT be serviced due to snow/ice.

MetroWest Regional Transit Authority
Public Transportation System

ROUTE 7 SATURDAY

7 Saturday

v 7.16

	AM		PM	
Outbound				
Blandin Hub	8:30			
Banana Lot	8:35	10:50	1:00	3:13
FSU/McCarthy Center (Tube Map)*	8:41	10:56	1:06	3:19
Stop and Shop / Temple St.	8:47	11:02	1:12	3:25
Jefferson Hills Complex*	8:53	11:08	1:18	3:31
Staples (Bus Shelter)	8:59	11:14	1:24	3:37
Rt 9 Park and Ride	9:09	11:24	1:34	3:47
Downtown Southborough	9:19	11:34	1:44	3:57
Main St. (Marlborough)	9:27	11:42	1:52	4:05
Seven 11 on Broad St	9:33	11:48	1:58	4:11
Marlborough Senior Center	9:38	11:53	2:03	4:16
Inbound				
Marlborough Senior Center	9:43	11:58	2:08	4:21
Bolton Bus Shelter	9:48	12:03P	2:13	4:26
Downtown Southborough	9:57	12:12P	2:22	4:35
Staples Bus Shelter	10:08	12:23P	2:33	4:46
Rt 9 Park & Ride	10:17	12:32P	2:42	4:55
Jefferson Hills Complex*	10:23	12:38P	2:48	5:01
Chapel Hill	10:25	12:40P	2:50	5:03
Stop & Shop / Temple St.	10:30	12:45P	2:55	5:08
FSU/McCarthy Center (Tube Map)*	10:36	12:51P	3:01	5:14
Banana Lot	10:43	12:57P	3:08	5:21
Howard St / Casa Del Carne				5:26
Blandin Hub				5:30

Transfers

Route 7 Saturday passengers can make the following transfers: Routes 2, 3, 4N Saturday at the Banana Lot and Route 7C in Marlborough.

***To request a deviation please call Customer Service at 508-935-2222.

Scheduled Times

Scheduled times are only approximate; please wait for the MWRTA ten minutes in advance of scheduled times to assure not missing the bus.

For up to the minute bus information call the MWRTA at 508.935.2222 or 888.996.9782, or visit www.mwrta.com for GPS tracking.

The MWRTA uses the Flag Down System which allows buses to stop anywhere along their routes to pick up passengers, where it is safe to do so. Passengers can hail MWRTA buses by waving.

*Stop may NOT be serviced due to snow/ice.

MetroWest Regional Transit Authority
Public Transportation System

ROUTE 7C: Inner City Marlborough

MetroWest Regional Transportation Authority

7C ROUTE 7C (Monday-Friday Service) 7C

Cash Fare Information

Adult fare: $1.50 / $1.25 with a Charlie Card
Student fare:$1.00 with valid Student ID.
Children under 6 ride free when accompanied by an adult.
Children under 12 may not ride unaccompanied.
Elderly (65 years of age or older)- $0.75 with photo ID indicating date of birth or a MWRTA senior TAP Pass or $0.70 with a Charlie Card
Individuals with disabilities- Valid MBTA Access Card, Medicare Card or MWRTA Disabled TAP Pass are accepted as proof of eligibility for the MWRTA reduced-fare program.
Charlie Cards are available free of charge at the Waverly Hub or on the bus. Value can be added to existing cards onboard, online at mbta.com, or at an MBTA kiosk.

Transfer/Connections

Transfer coupons are available on all buses and are good for transfers going in the same direction within the MWRTA system only. Transfers are not compatible within the MBTA system. One transfer per paid fare is issued upon request and must be presented to the next driver within 90 minutes.

Riders can access MBTA Commuter Rail Service in Downtown Framingham, at the West Natick Commuter Rail Station, as well as in Downtown Natick. For MBTA schedule and service information call 617.222.3200.

MWRTA Customer Service:
(508) 935-2222
MWRTA Website:
www.mwrta.com

Follow Us: @mwrta

Scan the QR code below with your smartphone to be directed to the MWRTA Routes and Schedules website.

7C ROUTE 7C Weekday (Monday-Friday Service) 7C

	AM				PM					
									v 7.16	
Solomon Pond Mall	--	7:55	9:35	11:20	1:00	--	2:40	4:20	6:00	7:35
Route 20 / Northboro Rd Central	--	8:02	9:42	11:27	1:07	--	2:47	4:27	6:07	7:43
Hannafords Plaza by AAA	--	8:09	9:49	11:34	1:13	--	2:54	4:34	6:14	7:48
Route 20 / Felton St	--	8:12	9:52	11:37	1:17	--	2:58	4:38	6:18	7:55
Broad / Lincoln Sts.	--	8:15	9:57	11:42	1:20*	1:20	3:01	4:41	6:21	8:00*
Lincoln / Pleasant Sts.	--	8:16	9:58	11:43	--	1:21	3:02	4:42	6:22	
Marlborough Hospital	--	8:20	10:02	11:47	--	1:25	3:06	4:46	6:26	
South Bolton / Main Sts.	--	8:23	10:05	11:50	--	1:29	3:10	4:50	6:30	
Post Road Shopping Center - Price Chopper	--	8:27	10:09	11:54	--	1:34	3:15	4:55	6:35	
Farm Rd. / Route 20	--	8:31	10:13	11:58	--	1:39	3:20	5:00	6:40	
Target	--	8:36	10:18	12:03	--	1:49	3:30	5:10	6:50	
Wayside Inn Store / Hager St	--	8:38	10:20	12:05	--	1:51	3:32	5:12	6:52	
Route 20 / Wilson St	--	8:42	10:24	12:09	--	1:55	3:36	5:16	6:56	
Post Road Shopping Center - Price Chopper	--	8:45	10:28	12:13	--	1:58	3:39	5:19	6:59	
Main St Downtown Marlborough	7:21~	8:49	10:33	12:18	--	2:01	3:42	5:22	7:02	
Marlborough Senior Center	--	8:53	10:37	12:22	--	2:04	3:45	5:25	7:05	
Lincoln / Pleasant Sts.	7:26	8:58	10:42	12:27	--	2:09	3:50	5:30	7:10	
Marlborough Hospital*	7:30	9:04	10:48	12:33	--	2:13	3:54	5:34	7:14	
Broad / Lincoln Sts.	7:35	9:09	10:53	12:38	--	2:16	3:57	5:37	7:17	
Route 20 / Felton St.	7:37	9:12	10:56	12:41	--	2:18	3:59	5:39	7:19	
Hannafords Plaza by AAA	7:41	9:16	11:01	12:46	--	2:20	4:01	5:41	7:21	
Route 20 / Hampton Inn	7:44	9:18	11:04	12:49	--	2:23	4:03	5:43	7:23	
Solomon Pond Mall	7:54	9:28	11:14	12:59	--	2:33	4:13	5:53	7:33	

Scheduled Times

Scheduled times are only approximate; please wait for the MWRTA ten minutes in advance of scheduled times to assure not missing the bus.

For up to the minute bus information call the MWRTA at 508.935.2222 or 888.996.9782, or visit www.mwrta.com for GPS tracking.

The MWRTA uses the Flag Down System which allows buses to stop anywhere along their routes to pick up passengers, where it is safe to do so. Passengers can hail MWRTA buses by waving.

* Continues as 7 to Blandin Hub with limited stops.

~Continues from the Route 7.

* Stop may NOT be serviced due to snow/ice.

Hub Info: Blandin Hub-15 Blandin Ave.

Transfers

Route 7C passengers can make the following transfers: Route 7 on Main St. and at the Marlborough Senior Center. **Route 7C services the Blandin Hub at 6:45 am and 12:25 pm going to Marlborough and at 2:30 pm and 8:45 pm from Marlborough.**

**To request a deviation please call MWRTA Customer Service at 508-935-2222.

ROUTE 7C Saturday Service

v 7.16

	AM			PM			
Blandin Hub	8:00						
Banana Lot	8:05						
FSU/McCarthy Center (Tube Map)	8:10						
Stop & Shop (Bottle Return) Temple St.	8:15						
Jefferson Hills (Club House)	8:25						
Downtown Southborough	8:35						
Solomon Pond Mall		9:36	11:21	1:00	--	2:40	4:20
Route 20 / Northboro Rd		9:43	11:28	1:07	--	2:47	4:27
Hannafords Plaza by AAA		9:50	11:35	1:13	--	2:54	4:34
Route 20 / Felton St		9:53	11:38	1:17	--	2:58	4:38
Broad / Lincoln Sts.		9:58	11:43	1:20	1:20	3:01	4:41
Lincoln / Pleasant Sts.		9:59	11:44	--	1:21	3:02	4:42
Marlborough Hospital		10:03	11:48	--	1:25	3:06	4:46
South Bolton / Main Sts.		10:06	11:51	--	1:29	3:10	4:50
Post Road Shopping Center - Price Chopper		10:10	11:55	--	1:34	3:15	--
Farm Rd. / Route 20		10:14	11:59	--	1:39	3:20	--
Target		10:19	12:04P	--	1:49	3:30	--
Wayside Inn Store / Hager St.		10:21	12:06P	--	1:51	3:32	--
Route 20 / Wilson St.		10:25	12:10P	--	1:55	3:36	--
Post Road Shopping Center - Price Chopper		10:29	12:14P	--	1:58	3:39	--
Main St. Downtown Marlborough	8:50	10:34	12:19P	--	2:01	3:42	--
Marlborough Senior Center	8:54	10:38	12:23P	--	2:04	3:45	--
Lincoln / Pleasant Sts.	8:59	10:43	12:28P	--	2:09	3:50	--
Marlborough Hospital*	9:05	10:49	12:34P	--	2:13	3:54	--
Broad St / Lincoln St	9:10	10:54	12:39P	--	2:16	3:57	--
Route 20 / Felton St	9:13	10:57	12:42P	--	2:18	3:59	--
Hannafords Plaza by AAA	9:17	11:02	12:47P	--	2:20	4:01	--
Route 20 / Hampton Inn	9:19	11:05	12:50P	--	2:23	4:03	--
Solomon Pond Mall	9:29	11:15	1:00P	--	2:33	4:13	--

Scheduled Times

Scheduled times are only approximate; please wait for the MWRTA ten minutes in advance of scheduled times to assure not missing the bus.

For up to the minute bus information call the MWRTA at 508.935.2222 or 888.996.9782, or visit www.mwrta.com for GPS tracking.

The MWRTA uses the Flag Down System which allows buses to stop anywhere along their routes to pick up passengers, where it is safe to do so. Passengers can hail MWRTA buses by waving.

R- Will stop at this location by Request only

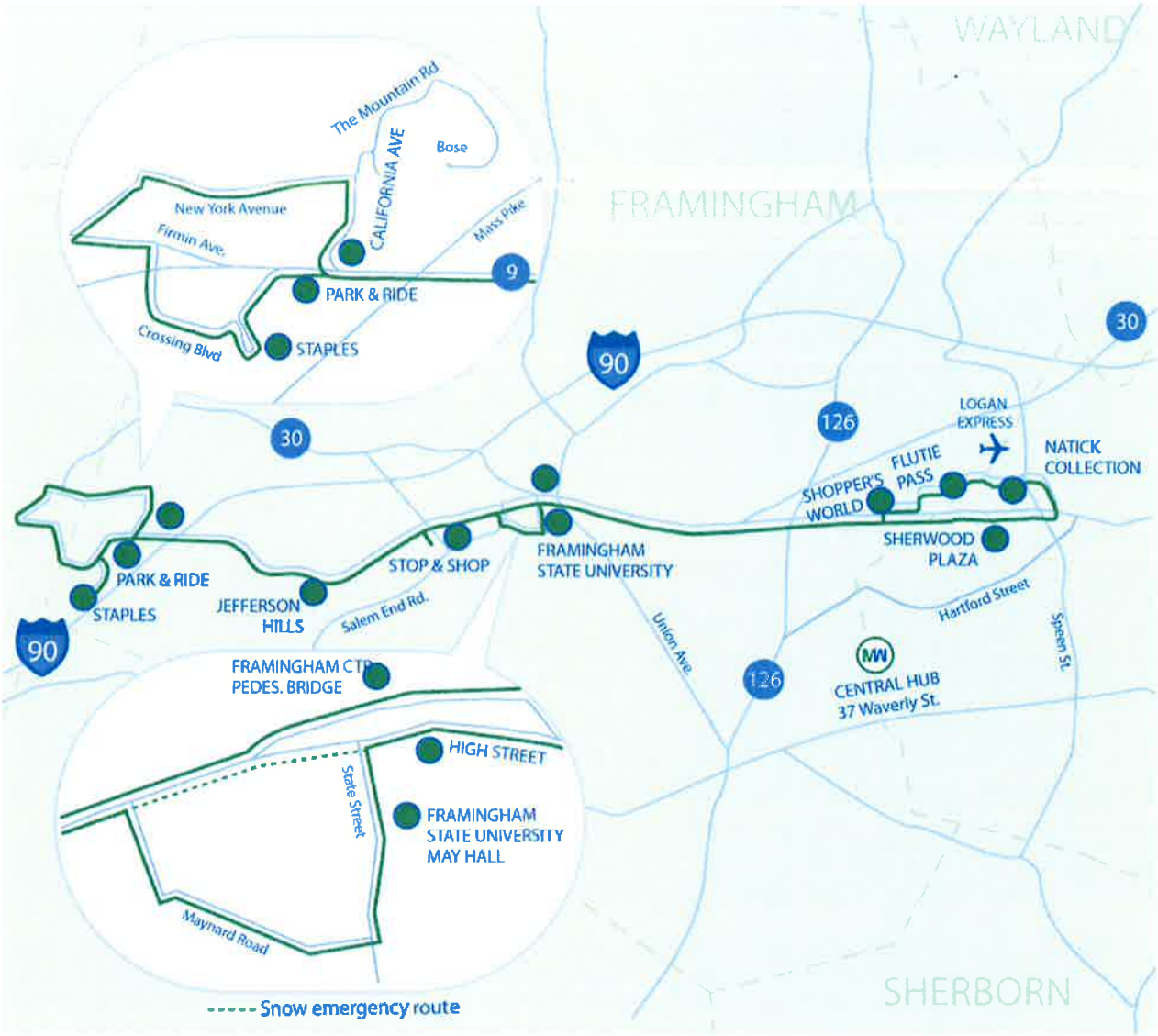
Transfers

Route 7C Saturday passengers can make the following transfers:
Route 7 Saturday at Main St. in Marlborough.

Banana Lot is the Framingham MBTA Commuter Northside Parking Lot.

**To request a deviation please call Customer Service at 508-935-2222.

MWRTA ROUTE 9
WEEKDAY



ROUTE 9 AM

WESTBOUND	Blandin Hub	5:50 AM		6:20 AM												
	Concord & Howard	5:52 AM		6:23 AM												
	Natick Mall (Macy's)		**6:18 AM**		**6:46 AM**	**6:58 AM**	**7:25 AM**	**7:40 AM**	**8:07 AM**	**8:28 AM**	**8:53 AM**	**9:22 AM**	**9:46 AM**	**10:07 AM**	**10:52 AM**	**11:35 AM**
	Flutie Pass		6:19 AM		6:47 AM	6:59 AM	7:26 AM	7:42 AM	8:09 AM	8:30 AM	8:55 AM	9:24 AM	9:48 AM	10:09 AM	10:54 AM	11:37 AM
	Shoppers World		6:20 AM		6:48 AM	7:00 AM	7:27 AM	7:43 AM	8:10 AM	8:31 AM	8:56 AM	9:25 AM	9:49 AM	10:10 AM	10:55 AM	11:38 AM
	Rte 9/30													10:20 AM	11:05 AM	11:48 AM
	Framingham Center				6:50 AM	7:05 AM	7:32 AM	7:48 AM	8:15 AM	8:36 AM	9:01 AM	9:30 AM		10:25 AM	11:10 AM	11:53 AM
	Jefferson Hills	6:04 AM	6:28 AM	6:35 AM	6:53 AM	7:07 AM	7:34 AM	7:51 AM	8:18 AM	8:40 AM	9:05 AM	9:34 AM		10:31 AM	11:16 AM	11:59 AM
	Staples Drive				**6:58 AM**	**7:12 AM**	**7:39 AM**	**7:56 AM**	**8:23 AM**	**8:45 AM**	**9:10 AM**	**9:39 AM**	**10:01 AM**			
	Westborough		6:38 AM										10:11 AM			
EASTBOUND	**Staples Drive**				**6:58 AM**	**7:12 AM**	**7:39 AM**	**7:56 AM**	**8:23 AM**	**8:45 AM**	**9:10 AM**	**9:39 AM**				
	California Ave				7:02 AM	7:15 AM	7:42 AM	7:59 AM	8:26 AM	8:48 AM	9:13 AM	9:42 AM				
	Jefferson Hills		6:48 AM											10:31 AM	11:16 AM	11:59 AM
	FSU (High St.)	6:07 AM		6:38 AM	7:10 AM	7:23 AM	7:50 AM	8:09 AM	8:36 AM	8:58 AM	9:23 AM	9:52 AM	10:24 AM	10:38 AM	11:23 AM	12:06 PM
	Flutie	6:13 AM	6:55 AM	6:44 AM	7:20 AM	7:33 AM	8:00 AM	8:19 AM	8:46 AM	9:08 AM	9:33 AM	9:59 AM		10:48 AM	11:33 AM	12:16 PM
	Natick Mall (Macy's)	**6:14 AM**	**6:56 AM**	**6:45 AM**	**7:21 AM**	**7:35 AM**	**8:02 AM**	**8:21 AM**	**8:48 AM**	**9:10 AM**	**9:35 AM**	**10:00 AM**		**10:50 AM**	**11:35 AM**	**12:18 PM**
	Framingham MBTA												10:32 AM			
	Blandin Hub												10:37 AM			

ROUTE 9 PM

WESTBOUND	Blandin Hub			1:35 PM		2:50 PM													
	Concord & Howard																		
	Natick Mall	**12:18 PM**	**1:01 PM**	**1:50 PM**	**2:35 PM**		**3:20 PM**	**3:50 PM**	**4:05 PM**	**4:35 PM**	**4:50 PM**	**5:20 PM**	**5:35 PM**	**6:05 PM**	**6:20 PM**	**6:50 PM**	**7:05 PM**	**7:35 PM**	**7:50 PM**
	Flutie Pass	12:20 PM	1:03 PM	1:52 PM	2:37 PM		3:22 PM	3:52 PM	4:07 PM	4:37 PM	4:52 PM	5:22 PM	5:37 PM	6:07 PM	6:22 PM	6:52 PM	7:07 PM	7:37 PM	7:52 PM
	Shoppers World	12:21 PM	1:04 PM	1:53 PM	2:38 PM		3:23 PM	3:53 PM	4:08 PM	4:38 PM	4:53 PM	5:23 PM	5:38 PM	6:08 PM	6:23 PM	6:53 PM	7:08 PM	7:38 PM	7:53 PM
	Framingham Center	12:36 PM	1:19 PM	2:08 PM	2:53 PM		3:38 PM	3:58 PM	4:13 PM	4:43 PM	4:58 PM	5:28 PM	5:43 PM	6:13 PM	6:28 PM	6:58 PM	7:13 PM	7:46 PM	7:58 PM
	Jefferson Hills	12:42 PM	1:25 PM	2:14 PM	2:59 PM		3:44 PM											7:51 PM	
	Staples Drive							**4:09 PM**	**4:24 PM**	**4:54 PM**	**5:09 PM**	**5:39 PM**	**5:54 PM**	**6:24 PM**	**6:39 PM**	**7:09 PM**	**7:24 PM**		**8:09 PM**
	Westborough					3:14 PM												R	
EASTBOUND	**Staples Drive**					**3:24 PM**		**4:09 PM**	**4:24 PM**	**4:54 PM**	**5:09 PM**	**5:39 PM**	**5:54 PM**	**6:24 PM**	**6:39 PM**	**7:09 PM**	**7:24 PM**		**8:09 PM**
	California Ave					3:27 PM		4:13 PM	4:27 PM	4:57 PM	5:12 PM	5:42 PM	5:57 PM	6:27 PM	6:42 PM	7:12 PM	7:27 PM		8:12 PM
	Jefferson Hills	12:42 PM	1:25 PM	2:14 PM	2:59 PM	3:32 PM	3:49 PM	4:18 PM	4:32 PM	5:02 PM	5:17 PM	5:47 PM	6:02 PM	6:32 PM	6:47 PM	7:17 PM	7:32 PM		8:17 PM
	FSU (High St)	12:49 PM	1:32 PM	2:21 PM	3:06 PM	3:37 PM	3:51 PM	4:23 PM	4:37 PM	5:07 PM	5:22 PM	5:52 PM	6:07 PM	6:37 PM	6:52 PM	7:22 PM	7:37 PM	8:13 PM	8:22 PM
	Flutie	12:59 PM	1:42 PM	2:31 PM	3:16 PM	3:47 PM	4:01 PM	4:33 PM	4:47 PM	5:17 PM	5:32 PM	6:02 PM	6:17 PM	6:47 PM	7:02 PM	7:32 PM	7:47 PM		8:32 PM
	Natick Mall	**1:01 PM**	**1:44 PM**	**2:33 PM**	**3:18 PM**	**3:49 PM**	**4:03 PM**	**4:35 PM**	**4:49 PM**	**5:19 PM**	**5:34 PM**	**6:04 PM**	**6:19 PM**	**6:49 PM**	**7:04 PM**	**7:34 PM**	**7:49 PM**		**8:34 PM**
	Framingham MBTA																	8:19 PM	
	Blandin Hub		1:50 PM															8:23 PM	8:40 PM

Commuter Shuttle - Please note:

Shaded areas are approximate arrival times only. The bus may leave these locations prior to the listed time. Riders should be at these time points at least ten minutes prior to the time listed. The bus will not leave the **bolded** locations prior to listed times.

If you have any questions, please contact MWRTA Customer Service at (508) 935-2222.

Effective: 7.16

Service Announcements (2)

HOME (HTTP://WWW.MWRTA.COM/INDEX.PHP) / ROUTES (HTTP://WWW.MWRTA.COM/INDEX.PHP/ROUTES) / RATES AND FARES (HTTP://WWW.MWRTA.COM/INDEX.PHP/ROUTES/RATES-AND-FARES)

Rates and Fares

The following are the latest fare rates for our services.

You may pay with exact fare on the buses, or obtain a Charlie Card to load value on, from either the bus driver, or at the office of the MWRTA, 37 Waverly Street, (Route 135), Framingham, MA 01702, You may also obtain Charlie Cards from the Treasurer's office at Framingham Town Hall, and the Town Clerk's office at Natick Town Hall. Value can be added to Charlie Cards on all MWRTA fixed route buses. Please note: When using a Charlie Card, your fare cost is reduced! See the fare charts below.

Fare	Cash Fare	CharlieCard Fare
Adults	$1.50	$1.25
Students under the age of 18, or with current school ID*	$1.00	N/A
Children under the age of six when accompanied by an adult	Free	N/A
Senior (65 years or older), with photo ID indicating date of birth	$0.75	
Individuals with disabilities with valid MWRTA Transportation Access Pass, MBTA Transportation Access Pass, or a Medicare Card**	$0.75	$0.70

	Cash Rate	Charlie Card Rate
Adults	$1.50	$1.25
Students under the age of 18, or with current school ID	$1.00	N/A
Children under the age of six when accompanied by an adult	Free	N/A
Senior (65 years or older), with photo ID indicating date of birth / MWRTA Senior Pass	$0.75	$0.70
Individuals with disabilities with valid MWRTA Transportation Access Pass, MBTA Transportation Access Pass, or a Medicare Card.	$0.75	$0.70

MWRTA now accepts the MBTA Charlie Card on all of its fixed route buses!

Patrons are encouraged to obtain a Charlie Card, either online at the MBTA Website (https://commerce.mbta.com/program/?prog=stored) or at the MWRTA Central Hub, located at 37 Waverly St, Framingham MA, during our normal business hours. Charlie Cards can be loaded

directly on any MWRTA bus. Drivers will have available Charlie Cards and will assist patrons in loading value.

Please Note:

Students – The MBTA Student Charlie Card is not honored on the MWRTA system. Students may use an Adult Charlie Card and be charged the $1.25 fare or continue to pay $1.00 in cash.

Senior/Disabled – Senior/Disabled patrons must obtain a Transportation Access Pass (TAP) Card from the MWRTA Central Hub or the MBTA Access Pass Office in order to receive the Senior/Disabled Charlie Card fare. Information for obtaining a TAP card can be found below or via the MBTA Website (http://www.mbta.com/riding_the_t/accessible_services/default.asp?id=17163).

CharlieTickets – MBTA Charlie Tickets are not honored on the MWRTA system. MWRTA buses only accept the plastic CharlieCards.

MBTA Monthly Passes –The only fare medium on the Charlie Card honored on the MWRTA system is stored value. Any MBTA pass product (i.e. monthly pass) is not honored on the MWRTA system.

Reduced Fare Identification Cards

Senior ID (Charlie Card) Transportation Pass – Anyone over 65 with photo identification as proof of age.

Transportation (Charlie Card) Access Pass – Disabled under 65 with approved application, available at MWRTA Offices.

The passes can be used to receive reduced fare on all fixed route busses and trains statewide. All passes have Charlie Card capability.

These Identification Cards may be obtained by visiting the MWRTA administrative offices at 37 Waverly St, Framingham. We are open Monday - Friday, between the hours of 8:00am - 4:00pm.

Weather Emergencies

www.commutercheck.com (http://www.commutercheck.com) or call 800-727-9436.

The service schedule is subject to change during a weather emergency. Any interruption of service will be posted under Service Announcements, located on the Home page, or you can call 508-935-2222 or 888-996-9782 to confirm the schedule.

Holidays:

There is also ***no*** fixed route bus service provided on the following holidays:

- New Year's Day
- Patriot's Day
- Memorial Day
- Independence Day
- Thanksgiving Day
- Christmas Day

MWRTA uses the "flag down" system. This allows you to wave down a bus in transit anywhere along the route, as well as at noted stops. The bus will stop to pick you up, as long as it is safe to do so. Due to various unexpected conditions, traffic, weather, we recommend to arrive ten

MASSDOT CRASH RATE WORKSHEETS

Moving Massachusetts Forward. massDOT Highway

INTERSECTION CRASH RATE WORKSHEET

#1

CITY/TOWN : Southborough COUNT DATE : Sep-15

DISTRICT : 3 UNSIGNALIZED : [ ] SIGNALIZED : [X]

~ INTERSECTION DATA ~

MAJOR STREET : Route 9

MINOR STREET(S) : Central Street/Oak Hill Road

INTERSECTION DIAGRAM (Label Approaches)

PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (PM) :	216	396	2,584	2,088		**5,284**

" K " FACTOR : **0.090** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **58,711**

TOTAL # OF CRASHES : 28 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR (**A**) : **9.33**

CRASH RATE CALCULATION : **0.44** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : The calculated Crash Rate do not exceed the MassDOT District 3 rate of 0.90

Project Title & Date: Framingham CMUZD Master Plan

Moving Massachusetts Forward. massDOT Highway

INTERSECTION CRASH RATE WORKSHEET

#2

CITY/TOWN : Southborough COUNT DATE : Sep-15

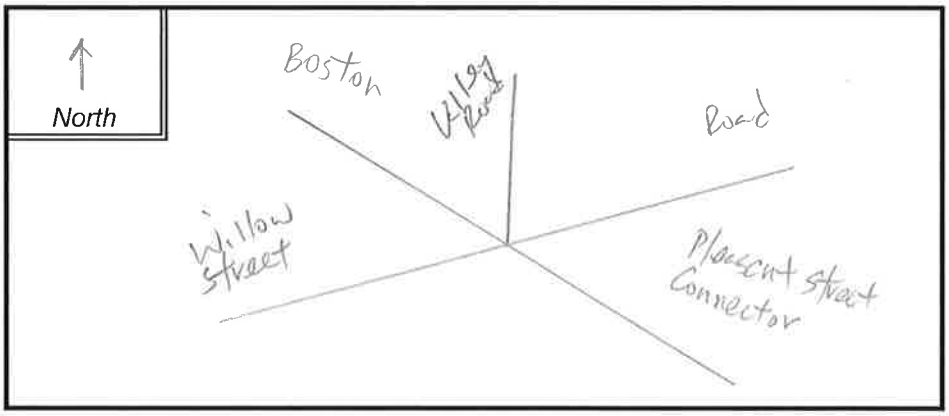
DISTRICT : 3 UNSIGNALIZED : [ ] SIGNALIZED : [X]

~ INTERSECTION DATA ~

MAJOR STREET : Boston Road

MINOR STREET(S) : Pleasant Street Connector/Willow Street

INTERSECTION DIAGRAM
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB	SW	
PEAK HOURLY VOLUMES (PM) :	76	708	881	576	11	**2,252**

" K " FACTOR : **0.090** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **25,022**

TOTAL # OF CRASHES : 6 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR (**A**) : **2.00**

CRASH RATE CALCULATION : **0.22** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : The calculated Crash Rate do not exceed the MassDOT District 3 rate of 0.90

Project Title & Date: Framingham CMUZD Master Plan

Moving Massachusetts Forward. massDOT Highway

INTERSECTION CRASH RATE WORKSHEET

#3

CITY/TOWN : Framingham COUNT DATE : Sep-15

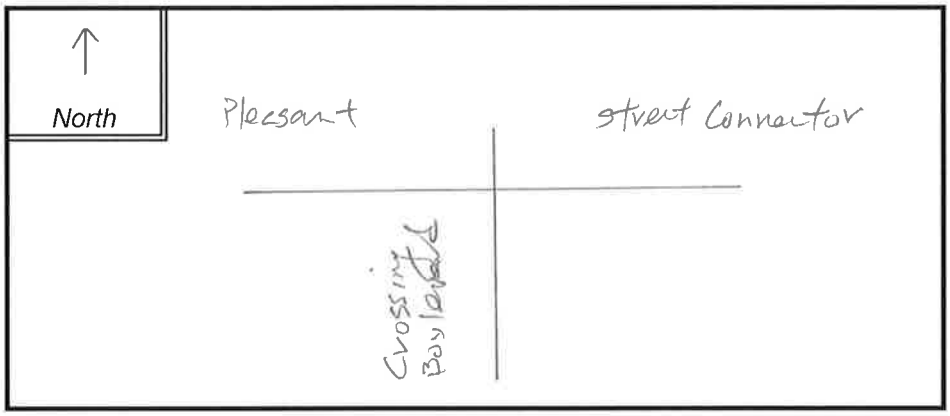
DISTRICT : 3 UNSIGNALIZED : [ ] SIGNALIZED : [X]

~ INTERSECTION DATA ~

MAJOR STREET : Pleasant Street Connector

MINOR STREET(S) : Crossing Boulevard

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (PM) :	770	3	516	306		1,595

" K " FACTOR : **0.090** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **17,722**

TOTAL # OF CRASHES : 3 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR (**A**) : **1.00**

CRASH RATE CALCULATION : 0.15 RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : The calculated Crash Rate do not exceed the MassDOT District 3 rate of 0.90

Project Title & Date: Framingham CMUZD Master Plan

Moving Massachusetts Forward.
massDOT
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INTERSECTION CRASH RATE WORKSHEET

#4

CITY/TOWN : Framingham COUNT DATE : Sep-15

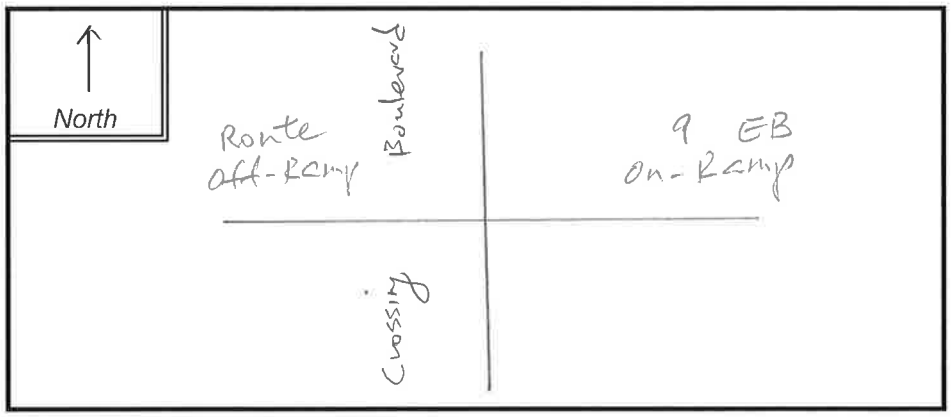
DISTRICT : 3 UNSIGNALIZED : [ ] SIGNALIZED : [X]

~ INTERSECTION DATA ~

MAJOR STREET : Crossing Boulevard

MINOR STREET(S) : Route 9 EB Ramps

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (PM) :	684	554	148			1,386

" K " FACTOR : **0.090** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **15,400**

TOTAL # OF CRASHES : 5 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR (**A**) : **1.67**

CRASH RATE CALCULATION : **0.30** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : The calculated Crash Rate do not exceed the MassDOT District 3 rate of 0.90

Project Title & Date: Framingham CMUZD Master Plan

Moving Massachusetts Forward. massDOT Highway

INTERSECTION CRASH RATE WORKSHEET

8

CITY/TOWN : Framingham COUNT DATE : Sep-15

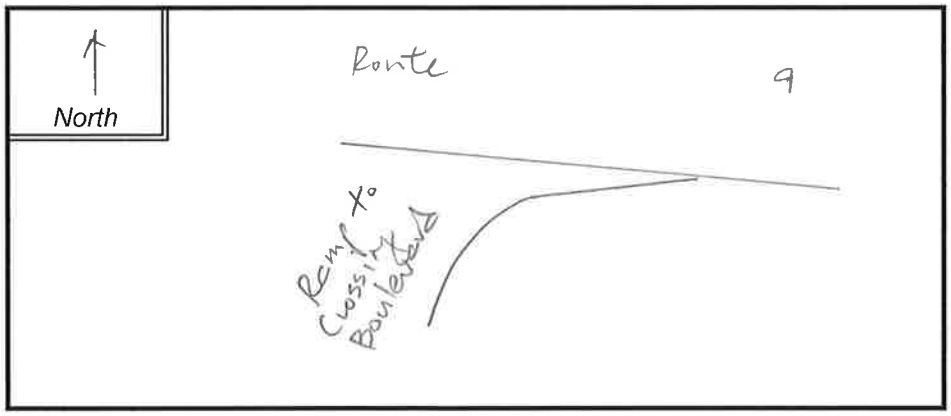
DISTRICT : 3 UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Route 9

MINOR STREET(S) : Ramp to Crossing Boulevard

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (PM) :				2,536		**2,536**

" K " FACTOR : **0.090** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **28,178**

TOTAL # OF CRASHES : 3 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR (**A**) : **1.00**

CRASH RATE CALCULATION : 0.10 RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : The calculated Crash Rate do not exceed the MassDOT District 3 rate of 0.65

Project Title & Date: Framingham CMUZD Master Plan

Moving Massachusetts Forward.
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INTERSECTION CRASH RATE WORKSHEET

#10

CITY/TOWN : Framingham COUNT DATE : Sep-15

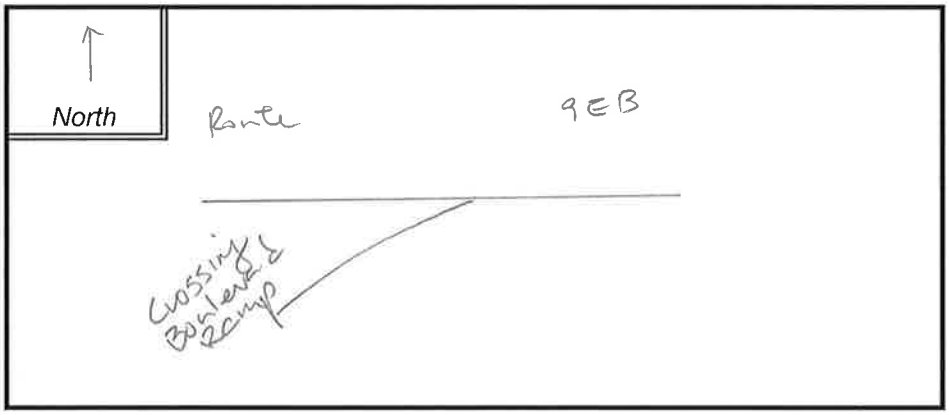
DISTRICT : 3 UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Route 9 EB

MINOR STREET(S) : Ramp from Crossing Boulevard

INTERSECTION DIAGRAM
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (PM) :	820		2,543			3,363

" K " FACTOR : **0.090** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **37,367**

TOTAL # OF CRASHES : 1 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR (**A**) : **0.33**

CRASH RATE CALCULATION : **0.02** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : The calculated Crash Rate do not exceed the MassDOT District 3 rate of 0.65

Project Title & Date: Framingham CMUZD Master Plan

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INTERSECTION CRASH RATE WORKSHEET

#11

CITY/TOWN : Framingham COUNT DATE : Sep-15

DISTRICT : 3 UNSIGNALIZED : [ ] SIGNALIZED : [X]

~ INTERSECTION DATA ~

MAJOR STREET : Route 9

MINOR STREET(S) : California Avenue

INTERSECTION DIAGRAM
(Label Approaches)

PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (PM) :	40	936	3,363	2,451		**6,790**

" K " FACTOR : **0.090** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **75,444**

TOTAL # OF CRASHES : 24 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR (**A**) : **8.00**

CRASH RATE CALCULATION : 0.29 RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : The calculated Crash Rate do not exceed the MassDOT District 3 rate of 0.90

Project Title & Date: Framingham CMUZD Master Plan

Moving Massachusetts Forward. massDOT Highway

INTERSECTION CRASH RATE WORKSHEET

#12

CITY/TOWN : Framingham COUNT DATE : Sep-15

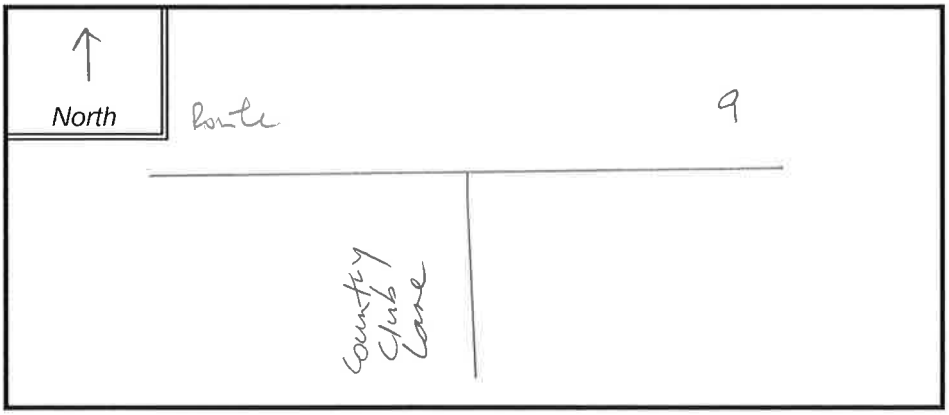
DISTRICT : 3 UNSIGNALIZED : [ ] SIGNALIZED : [X]

~ INTERSECTION DATA ~

MAJOR STREET : Route 9

MINOR STREET(S) : Country Club Lane

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (PM) :	490		2,418	1,635		4,543

" K " FACTOR : **0.090** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **50,478**

TOTAL # OF CRASHES : 27 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR (**A**) : **9.00**

CRASH RATE CALCULATION : 0.49 RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : The calculated Crash Rate do not exceed the MassDOT District 3 rate of 0.90

Project Title & Date: Framingham CMUZD Master Plan

Moving Massachusetts Forward
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Highway

INTERSECTION CRASH RATE WORKSHEET

#13

CITY/TOWN : Framingham COUNT DATE : Sep-15

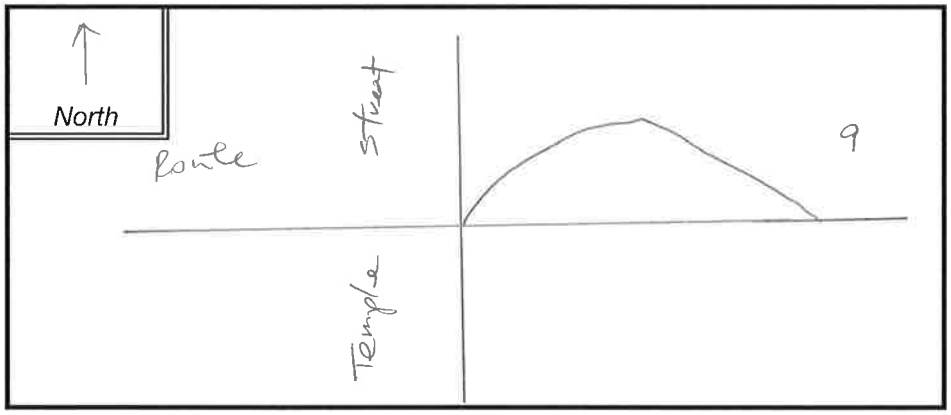
DISTRICT : 3 UNSIGNALIZED : [ ] SIGNALIZED : [X]

~ INTERSECTION DATA ~

MAJOR STREET : Route 9

MINOR STREET(S) : Temple Street

INTERSECTION DIAGRAM
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB	SEB	
PEAK HOURLY VOLUMES (PM) :	415	328	1,671	1,505	369	**4,288**

" K " FACTOR : **0.090** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **47,644**

TOTAL # OF CRASHES : 50 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR (**A**) : **16.67**

CRASH RATE CALCULATION : **0.96** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : The calculated Crash Rate exceeds the MassDOT District 3 rate of 0.90

Project Title & Date: Framingham CMUZD Master Plan

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INTERSECTION CRASH RATE WORKSHEET

#13

CITY/TOWN : Framingham COUNT DATE : Sep-15

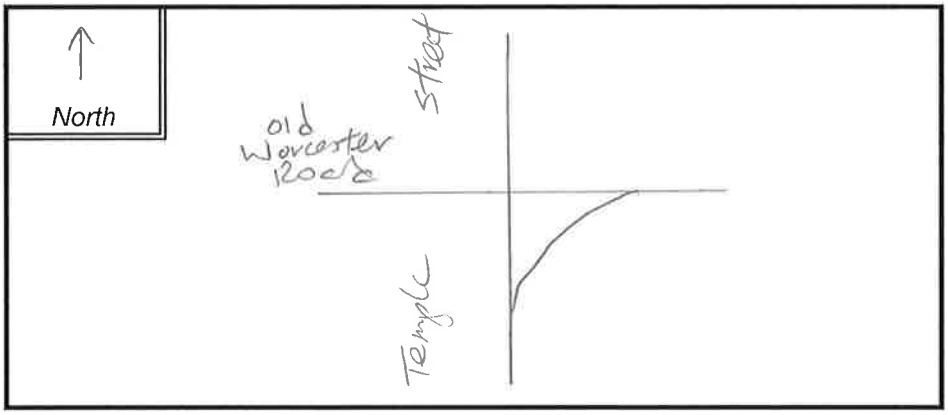
DISTRICT : 3 UNSIGNALIZED : [ ] SIGNALIZED : [X]

~ INTERSECTION DATA ~

MAJOR STREET : Old Worcester Road

MINOR STREET(S) : Temple Street

INTERSECTION DIAGRAM
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (PM) :	212	293	45	116		**666**

" K " FACTOR : **0.090** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **7,400**

TOTAL # OF CRASHES : 4 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR (**A**) : **1.33**

CRASH RATE CALCULATION : 0.49

RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : The calculated Crash Rate do not exceed the MassDOT District 3 rate of 0.90

Project Title & Date: Framingham CMUZD Master Plan

Moving Massachusetts Forward. massDOT Highway

INTERSECTION CRASH RATE WORKSHEET

#15

CITY/TOWN : Southborough COUNT DATE : Sep-15

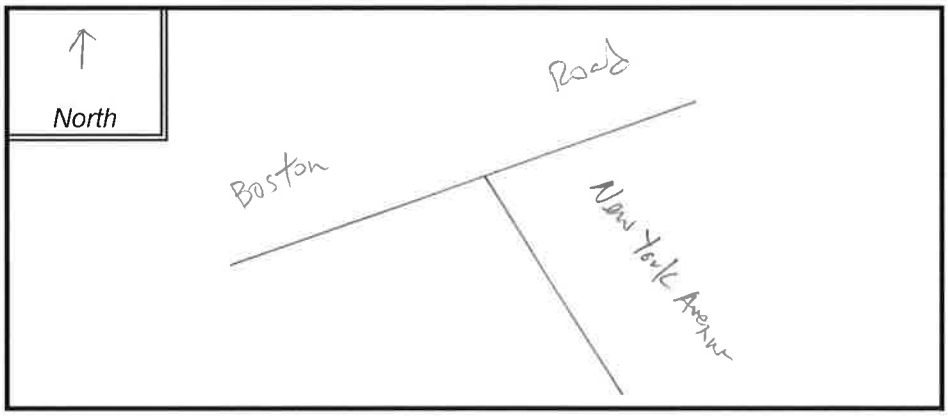
DISTRICT : 3 UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Boston Road

MINOR STREET(S) : New York Avenue

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (PM) :	484	561		465		1,510

" K " FACTOR : **0.090** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **16,778**

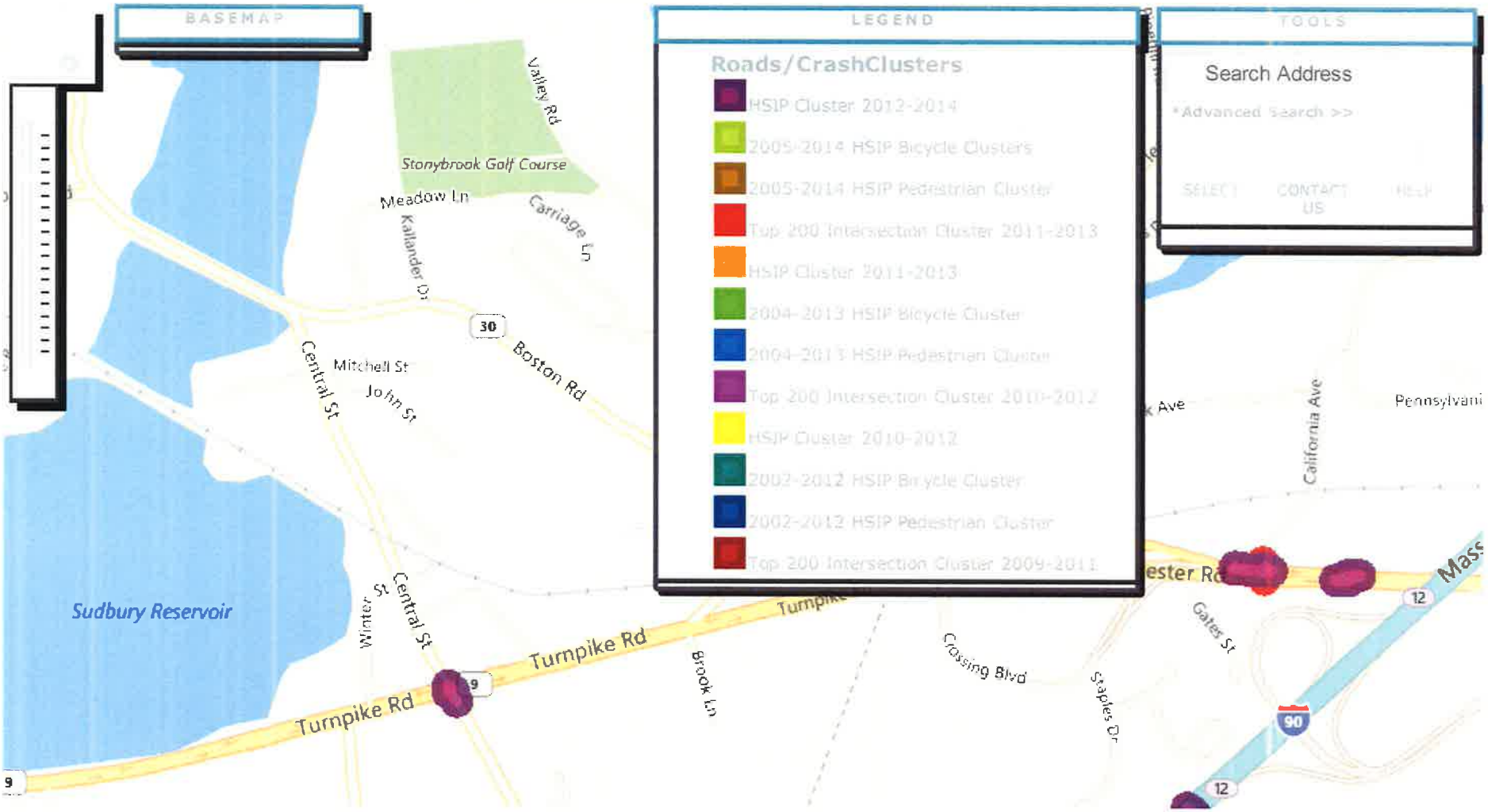
TOTAL # OF CRASHES : 2 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR (**A**) : **0.67**

CRASH RATE CALCULATION : 0.11 RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : The calculated Crash Rate do not exceed the MassDOT District 3 rate of 0.65

Project Title & Date: Framingham CMUZD Master Plan

Top Crash Locations



massDOT Massachusetts Department of Transportation Highway Division

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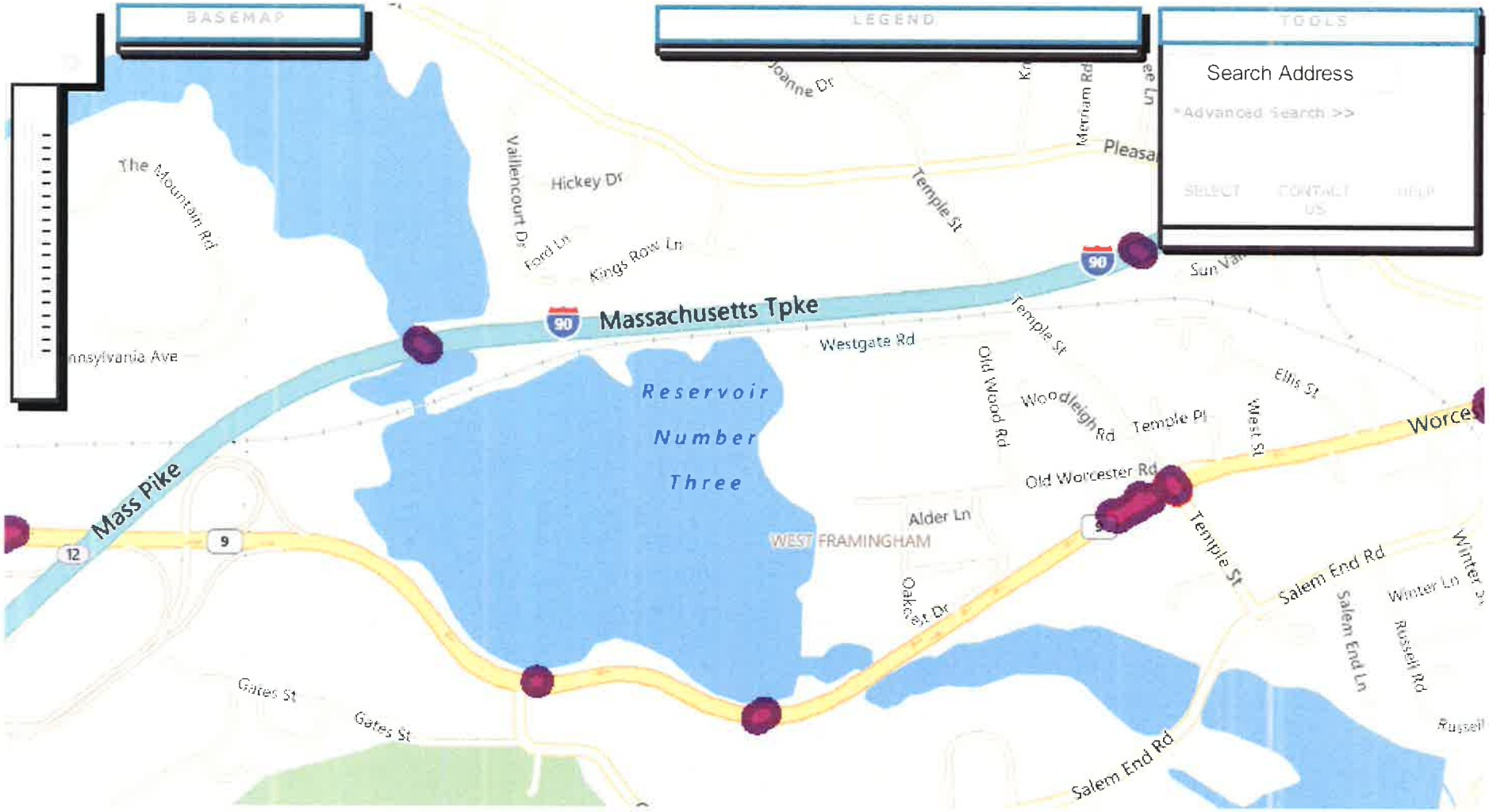
Mass.Gov

Top Crash Locations



TRIP GENERATION CALCULATIONS

Institute of Transportation Engineers (ITE)
Trip Generation, 9 th Edition
Land Use Code (LUC) 710 - General Office Building CMU I

Average Vehicle Trips Ends vs: 1,000 Square Feet Gross Floor Area
Independent Variable (X): 1340.000

AVERAGE WEEKDAY DAILY

Ln T = 0.76 Ln (X) + 3.68
Ln T = 0.76 Ln 1340.000 + (3.68)
Ln T = 9.15
T = 9436.33
T = 9,436 vehicle trips
with 50% (4,718 vpd) entering and 50% (4,718 vpd) exiting.

WEEKDAY MORNING PEAK HOUR

Ln T = 0.80 Ln (X) + 1.57
Ln T = 0.80 Ln 1340.000 + (1.57)
Ln T = 7.33
T = 1525.90
T = 1,526 vehicle trips
with 88% (1,343 vph) entering and 12% (183 vph) exiting.

WEEKDAY EVENING PEAK HOUR

T = 1.12 * (X) + 78.45
T = 1.12 * 1340.000 + (78.45)
T = 1579.25
T = 1,579 vehicle trips
with 17% (268 vph) entering and 83% (1,311 vph) exiting.

Institute of Transportation Engineers (ITE)
Trip Generation, 9 th Edition
Land Use Code (LUC) 220 - Apartment CMU I

Average Vehicle Trips Ends vs: Dwelling Units
Independent Variable (X): 560

AVERAGE WEEKDAY DAILY

T = 6.06 * (X) + 123.56
T = 6.06 * 560 + (123.56)
T = 3517.16
T = 3,518 vehicle trips
with 50% (1,759 vpd) entering and 50% (1,759 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.49 * (X) + 3.73
T = 0.49 * 560 + (3.73)
T = 278.13
T = 278 vehicle trips
with 20% (56 vph) entering and 80% (222 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.55 * (X) + 17.65
T = 0.55 * 560 + (17.65)
T = 325.65
T = 326 vehicle trips
with 65% (212 vph) entering and 35% (114 vph) exiting.

Institute of Transportation Engineers (ITE)
*Trip Generation, 9*th Edition
Land Use Code (LUC) 820 - Shopping Center CMU II

Average Vehicle Trips Ends vs: 1,000 Square Feet Gross Leasable Area
Independent Variable (X): 296.650

AVERAGE WEEKDAY DAILY

Ln T = 0.65 Ln (X) + 5.83
Ln T = 0.65 Ln 296.650 + (5.83)
Ln T = 9.53
T = 13768.79
T = 13,770 vehicle trips
with 50% (6,885 vpd) entering and 50% (6,885 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.96 * (X)
T = 0.96 * 296.650
T = 284.78
T = 285 vehicle trips
with 62% (177 vph) entering and 38% (108 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

Ln T = 0.67 Ln (X) + 3.31
Ln T = 0.67 Ln 296.650 + (3.31)
Ln T = 7.12
T = 1241.42
T = 1,241 vehicle trips
with 48% (596 vph) entering and 52% (645 vph) exiting.

Institute of Transportation Engineers (ITE)
*Trip Generation, 9*th Edition
Land Use Code (LUC) 710 - General Office Building CMU II

Average Vehicle Trips Ends vs: 1,000 Square Feet Gross Floor Area
Independent Variable (X): 296.650

AVERAGE WEEKDAY DAILY

Ln T = 0.76 Ln (X) + 3.68
Ln T = 0.76 Ln 296.650 + (3.68)
Ln T = 8.01
T = 2999.92
T = 3,000 vehicle trips
with 50% (1,500 vpd) entering and 50% (1,500 vpd) exiting.

WEEKDAY MORNING PEAK HOUR

Ln T = 0.80 Ln (X) + 1.57
Ln T = 0.80 Ln 296.650 + (1.57)
Ln T = 6.12
T = 456.71
T = 457 vehicle trips
with 88% (402 vph) entering and 12% (55 vph) exiting.

WEEKDAY EVENING PEAK HOUR

T = 1.12 * (X) + 78.45
T = 1.12 * 296.650 + (78.45)
T = 410.70
T = 411 vehicle trips
with 17% (70 vph) entering and 83% (341 vph) exiting.

Institute of Transportation Engineers (ITE)
Trip Generation, 9 th Edition
Land Use Code (LUC) 220 - Apartment CMU II

Average Vehicle Trips Ends vs: Dwelling Units
Independent Variable (X): 156

AVERAGE WEEKDAY DAILY

T = 6.06 * (X) + 123.56
T = 6.06 * 156 + (123.56)
T = 1068.92
T = 1,070 vehicle trips
with 50% (535 vpd) entering and 50% (535 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.49 * (X) + 3.73
T = 0.49 * 156 + (3.73)
T = 80.17
T = 80 vehicle trips
with 20% (16 vph) entering and 80% (64 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.55 * (X) + 17.65
T = 0.55 * 156 + (17.65)
T = 103.45
T = 103 vehicle trips
with 65% (67 vph) entering and 35% (36 vph) exiting.

TRIP-GENERATION SUMMARY TABLES

Table 1
TRIP GENERATION SUMMARY – TOTAL CMU ZONING DISTRICTS I AND II

	Commercial Development					Residential Development	
Time Period/Direction	(A) Retail Space (290,650 sf)[a]	(B) Pass-By Trips[b]	(C = A - B) Net Trips	(D) Office Space (1,636,650 sf)[c]	(E = C+D) Total Trips	(F) Apartments (716 Units)[d]	(G = E+F) Total NewTrips
Average Weekday Daily:							
Entering	6,885	2,341	4,544	6,218	10,762	2,294	13,056
Exiting	6,885	2,341	4,544	6,218	10,762	2,294	13,056
Total	13,770	4,682	9,088	12,436	21,524	4,588	26,112
Weekday Morning Peak Hour:							
Entering	177	49	128	1,745	1,873	72	1,945
Exiting	108	49	59	238	297	286	583
Total	285	98	187	1,983	2,170	358	2,528
Weekday Evening Peak Hour:							
Entering	596	211	385	338	723	279	1,002
Exiting	645	211	434	1,652	2,086	150	2,236
Total	1,241	422	819	1,990	2,809	429	3,238

[a]Based on ITE LUC 820, *Shopping Center.*
[b]Pass-by trip rates equal 34 percent.
[c]Based on ITE LUC 710, *General Office Building.*
[d]Based on ITE LUC 220, *Apartment.*

Table 2
TRIP GENERATION SUMMARY –CMU ZONING DISTRICT I

Time Period/Direction	(A) Office Space (1,340,000 sf)[c]	(B) Apartment (560 Units)[b]	(C=A+B) Total (New Trips)
Average Weekday Daily:			
Entering	4,718	1,759	6,477
Exiting	4,718	1,759	6,477
Total	9,436	3,518	12,954
Weekday Morning Peak Hour:			
Entering	1,343	56	1,399
Exiting	183	222	405
Total	1,526	278	1,804
Weekday Evening Peak Hour:			
Entering	268	212	480
Exiting	1,311	114	1,425
Total	1,579	326	1,905

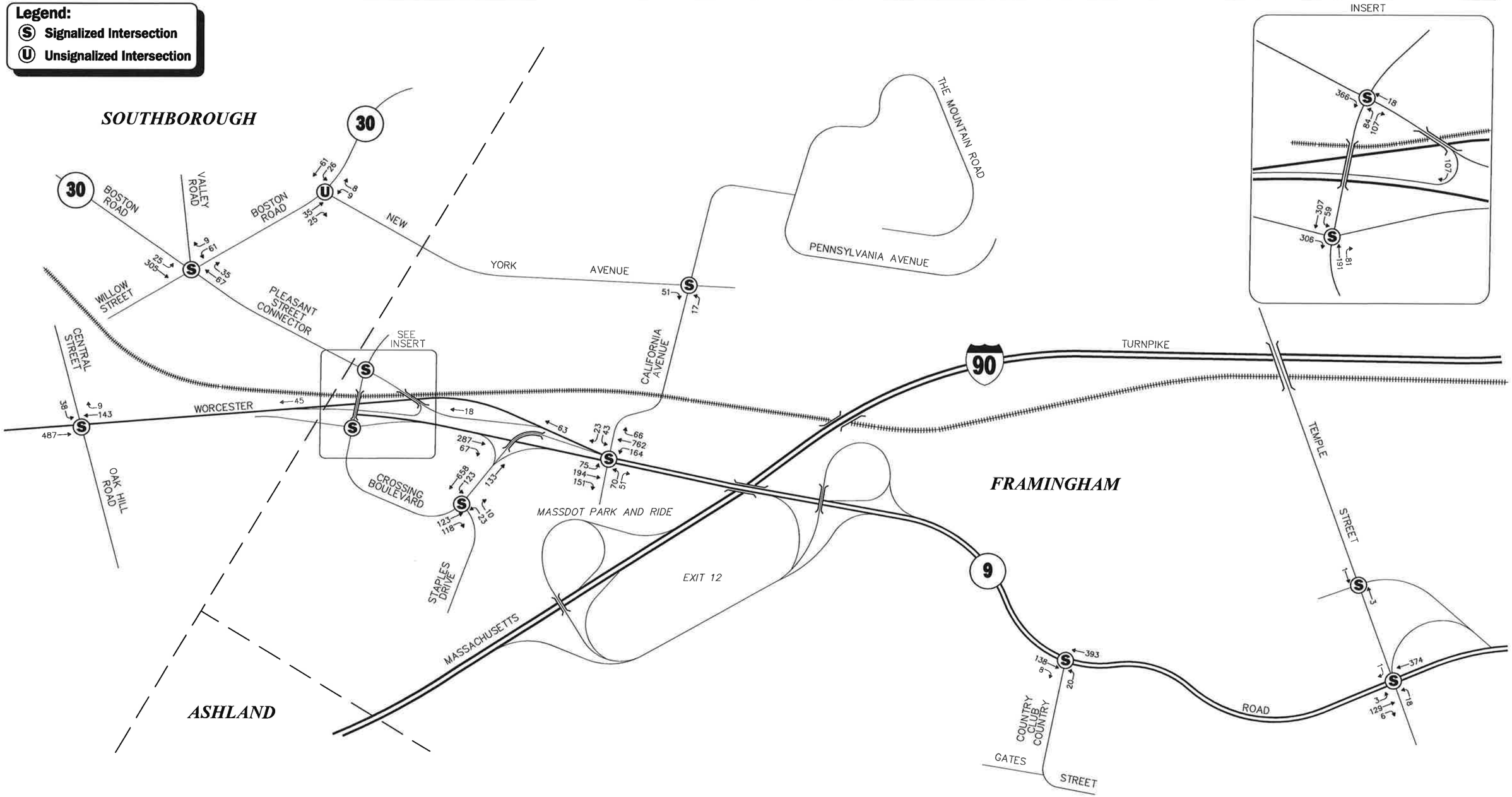
[a]Based on ITE LUC 710, *General Office Building.*
[b]Based on ITE LUC 220, *Apartment.*

Table 3
TRIP GENERATION SUMMARY – CMU ZONING DISTRICT II

Time Period/Direction	Commercial Development					Residential Development	
	(A) Retail Space (296,650 sf)[a]	(B) Pass-By Trips[b]	(C = A - B) Net Trips	(D) Office Space (296,650 sf)[c]	(E = C+D) Total Trips	(F) Apartments (156 Units)[d]	(G = E+F) Total NewTrips
Average Weekday Daily:							
Entering	6,885	2,341	4,544	1,500	6,044	535	6,579
Exiting	6,885	2,341	4,544	1,500	6,044	535	6,579
Total	13,770	4,682	9,088	3,000	12,088	1,070	13,158
Weekday Morning Peak Hour:							
Entering	177	49	128	402	530	16	546
Exiting	108	49	59	55	114	64	178
Total	285	98	187	457	644	80	724
Weekday Evening Peak Hour:							
Entering	596	211	385	70	455	67	522
Exiting	645	211	434	341	775	36	811
Total	1,241	422	819	411	1,230	103	1,333

[a]Based on ITE LUC 820, *Shopping Center*.
[b]Pass-by trip rates equal 34 percent.
[c]Based on ITE LUC 710, *General Office Building*.
[d]Based on ITE LUC 220, *Apartment*.

CMU DEVELOPMENT-GENERATED TRAFFIC-VOLUME NETWORKS



Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

Vanasse & Associates, Inc.
Transportation Engineers & Planners

Figure A-1

CMU Build-Out Generated Weekday Morning Peak Hour Traffic Volumes

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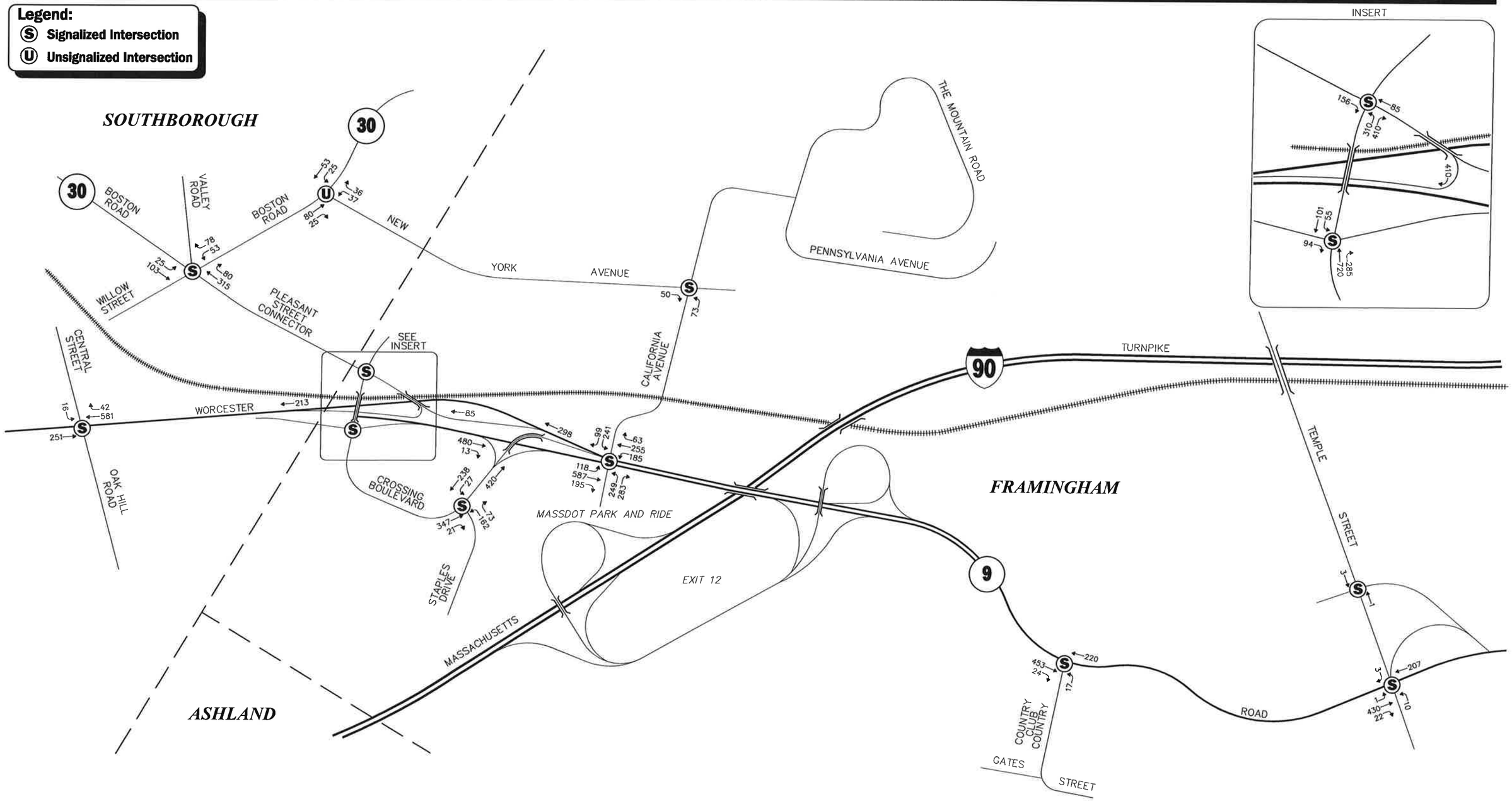

Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

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Figure A-2

CMU Build-Out Generated Weekday Evening Peak Hour Traffic Volumes

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CAPACITY ANALYSIS WORKSHEETS

2016 Existing Intersection Capacity Analysis
2016 Build-Out Intersection Capacity Analysis
2016 Build-Out with Improvements Intersection Capacity Analysis

2016 Existing Intersection Capacity Analysis

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	69	2121	66	82	2068	61	70	79	11	230	119	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	12	10	10	12	10	11	10	12	16	12
Storage Length (ft)	250		0	250		0	75		75	0		0
Storage Lanes	1		0	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1604	4723	0	1668	4762	0	1636	1766	1383	0	1970	0
Flt Permitted	0.950			0.950			0.389				0.837	
Satd. Flow (perm)	1604	4723	0	1668	4762	0	670	1766	1383	0	1681	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			3				102		22	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		389			936			444			493	
Travel Time (s)		8.8			21.3			10.1			11.2	
Peak Hour Factor	0.99	0.99	0.99	0.96	0.96	0.96	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	5%	2%	2%	1%	1%	10%	3%	4%	9%	1%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	70	2209	0	85	2218	0	75	85	12	0	643	0
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8		8	4		
Detector Phase	1	6		5	2		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	9.5	22.5		9.5	23.5		22.5	22.5	22.5	22.5	22.5	
Total Split (s)	21.0	56.0		21.0	56.0		37.0	37.0	37.0	37.0	37.0	
Total Split (%)	14.0%	37.3%		14.0%	37.3%		24.7%	24.7%	24.7%	24.7%	24.7%	
Yellow Time (s)	3.0	4.5		3.0	4.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	2.5	2.0		2.5	3.0		3.0	3.0	3.0	3.0	3.0	
Lost Time Adjust (s)	-1.5	-2.5		-1.5	-2.5		-2.5	-2.5	-2.5		-2.5	
Total Lost Time (s)	4.0	4.0		4.0	5.0		4.0	4.0	4.0		4.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Min		None	Min		None	None	None	None	None	
Act Effct Green (s)	11.6	52.0		12.4	54.3		33.0	33.0	33.0		33.0	
Actuated g/C Ratio	0.11	0.48		0.11	0.50		0.30	0.30	0.30		0.30	
v/c Ratio	0.41	0.98		0.45	0.94		0.37	0.16	0.02		1.23	
Control Delay	53.1	44.4		53.0	36.3		37.6	29.8	0.1		153.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay	53.1	44.4		53.0	36.3		37.6	29.8	0.1		153.7	
LOS	D	D		D	D		D	C	A		F	
Approach Delay		44.7			36.9			31.1			153.7	
Approach LOS		D			D			C			F	
Queue Length 50th (ft)	47	542		57	544		41	44	0		~551	
Queue Length 95th (ft)	93	#724		106	#722		91	87	0		#813	
Internal Link Dist (ft)		309			856			364			413	
Turn Bay Length (ft)	250			250			75		75			
Base Capacity (vph)	249	2247		259	2364		202	532	488		522	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	8.0
Total Split (s)	36.0
Total Split (%)	24%
Yellow Time (s)	3.5
All-Red Time (s)	0.5
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0		0	0	0		0	
Spillback Cap Reductn	0	0		0	0		0	0	0		0	
Storage Cap Reductn	0	0		0	0		0	0	0		0	
Reduced v/c Ratio	0.28	0.98		0.33	0.94		0.37	0.16	0.02		1.23	

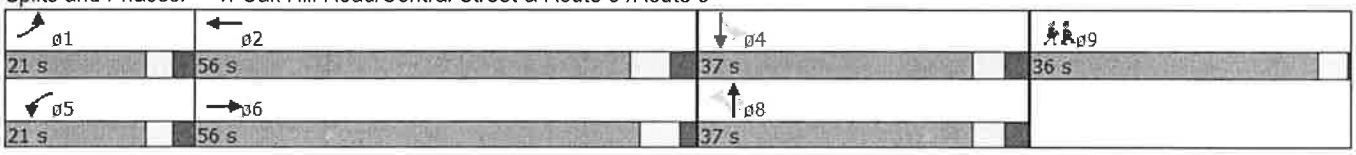
Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 109.4
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.23
Intersection Signal Delay: 53.9 Intersection LOS: D
Intersection Capacity Utilization 97.9% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 1: Oak Hill Road/Central Street & Route 9 /Route 9



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	206	2243	135	179	1789	120	83	115	18	160	175	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	12	10	10	12	10	11	10	12	16	12
Storage Length (ft)	250		0	250		0	75		75	0		0
Storage Lanes	1		0	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1685	4758	0	1685	4753	0	1685	1837	1507	0	2034	0
Flt Permitted	0.950			0.950			0.422				0.764	
Satd. Flow (perm)	1685	4758	0	1685	4753	0	748	1837	1507	0	1586	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			8				102		6	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		389			936			444			493	
Travel Time (s)		8.8			21.3			10.1			11.2	
Peak Hour Factor	0.91	0.91	0.91	0.94	0.94	0.94	0.93	0.93	0.93	0.77	0.77	0.77
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	2%	1%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	226	2613	0	190	2031	0	89	124	19	0	514	0
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8		8	4		
Detector Phase	1	6		5	2		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	9.5	22.5		9.5	23.5		22.5	22.5	22.5	22.5	22.5	
Total Split (s)	21.0	56.0		21.0	56.0		37.0	37.0	37.0	37.0	37.0	
Total Split (%)	14.0%	37.3%		14.0%	37.3%		24.7%	24.7%	24.7%	24.7%	24.7%	
Yellow Time (s)	3.0	4.5		3.0	4.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	2.5	2.0		2.5	3.0		3.0	3.0	3.0	3.0	3.0	
Lost Time Adjust (s)	-1.5	-2.5		-1.5	-2.5		-2.5	-2.5	-2.5		-2.5	
Total Lost Time (s)	4.0	4.0		4.0	5.0		4.0	4.0	4.0		4.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Min		None	Min		None	None	None	None	None	
Act Effct Green (s)	17.0	52.0		17.0	51.0		33.0	33.0	33.0		33.0	
Actuated g/C Ratio	0.15	0.46		0.15	0.45		0.29	0.29	0.29		0.29	
v/c Ratio	0.90	1.20		0.76	0.95		0.41	0.23	0.04		1.11	
Control Delay	84.5	125.3		66.4	41.9		39.7	32.3	0.1		113.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay	84.5	125.3		66.4	41.9		39.7	32.3	0.1		113.5	
LOS	F	F		E	D		D	C	A		F	
Approach Delay		122.1			44.0			32.5			113.5	
Approach LOS		F			D			C			F	
Queue Length 50th (ft)	165	~857		135	512		53	69	0		~430	
Queue Length 95th (ft)	#311	#951		#244	#636		104	120	0		#496	
Internal Link Dist (ft)		309			856			364			413	
Turn Bay Length (ft)	250			250			75		75			
Base Capacity (vph)	251	2174		251	2130		216	531	508		463	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	8.0
Total Split (s)	36.0
Total Split (%)	24%
Yellow Time (s)	3.5
All-Red Time (s)	0.5
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0		0	0	0		0	
Spillback Cap Reductn	0	0		0	0		0	0	0		0	
Storage Cap Reductn	0	0		0	0		0	0	0		0	
Reduced v/c Ratio	0.90	1.20		0.76	0.95		0.41	0.23	0.04		1.11	

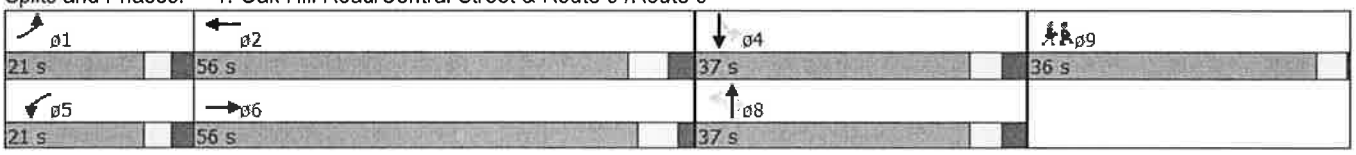
Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 114
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.20
Intersection Signal Delay: 87.9 Intersection LOS: F
Intersection Capacity Utilization 94.7% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 1: Oak Hill Road/Central Street & Route 9 /Route 9



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	615	420	97	76	260	128	8	1	8	13	78	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	125		0		0		0	150	
Storage Lanes	2		0	1		0		0		0	0	
Taper Length (ft)	25			25				25			25	
Satd. Flow (prot)	3502	1847	0	1787	1795	0	0	0	1703	0	0	1873
Flt Permitted	0.950			0.950					0.773			0.909
Satd. Flow (perm)	3502	1847	0	1787	1795	0	0	0	1337	0	0	1723
Right Turn on Red			Yes							Yes		
Satd. Flow (RTOR)		15							16			
Link Speed (mph)		30			30				30			30
Link Distance (ft)		135			625				135			331
Travel Time (s)		3.1			14.2				3.1			7.5
Peak Hour Factor	0.86	0.86	0.86	0.87	0.87	0.87	0.83	0.83	0.83	0.83	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	1%	1%	0%	13%	0%	0%	0%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	715	601	0	87	446	0	0	0	37	0	0	345
Turn Type	Prot	NA		Prot	NA		Perm	Perm	NA		Perm	NA
Protected Phases	5	2		1	6				4			4
Permitted Phases							4	4			4	
Detector Phase	5	2		1	6		4	4	4		4	4
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	9.0	21.0		9.0	21.0		21.0	21.0	21.0		21.0	21.0
Total Split (s)	30.0	54.0		11.0	35.0		25.0	25.0	25.0		25.0	25.0
Total Split (%)	28.6%	51.4%		10.5%	33.3%		23.8%	23.8%	23.8%		23.8%	23.8%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0				-1.0			-1.0
Total Lost Time (s)	4.0	4.0		4.0	4.0				4.0			4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lag		Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None		None	None		None	None	None		None	None
Act Effct Green (s)	23.3	45.7		7.2	26.7				21.5			21.5
Actuated g/C Ratio	0.26	0.52		0.08	0.30				0.24			0.24
v/c Ratio	0.77	0.62		0.60	0.82				0.11			0.82
Control Delay	37.9	19.9		62.2	43.7				22.4			52.7
Queue Delay	0.0	0.0		0.0	0.0				0.0			0.0
Total Delay	37.9	19.9		62.2	43.7				22.4			52.7
LOS	D	B		E	D				C			D
Approach Delay		29.6			46.8				22.4			34.2
Approach LOS		C			D				C			C
Queue Length 50th (ft)	178	204		47	215				9			179
Queue Length 95th (ft)	281	380		#130	#409				36			#411
Internal Link Dist (ft)		55			545				55			251
Turn Bay Length (ft)	200			125								
Base Capacity (vph)	1056	1078		145	645				337			419
Starvation Cap Reductn	0	0		0	0				0			0

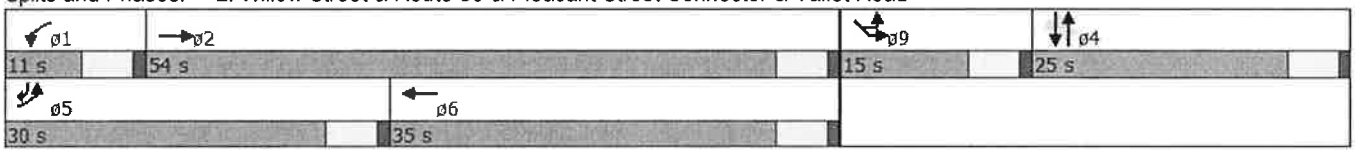
Lane Group	SBR	SBR2	SEL2	SEL
Lane Configurations				
Volume (vph)	239	4	5	8
Ideal Flow (vphpl)	1900	1900	1900	1900
Storage Length (ft)	0			0
Storage Lanes	1			1
Taper Length (ft)				25
Satd. Flow (prot)	1609	0	0	1805
Flt Permitted				0.950
Satd. Flow (perm)	1609	0	0	1805
Right Turn on Red		Yes		
Satd. Flow (RTOR)	73			
Link Speed (mph)				30
Link Distance (ft)				153
Travel Time (s)				3.5
Peak Hour Factor	0.92	0.92	0.67	0.67
Heavy Vehicles (%)	0%	25%	0%	0%
Shared Lane Traffic (%)				
Lane Group Flow (vph)	264	0	0	19
Turn Type	pm+ov		Split	NA
Protected Phases	5		9	9
Permitted Phases	4			
Detector Phase	5		9	9
Switch Phase				
Minimum Initial (s)	4.0		4.0	4.0
Minimum Split (s)	9.0		21.0	21.0
Total Split (s)	30.0		15.0	15.0
Total Split (%)	28.6%		14.3%	14.3%
Yellow Time (s)	4.0		4.0	4.0
All-Red Time (s)	1.0		1.0	1.0
Lost Time Adjust (s)	-1.0			-1.0
Total Lost Time (s)	4.0			4.0
Lead/Lag	Lead		Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes
Recall Mode	None		None	None
Act Effct Green (s)	48.9			7.7
Actuated g/C Ratio	0.55			0.09
v/c Ratio	0.29			0.12
Control Delay	9.9			43.9
Queue Delay	0.0			0.0
Total Delay	9.9			43.9
LOS	A			D
Approach Delay				43.9
Approach LOS				D
Queue Length 50th (ft)	46			10
Queue Length 95th (ft)	125			26
Internal Link Dist (ft)				73
Turn Bay Length (ft)				
Base Capacity (vph)	982			230
Starvation Cap Reductn	0			0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL	SBT
Spillback Cap Reductn	0	0		0	0				0			0
Storage Cap Reductn	0	0		0	0				0			0
Reduced v/c Ratio	0.68	0.56		0.60	0.69				0.11			0.82

Intersection Summary

Area Type: Other
Cycle Length: 105
Actuated Cycle Length: 88.2
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 34.4 Intersection LOS: C
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.

Splits and Phases: 2: Willow Street & Route 30 & Pleasant Street Connector & Vallet Road



Lane Group	SBR	SBR2	SEL2	SEL
Spillback Cap Reductn	0			0
Storage Cap Reductn	0			0
Reduced v/c Ratio	0.27			0.08

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	397	470	14	20	383	173	24	27	25	61	139	506
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	125		0			0	150		0
Storage Lanes	2		0	1		0			0	0		1
Taper Length (ft)	25			25						25		
Satd. Flow (prot)	3502	1892	0	1805	1793	0	0	1741	0	0	1872	1615
Flt Permitted	0.950			0.950				0.676			0.845	
Satd. Flow (perm)	3502	1892	0	1805	1793	0	0	1195	0	0	1606	1615
Right Turn on Red			Yes						Yes			
Satd. Flow (RTOR)		2						21				73
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		135			625			135			331	
Travel Time (s)		3.1			14.2			3.1			7.5	
Peak Hour Factor	0.89	0.89	0.89	0.88	0.88	0.88	0.63	0.63	0.63	0.89	0.89	0.89
Heavy Vehicles (%)	0%	0%	0%	0%	1%	1%	0%	0%	8%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	446	544	0	23	632	0	0	121	0	0	225	571
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2		1	6			4			4	5
Permitted Phases							4			4		4
Detector Phase	5	2		1	6		4	4		4	4	5
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	9.0	21.0		9.0	21.0		21.0	21.0		21.0	21.0	9.0
Total Split (s)	30.0	54.0		11.0	35.0		25.0	25.0		25.0	25.0	30.0
Total Split (%)	28.6%	51.4%		10.5%	33.3%		23.8%	23.8%		23.8%	23.8%	28.6%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag		Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None		None	None		None	None	None
Act Effct Green (s)	18.4	50.8		7.0	31.9			17.0			17.0	39.5
Actuated g/C Ratio	0.22	0.61		0.08	0.38			0.20			0.20	0.47
v/c Ratio	0.58	0.48		0.15	0.93			0.47			0.69	0.71
Control Delay	33.5	14.5		44.5	50.5			33.2			45.2	21.4
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay	33.5	14.5		44.5	50.5			33.2			45.2	21.4
LOS	C	B		D	D			C			D	C
Approach Delay		23.1			50.3			33.2			28.1	
Approach LOS		C			D			C			C	
Queue Length 50th (ft)	100	104		11	285			42			100	172
Queue Length 95th (ft)	176	352		40	#692			73			#223	365
Internal Link Dist (ft)		55			545			55			251	
Turn Bay Length (ft)	200			125								
Base Capacity (vph)	1117	1178		154	681			323			413	953
Starvation Cap Reductn	0	0		0	0			0			0	0

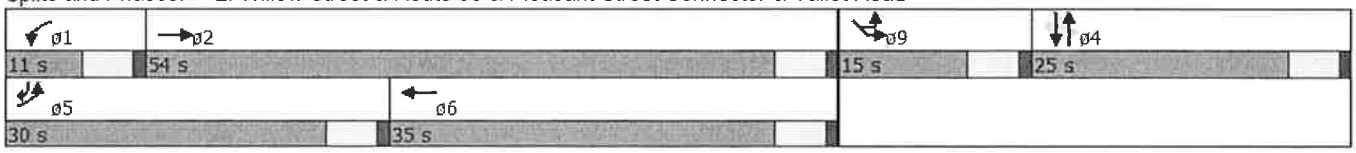
Lane Group	SBR2	SEL2	SEL
Lane Configurations			
Volume (vph)	2	6	4
Ideal Flow (vphpl)	1900	1900	1900
Storage Length (ft)			0
Storage Lanes			1
Taper Length (ft)			25
Satd. Flow (prot)	0	0	1805
Flt Permitted			0.950
Satd. Flow (perm)	0	0	1805
Right Turn on Red	Yes		
Satd. Flow (RTOR)			
Link Speed (mph)			30
Link Distance (ft)			153
Travel Time (s)			3.5
Peak Hour Factor	0.89	0.55	0.55
Heavy Vehicles (%)	0%	0%	0%
Shared Lane Traffic (%)			
Lane Group Flow (vph)	0	0	18
Turn Type		Split	NA
Protected Phases		9	9
Permitted Phases			
Detector Phase		9	9
Switch Phase			
Minimum Initial (s)		4.0	4.0
Minimum Split (s)		21.0	21.0
Total Split (s)		15.0	15.0
Total Split (%)		14.3%	14.3%
Yellow Time (s)		4.0	4.0
All-Red Time (s)		1.0	1.0
Lost Time Adjust (s)			-1.0
Total Lost Time (s)			4.0
Lead/Lag		Lead	Lead
Lead-Lag Optimize?		Yes	Yes
Recall Mode		None	None
Act Effct Green (s)			7.6
Actuated g/C Ratio			0.09
v/c Ratio			0.11
Control Delay			42.5
Queue Delay			0.0
Total Delay			42.5
LOS			D
Approach Delay			42.5
Approach LOS			D
Queue Length 50th (ft)			8
Queue Length 95th (ft)			20
Internal Link Dist (ft)			73
Turn Bay Length (ft)			
Base Capacity (vph)			243
Starvation Cap Reductn			0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn	0	0		0	0			0			0	0
Storage Cap Reductn	0	0		0	0			0			0	0
Reduced v/c Ratio	0.40	0.46		0.15	0.93			0.37			0.54	0.60

Intersection Summary

Area Type: Other
Cycle Length: 105
Actuated Cycle Length: 83.9
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 32.2 Intersection LOS: C
Intersection Capacity Utilization 77.0% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Willow Street & Route 30 & Pleasant Street Connector & Vallet Road



Lane Group	SBR2	SEL2	SEL
Spillback Cap Reductn			0
Storage Cap Reductn			0
Reduced v/c Ratio			0.07

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	14	501	21	273	1	168	0	50	0	2	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	11	12	12	12	12	12	12	12	12
Satd. Flow (prot)	0	1667	1546	1745	1881	0	0	1787	1615	0	1900	0
Flt Permitted				0.747				0.755				
Satd. Flow (perm)	0	1667	1546	1372	1881	0	0	1420	1615	0	1900	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			589						55			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		625			62			440			83	
Travel Time (s)		14.2			1.4			10.0			1.9	
Peak Hour Factor	0.85	0.85	0.85	0.89	0.89	0.89	0.91	0.91	0.91	0.50	0.50	0.50
Heavy Vehicles (%)	0%	14%	1%	0%	1%	0%	1%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	589	24	308	0	0	185	55	0	4	0
Turn Type	custom	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		1 2			1 2			3			3	
Permitted Phases	1		1 2	1 2			3		3	3		
Detector Phase	1	1 2	1 2	1 2	1 2		3	3	3	3	3	
Switch Phase												
Minimum Initial (s)	4.0						4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	20.0						20.0	20.0	20.0	20.0	20.0	
Total Split (s)	19.0						34.0	34.0	34.0	34.0	34.0	
Total Split (%)	18.6%						33.3%	33.3%	33.3%	33.3%	33.3%	
Yellow Time (s)	3.0						3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0						1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)								0.0	0.0		0.0	
Total Lost Time (s)								4.0	4.0		4.0	
Lead/Lag	Lead											
Lead-Lag Optimize?	Yes											
Recall Mode	None						None	None	None	None	None	
Act Effct Green (s)		44.4	44.4	44.4	44.4			15.4	15.4		15.4	
Actuated g/C Ratio		0.65	0.65	0.65	0.65			0.23	0.23		0.23	
v/c Ratio		0.01	0.49	0.03	0.25			0.58	0.14		0.01	
Control Delay		5.7	2.1	5.7	6.4			40.0	19.0		24.0	
Queue Delay		0.0	0.0	0.0	0.0			0.0	0.0		0.0	
Total Delay		5.7	2.1	5.7	6.4			40.0	19.0		24.0	
LOS		A	A	A	A			D	B		C	
Approach Delay		2.2			6.3			35.2			24.0	
Approach LOS		A			A			D			C	
Queue Length 50th (ft)		2	0	3	42			60	0		1	
Queue Length 95th (ft)		10	26	14	118			139	39		6	
Internal Link Dist (ft)		545			1			360			3	
Turn Bay Length (ft)												
Base Capacity (vph)		1487	1443	1224	1678			672	794		900	
Starvation Cap Reductn		0	38	0	0			0	0		0	
Spillback Cap Reductn		0	0	0	0			0	0		0	
Storage Cap Reductn		0	0	0	0			0	0		0	

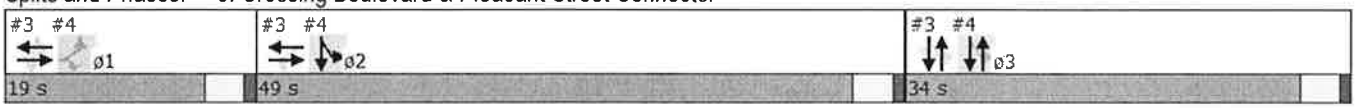
Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	20.0
Total Split (s)	49.0
Total Split (%)	48%
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
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	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.01	0.42	0.02	0.18			0.28	0.07		0.00	

Intersection Summary

Area Type: Other
Cycle Length: 102
Actuated Cycle Length: 68.4
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 10.2 Intersection LOS: B
Intersection Capacity Utilization 58.8% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: Crossing Boulevard & Pleasant Street Connector



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	22	494	58	248	0	330	0	440	1	2	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	11	12	12	12	12	12	12	12	12
Satd. Flow (prot)	0	1900	1546	1711	1863	0	0	1805	1615	0	1866	0
Flt Permitted				0.741				0.752			0.913	
Satd. Flow (perm)	0	1900	1546	1334	1863	0	0	1429	1615	0	1735	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			568						564			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		625			62			440			83	
Travel Time (s)		14.2			1.4			10.0			1.9	
Peak Hour Factor	0.87	0.87	0.87	0.76	0.76	0.76	0.78	0.78	0.78	0.38	0.38	0.38
Heavy Vehicles (%)	0%	0%	1%	2%	2%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	25	568	76	326	0	0	423	564	0	8	0
Turn Type	custom	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		1 2			1 2			3			3	
Permitted Phases	1		1 2	1 2			3		3	3		
Detector Phase	1	1 2	1 2	1 2	1 2		3	3	3	3	3	
Switch Phase												
Minimum Initial (s)	4.0						4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	20.0						20.0	20.0	20.0	20.0	20.0	
Total Split (s)	19.0						34.0	34.0	34.0	34.0	34.0	
Total Split (%)	18.6%						33.3%	33.3%	33.3%	33.3%	33.3%	
Yellow Time (s)	3.0						3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0						1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)								0.0	0.0		0.0	
Total Lost Time (s)								4.0	4.0		4.0	
Lead/Lag	Lead											
Lead-Lag Optimize?	Yes											
Recall Mode	None						None	None	None	None	None	
Act Effct Green (s)		56.3	56.3	56.3	56.3			30.4	30.4		30.4	
Actuated g/C Ratio		0.59	0.59	0.59	0.59			0.32	0.32		0.32	
v/c Ratio		0.02	0.49	0.10	0.30			0.92	0.63		0.01	
Control Delay		7.3	2.3	8.0	9.9			46.1	11.7		25.7	
Queue Delay		0.0	0.2	0.0	0.0			0.0	4.3		0.0	
Total Delay		7.3	2.4	8.0	9.9			46.1	16.0		25.7	
LOS		A	A	A	A			D	B		C	
Approach Delay		2.7			9.5			28.9			25.7	
Approach LOS		A			A			C			C	
Queue Length 50th (ft)		6	0	18	88			~99	83		4	
Queue Length 95th (ft)		15	31	30	107			#355	104		6	
Internal Link Dist (ft)		545			1			360			3	
Turn Bay Length (ft)												
Base Capacity (vph)		1280	1226	899	1254			458	901		556	
Starvation Cap Reductn		0	136	0	0			0	256		0	
Spillback Cap Reductn		0	31	27	0			0	0		0	
Storage Cap Reductn		0	0	0	0			0	0		0	

Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	20.0
Total Split (s)	49.0
Total Split (%)	48%
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
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	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.02	0.52	0.09	0.26			0.92	0.87		0.01	

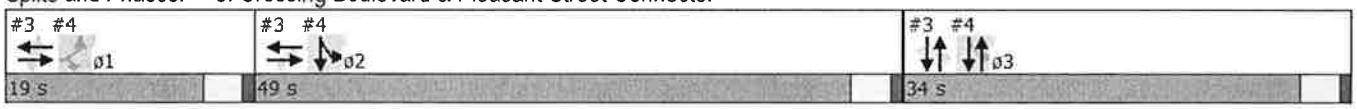
Intersection Summary

Area Type: Other
Cycle Length: 102
Actuated Cycle Length: 94.8
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 17.1 Intersection LOS: B
Intersection Capacity Utilization 57.0% ICU Level of Service B
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.

Splits and Phases: 3: Crossing Boulevard & Pleasant Street Connector



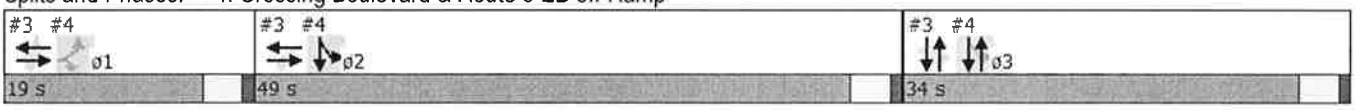
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	151	0	553	0	0	0	0	67	7	311	213	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	16	12	12	12	12	12	12	12	12	12
Satd. Flow (prot)	1787	0	1830	0	0	0	0	3496	0	1787	1900	0
Flt Permitted	0.950									0.689		
Satd. Flow (perm)	1787	0	1830	0	0	0	0	3496	0	1296	1900	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			608					9				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		347			261			206			440	
Travel Time (s)		7.9			5.9			4.7			10.0	
Peak Hour Factor	0.91	0.91	0.91	0.92	0.92	0.92	0.74	0.74	0.74	0.90	0.90	0.90
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	2%	0%	1%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	166	0	608	0	0	0	0	100	0	346	237	0
Turn Type	custom		custom					NA		D.P+P	NA	
Protected Phases								3		2	2 3	
Permitted Phases	1		1							3		
Detector Phase	1		1					3		2	2 3	
Switch Phase												
Minimum Initial (s)	4.0		4.0					4.0		4.0		
Minimum Split (s)	20.0		20.0					20.0		20.0		
Total Split (s)	19.0		19.0					34.0		49.0		
Total Split (%)	18.6%		18.6%					33.3%		48.0%		
Yellow Time (s)	3.0		3.0					3.0		3.0		
All-Red Time (s)	1.0		1.0					1.0		1.0		
Lost Time Adjust (s)	0.0		0.0					0.0		0.0		
Total Lost Time (s)	4.0		4.0					4.0		4.0		
Lead/Lag	Lead		Lead							Lag		
Lead-Lag Optimize?	Yes		Yes							Yes		
Recall Mode	None		None					None		None		
Act Effct Green (s)	15.4		15.4					15.4		40.1	44.4	
Actuated g/C Ratio	0.23		0.23					0.23		0.59	0.65	
v/c Ratio	0.41		0.69					0.13		0.37	0.19	
Control Delay	32.6		8.0					21.9		5.9	4.5	
Queue Delay	0.0		0.0					0.0		0.0	0.0	
Total Delay	32.6		8.0					21.9		5.9	4.5	
LOS	C		A					C		A	A	
Approach Delay								21.9			5.4	
Approach LOS								C			A	
Queue Length 50th (ft)	55		0					15		51	33	
Queue Length 95th (ft)	171		107					34		104	67	
Internal Link Dist (ft)		267			181			126			360	
Turn Bay Length (ft)												
Base Capacity (vph)	423		897					1661		1369	1690	
Starvation Cap Reductn	0		0					0		47	0	
Spillback Cap Reductn	0		0					0		0	0	
Storage Cap Reductn	0		0					0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.39		0.68					0.06		0.26	0.14	

Intersection Summary

Area Type: Other
Cycle Length: 102
Actuated Cycle Length: 68.4
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 10.7 Intersection LOS: B
Intersection Capacity Utilization 52.1% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 4: Crossing Boulevard & Route 9 EB off-Ramp



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	119	0	29	0	0	0	0	651	33	512	42	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	16	12	12	12	12	12	12	12	12	12
Satd. Flow (prot)	1787	0	1830	0	0	0	0	3580	0	1787	1810	0
Flt Permitted	0.950									0.136		
Satd. Flow (perm)	1787	0	1830	0	0	0	0	3580	0	256	1810	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			53					5				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		347			261			206			440	
Travel Time (s)		7.9			5.9			4.7			10.0	
Peak Hour Factor	0.76	0.76	0.76	0.92	0.92	0.92	0.79	0.79	0.79	0.84	0.84	0.84
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	0%	3%	1%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	157	0	38	0	0	0	0	866	0	610	50	0
Turn Type	custom		custom					NA		D.P+P	NA	
Protected Phases								3		2	2 3	
Permitted Phases	1		1							3		
Detector Phase	1		1					3		2	2 3	
Switch Phase												
Minimum Initial (s)	4.0		4.0					4.0		4.0		
Minimum Split (s)	20.0		20.0					20.0		20.0		
Total Split (s)	19.0		19.0					34.0		49.0		
Total Split (%)	18.6%		18.6%					33.3%		48.0%		
Yellow Time (s)	3.0		3.0					3.0		3.0		
All-Red Time (s)	1.0		1.0					1.0		1.0		
Lost Time Adjust (s)	0.0		0.0					0.0		0.0		
Total Lost Time (s)	4.0		4.0					4.0		4.0		
Lead/Lag	Lead		Lead							Lag		
Lead-Lag Optimize?	Yes		Yes							Yes		
Recall Mode	None		None					None		None		
Act Effct Green (s)	14.4		14.4					30.4		68.3	72.3	
Actuated g/C Ratio	0.15		0.15					0.32		0.72	0.76	
v/c Ratio	0.58		0.12					0.75		0.77	0.04	
Control Delay	48.8		7.6					35.3		22.5	2.9	
Queue Delay	0.0		0.0					0.0		0.0	0.0	
Total Delay	48.8		7.6					35.3		22.5	2.9	
LOS	D		A					D		C	A	
Approach Delay								35.3			21.0	
Approach LOS								D			C	
Queue Length 50th (ft)	97		0					273		247	7	
Queue Length 95th (ft)	135		12					293		333	15	
Internal Link Dist (ft)		267			181			126			360	
Turn Bay Length (ft)												
Base Capacity (vph)	286		338					1151		925	1380	
Starvation Cap Reductn	0		0					0		6	0	
Spillback Cap Reductn	0		0					0		0	0	
Storage Cap Reductn	0		0					0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.55		0.11					0.75		0.66	0.04	

Intersection Summary

Area Type: Other
Cycle Length: 102
Actuated Cycle Length: 94.8
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 30.5 Intersection LOS: C
Intersection Capacity Utilization 64.0% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 4: Crossing Boulevard & Route 9 EB off-Ramp

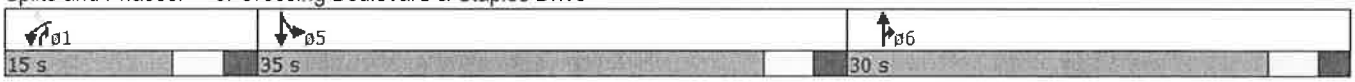
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	41	55	9	600	642	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12
Satd. Flow (prot)	1745	2748	1900	1615	1715	1737
Flt Permitted	0.950				0.950	0.965
Satd. Flow (perm)	1745	2748	1900	1615	1715	1737
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		73		92		
Link Speed (mph)	30		30			30
Link Distance (ft)	183		120			130
Travel Time (s)	4.2		2.7			3.0
Peak Hour Factor	0.75	0.75	0.84	0.84	0.89	0.89
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%
Shared Lane Traffic (%)					43%	
Lane Group Flow (vph)	55	73	11	714	411	423
Turn Type	NA	Perm	NA	pt+ov	Split	NA
Protected Phases	1		6	1 6	5	5
Permitted Phases		1				
Detector Phase	1	1	6	1 6	5	5
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	15.0	15.0	21.0		21.0	21.0
Total Split (s)	15.0	15.0	30.0		35.0	35.0
Total Split (%)	18.8%	18.8%	37.5%		43.8%	43.8%
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0		4.0	4.0
Lead/Lag			Lag		Lead	Lead
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None		None	None
Act Effct Green (s)	10.6	10.6	23.7	38.4	24.3	24.3
Actuated g/C Ratio	0.15	0.15	0.33	0.54	0.34	0.34
v/c Ratio	0.21	0.15	0.02	0.78	0.70	0.71
Control Delay	32.2	9.4	18.2	20.1	27.5	27.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.2	9.4	18.2	20.1	27.5	27.9
LOS	C	A	B	C	C	C
Approach Delay	19.2		20.0			27.7
Approach LOS	B		C			C
Queue Length 50th (ft)	23	0	3	213	169	175
Queue Length 95th (ft)	48	13	14	357	265	273
Internal Link Dist (ft)	103		40			50
Turn Bay Length (ft)						
Base Capacity (vph)	278	499	716	922	770	780
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

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Reduced v/c Ratio	0.20	0.15	0.02	0.77	0.53	0.54

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 70.9
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 23.8 Intersection LOS: C
Intersection Capacity Utilization 64.3% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 5: Crossing Boulevard & Staples Drive



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	538	743	71	49	81	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12
Satd. Flow (prot)	1745	2748	1900	1615	1649	1692
Flt Permitted	0.950				0.950	0.965
Satd. Flow (perm)	1745	2748	1900	1615	1649	1692
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		864		59		
Link Speed (mph)	30		30			30
Link Distance (ft)	183		120			130
Travel Time (s)	4.2		2.7			3.0
Peak Hour Factor	0.86	0.86	0.83	0.83	0.84	0.84
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%
Shared Lane Traffic (%)					43%	
Lane Group Flow (vph)	626	864	86	59	55	56
Turn Type	NA	Perm	NA	pt+ov	Split	NA
Protected Phases	1		6	1 6	5	5
Permitted Phases		1				
Detector Phase	1	1	6	1 6	5	5
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	15.0	15.0	21.0		21.0	21.0
Total Split (s)	53.0	53.0	19.0		18.0	18.0
Total Split (%)	58.9%	58.9%	21.1%		20.0%	20.0%
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0		4.0	4.0
Lead/Lag			Lag		Lead	Lead
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None		None	None
Act Effct Green (s)	34.9	34.9	12.0	44.8	11.4	11.4
Actuated g/C Ratio	0.61	0.61	0.21	0.79	0.20	0.20
v/c Ratio	0.59	0.43	0.21	0.05	0.17	0.17
Control Delay	14.0	1.4	29.1	0.8	29.9	29.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.0	1.4	29.1	0.8	29.9	29.8
LOS	B	A	C	A	C	C
Approach Delay	6.7		17.6			29.9
Approach LOS	A		B			C
Queue Length 50th (ft)	162	0	28	0	18	18
Queue Length 95th (ft)	303	19	78	6	61	61
Internal Link Dist (ft)	103		40			50
Turn Bay Length (ft)						
Base Capacity (vph)	1403	2379	726	1501	588	603
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

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Reduced v/c Ratio	**0.45**	**0.36**	**0.12**	**0.04**	**0.09**	**0.09**

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 56.9
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.59
Intersection Signal Delay: 9.1 Intersection LOS: A
Intersection Capacity Utilization 45.7% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 5: Crossing Boulevard & Staples Drive

ø1	ø5	ø6
53 s	18 s	19 s

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BG
Agency/Co.:	VAI
Date performed:	8/19/2016
Analysis time period:	Wkdy AM Peak
Freeway/Dir of Travel:	Route 9 EB
Junction:	Crossing Boulevard Off-Ramp #6
Jurisdiction:	MassDOT
Analysis Year:	2016

Description: Framingham Transportation Master Plan

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2191	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	9	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	70	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2191		9		70		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	595		1		19		v
Trucks and buses	0		0		0		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	1.5		1.5		1.5		
Recreational vehicle PCE, ER	1.2		1.2		1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2382	10	76	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2382 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2382	4500	No
$v_{FO} = v_F - v_R$	2372	4500	No
v_R	10	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 No

If yes, v_{12A} = 2382 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2382	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 22.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.429

Space mean speed in ramp influence area, S_R = 49.4 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 49.4 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BG
Agency/Co.:	VAI
Date performed:	8/19/2016
Analysis time period:	Wkdy PM Peak
Freeway/Dir of Travel:	Route 9 EB
Junction:	Crossing Boulevard Off-Ramp
Jurisdiction:	MassDOT
Analysis Year:	2016
Description:	Framingham Transportation Master Plan

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2546	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	3	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	820	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2546		3		820		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	692		1		223		v
Trucks and buses	0		0		0		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	1.5		1.5		1.5		
Recreational vehicle PCE, ER	1.2		1.2		1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2767	3	891	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 426.54 (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2767 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2767	4500	No
$v_{FO} = v_F - v_R$	2764	4500	No
v_R	3	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 No

If yes, v_{12A} = 2767 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2767	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 25.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.428

Space mean speed in ramp influence area, S_R = 49.4 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 49.4 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BG
Agency/Co.:	VAI
Date performed:	8/19/2016
Analysis time period:	Wkdy AM Peak
Freeway/Dir of Travel:	Route 9 WB
Junction:	Pleasant St Connector Off-Ramp #7
Jurisdiction:	MassDOT
Analysis Year:	2016

Description: Framingham Transportation Master Plan

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2216	vph

Off Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	295	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	734	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	250	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	2216		295		734	vph
Peak-hour factor, PHF	0.92		0.92		0.92	
Peak 15-min volume, v15	602		80		199	v
Trucks and buses	0		0		0	%
Recreational vehicles	0		0		0	%
Terrain type:	Level		Level		Level	
Grade	0.00	%	0.00	%	0.00	%
Length	0.00	mi	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5		1.5		1.5	
Recreational vehicle PCE, ER	1.2		1.2		1.2	

Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2409	321	798	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.685 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1751 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2409	6750	No
$v_{FO} = v_F - v_R$	2088	6750	No
v_R	321	2000	No
v_3 or v_{av34}	658 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 No

If yes, v_{12A} = 1751 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1751	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 15.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, D_S = 0.457

Space mean speed in ramp influence area, S_R = 49.1 mph

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 51.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BG
Agency/Co.:	VAI
Date performed:	8/19/2016
Analysis time period:	Wkdy PM Peak
Freeway/Dir of Travel:	Route 9 WB
Junction:	Pleasant St Connector Off-Ramp
Jurisdiction:	MassDOT
Analysis Year:	2016

Description: Framingham Transportation Master Plan

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2536	vph

Off Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	306	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	91	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	250	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2536		306		91		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	689		83		25		v
Trucks and buses	0		0		0		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	1.5		1.5		1.5		
Recreational vehicle PCE, ER	1.2		1.2		1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2757	333	99	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.676 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1971 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2757	6750	No
$v_{FO} = v_F - v_R$	2424	6750	No
v_R	333	2000	No
v_3 or v_{av34}	786 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 No

If yes, v_{12A} = 1971 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1971	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 17.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, D_S = 0.458

Space mean speed in ramp influence area, S_R = 49.0 mph

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 51.4 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BG
Agency/Co.:	VAI
Date performed:	8/19/2016
Analysis time period:	Wkdy AM Peak
Freeway/Dir of Travel:	Route 9 WB
Junction:	Crossing Boulevard Off-Ramp #8
Jurisdiction:	MassDOT
Analysis Year:	2016

Description: Framingham Transportation Master Plan

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2950	vph

Off Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	734	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	295	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2950		734		295		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	802		199		80		v
Trucks and buses	0		0		0		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	1.5		1.5		1.5		
Recreational vehicle PCE, ER	1.2		1.2		1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3207	798	321	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 426.54 (Equation 13-12 or 13-13)

P_{FD} = 0.643 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2347 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3207	6750	No
$v_{FO} = v_F - v_R$	2409	6750	No
v_R	798	2000	No
v_3 or v_{av34}	860 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 No

If yes, v_{12A} = 2347 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2347	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 23.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.500

Space mean speed in ramp influence area, S_R = 48.5 mph

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 50.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BG
Agency/Co.:	VAI
Date performed:	8/19/2016
Analysis time period:	Wkdy PM Peak
Freeway/Dir of Travel:	Route 9 WB
Junction:	Crossing Boulevard Off-Ramp
Jurisdiction:	MassDOT
Analysis Year:	2016
Description:	Framingham Transportation Master Plan

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2627	vph

Off Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	91	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	306	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2627		91		306		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	714		25		83		v
Trucks and buses	0		0		0		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	1.5		1.5		1.5		
Recreational vehicle PCE, ER	1.2		1.2		1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2855	99	333	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 325.90 (Equation 13-12 or 13-13)

P_{FD} = 0.684 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1984 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2855	6750	No
$v_{FO} = v_F - v_R$	2756	6750	No
v_R	99	2000	No
v_3 or v_{av34}	871 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 No

If yes, v_{12A} = 1984 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1984	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 19.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	D_S = 0.437	
Space mean speed in ramp influence area,	S_R = 49.3	mph
Space mean speed in outer lanes,	S_O = 60.3	mph
Space mean speed for all vehicles,	S = 51.9	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BG
Agency/Co.:	VAI
Date performed:	8/19/2016
Analysis time period:	Wkdy AM Peak
Freeway/Dir of Travel:	Route 9 WB
Junction:	Pleasant St Connector On-Ramp #9
Jurisdiction:	MassDOT
Analysis Year:	2016

Description: Framingham Transportation Master Plan

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1921	vph

On Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	64	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1921	64		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	522	17		v
Trucks and buses	0	0		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%		%
Length	mi	mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2088	70	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2088 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2158	4500	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 Yes

If yes, v_{12A} = 2088 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2408	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 19.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.329	
Space mean speed in ramp influence area,	S_R = 50.7	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 50.7	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BG
Agency/Co.:	VAI
Date performed:	8/19/2016
Analysis time period:	Wkdy PM Peak
Freeway/Dir of Travel:	Route 9 WB
Junction:	Pleasant St Connector On-Ramp
Jurisdiction:	MassDOT
Analysis Year:	2016
Description:	Framingham Transportation Master Plan

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2230	vph

On Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	463	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp	0	vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2230		463		0		vph
Peak-hour factor, PHF	0.92		0.92		0.94		
Peak 15-min volume, v15	606		126				v
Trucks and buses	0		0		0		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level				
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	1.5		1.5		1.5		
Recreational vehicle PCE, ER	1.2		1.2		1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2424	503	0	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2424 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2927	4500	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 No

If yes, v_{12A} = 2424 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3217	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 24.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.383	
Space mean speed in ramp influence area,	S_R = 50.0	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 50.0	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BG
Agency/Co.:	VAI
Date performed:	8/19/2016
Analysis time period:	Wkdy AM Peak
Freeway/Dir of Travel:	Route 9 EB
Junction:	Crossing Boulevard On-Ramp #10
Jurisdiction:	MassDOT
Analysis Year:	2016

Description: Framingham Transportation Master Plan

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2182	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	70	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2182	70		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	593	19		v
Trucks and buses	0	0		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%		%
Length	mi	mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2372	76	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2372 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2448	4500	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 Yes

If yes, v_{12A} = 2372 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2448	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 21.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.331	
Space mean speed in ramp influence area,	S_R = 50.7	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 50.7	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BG
Agency/Co.:	VAI
Date performed:	8/19/2016
Analysis time period:	Wkdy PM Peak
Freeway/Dir of Travel:	Route 9 EB
Junction:	Crossing Boulevard On-Ramp
Jurisdiction:	MassDOT
Analysis Year:	2016
Description:	Framingham Transportation Master Plan

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2543	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	820	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2543	820		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	691	223		v
Trucks and buses	0	0		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2764	891	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2764 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3655	4500	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 Yes

If yes, v_{12A} = 2764 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3655	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 30.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	M_S = 0.437	
Space mean speed in ramp influence area,	S_R = 49.3	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 49.3	mph

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	346	1890	16	0	2842	704	10	1	20	154	10	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	13	12	12	12	12	12	12
Storage Length (ft)	400		0	0		250	0		50	150		0
Storage Lanes	2		0	0		1	0		1	2		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	3255	5017	0	0	5085	1620	0	1529	1042	3213	1468	0
Flt Permitted	0.950							0.753		0.748		
Satd. Flow (perm)	3255	5017	0	0	5085	1620	0	1206	1042	2529	1468	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				388			67		116	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		658			453			379			639	
Travel Time (s)		15.0			10.3			8.6			14.5	
Peak Hour Factor	0.93	0.93	0.93	0.96	0.96	0.96	0.71	0.71	0.71	0.81	0.81	0.81
Heavy Vehicles (%)	4%	3%	38%	0%	2%	3%	20%	0%	55%	9%	10%	12%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	372	2049	0	0	2960	733	0	15	28	190	128	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases						8	2		2	6		
Detector Phase	7	4			8	8	2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	9.0	22.0			22.0	22.0	21.0	21.0	21.0	21.0	21.0	
Total Split (s)	35.0	101.0			66.0	66.0	30.0	30.0	30.0	30.0	30.0	
Total Split (%)	26.7%	77.1%			50.4%	50.4%	22.9%	22.9%	22.9%	22.9%	22.9%	
Yellow Time (s)	3.0	4.0			4.0	4.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-2.0			-2.0	-2.0		-1.0	-1.0	-1.0	-1.0	
Total Lost Time (s)	4.0	4.0			4.0	4.0		4.0	4.0	4.0	4.0	
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	Min			Min	Min	None	None	None	None	None	
Act Effct Green (s)	18.5	84.8			62.3	62.3		14.6	14.6	14.6	14.6	
Actuated g/C Ratio	0.17	0.79			0.58	0.58		0.14	0.14	0.14	0.14	
v/c Ratio	0.66	0.52			1.00	0.67		0.09	0.14	0.55	0.43	
Control Delay	48.0	4.8			41.4	10.9		42.6	1.5	50.3	14.6	
Queue Delay	0.0	0.1			37.3	2.2		0.0	0.0	0.0	0.0	
Total Delay	48.0	4.9			78.7	13.1		42.6	1.5	50.3	14.6	
LOS	D	A			E	B		D	A	D	B	
Approach Delay		11.5			65.7			15.8			35.9	
Approach LOS		B			E			B			D	
Queue Length 50th (ft)	123	144			~704	141		9	0	63	7	
Queue Length 95th (ft)	183	225			#1040	345		24	0	93	47	
Internal Link Dist (ft)		578			373			299			559	
Turn Bay Length (ft)	400					250			50	150		
Base Capacity (vph)	943	4551			2948	1102		293	304	614	444	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	950			585	231		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	0.39	0.57			1.25	0.84		0.05	0.09	0.31	0.29	

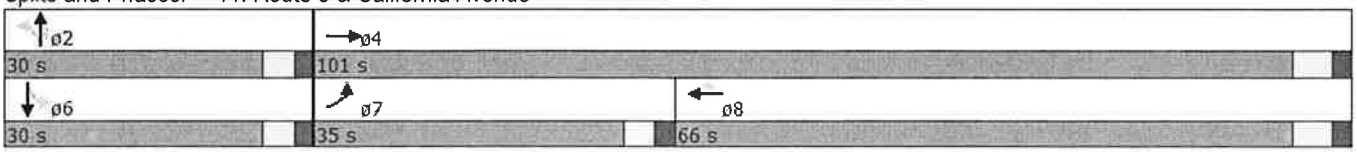
Intersection Summary

Area Type: Other
Cycle Length: 131
Actuated Cycle Length: 107.4
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 43.6 Intersection LOS: D
Intersection Capacity Utilization 85.8% ICU Level of Service E
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 11: Route 9 & California Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	3266	7	0	2289	162	25	0	15	612	11	313
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	13	12	12	12	12	12	12
Storage Length (ft)	400		0	0		250	0		50	150		0
Storage Lanes	2		0	0		1	0		1	2		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	2996	5136	0	0	5136	1605	0	1671	1583	3467	1546	0
Flt Permitted	0.950							0.154		0.728		
Satd. Flow (perm)	2996	5136	0	0	5136	1605	0	271	1583	2657	1546	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				111			67		364	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		658			453			379			639	
Travel Time (s)		15.0			10.3			8.6			14.5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.56	0.60	0.56	0.85	0.85	0.85
Heavy Vehicles (%)	13%	1%	0%	0%	1%	4%	8%	0%	2%	1%	36%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	96	3481	0	0	2435	172	0	45	27	720	381	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases						8	2		2	6		
Detector Phase	7	4			8	8	2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	9.0	22.0			22.0	22.0	21.0	21.0	21.0	21.0	21.0	
Total Split (s)	35.0	101.0			66.0	66.0	30.0	30.0	30.0	30.0	30.0	
Total Split (%)	26.7%	77.1%			50.4%	50.4%	22.9%	22.9%	22.9%	22.9%	22.9%	
Yellow Time (s)	3.0	4.0			4.0	4.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-2.0			-2.0	-2.0		-1.0	-1.0	-1.0	-1.0	
Total Lost Time (s)	4.0	4.0			4.0	4.0		4.0	4.0	4.0	4.0	
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	Min			Min	Min	None	None	None	None	None	
Act Effct Green (s)	10.6	97.0			82.4	82.4		26.0	26.0	26.0	26.0	
Actuated g/C Ratio	0.08	0.74			0.63	0.63		0.20	0.20	0.20	0.20	
v/c Ratio	0.40	0.92			0.75	0.16		0.85	0.07	1.37	0.64	
Control Delay	61.6	18.8			19.3	4.3		137.8	0.4	216.6	10.9	
Queue Delay	0.0	34.5			47.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	61.6	53.3			66.4	4.3		137.8	0.4	216.6	10.9	
LOS	E	D			E	A		F	A	F	B	
Approach Delay		53.5			62.3			86.3			145.4	
Approach LOS		D			E			F			F	
Queue Length 50th (ft)	40	769			502	19		37	0	~414	12	
Queue Length 95th (ft)	68	852			596	51		#62	0	#495	80	
Internal Link Dist (ft)		578			373			299			559	
Turn Bay Length (ft)	400					250			50	150		
Base Capacity (vph)	708	3803			3232	1051		53	367	527	598	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	565			1030	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	0.14	1.08			1.11	0.16		0.85	0.07	1.37	0.64	

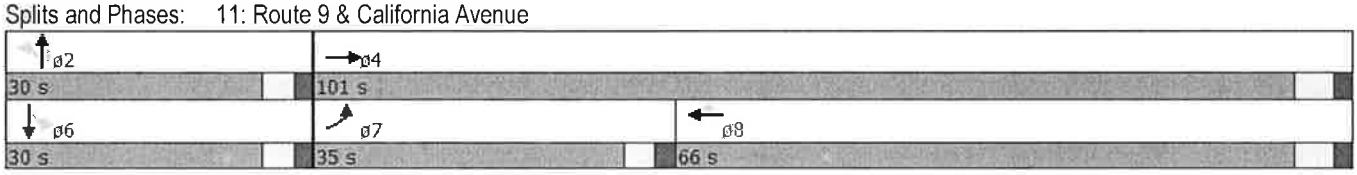
Intersection Summary

Area Type: Other
Cycle Length: 131
Actuated Cycle Length: 131
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.37
Intersection Signal Delay: 70.7 Intersection LOS: E
Intersection Capacity Utilization 96.5% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 11: Route 9 & California Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	1325	278	73	1683	0	371	0	75	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	145		125	100		0	225		0	0		0
Storage Lanes	1		1	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1805	3455	1615	1805	3574	0	1715	1668	0	0	0	0
Flt Permitted	0.950			0.950			0.950	0.965				
Satd. Flow (perm)	1805	3455	1615	1805	3574	0	1715	1668	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			176					87				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		453			651			275			82	
Travel Time (s)		10.3			14.8			6.3			1.9	
Peak Hour Factor	0.94	0.94	0.94	0.95	0.95	0.95	0.88	0.88	0.88	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	1%	2%	2%	2%
Shared Lane Traffic (%)							55%					
Lane Group Flow (vph)	48	1410	296	77	1772	0	190	317	0	0	0	0
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA				
Protected Phases	7	4		3	8			2				
Permitted Phases			4				2					
Detector Phase	7	4	4	3	8		2	2				
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0				
Minimum Split (s)	9.0	22.0	22.0	9.0	22.0		21.0	21.0				
Total Split (s)	20.0	55.0	55.0	20.0	55.0		25.0	25.0				
Total Split (%)	20.0%	55.0%	55.0%	20.0%	55.0%		25.0%	25.0%				
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0				
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		1.0	1.0				
Lost Time Adjust (s)	-1.0	-2.0	-2.0	-2.0	-2.0		-1.0	-1.0				
Total Lost Time (s)	4.0	4.0	4.0	3.0	4.0		4.0	4.0				
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Recall Mode	None	None	None	None	None		None	None				
Act Effct Green (s)	9.0	49.2	49.2	11.3	52.8		17.8	17.8				
Actuated g/C Ratio	0.10	0.57	0.57	0.13	0.61		0.21	0.21				
v/c Ratio	0.26	0.72	0.30	0.33	0.81		0.54	0.77				
Control Delay	42.8	18.3	5.9	41.2	19.7		38.7	38.1				
Queue Delay	0.0	1.3	0.0	0.0	0.4		0.0	0.0				
Total Delay	42.8	19.6	5.9	41.2	20.1		38.7	38.1				
LOS	D	B	A	D	C		D	D				
Approach Delay		18.0			21.0			38.3				
Approach LOS		B			C			D				
Queue Length 50th (ft)	27	324	34	43	462		105	134				
Queue Length 95th (ft)	62	450	85	86	#648		180	#257				
Internal Link Dist (ft)		373			571			195			2	
Turn Bay Length (ft)	145		125	100			225					
Base Capacity (vph)	344	2098	1050	365	2277		428	482				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	445	0	0	147		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	0.14	0.85	0.28	0.21	0.83		0.44	0.66				

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 86.6
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 21.8 Intersection LOS: C
Intersection Capacity Utilization 72.4% 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: 12: Country Club Lane & Route 9

ø2	ø3	ø4
25 s	20 s	55 s
	ø7	ø8
	20 s	55 s

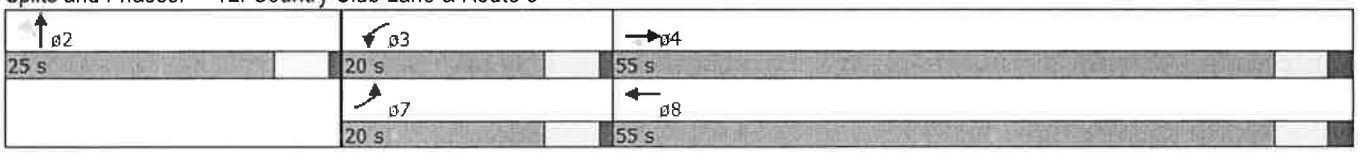
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	69	1804	545	207	1428	0	418	0	72	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	145		125	100		0	225		0	0		0
Storage Lanes	1		1	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1805	3490	1615	1805	3610	0	1715	1676	0	0	0	0
Flt Permitted	0.950			0.950			0.950	0.963				
Satd. Flow (perm)	1805	3490	1615	1805	3610	0	1715	1676	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			253					87				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		453			651			275			82	
Travel Time (s)		10.3			14.8			6.3			1.9	
Peak Hour Factor	0.98	0.98	0.98	0.92	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	2%
Shared Lane Traffic (%)							55%					
Lane Group Flow (vph)	70	1841	556	225	1552	0	200	322	0	0	0	0
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA				
Protected Phases	7	4		3	8			2				
Permitted Phases			4				2					
Detector Phase	7	4	4	3	8		2	2				
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0				
Minimum Split (s)	9.0	22.0	22.0	9.0	22.0		21.0	21.0				
Total Split (s)	20.0	55.0	55.0	20.0	55.0		25.0	25.0				
Total Split (%)	20.0%	55.0%	55.0%	20.0%	55.0%		25.0%	25.0%				
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0				
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		1.0	1.0				
Lost Time Adjust (s)	-1.0	-2.0	-2.0	-2.0	-2.0		-1.0	-1.0				
Total Lost Time (s)	4.0	4.0	4.0	3.0	4.0		4.0	4.0				
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Recall Mode	None	None	None	None	None		None	None				
Act Effct Green (s)	10.1	51.1	51.1	16.2	58.6		18.4	18.4				
Actuated g/C Ratio	0.10	0.53	0.53	0.17	0.61		0.19	0.19				
v/c Ratio	0.37	1.00	0.57	0.75	0.71		0.61	0.83				
Control Delay	46.5	45.2	11.0	55.4	17.5		44.6	45.9				
Queue Delay	0.0	37.4	1.0	0.0	0.5		0.0	0.0				
Total Delay	46.5	82.7	12.0	55.4	18.0		44.6	45.9				
LOS	D	F	B	E	B		D	D				
Approach Delay		65.7			22.7			45.4				
Approach LOS		E			C			D				
Queue Length 50th (ft)	42	~667	122	138	370		121	150				
Queue Length 95th (ft)	83	#806	225	#244	504		198	#285				
Internal Link Dist (ft)		373			571			195			2	
Turn Bay Length (ft)	145		125	100			225					
Base Capacity (vph)	298	1843	972	317	2184		373	432				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	340	197	0	231		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	1.22	0.72	0.71	0.79		0.54	0.75				

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 96.8
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 47.5 Intersection LOS: D
Intersection Capacity Utilization 85.1% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 12: Country Club Lane & Route 9



Lane Group	EBL2	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR	SWL2
Lane Configurations												
Volume (vph)	35	50	1555	101	1621	131	131	106	207	91	20	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	11	12	12	15	12	12
Storage Length (ft)		145		145		150		0	0		0	
Storage Lanes		1		1		1		0	0		0	
Taper Length (ft)		25				25			25			
Satd. Flow (prot)	0	1719	3438	1538	5036	1678	1677	0	0	1985	0	1736
Flt Permitted		0.950				0.592				0.150		0.950
Satd. Flow (perm)	0	1719	3438	1538	5036	1045	1677	0	0	308	0	1736
Right Turn on Red				Yes							Yes	
Satd. Flow (RTOR)				202						2		
Link Speed (mph)			30		30		30			30		
Link Distance (ft)			651		444		425			135		
Travel Time (s)			14.8		10.1		9.7			3.1		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.89	0.85	0.85	0.85	0.88	0.88	0.88	0.84
Heavy Vehicles (%)	5%	5%	5%	5%	3%	4%	4%	0%	1%	1%	1%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	90	1637	106	1821	154	279	0	0	361	0	126
Turn Type	Prot	Prot	NA	Prot	NA	Perm	NA		D.P+P	NA		Split
Protected Phases	1	1!	2 3	2 3	2 3		7		6 8	6 7 8		1!
Permitted Phases						7			7			
Detector Phase	1	1	2 3	2 3	2 3	7	7		6 8	6 7 8		1
Switch Phase												
Minimum Initial (s)	4.0	4.0				4.0	4.0					4.0
Minimum Split (s)	11.0	11.0				23.0	23.0					11.0
Total Split (s)	25.0	25.0				26.0	26.0					25.0
Total Split (%)	17.1%	17.1%				17.8%	17.8%					17.1%
Yellow Time (s)	3.0	3.0				3.0	3.0					3.0
All-Red Time (s)	4.0	4.0				4.0	4.0					4.0
Lost Time Adjust (s)		-3.0				-3.0	-3.0					-3.0
Total Lost Time (s)		4.0				4.0	4.0					4.0
Lead/Lag	Lead	Lead				Lead	Lead					Lead
Lead-Lag Optimize?	Yes	Yes				Yes	Yes					Yes
Recall Mode	None	None				None	None					None
Act Effct Green (s)		18.8	67.0	67.0	67.0	22.0	22.0			48.0		18.8
Actuated g/C Ratio		0.12	0.41	0.41	0.41	0.13	0.13			0.29		0.12
v/c Ratio		0.46	1.16	0.14	0.88	1.10	1.24			1.01		0.63
Control Delay		75.1	123.5	0.4	50.9	166.8	193.9			67.8		83.5
Queue Delay		0.0	0.6	0.0	0.0	0.0	0.0			31.2		0.0
Total Delay		75.1	124.2	0.4	50.9	166.8	193.9			98.9		83.5
LOS		E	F	A	D	F	F			F		F
Approach Delay			114.6		50.9		184.3			98.9		
Approach LOS			F		D		F			F		
Queue Length 50th (ft)		91	~1108	0	669	~189	~375			~112		131
Queue Length 95th (ft)		155	#1248	0	726	#320	#527			#424		191
Internal Link Dist (ft)			571		364		345			55		
Turn Bay Length (ft)		145		145		150						
Base Capacity (vph)		221	1410	749	2065	140	225			358		223

Lane Group	SWL	ø2	ø3	ø5	ø6	ø8
Lane Configurations	↰					
Volume (vph)	111					
Ideal Flow (vphpl)	1900					
Lane Width (ft)	12					
Storage Length (ft)	0					
Storage Lanes	2					
Taper Length (ft)	25					
Satd. Flow (prot)	1736					
Flt Permitted	0.950					
Satd. Flow (perm)	1736					
Right Turn on Red						
Satd. Flow (RTOR)						
Link Speed (mph)	30					
Link Distance (ft)	237					
Travel Time (s)	5.4					
Peak Hour Factor	0.84					
Heavy Vehicles (%)	4%					
Shared Lane Traffic (%)						
Lane Group Flow (vph)	132					
Turn Type	NA					
Protected Phases	1!	2	3	5	6	8
Permitted Phases						
Detector Phase	1					
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	11.0	23.0	8.0	8.0	23.0	21.0
Total Split (s)	25.0	9.0	48.0	17.0	10.0	11.0
Total Split (%)	17.1%	6%	33%	12%	7%	8%
Yellow Time (s)	3.0	3.0	3.5	3.5	3.0	3.0
All-Red Time (s)	4.0	4.0	0.5	0.5	4.0	2.0
Lost Time Adjust (s)	-3.0					
Total Lost Time (s)	4.0					
Lead/Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	Max	None	None	Max	None
Act Effct Green (s)	18.8					
Actuated g/C Ratio	0.12					
v/c Ratio	0.66					
Control Delay	85.5					
Queue Delay	0.0					
Total Delay	85.5					
LOS	F					
Approach Delay	84.5					
Approach LOS	F					
Queue Length 50th (ft)	137					
Queue Length 95th (ft)	199					
Internal Link Dist (ft)	157					
Turn Bay Length (ft)						
Base Capacity (vph)	223					

Lane Group	EBL2	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR	SWL2
Starvation Cap Reductn		0	217	0	0	0	0			42		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		0.41	1.37	0.14	0.88	1.10	1.24			1.14		0.57

Intersection Summary

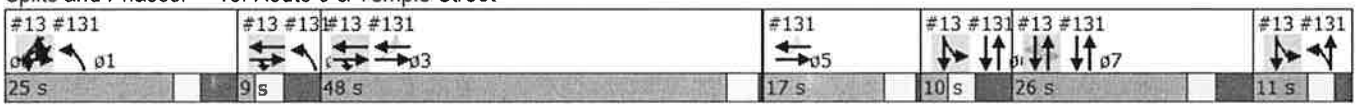
Area Type: Other
Cycle Length: 146
Actuated Cycle Length: 163.4
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.24
Intersection Signal Delay: 93.5 Intersection LOS: F
Intersection Capacity Utilization 93.3% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

! Phase conflict between lane groups.

Splits and Phases: 13: Route 9 & Temple Street



Lane Group	SWL	ø2	ø3	ø5	ø6	ø8
Starvation Cap Reductn	0					
Spillback Cap Reductn	0					
Storage Cap Reductn	0					
Reduced v/c Ratio	0.59					

Intersection Summary

Lane Group	EBL2	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR	SWL2
Lane Configurations												
Volume (vph)	25	50	1485	111	1505	172	162	81	162	126	40	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	11	12	12	15	12	12
Storage Length (ft)		145		145		150		0	0		0	
Storage Lanes		1		1		1		0	0		0	
Taper Length (ft)		25				25			25			
Satd. Flow (prot)	0	1781	3539	1538	5036	1711	1728	0	0	1968	0	1787
Flt Permitted		0.950				0.587				0.136		0.950
Satd. Flow (perm)	0	1781	3539	1538	5036	1057	1728	0	0	274	0	1787
Right Turn on Red				Yes							Yes	
Satd. Flow (RTOR)				202						4		
Link Speed (mph)			30		30		30			30		
Link Distance (ft)			651		444		425			135		
Travel Time (s)			14.8		10.1		9.7			3.1		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.93	0.93	0.93	0.90	0.90	0.90	0.91
Heavy Vehicles (%)	0%	2%	2%	5%	3%	2%	0%	3%	2%	2%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	77	1515	113	1536	185	261	0	0	364	0	178
Turn Type	Prot	Prot	NA	Prot	NA	Perm	NA		D.P+P	NA		Split
Protected Phases	1	1!	2 3	2 3	2 3		7		6 8	6 7 8		1!
Permitted Phases						7			7			
Detector Phase	1	1	2 3	2 3	2 3	7	7		6 8	6 7 8		1
Switch Phase												
Minimum Initial (s)	4.0	4.0				4.0	4.0					4.0
Minimum Split (s)	11.0	11.0				23.0	23.0					11.0
Total Split (s)	25.0	25.0				26.0	26.0					25.0
Total Split (%)	17.1%	17.1%				17.8%	17.8%					17.1%
Yellow Time (s)	3.0	3.0				3.0	3.0					3.0
All-Red Time (s)	4.0	4.0				4.0	4.0					4.0
Lost Time Adjust (s)		-3.0				-3.0	-3.0					-3.0
Total Lost Time (s)		4.0				4.0	4.0					4.0
Lead/Lag	Lead	Lead				Lead	Lead					Lead
Lead-Lag Optimize?	Yes	Yes				Yes	Yes					Yes
Recall Mode	None	None				None	None					None
Act Effct Green (s)		21.0	67.0	67.0	67.0	22.0	22.0			48.0		21.0
Actuated g/C Ratio		0.13	0.40	0.40	0.40	0.13	0.13			0.29		0.13
v/c Ratio		0.34	1.06	0.15	0.75	1.32	1.14			1.05		0.79
Control Delay		70.7	87.7	0.4	45.1	237.3	163.0			80.3		93.7
Queue Delay		0.0	17.6	0.0	0.0	0.0	0.8			20.4		0.0
Total Delay		70.7	105.2	0.4	45.1	237.3	163.8			100.8		93.7
LOS		E	F	A	D	F	F			F		F
Approach Delay			96.7		45.1		194.3			100.8		
Approach LOS			F		D		F			F		
Queue Length 50th (ft)		77	~943	0	520	~258	~328			~142		190
Queue Length 95th (ft)		135	#1083	0	580	#427	#522			#466		#312
Internal Link Dist (ft)			571		364		345			55		
Turn Bay Length (ft)		145		145		150						
Base Capacity (vph)		225	1431	742	2037	140	229			348		226

Lane Group	SWL	ø2	ø3	ø5	ø6	ø8
Lane Configurations	↰					
Volume (vph)	207					
Ideal Flow (vphpl)	1900					
Lane Width (ft)	12					
Storage Length (ft)	0					
Storage Lanes	2					
Taper Length (ft)	25					
Satd. Flow (prot)	1770					
Flt Permitted	0.950					
Satd. Flow (perm)	1770					
Right Turn on Red						
Satd. Flow (RTOR)						
Link Speed (mph)	30					
Link Distance (ft)	237					
Travel Time (s)	5.4					
Peak Hour Factor	0.91					
Heavy Vehicles (%)	2%					
Shared Lane Traffic (%)						
Lane Group Flow (vph)	227					
Turn Type	NA					
Protected Phases	1!	2	3	5	6	8
Permitted Phases						
Detector Phase	1					
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	11.0	23.0	8.0	8.0	23.0	21.0
Total Split (s)	25.0	9.0	48.0	17.0	10.0	11.0
Total Split (%)	17.1%	6%	33%	12%	7%	8%
Yellow Time (s)	3.0	3.0	3.5	3.5	3.0	3.0
All-Red Time (s)	4.0	4.0	0.5	0.5	4.0	2.0
Lost Time Adjust (s)	-3.0					
Total Lost Time (s)	4.0					
Lead/Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	Max	None	None	Max	None
Act Effct Green (s)	21.0					
Actuated g/C Ratio	0.13					
v/c Ratio	1.01					
Control Delay	132.7					
Queue Delay	0.0					
Total Delay	132.7					
LOS	F					
Approach Delay	115.6					
Approach LOS	F					
Queue Length 50th (ft)	~254					
Queue Length 95th (ft)	#442					
Internal Link Dist (ft)	157					
Turn Bay Length (ft)						
Base Capacity (vph)	224					

Lane Group	EBL2	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR	SWL2
Starvation Cap Reductn		0	260	0	0	0	0			44		0
Spillback Cap Reductn		0	0	0	0	0	12			0		0
Storage Cap Reductn		0	0	0	0	0	0			0		0
Reduced v/c Ratio		0.34	1.29	0.15	0.75	1.32	1.20			1.20		0.79

Intersection Summary

Area Type: Other
Cycle Length: 146
Actuated Cycle Length: 165.6
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.32
Intersection Signal Delay: 90.8 Intersection LOS: F
Intersection Capacity Utilization 97.3% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

! Phase conflict between lane groups.

Splits and Phases: 13: Route 9 & Temple Street

Lane Group	SWL	ø2	ø3	ø5	ø6	ø8
Starvation Cap Reductn	0					
Spillback Cap Reductn	0					
Storage Cap Reductn	0					
Reduced v/c Ratio	1.01					

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	0	45	0	10	81	5	176	0	0	273	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	12	14	12	12	15	12	12	13	12
Satd. Flow (prot)	0	1760	0	0	1732	0	0	2008	0	0	1944	0
Flt Permitted		0.907										
Satd. Flow (perm)	0	1620	0	0	1732	0	0	2010	0	0	1944	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		224			91							
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		108			188			135			245	
Travel Time (s)		2.5			4.3			3.1			5.6	
Peak Hour Factor	0.86	0.86	0.86	0.89	0.89	0.89	0.85	0.85	0.85	0.88	0.88	0.88
Heavy Vehicles (%)	6%	6%	6%	3%	3%	3%	4%	4%	4%	1%	1%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	75	0	0	102	0	0	213	0	0	310	0
Turn Type	Perm	NA			NA		custom	NA			NA	
Protected Phases		3 5			3 5		1 2 8	6 7 8			6 7	
Permitted Phases	3 5						2					
Detector Phase	3 5	3 5			3 5		1 2 8	6 7 8			6 7	
Switch Phase												
Minimum Initial (s)												
Minimum Split (s)												
Total Split (s)												
Total Split (%)												
Yellow Time (s)												
All-Red Time (s)												
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode												
Act Effct Green (s)		53.5			53.5			91.8			42.0	
Actuated g/C Ratio		0.33			0.33			0.56			0.26	
v/c Ratio		0.11			0.16			0.19			0.62	
Control Delay		0.3			42.2			1.5			60.4	
Queue Delay		0.1			0.0			5.3			3.4	
Total Delay		0.4			42.2			6.8			63.8	
LOS		A			D			A			E	
Approach Delay		0.4			42.2			6.8			63.8	
Approach LOS		A			D			A			E	
Queue Length 50th (ft)		0			86			9			300	
Queue Length 95th (ft)		0			m88			m9			401	
Internal Link Dist (ft)		28			108			55			165	
Turn Bay Length (ft)												
Base Capacity (vph)		745			703			1129			500	
Starvation Cap Reductn		0			0			845			0	
Spillback Cap Reductn		219			0			0			111	
Storage Cap Reductn		0			0			0			0	

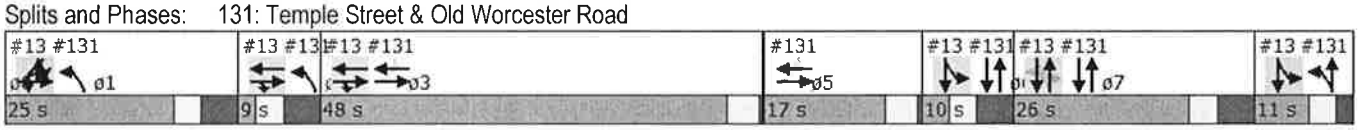
Lane Group	ø1	ø2	ø3	ø5	ø6	ø7	ø8
Lane Configurations							
Volume (vph)							
Ideal Flow (vphpl)							
Lane Width (ft)							
Satd. Flow (prot)							
Flt Permitted							
Satd. Flow (perm)							
Right Turn on Red							
Satd. Flow (RTOR)							
Link Speed (mph)							
Link Distance (ft)							
Travel Time (s)							
Peak Hour Factor							
Heavy Vehicles (%)							
Shared Lane Traffic (%)							
Lane Group Flow (vph)							
Turn Type							
Protected Phases	1	2	3	5	6	7	8
Permitted Phases							
Detector Phase							
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	11.0	23.0	8.0	8.0	23.0	23.0	21.0
Total Split (s)	25.0	9.0	48.0	17.0	10.0	26.0	11.0
Total Split (%)	17%	6%	33%	12%	7%	18%	8%
Yellow Time (s)	3.0	3.0	3.5	3.5	3.0	3.0	3.0
All-Red Time (s)	4.0	4.0	0.5	0.5	4.0	4.0	2.0
Lost Time Adjust (s)							
Total Lost Time (s)							
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	None	Max	None	None
Act Effct Green (s)							
Actuated g/C Ratio							
v/c Ratio							
Control Delay							
Queue Delay							
Total Delay							
LOS							
Approach Delay							
Approach LOS							
Queue Length 50th (ft)							
Queue Length 95th (ft)							
Internal Link Dist (ft)							
Turn Bay Length (ft)							
Base Capacity (vph)							
Starvation Cap Reductn							
Spillback Cap Reductn							
Storage Cap Reductn							

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.14			0.15			0.75			0.80	

Intersection Summary

Area Type: Other
Cycle Length: 146
Actuated Cycle Length: 163.4
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.24
Intersection Signal Delay: 36.5 — Intersection LOS: D
Intersection Capacity Utilization 34.1% — ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 131: Temple Street & Old Worcester Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	0	40	0	30	86	15	197	0	0	288	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	12	14	12	12	15	12	12	13	12
Satd. Flow (prot)	0	1707	0	0	1797	0	0	2046	0	0	1940	0
Flt Permitted		0.976						0.996				
Satd. Flow (perm)	0	1676	0	0	1797	0	0	2044	0	0	1940	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		224			95						1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		108			188			135			245	
Travel Time (s)		2.5			4.3			3.1			5.6	
Peak Hour Factor	0.83	0.83	0.83	0.91	0.91	0.91	0.93	0.93	0.93	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	8%	0%	3%	1%	0%	2%	0%	0%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	54	0	0	128	0	0	228	0	0	326	0
Turn Type	Perm	NA			NA		custom	NA			NA	
Protected Phases		3 5			3 5		1 2 8	6 7 8			6 7	
Permitted Phases	3 5						2					
Detector Phase	3 5	3 5			3 5		1 2 8	6 7 8			6 7	
Switch Phase												
Minimum Initial (s)												
Minimum Split (s)												
Total Split (s)												
Total Split (%)												
Yellow Time (s)												
All-Red Time (s)												
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode												
Act Effct Green (s)		53.6			53.6			94.0			42.0	
Actuated g/C Ratio		0.32			0.32			0.57			0.25	
v/c Ratio		0.08			0.20			0.20			0.66	
Control Delay		0.2			44.4			2.9			62.7	
Queue Delay		0.2			0.0			10.9			11.2	
Total Delay		0.4			44.4			13.8			74.0	
LOS		A			D			B			E	
Approach Delay		0.4			44.4			13.8			74.0	
Approach LOS		A			D			B			E	
Queue Length 50th (ft)		0			116			28			319	
Queue Length 95th (ft)		0			m131			m27			434	
Internal Link Dist (ft)		28			108			55			165	
Turn Bay Length (ft)												
Base Capacity (vph)		759			722			1161			493	
Starvation Cap Reductn		0			0			897			0	
Spillback Cap Reductn		382			0			0			140	
Storage Cap Reductn		0			0			0			0	

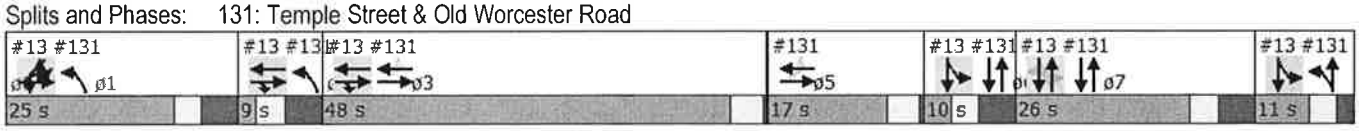
Lane Group	ø1	ø2	ø3	ø5	ø6	ø7	ø8
Lane Configurations							
Volume (vph)							
Ideal Flow (vphpl)							
Lane Width (ft)							
Satd. Flow (prot)							
Flt Permitted							
Satd. Flow (perm)							
Right Turn on Red							
Satd. Flow (RTOR)							
Link Speed (mph)							
Link Distance (ft)							
Travel Time (s)							
Peak Hour Factor							
Heavy Vehicles (%)							
Shared Lane Traffic (%)							
Lane Group Flow (vph)							
Turn Type							
Protected Phases	1	2	3	5	6	7	8
Permitted Phases							
Detector Phase							
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	11.0	23.0	8.0	8.0	23.0	23.0	21.0
Total Split (s)	25.0	9.0	48.0	17.0	10.0	26.0	11.0
Total Split (%)	17%	6%	33%	12%	7%	18%	8%
Yellow Time (s)	3.0	3.0	3.5	3.5	3.0	3.0	3.0
All-Red Time (s)	4.0	4.0	0.5	0.5	4.0	4.0	2.0
Lost Time Adjust (s)							
Total Lost Time (s)							
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	None	Max	None	None
Act Effct Green (s)							
Actuated g/C Ratio							
v/c Ratio							
Control Delay							
Queue Delay							
Total Delay							
LOS							
Approach Delay							
Approach LOS							
Queue Length 50th (ft)							
Queue Length 95th (ft)							
Internal Link Dist (ft)							
Turn Bay Length (ft)							
Base Capacity (vph)							
Starvation Cap Reductn							
Spillback Cap Reductn							
Storage Cap Reductn							

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.14			0.18			0.86			0.92	

Intersection Summary

Area Type: Other
Cycle Length: 146
Actuated Cycle Length: 165.6
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.32
Intersection Signal Delay: 44.8 Intersection LOS: D
Intersection Capacity Utilization 39.2% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 131: Temple Street & Old Worcester Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	188	1	138	1	1	1	293	577	1	1	60	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	12	14	12	11	12	12	12	14	12
Storage Length (ft)	0		220	0		0	120		0	0		0
Storage Lanes	0		1	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1811	1546	0	1904	0	1728	1881	0	0	1818	0
Flt Permitted		0.721			0.925		0.726				0.997	
Satd. Flow (perm)	0	1370	1546	0	1790	0	1320	1881	0	0	1812	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			159		3						24	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1458			137			639			100	
Travel Time (s)		33.1			3.1			14.5			2.3	
Peak Hour Factor	0.87	0.87	0.87	0.38	0.38	0.38	0.95	0.95	0.95	0.87	0.87	0.87
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	1%	1%	0%	0%	10%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	217	159	0	9	0	308	608	0	0	103	0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			4		1	2			2	
Permitted Phases	4		4	4			2			2		
Detector Phase	4	4	4	4	4		1	2		2	2	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0		9.0	21.0		21.0	21.0	
Total Split (s)	30.0	30.0	30.0	30.0	30.0		20.0	55.0		55.0	55.0	
Total Split (%)	24.8%	24.8%	24.8%	24.8%	24.8%		16.5%	45.5%		45.5%	45.5%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0	-1.0		-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)		4.0	4.0		4.0		4.0	4.0			4.0	
Lead/Lag	Lag	Lag	Lag	Lag	Lag		Lead	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	None		None	None	
Act Effct Green (s)		20.3	20.3		20.3		48.0	34.6			34.6	
Actuated g/C Ratio		0.25	0.25		0.25		0.59	0.43			0.43	
v/c Ratio		0.63	0.31		0.02		0.36	0.76			0.13	
Control Delay		39.1	7.1		23.7		7.9	26.9			12.2	
Queue Delay		0.0	0.0		0.0		0.0	0.0			0.0	
Total Delay		39.1	7.1		23.7		7.9	27.0			12.2	
LOS		D	A		C		A	C			B	
Approach Delay		25.6			23.7			20.6			12.2	
Approach LOS		C			C			C			B	
Queue Length 50th (ft)		100	0		2		61	257			24	
Queue Length 95th (ft)		205	46		6		111	426			55	
Internal Link Dist (ft)		1378			57			559			20	
Turn Bay Length (ft)			220				120					
Base Capacity (vph)		465	630		610		911	1254			1216	

Lane Group	ø3
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	8.0
Total Split (s)	16.0
Total Split (%)	13%
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0	30			0	
Spillback Cap Reductn		0	0		0		0	0			0	
Storage Cap Reductn		0	0		0		0	0			0	
Reduced v/c Ratio		0.47	0.25		0.01		0.34	0.50			0.08	

Intersection Summary

Area Type: Other
Cycle Length: 121
Actuated Cycle Length: 81
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 21.3 Intersection LOS: C
Intersection Capacity Utilization 54.2% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 14: California Avenue & New York Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	0	332	0	0	0	139	55	0	0	535	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	12	14	12	11	12	12	12	14	12
Storage Length (ft)	0		220	0		0	120		0	0		0
Storage Lanes	0		1	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1805	1561	0	2027	0	1745	1681	0	0	1848	0
Flt Permitted		0.757					0.199					
Satd. Flow (perm)	0	1438	1561	0	2027	0	365	1681	0	0	1848	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			395								16	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1458			137			639			100	
Travel Time (s)		33.1			3.1			14.5			2.3	
Peak Hour Factor	0.84	0.84	0.84	0.92	0.92	0.92	0.87	0.87	0.87	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	13%	0%	0%	8%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	50	395	0	0	0	160	63	0	0	802	0
Turn Type	Perm	NA	Perm	Perm			pm+pt	NA		Perm	NA	
Protected Phases		4			4		1	2			2	
Permitted Phases	4		4	4			2			2		
Detector Phase	4	4	4	4	4		1	2		2	2	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0		9.0	21.0		21.0	21.0	
Total Split (s)	30.0	30.0	30.0	30.0	30.0		20.0	55.0		55.0	55.0	
Total Split (%)	24.8%	24.8%	24.8%	24.8%	24.8%		16.5%	45.5%		45.5%	45.5%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0	-1.0		-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)		4.0	4.0		4.0		4.0	4.0			4.0	
Lead/Lag	Lag	Lag	Lag	Lag	Lag		Lead	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	None		None	None	
Act Effct Green (s)		10.7	10.7				59.8	49.6			49.6	
Actuated g/C Ratio		0.13	0.13				0.72	0.60			0.60	
v/c Ratio		0.27	0.72				0.37	0.06			0.72	
Control Delay		37.0	12.2				5.5	9.1			18.0	
Queue Delay		0.0	0.0				0.0	0.0			0.0	
Total Delay		37.0	12.2				5.5	9.1			18.0	
LOS		D	B				A	A			B	
Approach Delay		15.0						6.5			18.0	
Approach LOS		B						A			B	
Queue Length 50th (ft)		24	0				14	11			240	
Queue Length 95th (ft)		55	56				43	39			558	
Internal Link Dist (ft)		1378			57			559			20	
Turn Bay Length (ft)			220				120					
Base Capacity (vph)		458	766				549	1050			1160	

Lane Group	ø3
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	8.0
Total Split (s)	16.0
Total Split (%)	13%
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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		0.11	0.52				0.29	0.06			0.69	

Intersection Summary

Area Type: Other
Cycle Length: 121
Actuated Cycle Length: 82.6
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 15.3 Intersection LOS: B
Intersection Capacity Utilization 65.8% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 14: California Avenue & New York Avenue

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	31	48	445	240	153	486
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	13	12	11	11
Storage Length (ft)	0	100		0	125	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25				25	
Satd. Flow (prot)	1745	1531	1853	0	1745	1818
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1745	1531	1853	0	1745	1818
Link Speed (mph)	30		30			30
Link Distance (ft)	1458		331			171
Travel Time (s)	33.1		7.5			3.9
Peak Hour Factor	0.73	0.73	0.92	0.92	0.88	0.88
Heavy Vehicles (%)	0%	2%	1%	1%	0%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	42	66	745	0	174	552
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 59.9%	ICU Level of Service B
Analysis Period (min) 15	

Intersection	
Intersection Delay, s/veh	3.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	31	48	445	240	153	486
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	100	-	-	125	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	73	73	92	92	88	88
Heavy Vehicles, %	0	2	1	1	0	1
Mvmt Flow	42	66	484	261	174	552

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1514	614	0	0	745	0
Stage 1	614	-	-	-	-	-
Stage 2	900	-	-	-	-	-
Follow-up Headway	3.5	3.318	-	-	2.2	-
Pot Capacity-1 Maneuver	133	492	-	-	872	-
Stage 1	544	-	-	-	-	-
Stage 2	400	-	-	-	-	-
Time blocked-Platoon, %			-	-		-
Mov Capacity-1 Maneuver	106	492	-	-	872	-
Mov Capacity-2 Maneuver	106	-	-	-	-	-
Stage 1	544	-	-	-	-	-
Stage 2	320	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	31.7	0	2.4
HCM LOS	D		

Minor Lane / Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	106	492	872	-
HCM Lane V/C Ratio	-	-	0.401	0.134	0.199	-
HCM Control Delay (s)	-	-	60	13.4	10.154	-
HCM Lane LOS			F	B	B	
HCM 95th %tile Q(veh)	-	-	1.659	0.459	0.741	-

Notes

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

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	254	211	425	59	54	507
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	13	12	11	11
Storage Length (ft)	0	100		0	125	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25				25	
Satd. Flow (prot)	1728	1561	1899	0	1711	1837
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1728	1561	1899	0	1711	1837
Link Speed (mph)	30		30			30
Link Distance (ft)	1458		331			171
Travel Time (s)	33.1		7.5			3.9
Peak Hour Factor	0.89	0.89	0.83	0.83	0.97	0.97
Heavy Vehicles (%)	1%	0%	1%	7%	2%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	285	237	583	0	56	523
Sign Control	Stop		Free			Free

Intersection Summary

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

Intersection	
Intersection Delay, s/veh	47.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	254	211	425	59	54	507
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	100	-	-	125	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	83	83	97	97
Heavy Vehicles, %	1	0	1	7	2	0
Mvmt Flow	285	237	512	71	56	523

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1182	548	0	0	583	0
Stage 1	548	-	-	-	-	-
Stage 2	634	-	-	-	-	-
Follow-up Headway	3.509	3.3	-	-	2.218	-
Pot Capacity-1 Maneuver	# 211	540	-	-	991	-
Stage 1	581	-	-	-	-	-
Stage 2	530	-	-	-	-	-
Time blocked-Platoon, %			-	-		-
Mov Capacity-1 Maneuver	# 199	540	-	-	991	-
Mov Capacity-2 Maneuver	# 199	-	-	-	-	-
Stage 1	581	-	-	-	-	-
Stage 2	500	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	153.1	0	0.9
HCM LOS	F		

Minor Lane / Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	199	540	991	-
HCM Lane V/C Ratio	-	-	1.434	0.439	0.056	-
HCM Control Delay (s)	-	-	266.4	16.8	8.849	-
HCM Lane LOS			F	C	A	
HCM 95th %tile Q(veh)	-	-	17.069	2.218	0.178	-

Notes

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

2016 Build-Out Intersection Capacity Analysis

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	69	2608	66	82	2211	70	70	79	11	268	119	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	12	10	10	12	10	11	10	12	16	12
Storage Length (ft)	250		0	250		0	75		75	0		0
Storage Lanes	1		0	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1604	4727	0	1668	4756	0	1636	1766	1383	0	1973	0
Flt Permitted	0.950			0.950			0.420				0.824	
Satd. Flow (perm)	1604	4727	0	1668	4756	0	723	1766	1383	0	1661	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			3				102		20	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		389			936			444			493	
Travel Time (s)		8.8			21.3			10.1			11.2	
Peak Hour Factor	0.99	0.99	0.99	0.96	0.96	0.96	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	5%	2%	2%	1%	1%	10%	3%	4%	9%	1%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	70	2701	0	85	2376	0	75	85	12	0	684	0
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8		8	4		
Detector Phase	1	6		5	2		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	9.5	22.5		9.5	23.5		22.5	22.5	22.5	22.5	22.5	
Total Split (s)	21.0	56.0		21.0	56.0		37.0	37.0	37.0	37.0	37.0	
Total Split (%)	14.0%	37.3%		14.0%	37.3%		24.7%	24.7%	24.7%	24.7%	24.7%	
Yellow Time (s)	3.0	4.5		3.0	4.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	2.5	2.0		2.5	3.0		3.0	3.0	3.0	3.0	3.0	
Lost Time Adjust (s)	-1.5	-2.5		-1.5	-2.5		-2.5	-2.5	-2.5		-2.5	
Total Lost Time (s)	4.0	4.0		4.0	5.0		4.0	4.0	4.0		4.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Min		None	Min		None	None	None	None	None	
Act Effct Green (s)	11.6	52.0		12.4	54.3		33.0	33.0	33.0		33.0	
Actuated g/C Ratio	0.11	0.48		0.11	0.50		0.30	0.30	0.30		0.30	
v/c Ratio	0.41	1.20		0.45	1.01		0.34	0.16	0.02		1.33	
Control Delay	53.1	123.3		53.0	48.9		36.2	29.8	0.1		193.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay	53.1	123.3		53.0	48.9		36.2	29.8	0.1		193.1	
LOS	D	F		D	D		D	C	A		F	
Approach Delay		121.5			49.1			30.6			193.1	
Approach LOS		F			D			C			F	
Queue Length 50th (ft)	47	~850		57	~671		41	44	0		~619	
Queue Length 95th (ft)	93	#997		106	#811		90	87	0		#886	
Internal Link Dist (ft)		309			856			364			413	
Turn Bay Length (ft)	250			250			75		75			
Base Capacity (vph)	249	2249		259	2361		218	532	488		515	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	8.0
Total Split (s)	36.0
Total Split (%)	24%
Yellow Time (s)	3.5
All-Red Time (s)	0.5
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0		0	0	0		0	
Spillback Cap Reductn	0	0		0	0		0	0	0		0	
Storage Cap Reductn	0	0		0	0		0	0	0		0	
Reduced v/c Ratio	0.28	1.20		0.33	1.01		0.34	0.16	0.02		1.33	

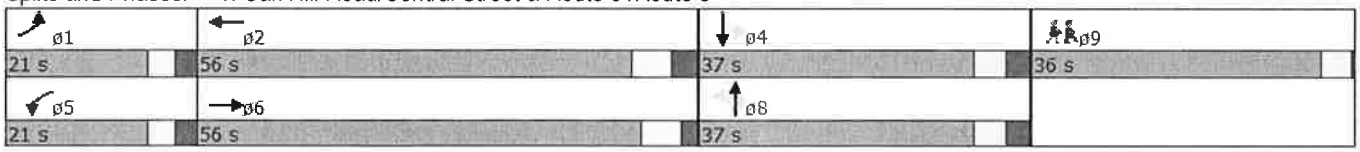
Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 109.4
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.33
Intersection Signal Delay: 97.7 Intersection LOS: F
Intersection Capacity Utilization 109.4% ICU Level of Service H
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.

Splits and Phases: 1: Oak Hill Road/Central Street & Route 9 /Route 9



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	206	2494	135	179	2370	162	83	115	18	176	175	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	12	10	10	12	10	11	10	12	16	12
Storage Length (ft)	250		0	250		0	75		75	0		0
Storage Lanes	1		0	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1685	4757	0	1685	4748	0	1685	1837	1507	0	2034	0
Flt Permitted	0.950			0.950			0.454				0.756	
Satd. Flow (perm)	1685	4757	0	1685	4748	0	805	1837	1507	0	1571	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			8				102		5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		389			936			444			493	
Travel Time (s)		8.8			21.3			10.1			11.2	
Peak Hour Factor	0.92	0.92	0.92	0.94	0.94	0.94	0.93	0.93	0.93	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	2%	1%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	224	2858	0	190	2693	0	89	124	19	0	447	0
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8		8	4		
Detector Phase	1	6		5	2		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	9.5	22.5		9.5	23.5		22.5	22.5	22.5	22.5	22.5	
Total Split (s)	21.0	56.0		21.0	56.0		37.0	37.0	37.0	37.0	37.0	
Total Split (%)	14.0%	37.3%		14.0%	37.3%		24.7%	24.7%	24.7%	24.7%	24.7%	
Yellow Time (s)	3.0	4.5		3.0	4.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	2.5	2.0		2.5	3.0		3.0	3.0	3.0	3.0	3.0	
Lost Time Adjust (s)	-1.5	-2.5		-1.5	-2.5		-2.5	-2.5	-2.5		-2.5	
Total Lost Time (s)	4.0	4.0		4.0	5.0		4.0	4.0	4.0		4.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Min		None	Min		None	None	None	None	None	
Act Effct Green (s)	17.0	52.0		17.0	51.0		33.0	33.0	33.0		33.0	
Actuated g/C Ratio	0.15	0.46		0.15	0.45		0.29	0.29	0.29		0.29	
v/c Ratio	0.89	1.32		0.76	1.27		0.38	0.23	0.04		0.98	
Control Delay	83.2	174.0		66.4	152.9		38.3	32.3	0.1		77.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay	83.2	174.0		66.4	152.9		38.3	32.3	0.1		77.0	
LOS	F	F		E	F		D	C	A		E	
Approach Delay		167.4			147.2			32.0			77.0	
Approach LOS		F			F			C			E	
Queue Length 50th (ft)	163	~997		135	~916		52	69	0		321	
Queue Length 95th (ft)	#306	#1088		#244	#1009		102	120	0		#534	
Internal Link Dist (ft)		309			856			364			413	
Turn Bay Length (ft)	250			250			75		75			
Base Capacity (vph)	251	2173		251	2128		233	531	508		458	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	8.0
Total Split (s)	36.0
Total Split (%)	24%
Yellow Time (s)	3.5
All-Red Time (s)	0.5
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0		0	0	0		0	
Spillback Cap Reductn	0	0		0	0		0	0	0		0	
Storage Cap Reductn	0	0		0	0		0	0	0		0	
Reduced v/c Ratio	0.89	1.32		0.76	1.27		0.38	0.23	0.04		0.98	

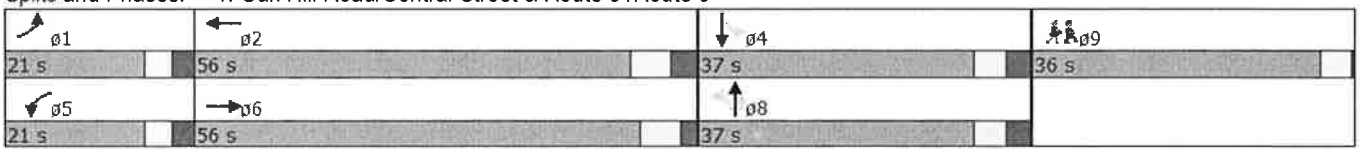
Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 114
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.32
Intersection Signal Delay: 147.8 Intersection LOS: F
Intersection Capacity Utilization 101.0% ICU Level of Service G
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.

Splits and Phases: 1: Oak Hill Road/Central Street & Route 9 /Route 9



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	640	725	97	76	327	163	8	1	8	13	139	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	125		0		0		0	150	
Storage Lanes	2		0	1		0		0		0	0	
Taper Length (ft)	25			25				25			25	
Satd. Flow (prot)	3502	1866	0	1787	1793	0	0	0	1703	0	0	1859
Flt Permitted	0.950			0.950					0.540			0.863
Satd. Flow (perm)	3502	1866	0	1787	1793	0	0	0	934	0	0	1634
Right Turn on Red			Yes							Yes		
Satd. Flow (RTOR)		9							16			
Link Speed (mph)		30			30				30			30
Link Distance (ft)		135			625				135			331
Travel Time (s)		3.1			14.2				3.1			7.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.83	0.83	0.83	0.83	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	1%	1%	0%	13%	0%	0%	0%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	696	893	0	83	532	0	0	0	37	0	0	411
Turn Type	Prot	NA		Prot	NA		Perm	Perm	NA		Perm	NA
Protected Phases	5	2		1	6				4			4
Permitted Phases							4	4			4	
Detector Phase	5	2		1	6		4	4	4		4	4
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	9.0	21.0		9.0	21.0		21.0	21.0	21.0		21.0	21.0
Total Split (s)	30.0	54.0		11.0	35.0		25.0	25.0	25.0		25.0	25.0
Total Split (%)	28.6%	51.4%		10.5%	33.3%		23.8%	23.8%	23.8%		23.8%	23.8%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0				-1.0			-1.0
Total Lost Time (s)	4.0	4.0		4.0	4.0				4.0			4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lag		Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None		None	None		None	None	None		None	None
Act Effct Green (s)	23.2	51.1		7.1	32.4				21.2			21.2
Actuated g/C Ratio	0.25	0.55		0.08	0.35				0.23			0.23
v/c Ratio	0.80	0.87		0.62	0.86				0.17			1.11
Control Delay	41.4	32.0		65.3	45.9				23.9			117.2
Queue Delay	0.0	0.0		0.0	0.0				0.0			0.0
Total Delay	41.4	32.0		65.3	45.9				23.9			117.2
LOS	D	C		E	D				C			F
Approach Delay		36.1			48.5				23.9			74.8
Approach LOS		D			D				C			E
Queue Length 50th (ft)	185	400		47	270				9			~263
Queue Length 95th (ft)	289	#844		#129	#567				36			#526
Internal Link Dist (ft)		55			545				55			251
Turn Bay Length (ft)	200			125								
Base Capacity (vph)	981	1022		134	620				223			369
Starvation Cap Reductn	0	0		0	0				0			0

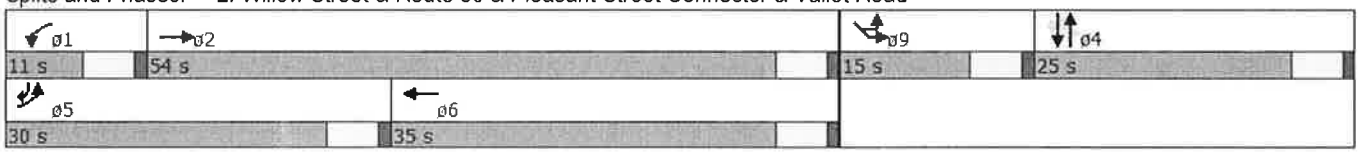
Lane Group	SBR	SBR2	SEL2	SEL
Lane Configurations				
Volume (vph)	248	4	5	8
Ideal Flow (vphpl)	1900	1900	1900	1900
Storage Length (ft)	0			0
Storage Lanes	1			1
Taper Length (ft)				25
Satd. Flow (prot)	1609	0	0	1805
Flt Permitted				0.950
Satd. Flow (perm)	1609	0	0	1805
Right Turn on Red		Yes		
Satd. Flow (RTOR)	73			
Link Speed (mph)				30
Link Distance (ft)				153
Travel Time (s)				3.5
Peak Hour Factor	0.92	0.92	0.67	0.67
Heavy Vehicles (%)	0%	25%	0%	0%
Shared Lane Traffic (%)				
Lane Group Flow (vph)	274	0	0	19
Turn Type	pm+ov		Prot	Prot
Protected Phases	5		9	9
Permitted Phases	4			
Detector Phase	5		9	9
Switch Phase				
Minimum Initial (s)	4.0		4.0	4.0
Minimum Split (s)	9.0		21.0	21.0
Total Split (s)	30.0		15.0	15.0
Total Split (%)	28.6%		14.3%	14.3%
Yellow Time (s)	4.0		4.0	4.0
All-Red Time (s)	1.0		1.0	1.0
Lost Time Adjust (s)	-1.0			-1.0
Total Lost Time (s)	4.0			4.0
Lead/Lag	Lead		Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes
Recall Mode	None		None	None
Act Effct Green (s)	48.4			7.6
Actuated g/C Ratio	0.52			0.08
v/c Ratio	0.32			0.13
Control Delay	11.1			44.6
Queue Delay	0.0			0.0
Total Delay	11.1			44.6
LOS	B			D
Approach Delay				44.6
Approach LOS				D
Queue Length 50th (ft)	55			10
Queue Length 95th (ft)	132			26
Internal Link Dist (ft)				73
Turn Bay Length (ft)				
Base Capacity (vph)	917			214
Starvation Cap Reductn	0			0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL	SBT
Spillback Cap Reductn	0	0		0	0				0			0
Storage Cap Reductn	0	0		0	0				0			0
Reduced v/c Ratio	0.71	0.87		0.62	0.86				0.17			1.11

Intersection Summary

Area Type: Other
Cycle Length: 105
Actuated Cycle Length: 93.5
Natural Cycle: 130
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.11
Intersection Signal Delay: 47.6 Intersection LOS: D
Intersection Capacity Utilization 91.9% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Willow Street & Route 30 & Pleasant Street Connector & Vallet Road



Lane Group	SBR	SBR2	SEL2	SEL
Spillback Cap Reductn	0			0
Storage Cap Reductn	0			0
Reduced v/c Ratio	0.30			0.09

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	422	573	14	20	701	250	24	27	25	114	139	540
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	125		0			0	150		0
Storage Lanes	2		0	1		0			0	0		1
Taper Length (ft)	25			25						25		
Satd. Flow (prot)	3502	1892	0	1805	1808	0	0	1741	0	0	1858	1615
Flt Permitted	0.950			0.950				0.658			0.772	
Satd. Flow (perm)	3502	1892	0	1805	1808	0	0	1163	0	0	1467	1615
Right Turn on Red			Yes						Yes			
Satd. Flow (RTOR)		2						21				73
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		135			625			135			331	
Travel Time (s)		3.1			14.2			3.1			7.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.63	0.63	0.63	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	1%	1%	0%	0%	8%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	459	638	0	22	1034	0	0	121	0	0	275	589
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2		1	6			4			4	5
Permitted Phases							4			4		4
Detector Phase	5	2		1	6		4	4		4	4	5
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	9.0	21.0		9.0	21.0		21.0	21.0		21.0	21.0	9.0
Total Split (s)	30.0	54.0		11.0	35.0		25.0	25.0		25.0	25.0	30.0
Total Split (%)	28.6%	51.4%		10.5%	33.3%		23.8%	23.8%		23.8%	23.8%	28.6%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag		Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None		None	None		None	None	None
Act Effct Green (s)	19.1	50.8		6.9	31.5			21.1			21.1	44.3
Actuated g/C Ratio	0.22	0.58		0.08	0.36			0.24			0.24	0.50
v/c Ratio	0.61	0.59		0.16	1.61			0.41			0.79	0.70
Control Delay	35.2	17.4		45.4	304.5			31.3			51.6	20.5
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay	35.2	17.4		45.4	304.5			31.3			51.6	20.5
LOS	D	B		D	F			C			D	C
Approach Delay		24.8			299.1			31.3			30.4	
Approach LOS		C			F			C			C	
Queue Length 50th (ft)	109	154		11	~759			42			131	182
Queue Length 95th (ft)	184	448		40	#1295			73			#335	393
Internal Link Dist (ft)		55			545			55			251	
Turn Bay Length (ft)	200			125								
Base Capacity (vph)	1047	1109		145	644			296			354	973
Starvation Cap Reductn	0	0		0	0			0			0	0

Lane Group	SBR2	SEL2	SEL
Lane Configurations			
Volume (vph)	2	6	4
Ideal Flow (vphpl)	1900	1900	1900
Storage Length (ft)			0
Storage Lanes			1
Taper Length (ft)			25
Satd. Flow (prot)	0	0	1805
Flt Permitted			0.950
Satd. Flow (perm)	0	0	1805
Right Turn on Red	Yes		
Satd. Flow (RTOR)			
Link Speed (mph)			30
Link Distance (ft)			153
Travel Time (s)			3.5
Peak Hour Factor	0.92	0.55	0.55
Heavy Vehicles (%)	0%	0%	0%
Shared Lane Traffic (%)			
Lane Group Flow (vph)	0	0	18
Turn Type		Prot	Prot
Protected Phases		9	9
Permitted Phases			
Detector Phase		9	9
Switch Phase			
Minimum Initial (s)		4.0	4.0
Minimum Split (s)		21.0	21.0
Total Split (s)		15.0	15.0
Total Split (%)		14.3%	14.3%
Yellow Time (s)		4.0	4.0
All-Red Time (s)		1.0	1.0
Lost Time Adjust (s)			-1.0
Total Lost Time (s)			4.0
Lead/Lag		Lead	Lead
Lead-Lag Optimize?		Yes	Yes
Recall Mode		None	None
Act Effct Green (s)			7.6
Actuated g/C Ratio			0.09
v/c Ratio			0.12
Control Delay			43.3
Queue Delay			0.0
Total Delay			43.3
LOS			D
Approach Delay			43.3
Approach LOS			D
Queue Length 50th (ft)			9
Queue Length 95th (ft)			20
Internal Link Dist (ft)			73
Turn Bay Length (ft)			
Base Capacity (vph)			228
Starvation Cap Reductn			0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn	0	0		0	0			0			0	0
Storage Cap Reductn	0	0		0	0			0			0	0
Reduced v/c Ratio	0.44	0.58		0.15	1.61			0.41			0.78	0.61

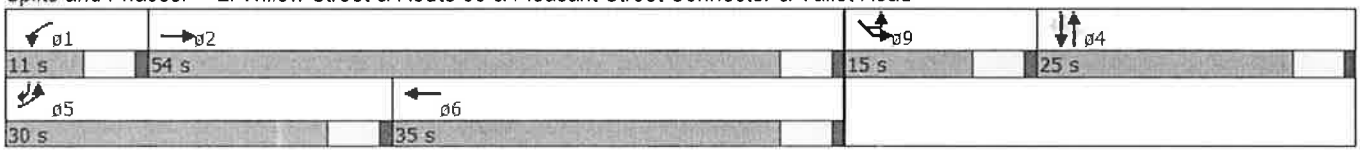
Intersection Summary

Area Type: Other
Cycle Length: 105
Actuated Cycle Length: 88.3
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.61
Intersection Signal Delay: 118.5 Intersection LOS: F
Intersection Capacity Utilization 102.0% ICU Level of Service G
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.

Splits and Phases: 2: Willow Street & Route 30 & Pleasant Street Connector & Vallet Road



Lane Group	SBR2	SEL2	SEL
Spillback Cap Reductn			0
Storage Cap Reductn			0
Reduced v/c Ratio			0.08

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	14	867	21	292	1	168	0	50	0	2	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	11	12	12	12	12	12	12	12	12
Satd. Flow (prot)	0	1667	1546	1745	1881	0	0	1787	1615	0	1900	0
Flt Permitted				0.747				0.755				
Satd. Flow (perm)	0	1667	1546	1372	1881	0	0	1420	1615	0	1900	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			1020						55			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		625			62			440			83	
Travel Time (s)		14.2			1.4			10.0			1.9	
Peak Hour Factor	0.85	0.85	0.85	0.89	0.89	0.89	0.91	0.91	0.91	0.50	0.50	0.50
Heavy Vehicles (%)	0%	14%	1%	0%	1%	0%	1%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	1020	24	329	0	0	185	55	0	4	0
Turn Type		NA	Perm	Perm	NA		Perm	NA	Perm		NA	
Protected Phases		1 2			1 2			3			3	
Permitted Phases	1		1 2	1 2			3		3	3		
Detector Phase	1	1 2	1 2	1 2	1 2		3	3	3	3	3	
Switch Phase												
Minimum Initial (s)	4.0						4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	20.0						20.0	20.0	20.0	20.0	20.0	
Total Split (s)	19.0						34.0	34.0	34.0	34.0	34.0	
Total Split (%)	18.6%						33.3%	33.3%	33.3%	33.3%	33.3%	
Yellow Time (s)	3.0						3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0						1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)								0.0	0.0		0.0	
Total Lost Time (s)								4.0	4.0		4.0	
Lead/Lag	Lead											
Lead-Lag Optimize?	Yes											
Recall Mode	None						None	None	None	None	None	
Act Effct Green (s)		60.3	60.3	60.3	60.3			22.9	22.9		22.9	
Actuated g/C Ratio		0.66	0.66	0.66	0.66			0.25	0.25		0.25	
v/c Ratio		0.01	0.75	0.03	0.27			0.52	0.12		0.01	
Control Delay		6.9	4.6	6.9	7.9			28.9	7.0		26.0	
Queue Delay		0.0	0.3	0.0	0.0			0.0	0.0		0.0	
Total Delay		6.9	4.8	6.9	7.9			28.9	7.0		26.0	
LOS		A	A	A	A			C	A		C	
Approach Delay		4.9			7.8			23.8			26.0	
Approach LOS		A			A			C			C	
Queue Length 50th (ft)		3	0	5	74			54	2		2	
Queue Length 95th (ft)		11	27	15	131			85	m13		6	
Internal Link Dist (ft)		545			1			360			3	
Turn Bay Length (ft)												
Base Capacity (vph)		1197	1398	985	1352			478	580		640	
Starvation Cap Reductn		0	68	0	0			0	0		0	
Spillback Cap Reductn		0	0	0	0			0	0		0	
Storage Cap Reductn		0	0	0	0			0	0		0	

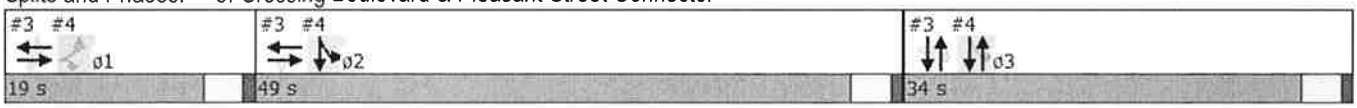
Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	20.0
Total Split (s)	49.0
Total Split (%)	48%
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
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	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.01	0.77	0.02	0.24			0.39	0.09		0.01	

Intersection Summary

Area Type: Other
Cycle Length: 102
Actuated Cycle Length: 91.4
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.43
Intersection Signal Delay: 8.4 Intersection LOS: A
Intersection Capacity Utilization 82.4% ICU Level of Service E
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Crossing Boulevard & Pleasant Street Connector



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	22	650	58	333	0	640	0	850	1	2	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	11	12	12	12	12	12	12	12	12
Satd. Flow (prot)	0	1900	1546	1711	1863	0	0	1805	1615	0	1866	0
Flt Permitted				0.741				0.752			0.704	
Satd. Flow (perm)	0	1900	1546	1334	1863	0	0	1429	1615	0	1338	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			747						730			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		625			62			440			83	
Travel Time (s)		14.2			1.4			10.0			1.9	
Peak Hour Factor	0.87	0.87	0.87	0.76	0.76	0.76	0.92	0.92	0.92	0.38	0.38	0.38
Heavy Vehicles (%)	0%	0%	1%	2%	2%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	25	747	76	438	0	0	696	924	0	8	0
Turn Type		NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		1 2			1 2			3			3	
Permitted Phases	1		1 2	1 2			3		3	3		
Detector Phase	1	1 2	1 2	1 2	1 2		3	3	3	3	3	
Switch Phase												
Minimum Initial (s)	4.0						4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	20.0						20.0	20.0	20.0	20.0	20.0	
Total Split (s)	19.0						34.0	34.0	34.0	34.0	34.0	
Total Split (%)	18.6%						33.3%	33.3%	33.3%	33.3%	33.3%	
Yellow Time (s)	3.0						3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0						1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)								0.0	0.0		0.0	
Total Lost Time (s)								4.0	4.0		4.0	
Lead/Lag	Lead											
Lead-Lag Optimize?	Yes											
Recall Mode	None						None	None	None	None	None	
Act Effct Green (s)		59.9	59.9	59.9	59.9			30.1	30.1		30.1	
Actuated g/C Ratio		0.61	0.61	0.61	0.61			0.31	0.31		0.31	
v/c Ratio		0.02	0.60	0.09	0.39			1.59	0.92		0.02	
Control Delay		7.3	2.9	7.9	10.7			289.5	26.4		26.0	
Queue Delay		0.0	0.2	0.0	0.0			0.0	47.1		0.0	
Total Delay		7.3	3.1	7.9	10.7			289.5	73.5		26.0	
LOS		A	A	A	B			F	E		C	
Approach Delay		3.3			10.3			166.3			26.0	
Approach LOS		A			B			F			C	
Queue Length 50th (ft)		6	0	18	127			~632	373		4	
Queue Length 95th (ft)		15	33	30	148			m#308	m102		7	
Internal Link Dist (ft)		545			1			360			3	
Turn Bay Length (ft)												
Base Capacity (vph)		1245	1270	874	1221			439	1002		411	
Starvation Cap Reductn		0	108	0	0			0	330		0	
Spillback Cap Reductn		0	33	29	0			0	0		0	
Storage Cap Reductn		0	0	0	0			0	0		0	

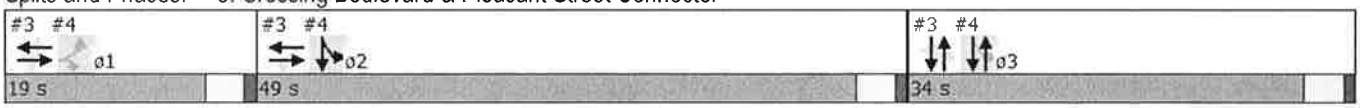
Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	20.0
Total Split (s)	49.0
Total Split (%)	48%
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
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	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.02	0.64	0.09	0.36			1.59	1.38		0.02	

Intersection Summary

Area Type: Other
Cycle Length: 102
Actuated Cycle Length: 98.1
Natural Cycle: 140
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.68
Intersection Signal Delay: 95.2 Intersection LOS: F
Intersection Capacity Utilization 71.1% 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: 3: Crossing Boulevard & Pleasant Street Connector



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	151	0	859	0	0	0	0	258	88	370	520	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	16	12	12	12	12	12	12	12	12	12
Satd. Flow (prot)	1787	0	1830	0	0	0	0	3422	0	1787	1900	0
Flt Permitted	0.950									0.339		
Satd. Flow (perm)	1787	0	1830	0	0	0	0	3422	0	638	1900	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			416					47				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		347			261			206			440	
Travel Time (s)		7.9			5.9			4.7			10.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.74	0.74	0.74	0.90	0.90	0.90
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	2%	0%	1%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	164	0	934	0	0	0	0	468	0	411	578	0
Turn Type	Perm		Perm					NA		D.P+P	NA	
Protected Phases								3		2	2 3	
Permitted Phases	1		1							3		
Detector Phase	1		1					3		2	2 3	
Switch Phase												
Minimum Initial (s)	4.0		4.0					4.0		4.0		
Minimum Split (s)	20.0		20.0					20.0		20.0		
Total Split (s)	19.0		19.0					34.0		49.0		
Total Split (%)	18.6%		18.6%					33.3%		48.0%		
Yellow Time (s)	3.0		3.0					3.0		3.0		
All-Red Time (s)	1.0		1.0					1.0		1.0		
Lost Time Adjust (s)	0.0		0.0					0.0		0.0		
Total Lost Time (s)	4.0		4.0					4.0		4.0		
Lead/Lag	Lead		Lead							Lag		
Lead-Lag Optimize?	Yes		Yes							Yes		
Recall Mode	None		None					None		None		
Act Effct Green (s)	15.4		15.4					22.9		63.7	67.8	
Actuated g/C Ratio	0.17		0.17					0.25		0.70	0.74	
v/c Ratio	0.55		1.43					0.53		0.43	0.41	
Control Delay	46.1		221.3					28.9		5.0	4.9	
Queue Delay	0.0		0.0					0.0		0.2	0.5	
Total Delay	46.1		221.3					28.9		5.2	5.4	
LOS	D		F					C		A	A	
Approach Delay								28.9			5.3	
Approach LOS								C			A	
Queue Length 50th (ft)	95		~565					116		65	101	
Queue Length 95th (ft)	171		#849					127		95	150	
Internal Link Dist (ft)		267			181			126			360	
Turn Bay Length (ft)												
Base Capacity (vph)	300		653					1183		1037	1562	
Starvation Cap Reductn	0		0					0		168	561	
Spillback Cap Reductn	0		0					0		0	0	
Storage Cap Reductn	0		0					0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.55		1.43					0.40		0.47	0.58	

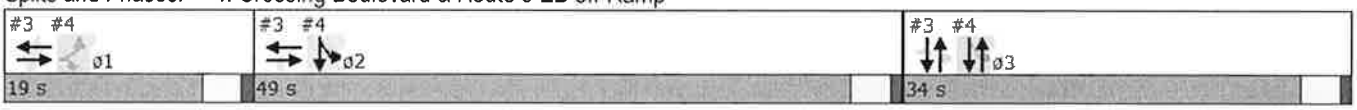
Intersection Summary

Area Type: Other
Cycle Length: 102
Actuated Cycle Length: 91.4
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.43
Intersection Signal Delay: 91.2 Intersection LOS: F
Intersection Capacity Utilization 87.2% ICU Level of Service E
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 4: Crossing Boulevard & Route 9 EB off-Ramp



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	119	0	123	0	0	0	0	1371	318	567	143	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	16	12	12	12	12	12	12	12	12	12
Satd. Flow (prot)	1787	0	1830	0	0	0	0	3489	0	1787	1810	0
Flt Permitted	0.950									0.132		
Satd. Flow (perm)	1787	0	1830	0	0	0	0	3489	0	248	1810	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			162					28				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		347			261			206			440	
Travel Time (s)		7.9			5.9			4.7			10.0	
Peak Hour Factor	0.76	0.76	0.76	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	0%	3%	1%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	157	0	162	0	0	0	0	1836	0	616	155	0
Turn Type	Perm		Perm					NA		D.P+P	NA	
Protected Phases								3		2	2 3	
Permitted Phases	1		1							3		
Detector Phase	1		1					3		2	2 3	
Switch Phase												
Minimum Initial (s)	4.0		4.0					4.0		4.0		
Minimum Split (s)	20.0		20.0					20.0		20.0		
Total Split (s)	19.0		19.0					34.0		49.0		
Total Split (%)	18.6%		18.6%					33.3%		48.0%		
Yellow Time (s)	3.0		3.0					3.0		3.0		
All-Red Time (s)	1.0		1.0					1.0		1.0		
Lost Time Adjust (s)	0.0		0.0					0.0		0.0		
Total Lost Time (s)	4.0		4.0					4.0		4.0		
Lead/Lag	Lead		Lead							Lag		
Lead-Lag Optimize?	Yes		Yes							Yes		
Recall Mode	None		None					None		None		
Act Effct Green (s)	15.1		15.1					30.1		71.0	75.0	
Actuated g/C Ratio	0.15		0.15					0.31		0.72	0.76	
v/c Ratio	0.57		0.39					1.68		0.75	0.11	
Control Delay	49.1		9.4					337.4		21.7	3.2	
Queue Delay	14.0		0.0					0.1		0.0	0.0	
Total Delay	63.1		9.4					337.5		21.7	3.2	
LOS	E		A					F		C	A	
Approach Delay								337.5			18.0	
Approach LOS								F			B	
Queue Length 50th (ft)	97		0					~945		255	23	
Queue Length 95th (ft)	135		32					#1086		392	40	
Internal Link Dist (ft)		267			181			126			360	
Turn Bay Length (ft)												
Base Capacity (vph)	274		418					1091		892	1375	
Starvation Cap Reductn	0		0					0		0	0	
Spillback Cap Reductn	95		0					26		0	0	
Storage Cap Reductn	0		0					0		0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.88		0.39					1.72		0.69	0.11	

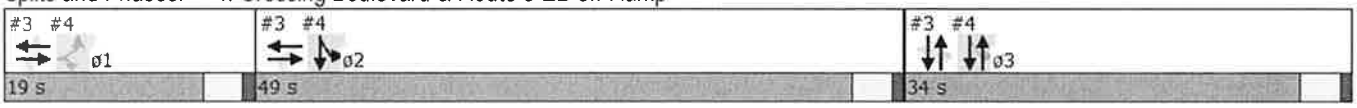
Intersection Summary

Area Type: Other
Cycle Length: 102
Actuated Cycle Length: 98.1
Natural Cycle: 140
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.68
Intersection Signal Delay: 220.4 Intersection LOS: F
Intersection Capacity Utilization 96.1% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 4: Crossing Boulevard & Route 9 EB off-Ramp



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	64	65	132	718	765	759
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12
Satd. Flow (prot)	1745	2748	1900	1615	1715	1780
Flt Permitted	0.950				0.950	0.995
Satd. Flow (perm)	1745	2748	1900	1615	1715	1780
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		71		62		
Link Speed (mph)	30		30			30
Link Distance (ft)	183		120			130
Travel Time (s)	4.2		2.7			3.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%
Shared Lane Traffic (%)					10%	
Lane Group Flow (vph)	70	71	143	780	749	908
Turn Type	Prot	Perm	NA	pt+ov	Split	NA
Protected Phases	1		6	1 6	5	5
Permitted Phases		1				
Detector Phase	1	1	6	1 6	5	5
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	15.0	15.0	21.0		21.0	21.0
Total Split (s)	15.0	15.0	30.0		35.0	35.0
Total Split (%)	18.8%	18.8%	37.5%		43.8%	43.8%
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0		4.0	4.0
Lead/Lag			Lag		Lead	Lead
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None		None	None
Act Effct Green (s)	11.0	11.0	26.0	41.0	31.0	31.0
Actuated g/C Ratio	0.14	0.14	0.32	0.51	0.39	0.39
v/c Ratio	0.29	0.16	0.23	0.91	1.13	1.32
Control Delay	34.7	9.5	21.0	33.6	102.0	178.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.7	9.5	21.0	33.6	102.0	178.4
LOS	C	A	C	C	F	F
Approach Delay	22.0		31.7			143.8
Approach LOS	C		C			F
Queue Length 50th (ft)	32	0	52	313	~463	~626
Queue Length 95th (ft)	70	19	95	#568	#682	#858
Internal Link Dist (ft)	103		40			50
Turn Bay Length (ft)						
Base Capacity (vph)	239	439	617	857	664	689
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

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Reduced v/c Ratio	0.29	0.16	0.23	0.91	1.13	1.32

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.32
Intersection Signal Delay: 99.5 Intersection LOS: F
Intersection Capacity Utilization 92.3% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 5: Crossing Boulevard & Staples Drive

ø1	ø5	ø6
15 s	35 s	30 s

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	700	816	418	70	108	251
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12
Satd. Flow (prot)	1745	2748	1900	1615	1649	1798
Flt Permitted	0.950				0.950	0.998
Satd. Flow (perm)	1745	2748	1900	1615	1649	1798
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		887		76		
Link Speed (mph)	30		30			30
Link Distance (ft)	183		120			130
Travel Time (s)	4.2		2.7			3.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%
Shared Lane Traffic (%)					10%	
Lane Group Flow (vph)	761	887	454	76	105	285
Turn Type	Prot	Perm	NA	pt+ov	Split	NA
Protected Phases	1		6	1 6	5	5
Permitted Phases		1				
Detector Phase	1	1	6	1 6	5	5
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	15.0	15.0	21.0		21.0	21.0
Total Split (s)	53.0	53.0	19.0		18.0	18.0
Total Split (%)	58.9%	58.9%	21.1%		20.0%	20.0%
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0		4.0	4.0
Lead/Lag			Lag		Lead	Lead
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None		None	None
Act Effct Green (s)	42.3	42.3	15.1	61.5	14.1	14.1
Actuated g/C Ratio	0.51	0.51	0.18	0.73	0.17	0.17
v/c Ratio	0.86	0.49	1.32	0.06	0.38	0.94
Control Delay	29.5	1.7	195.6	0.8	37.8	77.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.5	1.7	195.6	0.8	37.8	77.1
LOS	C	A	F	A	D	E
Approach Delay	14.5		167.7			66.5
Approach LOS	B		F			E
Queue Length 50th (ft)	328	0	~345	0	56	~171
Queue Length 95th (ft)	499	28	#537	9	110	#346
Internal Link Dist (ft)	103		40			50
Turn Bay Length (ft)						
Base Capacity (vph)	1031	1987	343	1338	278	303
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

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Reduced v/c Ratio	0.74	0.45	1.32	0.06	0.38	0.94

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 83.7
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.32
Intersection Signal Delay: 54.0 Intersection LOS: D
Intersection Capacity Utilization 84.0% ICU Level of Service E
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 5: Crossing Boulevard & Staples Drive

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BG
Agency/Co.:	VAI
Date performed:	8/19/2016
Analysis time period:	Wkdy AM Peak
Freeway/Dir of Travel:	Route 9 EB
Junction:	Crossing Boulevard Off-Ramp #6
Jurisdiction:	MassDOT
Analysis Year:	2016 Buildout

Description: Framingham Transportation Master Plan

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2545	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	76	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	202	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2545		76		202		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	692		21		55		v
Trucks and buses	0		0		0		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	1.5		1.5		1.5		
Recreational vehicle PCE, ER	1.2		1.2		1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2766	83	220	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2766 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2766	4500	No
$v_{FO} = v_F - v_R$	2683	4500	No
v_R	83	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	
Is v_3 or v_{av34} > 1.5 v_{12}/2		No	

If yes, v_{12A} = 2766 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2766	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 25.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.435	
Space mean speed in ramp influence area,	S_R = 49.3	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 49.3	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BG
Agency/Co.:	VAI
Date performed:	8/19/2016
Analysis time period:	Wkdy PM Peak
Freeway/Dir of Travel:	Route 9 EB
Junction:	Crossing Boulevard Off-Ramp
Jurisdiction:	MassDOT
Analysis Year:	2016 Buildout
Description:	Framingham Transportation Master Plan

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	3039	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	16	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1240	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3039		16		1240		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	826		4		337		v
Trucks and buses	0		0		0		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	1.5		1.5		1.5		
Recreational vehicle PCE, ER	1.2		1.2		1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3303	17	1348	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3303 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3303	4500	No
$v_{FO} = v_F - v_R$	3286	4500	No
v_R	17	2000	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	
Is v_3 or v_{av34} > 1.5 v_{12}/2		No	

If yes, v_{12A} = 3303 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3303	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 30.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, D_S = 0.430

Space mean speed in ramp influence area, S_R = 49.4 mph

Space mean speed in outer lanes, S_O = N/A mph

Space mean speed for all vehicles, S = 49.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BG
Agency/Co.:	VAI
Date performed:	8/19/2016
Analysis time period:	Wkdy AM Peak
Freeway/Dir of Travel:	Route 9 WB
Junction:	Pleasant St Connector Off-Ramp #7
Jurisdiction:	MassDOT
Analysis Year:	2016 Buildout
Description:	Framingham Transportation Master Plan

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2280	vph

Off Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	314	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1448	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	250	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2280		314		1448		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	620		85		393		v
Trucks and buses	0		0		0		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	1.5		1.5		1.5		
Recreational vehicle PCE, ER	1.2		1.2		1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2478	341	1574	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.682 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1799 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2478	6750	No
$v_{FO} = v_F - v_R$	2137	6750	No
v_R	341	2000	No
v_3 or v_{av34}	679 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	
Is v_3 or v_{av34} > 1.5 v_{12}/2		No	

If yes, v_{12A} = 1799 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1799	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 16.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	D_S = 0.459	
Space mean speed in ramp influence area,	S_R = 49.0	mph
Space mean speed in outer lanes,	S_O = 60.3	mph
Space mean speed for all vehicles,	S = 51.3	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BG
Agency/Co.:	VAI
Date performed:	8/19/2016
Analysis time period:	Wkdy PM Peak
Freeway/Dir of Travel:	Route 9 WB
Junction:	Pleasant St Connector Off-Ramp
Jurisdiction:	MassDOT
Analysis Year:	2016 Buildout
Description:	Framingham Transportation Master Plan

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2834	vph

Off Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	391	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	343	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	250	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2834		391		343		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	770		106		93		v
Trucks and buses	0		0		0		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	1.5		1.5		1.5		
Recreational vehicle PCE, ER	1.2		1.2		1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3080	425	373	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.663 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2186 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3080	6750	No
$v_{FO} = v_F - v_R$	2655	6750	No
v_R	425	2000	No
v_3 or v_{av34}	894 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	
Is v_3 or v_{av34} > 1.5 v_{12}/2		No	

If yes, v_{12A} = 2186 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2186	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 19.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	D_S = 0.466	
Space mean speed in ramp influence area,	S_R = 48.9	mph
Space mean speed in outer lanes,	S_O = 60.3	mph
Space mean speed for all vehicles,	S = 51.4	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BG
Agency/Co.:	VAI
Date performed:	8/19/2016
Analysis time period:	Wkdy AM Peak
Freeway/Dir of Travel:	Route 9 WB
Junction:	Crossing Boulevard Off-Ramp #8
Jurisdiction:	MassDOT
Analysis Year:	2016 Buildout
Description:	Framingham Transportation Master Plan

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	3728	vph

Off Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	1448	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	316	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3728		1448		316		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	1013		393		86		v
Trucks and buses	0		0		0		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	1.5		1.5		1.5		
Recreational vehicle PCE, ER	1.2		1.2		1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4052	1574	343	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 781.17 (Equation 13-12 or 13-13)

P_{FD} = 0.616 Using Equation 7

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3100 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4052	6750	No
$v_{FO} = v_F - v_R$	2478	6750	No
v_R	1574	2000	No
v_3 or v_{av34}	952 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	
Is v_3 or v_{av34} > 1.5 v_{12}/2		No	

If yes, v_{12A} = 3100 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3100	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 30.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, D_S = 0.570

Space mean speed in ramp influence area, S_R = 47.6 mph

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 49.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BG
Agency/Co.:	VAI
Date performed:	8/19/2016
Analysis time period:	Wkdy PM Peak
Freeway/Dir of Travel:	Route 9 WB
Junction:	Crossing Boulevard Off-Ramp
Jurisdiction:	MassDOT
Analysis Year:	2016 Buildout
Description:	Framingham Transportation Master Plan

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	3177	vph

Off Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	343	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	391	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3177		343		391		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	863		93		106		v
Trucks and buses	0		0		0		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	1.5		1.5		1.5		
Recreational vehicle PCE, ER	1.2		1.2		1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3453	373	425	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 471.44 (Equation 13-12 or 13-13)

P_{FD} = 0.657 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2395 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3453	6750	No
$v_{FO} = v_F - v_R$	3080	6750	No
v_R	373	2000	No
v_3 or v_{av34}	1058 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	
Is v_3 or v_{av34} > 1.5 v_{12}/2		No	

If yes, v_{12A} = 2395 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2395	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 23.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.462

Space mean speed in ramp influence area, S_R = 49.0 mph

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 51.6 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BG
Agency/Co.:	VAI
Date performed:	8/19/2016
Analysis time period:	Wkdy AM Peak
Freeway/Dir of Travel:	Route 9 WB
Junction:	Pleasant St Connector On-Ramp #9
Jurisdiction:	MassDOT
Analysis Year:	2016 Buildout

Description: Framingham Transportation Master Plan

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1966	vph

On Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	64	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1966	64		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	534	17		v
Trucks and buses	0	0		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%		%
Length	mi	mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2137	70	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2137 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2207	4500	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	
Is v_3 or v_{av34} > 1.5 v_{12}/2		No	

If yes, v_{12A} = 2137 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2463	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 19.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.332	
Space mean speed in ramp influence area,	S_R = 50.7	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 50.7	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BG
Agency/Co.:	VAI
Date performed:	8/19/2016
Analysis time period:	Wkdy PM Peak
Freeway/Dir of Travel:	Route 9 WB
Junction:	Pleasant St Connector On-Ramp
Jurisdiction:	MassDOT
Analysis Year:	2016 Buildout
Description:	Framingham Transportation Master Plan

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2443	vph

On Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	873	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2443	873		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	664	237		v
Trucks and buses	0	0		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%		%
Length	mi	mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2655	949	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2655 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3604	4500	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	
Is v_3 or v_{av34} > 1.5 v_{12}/2		No	

If yes, v_{12A} = 2655 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3922	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 30.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	M_S = 0.483	
Space mean speed in ramp influence area,	S_R = 48.7	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 48.7	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BG
Agency/Co.:	VAI
Date performed:	8/19/2016
Analysis time period:	Wkdy AM Peak
Freeway/Dir of Travel:	Route 9 EB
Junction:	Crossing Boulevard On-Ramp #10
Jurisdiction:	MassDOT
Analysis Year:	2016 Buildout
Description:	Framingham Transportation Master Plan

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2469	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	203	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2469	203		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	671	55		v
Trucks and buses	0	0		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2684	221	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2684 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2905	4500	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 No

If yes, v_{12A} = 2684 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2905	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 24.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.357	
Space mean speed in ramp influence area,	S_R = 50.4	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 50.4	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BG
Agency/Co.:	VAI
Date performed:	8/19/2016
Analysis time period:	Wkdy PM Peak
Freeway/Dir of Travel:	Route 9 EB
Junction:	Crossing Boulevard On-Ramp
Jurisdiction:	MassDOT
Analysis Year:	2016 Buildout
Description:	Framingham Transportation Master Plan

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	3023	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1240	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3023	1240		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	821	337		v
Trucks and buses	0	0		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3286	1348	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3286 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4634	4500	Yes

v_3 or v_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 No

If yes, v_{12A} = 3286 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	4634	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 37.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable,	M_S = 0.687	
Space mean speed in ramp influence area,	S_R = 46.1	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 46.1	mph

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	421	2084	167	164	3604	770	81	0	71	197	0	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	13	12	12	12	12	12	12
Storage Length (ft)	400		0	200		250	0		50	150		0
Storage Lanes	2		0	1		1	0		1	2		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	3255	4858	0	1805	5085	1620	0	1504	1042	3213	1442	0
Flt Permitted	0.950			0.950				0.518		0.635		
Satd. Flow (perm)	3255	4858	0	1805	5085	1620	0	820	1042	2147	1442	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16				398			77		200	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		658			453			379			639	
Travel Time (s)		15.0			10.3			8.6			14.5	
Peak Hour Factor	0.93	0.93	0.93	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	3%	38%	0%	2%	3%	20%	0%	55%	9%	10%	12%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	453	2421	0	171	3754	802	0	88	77	214	127	0
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases						8	2		2	6		
Detector Phase	7	4		3	8	8	2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	9.0	22.0		9.0	22.0	22.0	21.0	21.0	21.0	21.0	21.0	
Total Split (s)	23.0	86.0		23.0	86.0	86.0	31.0	31.0	31.0	31.0	31.0	
Total Split (%)	16.4%	61.4%		16.4%	61.4%	61.4%	22.1%	22.1%	22.1%	22.1%	22.1%	
Yellow Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-2.0		-1.0	-2.0	-2.0		-1.0	-1.0	-1.0	-1.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes						
Recall Mode	None	Min		None	Min	Min	None	None	None	None	None	
Act Effct Green (s)	19.0	84.1		17.1	82.1	82.1		19.7	19.7	19.7	19.7	
Actuated g/C Ratio	0.14	0.63		0.13	0.62	0.62		0.15	0.15	0.15	0.15	
v/c Ratio	0.97	0.79		0.74	1.19	0.70		0.73	0.35	0.67	0.33	
Control Delay	92.1	21.2		75.6	116.9	11.9		85.8	14.6	64.2	2.3	
Queue Delay	0.0	2.9		0.0	0.3	5.4		0.0	0.0	0.0	0.0	
Total Delay	92.1	24.2		75.6	117.2	17.3		85.8	14.6	64.2	2.3	
LOS	F	C		E	F	B		F	B	E	A	
Approach Delay		34.9			98.8			52.6			41.1	
Approach LOS		C			F			D			D	
Queue Length 50th (ft)	202	538		141	~1422	214		73	0	91	0	
Queue Length 95th (ft)	#338	704		#245	#1626	419		135	46	134	0	
Internal Link Dist (ft)		578			373			299			559	
Turn Bay Length (ft)	400			200		250			50	150		
Base Capacity (vph)	466	3080		258	3142	1153		166	273	436	452	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	536		0	466	286		0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	0.97	0.95		0.66	1.40	0.93		0.53	0.28	0.49	0.28	

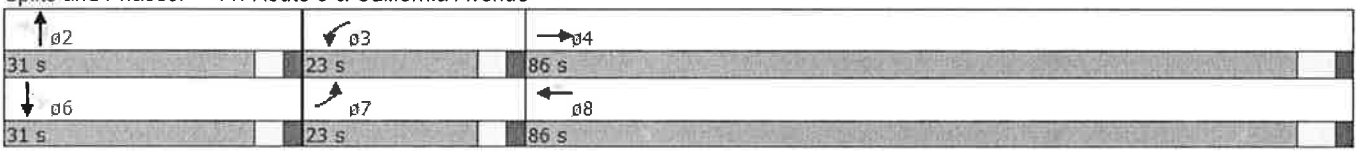
Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 132.9
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.19
Intersection Signal Delay: 72.8 Intersection LOS: E
Intersection Capacity Utilization 103.9% ICU Level of Service G
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.

Splits and Phases: 11: Route 9 & California Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	208	3853	202	185	2544	225	274	0	298	853	0	412
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	13	12	12	12	12	12	12
Storage Length (ft)	400		0	0		250	0		50	150		0
Storage Lanes	2		0	1		1	0		1	2		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	2996	5102	0	1805	5136	1605	0	1671	1583	3467	1553	0
Flt Permitted	0.950			0.950				0.154		0.168		
Satd. Flow (perm)	2996	5102	0	1805	5136	1605	0	271	1583	613	1553	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10				138			103		291	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		658			453			379			639	
Travel Time (s)		15.0			10.3			8.6			14.5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	13%	1%	0%	0%	1%	4%	8%	0%	2%	1%	36%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	221	4314	0	197	2706	239	0	298	324	927	448	0
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases						8	2		2	6		
Detector Phase	7	4		3	8	8	2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	9.0	22.0		9.0	22.0	22.0	21.0	21.0	21.0	21.0	21.0	
Total Split (s)	35.0	87.0		23.0	66.0	66.0	30.0	30.0	30.0	30.0	30.0	
Total Split (%)	25.0%	62.1%		16.4%	47.1%	47.1%	21.4%	21.4%	21.4%	21.4%	21.4%	
Yellow Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-2.0		-1.0	-2.0	-2.0		-1.0	-1.0	-1.0	-1.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes						
Recall Mode	None	Min		None	Min	Min	None	None	None	None	None	
Act Effct Green (s)	16.6	83.0		18.2	84.6	84.6		26.0	26.0	26.0	26.0	
Actuated g/C Ratio	0.12	0.60		0.13	0.61	0.61		0.19	0.19	0.19	0.19	
v/c Ratio	0.62	1.42		0.84	0.87	0.23		5.96	0.85	8.13	0.85	
Control Delay	65.9	215.9		87.4	27.0	6.0		2273.6	58.8	3240.9	35.1	
Queue Delay	0.0	0.1		0.0	46.4	0.7		0.0	0.0	0.0	0.0	
Total Delay	65.9	216.0		87.4	73.4	6.6		2273.6	58.8	3240.9	35.1	
LOS	E	F		F	E	A		F	E	F	D	
Approach Delay		208.7			69.2			1119.9			2196.4	
Approach LOS		F			E			F			F	
Queue Length 50th (ft)	100	~1949		177	709	36		~481	203	~810	148	
Queue Length 95th (ft)	140	#1992		#303	850	83		#673	#370	#944	#338	
Internal Link Dist (ft)		578			373			299			559	
Turn Bay Length (ft)	400					250			50	150		
Base Capacity (vph)	667	3045		245	3121	1029		50	379	114	526	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	158		0	903	499		0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	0.33	1.49		0.80	1.22	0.45		5.96	0.85	8.13	0.85	

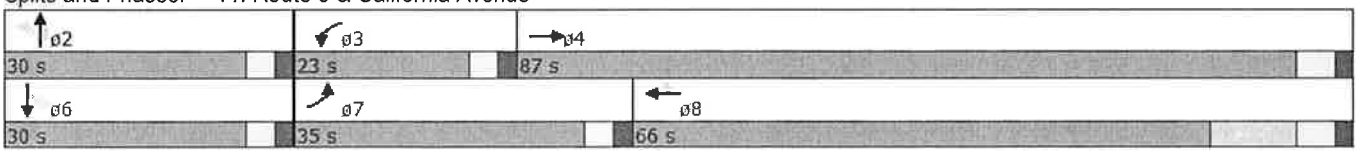
Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 139.2
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 8.13
Intersection Signal Delay: 504.5 Intersection LOS: F
Intersection Capacity Utilization 143.2% ICU Level of Service H
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.

Splits and Phases: 11: Route 9 & California Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	1463	286	73	2076	0	391	0	75	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	145		125	100		0	225		0	0		0
Storage Lanes	1		1	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1805	3455	1615	1805	3574	0	1715	1668	0	0	0	0
Flt Permitted	0.950			0.950			0.950	0.964				
Satd. Flow (perm)	1805	3455	1615	1805	3574	0	1715	1668	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			164					87				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		453			651			275			82	
Travel Time (s)		10.3			14.8			6.3			1.9	
Peak Hour Factor	0.94	0.94	0.94	0.95	0.95	0.95	0.88	0.88	0.88	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	1%	2%	2%	2%
Shared Lane Traffic (%)							55%					
Lane Group Flow (vph)	48	1556	304	77	2185	0	200	329	0	0	0	0
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA				
Protected Phases	7	4		3	8			2				
Permitted Phases			4				2					
Detector Phase	7	4	4	3	8		2	2				
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0				
Minimum Split (s)	9.0	22.0	22.0	9.0	22.0		21.0	21.0				
Total Split (s)	20.0	55.0	55.0	20.0	55.0		25.0	25.0				
Total Split (%)	20.0%	55.0%	55.0%	20.0%	55.0%		25.0%	25.0%				
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0				
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		1.0	1.0				
Lost Time Adjust (s)	-1.0	-2.0	-2.0	-2.0	-2.0		-1.0	-1.0				
Total Lost Time (s)	4.0	4.0	4.0	3.0	4.0		4.0	4.0				
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Recall Mode	None	None	None	None	None		None	None				
Act Effct Green (s)	8.9	51.7	51.7	11.3	55.3		18.2	18.2				
Actuated g/C Ratio	0.10	0.58	0.58	0.13	0.62		0.20	0.20				
v/c Ratio	0.27	0.78	0.30	0.34	0.99		0.58	0.81				
Control Delay	43.4	20.4	6.4	42.0	37.7		40.4	42.0				
Queue Delay	0.0	7.9	0.0	0.0	15.6		0.0	0.0				
Total Delay	43.4	28.3	6.4	42.0	53.3		40.4	42.0				
LOS	D	C	A	D	D		D	D				
Approach Delay		25.2			52.9			41.4				
Approach LOS		C			D			D				
Queue Length 50th (ft)	27	385	40	43	~787		111	143				
Queue Length 95th (ft)	62	534	94	86	#973		188	#276				
Internal Link Dist (ft)		373			571			195			2	
Turn Bay Length (ft)	145		125	100			225					
Base Capacity (vph)	327	1995	1002	347	2206		407	463				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	410	0	0	110		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	0.15	0.98	0.30	0.22	1.04		0.49	0.71				

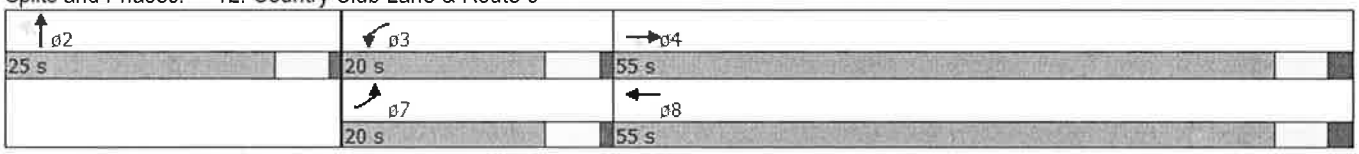
Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 89.6
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 40.3 Intersection LOS: D
Intersection Capacity Utilization 80.4% ICU Level of Service D
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 12: Country Club Lane & Route 9



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	69	2257	569	207	1648	0	435	0	72	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	145		125	100		0	225		0	0		0
Storage Lanes	1		1	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1805	3490	1615	1805	3610	0	1715	1677	0	0	0	0
Flt Permitted	0.950			0.950			0.950	0.963				
Satd. Flow (perm)	1805	3490	1615	1805	3610	0	1715	1677	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			211					87				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		453			651			275			82	
Travel Time (s)		10.3			14.8			6.3			1.9	
Peak Hour Factor	0.98	0.98	0.98	0.92	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	2%
Shared Lane Traffic (%)							55%					
Lane Group Flow (vph)	70	2303	581	225	1791	0	208	332	0	0	0	0
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA				
Protected Phases	7	4		3	8			2				
Permitted Phases			4				2					
Detector Phase	7	4	4	3	8		2	2				
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0				
Minimum Split (s)	9.0	22.0	22.0	9.0	22.0		21.0	21.0				
Total Split (s)	20.0	55.0	55.0	20.0	55.0		25.0	25.0				
Total Split (%)	20.0%	55.0%	55.0%	20.0%	55.0%		25.0%	25.0%				
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0				
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		1.0	1.0				
Lost Time Adjust (s)	-1.0	-2.0	-2.0	-2.0	-2.0		-1.0	-1.0				
Total Lost Time (s)	4.0	4.0	4.0	3.0	4.0		4.0	4.0				
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Recall Mode	None	None	None	None	None		None	None				
Act Effct Green (s)	10.1	51.1	51.1	16.2	58.6		18.8	18.8				
Actuated g/C Ratio	0.10	0.53	0.53	0.17	0.60		0.19	0.19				
v/c Ratio	0.37	1.25	0.61	0.75	0.82		0.63	0.84				
Control Delay	46.6	143.1	13.5	55.7	21.7		45.2	47.9				
Queue Delay	0.0	0.4	1.4	0.0	1.4		0.0	0.0				
Total Delay	46.6	143.5	14.9	55.7	23.1		45.2	47.9				
LOS	D	F	B	E	C		D	D				
Approach Delay		115.9			26.7			46.8				
Approach LOS		F			C			D				
Queue Length 50th (ft)	42	~992	159	138	483		126	157				
Queue Length 95th (ft)	83	#1130	273	#244	#720		206	#303				
Internal Link Dist (ft)		373			571			195			2	
Turn Bay Length (ft)	145		125	100			225					
Base Capacity (vph)	298	1837	950	316	2176		372	431				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	235	192	0	203		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	1.44	0.77	0.71	0.91		0.56	0.77				

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 97.1
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.25
Intersection Signal Delay: 76.5 Intersection LOS: E
Intersection Capacity Utilization 98.1% ICU Level of Service F
Analysis Period (min) 15

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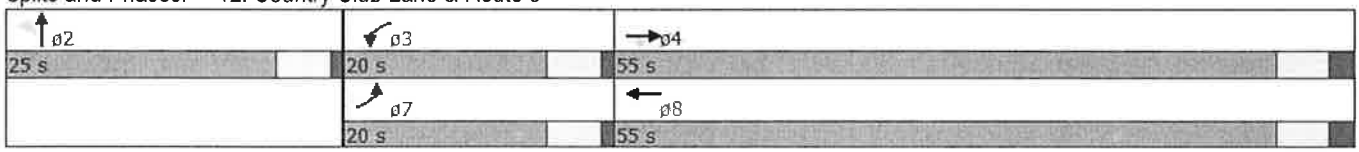
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 12: Country Club Lane & Route 9



Lane Group	EBL2	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR	SWL2
Lane Configurations												
Volume (vph)	35	53	1684	107	1995	149	131	106	207	91	20	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	11	12	12	15	12	12
Storage Length (ft)		145		145		150		0	0		0	
Storage Lanes		1		1		1		0	0		0	
Taper Length (ft)		25				25			25			
Satd. Flow (prot)	0	1719	3438	1538	5036	1678	1677	0	0	1985	0	1736
Flt Permitted		0.950				0.592				0.150		0.950
Satd. Flow (perm)	0	1719	3438	1538	5036	1045	1677	0	0	308	0	1736
Right Turn on Red				Yes							Yes	
Satd. Flow (RTOR)				202						2		
Link Speed (mph)			30		30		30			30		
Link Distance (ft)			651		444		425			135		
Travel Time (s)			14.8		10.1		9.7			3.1		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.92	0.85	0.85	0.85	0.88	0.88	0.88	0.84
Heavy Vehicles (%)	5%	5%	5%	5%	3%	4%	4%	0%	1%	1%	1%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	93	1773	113	2168	175	279	0	0	361	0	126
Turn Type	Prot	Prot	NA	Prot	NA	Perm	NA		D.P+P	NA		Prot
Protected Phases	1	1!	2 3	2 3	2 3		7		6 8	6 7 8		1!
Permitted Phases						7			7			
Detector Phase	1	1	2 3	2 3	2 3	7	7		6 8	6 7 8		1
Switch Phase												
Minimum Initial (s)	4.0	4.0				4.0	4.0					4.0
Minimum Split (s)	11.0	11.0				23.0	23.0					11.0
Total Split (s)	25.0	25.0				26.0	26.0					25.0
Total Split (%)	17.1%	17.1%				17.8%	17.8%					17.1%
Yellow Time (s)	3.0	3.0				3.0	3.0					3.0
All-Red Time (s)	4.0	4.0				4.0	4.0					4.0
Lost Time Adjust (s)		-3.0				-3.0	-3.0					-3.0
Total Lost Time (s)		4.0				4.0	4.0					4.0
Lead/Lag	Lead	Lead				Lead	Lead					Lead
Lead-Lag Optimize?	Yes	Yes				Yes	Yes					Yes
Recall Mode	None	None				None	None					None
Act Effct Green (s)		18.8	67.0	67.0	67.0	22.0	22.0			48.0		18.8
Actuated g/C Ratio		0.12	0.41	0.41	0.41	0.13	0.13			0.29		0.12
v/c Ratio		0.47	1.26	0.15	1.05	1.25	1.24			1.01		0.63
Control Delay		75.7	162.1	0.4	80.4	211.7	193.9			67.8		83.5
Queue Delay		0.0	0.6	0.0	0.0	0.0	0.0			31.2		0.0
Total Delay		75.7	162.6	0.4	80.4	211.7	193.9			99.0		83.5
LOS		E	F	A	F	F	F			F		F
Approach Delay			149.3		80.4		200.8			99.0		
Approach LOS			F		F		F			F		
Queue Length 50th (ft)		95	~1269	0	~941	~236	~375			~113		131
Queue Length 95th (ft)		158	#1406	0	#1031	#372	#527			#424		191
Internal Link Dist (ft)			571		364		345			55		
Turn Bay Length (ft)		145		145		150						
Base Capacity (vph)		221	1410	749	2065	140	225			358		223

Lane Group	SWL	ø2	ø3	ø5	ø6	ø8
Lane Configurations	↰					
Volume (vph)	111					
Ideal Flow (vphpl)	1900					
Lane Width (ft)	12					
Storage Length (ft)	0					
Storage Lanes	2					
Taper Length (ft)	25					
Satd. Flow (prot)	1736					
Flt Permitted	0.950					
Satd. Flow (perm)	1736					
Right Turn on Red						
Satd. Flow (RTOR)						
Link Speed (mph)	30					
Link Distance (ft)	237					
Travel Time (s)	5.4					
Peak Hour Factor	0.84					
Heavy Vehicles (%)	4%					
Shared Lane Traffic (%)						
Lane Group Flow (vph)	132					
Turn Type	Prot					
Protected Phases	1!	2	3	5	6	8
Permitted Phases						
Detector Phase	1					
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	11.0	23.0	8.0	8.0	23.0	21.0
Total Split (s)	25.0	9.0	48.0	17.0	10.0	11.0
Total Split (%)	17.1%	6%	33%	12%	7%	8%
Yellow Time (s)	3.0	3.0	3.5	3.5	3.0	3.0
All-Red Time (s)	4.0	4.0	0.5	0.5	4.0	2.0
Lost Time Adjust (s)	-3.0					
Total Lost Time (s)	4.0					
Lead/Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	Max	None	None	Max	None
Act Effct Green (s)	18.8					
Actuated g/C Ratio	0.12					
v/c Ratio	0.66					
Control Delay	85.5					
Queue Delay	0.0					
Total Delay	85.5					
LOS	F					
Approach Delay	84.5					
Approach LOS	F					
Queue Length 50th (ft)	137					
Queue Length 95th (ft)	199					
Internal Link Dist (ft)	157					
Turn Bay Length (ft)						
Base Capacity (vph)	223					

Lane Group	EBL2	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR	SWL2
Starvation Cap Reductn		0	199	0	0	0	0			43		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		0.42	1.46	0.15	1.05	1.25	1.24			1.15		0.57

Intersection Summary

Area Type: Other
Cycle Length: 146
Actuated Cycle Length: 163.4
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.26
Intersection Signal Delay: 118.5 Intersection LOS: F
Intersection Capacity Utilization 97.1% ICU Level of Service F
Analysis Period (min) 15

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

! Phase conflict between lane groups.

Splits and Phases: 13: Route 9 & Temple Street

Lane Group	SWL	ø2	ø3	ø5	ø6	ø8
Starvation Cap Reductn	0					
Spillback Cap Reductn	0					
Storage Cap Reductn	0					
Reduced v/c Ratio	0.59					

Intersection Summary

Lane Group	EBL2	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR	SWL2
Lane Configurations												
Volume (vph)	25	51	1915	133	1712	182	162	81	162	126	43	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	11	12	12	15	12	12
Storage Length (ft)		145		145		150		0	0		0	
Storage Lanes		1		1		1		0	0		0	
Taper Length (ft)		25				25			25			
Satd. Flow (prot)	0	1781	3539	1538	5036	1711	1728	0	0	1964	0	1787
Flt Permitted		0.950				0.582				0.135		0.950
Satd. Flow (perm)	0	1781	3539	1538	5036	1048	1728	0	0	272	0	1787
Right Turn on Red				Yes							Yes	
Satd. Flow (RTOR)				202						5		
Link Speed (mph)			30		30		30			30		
Link Distance (ft)			651		444		425			135		
Travel Time (s)			14.8		10.1		9.7			3.1		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.93	0.93	0.93	0.90	0.90	0.90	0.91
Heavy Vehicles (%)	0%	2%	2%	5%	3%	2%	0%	3%	2%	2%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	78	1954	136	1747	196	261	0	0	368	0	178
Turn Type	Prot	Prot	NA	Prot	NA	Perm	NA		D.P+P	NA		Prot
Protected Phases	1	1!	2 3	2 3	2 3		7		6 8	6 7 8		1!
Permitted Phases						7			7			
Detector Phase	1	1	2 3	2 3	2 3	7	7		6 8	6 7 8		1
Switch Phase												
Minimum Initial (s)	4.0	4.0				4.0	4.0					4.0
Minimum Split (s)	11.0	11.0				23.0	23.0					11.0
Total Split (s)	25.0	25.0				26.0	26.0					25.0
Total Split (%)	17.1%	17.1%				17.8%	17.8%					17.1%
Yellow Time (s)	3.0	3.0				3.0	3.0					3.0
All-Red Time (s)	4.0	4.0				4.0	4.0					4.0
Lost Time Adjust (s)		-3.0				-3.0	-3.0					-3.0
Total Lost Time (s)		4.0				4.0	4.0					4.0
Lead/Lag	Lead	Lead				Lead	Lead					Lead
Lead-Lag Optimize?	Yes	Yes				Yes	Yes					Yes
Recall Mode	None	None				None	None					None
Act Effct Green (s)		21.0	67.0	67.0	67.0	22.0	22.0			48.0		21.0
Actuated g/C Ratio		0.13	0.40	0.40	0.40	0.13	0.13			0.29		0.13
v/c Ratio		0.35	1.37	0.18	0.86	1.41	1.14			1.06		0.79
Control Delay		70.9	207.1	0.7	50.2	269.7	163.0			101.6		93.7
Queue Delay		0.0	0.6	0.0	0.0	0.0	0.0			20.5		0.0
Total Delay		70.9	207.6	0.7	50.2	269.7	163.0			122.1		93.7
LOS		E	F	A	D	F	F			F		F
Approach Delay			189.7		50.2		208.8			122.1		
Approach LOS			F		D		F			F		
Queue Length 50th (ft)		79	~1461	0	630	~284	~328			~360		190
Queue Length 95th (ft)		136	#1594	1	695	#457	#522			#516		#312
Internal Link Dist (ft)			571		364		345			55		
Turn Bay Length (ft)		145		145		150						
Base Capacity (vph)		225	1431	742	2037	139	229			348		226

Lane Group	SWL	ø2	ø3	ø5	ø6	ø8
Lane Configurations						
Volume (vph)	207					
Ideal Flow (vphpl)	1900					
Lane Width (ft)	12					
Storage Length (ft)	0					
Storage Lanes	2					
Taper Length (ft)	25					
Satd. Flow (prot)	1770					
Flt Permitted	0.950					
Satd. Flow (perm)	1770					
Right Turn on Red						
Satd. Flow (RTOR)						
Link Speed (mph)	30					
Link Distance (ft)	237					
Travel Time (s)	5.4					
Peak Hour Factor	0.91					
Heavy Vehicles (%)	2%					
Shared Lane Traffic (%)						
Lane Group Flow (vph)	227					
Turn Type	Prot					
Protected Phases	1!	2	3	5	6	8
Permitted Phases						
Detector Phase	1					
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	11.0	23.0	8.0	8.0	23.0	21.0
Total Split (s)	25.0	9.0	48.0	17.0	10.0	11.0
Total Split (%)	17.1%	6%	33%	12%	7%	8%
Yellow Time (s)	3.0	3.0	3.5	3.5	3.0	3.0
All-Red Time (s)	4.0	4.0	0.5	0.5	4.0	2.0
Lost Time Adjust (s)	-3.0					
Total Lost Time (s)	4.0					
Lead/Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	Max	None	None	Max	None
Act Effct Green (s)	21.0					
Actuated g/C Ratio	0.13					
v/c Ratio	1.01					
Control Delay	132.7					
Queue Delay	0.0					
Total Delay	132.7					
LOS	F					
Approach Delay	115.6					
Approach LOS	F					
Queue Length 50th (ft)	~254					
Queue Length 95th (ft)	#442					
Internal Link Dist (ft)	157					
Turn Bay Length (ft)						
Base Capacity (vph)	224					

Lane Group	EBL2	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR	SWL2
Starvation Cap Reductn		0	200	0	0	0	0			121		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		0.35	1.59	0.18	0.86	1.41	1.14			1.62		0.79

Intersection Summary

Area Type: Other
Cycle Length: 146
Actuated Cycle Length: 165.6
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.41
Intersection Signal Delay: 133.4 Intersection LOS: F
Intersection Capacity Utilization 109.4% ICU Level of Service H
Analysis Period (min) 15

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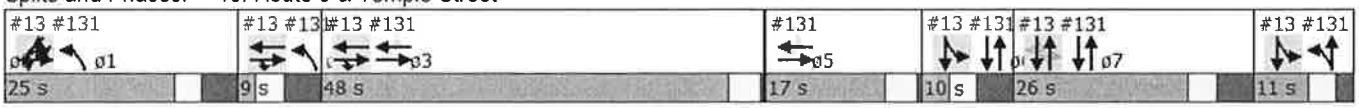
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

! Phase conflict between lane groups.

Splits and Phases: 13: Route 9 & Temple Street



Lane Group	SWL	ø2	ø3	ø5	ø6	ø8
Starvation Cap Reductn	**0**					
Spillback Cap Reductn	0					
Storage Cap Reductn	0					
Reduced v/c Ratio	1.01					

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	0	45	0	10	81	5	179	0	0	274	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	12	14	12	12	15	12	12	13	12
Satd. Flow (prot)	0	1760	0	0	1732	0	0	2008	0	0	1944	0
Flt Permitted		0.907										
Satd. Flow (perm)	0	1620	0	0	1732	0	0	2010	0	0	1944	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		224			91							
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		108			188			135			245	
Travel Time (s)		2.5			4.3			3.1			5.6	
Peak Hour Factor	0.86	0.86	0.86	0.89	0.89	0.89	0.85	0.85	0.85	0.88	0.88	0.88
Heavy Vehicles (%)	6%	6%	6%	3%	3%	3%	4%	4%	4%	1%	1%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	75	0	0	102	0	0	217	0	0	311	0
Turn Type	Perm	NA			NA		custom	NA			NA	
Protected Phases		3 5			3 5		1 2 8	6 7 8			6 7	
Permitted Phases	3 5						2					
Detector Phase	3 5	3 5			3 5		1 2 8	6 7 8			6 7	
Switch Phase												
Minimum Initial (s)												
Minimum Split (s)												
Total Split (s)												
Total Split (%)												
Yellow Time (s)												
All-Red Time (s)												
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode												
Act Effct Green (s)		53.5			53.5			91.8			42.0	
Actuated g/C Ratio		0.33			0.33			0.56			0.26	
v/c Ratio		0.11			0.16			0.19			0.62	
Control Delay		0.3			41.8			1.7			60.4	
Queue Delay		0.1			0.0			5.5			3.5	
Total Delay		0.4			41.8			7.2			64.0	
LOS		A			D			A			E	
Approach Delay		0.4			41.8			7.2			64.0	
Approach LOS		A			D			A			E	
Queue Length 50th (ft)		0			86			11			302	
Queue Length 95th (ft)		0			m89			m10			401	
Internal Link Dist (ft)		28			108			55			165	
Turn Bay Length (ft)												
Base Capacity (vph)		745			703			1129			500	
Starvation Cap Reductn		0			0			843			0	
Spillback Cap Reductn		220			0			0			112	
Storage Cap Reductn		0			0			0			0	

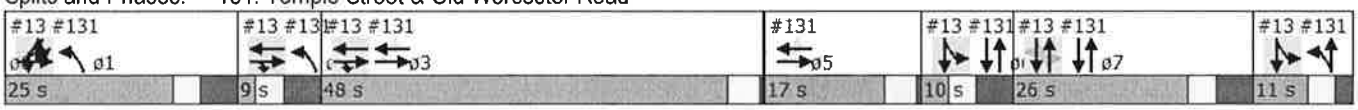
Lane Group	ø1	ø2	ø3	ø5	ø6	ø7	ø8
Lane Configurations							
Volume (vph)							
Ideal Flow (vphpl)							
Lane Width (ft)							
Satd. Flow (prot)							
Flt Permitted							
Satd. Flow (perm)							
Right Turn on Red							
Satd. Flow (RTOR)							
Link Speed (mph)							
Link Distance (ft)							
Travel Time (s)							
Peak Hour Factor							
Heavy Vehicles (%)							
Shared Lane Traffic (%)							
Lane Group Flow (vph)							
Turn Type							
Protected Phases	1	2	3	5	6	7	8
Permitted Phases							
Detector Phase							
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	11.0	23.0	8.0	8.0	23.0	23.0	21.0
Total Split (s)	25.0	9.0	48.0	17.0	10.0	26.0	11.0
Total Split (%)	17%	6%	33%	12%	7%	18%	8%
Yellow Time (s)	3.0	3.0	3.5	3.5	3.0	3.0	3.0
All-Red Time (s)	4.0	4.0	0.5	0.5	4.0	4.0	2.0
Lost Time Adjust (s)							
Total Lost Time (s)							
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	None	Max	None	None
Act Effct Green (s)							
Actuated g/C Ratio							
v/c Ratio							
Control Delay							
Queue Delay							
Total Delay							
LOS							
Approach Delay							
Approach LOS							
Queue Length 50th (ft)							
Queue Length 95th (ft)							
Internal Link Dist (ft)							
Turn Bay Length (ft)							
Base Capacity (vph)							
Starvation Cap Reductn							
Spillback Cap Reductn							
Storage Cap Reductn							

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		**0.14**			**0.15**			**0.76**			**0.80**	

Intersection Summary

Area Type: Other
Cycle Length: 146
Actuated Cycle Length: 163.4
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.26
Intersection Signal Delay: 36.5 **Intersection LOS: D**
Intersection Capacity Utilization 34.1% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 131: Temple Street & Old Worcester Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	0	40	0	30	86	15	198	0	0	291	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	12	14	12	12	15	12	12	13	12
Satd. Flow (prot)	0	1707	0	0	1797	0	0	2046	0	0	1940	0
Flt Permitted		0.976						0.996				
Satd. Flow (perm)	0	1676	0	0	1797	0	0	2044	0	0	1940	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		224			95						1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		108			188			135			245	
Travel Time (s)		2.5			4.3			3.1			5.6	
Peak Hour Factor	0.83	0.83	0.83	0.91	0.91	0.91	0.93	0.93	0.93	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	8%	0%	3%	1%	0%	2%	0%	0%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	54	0	0	128	0	0	229	0	0	329	0
Turn Type	Perm	NA			NA		custom	NA			NA	
Protected Phases		3 5			3 5		1 2 8	6 7 8			6 7	
Permitted Phases	3 5						2					
Detector Phase	3 5	3 5			3 5		1 2 8	6 7 8			6 7	
Switch Phase												
Minimum Initial (s)												
Minimum Split (s)												
Total Split (s)												
Total Split (%)												
Yellow Time (s)												
All-Red Time (s)												
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode												
Act Effct Green (s)		53.6			53.6			94.0			42.0	
Actuated g/C Ratio		0.32			0.32			0.57			0.25	
v/c Ratio		0.08			0.20			0.20			0.67	
Control Delay		0.2			44.3			3.0			63.0	
Queue Delay		0.2			0.0			11.1			14.0	
Total Delay		0.5			44.3			14.1			77.1	
LOS		A			D			B			E	
Approach Delay		0.5			44.3			14.1			77.1	
Approach LOS		A			D			B			E	
Queue Length 50th (ft)		0			116			28			322	
Queue Length 95th (ft)		0			m132			m29			439	
Internal Link Dist (ft)		28			108			55			165	
Turn Bay Length (ft)												
Base Capacity (vph)		759			722			1161			493	
Starvation Cap Reductn		0			0			897			0	
Spillback Cap Reductn		414			0			0			145	
Storage Cap Reductn		0			0			0			0	

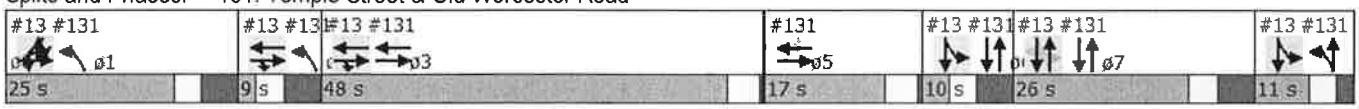
Lane Group	ø1	ø2	ø3	ø5	ø6	ø7	ø8
Lane Configurations							
Volume (vph)							
Ideal Flow (vphpl)							
Lane Width (ft)							
Satd. Flow (prot)							
Flt Permitted							
Satd. Flow (perm)							
Right Turn on Red							
Satd. Flow (RTOR)							
Link Speed (mph)							
Link Distance (ft)							
Travel Time (s)							
Peak Hour Factor							
Heavy Vehicles (%)							
Shared Lane Traffic (%)							
Lane Group Flow (vph)							
Turn Type							
Protected Phases	1	2	3	5	6	7	8
Permitted Phases							
Detector Phase							
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	11.0	23.0	8.0	8.0	23.0	23.0	21.0
Total Split (s)	25.0	9.0	48.0	17.0	10.0	26.0	11.0
Total Split (%)	17%	6%	33%	12%	7%	18%	8%
Yellow Time (s)	3.0	3.0	3.5	3.5	3.0	3.0	3.0
All-Red Time (s)	4.0	4.0	0.5	0.5	4.0	4.0	2.0
Lost Time Adjust (s)							
Total Lost Time (s)							
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	None	Max	None	None
Act Effct Green (s)							
Actuated g/C Ratio							
v/c Ratio							
Control Delay							
Queue Delay							
Total Delay							
LOS							
Approach Delay							
Approach LOS							
Queue Length 50th (ft)							
Queue Length 95th (ft)							
Internal Link Dist (ft)							
Turn Bay Length (ft)							
Base Capacity (vph)							
Starvation Cap Reductn							
Spillback Cap Reductn							
Storage Cap Reductn							

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.16			**0.18**			**0.87**			0.95	

Intersection Summary

Area Type: Other
Cycle Length: 146
Actuated Cycle Length: 165.6
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.41
Intersection Signal Delay: 46.3 Intersection LOS: D
Intersection Capacity Utilization 39.2% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 131: Temple Street & Old Worcester Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	188	1	189	1	1	1	310	577	1	1	60	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	12	14	12	11	12	12	12	14	12
Storage Length (ft)	0		220	0		0	120		0	0		0
Storage Lanes	0		1	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1811	1546	0	1904	0	1728	1881	0	0	1818	0
Flt Permitted		0.721			0.925		0.725				0.997	
Satd. Flow (perm)	0	1370	1546	0	1790	0	1318	1881	0	0	1812	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			217		3						24	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1458			137			639			100	
Travel Time (s)		33.1			3.1			14.5			2.3	
Peak Hour Factor	0.87	0.87	0.87	0.38	0.38	0.38	0.95	0.95	0.95	0.87	0.87	0.87
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	1%	1%	0%	0%	10%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	217	217	0	9	0	326	608	0	0	103	0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			4		1	2			2	
Permitted Phases	4		4	4			2			2		
Detector Phase	4	4	4	4	4		1	2		2	2	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0		9.0	21.0		21.0	21.0	
Total Split (s)	30.0	30.0	30.0	30.0	30.0		20.0	55.0		55.0	55.0	
Total Split (%)	24.8%	24.8%	24.8%	24.8%	24.8%		16.5%	45.5%		45.5%	45.5%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0	-1.0		-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)		4.0	4.0		4.0		4.0	4.0			4.0	
Lead/Lag	Lag	Lag	Lag	Lag	Lag		Lead	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	None		None	None	
Act Effct Green (s)		20.4	20.4		20.4		48.5	34.8			34.8	
Actuated g/C Ratio		0.25	0.25		0.25		0.59	0.43			0.43	
v/c Ratio		0.63	0.40		0.02		0.38	0.76			0.13	
Control Delay		39.5	6.8		24.0		8.1	27.3			12.4	
Queue Delay		0.0	0.0		0.0		0.0	0.0			0.0	
Total Delay		39.5	6.8		24.0		8.1	27.3			12.4	
LOS		D	A		C		A	C			B	
Approach Delay		23.1			24.0			20.6			12.4	
Approach LOS		C			C			C			B	
Queue Length 50th (ft)		100	0		2		65	260			24	
Queue Length 95th (ft)		205	51		6		118	426			55	
Internal Link Dist (ft)		1378			57			559			20	
Turn Bay Length (ft)			220				120					
Base Capacity (vph)		462	665		605		909	1244			1207	

Lane Group	ø3
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	8.0
Total Split (s)	16.0
Total Split (%)	13%
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0	30			0	
Spillback Cap Reductn		0	0		0		0	0			0	
Storage Cap Reductn		0	0		0		0	0			0	
Reduced v/c Ratio		0.47	0.33		0.01		0.36	0.50			0.09	

Intersection Summary

Area Type: Other
Cycle Length: 121
Actuated Cycle Length: 81.6
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 20.8 Intersection LOS: C
Intersection Capacity Utilization 54.2% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 14: California Avenue & New York Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	0	382	0	0	0	212	55	0	0	535	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	12	14	12	11	12	12	12	14	12
Storage Length (ft)	0		220	0		0	120		0	0		0
Storage Lanes	0		1	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1805	1561	0	2027	0	1745	1681	0	0	1848	0
Flt Permitted		0.757					0.177					
Satd. Flow (perm)	0	1438	1561	0	2027	0	325	1681	0	0	1848	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			455								16	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1458			137			639			100	
Travel Time (s)		33.1			3.1			14.5			2.3	
Peak Hour Factor	0.84	0.84	0.84	0.92	0.92	0.92	0.87	0.87	0.87	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	13%	0%	0%	8%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	50	455	0	0	0	244	63	0	0	802	0
Turn Type	Perm	NA	Perm				pm+pt	NA			NA	
Protected Phases		4			4		1	2			2	
Permitted Phases	4		4	4			2			2		
Detector Phase	4	4	4	4	4		1	2		2	2	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0		9.0	21.0		21.0	21.0	
Total Split (s)	30.0	30.0	30.0	30.0	30.0		20.0	55.0		55.0	55.0	
Total Split (%)	24.8%	24.8%	24.8%	24.8%	24.8%		16.5%	45.5%		45.5%	45.5%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0	-1.0		-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)		4.0	4.0		4.0		4.0	4.0			4.0	
Lead/Lag	Lag	Lag	Lag	Lag	Lag		Lead	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	None		None	None	
Act Effct Green (s)		11.4	11.4				64.7	50.8			50.8	
Actuated g/C Ratio		0.13	0.13				0.73	0.58			0.58	
v/c Ratio		0.27	0.76				0.53	0.07			0.75	
Control Delay		38.4	12.7				9.9	10.5			21.1	
Queue Delay		0.0	0.0				0.0	0.0			0.0	
Total Delay		38.4	12.7				9.9	10.5			21.1	
LOS		D	B				A	B			C	
Approach Delay		15.2						10.1			21.1	
Approach LOS		B						B			C	
Queue Length 50th (ft)		26	0				24	15			310	
Queue Length 95th (ft)		55	57				91	40			#584	
Internal Link Dist (ft)		1378			57			559			20	
Turn Bay Length (ft)			220				120					
Base Capacity (vph)		427	783				503	979			1083	

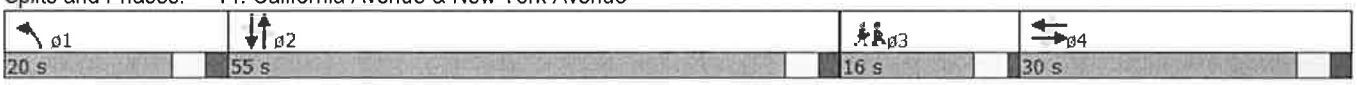
Lane Group	ø3
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	8.0
Total Split (s)	16.0
Total Split (%)	13%
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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		0.12	0.58				0.49	0.06			0.74	

Intersection Summary

Area Type: Other
Cycle Length: 121
Actuated Cycle Length: 88.2
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 17.2 Intersection LOS: B
Intersection Capacity Utilization 68.9% 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: 14: California Avenue & New York Avenue



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	40	56	480	265	179	549
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	13	12	11	11
Storage Length (ft)	0	100		0	125	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25				25	
Satd. Flow (prot)	1745	1531	1851	0	1745	1818
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1745	1531	1851	0	1745	1818
Link Speed (mph)	30		30			30
Link Distance (ft)	1458		331			171
Travel Time (s)	33.1		7.5			3.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	1%	1%	0%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	43	61	810	0	195	597
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 64.7% ICU Level of Service C
Analysis Period (min) 15

Intersection	
Int Delay, s/veh	3.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	40	56	480	265	179	549
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	100	-	-	125	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	2	1	1	0	1
Mvmt Flow	43	61	522	288	195	597

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1652	666	0	0	810	0
Stage 1	666	-	-	-	-	-
Stage 2	986	-	-	-	-	-
Critical Hdwy	6.4	6.22	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	-	-	2.2	-
Pot Cap-1 Maneuver	110	459	-	-	825	-
Stage 1	515	-	-	-	-	-
Stage 2	364	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	84	459	-	-	825	-
Mov Cap-2 Maneuver	84	-	-	-	-	-
Stage 1	515	-	-	-	-	-
Stage 2	278	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	44.3	0	2.6
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	84	459	825	-
HCM Lane V/C Ratio	-	-	0.518	0.133	0.236	-
HCM Control Delay (s)	-	-	86.8	14	10.7	-
HCM Lane LOS	-	-	F	B	B	-
HCM 95th %tile Q(veh)	-	-	2.2	0.5	0.9	-

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	285	250	502	84	79	560
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	13	12	11	11
Storage Length (ft)	0	100		0	125	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25				25	
Satd. Flow (prot)	1728	1561	1891	0	1711	1837
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1728	1561	1891	0	1711	1837
Link Speed (mph)	30		30			30
Link Distance (ft)	1458		331			171
Travel Time (s)	33.1		7.5			3.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.97	0.97
Heavy Vehicles (%)	1%	0%	1%	7%	2%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	310	272	637	0	81	577
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 61.7% ICU Level of Service B
Analysis Period (min) 15

Intersection	
Int Delay, s/veh	88.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	285	250	502	84	79	560
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	100	-	-	125	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	97	97
Heavy Vehicles, %	1	0	1	7	2	0
Mvmt Flow	310	272	546	91	81	577

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1331	591	0	0	637	0
Stage 1	591	-	-	-	-	-
Stage 2	740	-	-	-	-	-
Critical Hdwy	6.41	6.2	-	-	4.12	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.3	-	-	2.218	-
Pot Cap-1 Maneuver	~ 171	511	-	-	947	-
Stage 1	555	-	-	-	-	-
Stage 2	474	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 156	511	-	-	947	-
Mov Cap-2 Maneuver	~ 156	-	-	-	-	-
Stage 1	555	-	-	-	-	-
Stage 2	433	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	283.1	0	1.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	156	511	947	-
HCM Lane V/C Ratio	-	-	1.986	0.532	0.086	-
HCM Control Delay (s)	-	-	$ 514.1	19.8	9.2	-
HCM Lane LOS	-	-	F	C	A	-
HCM 95th %tile Q(veh)	-	-	24.1	3.1	0.3	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

2016 Build-Out with Improvements Intersection Capacity Analysis

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	69	2608	66	82	2211	70	70	79	11	268	119	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	12	10	10	12	10	11	10	12	12	12
Storage Length (ft)	250		0	250		0	75		75	0		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1604	4727	0	1668	4756	0	1636	1766	1383	1787	1684	0
Flt Permitted	0.950			0.950			0.222			0.700		
Satd. Flow (perm)	1604	4727	0	1668	4756	0	382	1766	1383	1317	1684	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			3				102		64	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		389			936			444			493	
Travel Time (s)		8.8			21.3			10.1			11.2	
Peak Hour Factor	0.99	0.99	0.99	0.96	0.96	0.96	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	5%	2%	2%	1%	1%	10%	3%	4%	9%	1%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	70	2701	0	85	2376	0	75	85	12	288	396	0
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8		8	4		
Detector Phase	1	6		5	2		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	9.5	22.5		9.5	23.5		22.5	22.5	22.5	22.5	22.5	
Total Split (s)	17.0	64.0		13.0	60.0		37.0	37.0	37.0	37.0	37.0	
Total Split (%)	11.3%	42.7%		8.7%	40.0%		24.7%	24.7%	24.7%	24.7%	24.7%	
Yellow Time (s)	3.0	4.5		3.0	4.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	2.5	2.0		2.5	3.0		3.0	3.0	3.0	3.0	3.0	
Lost Time Adjust (s)	-1.5	-2.5		-1.5	-2.5		-2.5	-2.5	-2.5	0.0	-2.5	
Total Lost Time (s)	4.0	4.0		4.0	5.0		4.0	4.0	4.0	6.5	4.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Min		None	Min		None	None	None	None	None	
Act Effct Green (s)	11.2	60.0		9.0	59.2		33.0	33.0	33.0	30.5	33.0	
Actuated g/C Ratio	0.10	0.53		0.08	0.52		0.29	0.29	0.29	0.27	0.29	
v/c Ratio	0.45	1.09		0.65	0.96		0.68	0.17	0.03	0.82	0.74	
Control Delay	57.2	73.3		74.1	38.8		68.3	31.4	0.1	59.0	40.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	57.2	73.3		74.1	38.8		68.3	31.4	0.1	59.0	40.3	
LOS	E	E		E	D		E	C	A	E	D	
Approach Delay		72.9			40.0			45.3			48.2	
Approach LOS		E			D			D			D	
Queue Length 50th (ft)	49	~817		62	~638		49	46	0	198	223	
Queue Length 95th (ft)	95	#909		#133	#783		#130	87	0	#344	342	
Internal Link Dist (ft)		309			856			364			413	
Turn Bay Length (ft)	250			250			75		75			
Base Capacity (vph)	182	2489		131	2472		110	511	472	352	532	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	8.0
Total Split (s)	36.0
Total Split (%)	24%
Yellow Time (s)	3.5
All-Red Time (s)	0.5
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.38	1.09		0.65	0.96		0.68	0.17	0.03	0.82	0.74	

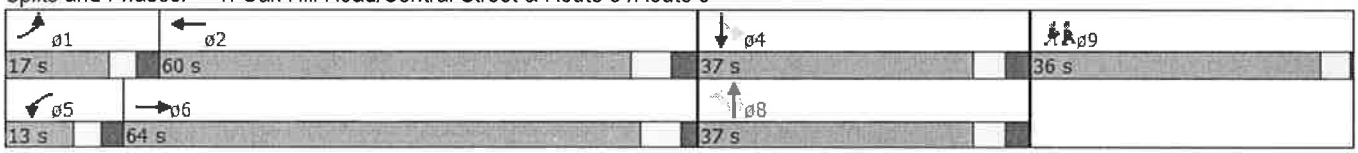
Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 114
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.09
Intersection Signal Delay: 56.0 Intersection LOS: E
Intersection Capacity Utilization 95.2% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 1: Oak Hill Road/Central Street & Route 9 /Route 9



2016 Built-Out Wkdy PM Peak Hour Analysis W/Improvements
1: Oak Hill Road/Central Street & Route 9 /Route 9

10/13/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	206	2494	135	179	2370	162	83	115	18	176	175	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	12	10	10	12	10	11	10	12	12	12
Storage Length (ft)	250		0	250		0	75		75	0		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1685	4757	0	1685	4748	0	1685	1837	1507	1770	1803	0
Flt Permitted	0.950			0.950			0.342			0.600		
Satd. Flow (perm)	1685	4757	0	1685	4748	0	606	1837	1507	1118	1803	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			8				102		10	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		389			936			444			493	
Travel Time (s)		8.8			21.3			10.1			11.2	
Peak Hour Factor	0.92	0.92	0.92	0.94	0.94	0.94	0.93	0.93	0.93	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	2%	1%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	224	2858	0	190	2693	0	89	124	19	191	256	0
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8		8	4		
Detector Phase	1	6		5	2		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	9.5	22.5		9.5	23.5		22.5	22.5	22.5	22.5	22.5	
Total Split (s)	21.0	66.0		19.0	64.0		29.0	29.0	29.0	29.0	29.0	
Total Split (%)	14.0%	44.0%		12.7%	42.7%		19.3%	19.3%	19.3%	19.3%	19.3%	
Yellow Time (s)	3.0	4.5		3.0	4.5		3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	2.5	2.0		2.5	3.0		3.0	3.0	3.0	3.0	3.0	
Lost Time Adjust (s)	-1.5	-2.5		-1.5	-2.5		-2.5	-2.5	-2.5	0.0	-2.5	
Total Lost Time (s)	4.0	4.0		4.0	5.0		4.0	4.0	4.0	6.5	4.0	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Min		None	Min		None	None	None	None	None	
Act Effct Green (s)	17.0	62.0		15.0	59.0		25.0	25.0	25.0	22.5	25.0	
Actuated g/C Ratio	0.15	0.54		0.13	0.52		0.22	0.22	0.22	0.20	0.22	
v/c Ratio	0.89	1.10		0.86	1.09		0.67	0.31	0.05	0.87	0.64	
Control Delay	83.2	79.5		82.2	77.3		67.2	39.8	0.2	79.8	46.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	83.2	79.5		82.2	77.3		67.2	39.8	0.2	79.8	46.8	
LOS	F	E		F	E		E	D	A	E	D	
Approach Delay		79.8			77.7			47.1			60.9	
Approach LOS		E			E			D			E	
Queue Length 50th (ft)	163	~876		138	~820		60	77	0	137	165	
Queue Length 95th (ft)	#306	#967		#266	#912		#140	132	0	#270	255	
Internal Link Dist (ft)		309			856			364			413	
Turn Bay Length (ft)	250			250			75		75			
Base Capacity (vph)	251	2590		221	2461		132	402	410	220	403	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	8.0
Total Split (s)	36.0
Total Split (%)	24%
Yellow Time (s)	3.5
All-Red Time (s)	0.5
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	
Reduced v/c Ratio	0.89	1.10		0.86	1.09		0.67	0.31	0.05	0.87	0.64	

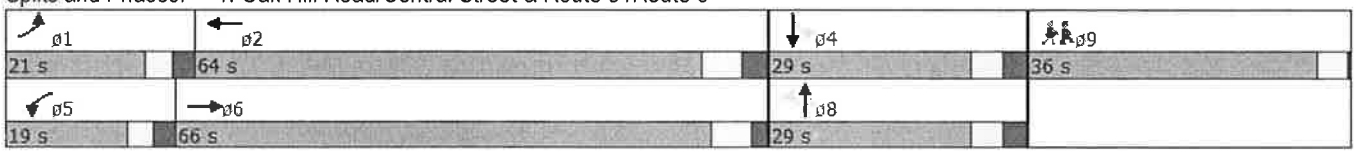
Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 114
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.10
Intersection Signal Delay: 76.4 Intersection LOS: E
Intersection Capacity Utilization 92.9% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 1: Oak Hill Road/Central Street & Route 9 /Route 9



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	640	725	97	76	327	163	8	1	8	13	139	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		0	125		0		0		0	150	
Storage Lanes	2		0	0		0		0		0	0	
Taper Length (ft)	25			25				25			25	
Satd. Flow (prot)	3502	1866	0	0	3406	0	0	0	1703	0	0	1859
Flt Permitted	0.950				0.615				0.790			0.863
Satd. Flow (perm)	3502	1866	0	0	2110	0	0	0	1366	0	0	1634
Right Turn on Red			Yes							Yes		
Satd. Flow (RTOR)		10							16			
Link Speed (mph)		30			30				30			30
Link Distance (ft)		135			625				135			331
Travel Time (s)		3.1			14.2				3.1			7.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.83	0.83	0.83	0.83	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	1%	1%	0%	13%	0%	0%	0%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	696	893	0	0	615	0	0	0	37	0	0	411
Turn Type	Prot	NA		Perm	NA		Perm	Perm	NA		Perm	NA
Protected Phases	5	2			6				4			4
Permitted Phases				6			4	4			4	
Detector Phase	5	2		6	6		4	4	4		4	4
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	9.0	21.0		21.0	21.0		21.0	21.0	21.0		21.0	21.0
Total Split (s)	25.0	59.0		34.0	34.0		34.0	34.0	34.0		34.0	34.0
Total Split (%)	23.8%	56.2%		32.4%	32.4%		32.4%	32.4%	32.4%		32.4%	32.4%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	-1.0	-1.0			-1.0				-1.0			-1.0
Total Lost Time (s)	4.0	4.0			4.0				4.0			4.0
Lead/Lag	Lead			Lag	Lag		Lag	Lag	Lag		Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None		None	None		None	None	None		None	None
Act Effct Green (s)	21.2	55.4			30.2				27.8			27.8
Actuated g/C Ratio	0.22	0.58			0.32				0.29			0.29
v/c Ratio	0.90	0.82			0.92				0.09			0.87
Control Delay	53.6	26.1			54.5				18.4			52.8
Queue Delay	0.0	0.0			0.0				0.0			16.0
Total Delay	53.6	26.1			54.5				18.4			68.8
LOS	D	C			D				B			E
Approach Delay		38.1			54.5				18.4			45.7
Approach LOS		D			D				B			D
Queue Length 50th (ft)	205	375			181				8			217
Queue Length 95th (ft)	#365	#801			#345				32			#437
Internal Link Dist (ft)		55			545				55			251
Turn Bay Length (ft)	350											
Base Capacity (vph)	775	1085			666				442			516
Starvation Cap Reductn	0	0			0				0			97

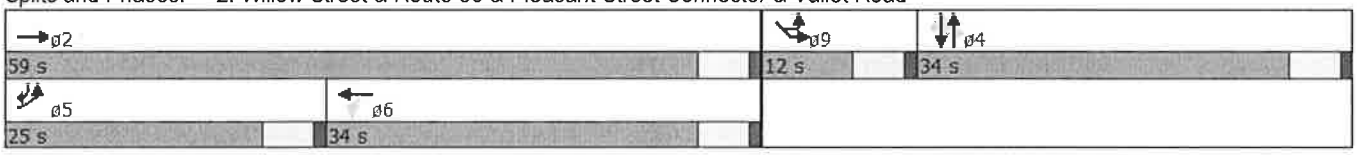
Lane Group	SBR	SBR2	SEL2	SEL
Lane Configurations				
Volume (vph)	248	4	5	8
Ideal Flow (vphpl)	1900	1900	1900	1900
Storage Length (ft)	0			0
Storage Lanes	1			1
Taper Length (ft)				25
Satd. Flow (prot)	1609	0	0	1805
Flt Permitted				0.950
Satd. Flow (perm)	1609	0	0	1805
Right Turn on Red		Yes		
Satd. Flow (RTOR)	73			
Link Speed (mph)				30
Link Distance (ft)				153
Travel Time (s)				3.5
Peak Hour Factor	0.92	0.92	0.67	0.67
Heavy Vehicles (%)	0%	25%	0%	0%
Shared Lane Traffic (%)				
Lane Group Flow (vph)	274	0	0	19
Turn Type	pm+ov		Prot	Prot
Protected Phases	5		9	9
Permitted Phases	4			
Detector Phase	5		9	9
Switch Phase				
Minimum Initial (s)	4.0		4.0	4.0
Minimum Split (s)	9.0		13.0	13.0
Total Split (s)	25.0		12.0	12.0
Total Split (%)	23.8%		11.4%	11.4%
Yellow Time (s)	4.0		4.0	4.0
All-Red Time (s)	1.0		1.0	1.0
Lost Time Adjust (s)	-1.0			-1.0
Total Lost Time (s)	4.0			4.0
Lead/Lag	Lead		Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes
Recall Mode	None		None	None
Act Effct Green (s)	52.9			7.3
Actuated g/C Ratio	0.55			0.08
v/c Ratio	0.30			0.14
Control Delay	9.8			46.6
Queue Delay	1.2			0.0
Total Delay	11.0			46.6
LOS	B			D
Approach Delay				46.6
Approach LOS				D
Queue Length 50th (ft)	51			11
Queue Length 95th (ft)	124			27
Internal Link Dist (ft)				73
Turn Bay Length (ft)				
Base Capacity (vph)	923			152
Starvation Cap Reductn	437			0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL	SBT
Spillback Cap Reductn	0	0			0				0			0
Storage Cap Reductn	0	0			0				0			0
Reduced v/c Ratio	0.90	0.82			0.92				0.08			0.98

Intersection Summary

Area Type: Other
Cycle Length: 105
Actuated Cycle Length: 95.6
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 43.1 Intersection LOS: D
Intersection Capacity Utilization 104.1% ICU Level of Service G
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Willow Street & Route 30 & Pleasant Street Connector & Vallet Road



Lane Group	SBR	SBR2	SEL2	SEL
Spillback Cap Reductn	0			0
Storage Cap Reductn	0			0
Reduced v/c Ratio	0.56			0.13

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	422	573	14	20	701	250	24	27	25	114	139	540
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		0	125		0			0	150		0
Storage Lanes	2		0	0		0			0	0		1
Taper Length (ft)	25			25						25		
Satd. Flow (prot)	3502	1892	0	0	3432	0	0	1741	0	0	1858	1615
Flt Permitted	0.950				0.934			0.673			0.775	
Satd. Flow (perm)	3502	1892	0	0	3209	0	0	1190	0	0	1472	1615
Right Turn on Red			Yes						Yes			
Satd. Flow (RTOR)		2						21				73
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		135			625			135			331	
Travel Time (s)		3.1			14.2			3.1			7.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.63	0.63	0.63	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	1%	1%	0%	0%	8%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	459	638	0	0	1056	0	0	121	0	0	275	589
Turn Type	Prot	NA		Perm	NA		Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2			6			4			4	5
Permitted Phases				6			4			4		4
Detector Phase	5	2		6	6		4	4		4	4	5
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	9.0	21.0		21.0	21.0		21.0	21.0		21.0	21.0	9.0
Total Split (s)	22.0	61.0		39.0	39.0		25.0	25.0		25.0	25.0	22.0
Total Split (%)	21.0%	58.1%		37.1%	37.1%		23.8%	23.8%		23.8%	23.8%	21.0%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	-1.0	-1.0			-1.0			-1.0			-1.0	-1.0
Total Lost Time (s)	4.0	4.0			4.0			4.0			4.0	4.0
Lead/Lag	Lead			Lag	Lag		Lag	Lag		Lag	Lag	Lead
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes	Yes	Yes
Recall Mode	None	None		None	None		None	None		None	None	None
Act Effct Green (s)	16.8	56.1			35.2			21.1			21.1	41.9
Actuated g/C Ratio	0.19	0.62			0.39			0.23			0.23	0.47
v/c Ratio	0.70	0.54			0.84			0.41			0.80	0.74
Control Delay	41.4	12.7			33.6			30.8			52.8	25.1
Queue Delay	0.0	0.0			0.0			0.0			0.0	17.4
Total Delay	41.4	12.7			33.6			30.8			52.8	42.5
LOS	D	B			C			C			D	D
Approach Delay		24.7			33.6			30.8			45.8	
Approach LOS		C			C			C			D	
Queue Length 50th (ft)	117	154			258			45			139	204
Queue Length 95th (ft)	196	346			#468			70			#316	#437
Internal Link Dist (ft)		55			545			55			251	
Turn Bay Length (ft)	350											
Base Capacity (vph)	706	1210			1259			296			346	815
Starvation Cap Reductn	0	0			0			0			0	223

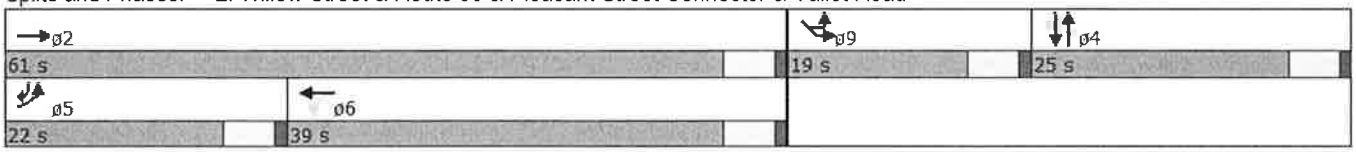
Lane Group	SBR2	SEL2	SEL
Lane Configurations			
Volume (vph)	2	6	4
Ideal Flow (vphpl)	1900	1900	1900
Storage Length (ft)			0
Storage Lanes			1
Taper Length (ft)			25
Satd. Flow (prot)	0	0	1805
Flt Permitted			0.950
Satd. Flow (perm)	0	0	1805
Right Turn on Red	Yes		
Satd. Flow (RTOR)			
Link Speed (mph)			30
Link Distance (ft)			153
Travel Time (s)			3.5
Peak Hour Factor	0.92	0.55	0.55
Heavy Vehicles (%)	0%	0%	0%
Shared Lane Traffic (%)			
Lane Group Flow (vph)	0	0	18
Turn Type		Prot	Prot
Protected Phases		9	9
Permitted Phases			
Detector Phase		9	9
Switch Phase			
Minimum Initial (s)		4.0	4.0
Minimum Split (s)		21.0	21.0
Total Split (s)		19.0	19.0
Total Split (%)		18.1%	18.1%
Yellow Time (s)		4.0	4.0
All-Red Time (s)		1.0	1.0
Lost Time Adjust (s)			-1.0
Total Lost Time (s)			4.0
Lead/Lag		Lead	Lead
Lead-Lag Optimize?		Yes	Yes
Recall Mode		None	None
Act Effct Green (s)			7.5
Actuated g/C Ratio			0.08
v/c Ratio			0.12
Control Delay			42.5
Queue Delay			0.0
Total Delay			42.5
LOS			D
Approach Delay			42.5
Approach LOS			D
Queue Length 50th (ft)			9
Queue Length 95th (ft)			20
Internal Link Dist (ft)			73
Turn Bay Length (ft)			
Base Capacity (vph)			303
Starvation Cap Reductn			0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn	0	0			0			0			0	0
Storage Cap Reductn	0	0			0			0			0	0
Reduced v/c Ratio	0.65	0.53			0.84			0.41			0.79	0.99

Intersection Summary

Area Type: Other
Cycle Length: 105
Actuated Cycle Length: 89.8
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 33.8 Intersection LOS: C
Intersection Capacity Utilization 96.9% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Willow Street & Route 30 & Pleasant Street Connector & Vallet Road



Lane Group	SBR2	SEL2	SEL
Spillback Cap Reductn			0
Storage Cap Reductn			0
Reduced v/c Ratio			0.06

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	14	867	21	292	1	168	0	50	0	2	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	11	12	12	12	12	12	12	12	12
Satd. Flow (prot)	0	1667	1546	1745	1881	0	0	1787	1615	0	1900	0
Flt Permitted				0.747				0.755				
Satd. Flow (perm)	0	1667	1546	1372	1881	0	0	1420	1615	0	1900	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			1020						55			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		625			62			440			83	
Travel Time (s)		14.2			1.4			10.0			1.9	
Peak Hour Factor	0.85	0.85	0.85	0.89	0.89	0.89	0.91	0.91	0.91	0.50	0.50	0.50
Heavy Vehicles (%)	0%	14%	1%	0%	1%	0%	1%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	16	1020	24	329	0	0	185	55	0	4	0
Turn Type		NA	Perm	Perm	NA		Perm	NA	Perm		NA	
Protected Phases		1 2			1 2			3			3	
Permitted Phases	1		1 2	1 2			3		3	3		
Detector Phase	1	1 2	1 2	1 2	1 2		3	3	3	3	3	
Switch Phase												
Minimum Initial (s)	4.0						4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	20.0						20.0	20.0	20.0	20.0	20.0	
Total Split (s)	37.0						32.0	32.0	32.0	32.0	32.0	
Total Split (%)	36.3%						31.4%	31.4%	31.4%	31.4%	31.4%	
Yellow Time (s)	3.0						3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0						1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)								0.0	0.0		0.0	
Total Lost Time (s)								4.0	4.0		4.0	
Lead/Lag	Lead											
Lead-Lag Optimize?	Yes											
Recall Mode	None						None	None	None	None	None	
Act Effct Green (s)		57.3	57.3	57.3	57.3			21.1	21.1		21.1	
Actuated g/C Ratio		0.66	0.66	0.66	0.66			0.24	0.24		0.24	
v/c Ratio		0.01	0.75	0.03	0.26			0.54	0.13		0.01	
Control Delay		6.4	4.5	6.4	7.4			27.9	5.7		27.0	
Queue Delay		0.0	0.2	0.0	0.0			0.0	0.0		0.0	
Total Delay		6.4	4.7	6.4	7.4			27.9	5.7		27.0	
LOS		A	A	A	A			C	A		C	
Approach Delay		4.7			7.4			22.8			27.0	
Approach LOS		A			A			C			C	
Queue Length 50th (ft)		3	0	4	72			46	1		2	
Queue Length 95th (ft)		10	25	14	123			78	9		6	
Internal Link Dist (ft)		545			1			360			3	
Turn Bay Length (ft)												
Base Capacity (vph)		1118	1373	920	1262			475	577		636	
Starvation Cap Reductn		0	52	0	0			0	0		0	
Spillback Cap Reductn		0	14	13	0			0	0		0	
Storage Cap Reductn		0	0	0	0			0	0		0	

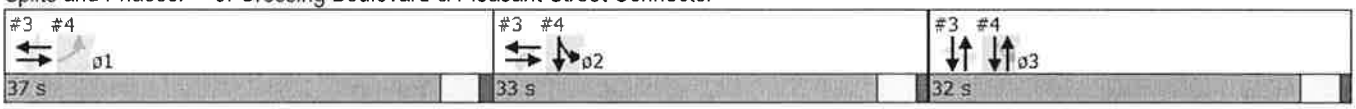
Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	20.0
Total Split (s)	33.0
Total Split (%)	32%
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
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	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.01	0.77	0.03	0.26			0.39	0.10		0.01	

Intersection Summary

Area Type: Other
Cycle Length: 102
Actuated Cycle Length: 86.7
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 8.0 Intersection LOS: A
Intersection Capacity Utilization 82.4% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: Crossing Boulevard & Pleasant Street Connector



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	22	650	58	333	0	640	0	850	1	2	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	11	12	12	12	12	12	12	12	12
Satd. Flow (prot)	0	1900	1546	1711	1863	0	0	1805	1615	0	1866	0
Flt Permitted				0.741				0.752			0.900	
Satd. Flow (perm)	0	1900	1546	1334	1863	0	0	1429	1615	0	1710	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			747						924			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		625			62			440			83	
Travel Time (s)		14.2			1.4			10.0			1.9	
Peak Hour Factor	0.87	0.87	0.87	0.76	0.76	0.76	0.92	0.92	0.92	0.38	0.38	0.38
Heavy Vehicles (%)	0%	0%	1%	2%	2%	0%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	25	747	76	438	0	0	696	924	0	8	0
Turn Type		NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		1 2			1 2			3			3	
Permitted Phases	1		1 2	1 2			3		3	3		
Detector Phase	1	1 2	1 2	1 2	1 2		3	3	3	3	3	
Switch Phase												
Minimum Initial (s)	4.0						4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	20.0						20.0	20.0	20.0	20.0	20.0	
Total Split (s)	16.0						52.0	52.0	52.0	52.0	52.0	
Total Split (%)	15.7%						51.0%	51.0%	51.0%	51.0%	51.0%	
Yellow Time (s)	3.0						3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0						1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)								0.0	0.0		0.0	
Total Lost Time (s)								4.0	4.0		4.0	
Lead/Lag	Lead											
Lead-Lag Optimize?	Yes											
Recall Mode	None						None	None	None	None	None	
Act Effct Green (s)		46.0	46.0	46.0	46.0			48.0	48.0		48.0	
Actuated g/C Ratio		0.45	0.45	0.45	0.45			0.47	0.47		0.47	
v/c Ratio		0.03	0.67	0.13	0.52			1.04	0.74		0.01	
Control Delay		15.8	4.8	17.1	22.9			49.6	10.5		14.3	
Queue Delay		0.0	0.5	0.1	0.0			0.0	8.9		0.0	
Total Delay		15.8	5.3	17.1	22.9			49.6	19.5		14.3	
LOS		B	A	B	C			D	B		B	
Approach Delay		5.6			22.1			32.4			14.3	
Approach LOS		A			C			C			B	
Queue Length 50th (ft)		9	0	28	199			~108	154		3	
Queue Length 95th (ft)		23	51	47	230			m#616	m284		5	
Internal Link Dist (ft)		545			1			360			3	
Turn Bay Length (ft)												
Base Capacity (vph)		856	1107	601	840			672	1249		804	
Starvation Cap Reductn		0	0	0	0			0	295		0	
Spillback Cap Reductn		0	91	78	0			0	0		0	
Storage Cap Reductn		0	0	0	0			0	0		0	

Lane Group	ø2
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	20.0
Total Split (s)	34.0
Total Split (%)	33%
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
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	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.03	0.74	0.15	0.52			1.04	0.97		0.01	

Intersection Summary

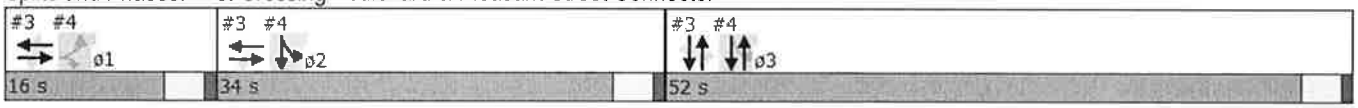
Area Type: Other
Cycle Length: 102
Actuated Cycle Length: 102
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.04
Intersection Signal Delay: 23.4 Intersection LOS: C
Intersection Capacity Utilization 71.1% ICU Level of Service C
Analysis Period (min) 15

~ 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: 3: Crossing Boulevard & Pleasant Street Connector



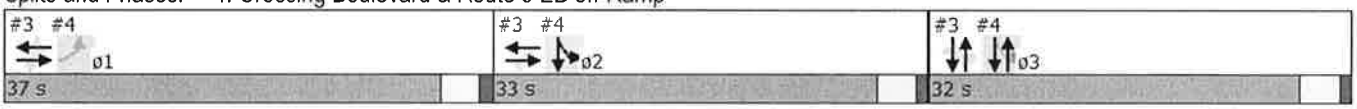
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	151	0	859	0	0	0	0	258	88	370	520	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	16	12	12	12	12	12	12	12	12	12
Satd. Flow (prot)	1787	0	1830	0	0	0	0	3539	1615	1787	1900	0
Flt Permitted	0.950									0.455		
Satd. Flow (perm)	1787	0	1830	0	0	0	0	3539	1615	856	1900	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			597						119			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		347			261			206			440	
Travel Time (s)		7.9			5.9			4.7			10.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.74	0.74	0.74	0.90	0.90	0.90
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	2%	0%	1%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	164	0	934	0	0	0	0	349	119	411	578	0
Turn Type	Perm		Free					NA	Perm	D.P+P	NA	
Protected Phases								3		2	2 3	
Permitted Phases	1		Free						3	3		
Detector Phase	1							3	3	2	2 3	
Switch Phase												
Minimum Initial (s)	4.0							4.0	4.0	4.0		
Minimum Split (s)	20.0							20.0	20.0	20.0		
Total Split (s)	37.0							32.0	32.0	33.0		
Total Split (%)	36.3%							31.4%	31.4%	32.4%		
Yellow Time (s)	3.0							3.0	3.0	3.0		
All-Red Time (s)	1.0							1.0	1.0	1.0		
Lost Time Adjust (s)	0.0							0.0	0.0	0.0		
Total Lost Time (s)	4.0							4.0	4.0	4.0		
Lead/Lag	Lead									Lag		
Lead-Lag Optimize?	Yes									Yes		
Recall Mode	None							None	None	None		
Act Effct Green (s)	24.0		86.7					21.1	21.1	50.3	54.4	
Actuated g/C Ratio	0.28		1.00					0.24	0.24	0.58	0.63	
v/c Ratio	0.33		0.51					0.41	0.25	0.51	0.48	
Control Delay	27.6		1.0					29.6	7.0	11.3	11.6	
Queue Delay	0.0		0.0					0.0	0.0	0.0	0.6	
Total Delay	27.6		1.0					29.6	7.0	11.3	12.1	
LOS	C		A					C	A	B	B	
Approach Delay								23.9			11.8	
Approach LOS								C			B	
Queue Length 50th (ft)	74		0					85	0	103	160	
Queue Length 95th (ft)	133		0					110	23	218	329	
Internal Link Dist (ft)		267			181			126			360	
Turn Bay Length (ft)												
Base Capacity (vph)	705		1830					1184	619	828	1361	
Starvation Cap Reductn	0		0					0	0	9	401	
Spillback Cap Reductn	0		0					0	0	0	0	
Storage Cap Reductn	0		0					0	0	0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.23		0.51					0.29	0.19	0.50	0.60	

Intersection Summary

Area Type: Other
Cycle Length: 102
Actuated Cycle Length: 86.7
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 11.1 Intersection LOS: B
Intersection Capacity Utilization 46.0% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 4: Crossing Boulevard & Route 9 EB off-Ramp



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	119	0	123	0	0	0	0	1371	318	567	143	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	16	12	12	12	12	12	12	12	12	12
Satd. Flow (prot)	1787	0	1830	0	0	0	0	3610	1568	1787	1810	0
Flt Permitted	0.950									0.083		
Satd. Flow (perm)	1787	0	1830	0	0	0	0	3610	1568	156	1810	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			162						324			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		347			261			206			440	
Travel Time (s)		7.9			5.9			4.7			10.0	
Peak Hour Factor	0.76	0.76	0.76	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	0%	3%	1%	5%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	157	0	162	0	0	0	0	1490	346	616	155	0
Turn Type	Perm		Perm					NA	Perm	D.P+P	NA	
Protected Phases								3		2	2 3	
Permitted Phases	1		1						3	3		
Detector Phase	1		1					3	3	2	2 3	
Switch Phase												
Minimum Initial (s)	4.0		4.0					4.0	4.0	4.0		
Minimum Split (s)	20.0		20.0					20.0	20.0	20.0		
Total Split (s)	16.0		16.0					52.0	52.0	34.0		
Total Split (%)	15.7%		15.7%					51.0%	51.0%	33.3%		
Yellow Time (s)	3.0		3.0					3.0	3.0	3.0		
All-Red Time (s)	1.0		1.0					1.0	1.0	1.0		
Lost Time Adjust (s)	0.0		0.0					0.0	0.0	0.0		
Total Lost Time (s)	4.0		4.0					4.0	4.0	4.0		
Lead/Lag	Lead		Lead							Lag		
Lead-Lag Optimize?	Yes		Yes							Yes		
Recall Mode	None		None					None	None	None		
Act Effct Green (s)	12.0		12.0					48.0	48.0	78.0	82.0	
Actuated g/C Ratio	0.12		0.12					0.47	0.47	0.76	0.80	
v/c Ratio	0.75		0.45					0.88	0.38	1.03	0.11	
Control Delay	66.1		11.1					31.7	3.7	67.5	2.4	
Queue Delay	4.3		0.0					1.0	0.0	3.3	0.0	
Total Delay	70.3		11.1					32.7	3.7	70.9	2.4	
LOS	E		B					C	A	E	A	
Approach Delay								27.2			57.1	
Approach LOS								C			E	
Queue Length 50th (ft)	100		0					445	7	~381	18	
Queue Length 95th (ft)	#142		33					551	56	#599	m23	
Internal Link Dist (ft)		267			181			126			360	
Turn Bay Length (ft)												
Base Capacity (vph)	210		358					1698	909	599	1455	
Starvation Cap Reductn	0		0					0	0	6	0	
Spillback Cap Reductn	19		0					66	0	0	0	
Storage Cap Reductn	0		0					0	0	0	0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.82		0.45					0.91	0.38	1.04	0.11	

Intersection Summary

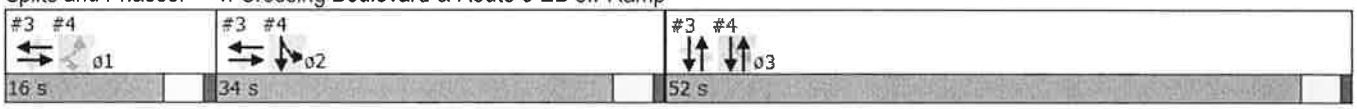
Area Type: Other
Cycle Length: 102
Actuated Cycle Length: 102
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.04
Intersection Signal Delay: 36.5 Intersection LOS: D
Intersection Capacity Utilization 85.9% ICU Level of Service E
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

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

Splits and Phases: 4: Crossing Boulevard & Route 9 EB off-Ramp



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	64	65	132	718	765	759
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12
Satd. Flow (prot)	3385	2748	1900	1615	1715	1780
Flt Permitted	0.950				0.950	0.995
Satd. Flow (perm)	3385	2748	1900	1615	1715	1780
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		71		115		
Link Speed (mph)	30		30			30
Link Distance (ft)	183		120			130
Travel Time (s)	4.2		2.7			3.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%
Shared Lane Traffic (%)					10%	
Lane Group Flow (vph)	70	71	143	780	749	908
Turn Type	Prot	pm+ov	NA	pt+ov	Split	NA
Protected Phases	1	5	6	1 6	5	5
Permitted Phases		1				
Detector Phase	1	5	6	1 6	5	5
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	15.0	21.0	21.0		21.0	21.0
Total Split (s)	19.0	48.0	23.0		48.0	48.0
Total Split (%)	21.1%	53.3%	25.6%		53.3%	53.3%
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0		4.0	4.0
Lead/Lag		Lead	Lag		Lead	Lead
Lead-Lag Optimize?		Yes	Yes		Yes	Yes
Recall Mode	None	None	None		None	None
Act Effct Green (s)	15.0	63.0	19.0	38.0	44.0	44.0
Actuated g/C Ratio	0.17	0.70	0.21	0.42	0.49	0.49
v/c Ratio	0.12	0.04	0.36	1.04	0.89	1.04
Control Delay	32.6	1.2	33.3	68.5	36.3	67.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.6	1.2	33.3	68.5	36.3	67.3
LOS	C	A	C	E	D	E
Approach Delay	16.8		63.1			53.3
Approach LOS	B		E			D
Queue Length 50th (ft)	17	0	70	~444	389	~594
Queue Length 95th (ft)	36	6	124	#669	#644	#836
Internal Link Dist (ft)	103		40			50
Turn Bay Length (ft)						
Base Capacity (vph)	564	1944	401	748	838	870
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

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Reduced v/c Ratio	0.12	0.04	0.36	1.04	0.89	1.04

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.04
Intersection Signal Delay: 54.7 **Intersection LOS: D**
Intersection Capacity Utilization 92.3% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 5: Crossing Boulevard & Staples Drive

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	700	816	418	70	108	251
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	12	12
Satd. Flow (prot)	3385	2748	1900	1615	1649	1798
Flt Permitted	0.950				0.950	0.998
Satd. Flow (perm)	3385	2748	1900	1615	1649	1798
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		887		76		
Link Speed (mph)	30		30			30
Link Distance (ft)	183		120			130
Travel Time (s)	4.2		2.7			3.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%
Shared Lane Traffic (%)					10%	
Lane Group Flow (vph)	761	887	454	76	105	285
Turn Type	Prot	Perm	NA	pt+ov	Split	NA
Protected Phases	1		6	1 6	5	5
Permitted Phases		1				
Detector Phase	1	1	6	1 6	5	5
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	15.0	15.0	21.0		21.0	21.0
Total Split (s)	30.0	30.0	35.0		25.0	25.0
Total Split (%)	33.3%	33.3%	38.9%		27.8%	27.8%
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0		-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0		4.0	4.0
Lead/Lag			Lag		Lead	Lead
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None		None	None
Act Effct Green (s)	23.9	23.9	24.6	52.7	17.5	17.5
Actuated g/C Ratio	0.30	0.30	0.31	0.67	0.22	0.22
v/c Ratio	0.74	0.61	0.76	0.07	0.29	0.71
Control Delay	31.0	3.9	34.3	1.4	30.0	40.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.0	3.9	34.3	1.4	30.0	40.5
LOS	C	A	C	A	C	D
Approach Delay	16.4		29.6			37.7
Approach LOS	B		C			D
Queue Length 50th (ft)	183	0	213	0	48	146
Queue Length 95th (ft)	271	46	329	12	100	248
Internal Link Dist (ft)	103		40			50
Turn Bay Length (ft)						
Base Capacity (vph)	1158	1523	775	1167	455	497
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

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Reduced v/c Ratio	0.66	0.58	0.59	0.07	0.23	0.57

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 78.5
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 22.4 Intersection LOS: C
Intersection Capacity Utilization 65.2% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 5: Crossing Boulevard & Staples Drive

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BG
Agency/Co.:	VAI
Date performed:	8/19/2016
Analysis time period:	Wkdy AM Peak
Freeway/Dir of Travel:	Route 9 EB
Junction:	Crossing Boulevard Off-Ramp
Jurisdiction:	MassDOT
Analysis Year:	2016 Buildout w/Improvements #6
Description:	Framingham Transportation Master Plan

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2545	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	76	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	202	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2545		76		202		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	692		21		55		v
Trucks and buses	0		0		0		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	1.5		1.5		1.5		
Recreational vehicle PCE, ER	1.2		1.2		1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2766	83	220	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.687 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1926 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2766	6750	No
$v_{FO} = v_F - v_R$	2683	6750	No
v_R	83	2000	No
v_3 or v_{av34}	840 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	
Is v_3 or v_{av34} > 1.5 v_{12}/2		No	

If yes, v_{12A} = 1926 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1926	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 18.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	D_S = 0.435	
Space mean speed in ramp influence area,	S_R = 49.3	mph
Space mean speed in outer lanes,	S_O = 60.3	mph
Space mean speed for all vehicles,	S = 52.2	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BG
Agency/Co.:	VAI
Date performed:	8/19/2016
Analysis time period:	Wkdy PM Peak
Freeway/Dir of Travel:	Route 9 EB
Junction:	Crossing Boulevard Off-Ramp
Jurisdiction:	MassDOT
Analysis Year:	2016 Buildout w/Improvements
Description:	Framingham Transportation Master Plan

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	3039	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	16	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1240	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	3039		16		1240		vph
Peak-hour factor, PHF	0.92		0.92		0.92		
Peak 15-min volume, v15	826		4		337		v
Trucks and buses	0		0		0		%
Recreational vehicles	0		0		0		%
Terrain type:	Level		Level		Level		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	1.5		1.5		1.5		
Recreational vehicle PCE, ER	1.2		1.2		1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3303	17	1348	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 0.677 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2240 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3303	6750	No
$v_{FO} = v_F - v_R$	3286	6750	No
v_R	17	2000	No
v_3 or v_{av34}	1063 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34} > 2700 pc/h?		No	
Is v_3 or v_{av34} > 1.5 v_{12}/2		No	

If yes, v_{12A} = 2240 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2240	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 21.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.430	
Space mean speed in ramp influence area,	S_R = 49.4	mph
Space mean speed in outer lanes,	S_O = 60.1	mph
Space mean speed for all vehicles,	S = 52.4	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BG
Agency/Co.:	VAI
Date performed:	8/19/2016
Analysis time period:	Wkdy AM Peak
Freeway/Dir of Travel:	Route 9 EB
Junction:	Crossing Boulevard On-Ramp #10
Jurisdiction:	MassDOT
Analysis Year:	2016 Buildout W/Improvements

Description: Framingham Transportation Master Plan

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2469	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	203	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2469	203		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	671	55		v
Trucks and buses	0	0		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%		%
Length	mi	mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2684	221	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.591 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1588 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2905	6750	No
v_3 or v_{av34}	1096 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 Yes

If yes, v_{12A} = 1588 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1809	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 16.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.310	
Space mean speed in ramp influence area,	S_R = 51.0	mph
Space mean speed in outer lanes,	S_O = 52.9	mph
Space mean speed for all vehicles,	S = 51.7	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BG
Agency/Co.:	VAI
Date performed:	8/19/2016
Analysis time period:	Wkdy PM Peak
Freeway/Dir of Travel:	Route 9 EB
Junction:	Crossing Boulevard On-Ramp
Jurisdiction:	MassDOT
Analysis Year:	2016 Buildout w/Improvements
Description:	Framingham Transportation Master Plan

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	3023	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1240	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3023	1240		vph
Peak-hour factor, PHF	0.92	0.92		
Peak 15-min volume, v15	821	337		v
Trucks and buses	0	0		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%		%
Length	mi	mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	1.000	1.000	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3286	1348	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.591 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1944 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4634	6750	No
v_3 or v_{av34}	1342 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 No

If yes, v_{12A} = 1944 (Equation 13-15, 13-16, 18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3292	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 27.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.391	
Space mean speed in ramp influence area,	S_R = 49.9	mph
Space mean speed in outer lanes,	S_O = 52.0	mph
Space mean speed for all vehicles,	S = 50.5	mph

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	421	2084	108	164	3604	770	81	0	71	197	0	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	13	12	12	12	12	12	12
Storage Length (ft)	400		0	200		250	0		50	150		0
Storage Lanes	2		0	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	3255	6198	0	3502	5085	1620	2918	0	1042	3213	0	1442
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3255	6198	0	3502	5085	1620	2918	0	1042	3213	0	1442
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17				463			22			22
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		658			453			379			639	
Travel Time (s)		15.0			10.3			8.6			14.5	
Peak Hour Factor	0.93	0.93	0.93	0.96	0.96	0.96	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	3%	38%	0%	2%	3%	20%	0%	55%	9%	10%	12%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	453	2357	0	171	3754	802	88	0	77	214	0	127
Turn Type	Prot	NA		Prot	NA	Perm	Prot		pm+ov	Prot		pm+ov
Protected Phases	7	4		3	8		5		3	1		7
Permitted Phases						8			5			1
Detector Phase	7	4		3	8	8	5		3	1		7
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0		4.0
Minimum Split (s)	9.0	22.0		9.0	22.0	22.0	9.0		9.0	9.0		9.0
Total Split (s)	27.0	109.0		22.0	104.0	104.0	17.0		22.0	17.0		27.0
Total Split (%)	18.2%	73.6%		14.9%	70.3%	70.3%	11.5%		14.9%	11.5%		18.2%
Yellow Time (s)	3.0	4.0		3.0	4.0	4.0	3.0		3.0	3.0		3.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0		2.0
Lost Time Adjust (s)	-1.0	-2.0		-1.0	-2.0	-2.0	-1.0		-1.0	-1.0		0.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0		5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag			Lead			Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes			Yes			Yes
Recall Mode	None	Min		None	Min	Min	None		None	None		None
Act Effct Green (s)	22.7	109.3		13.5	100.0	100.0	12.8		30.3	12.8		38.6
Actuated g/C Ratio	0.15	0.74		0.09	0.68	0.68	0.09		0.21	0.09		0.26
v/c Ratio	0.90	0.51		0.53	1.09	0.64	0.35		0.33	0.77		0.32
Control Delay	83.6	8.6		70.0	70.4	7.6	67.6		39.1	84.1		38.7
Queue Delay	0.0	0.3		0.0	4.8	4.0	0.0		0.0	0.0		0.0
Total Delay	83.6	9.0		70.0	75.2	11.6	67.6		39.1	84.1		38.7
LOS	F	A		E	E	B	E		D	F		D
Approach Delay		21.0			64.3							
Approach LOS		C			E							
Queue Length 50th (ft)	224	247		82	~1492	158	41		45	106		81
Queue Length 95th (ft)	#319	297		120	#1545	274	72		94	#163		143
Internal Link Dist (ft)		578			373			299			559	
Turn Bay Length (ft)	400			200		250			50	150		
Base Capacity (vph)	507	4592		426	3445	1246	257		263	283		395

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	1389		0	571	353	0		0	0		0
Spillback Cap Reductn	0	0		0	0	0	0		0	0		0
Storage Cap Reductn	0	0		0	0	0	0		0	0		0
Reduced v/c Ratio	0.89	0.74		0.40	1.31	0.90	0.34		0.29	0.76		0.32

Intersection Summary

Area Type: Other
Cycle Length: 148
Actuated Cycle Length: 147.6
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.09
Intersection Signal Delay: 49.1 Intersection LOS: D
Intersection Capacity Utilization 97.3% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 11: Route 9 & California Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	208	3853	147	185	2544	225	274	0	298	853	0	412
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	13	12	12	12	12	12	12
Storage Length (ft)	400		0	0		250	0		50	150		0
Storage Lanes	2		0	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	2996	6441	0	3502	5136	1605	3242	0	1583	3467	0	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	2996	6441	0	3502	5136	1605	3242	0	1583	3467	0	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9				145			59			22
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		658			453			379			639	
Travel Time (s)		15.0			10.3			8.6			14.5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	13%	1%	0%	0%	1%	4%	8%	0%	2%	1%	36%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	221	4255	0	197	2706	239	298	0	324	927	0	448
Turn Type	Prot	NA		Prot	NA	Perm	Prot		pm+ov	Prot		pm+ov
Protected Phases	7	4		3	8		5		3	1		7
Permitted Phases						8			5			1
Detector Phase	7	4		3	8	8	5		3	1		7
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0		4.0
Minimum Split (s)	9.0	22.0		9.0	22.0	22.0	9.0		9.0	9.0		9.0
Total Split (s)	22.0	93.0		15.0	86.0	86.0	40.0		15.0	40.0		22.0
Total Split (%)	14.9%	62.8%		10.1%	58.1%	58.1%	27.0%		10.1%	27.0%		14.9%
Yellow Time (s)	3.0	4.0		3.0	4.0	4.0	3.0		3.0	3.0		3.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0		2.0
Lost Time Adjust (s)	-1.0	-2.0		-1.0	-2.0	-2.0	-1.0		-1.0	-1.0		0.0
Total Lost Time (s)	4.0	4.0		4.0	4.0	4.0	4.0		4.0	4.0		5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag			Lead			Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes			Yes			Yes
Recall Mode	None	Min		None	Min	Min	None		None	None		None
Act Effct Green (s)	16.2	89.0		11.0	83.8	83.8	36.0		51.0	36.0		55.2
Actuated g/C Ratio	0.11	0.60		0.07	0.57	0.57	0.24		0.34	0.24		0.37
v/c Ratio	0.67	1.10		0.76	0.93	0.25	0.38		0.55	1.10		0.76
Control Delay	73.8	78.0		85.7	36.8	7.0	48.4		35.9	112.9		47.5
Queue Delay	0.0	1.2		0.0	45.4	0.7	0.0		0.0	0.0		0.9
Total Delay	73.8	79.2		85.7	82.2	7.7	48.4		35.9	112.9		48.4
LOS	E	E		F	F	A	D		D	F		D
Approach Delay		78.9			76.7							
Approach LOS		E			E							
Queue Length 50th (ft)	106	~1349		97	862	41	124		208	~521		355
Queue Length 95th (ft)	152	#1379		#154	951	88	170		311	#655		493
Internal Link Dist (ft)		578			373			299			559	
Turn Bay Length (ft)	400					250			50	150		
Base Capacity (vph)	364	3876		260	2907	971	788		584	843		611

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	520		0	833	461	0		0	0		39
Spillback Cap Reductn	0	0		0	0	0	0		0	0		0
Storage Cap Reductn	0	0		0	0	0	0		0	0		0
Reduced v/c Ratio	0.61	1.27		0.76	1.30	0.47	0.38		0.55	1.10		0.78

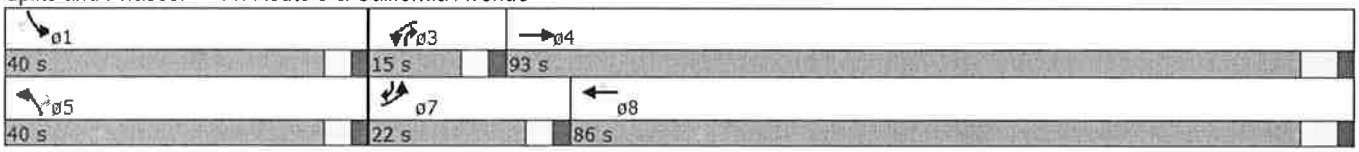
Intersection Summary

Area Type: Other
Cycle Length: 148
Actuated Cycle Length: 148
Natural Cycle: 140
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.10
Intersection Signal Delay: 77.7 Intersection LOS: E
Intersection Capacity Utilization 111.1% ICU Level of Service H
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.

Splits and Phases: 11: Route 9 & California Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	1463	286	73	2076	0	391	0	75	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	145		125	100		0	225		0	0		0
Storage Lanes	1		1	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1805	3455	1615	1805	3574	0	1715	1668	0	0	0	0
Flt Permitted	0.950			0.950			0.950	0.964				
Satd. Flow (perm)	1805	3455	1615	1805	3574	0	1715	1668	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			206					87				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		453			651			275			82	
Travel Time (s)		10.3			14.8			6.3			1.9	
Peak Hour Factor	0.94	0.94	0.94	0.95	0.95	0.95	0.88	0.88	0.88	0.92	0.92	0.92
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	1%	2%	2%	2%
Shared Lane Traffic (%)							55%					
Lane Group Flow (vph)	48	1556	304	77	2185	0	200	329	0	0	0	0
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA				
Protected Phases	7	4		3	8			2				
Permitted Phases			4				2					
Detector Phase	7	4	4	3	8		2	2				
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0				
Minimum Split (s)	9.0	22.0	22.0	9.0	22.0		21.0	21.0				
Total Split (s)	12.0	65.0	65.0	12.0	65.0		23.0	23.0				
Total Split (%)	12.0%	65.0%	65.0%	12.0%	65.0%		23.0%	23.0%				
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0				
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		1.0	1.0				
Lost Time Adjust (s)	-1.0	-2.0	-2.0	-2.0	-2.0		-1.0	-1.0				
Total Lost Time (s)	4.0	4.0	4.0	3.0	4.0		4.0	4.0				
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Recall Mode	None	None	None	None	None		None	None				
Act Effct Green (s)	7.6	59.9	59.9	8.8	62.4		17.7	17.7				
Actuated g/C Ratio	0.08	0.63	0.63	0.09	0.66		0.19	0.19				
v/c Ratio	0.33	0.71	0.28	0.46	0.93		0.63	0.86				
Control Delay	49.8	15.2	3.7	52.4	25.3		46.0	50.9				
Queue Delay	0.0	3.7	0.0	0.0	14.3		0.0	0.0				
Total Delay	49.8	18.9	3.7	52.4	39.6		46.0	50.9				
LOS	D	B	A	D	D		D	D				
Approach Delay		17.2			40.0			49.0				
Approach LOS		B			D			D				
Queue Length 50th (ft)	29	341	24	47	~683		124	160				
Queue Length 95th (ft)	66	428	59	95	#906		198	#306				
Internal Link Dist (ft)		373			571			195			2	
Turn Bay Length (ft)	145		125	100			225					
Base Capacity (vph)	152	2230	1115	171	2347		344	404				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	571	0	0	211		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	0.32	0.94	0.27	0.45	1.02		0.58	0.81				

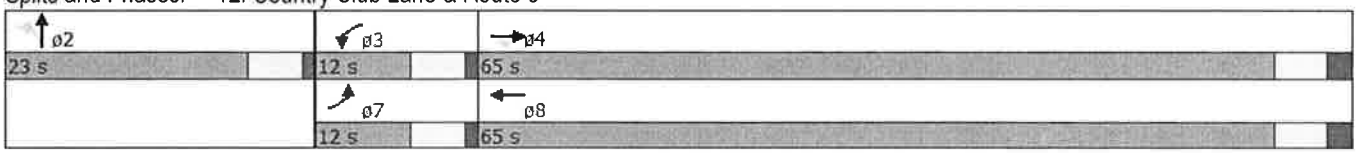
Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 95
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 31.8 Intersection LOS: C
Intersection Capacity Utilization 80.4% ICU Level of Service D
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 12: Country Club Lane & Route 9



2016 Built-Out Wkdy PM Peak Hour Analysis W/Improvements
12: Country Club Lane & Route 9

10/13/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	69	2257	569	207	1648	0	435	0	72	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	145		125	100		0	225		0	0		0
Storage Lanes	1		1	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	1805	3490	1615	1805	3610	0	1715	1676	0	0	0	0
Flt Permitted	0.950			0.950			0.950	0.964				
Satd. Flow (perm)	1805	3490	1615	1805	3610	0	1715	1676	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			259					87				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		453			651			275			82	
Travel Time (s)		10.3			14.8			6.3			1.9	
Peak Hour Factor	0.98	0.98	0.98	0.92	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	2%
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	70	2303	581	225	1791	0	231	309	0	0	0	0
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA				
Protected Phases	7	4		3	8			2				
Permitted Phases			4				2					
Detector Phase	7	4	4	3	8		2	2				
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0				
Minimum Split (s)	9.0	22.0	22.0	9.0	22.0		21.0	21.0				
Total Split (s)	18.0	64.0	64.0	17.0	63.0		19.0	19.0				
Total Split (%)	18.0%	64.0%	64.0%	17.0%	63.0%		19.0%	19.0%				
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0				
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0		1.0	1.0				
Lost Time Adjust (s)	-1.0	-2.0	-2.0	-2.0	-2.0		-1.0	-1.0				
Total Lost Time (s)	4.0	4.0	4.0	3.0	4.0		4.0	4.0				
Lead/Lag	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Recall Mode	None	None	None	None	None		None	None				
Act Effct Green (s)	10.2	60.0	60.0	14.0	64.9		15.0	15.0				
Actuated g/C Ratio	0.10	0.60	0.60	0.14	0.65		0.15	0.15				
v/c Ratio	0.38	1.10	0.54	0.89	0.76		0.90	0.95				
Control Delay	47.1	74.6	8.2	78.4	16.3		78.5	70.6				
Queue Delay	0.0	0.6	1.3	0.0	1.1		0.0	0.0				
Total Delay	47.1	75.2	9.4	78.4	17.4		78.5	70.6				
LOS	D	E	A	E	B		E	E				
Approach Delay		61.6			24.2			74.0				
Approach LOS		E			C			E				
Queue Length 50th (ft)	42	~882	102	143	405		154	152				
Queue Length 95th (ft)	83	#1019	188	#280	561		#301	#330				
Internal Link Dist (ft)		373			571			195			2	
Turn Bay Length (ft)	145		125	100			225					
Base Capacity (vph)	252	2094	1072	252	2344		257	325				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	331	280	0	305		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	0.28	1.31	0.73	0.89	0.88		0.90	0.95				

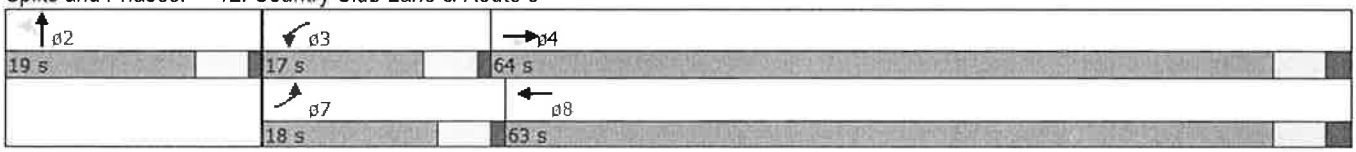
Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Natural Cycle: 130
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.10
Intersection Signal Delay: 49.1 Intersection LOS: D
Intersection Capacity Utilization 98.1% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 12: Country Club Lane & Route 9



Lane Group	EBL2	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR	SWL2
Lane Configurations												
Volume (vph)	35	53	1684	107	1995	149	131	106	207	91	20	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	11	12	11	11	12	12
Storage Length (ft)		145		145		150		0	0		0	
Storage Lanes		1		0		1		1	1		0	
Taper Length (ft)		25				25			25			
Satd. Flow (prot)	0	1719	4896	0	5036	1678	1766	1615	1728	1769	0	1736
Flt Permitted		0.950				0.676			0.336			0.950
Satd. Flow (perm)	0	1719	4896	0	5036	1194	1766	1615	611	1769	0	1736
Right Turn on Red				Yes							Yes	
Satd. Flow (RTOR)			8							8		
Link Speed (mph)			30		30		30			30		
Link Distance (ft)			651		444		425			135		
Travel Time (s)			14.8		10.1		9.7			3.1		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.92	0.85	0.85	0.85	0.88	0.88	0.88	0.84
Heavy Vehicles (%)	5%	5%	5%	5%	3%	4%	4%	0%	1%	1%	1%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	93	1886	0	2168	175	154	125	235	126	0	126
Turn Type	Prot	Prot	NA		NA	Perm	NA	Perm	D.P+P	NA		Prot
Protected Phases	1	1!	2 3		2 3		7		6 8	6 7 8		1!
Permitted Phases						7		7	7			
Detector Phase	1	1	2 3		2 3	7	7	7	6 8	6 7 8		1
Switch Phase												
Minimum Initial (s)	4.0	4.0				4.0	4.0	4.0				4.0
Minimum Split (s)	11.0	11.0				23.0	23.0	23.0				11.0
Total Split (s)	23.0	23.0				26.0	26.0	26.0				23.0
Total Split (%)	15.8%	15.8%				17.8%	17.8%	17.8%				15.8%
Yellow Time (s)	3.0	3.0				3.0	3.0	3.0				3.0
All-Red Time (s)	4.0	4.0				4.0	4.0	4.0				4.0
Lost Time Adjust (s)		-3.0				-3.0	-3.0	-3.0				-3.0
Total Lost Time (s)		4.0				4.0	4.0	4.0				4.0
Lead/Lag	Lead	Lead				Lead	Lead	Lead				Lead
Lead-Lag Optimize?	Yes	Yes				Yes	Yes	Yes				Yes
Recall Mode	None	None				None	None	None				None
Act Effct Green (s)		17.7	71.0		71.0	22.0	22.0	22.0	37.0	54.0		17.7
Actuated g/C Ratio		0.11	0.43		0.43	0.13	0.13	0.13	0.23	0.33		0.11
v/c Ratio		0.50	0.89		1.00	1.10	0.65	0.58	0.90	0.21		0.67
Control Delay		79.0	49.3		64.3	162.7	81.7	78.8	59.7	3.7		88.7
Queue Delay		0.0	44.0		0.0	0.0	0.0	0.0	23.5	2.5		0.0
Total Delay		79.0	93.3		64.3	162.7	81.7	78.8	83.3	6.2		88.7
LOS		E	F		E	F	F	E	F	A		F
Approach Delay			92.6		64.3		112.1			56.4		
Approach LOS			F		E		F			E		
Queue Length 50th (ft)		96	687		~863	~215	161	129	82	7		133
Queue Length 95th (ft)		160	757		#981	#350	230	192	#280	14		194
Internal Link Dist (ft)			571		364		345			55		
Turn Bay Length (ft)		145				150						
Base Capacity (vph)		198	2120		2177	159	236	216	260	587		200

Lane Group	SWL	ø2	ø3	ø5	ø6	ø8
Lane Configurations	↰					
Volume (vph)	111					
Ideal Flow (vphpl)	1900					
Lane Width (ft)	12					
Storage Length (ft)	0					
Storage Lanes	2					
Taper Length (ft)	25					
Satd. Flow (prot)	1736					
Flt Permitted	0.950					
Satd. Flow (perm)	1736					
Right Turn on Red						
Satd. Flow (RTOR)						
Link Speed (mph)	30					
Link Distance (ft)	237					
Travel Time (s)	5.4					
Peak Hour Factor	0.84					
Heavy Vehicles (%)	4%					
Shared Lane Traffic (%)						
Lane Group Flow (vph)	132					
Turn Type	Prot					
Protected Phases	1!	2	3	5	6	8
Permitted Phases						
Detector Phase	1					
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	11.0	23.0	8.0	8.0	23.0	21.0
Total Split (s)	23.0	9.0	52.0	18.0	9.0	9.0
Total Split (%)	15.8%	6%	36%	12%	6%	6%
Yellow Time (s)	3.0	3.0	3.5	3.5	3.0	3.0
All-Red Time (s)	4.0	4.0	0.5	0.5	4.0	2.0
Lost Time Adjust (s)	-3.0					
Total Lost Time (s)	4.0					
Lead/Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	Max	None	None	Max	None
Act Effct Green (s)	17.7					
Actuated g/C Ratio	0.11					
v/c Ratio	0.71					
Control Delay	91.2					
Queue Delay	0.0					
Total Delay	91.2					
LOS	F					
Approach Delay	90.0					
Approach LOS	F					
Queue Length 50th (ft)	139					
Queue Length 95th (ft)	202					
Internal Link Dist (ft)	157					
Turn Bay Length (ft)						
Base Capacity (vph)	200					

Lane Group	EBL2	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR	SWL2
Starvation Cap Reductn		0	397		0	0	0	0	30	355		0
Spillback Cap Reductn		0	0		0	0	0	0	0	0		0
Storage Cap Reductn		0	0		0	0	0	0	0	0		0
Reduced v/c Ratio		0.47	1.09		1.00	1.10	0.65	0.58	1.02	0.54		0.63

Intersection Summary

Area Type: Other
Cycle Length: 146
Actuated Cycle Length: 164.3
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.10
Intersection Signal Delay: 79.9 Intersection LOS: E
Intersection Capacity Utilization 86.0% ICU Level of Service E
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

! Phase conflict between lane groups.

Splits and Phases: 13: Route 9 & Temple Street

Lane Group	SWL	ø2	ø3	ø5	ø6	ø8
Starvation Cap Reductn	0					
Spillback Cap Reductn	0					
Storage Cap Reductn	0					
Reduced v/c Ratio	0.66					

Intersection Summary

Lane Group	EBL2	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR	SWL2
Lane Configurations												
Volume (vph)	25	51	1915	133	1712	182	162	81	162	126	43	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	11	11	12	11	11	12	12
Storage Length (ft)		145		145		150		0	0		0	
Storage Lanes		1		0		1		1	1		0	
Taper Length (ft)		25				25			25			
Satd. Flow (prot)	0	1781	5025	0	5036	1711	1837	1568	1711	1732	0	1787
Flt Permitted		0.950				0.639			0.260			0.950
Satd. Flow (perm)	0	1781	5025	0	5036	1151	1837	1568	468	1732	0	1787
Right Turn on Red				Yes							Yes	
Satd. Flow (RTOR)			8							12		
Link Speed (mph)			30		30		30			30		
Link Distance (ft)			651		444		425			135		
Travel Time (s)			14.8		10.1		9.7			3.1		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.93	0.93	0.93	0.90	0.90	0.90	0.91
Heavy Vehicles (%)	0%	2%	2%	5%	3%	2%	0%	3%	2%	2%	2%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	78	2090	0	1747	196	174	87	180	188	0	178
Turn Type	Prot	Prot	NA		NA	Perm	NA	Perm	D.P+P	NA		Prot
Protected Phases	1	1!	2 3		2 3		7		6 8	6 7 8		1!
Permitted Phases						7		7	7			
Detector Phase	1	1	2 3		2 3	7	7	7	6 8	6 7 8		1
Switch Phase												
Minimum Initial (s)	4.0	4.0				4.0	4.0	4.0				4.0
Minimum Split (s)	11.0	11.0				23.0	23.0	23.0				11.0
Total Split (s)	25.0	25.0				26.0	26.0	26.0				25.0
Total Split (%)	17.1%	17.1%				17.8%	17.8%	17.8%				17.1%
Yellow Time (s)	3.0	3.0				3.0	3.0	3.0				3.0
All-Red Time (s)	4.0	4.0				4.0	4.0	4.0				4.0
Lost Time Adjust (s)		-3.0				-3.0	-3.0	-3.0				-3.0
Total Lost Time (s)		4.0				4.0	4.0	4.0				4.0
Lead/Lag	Lead	Lead				Lead	Lead	Lead				Lead
Lead-Lag Optimize?	Yes	Yes				Yes	Yes	Yes				Yes
Recall Mode	None	None				None	None	None				None
Act Effct Green (s)		21.0	67.0		67.0	22.0	22.0	22.0	39.0	56.0		21.0
Actuated g/C Ratio		0.13	0.40		0.40	0.13	0.13	0.13	0.24	0.34		0.13
v/c Ratio		0.35	1.03		0.86	1.28	0.71	0.42	0.69	0.32		0.79
Control Delay		70.9	74.4		50.2	221.6	85.6	72.8	47.7	28.8		93.7
Queue Delay		0.0	30.1		0.0	0.0	0.0	0.0	40.2	29.2		0.0
Total Delay		70.9	104.4		50.2	221.6	85.6	72.8	88.0	58.1		93.7
LOS		E	F		D	F	F	E	F	E		F
Approach Delay			103.2		50.2		141.5			72.7		
Approach LOS			F		D		F			E		
Queue Length 50th (ft)		79	~878		630	~268	184	88	105	98		190
Queue Length 95th (ft)		136	#969		695	#442	#283	151	207	188		#312
Internal Link Dist (ft)			571		364		345			55		
Turn Bay Length (ft)		145				150						
Base Capacity (vph)		225	2038		2037	153	244	208	260	593		226

Lane Group	SWL	ø2	ø3	ø5	ø6	ø8
Lane Configurations	↰					
Volume (vph)	207					
Ideal Flow (vphpl)	1900					
Lane Width (ft)	12					
Storage Length (ft)	0					
Storage Lanes	2					
Taper Length (ft)	25					
Satd. Flow (prot)	1770					
Flt Permitted	0.950					
Satd. Flow (perm)	1770					
Right Turn on Red						
Satd. Flow (RTOR)						
Link Speed (mph)	30					
Link Distance (ft)	237					
Travel Time (s)	5.4					
Peak Hour Factor	0.91					
Heavy Vehicles (%)	2%					
Shared Lane Traffic (%)						
Lane Group Flow (vph)	227					
Turn Type	Prot					
Protected Phases	1!	2	3	5	6	8
Permitted Phases						
Detector Phase	1					
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	11.0	23.0	8.0	8.0	23.0	21.0
Total Split (s)	25.0	9.0	48.0	17.0	10.0	11.0
Total Split (%)	17.1%	6%	33%	12%	7%	8%
Yellow Time (s)	3.0	3.0	3.5	3.5	3.0	3.0
All-Red Time (s)	4.0	4.0	0.5	0.5	4.0	2.0
Lost Time Adjust (s)	-3.0					
Total Lost Time (s)	4.0					
Lead/Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	Max	None	None	Max	None
Act Effct Green (s)	21.0					
Actuated g/C Ratio	0.13					
v/c Ratio	1.01					
Control Delay	132.7					
Queue Delay	0.0					
Total Delay	132.7					
LOS	F					
Approach Delay	115.6					
Approach LOS	F					
Queue Length 50th (ft)	~254					
Queue Length 95th (ft)	#442					
Internal Link Dist (ft)	157					
Turn Bay Length (ft)						
Base Capacity (vph)	224					

Lane Group	EBL2	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR	SWL2
Starvation Cap Reductn		0	338		0	0	0	0	85	400		0
Spillback Cap Reductn		0	0		0	0	0	0	0	0		0
Storage Cap Reductn		0	0		0	0	0	0	0	0		0
Reduced v/c Ratio		0.35	1.23		0.86	1.28	0.71	0.42	1.03	0.97		0.79

Intersection Summary

Area Type: Other
Cycle Length: 146
Actuated Cycle Length: 165.6
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.28
Intersection Signal Delay: 87.4 Intersection LOS: F
Intersection Capacity Utilization 84.8% ICU Level of Service E
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

! Phase conflict between lane groups.

Splits and Phases: 13: Route 9 & Temple Street

Lane Group	SWL	ø2	ø3	ø5	ø6	ø8
Starvation Cap Reductn	0					
Spillback Cap Reductn	0					
Storage Cap Reductn	0					
Reduced v/c Ratio	1.01					

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	0	45	0	10	81	5	179	0	0	274	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	12	14	12	12	15	12	12	13	12
Satd. Flow (prot)	0	1760	0	0	1732	0	0	2008	0	0	1944	0
Flt Permitted		0.908										
Satd. Flow (perm)	0	1622	0	0	1732	0	0	2010	0	0	1944	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		224			91							
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		108			188			135			245	
Travel Time (s)		2.5			4.3			3.1			5.6	
Peak Hour Factor	0.86	0.86	0.86	0.89	0.89	0.89	0.85	0.85	0.85	0.88	0.88	0.88
Heavy Vehicles (%)	6%	6%	6%	3%	3%	3%	4%	4%	4%	1%	1%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	75	0	0	102	0	0	217	0	0	311	0
Turn Type	Perm	NA			NA		custom	NA			NA	
Protected Phases		3 5			3 5		1 2 8	6 7 8			6 7	
Permitted Phases	3 5						2					
Detector Phase	3 5	3 5			3 5		1 2 8	6 7 8			6 7	
Switch Phase												
Minimum Initial (s)												
Minimum Split (s)												
Total Split (s)												
Total Split (%)												
Yellow Time (s)												
All-Red Time (s)												
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode												
Act Effct Green (s)		57.5			57.5			88.8			42.0	
Actuated g/C Ratio		0.35			0.35			0.54			0.26	
v/c Ratio		0.11			0.15			0.20			0.63	
Control Delay		0.3			42.9			2.1			60.9	
Queue Delay		0.0			0.0			1.5			1.3	
Total Delay		0.3			42.9			3.7			62.2	
LOS		A			D			A			E	
Approach Delay		0.3			42.9			3.7			62.2	
Approach LOS		A			D			A			E	
Queue Length 50th (ft)		0			88			11			302	
Queue Length 95th (ft)		0			152			15			401	
Internal Link Dist (ft)		28			108			55			165	
Turn Bay Length (ft)												
Base Capacity (vph)		785			750			1085			497	
Starvation Cap Reductn		0			0			691			0	
Spillback Cap Reductn		120			0			0			65	
Storage Cap Reductn		0			0			0			0	

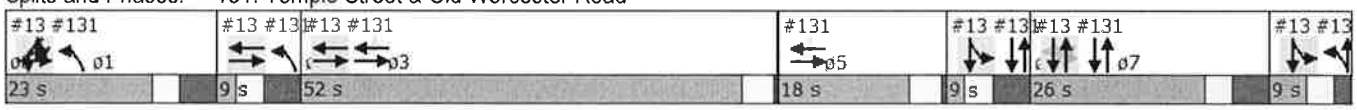
Lane Group	ø1	ø2	ø3	ø5	ø6	ø7	ø8
Lane Configurations							
Volume (vph)							
Ideal Flow (vphpl)							
Lane Width (ft)							
Satd. Flow (prot)							
Flt Permitted							
Satd. Flow (perm)							
Right Turn on Red							
Satd. Flow (RTOR)							
Link Speed (mph)							
Link Distance (ft)							
Travel Time (s)							
Peak Hour Factor							
Heavy Vehicles (%)							
Shared Lane Traffic (%)							
Lane Group Flow (vph)							
Turn Type							
Protected Phases	1	2	3	5	6	7	8
Permitted Phases							
Detector Phase							
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	11.0	23.0	8.0	8.0	23.0	23.0	21.0
Total Split (s)	23.0	9.0	52.0	18.0	9.0	26.0	9.0
Total Split (%)	16%	6%	36%	12%	6%	18%	6%
Yellow Time (s)	3.0	3.0	3.5	3.5	3.0	3.0	3.0
All-Red Time (s)	4.0	4.0	0.5	0.5	4.0	4.0	2.0
Lost Time Adjust (s)							
Total Lost Time (s)							
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	None	Max	None	None
Act Effct Green (s)							
Actuated g/C Ratio							
v/c Ratio							
Control Delay							
Queue Delay							
Total Delay							
LOS							
Approach Delay							
Approach LOS							
Queue Length 50th (ft)							
Queue Length 95th (ft)							
Internal Link Dist (ft)							
Turn Bay Length (ft)							
Base Capacity (vph)							
Starvation Cap Reductn							
Spillback Cap Reductn							
Storage Cap Reductn							

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.11			0.14			0.55			0.72	

Intersection Summary

Area Type: Other
Cycle Length: 146
Actuated Cycle Length: 164.3
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.10
Intersection Signal Delay: 34.8 Intersection LOS: C
Intersection Capacity Utilization 34.1% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 131: Temple Street & Old Worcester Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	0	40	0	30	86	15	198	0	0	291	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	12	14	12	12	15	12	12	13	12
Satd. Flow (prot)	0	1707	0	0	1797	0	0	2046	0	0	1940	0
Flt Permitted		0.976						0.996				
Satd. Flow (perm)	0	1676	0	0	1797	0	0	2044	0	0	1940	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		224			95						1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		108			188			135			245	
Travel Time (s)		2.5			4.3			3.1			5.6	
Peak Hour Factor	0.83	0.83	0.83	0.91	0.91	0.91	0.93	0.93	0.93	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	8%	0%	3%	1%	0%	2%	0%	0%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	54	0	0	128	0	0	229	0	0	329	0
Turn Type	Perm	NA			NA		custom	NA			NA	
Protected Phases		3 5			3 5		1 2 8	6 7 8			6 7	
Permitted Phases	3 5						2					
Detector Phase	3 5	3 5			3 5		1 2 8	6 7 8			6 7	
Switch Phase												
Minimum Initial (s)												
Minimum Split (s)												
Total Split (s)												
Total Split (%)												
Yellow Time (s)												
All-Red Time (s)												
Lost Time Adjust (s)												
Total Lost Time (s)												
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode												
Act Effct Green (s)		53.6			53.6			94.0			42.0	
Actuated g/C Ratio		0.32			0.32			0.57			0.25	
v/c Ratio		0.08			0.20			0.20			0.67	
Control Delay		0.2			47.7			2.6			63.0	
Queue Delay		0.0			0.0			3.6			1.4	
Total Delay		0.2			47.7			6.2			64.5	
LOS		A			D			A			E	
Approach Delay		0.2			47.7			6.2			64.5	
Approach LOS		A			D			A			E	
Queue Length 50th (ft)		0			116			12			322	
Queue Length 95th (ft)		0			192			77			439	
Internal Link Dist (ft)		28			108			55			165	
Turn Bay Length (ft)												
Base Capacity (vph)		759			722			1161			493	
Starvation Cap Reductn		0			0			834			0	
Spillback Cap Reductn		104			0			0			55	
Storage Cap Reductn		0			0			0			0	

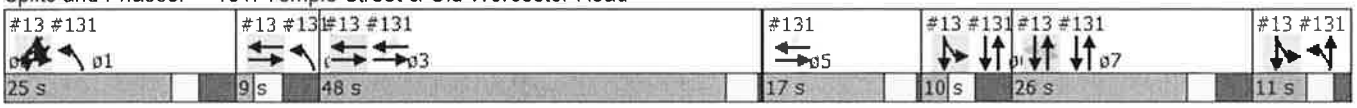
Lane Group	ø1	ø2	ø3	ø5	ø6	ø7	ø8
Lane Configurations							
Volume (vph)							
Ideal Flow (vphpl)							
Lane Width (ft)							
Satd. Flow (prot)							
Flt Permitted							
Satd. Flow (perm)							
Right Turn on Red							
Satd. Flow (RTOR)							
Link Speed (mph)							
Link Distance (ft)							
Travel Time (s)							
Peak Hour Factor							
Heavy Vehicles (%)							
Shared Lane Traffic (%)							
Lane Group Flow (vph)							
Turn Type							
Protected Phases	1	2	3	5	6	7	8
Permitted Phases							
Detector Phase							
Switch Phase							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	11.0	23.0	8.0	8.0	23.0	23.0	21.0
Total Split (s)	25.0	9.0	48.0	17.0	10.0	26.0	11.0
Total Split (%)	17%	6%	33%	12%	7%	18%	8%
Yellow Time (s)	3.0	3.0	3.5	3.5	3.0	3.0	3.0
All-Red Time (s)	4.0	4.0	0.5	0.5	4.0	4.0	2.0
Lost Time Adjust (s)							
Total Lost Time (s)							
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	None	Max	None	None
Act Effct Green (s)							
Actuated g/C Ratio							
v/c Ratio							
Control Delay							
Queue Delay							
Total Delay							
LOS							
Approach Delay							
Approach LOS							
Queue Length 50th (ft)							
Queue Length 95th (ft)							
Internal Link Dist (ft)							
Turn Bay Length (ft)							
Base Capacity (vph)							
Starvation Cap Reductn							
Spillback Cap Reductn							
Storage Cap Reductn							

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.08			0.18			0.70			0.75	

Intersection Summary

Area Type: Other
Cycle Length: 146
Actuated Cycle Length: 165.6
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.28
Intersection Signal Delay: 38.9 Intersection LOS: D
Intersection Capacity Utilization 39.2% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 131: Temple Street & Old Worcester Road



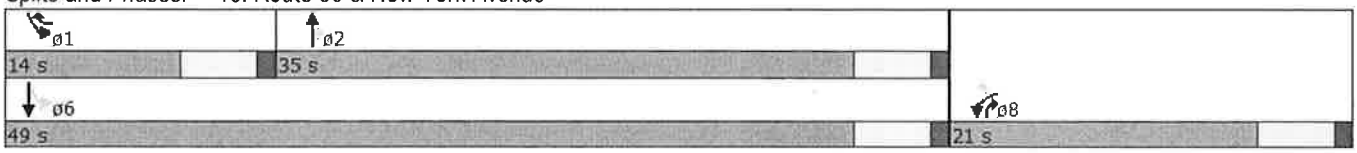
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	40	56	480	265	179	549
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	11
Storage Length (ft)	250	0		0	125	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Satd. Flow (prot)	1745	1531	1881	1599	1745	1818
Flt Permitted	0.950				0.269	
Satd. Flow (perm)	1745	1531	1881	1599	494	1818
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		61		288		
Link Speed (mph)	30		30			30
Link Distance (ft)	1458		331			171
Travel Time (s)	33.1		7.5			3.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	2%	1%	1%	0%	1%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	43	61	522	288	195	597
Turn Type	Prot	pm+ov	NA	pm+ov	pm+pt	NA
Protected Phases	8	1	2	8	1	6
Permitted Phases		8		2	6	
Detector Phase	8	1	2	8	1	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	9.0	21.0	21.0	9.0	21.0
Total Split (s)	21.0	14.0	35.0	21.0	14.0	49.0
Total Split (%)	30.0%	20.0%	50.0%	30.0%	20.0%	70.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag		Lead	Lag		Lead	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	Min	None	None	Min
Act Effct Green (s)	8.1	21.1	21.6	35.2	31.2	31.2
Actuated g/C Ratio	0.17	0.44	0.45	0.74	0.65	0.65
v/c Ratio	0.15	0.09	0.61	0.23	0.35	0.50
Control Delay	21.9	4.3	14.7	0.9	4.8	5.7
Queue Delay	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	21.9	4.3	14.7	0.9	4.8	5.7
LOS	C	A	B	A	A	A
Approach Delay	11.6		9.8			5.4
Approach LOS	B		A			A
Queue Length 50th (ft)	11	0	112	0	15	60
Queue Length 95th (ft)	39	20	213	15	34	123
Internal Link Dist (ft)	1378		251			91
Turn Bay Length (ft)	250				125	
Base Capacity (vph)	655	765	1289	1436	599	1631

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Starvation Cap Reductn	0	0	90	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	0.07	0.08	0.44	0.20	0.33	0.37

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 47.8
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.61
Intersection Signal Delay: 7.9 Intersection LOS: A
Intersection Capacity Utilization 48.5% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 15: Route 30 & New York Avenue



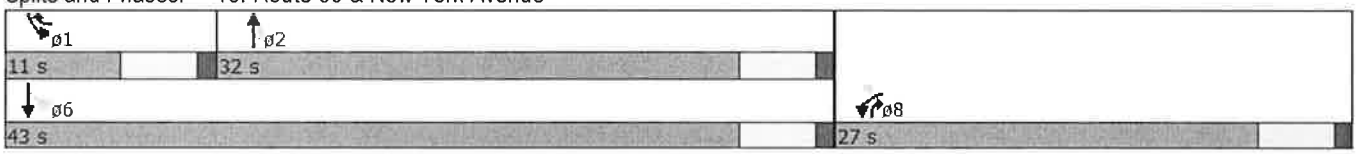
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	285	250	502	84	79	560
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	12	11	11
Storage Length (ft)	250	0		0	125	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Satd. Flow (prot)	1728	1561	1881	1509	1711	1837
Flt Permitted	0.950				0.188	
Satd. Flow (perm)	1728	1561	1881	1509	339	1837
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		182		91		
Link Speed (mph)	30		30			30
Link Distance (ft)	1458		331			171
Travel Time (s)	33.1		7.5			3.9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.97	0.97
Heavy Vehicles (%)	1%	0%	1%	7%	2%	0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	310	272	546	91	81	577
Turn Type	Prot	pm+ov	NA	pm+ov	pm+pt	NA
Protected Phases	8	1	2	8	1	6
Permitted Phases		8		2	6	
Detector Phase	8	1	2	8	1	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	9.0	21.0	21.0	9.0	21.0
Total Split (s)	27.0	11.0	32.0	27.0	11.0	43.0
Total Split (%)	38.6%	15.7%	45.7%	38.6%	15.7%	61.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag		Lead	Lag		Lead	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	Min	None	None	Min
Act Effct Green (s)	16.5	27.8	22.1	42.8	33.4	33.4
Actuated g/C Ratio	0.28	0.48	0.38	0.74	0.57	0.57
v/c Ratio	0.63	0.32	0.76	0.08	0.22	0.55
Control Delay	25.5	5.1	24.5	0.6	8.0	10.8
Queue Delay	0.0	0.0	0.5	0.0	0.0	0.0
Total Delay	25.5	5.1	25.0	0.6	8.0	10.8
LOS	C	A	C	A	A	B
Approach Delay	15.9		21.5			10.5
Approach LOS	B		C			B
Queue Length 50th (ft)	97	17	161	0	11	112
Queue Length 95th (ft)	182	59	305	6	32	232
Internal Link Dist (ft)	1378		251			91
Turn Bay Length (ft)	250				125	
Base Capacity (vph)	707	843	938	1311	365	1276

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Starvation Cap Reductn	0	0	119	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	0.32	0.67	0.07	0.22	0.45

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 58.2
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 15.9 Intersection LOS: B
Intersection Capacity Utilization 56.6% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 15: Route 30 & New York Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	188	1	189	1	1	1	310	577	1	1	60	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	12	14	12	11	12	12	12	14	12
Storage Length (ft)	0		220	0		0	120		0	0		0
Storage Lanes	0		1	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1811	1546	0	1904	0	1728	1881	0	0	1818	0
Flt Permitted		0.721			0.925		0.725				0.997	
Satd. Flow (perm)	0	1370	1546	0	1790	0	1318	1881	0	0	1812	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			217		3						24	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1458			137			639			100	
Travel Time (s)		33.1			3.1			14.5			2.3	
Peak Hour Factor	0.87	0.87	0.87	0.38	0.38	0.38	0.95	0.95	0.95	0.87	0.87	0.87
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	1%	1%	0%	0%	10%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	217	217	0	9	0	326	608	0	0	103	0
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			4		1	2			2	
Permitted Phases	4		4	4			2			2		
Detector Phase	4	4	4	4	4		1	2		2	2	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0		9.0	21.0		21.0	21.0	
Total Split (s)	30.0	30.0	30.0	30.0	30.0		20.0	55.0		55.0	55.0	
Total Split (%)	24.8%	24.8%	24.8%	24.8%	24.8%		16.5%	45.5%		45.5%	45.5%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0	-1.0		-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)		4.0	4.0		4.0		4.0	4.0			4.0	
Lead/Lag	Lag	Lag	Lag	Lag	Lag		Lead	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	None		None	None	
Act Effct Green (s)		20.4	20.4		20.4		48.5	34.8			34.8	
Actuated g/C Ratio		0.25	0.25		0.25		0.59	0.43			0.43	
v/c Ratio		0.63	0.40		0.02		0.38	0.76			0.13	
Control Delay		39.5	6.8		24.0		8.1	27.3			12.4	
Queue Delay		0.0	0.0		0.0		0.0	0.0			0.0	
Total Delay		39.5	6.8		24.0		8.1	27.3			12.4	
LOS		D	A		C		A	C			B	
Approach Delay		23.1			24.0			20.6			12.4	
Approach LOS		C			C			C			B	
Queue Length 50th (ft)		100	0		2		65	260			24	
Queue Length 95th (ft)		205	51		6		118	426			55	
Internal Link Dist (ft)		1378			57			559			20	
Turn Bay Length (ft)			220				120					
Base Capacity (vph)		462	665		605		909	1244			1207	

Lane Group	ø3
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	8.0
Total Split (s)	16.0
Total Split (%)	13%
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0	0		0		0	30			0	
Spillback Cap Reductn		0	0		0		0	0			0	
Storage Cap Reductn		0	0		0		0	0			0	
Reduced v/c Ratio		0.47	0.33		0.01		0.36	0.50			0.09	

Intersection Summary

Area Type: Other
Cycle Length: 121
Actuated Cycle Length: 81.6
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 20.8 Intersection LOS: C
Intersection Capacity Utilization 54.2% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 14: California Avenue & New York Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	0	382	0	0	0	212	55	0	0	535	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	12	14	12	11	12	12	12	14	12
Storage Length (ft)	0		220	0		0	120		0	0		0
Storage Lanes	0		1	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1805	1561	0	2027	0	1745	1681	0	0	1848	0
Flt Permitted		0.757					0.177					
Satd. Flow (perm)	0	1438	1561	0	2027	0	325	1681	0	0	1848	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			455								16	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1458			137			639			100	
Travel Time (s)		33.1			3.1			14.5			2.3	
Peak Hour Factor	0.84	0.84	0.84	0.92	0.92	0.92	0.87	0.87	0.87	0.88	0.88	0.88
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	13%	0%	0%	8%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	50	455	0	0	0	244	63	0	0	802	0
Turn Type	Perm	NA	Perm				pm+pt	NA			NA	
Protected Phases		4			4		1	2			2	
Permitted Phases	4		4	4			2			2		
Detector Phase	4	4	4	4	4		1	2		2	2	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0		9.0	21.0		21.0	21.0	
Total Split (s)	30.0	30.0	30.0	30.0	30.0		20.0	55.0		55.0	55.0	
Total Split (%)	24.8%	24.8%	24.8%	24.8%	24.8%		16.5%	45.5%		45.5%	45.5%	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.0	-1.0		-1.0		-1.0	-1.0			-1.0	
Total Lost Time (s)		4.0	4.0		4.0		4.0	4.0			4.0	
Lead/Lag	Lag	Lag	Lag	Lag	Lag		Lead	Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	None		None	None	
Act Effct Green (s)		11.4	11.4				64.7	50.8			50.8	
Actuated g/C Ratio		0.13	0.13				0.73	0.58			0.58	
v/c Ratio		0.27	0.76				0.53	0.07			0.75	
Control Delay		38.4	12.7				9.9	10.5			21.1	
Queue Delay		0.0	0.0				0.0	0.0			0.0	
Total Delay		38.4	12.7				9.9	10.5			21.1	
LOS		D	B				A	B			C	
Approach Delay		15.2						10.1			21.1	
Approach LOS		B						B			C	
Queue Length 50th (ft)		26	0				24	15			310	
Queue Length 95th (ft)		55	57				91	40			#584	
Internal Link Dist (ft)		1378			57			559			20	
Turn Bay Length (ft)			220				120					
Base Capacity (vph)		427	783				503	979			1083	

Lane Group	ø3
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	4.0
Minimum Split (s)	8.0
Total Split (s)	16.0
Total Split (%)	13%
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
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		0.12	0.58				0.49	0.06			0.74	

Intersection Summary

Area Type: Other
Cycle Length: 121
Actuated Cycle Length: 88.2
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 17.2 Intersection LOS: B
Intersection Capacity Utilization 68.9% **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: 14: California Avenue & New York Avenue