FRAMINGHAM DOWNTOWN PROGRAMMATIC STUDY
TECHNICAL MEMORANDUM ON EXISTING CONDITIONS

Technical Memorandum #3 - Existing Traffic Operations

Prepared by: BETA Group, Inc.
Prepared for: Town of Framingham

June, 2008

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PROJECT OVERVIEW

Traffic congestion in the downtown area continues to be a concern that could someday inhibit downtown revitalization; for some that time has already arrived. A number of projects focused on improving traffic operations in the downtown area have been conducted or are currently underway. Short term signal improvements have been developed at the intersection of Waverly Street (Route 135) and Concord Street (Route 126) based on a study completed in 2007. To date, most of the recommended improvements have been implemented, and the remaining improvements are in the process of being implemented in the very near future.

Phase I of the downtown study, to describe existing transportation, economic, and land use conditions has been completed, and Phase II, to develop long-term transportation improvements will be underway shortly. Economic, transportation, and urban design issues are being considered together to formulate the future vision of the downtown area. This project will look at improvements to the downtown that may not materialize for another 20 years.

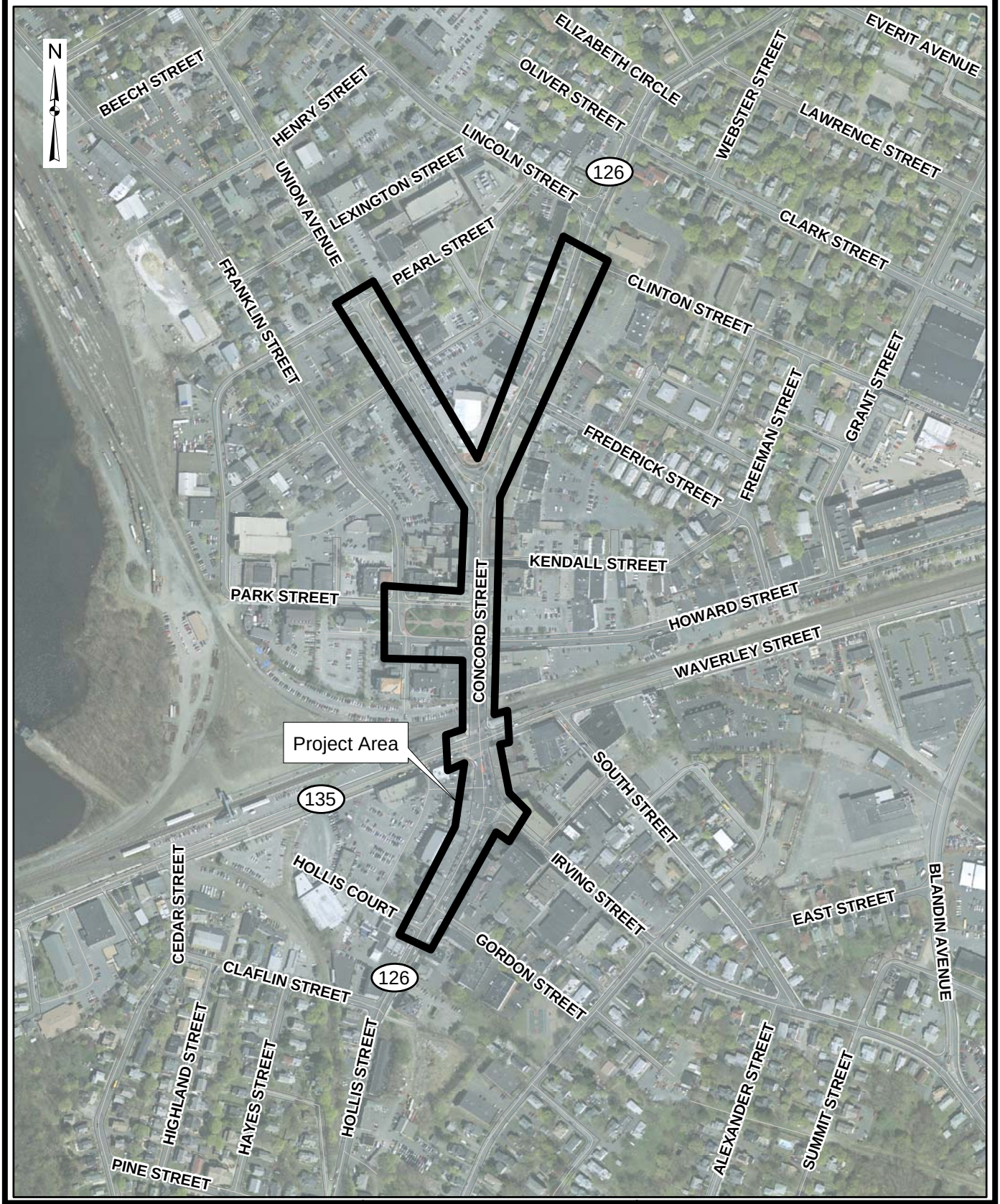
The purpose of this Programmatic Study is to bridge the gap between the immediate improvements and the long term vision. Improvements assessed in this study are intended to develop conceptual level mid-term solutions to effectively move traffic through Downtown Framingham. These enhancements to the public right of way focus on period lighting, streetscape treatments, and roadway and traffic related measures. The focus of this technical memorandum will be to document the existing roadway and traffic conditions within the core downtown area.

INTRODUCTION

This project will consider improvements to the intersections of Concord Street at Union Avenue and Hollis Street at Irving Street. These intersections have been chosen because they are adjacent to the Waverly Street and Howard Street intersections, and they are the points of convergence of three major north-south traffic flows through the downtown. Concord Street is designated as State Route 126 which carries regional traffic north and south through the area. Union Avenue, which carries traffic to and from the area northwest of the downtown, intersects Concord Street on the north end of the downtown in front of Memorial Hall. Irving Street, which carries traffic to and from the area southeast of the downtown, intersects Concord Street at the south end of the downtown. Figure 1 is a map of the study area.

BETA has conducted numerous field visits during the months of May through August 2007 and June 2008 to reaffirm conditions within the study area. During these visits observations were made of roadway geometrics, pedestrian and bicycle activity, traffic control and existing vehicle queues, delay and conflicts. This information was used to create and calibrate an existing traffic model of the intersections studied within the study area.

Historical data utilized to establish the existing transportation conditions include multiple sources from the Town and various other consultants. Of particular use is the Route 126 Corridor Study dated January 9, 1997 and two letters that update this study dated July 12, 2006 and January 23, 2007 from Rizzo Associates.



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Framingham Downtown Programmatic Plan
Framingham, MA

Figure 1

Downtown Area Map

EXISTING CONDITIONS

Study Area Intersections

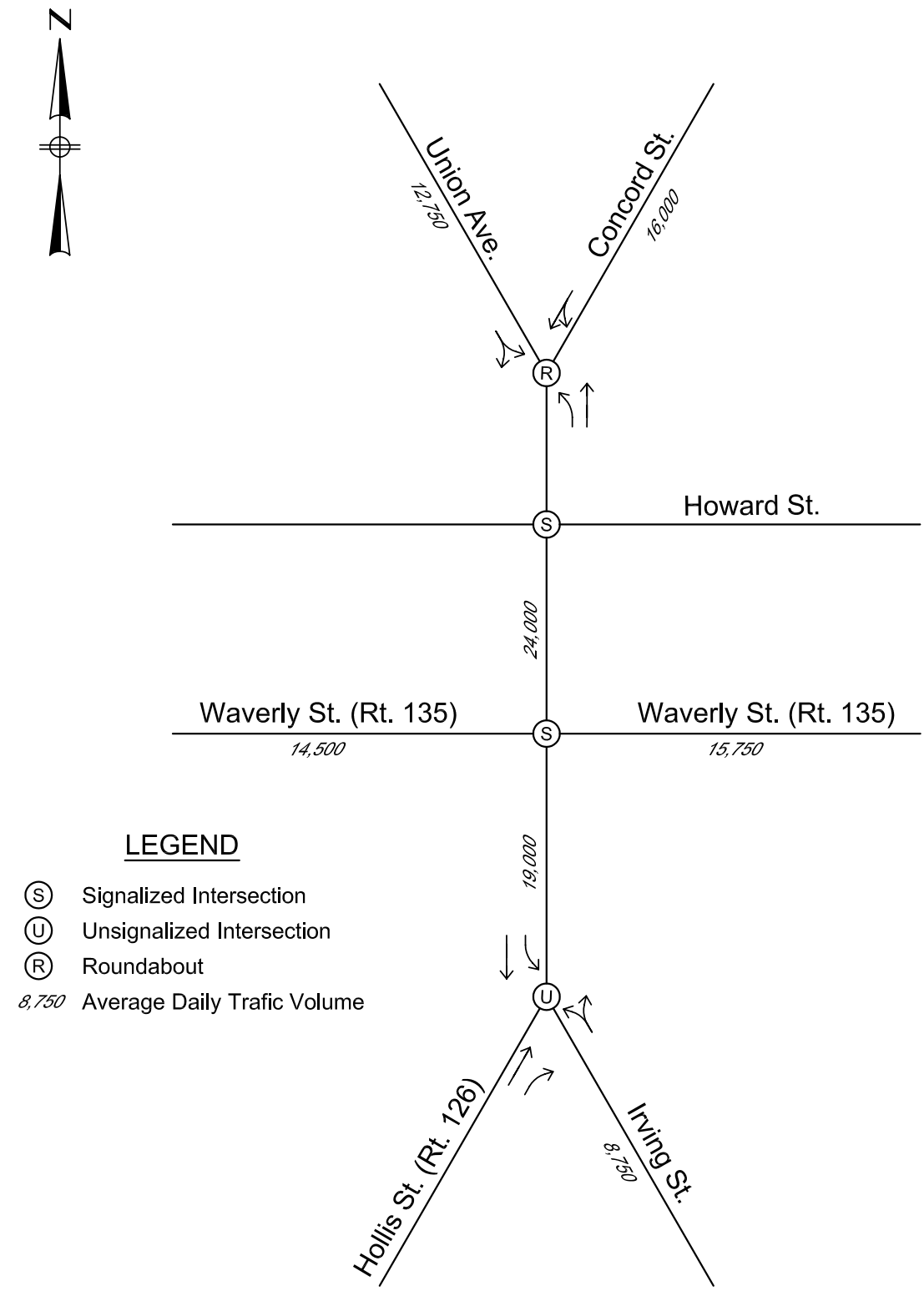
The following section will provide descriptions of the existing geometric conditions at the two study area intersections. Existing lane use and average daily traffic volumes are presented in Figure 2 for the study area.

Route 126 (Hollis Street) @ Irving Street

This unsignalized Y-intersection consists of Hollis Street approaching from the north and southwest and Irving Street approaching from the southeast. The intersection is located 230 feet south of the Waverley Street @ Concord Street & Hollis Street intersection. No traffic controls are provided. The intersection operates similar to a roundabout. A "Keep Right" (R4-7) sign is mounted inside a tire on a ten foot wide circular traffic island which mimics the center island of a roundabout. The intersection is wide open (over 100 feet wide) with no pavement markings to guide vehicles through the intersection. Most approaches to the intersection consist of one all purpose lane along with one departure lane. The Hollis Street Southbound approach provides two south bound lanes, with the left lane functioning as an exclusive left turn lane. Parking is allowed along all approaches and departures with the exception of the Irving Street approach. Directional flow on all approaches is divided by a double yellow center line. Concrete sidewalks are provided along all approaches and crosswalks are striped across Irving Street and the southern leg of Hollis Street. Both roads are maintained by the Town of Framingham. Land use in the area is commercial.

Route 126 (Concord Street) @ Union Avenue

This modern roundabout consists of Concord Street approaching from the south and northeast and Union Avenue approaching from the northwest. The intersection is located 530 feet north of the Concord Street / Howard Street intersection. All approaches are chanalized into the roundabout by use of landscaped traffic islands and pavement markings. Yield lines are included along all approaches to delineate the circulating roadway. The landscaped center island is thirty feet in diameter surrounded by a five foot truck apron. Union Avenue and Concord Street each consist of a single lane approach. Concord Street from the south maintains two travel lanes, the right lane is intended for through movements onto Concord Street and the left lane is for movements onto Union Avenue. All departures consist of one lane although the Concord Street southbound departure quickly transitions to two lanes. Parking lanes are included along all approaches. Directional flow on all approaches is divided by a double yellow center line. Concrete/brick sidewalks exist along all approaches and crosswalks are striped across Union Avenue and Concord Street from the northeast. Both roads are maintained by the Town of Framingham. Land use in the area is commercial with Town Hall located immediately to the north of the intersection.



LEGEND

- (S) Signalized Intersection
- (U) Unsignalized Intersection
- (R) Roundabout
- *8,750* Average Daily Trafic Volume

Average Daily Volume Source:
Rizzo Associates
MassHighway Department

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Figure 2

Existing Intersection Lane Use

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Data Collection

Traffic volumes used as a basis for analysis were gathered from historical data. Available historical turning movement counts were conducted during the month of May, 2006.

The MassHighway weekday seasonal adjustment factors worksheet was reviewed to determine whether the traffic count data required a seasonal adjustment. The MassHighway seasonal factors are based on statewide traffic data collection and are classified by roadway type. Group 6 (urban arterials, collectors and rural arterials), was used to determine that March, May and June traffic are typically higher than average monthly traffic conditions. Seasonal adjustments were not made in order to present a conservative analysis.

An annual 1% growth rate, consistent with the Route 126 Corridor Study performed by Rizzo Associates, was applied to all traffic counts conducted prior to 2007.

The 2007 existing peak hour traffic volumes are presented in Figure 3.

Pedestrian and Bicycle activity

In June of 2006 Rizzo Associates conducted an extensive pedestrian count during the AM and PM peak hours within the core Downtown area. This count revealed a high level of pedestrian activity during both peak hours. The 2006 count indicates an increase in pedestrian activity compared to a count conducted in 1996.

BETA conducted pedestrian observations during field visits in July, 2007 and June, 2008. These observations and the previous counts reveal that the north-south route along Route 126 from the Irving Street/Hollis Street intersection to Town Hall is a predominant pedestrian path. Several pedestrians were observed crossing Concord Street and Hollis Street at locations without crosswalks particularly south of the Concord Street/Union Street intersection and north of the Hollis Street/Irving Street intersection.

The remainder of the Downtown area is typified by a high level of pedestrian activity. Significant generators of pedestrian activity include the MBTA commuter rail station, Town Hall, the Salvation Army, the Metro West Regional Transit Authority bus stop on Concord Street and the Store 24 on the corner of Waverley Street and Hollis Street.

A moderate level of bicycle traffic is evident in the Downtown study area. Previous counts identified approximately five bicycles per intersection during the AM peak hour with the exception of the Waverley Street/Concord Street intersection where 29 bicycles, predominantly traveling northbound on Concord Street were observed. During the PM peak hour 22 bicycles per intersection were identified with the exception again of the Waverley Street/Concord Street intersection, at which, 61 bicycles, predominantly traveling northbound and southbound on Concord Street were observed. Recent observations conducted on Thursday, June 5, 2008 for this study, however, found less than ten bicycles during the same periods.

Intersection Operations

<u>HCM Methodology</u>

Traffic operations at the unsignalized intersection of Hollis Street at Irving Street were evaluated using the SYNCHRO software package (Version 6, Build 614), which is based on methodologies contained in the 2000 Highway Capacity Manual. Traffic operations are defined by level-of-service (LOS), which is a qualitative measure that associates LOS with vehicle delays. The relationship between LOS and delay is summarized in Table 1.

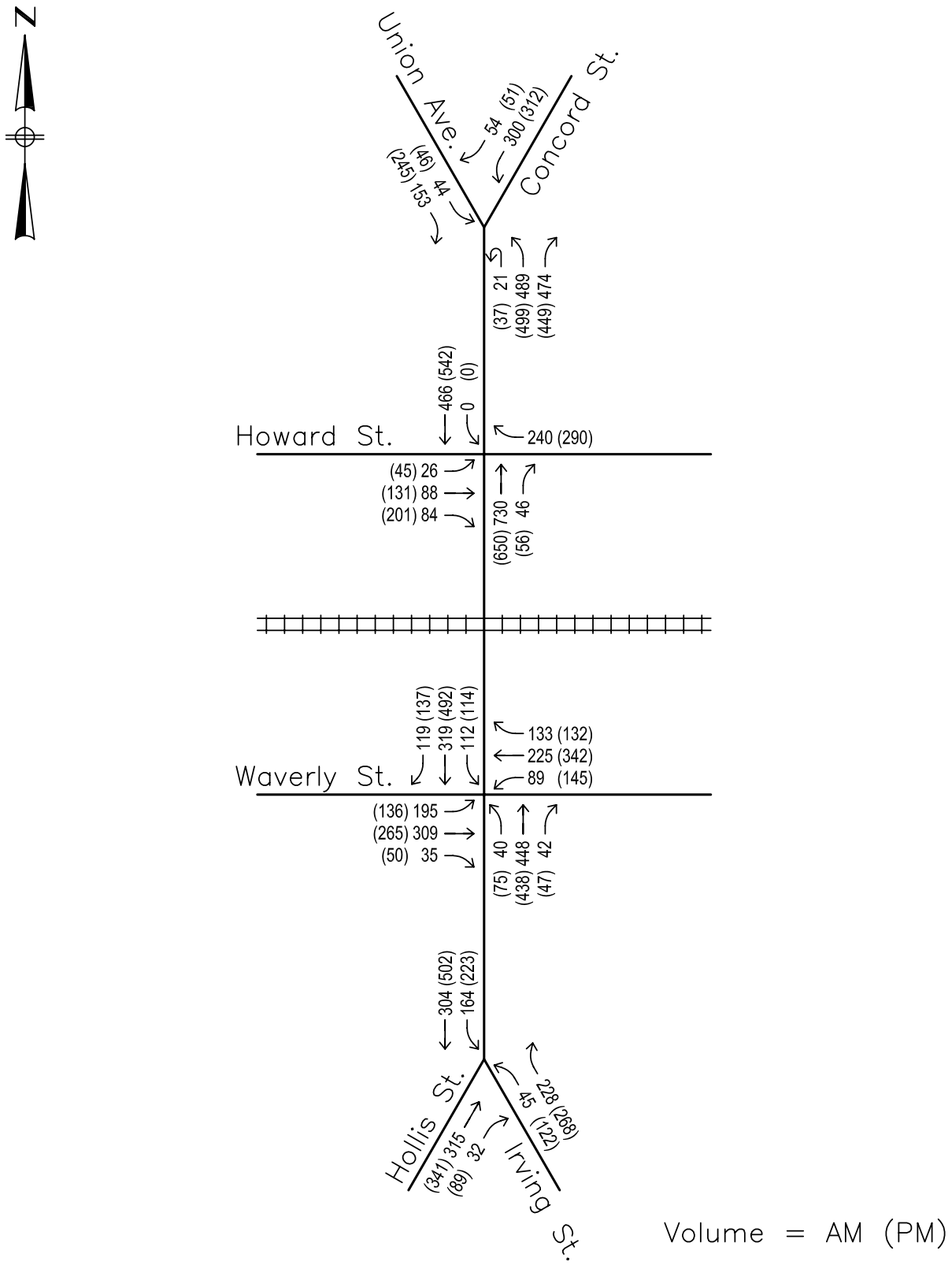

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Figure 3

Existing (2007) Peak Hour Turning Movement Volumes

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Table 1 - Level of Service Criteria

LOS	Signalized Intersection & Roundabout Criteria Average Total Delay (Seconds per Vehicle)	Unsignalized Intersection Criteria Average Total Delay (Seconds per Vehicle)
A	< 10.0	< 10.0
B	10.1 to 20.0	10.1 to 15.0
C	20.1 to 35.0	15.1 to 25.0
D	35.1 to 55.0	25.1 to 35.0
E	55.1 to 80.0	35.1 to 50.0
F	> 80.0	> 50.0

Source: Highway Capacity Manual, Transportation Research Board; Washington, DC; 2000

Traffic operations at the roundabout type intersection of Concord Street at Union Avenue were evaluated using the SIDRA software package (Version 2.0). SIDRA is used to analyze modern roundabout intersections. The Level of Service criteria are the same for roundabouts and signalized intersections. The Level of Service criteria are presented in Table 1.

The study area intersections were analyzed for existing conditions observed during weekday morning and weekday afternoon peak hours.

Analysis Results

The following section will describe the Level of Service analysis results for the study area intersections. The results are summarized in Table 2 and Figure 4.

Table 2 - Existing (2007) Intersection Level of Service Analysis Results

Intersection	Movement	AM Peak Hour		PM Peak Hour	
		LOS	Delay	LOS	Delay
Route 126 (Hollis Street) @ Irving Street	Hollis Street Northbound	C	20.1	D	26.1
	Hollis Street Southbound	C	16.3	F	85.1
	Irving Street Northwestbound	C	16.8	D	30.5
Route 126 (Concord Street) @ Union Avenue	Concord Street Northbound	B	18.0	B	18.1
	Concord Street Southbound	A	6.0	A	5.9
	Union Avenue Southeastbound	A	8.1	A	7.8

The level of service analysis results for the morning peak hour are favorable at all intersections. All approaches of the Hollis Street at Irving Street intersection operate at LOS C. At the Concord Street at Union Street Roundabout, the Concord Street southbound and Union Avenue approach operate at LOS A during the morning peak hour and the Concord Street northbound approach operates at LOS C.

Conditions remain approximately the same between the morning and afternoon peak hours at the Concord Street at Union Avenue roundabout. Results, however, are much different between the morning and afternoon peak hours at the Hollis Street at Irving Street intersection. The northbound and northwestbound approaches of this intersection operate at LOS D and the southbound approach operates at LOS F during the afternoon peak hour. Congestion from the Concord Street/Waverly street intersection causes northbound traffic to back up through this intersection making it difficult to make southbound left turns. Based on field observations, the traffic model slightly over estimates the delay that is experienced by the southbound approach.

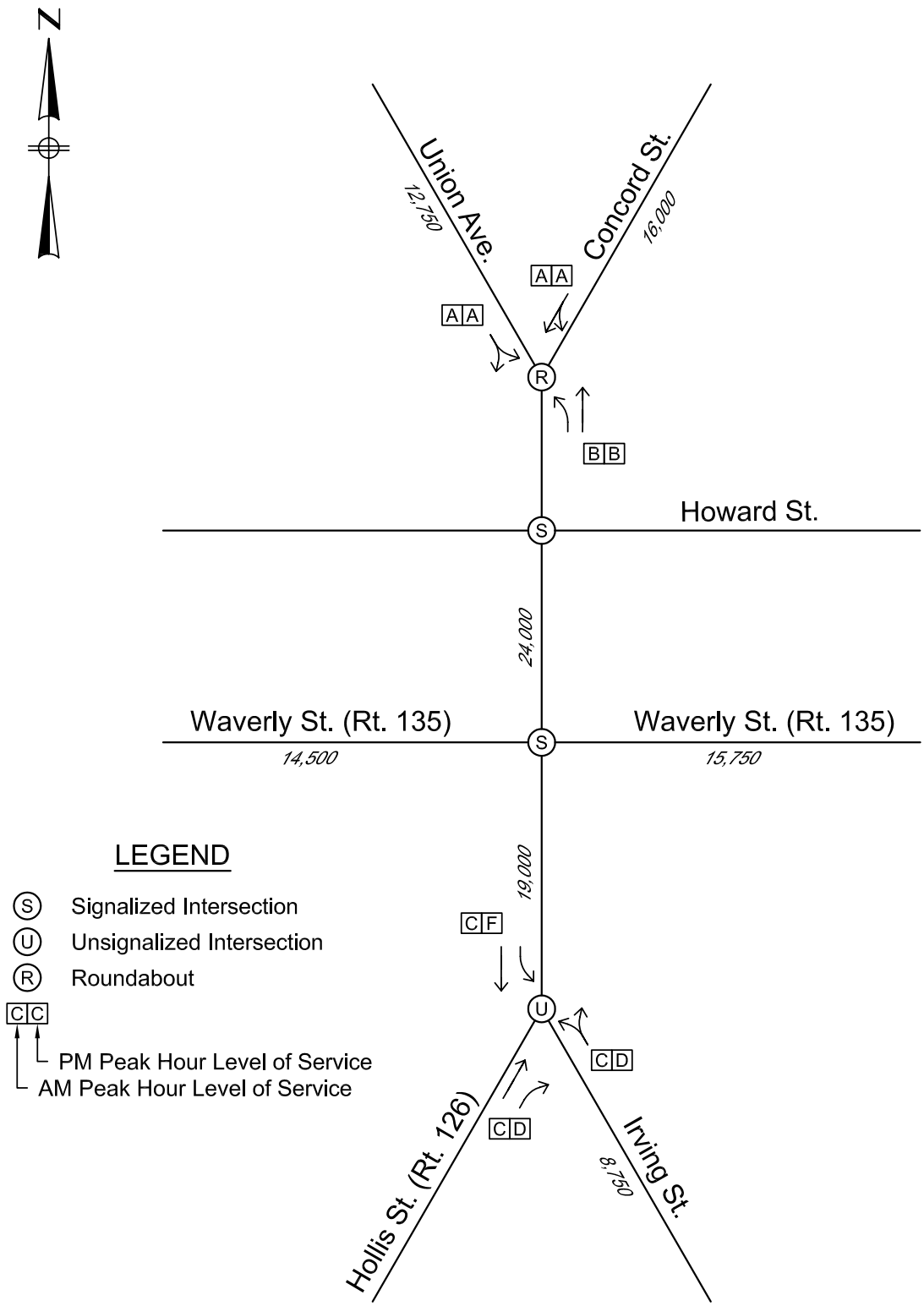

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Figure 4

Existing Intersection Level of Service Analysis Results

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The field observations also reveal that northbound drivers typically leave space for left turns to pass through queued traffic if the queue reaches through this intersection. Occasionally, however, the space is not open and southbound left turns need to wait for the queue to clear before making the left turn.

VEHICLE CRASH HISTORY

Crash records maintained by the Massachusetts Registry of Motor Vehicles and distributed by the Massachusetts Highway Department were reviewed for the years 2004 through 2006, the most recent three-year period available. The crash data is reviewed to determine if there are any trends that could be corrected. The results of the review at the two project intersections are summarized in Table 3.

Table 3 - Vehicle Crash History

		Concord Street @ Union Avenue				Hollis Street @ Irving Street			
Year		2004	2005	2006	Total	2004	2005	2006	Total
Total Crashes		24	12	17	53	13	18	10	41
Collision Type	Rear End	8	3	9	20	5	3	3	11
	Angle	3	3	2	8	2	5	0	7
	Head On	0	0	0	0	0	0	0	0
	Sideswipe (Same Direction)	7	4	6	17	3	5	5	13
	Sideswipe (Opposite Direction)	1	0	0	1	1	0	0	1
	Single Vehicle Crash	1	0	0	1	1	2	2	5
	Unknown	1	0	0	1	0	0	0	0
	Not Reported	3	2	0	5	1	3	0	4
Accident Type	Property Damage	10	6	9	25	7	13	7	27
	Non-Fatal Injury	7	1	4	12	1	1	1	3
	Fatal Injury	0	0	0	0	0	0	0	0
	Unknown	0	0	0	0	0	0	1	1
	Not Reported	7	5	4	16	5	4	1	10
Ambient Light	Daylight	19	8	14	41	7	13	8	28
	Dark Roadway	1	0	0	1	0	0	0	0
	Dark Lighted Roadway	3	3	2	8	4	3	0	7
	Dusk	1	0	0	1	1	2	2	5
	Dawn	0	0	1	1	0	0	0	0
	Dark Unknown Roadway Lighting	0	0	0	0	0	0	0	0
	Not Reported	0	1	0	1	1	0	0	1
Weather Condition	Clear	12	7	10	29	6	15	6	27
	Sleet	0	0	1	1	0	1	0	1
	Rain	6	0	1	7	1	0	0	1
	Snow	1	1	0	2	1	0	0	1
	Cloudy	5	3	5	13	3	2	4	9
	Unknown	0	0	0	0	1	0	0	1
	Not Reported	0	1	0	1	1	0	0	1

A total of 53 crashes, or an average of 17.7 crashes per year, occurred at the Concord Street at Union Avenue intersection over the three year period reviewed. A total of 41 crashes, or an average of 13.7 crashes per year, occurred at the Hollis Street at Irving Street intersection over the three year period reviewed. Crash characteristics of an intersection are expressed in terms of its crash rate, or crashes per million vehicles entering (CPMVE) the intersection. The crash rate for the Concord Street/Union Avenue intersection is 1.86 CPMVE and the Hollis Street at Irving Street intersection crash rate is 1.48 CPMVE. The statewide average is 0.66 CPMVE for unsignalized intersections. The average crash rate for unsignalized intersections within MassHighway District 3, the district which Framingham lies in, is 0.78 CPMVE.

The intersection of Concord Street/Union Avenue has a crash rate that is nearly 3 times the statewide average, and slightly more than twice the District 3 average crash rate. The intersection of Hollis Street at Irving Street has a crash rate that is more than twice the statewide average and slightly less than twice the District 3 average. In general the downtown Framingham area has an extensive crash history. Between 2004 and 2006 approximately 269 vehicle crashes occurred along the stretch of Concord Street between and at the two study area intersections.

Crashes at both study area intersections are primarily rear-end and sideswipe (same direction) type collisions occurring on clear days during daylight hours. No fatalities have been reported at the intersections, and the number of injuries reported is relatively low. Most crashes are property damage only crashes.

Rear-end crashes are generally not the type that would be improved through traffic signal operations. In this case, however, the Concord Street/Union Avenue intersection is a roundabout, while the Hollis Street/Irving Street intersection operates with characteristics similar to a roundabout. These characteristics are indicative of a highly congested corridor where driver frustration may be high due to the constant stop-and-go flow. In these cases, installation of traffic signals would create more predictable and therefore orderly traffic flow.

TRAFFIC SIGNAL WARRANT ANALYSIS

Justification for traffic signal installation requires an engineering analysis which includes an evaluation of the intersection operation and safety to determine if a traffic control signal is warranted at the location.

The Manual on Uniform Traffic Control Devices (MUTCD) contains eight Warrants for the installation of traffic signals. These warrants, which consider vehicular and pedestrian volumes, delay, and crash history, are listed below.

Warrant 1.	Eight Hour Vehicular Volume
Warrant 2.	Four Hour Vehicular Volume
Warrant 3.	Peak Hour
Warrant 4.	Pedestrian Volume
Warrant 5.	School Crossing
Warrant 6.	Coordinated Signal System
Warrant 7.	Crash Experience
Warrant 8.	Roadway Network

An intersection need only satisfy one of these warrants to justify installation of traffic signals. Satisfaction of one or more of these warrants in itself, however, does not require either the installation or continued operation of a traffic signal.

An evaluation of the signal warrants indicates the criteria for the following warrants are satisfied at the both the Concord Street at Union Avenue and the Hollis Street at Irving Street intersections.

Warrant 1.	Eight Hour Vehicular Volume
Warrant 2.	Four Hour Vehicular Volume
Warrant 3.	Peak Hour

A copy of the complete warrant analysis for these locations is included in the appendix.

Based on this analysis it is concluded that a traffic control signal is warranted for installation at both study area intersections.

APPENDIX A

Turning Movement and ATR Data

Accurate Counts
978-664-2565

N/S Street : Route 126
E/W Street: Irving Street
City/State : Framingham, MA
Weather : Clear

File Name : 06910004
Site Code : 09610004
Start Date : 5/18/2006
Page No : 1

Groups Printed- Cars - Trucks

	Route 126 From North			Irving St From East			Route 126 From South			Store 24 Dr From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00	46	76	6	10	6	56	3	78	17	3	6	2	309
07:15	37	75	3	12	6	64	0	71	26	1	11	1	307
07:30	32	58	4	11	6	50	0	72	18	2	9	2	264
07:45	36	52	3	12	2	47	0	62	16	0	5	0	235
Total	151	261	16	45	20	217	3	283	77	6	31	5	1115
08:00	35	74	7	13	1	28	1	63	9	2	11	3	247
08:15	37	70	5	10	5	67	1	74	6	1	9	2	287
08:30	19	56	3	12	4	58	2	86	8	2	6	2	258
08:45	33	78	8	10	6	49	1	73	9	2	10	6	285
Total	124	278	23	45	16	202	5	296	32	7	36	13	1077
Grand Total	275	539	39	90	36	419	8	579	109	13	67	18	2192
Apprch %	32.2	63.2	4.6	16.5	6.6	76.9	1.1	83.2	15.7	13.3	68.4	18.4	
Total %	12.5	24.6	1.8	4.1	1.6	19.1	0.4	26.4	5	0.6	3.1	0.8	
Cars	240	488	39	77	34	351	7	515	97	12	67	18	1945
% Cars	87.3	90.5	100	85.6	94.4	83.8	87.5	88.9	89	92.3	100	100	88.7
Trucks	35	51	0	13	2	68	1	64	12	1	0	0	247
% Trucks	12.7	9.5	0	14.4	5.6	16.2	12.5	11.1	11	7.7	0	0	11.3

	Route 126 From North				Irving St From East				Route 126 From South				Store 24 Dr 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 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00																	
07:00	**46**	**76**	**6**	**128**	10	**6**	56	72	**3**	**78**	17	**98**	**3**	6	**2**	11	**309**
07:15	37	75	3	115	**12**	6	**64**	**82**	0	71	**26**	97	1	**11**	1	**13**	307
07:30	32	58	4	94	11	6	50	67	0	72	18	90	2	9	2	13	264
07:45	36	52	3	91	12	2	47	61	0	62	16	78	0	5	0	5	235
Total Volume	151	261	16	428	45	20	217	282	3	283	77	363	6	31	5	42	1115
% App. Total	35.3	61	3.7		16	7.1	77		0.8	78	21.2		14.3	73.8	11.9		
PHF	.821	.859	.667	.836	.938	.833	.848	.860	.250	.907	.740	.926	.500	.705	.625	.808	.902
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:00				07:00				07:00				08:00				
+0 mins.	**46**	**76**	**6**	**128**	10	**6**	56	72	**3**	**78**	17	**98**	**2**	**11**	3	16	
+15 mins.	37	75	3	115	**12**	6	**64**	**82**	0	71	**26**	97	1	9	2	12	
+30 mins.	32	58	4	94	11	6	50	67	0	72	18	90	2	6	2	10	
+45 mins.	36	52	3	91	12	2	47	61	0	62	16	78	2	10	**6**	**18**	
Total Volume	151	261	16	428	45	20	217	282	3	283	77	363	7	36	13	56	
% App. Total	35.3	61	3.7		16	7.1	77		0.8	78	21.2		12.5	64.3	23.2		
PHF	.821	.859	.667	.836	.938	.833	.848	.860	.250	.907	.740	.926	.875	.818	.542	.778	

Accurate Counts
978-664-2565

N/S Street : Route 126
E/W Street: Irving Street
City/State : Framingham, MA
Weather : Clear

File Name : 06910004
Site Code : 09610004
Start Date : 5/18/2006
Page No : 1

Groups Printed- Cars

	Route 126 From North			Irving St From East			Route 126 From South			Store 24 Dr From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00	38	71	6	8	6	42	3	66	15	3	6	2	266
07:15	30	66	3	11	5	57	0	65	23	1	11	1	273
07:30	29	54	4	9	6	35	0	66	16	1	9	2	231
07:45	32	46	3	10	1	36	0	55	14	0	5	0	202
Total	129	237	16	38	18	170	3	252	68	5	31	5	972
08:00	31	66	7	11	1	24	1	58	6	2	11	3	221
08:15	35	62	5	9	5	62	1	69	6	1	9	2	266
08:30	14	50	3	11	4	53	2	80	8	2	6	2	235
08:45	31	73	8	8	6	42	0	56	9	2	10	6	251
Total	111	251	23	39	16	181	4	263	29	7	36	13	973
Grand Total	240	488	39	77	34	351	7	515	97	12	67	18	1945
Apprch %	31.3	63.6	5.1	16.7	7.4	76	1.1	83.2	15.7	12.4	69.1	18.6	
Total %	12.3	25.1	2	4	1.7	18	0.4	26.5	5	0.6	3.4	0.9	

	Route 126 From North				Irving St From East				Route 126 From South				Store 24 Dr 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 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00																	
08:00	31	66	7	104	**11**	1	24	36	1	58	6	65	**2**	**11**	3	16	221
08:15	**35**	62	5	102	9	5	**62**	**76**	1	69	6	76	1	9	2	12	**266**
08:30	14	50	3	67	11	4	53	68	**2**	**80**	8	**90**	2	6	2	10	235
08:45	31	**73**	**8**	**112**	8	**6**	42	56	0	56	**9**	65	2	10	**6**	**18**	251
Total Volume	111	251	23	385	39	16	181	236	4	263	29	296	7	36	13	56	973
% App. Total	28.8	65.2	6		16.5	6.8	76.7		1.4	88.9	9.8		12.5	64.3	23.2		
PHF	.793	.860	.719	.859	.886	.667	.730	.776	.500	.822	.806	.822	.875	.818	.542	.778	.914

Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00				08:00				07:00				08:00			
+0 mins.	31	66	7	104	**11**	1	24	36	3	**66**	15	84	**2**	**11**	3	16
+15 mins.	**35**	62	5	102	9	5	**62**	**76**	0	65	**23**	**88**	1	9	2	12
+30 mins.	14	50	3	67	11	4	53	68	0	66	16	82	2	6	2	10
+45 mins.	31	**73**	**8**	**112**	8	**6**	42	56	0	55	14	69	2	10	**6**	**18**
Total Volume	111	251	23	385	39	16	181	236	3	252	68	323	7	36	13	56
% App. Total	28.8	65.2	6		16.5	6.8	76.7		0.9	78	21.1		12.5	64.3	23.2	
PHF	.793	.860	.719	.859	.886	.667	.730	.776	.250	.955	.739	.918	.875	.818	.542	.778

Accurate Counts
978-664-2565

N/S Street : Route 126
E/W Street: Irving Street
City/State : Framingham, MA
Weather : Clear

File Name : 06910004
Site Code : 09610004
Start Date : 5/18/2006
Page No : 1

Groups Printed- Trucks

	Route 126 From North			Irving St From East			Route 126 From South			Store 24 Dr From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00	8	5	0	2	0	14	0	12	2	0	0	0	43
07:15	7	9	0	1	1	7	0	6	3	0	0	0	34
07:30	3	4	0	2	0	15	0	6	2	1	0	0	33
07:45	4	6	0	2	1	11	0	7	2	0	0	0	33
Total	22	24	0	7	2	47	0	31	9	1	0	0	143
08:00	4	8	0	2	0	4	0	5	3	0	0	0	26
08:15	2	8	0	1	0	5	0	5	0	0	0	0	21
08:30	5	6	0	1	0	5	0	6	0	0	0	0	23
08:45	2	5	0	2	0	7	1	17	0	0	0	0	34
Total	13	27	0	6	0	21	1	33	3	0	0	0	104
Grand Total	35	51	0	13	2	68	1	64	12	1	0	0	247
Apprch %	40.7	59.3	0	15.7	2.4	81.9	1.3	83.1	15.6	100	0	0	
Total %	14.2	20.6	0	5.3	0.8	27.5	0.4	25.9	4.9	0.4	0	0	

	Route 126 From North				Irving St From East				Route 126 From South				Store 24 Dr 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 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00																	
07:00	**8**	5	0	13	**2**	0	14	16	0	**12**	2	**14**	0	0	0	0	**43**
07:15	7	**9**	0	**16**	1	**1**	7	9	0	6	**3**	9	0	0	0	0	34
07:30	3	4	0	7	2	0	**15**	**17**	0	6	2	8	**1**	0	0	**1**	33
07:45	4	6	0	10	2	1	11	14	0	7	2	9	0	0	0	0	33
Total Volume	22	24	0	46	7	2	47	56	0	31	9	40	1	0	0	1	143
% App. Total	47.8	52.2	0		12.5	3.6	83.9		0	77.5	22.5		100	0	0		
PHF	.688	.667	.000	.719	.875	.500	.783	.824	.000	.646	.750	.714	.250	.000	.000	.250	.831

Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00				07:00				07:00				07:00			
+0 mins.	**8**	5	0	13	**2**	0	14	16	0	**12**	2	**14**	0	0	0	0
+15 mins.	7	**9**	0	**16**	1	**1**	7	9	0	6	**3**	9	0	0	0	0
+30 mins.	3	4	0	7	2	0	**15**	**17**	0	6	2	8	**1**	0	0	**1**
+45 mins.	4	6	0	10	2	1	11	14	0	7	2	9	0	0	0	0
Total Volume	22	24	0	46	7	2	47	56	0	31	9	40	1	0	0	1
% App. Total	47.8	52.2	0		12.5	3.6	83.9		0	77.5	22.5		100	0	0	
PHF	.688	.667	.000	.719	.875	.500	.783	.824	.000	.646	.750	.714	.250	.000	.000	.250

Accurate Counts
978-664-2565

N/S Street : Route 126
E/W Street: Irving Street
City/State : Framingham, MA
Weather : Clear

File Name : 06910004
Site Code : 09610004
Start Date : 5/18/2006
Page No : 1

Groups Printed- Cars - Trucks

	Route 126 From North			Irving St From East			Route 126 From South			Store 24 Dr From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
16:00	35	116	10	22	3	47	2	71	30	7	13	5	361
16:15	49	127	13	23	11	46	1	67	12	3	3	5	360
16:30	33	88	9	27	14	54	1	86	15	3	13	8	351
16:45	25	87	7	37	11	56	1	70	9	3	20	6	332
Total	142	418	39	109	39	203	5	294	66	16	49	24	1404
17:00	38	80	9	35	7	69	3	69	11	0	13	7	341
17:15	35	129	8	29	7	47	1	98	18	2	12	7	393
17:30	51	97	4	22	23	65	0	72	35	0	15	2	386
17:45	36	139	11	36	7	41	3	91	25	0	11	5	405
Total	160	445	32	122	44	222	7	330	89	2	51	21	1525
Grand Total	302	863	71	231	83	425	12	624	155	18	100	45	2929
Apprch %	24.4	69.8	5.7	31.3	11.2	57.5	1.5	78.9	19.6	11	61.3	27.6	
Total %	10.3	29.5	2.4	7.9	2.8	14.5	0.4	21.3	5.3	0.6	3.4	1.5	
Cars	286	840	69	218	83	410	12	604	146	18	99	43	2828
% Cars	94.7	97.3	97.2	94.4	100	96.5	100	96.8	94.2	100	99	95.6	96.6
Trucks	16	23	2	13	0	15	0	20	9	0	1	2	101
% Trucks	5.3	2.7	2.8	5.6	0	3.5	0	3.2	5.8	0	1	4.4	3.4

	Route 126 From North				Irving St From East				Route 126 From South				Store 24 Dr 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 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	38	80	9	127	35	7	**69**	**111**	**3**	69	11	83	0	13	**7**	20	341
17:15	35	129	8	172	29	7	47	83	1	**98**	18	117	**2**	12	7	**21**	393
17:30	**51**	97	4	152	22	**23**	65	110	0	72	**35**	107	0	**15**	2	17	386
17:45	36	**139**	**11**	**186**	**36**	7	41	84	3	91	25	**119**	0	11	5	16	**405**
Total Volume	160	445	32	637	122	44	222	388	7	330	89	426	2	51	21	74	1525
% App. Total	25.1	69.9	5		31.4	11.3	57.2		1.6	77.5	20.9		2.7	68.9	28.4		
PHF	.784	.800	.727	.856	.847	.478	.804	.874	.583	.842	.636	.895	.250	.850	.750	.881	.941

Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	17:00				16:45				17:00				16:30				
+0 mins.	38	80	9	127	**37**	11	56	104	**3**	69	11	83	**3**	13	**8**	24	
+15 mins.	35	129	8	172	35	7	**69**	**111**	1	**98**	18	117	3	**20**	6	**29**	
+30 mins.	**51**	97	4	152	29	7	47	83	0	72	**35**	107	0	13	7	20	
+45 mins.	36	**139**	**11**	**186**	22	**23**	65	110	3	91	25	**119**	2	12	7	21	
Total Volume	160	445	32	637	123	48	237	408	7	330	89	426	8	58	28	94	
% App. Total	25.1	69.9	5		30.1	11.8	58.1		1.6	77.5	20.9		8.5	61.7	29.8		
PHF	.784	.800	.727	.856	.831	.522	.859	.919	.583	.842	.636	.895	.667	.725	.875	.810	

Accurate Counts
978-664-2565

N/S Street : Route 126
E/W Street: Irving Street
City/State : Framingham, MA
Weather : Clear

File Name : 06910004
Site Code : 09610004
Start Date : 5/18/2006
Page No : 1

Groups Printed- Cars

	Route 126 From North			Irving St From East			Route 126 From South			Store 24 Dr From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
16:00	32	114	10	22	3	46	2	67	28	7	13	5	349
16:15	43	123	12	20	11	43	1	62	12	3	3	4	337
16:30	31	85	9	25	14	53	1	83	13	3	13	8	338
16:45	23	85	6	34	11	55	1	69	8	3	20	6	321
Total	129	407	37	101	39	197	5	281	61	16	49	23	1345
17:00	36	77	9	34	7	68	3	68	11	0	13	6	332
17:15	35	127	8	28	7	44	1	96	18	2	11	7	384
17:30	51	95	4	20	23	63	0	69	33	0	15	2	375
17:45	35	134	11	35	7	38	3	90	23	0	11	5	392
Total	157	433	32	117	44	213	7	323	85	2	50	20	1483
Grand Total	286	840	69	218	83	410	12	604	146	18	99	43	2828
Apprch %	23.9	70.3	5.8	30.7	11.7	57.7	1.6	79.3	19.2	11.2	61.9	26.9	
Total %	10.1	29.7	2.4	7.7	2.9	14.5	0.4	21.4	5.2	0.6	3.5	1.5	

	Route 126 From North				Irving St From East				Route 126 From South				Store 24 Dr 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 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	36	77	9	122	34	7	**68**	**109**	**3**	68	11	82	0	13	6	19	332
17:15	35	127	8	170	28	**7**	44	79	1	**96**	18	115	**2**	11	**7**	**20**	384
17:30	**51**	95	4	150	20	**23**	63	106	0	69	**33**	102	0	**15**	2	17	375
17:45	35	**134**	**11**	**180**	**35**	7	38	80	3	90	23	**116**	0	11	5	16	**392**
Total Volume	157	433	32	622	117	44	213	374	7	323	85	415	2	50	20	72	1483
% App. Total	25.2	69.6	5.1		31.3	11.8	57		1.7	77.8	20.5		2.8	69.4	27.8		
PHF	.770	.808	.727	.864	.836	.478	.783	.858	.583	.841	.644	.894	.250	.833	.714	.900	.946

Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	17:00				16:45				17:00				16:30			
+0 mins.	36	77	9	122	34	11	55	100	**3**	68	11	82	**3**	13	**8**	24
+15 mins.	35	127	8	170	34	7	**68**	**109**	1	**96**	18	115	3	**20**	6	**29**
+30 mins.	**51**	95	4	150	28	7	44	79	0	69	**33**	102	0	13	6	19
+45 mins.	35	**134**	**11**	**180**	20	**23**	63	106	3	90	23	**116**	2	11	7	20
Total Volume	157	433	32	622	116	48	230	394	7	323	85	415	8	57	27	92
% App. Total	25.2	69.6	5.1		29.4	12.2	58.4		1.7	77.8	20.5		8.7	62	29.3	
PHF	.770	.808	.727	.864	.853	.522	.846	.904	.583	.841	.644	.894	.667	.713	.844	.793

Accurate Counts
978-664-2565

N/S Street : Route 126
E/W Street: Irving Street
City/State : Framingham, MA
Weather : Clear

File Name : 06910004
Site Code : 09610004
Start Date : 5/18/2006
Page No : 1

Groups Printed- Trucks

	Route 126 From North			Irving St From East			Route 126 From South			Store 24 Dr From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
16:00	3	2	0	0	0	1	0	4	2	0	0	0	12
16:15	6	4	1	3	0	3	0	5	0	0	0	1	23
16:30	2	3	0	2	0	1	0	3	2	0	0	0	13
16:45	2	2	1	3	0	1	0	1	1	0	0	0	11
Total	13	11	2	8	0	6	0	13	5	0	0	1	59
17:00	2	3	0	1	0	1	0	1	0	0	0	1	9
17:15	0	2	0	1	0	3	0	2	0	0	1	0	9
17:30	0	2	0	2	0	2	0	3	2	0	0	0	11
17:45	1	5	0	1	0	3	0	1	2	0	0	0	13
Total	3	12	0	5	0	9	0	7	4	0	1	1	42
Grand Total	16	23	2	13	0	15	0	20	9	0	1	2	101
Apprch %	39	56.1	4.9	46.4	0	53.6	0	69	31	0	33.3	66.7	
Total %	15.8	22.8	2	12.9	0	14.9	0	19.8	8.9	0	1	2	

	Route 126 From North				Irving St From East				Route 126 From South				Store 24 Dr 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 16:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:00																	
16:00	3	2	0	5	0	0	1	1	0	4	2	6	0	0	0	0	12
16:15	6	4	1	11	3	0	3	6	0	5	0	5	0	0	1	1	23
16:30	2	3	0	5	2	0	1	3	0	3	2	5	0	0	0	0	13
16:45	2	2	1	5	3	0	1	4	0	1	1	2	0	0	0	0	11
Total Volume	13	11	2	26	8	0	6	14	0	13	5	18	0	0	1	1	59
% App. Total	50	42.3	7.7		57.1	0	42.9		0	72.2	27.8		0	0	100		
PHF	.542	.688	.500	.591	.667	.000	.500	.583	.000	.650	.625	.750	.000	.000	.250	.250	.641

Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	16:00				16:15				16:00				16:15			
+0 mins.	3	2	0	5	3	0	3	6	0	4	2	6	0	0	1	1
+15 mins.	6	4	1	11	2	0	1	3	0	5	0	5	0	0	0	0
+30 mins.	2	3	0	5	3	0	1	4	0	3	2	5	0	0	0	0
+45 mins.	2	2	1	5	1	0	1	2	0	1	1	2	0	0	1	1
Total Volume	13	11	2	26	9	0	6	15	0	13	5	18	0	0	2	2
% App. Total	50	42.3	7.7		60	0	40		0	72.2	27.8		0	0	100	
PHF	.542	.688	.500	.591	.750	.000	.500	.625	.000	.650	.625	.750	.000	.000	.500	.500

Accurate Counts
978-664-2565

N/S Street : Route 126
E/W Street: Union Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 06910002
Site Code : 06910002
Start Date : 5/18/2006
Page No : 1

Groups Printed- Cars - Trucks

	Route 126 From North			Route 126 From South			Union Ave From West		
Start Time	Thru	Right	U-Trn	Left	Thru	U-Trn	Left	Right	Int. Total
07:00	72	7	4	115	125	3	10	46	382
07:15	74	7	1	109	114	4	16	48	373
07:30	60	14	2	103	118	2	7	39	345
07:45	69	10	0	96	98	1	8	38	320
Total	275	38	7	423	455	10	41	171	1420
08:00	67	14	0	98	101	2	16	42	340
08:15	88	10	5	105	106	4	5	29	352
08:30	57	15	3	144	135	6	11	27	398
08:45	87	15	4	128	118	10	12	59	433
Total	299	54	12	475	460	22	44	157	1523
Grand Total	574	92	19	898	915	32	85	328	2943
Apprch %	83.8	13.4	2.8	48.7	49.6	1.7	20.6	79.4	
Total %	19.5	3.1	0.6	30.5	31.1	1.1	2.9	11.1	
Cars	518	89	18	795	838	29	79	285	2651
% Cars	90.2	96.7	94.7	88.5	91.6	90.6	92.9	86.9	90.1
Trucks	56	3	1	103	77	3	6	43	292
% Trucks	9.8	3.3	5.3	11.5	8.4	9.4	7.1	13.1	9.9

	Route 126 From North				Route 126 From South				Union Ave From West			
Start Time	Thru	Right	U-Trn	App. Total	Left	Thru	U-Trn	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - ~~Peak 1 of 1~~												
Peak Hour for Entire Intersection Begins at 08:00												
08:00	67	14	0	81	98	101	2	201	16	42	58	340
08:15	**88**	10	**5**	103	105	106	4	215	5	29	34	352
08:30	57	**15**	3	75	**144**	**135**	6	**285**	11	27	38	398
08:45	87	15	4	**106**	128	118	**10**	256	12	**59**	**71**	**433**
Total Volume	299	54	12	365	475	460	22	957	44	157	201	1523
% App. Total	81.9	14.8	3.3		49.6	48.1	2.3		21.9	78.1		
PHF	.849	.900	.600	.861	.825	.852	.550	.839	.688	.665	.708	.879

Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00				08:00				07:15		
+0 mins.	67	14	0	81	98	101	2	201	16	**48**	**64**
+15 mins.	**88**	10	**5**	103	105	106	4	215	7	39	46
+30 mins.	57	**15**	3	75	**144**	**135**	6	**285**	8	38	46
+45 mins.	87	15	4	**106**	128	118	**10**	256	16	42	58
Total Volume	299	54	12	365	475	460	22	957	47	167	214
% App. Total	81.9	14.8	3.3		49.6	48.1	2.3		22	78	
PHF	.849	.900	.600	.861	.825	.852	.550	.839	.734	.870	.836

Accurate Counts
978-664-2565

N/S Street : Route 126
E/W Street: Union Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 06910002
Site Code : 06910002
Start Date : 5/18/2006
Page No : 1

Groups Printed- Cars

	Route 126 From North			Route 126 From South			Union Ave From West		
Start Time	Thru	Right	U-Trn	Left	Thru	U-Trn	Left	Right	Int. Total
07:00	62	7	4	96	117	3	10	42	341
07:15	64	6	1	91	104	3	15	41	325
07:30	57	14	2	85	109	1	6	36	310
07:45	64	10	0	84	88	1	7	28	282
Total	247	37	7	356	418	8	38	147	1258
08:00	57	14	0	90	97	2	15	32	307
08:15	77	10	4	98	99	3	5	28	324
08:30	53	13	3	127	124	6	10	25	361
08:45	84	15	4	124	100	10	11	53	401
Total	271	52	11	439	420	21	41	138	1393
Grand Total	518	89	18	795	838	29	79	285	2651
Apprch %	82.9	14.2	2.9	47.8	50.4	1.7	21.7	78.3	
Total %	19.5	3.4	0.7	30	31.6	1.1	3	10.8	

	Route 126 From North				Route 126 From South				Union Ave From West			
Start Time	Thru	Right	U-Trn	App. Total	Left	Thru	U-Trn	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1												
Peak Hour for Entire Intersection Begins at 08:00												
08:00	57	14	0	71	90	97	2	189	15	32	47	307
08:15	77	10	4	91	98	99	3	200	5	28	33	324
08:30	53	13	3	69	127	124	6	257	10	25	35	361
08:45	84	15	4	103	124	100	10	234	11	53	64	401
Total Volume	271	52	11	334	439	420	21	880	41	138	179	1393
% App. Total	81.1	15.6	3.3		49.9	47.7	2.4		22.9	77.1		
PHF	.807	.867	.688	.811	.864	.847	.525	.856	.683	.651	.699	.868

Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00				08:00				07:00		
+0 mins.	57	14	0	71	90	97	2	189	10	42	52
+15 mins.	77	10	4	91	98	99	3	200	15	41	56
+30 mins.	53	13	3	69	127	124	6	257	6	36	42
+45 mins.	84	15	4	103	124	100	10	234	7	28	35
Total Volume	271	52	11	334	439	420	21	880	38	147	185
% App. Total	81.1	15.6	3.3		49.9	47.7	2.4		20.5	79.5	
PHF	.807	.867	.688	.811	.864	.847	.525	.856	.633	.875	.826

Accurate Counts
978-664-2565

N/S Street : Route 126
E/W Street: Union Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 06910002
Site Code : 06910002
Start Date : 5/18/2006
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Groups Printed- Trucks

	Route 126 From North			Route 126 From South			Union Ave From West		
Start Time	Thru	Right	U-Trn	Left	Thru	U-Trn	Left	Right	Int. Total
07:00	10	0	0	19	8	0	0	4	41
07:15	10	1	0	18	10	1	1	7	48
07:30	3	0	0	18	9	1	1	3	35
07:45	5	0	0	12	10	0	1	10	38
Total	28	1	0	67	37	2	3	24	162
08:00	10	0	0	8	4	0	1	10	33
08:15	11	0	1	7	7	1	0	1	28
08:30	4	2	0	17	11	0	1	2	37
08:45	3	0	0	4	18	0	1	6	32
Total	28	2	1	36	40	1	3	19	130
Grand Total	56	3	1	103	77	3	6	43	292
Apprch %	93.3	5	1.7	56.3	42.1	1.6	12.2	87.8	
Total %	19.2	1	0.3	35.3	26.4	1	2.1	14.7	

	Route 126 From North				Route 126 From South				Union Ave From West			
Start Time	Thru	Right	U-Trn	App. Total	Left	Thru	U-Trn	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1												
Peak Hour for Entire Intersection Begins at 07:00												
07:00	**10**	0	0	10	**19**	8	0	27	0	4	4	41
07:15	10	**1**	0	**11**	18	**10**	**1**	**29**	**1**	7	8	**48**
07:30	3	0	0	3	18	9	1	28	1	3	4	35
07:45	5	0	0	5	12	10	0	22	1	**10**	**11**	38
Total Volume	28	1	0	29	67	37	2	106	3	24	27	162
% App. Total	96.6	3.4	0		63.2	34.9	1.9		11.1	88.9		
PHF	.700	.250	.000	.659	.882	.925	.500	.914	.750	.600	.614	.844

Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45				07:00				07:15		
+0 mins.	5	0	0	5	**19**	8	0	27	**1**	7	8
+15 mins.	10	0	0	10	18	**10**	**1**	**29**	1	3	4
+30 mins.	**11**	0	**1**	**12**	18	9	1	28	1	**10**	**11**
+45 mins.	4	**2**	0	6	12	10	0	22	1	10	11
Total Volume	30	2	1	33	67	37	2	106	4	30	34
% App. Total	90.9	6.1	3		63.2	34.9	1.9		11.8	88.2	
PHF	.682	.250	.250	.688	.882	.925	.500	.914	1.000	.750	.773

Accurate Counts
978-664-2565

N/S Street : Route 126
E/W Street: Union Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 06910002
Site Code : 06910002
Start Date : 5/18/2006
Page No : 1

Groups Printed- Cars - Trucks

	Route 126 From North			Route 126 From South			Union Ave From West			
Start Time	Thru	Right	U-Trn	Left	Thru	U-Trn	Left	Right	Peds	Int. Total
16:00	81	12	4	130	120	13	10	62	0	432
16:15	113	15	0	103	111	6	16	69	2	435
16:30	93	13	0	135	106	9	16	59	3	434
16:45	76	11	2	133	111	10	15	62	2	422
Total	363	51	6	501	448	38	57	252	7	1723
17:00	73	9	0	127	114	12	10	67	5	417
17:15	83	14	1	129	111	10	12	61	0	421
17:30	72	13	0	123	112	5	13	58	2	398
17:45	86	15	3	132	126	10	11	61	3	447
Total	314	51	4	511	463	37	46	247	10	1683
Grand Total	677	102	10	1012	911	75	103	499	17	3406
Apprch %	85.8	12.9	1.3	50.7	45.6	3.8	16.6	80.6	2.7	
Total %	19.9	3	0.3	29.7	26.7	2.2	3	14.7	0.5	
Cars	651	101	10	978	879	75	101	472	16	3283
% Cars	96.2	99	100	96.6	96.5	100	98.1	94.6	94.1	96.4
Trucks	26	1	0	34	32	0	2	27	1	123
% Trucks	3.8	1	0	3.4	3.5	0	1.9	5.4	5.9	3.6

	Route 126 From North				Route 126 From South				Union Ave From West				
Start Time	Thru	Right	U-Trn	App. Total	Left	Thru	U-Trn	App. Total	Left	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at ~~16:00~~ 4pm													
16:00	81	12	12	97	130	130	~~130~~ 13	130	10	62	0	72	432
16:15	~~132~~ 113	~~432~~ 15	0	0	103	111	6	220	220	220	2	2	2
16:30	93	13	0	106	106	106	9	250	16	59	59	78	434
16:45	76	11	2	89	133	111	10	254	15	62	2	79	422
Total Volume	363	51	6	420	501	448	38	987	57	252	7	316	1723
% App. Total	86.4	12.1	1.4		50.8	45.4	3.9		18	79.7	2.2		
PHF	.803	.850	.375	.820	.928	.933	.731	.938	.891	.913	.583	.908	.990

Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	16:00				17:00				16:15			
+0 mins.	81	12	12	97	127	114	114	253	253	253	2	2
+15 mins.	2	2	0	0	129	111	10	250	16	59	3	78
+30 mins.	93	13	0	106	123	112	5	240	15	62	2	79
+45 mins.	76	11	2	89	89	89	10	10	10	67	67	82
Total Volume	363	51	6	420	511	463	37	1011	57	257	12	326
% App. Total	86.4	12.1	1.4		50.5	45.8	3.7		17.5	78.8	3.7	
PHF	.803	.850	.375	.820	.968	.919	.771	.943	.891	.931	.600	.937

Accurate Counts
978-664-2565

N/S Street : Route 126
E/W Street: Union Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 06910002
Site Code : 06910002
Start Date : 5/18/2006
Page No : 1

Groups Printed- Cars

	Route 126 From North			Route 126 From South			Union Ave From West			
Start Time	Thru	Right	U-Trn	Left	Thru	U-Trn	Left	Right	Peds	Int. Total
16:00	74	12	4	128	118	13	10	59	0	418
16:15	110	15	0	98	102	6	16	66	2	415
16:30	90	13	0	129	101	9	16	55	3	416
16:45	71	11	2	126	107	10	15	55	2	399
Total	345	51	6	481	428	38	57	235	7	1648
17:00	71	9	0	125	110	12	10	64	5	406
17:15	82	14	1	125	106	10	12	59	0	409
17:30	70	13	0	120	109	5	12	56	1	386
17:45	83	14	3	127	126	10	10	58	3	434
Total	306	50	4	497	451	37	44	237	9	1635
Grand Total	651	101	10	978	879	75	101	472	16	3283
Apprch %	85.4	13.3	1.3	50.6	45.5	3.9	17.1	80.1	2.7	
Total %	19.8	3.1	0.3	29.8	26.8	2.3	3.1	14.4	0.5	

	Route 126 From North				Route 126 From South				Union Ave From West				
Start Time	Thru	Right	U-Trn	App. Total	Left	Thru	U-Trn	App. Total	Left	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 16:00													
16:00	74	12	12	90	128	128	128	128	10	59	0	69	69
16:15	69	69	0	0	98	102	6	206	206	206	2	2	415
16:30	90	13	0	103	103	101	9	239	16	55	55	74	416
16:45	71	11	2	84	126	107	10	243	15	55	2	72	399
Total Volume	345	51	6	402	481	428	38	947	57	235	7	299	1648
% App. Total	85.8	12.7	1.5		50.8	45.2	4		19.1	78.6	2.3		
PHF	.784	.850	.375	.804	.932	.907	.731	.914	.891	.890	.583	.890	.986

Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	16:00				17:00				16:15			
+0 mins.	74	12	12	90	125	110	110	247	247	247	2	2
+15 mins.	2	2	0	0	125	106	10	241	16	55	3	74
+30 mins.	90	13	0	103	120	109	5	234	15	55	2	72
+45 mins.	71	11	2	84	84	84	10	10	10	64	64	79
Total Volume	345	51	6	402	497	451	37	985	57	240	12	309
% App. Total	85.8	12.7	1.5		50.5	45.8	3.8		18.4	77.7	3.9	
PHF	.784	.850	.375	.804	.978	.895	.771	.936	.891	.909	.600	.920

Accurate Counts
978-664-2565

N/S Street : Route 126
E/W Street: Union Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 06910002
Site Code : 06910002
Start Date : 5/18/2006
Page No : 1

Groups Printed- Trucks

	Route 126 From North			Route 126 From South			Union Ave From West			
Start Time	Thru	Right	U-Trn	Left	Thru	U-Trn	Left	Right	Peds	Int. Total
16:00	7	0	0	2	2	0	0	3	0	14
16:15	3	0	0	5	9	0	0	3	0	20
16:30	3	0	0	6	5	0	0	4	0	18
16:45	5	0	0	7	4	0	0	7	0	23
Total	18	0	0	20	20	0	0	17	0	75
17:00	2	0	0	2	4	0	0	3	0	11
17:15	1	0	0	4	5	0	0	2	0	12
17:30	2	0	0	3	3	0	1	2	1	12
17:45	3	1	0	5	0	0	1	3	0	13
Total	8	1	0	14	12	0	2	10	1	48
Grand Total	26	1	0	34	32	0	2	27	1	123
Apprch %	96.3	3.7	0	51.5	48.5	0	6.7	90	3.3	
Total %	21.1	0.8	0	27.6	26	0	1.6	22	0.8	

	Route 126 From North				Route 126 From South				Union Ave From West				
Start Time	Thru	Right	U-Trn	App. Total	Left	Thru	U-Trn	App. Total	Left	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 16:00													
16:00	Tot. Volume	0	0	0	2	2	0	4	0	3	0	3	14
16:15	3	0	0	3	5	5	0	0	0	3	0	3	20
16:30	3	0	0	3	6	5	0	11	0	4	0	4	18
16:45	5	0	0	5	5	4	0	11	0	0	0	0	0
Total Volume	18	0	0	18	20	20	0	40	0	17	0	17	75
% App. Total	100	0	0		50	50	0		0	100	0		
PHF	.643	.000	.000	.643	.714	.556	.000	.714	.000	.607	.000	.607	.815

Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	16:00				16:15				16:00			
+0 mins.	100	0	0	0	5	5	0	0	0	3	0	3
+15 mins.	3	0	0	3	6	5	0	11	0	3	0	3
+30 mins.	3	0	0	3	3	4	0	11	0	4	0	4
+45 mins.	5	0	0	5	2	4	0	6	0	0	0	0
Total Volume	18	0	0	18	20	22	0	42	0	17	0	17
% App. Total	100	0	0		47.6	52.4	0		0	100	0	
PHF	.643	.000	.000	.643	.714	.611	.000	.750	.000	.607	.000	.607

Accurate Counts
978-664-2565

N/S Street : Route 126
E/W Street: Union Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 06910002
Site Code : 06910002
Start Date : 5/18/2006
Page No : 1

Groups Printed- Peds

	Route 126 From North			Route 126 From South	
Start Time	#17 WB	#17 EB	#16 EB	#16 WB	Int. Total
07:00	1	4	0	0	5
07:15	5	3	0	0	8
07:30	9	9	4	4	26
07:45	6	4	1	3	14
Total	21	20	5	7	53
08:00	1	12	3	0	16
08:15	9	3	7	1	20
08:30	10	3	2	3	18
08:45	9	7	0	5	21
Total	29	25	12	9	75
Grand Total	50	45	17	16	128
Apprch %	44.6	40.2	15.2	100	
Total %	39.1	35.2	13.3	12.5	

	Route 126 From North				Route 126 From South		
Start Time	#17 WB	#17 EB	#16 EB	App. Total	#16 WB	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1							
Peak Hour for Entire Intersection Begins at 07:30							
07:30	**9**	9	4	**22**	**4**	**4**	**26**
07:45	6	4	1	11	3	3	14
08:00	1	**12**	3	16	0	0	16
08:15	9	3	7	19	1	1	20
Total Volume	25	28	15	68	8	8	76
% App. Total	36.8	41.2	22.1		100		
PHF	.694	.583	.536	.773	.500	.500	.731

Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30				08:00	
+0 mins.	**9**	9	4	**22**	0	0
+15 mins.	6	4	1	11	1	1
+30 mins.	1	**12**	3	16	3	3
+45 mins.	9	3	7	19	**5**	**5**
Total Volume	25	28	15	68	9	9
% App. Total	36.8	41.2	22.1		100	
PHF	.694	.583	.536	.773	.450	.450

Accurate Counts
978-664-2565

N/S Street : Route 126
E/W Street: Union Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 06910002
Site Code : 06910002
Start Date : 5/18/2006
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Groups Printed- Bikes

	Route 126 From North		Route 126 From South		Union Ave From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
07:00	0	0	0	0	0	0	0
07:15	1	0	1	0	1	0	3
07:30	0	0	1	0	1	0	2
07:45	0	0	0	0	0	0	0
Total	1	0	2	0	2	0	5
08:00	0	0	0	0	1	0	1
08:15	0	0	0	0	1	0	1
08:30	0	0	0	0	0	0	0
08:45	2	0	0	0	0	0	2
Total	2	0	0	0	2	0	4
Grand Total	3	0	2	0	4	0	9
Apprch %	100	0	100	0	100	0	
Total %	33.3	0	22.2	0	44.4	0	

	Route 126 From North			Route 126 From South			Union Ave From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15										
07:15	1	0	1	1	0	1	1	0	1	3
07:30	0	0	0	1	0	1	1	0	1	2
07:45	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	1	0	1	1
Total Volume	1	0	1	2	0	2	3	0	3	6
% App. Total	100	0		100	0		100	0		
PHF	.250	.000	.250	.500	.000	.500	.750	.000	.750	.500

Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00			07:00			07:15		
+0 mins.	0	0	0	0	0	0	1	0	1
+15 mins.	0	0	0	1	0	1	1	0	1
+30 mins.	0	0	0	1	0	1	0	0	0
+45 mins.	2	0	2	0	0	0	1	0	1
Total Volume	2	0	2	2	0	2	3	0	3
% App. Total	100	0		100	0		100	0	
PHF	.250	.000	.250	.500	.000	.500	.750	.000	.750

Accurate Counts
978-664-2565

N/S Street : Route 126
E/W Street: Union Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 06910002
Site Code : 06910002
Start Date : 5/18/2006
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Groups Printed- Peds

	Route 126 From North			Route 126 From South	
Start Time	#17 WB	#17 EB	#16 EB	#16 WB	Int. Total
16:00	11	3	9	1	24
16:15	12	5	4	13	34
16:30	15	4	8	2	29
16:45	10	11	9	15	45
Total	48	23	30	31	132
17:00	16	12	13	8	49
17:15	9	10	7	7	33
17:30	14	9	14	8	45
17:45	11	9	16	8	44
Total	50	40	50	31	171
Grand Total	98	63	80	62	303
Apprch %	40.7	26.1	33.2	100	
Total %	32.3	20.8	26.4	20.5	

	Route 126 From North				Route 126 From South		
Start Time	#17 WB	#17 EB	#16 EB	App. Total	#16 WB	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1							
Peak Hour for Entire Intersection Begins at 16:45							
16:45	10	11	9	30	30	30	45
17:00	45	45	13	13	8	8	8
17:15	9	10	7	26	7	7	33
17:30	14	9	9	37	8	8	45
Total Volume	49	42	43	134	38	38	172
% App. Total	36.6	31.3	32.1		100		
PHF	.766	.875	.768	.817	.633	.633	.878

Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	17:00				16:15	
+0 mins.	100	100	13	13	13	13
+15 mins.	9	10	7	26	2	2
+30 mins.	14	9	14	37	37	37
+45 mins.	11	9	9	36	8	8
Total Volume	50	40	50	140	38	38
% App. Total	35.7	28.6	35.7		100	
PHF	.781	.833	.781	.854	.633	.633

Accurate Counts
978-664-2565

N/S Street : Route 126
E/W Street: Union Avenue
City/State : Framingham, MA
Weather : Clear

File Name : 06910002
Site Code : 06910002
Start Date : 5/18/2006
Page No : 1

Groups Printed- Bikes

	Route 126 From North		Route 126 From South		Union Ave From West		
Start Time	Thru	Right	Left	Thru	Left	Right	Int. Total
16:00	2	0	1	0	0	0	3
16:15	0	0	0	0	0	0	0
16:30	4	0	0	2	0	1	7
16:45	1	0	0	1	0	0	2
Total	7	0	1	3	0	1	12
17:00	1	0	1	0	0	0	2
17:15	4	0	0	2	0	0	6
17:30	1	1	1	0	0	0	3
17:45	0	0	1	0	0	0	1
Total	6	1	3	2	0	0	12
Grand Total	13	1	4	5	0	1	24
Apprch %	92.9	7.1	44.4	55.6	0	100	
Total %	54.2	4.2	16.7	20.8	0	4.2	

	Route 126 From North			Route 126 From South			Union Ave From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 16:30										
16:30 Tot. Volume	0	0	0	0	0	0	0	0	0	0
16:45	1	0	1	0	1	1	0	0	0	2
17:00	1	0	1	1	0	1	0	0	0	2
17:15	4	0	4	0	2	2	0	0	0	6
Total Volume	10	0	10	1	5	6	0	1	1	17
% App. Total	100	0		16.7	83.3		0	100		
PHF	.625	.000	.625	.250	.625	.750	.000	.250	.250	.607

Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	16:30			16:30			16:00		
+0 mins.	100	0	0	0	0	0	0	0	0
+15 mins.	1	0	1	0	1	1	0	0	0
+30 mins.	1	0	1	1	0	1	0	0	0
+45 mins.	4	0	4	0	2	2	0	0	0
Total Volume	10	0	10	1	5	6	0	1	1
% App. Total	100	0		16.7	83.3		0	100	
PHF	.625	.000	.625	.250	.625	.750	.000	.250	.250

Accurate Counts
978-664-2565

Location : Route 126 North of
Location : Union Avenue
City/State: Framingham, MA
Counter : 10064

A

06910001
Site Code: 06910001

Start Time	29-May-06 NB	29-May-06 SB	Tue NB	Tue SB	Wed NB	Wed SB	Thu NB	Thu SB	Fri NB	Fri SB	Sat NB	Sat SB	Sun NB	Sun SB	Week Average NB	Week Average SB
12:00 AM	*	*	*	*	*	*	82	117	*	*	*	*	*	*	82	117
01:00	*	*	*	*	*	*	51	67	*	*	*	*	*	*	51	67
02:00	*	*	*	*	*	*	34	24	*	*	*	*	*	*	34	24
03:00	*	*	*	*	*	*	49	28	*	*	*	*	*	*	49	28
04:00	*	*	*	*	*	*	106	52	*	*	*	*	*	*	106	52
05:00	*	*	*	*	*	*	248	126	*	*	*	*	*	*	248	126
06:00	*	*	*	*	*	*	577	361	*	*	*	*	*	*	577	361
07:00	*	*	*	*	*	*	536	321	*	*	*	*	*	*	536	321
08:00	*	*	*	*	*	*	480	347	*	*	*	*	*	*	480	347
09:00	*	*	*	*	*	*	541	383	*	*	*	*	*	*	541	383
10:00	*	*	*	*	*	*	551	402	*	*	*	*	*	*	551	402
11:00	*	*	*	*	*	*	517	333	*	*	*	*	*	*	517	333
12:00 PM	*	*	*	*	*	*	506	313	*	*	*	*	*	*	506	313
01:00	*	*	*	*	*	*	545	462	*	*	*	*	*	*	545	462
02:00	*	*	*	*	*	*	479	277	*	*	*	*	*	*	479	277
03:00	*	*	*	*	*	*	550	327	*	*	*	*	*	*	550	327
04:00	*	*	*	*	*	*	525	398	*	*	*	*	*	*	525	398
05:00	*	*	*	*	*	*	508	278	*	*	*	*	*	*	508	278
06:00	*	*	*	*	*	*	555	345	*	*	*	*	*	*	555	345
07:00	*	*	*	*	*	*	516	446	*	*	*	*	*	*	516	446
08:00	*	*	*	*	*	*	434	429	*	*	*	*	*	*	434	429
09:00	*	*	*	*	*	*	402	457	*	*	*	*	*	*	402	457
10:00	*	*	*	*	*	*	261	354	*	*	*	*	*	*	261	354
11:00	*	*	*	*	*	*	165	238	*	*	*	*	*	*	165	238
Lane	0	0	0	0	0	0	9218	6885	0	0	0	0	0	0	9218	6885
Day	0		0		0		16103		0		0		0		16103	
AM Peak Vol.							06:00	10:00							06:00	10:00
							577	402							577	402
PM Peak Vol.							18:00	13:00							18:00	13:00
							555	462							555	462
Comb. Total	0		0		0		16103		0		0		0		16103	

ADT Not Calculated

B

Accurate Counts
978-664-2565

Location : Route 126 North of
Location : Route 135
City/State: Framingham, MA
Counter : 9577

06910002
Site Code: 06910002

Start Time	29-May-06 SB	29-May-06 NB	Tue SB	Tue NB	Wed SB	Wed NB	Thu SB	Thu NB	Fri SB	Fri NB	Sat SB	Sat NB	Sun SB	Sun NB	Week Average SB	Week Average NB
12:00 AM	*	*	*	*	*	*	175	120	192	120	*	*	*	*	184	120
01:00	*	*	*	*	*	*	94	60	136	82	*	*	*	*	115	71
02:00	*	*	*	*	*	*	39	47	66	52	*	*	*	*	52	50
03:00	*	*	*	*	*	*	55	58	49	75	*	*	*	*	52	66
04:00	*	*	*	*	*	*	74	131	74	109	*	*	*	*	74	120
05:00	*	*	*	*	*	*	222	321	221	320	*	*	*	*	222	320
06:00	*	*	*	*	*	*	595	728	544	685	*	*	*	*	570	706
07:00	*	*	*	*	*	*	570	764	560	723	*	*	*	*	565	744
08:00	*	*	*	*	*	*	526	707	620	780	*	*	*	*	573	744
09:00	*	*	*	*	*	*	623	714	670	802	*	*	*	*	646	758
10:00	*	*	*	*	*	*	624	691	685	768	*	*	*	*	654	730
11:00	*	*	*	*	*	*	656	696	657	715	*	*	*	*	656	706
12:00 PM	*	*	*	*	*	*	648	649	688	722	*	*	*	*	668	686
01:00	*	*	*	*	*	*	736	725	693	762	*	*	*	*	714	744
02:00	*	*	*	*	*	*	601	672	696	799	*	*	*	*	648	736
03:00	*	*	*	*	*	*	668	693	676	747	*	*	*	*	672	720
04:00	*	*	*	*	*	*	780	686	677	691	*	*	*	*	728	688
05:00	*	*	*	*	*	*	675	662	681	620	*	*	*	*	678	641
06:00	*	*	*	*	*	*	764	691	684	627	*	*	*	*	724	659
07:00	*	*	*	*	*	*	749	674	717	676	*	*	*	*	733	675
08:00	*	*	*	*	*	*	631	540	620	602	*	*	*	*	626	571
09:00	*	*	*	*	*	*	696	516	671	498	*	*	*	*	684	507
10:00	*	*	*	*	*	*	513	376	607	457	*	*	*	*	560	416
11:00	*	*	*	*	*	*	366	257	452	322	*	*	*	*	409	290
Lane	0	0	0	0	0	0	12080	12178	12336	12754	0	0	0	0	12207	12468
Day	0		0		0		24258		25090		0		0		24675	
AM Peak							11:00	07:00	10:00	09:00					11:00	09:00
Vol.							656	764	685	802					656	758
PM Peak							16:00	13:00	19:00	14:00					19:00	13:00
Vol.							780	725	717	799					733	744
Comb. Total	0		0		0		24258		25090		0		0		24675	

ADT Not Calculated

Accurate Counts
978-664-2565

C

Location : Route 126 SB South of
Location : Route 135
City/State: Framingham, MA
Counter : 15841

06910SB3
Site Code: 06910003

Start Time	Mon 29-May-06	Tue 30-May-06	Wed 31-May-06	Thu 01-Jun-06	Fri 02-Jun-06	Average Day	Sat 03-Jun-06	Sun 04-Jun-06	Week Average
12:00 AM	*	*	*	155	*	155	*	*	155
01:00	*	*	*	122	*	122	*	*	122
02:00	*	*	*	66	*	66	*	*	66
03:00	*	*	*	51	*	51	*	*	51
04:00	*	*	*	72	*	72	*	*	72
05:00	*	*	*	167	*	167	*	*	167
06:00	*	*	*	471	*	471	*	*	471
07:00	*	*	*	511	*	511	*	*	511
08:00	*	*	*	536	*	536	*	*	536
09:00	*	*	*	579	*	579	*	*	579
10:00	*	*	*	570	*	570	*	*	570
11:00	*	*	*	591	*	591	*	*	591
12:00 PM	*	*	*	588	*	588	*	*	588
01:00	*	*	*	602	*	602	*	*	602
02:00	*	*	*	616	*	616	*	*	616
03:00	*	*	*	623	*	623	*	*	623
04:00	*	*	*	724	*	724	*	*	724
05:00	*	*	*	596	*	596	*	*	596
06:00	*	*	*	697	*	697	*	*	697
07:00	*	*	*	647	*	647	*	*	647
08:00	*	*	*	548	*	548	*	*	548
09:00	*	*	*	643	*	643	*	*	643
10:00	*	*	*	485	*	485	*	*	485
11:00	*	*	*	355	*	355	*	*	355
Day Total	0	0	0	11015	0	11015	0	0	11015
% Avg. WkDay	0.0%	0.0%	0.0%	100.0%	0.0%				
% Avg. Week	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%	0.0%	0.0%	
AM Peak				11:00		11:00			11:00
Vol.				591		591			591
PM Peak				16:00		16:00			16:00
Vol.				724		724			724
Grand Total	0	0	0	11015	0	11015	0	0	11015

ADT Not Calculated

Accurate Counts
978-664-2565

Location : Route 126 NB South of
Location : Route 135
City/State: Framingham, MA
Counter : 14015

06910NB3
Site Code: 06910003

Start Time	Mon 29-May-06	Tue 30-May-06	Wed 31-May-06	Thu 01-Jun-06	Fri 02-Jun-06	Average Day	Sat 03-Jun-06	Sun 04-Jun-06	Week Average
12:00 AM	*	*	*	94	*	94	*	*	94
01:00	*	*	*	82	*	82	*	*	82
02:00	*	*	*	42	*	42	*	*	42
03:00	*	*	*	67	*	67	*	*	67
04:00	*	*	*	101	*	101	*	*	101
05:00	*	*	*	292	*	292	*	*	292
06:00	*	*	*	513	*	513	*	*	513
07:00	*	*	*	514	*	514	*	*	514
08:00	*	*	*	529	*	529	*	*	529
09:00	*	*	*	508	*	508	*	*	508
10:00	*	*	*	483	*	483	*	*	483
11:00	*	*	*	467	*	467	*	*	467
12:00 PM	*	*	*	428	*	428	*	*	428
01:00	*	*	*	502	*	502	*	*	502
02:00	*	*	*	419	*	419	*	*	419
03:00	*	*	*	479	*	479	*	*	479
04:00	*	*	*	460	*	460	*	*	460
05:00	*	*	*	471	*	471	*	*	471
06:00	*	*	*	521	*	521	*	*	521
07:00	*	*	*	404	*	404	*	*	404
08:00	*	*	*	0	*	0	*	*	0
09:00	*	*	*	269	*	269	*	*	269
10:00	*	*	*	308	*	308	*	*	308
11:00	*	*	*	203	*	203	*	*	203
Day Total	0	0	0	8156	0	8156	0	0	8156
% Avg. WkDay	0.0%	0.0%	0.0%	100.0%	0.0%				
% Avg. Week	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%	0.0%	0.0%	
AM Peak				08:00		08:00			08:00
Vol.				529		529			529
PM Peak				18:00		18:00			18:00
Vol.				521		521			521
Grand Total	0	0	0	8156	0	8156	0	0	8156

ADT Not Calculated

Accurate Counts
978-664-2565

Location : Route 126 South of
Location : Waushakum Street
City/State: Framingham, MA
Counter : 16216

D

06910004
Site Code: 06910004

Start Time	29-May-06 NB	29-May-06 SB	Tue NB	Tue SB	Wed NB	Wed SB	Thu NB	Thu SB	Fri NB	Fri SB	Sat NB	Sat SB	Sun NB	Sun SB	Week Average NB	Week Average SB
12:00 AM	*	*	*	*	*	*	73	106	*	*	*	*	*	*	73	106
01:00	*	*	*	*	*	*	40	68	*	*	*	*	*	*	40	68
02:00	*	*	*	*	*	*	33	14	*	*	*	*	*	*	33	14
03:00	*	*	*	*	*	*	37	37	*	*	*	*	*	*	37	37
04:00	*	*	*	*	*	*	89	51	*	*	*	*	*	*	89	51
05:00	*	*	*	*	*	*	258	150	*	*	*	*	*	*	258	150
06:00	*	*	*	*	*	*	577	449	*	*	*	*	*	*	577	449
07:00	*	*	*	*	*	*	661	467	*	*	*	*	*	*	661	467
08:00	*	*	*	*	*	*	569	476	*	*	*	*	*	*	569	476
09:00	*	*	*	*	*	*	557	478	*	*	*	*	*	*	557	478
10:00	*	*	*	*	*	*	534	475	*	*	*	*	*	*	534	475
11:00	*	*	*	*	*	*	873	190	*	*	*	*	*	*	873	190
12:00 PM	*	*	*	*	*	*	974	83	*	*	*	*	*	*	974	83
01:00	*	*	*	*	*	*	1013	74	*	*	*	*	*	*	1013	74
02:00	*	*	*	*	*	*	1057	50	*	*	*	*	*	*	1057	50
03:00	*	*	*	*	*	*	1135	67	*	*	*	*	*	*	1135	67
04:00	*	*	*	*	*	*	1312	58	*	*	*	*	*	*	1312	58
05:00	*	*	*	*	*	*	1345	64	*	*	*	*	*	*	1345	64
06:00	*	*	*	*	*	*	1295	85	*	*	*	*	*	*	1295	85
07:00	*	*	*	*	*	*	1144	48	*	*	*	*	*	*	1144	48
08:00	*	*	*	*	*	*	868	67	*	*	*	*	*	*	868	67
09:00	*	*	*	*	*	*	788	51	*	*	*	*	*	*	788	51
10:00	*	*	*	*	*	*	575	29	*	*	*	*	*	*	575	29
11:00	*	*	*	*	*	*	359	3	*	*	*	*	*	*	359	3
Lane	0	0	0	0	0	0	16166	3640	0	0	0	0	0	0	16166	3640
Day	0		0		0		19806		0		0		0		19806	
AM Peak							11:00	09:00							11:00	09:00
Vol.							873	478							873	478
PM Peak							17:00	18:00							17:00	18:00
Vol.							1345	85							1345	85
Comb. Total	0		0		0		19806		0		0		0		19806	

ADT Not Calculated

Accurate Counts
978-664-2565

Location : Route 135 East of
Location : Route 126
City/State: Framingham, MA
Counter : 16193

E

06910005
Site Code: 06910005

Start Time	29-May-06 EB	29-May-06 WB	Tue EB	Tue WB	Wed EB	Wed WB	Thu EB	Thu WB	Fri EB	Fri WB	Sat EB	Sat WB	Sun EB	Sun WB	Week Average EB	Week Average WB
12:00 AM	*	*	*	*	*	*	89	91	*	*	*	*	*	*	89	91
01:00	*	*	*	*	*	*	28	34	*	*	*	*	*	*	28	34
02:00	*	*	*	*	*	*	32	17	*	*	*	*	*	*	32	17
03:00	*	*	*	*	*	*	22	18	*	*	*	*	*	*	22	18
04:00	*	*	*	*	*	*	52	40	*	*	*	*	*	*	52	40
05:00	*	*	*	*	*	*	165	133	*	*	*	*	*	*	165	133
06:00	*	*	*	*	*	*	470	346	*	*	*	*	*	*	470	346
07:00	*	*	*	*	*	*	507	401	*	*	*	*	*	*	507	401
08:00	*	*	*	*	*	*	566	441	*	*	*	*	*	*	566	441
09:00	*	*	*	*	*	*	479	440	*	*	*	*	*	*	479	440
10:00	*	*	*	*	*	*	463	454	*	*	*	*	*	*	463	454
11:00	*	*	*	*	*	*	405	432	*	*	*	*	*	*	405	432
12:00 PM	*	*	*	*	*	*	434	478	*	*	*	*	*	*	434	478
01:00	*	*	*	*	*	*	498	419	*	*	*	*	*	*	498	419
02:00	*	*	*	*	*	*	449	452	*	*	*	*	*	*	449	452
03:00	*	*	*	*	*	*	515	466	*	*	*	*	*	*	515	466
04:00	*	*	*	*	*	*	470	478	*	*	*	*	*	*	470	478
05:00	*	*	*	*	*	*	449	522	*	*	*	*	*	*	449	522
06:00	*	*	*	*	*	*	504	476	*	*	*	*	*	*	504	476
07:00	*	*	*	*	*	*	425	437	*	*	*	*	*	*	425	437
08:00	*	*	*	*	*	*	369	339	*	*	*	*	*	*	369	339
09:00	*	*	*	*	*	*	313	301	*	*	*	*	*	*	313	301
10:00	*	*	*	*	*	*	224	265	*	*	*	*	*	*	224	265
11:00	*	*	*	*	*	*	179	157	*	*	*	*	*	*	179	157
Lane	0	0	0	0	0	0	8107	7637	0	0	0	0	0	0	8107	7637
Day	0		0		0		15744		0		0		0		15744	
AM Peak Vol.							08:00 566	10:00 454							08:00 566	10:00 454
PM Peak Vol.							15:00 515	17:00 522							15:00 515	17:00 522
Comb. Total	0		0		0		15744		0		0		0		15744	
ADT	Not Calculated															

Accurate Counts
978-664-2565

Location : Route 135 WB West of
Location : Route 126
City/State: Framingham, MA
Counter : 9574

F

06910WB6
Site Code: 06910006

Start Time	Mon 29-May-06	Tue 30-May-06	Wed 31-May-06	Thu 01-Jun-06	Fri 02-Jun-06	Average Day	Sat 03-Jun-06	Sun 04-Jun-06	Week Average
12:00 AM	*	*	*	125	*	125	*	*	125
01:00	*	*	*	56	*	56	*	*	56
02:00	*	*	*	27	*	27	*	*	27
03:00	*	*	*	15	*	15	*	*	15
04:00	*	*	*	45	*	45	*	*	45
05:00	*	*	*	159	*	159	*	*	159
06:00	*	*	*	425	*	425	*	*	425
07:00	*	*	*	507	*	507	*	*	507
08:00	*	*	*	499	*	499	*	*	499
09:00	*	*	*	390	*	390	*	*	390
10:00	*	*	*	368	*	368	*	*	368
11:00	*	*	*	386	*	386	*	*	386
12:00 PM	*	*	*	386	*	386	*	*	386
01:00	*	*	*	431	*	431	*	*	431
02:00	*	*	*	452	*	452	*	*	452
03:00	*	*	*	526	*	526	*	*	526
04:00	*	*	*	485	*	485	*	*	485
05:00	*	*	*	504	*	504	*	*	504
06:00	*	*	*	533	*	533	*	*	533
07:00	*	*	*	491	*	491	*	*	491
08:00	*	*	*	370	*	370	*	*	370
09:00	*	*	*	309	*	309	*	*	309
10:00	*	*	*	239	*	239	*	*	239
11:00	*	*	*	159	*	159	*	*	159
Day Total	0	0	0	7887	0	7887	0	0	7887
% Avg. WkDay	0.0%	0.0%	0.0%	100.0%	0.0%				
% Avg. Week	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%	0.0%	0.0%	
AM Peak				07:00		07:00			07:00
Vol.				507		507			507
PM Peak				18:00		18:00			18:00
Vol.				533		533			533
Grand Total	0	0	0	7887	0	7887	0	0	7887

ADT Not Calculated

Accurate Counts
978-664-2565

Location : Route 135 EB West of
Location : Route 126
City/State: Framingham, MA
Counter : 10109

06910EB6
Site Code: 06910006

Start Time	Mon 29-May-06	Tue 30-May-06	Wed 31-May-06	Thu 01-Jun-06	Fri 02-Jun-06	Average Day	Sat 03-Jun-06	Sun 04-Jun-06	Week Average
12:00 AM	*	*	*	57	*	57	*	*	57
01:00	*	*	*	35	*	35	*	*	35
02:00	*	*	*	37	*	37	*	*	37
03:00	*	*	*	20	*	20	*	*	20
04:00	*	*	*	38	*	38	*	*	38
05:00	*	*	*	145	*	145	*	*	145
06:00	*	*	*	408	*	408	*	*	408
07:00	*	*	*	449	*	449	*	*	449
08:00	*	*	*	469	*	469	*	*	469
09:00	*	*	*	441	*	441	*	*	441
10:00	*	*	*	409	*	409	*	*	409
11:00	*	*	*	355	*	355	*	*	355
12:00 PM	*	*	*	356	*	356	*	*	356
01:00	*	*	*	364	*	364	*	*	364
02:00	*	*	*	363	*	363	*	*	363
03:00	*	*	*	346	*	346	*	*	346
04:00	*	*	*	326	*	326	*	*	326
05:00	*	*	*	365	*	365	*	*	365
06:00	*	*	*	344	*	344	*	*	344
07:00	*	*	*	352	*	352	*	*	352
08:00	*	*	*	258	*	258	*	*	258
09:00	*	*	*	248	*	248	*	*	248
10:00	*	*	*	191	*	191	*	*	191
11:00	*	*	*	132	*	132	*	*	132
Day Total	0	0	0	6508	0	6508	0	0	6508
% Avg. WkDay	0.0%	0.0%	0.0%	100.0%	0.0%				
% Avg. Week	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%	0.0%	0.0%	
AM Peak				08:00		08:00			08:00
Vol.				469		469			469
PM Peak				17:00		17:00			17:00
Vol.				365		365			365
Grand Total	0	0	0	6508	0	6508	0	0	6508

ADT Not Calculated

Accurate Counts
978-664-2565

Location : Union Avenue West of
Location : Route 126
City/State: Framingham, MA
Counter : 13648

G

06910007
Site Code: 06910007

Start Time	29-May-06 SB	29-May-06 NB	Tue SB	Tue NB	Wed SB	Wed NB	Thu SB	Thu NB	Fri SB	Fri NB	Sat SB	Sat NB	Sun SB	Sun NB	Week Average SB	Week Average NB
12:00 AM	*	*	*	*	*	*	57	62	*	*	*	*	*	*	57	62
01:00	*	*	*	*	*	*	20	17	*	*	*	*	*	*	20	17
02:00	*	*	*	*	*	*	14	15	*	*	*	*	*	*	14	15
03:00	*	*	*	*	*	*	25	22	*	*	*	*	*	*	25	22
04:00	*	*	*	*	*	*	23	37	*	*	*	*	*	*	23	37
05:00	*	*	*	*	*	*	111	122	*	*	*	*	*	*	111	122
06:00	*	*	*	*	*	*	300	403	*	*	*	*	*	*	300	403
07:00	*	*	*	*	*	*	267	552	*	*	*	*	*	*	267	552
08:00	*	*	*	*	*	*	209	462	*	*	*	*	*	*	209	462
09:00	*	*	*	*	*	*	278	425	*	*	*	*	*	*	278	425
10:00	*	*	*	*	*	*	253	438	*	*	*	*	*	*	253	438
11:00	*	*	*	*	*	*	183	473	*	*	*	*	*	*	183	473
12:00 PM	*	*	*	*	*	*	240	409	*	*	*	*	*	*	240	409
01:00	*	*	*	*	*	*	334	479	*	*	*	*	*	*	334	479
02:00	*	*	*	*	*	*	200	413	*	*	*	*	*	*	200	413
03:00	*	*	*	*	*	*	278	452	*	*	*	*	*	*	278	452
04:00	*	*	*	*	*	*	314	512	*	*	*	*	*	*	314	512
05:00	*	*	*	*	*	*	236	551	*	*	*	*	*	*	236	551
06:00	*	*	*	*	*	*	325	513	*	*	*	*	*	*	325	513
07:00	*	*	*	*	*	*	286	429	*	*	*	*	*	*	286	429
08:00	*	*	*	*	*	*	236	337	*	*	*	*	*	*	236	337
09:00	*	*	*	*	*	*	245	293	*	*	*	*	*	*	245	293
10:00	*	*	*	*	*	*	189	275	*	*	*	*	*	*	189	275
11:00	*	*	*	*	*	*	142	162	*	*	*	*	*	*	142	162
Lane	0	0	0	0	0	0	4765	7853	0	0	0	0	0	0	4765	7853
Day	0		0		0		12618		0		0		0		12618	
AM Peak Vol.							06:00 300	07:00 552							06:00 300	07:00 552
PM Peak Vol.							13:00 334	17:00 551							13:00 334	17:00 551
Comb. Total	0		0		0		12618		0		0		0		12618	
ADT	Not Calculated															

Accurate Counts
978-664-2565

Location : Irving Street East of
Location : Route 126
City/State: Framingham, MA
Counter : 16192

H

06910008
Site Code: 06910008

Start Time	29-May-06 EB	29-May-06 WB	Tue EB	Tue WB	Wed EB	Wed WB	Thu EB	Thu WB	Fri EB	Fri WB	Sat EB	Sat WB	Sun EB	Sun WB	Week Average EB	Week Average WB
12:00 AM	*	*	*	*	*	*	21	46	*	*	*	*	*	*	21	46
01:00	*	*	*	*	*	*	15	28	*	*	*	*	*	*	15	28
02:00	*	*	*	*	*	*	5	12	*	*	*	*	*	*	5	12
03:00	*	*	*	*	*	*	24	16	*	*	*	*	*	*	24	16
04:00	*	*	*	*	*	*	29	26	*	*	*	*	*	*	29	26
05:00	*	*	*	*	*	*	90	92	*	*	*	*	*	*	90	92
06:00	*	*	*	*	*	*	150	391	*	*	*	*	*	*	150	391
07:00	*	*	*	*	*	*	122	353	*	*	*	*	*	*	122	353
08:00	*	*	*	*	*	*	76	339	*	*	*	*	*	*	76	339
09:00	*	*	*	*	*	*	155	276	*	*	*	*	*	*	155	276
10:00	*	*	*	*	*	*	206	246	*	*	*	*	*	*	206	246
11:00	*	*	*	*	*	*	219	232	*	*	*	*	*	*	219	232
12:00 PM	*	*	*	*	*	*	201	237	*	*	*	*	*	*	201	237
01:00	*	*	*	*	*	*	246	291	*	*	*	*	*	*	246	291
02:00	*	*	*	*	*	*	217	236	*	*	*	*	*	*	217	236
03:00	*	*	*	*	*	*	269	251	*	*	*	*	*	*	269	251
04:00	*	*	*	*	*	*	322	318	*	*	*	*	*	*	322	318
05:00	*	*	*	*	*	*	299	246	*	*	*	*	*	*	299	246
06:00	*	*	*	*	*	*	311	272	*	*	*	*	*	*	311	272
07:00	*	*	*	*	*	*	239	264	*	*	*	*	*	*	239	264
08:00	*	*	*	*	*	*	186	194	*	*	*	*	*	*	186	194
09:00	*	*	*	*	*	*	152	248	*	*	*	*	*	*	152	248
10:00	*	*	*	*	*	*	137	178	*	*	*	*	*	*	137	178
11:00	*	*	*	*	*	*	92	103	*	*	*	*	*	*	92	103
Lane	0	0	0	0	0	0	3783	4895	0	0	0	0	0	0	3783	4895
Day	0		0		0		8678		0		0		0		8678	
AM Peak Vol.							11:00 219	06:00 391							11:00 219	06:00 391
PM Peak Vol.							16:00 322	16:00 318							16:00 322	16:00 318
Comb. Total	0		0		0		8678		0		0		0		8678	

ADT Not Calculated

APPENDIX B

Crash Rate Worksheets

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : Framingham COUNT DATE : May-06

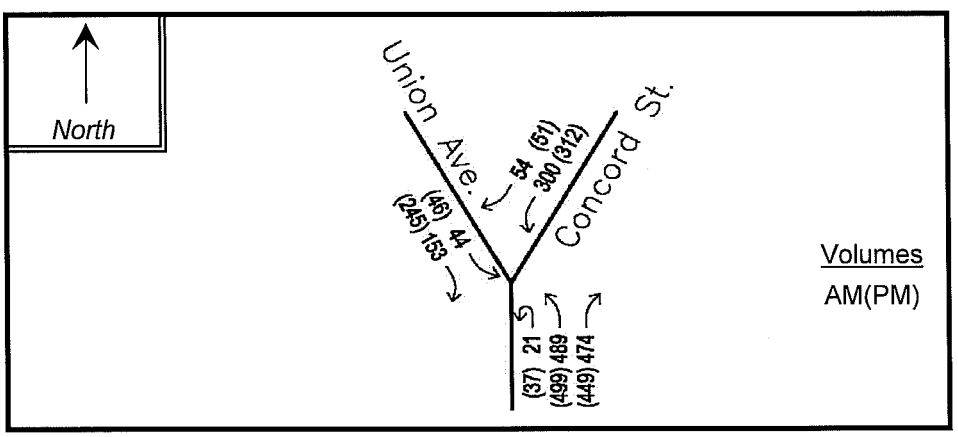
DISTRICT : 3 UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Concord St

MINOR STREET(S) : Union Ave

INTERSECTION DIAGRAM
(Label Approaches)



Peak Hour Volumes

APPROACH :	1	2	3	4	5	Total Entering Vehicles
DIRECTION :	NB	SB	EB			
VOLUMES (AM/PM) :	985	363	291			1,639

" K " FACTOR : 0.063 APPROACH ADT : 26,016 ADT = TOTAL VOL/"K" FACT.

TOTAL # OF CRASHES : 53 # OF YEARS : 3 AVERAGE # OF CRASHES (A) : 17.67

CRASH RATE CALCULATION : 1.86 RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Comments : Average Crash Rates for unsignalized intersections: District 3 = 0.79; Statewide = 0.66

Project Title & Date: Framingham Downtown Programatic Plan

MassHighway

CRASH RATE WORKSHEET

CITY/TOWN : Framingham COUNT DATE : May-06

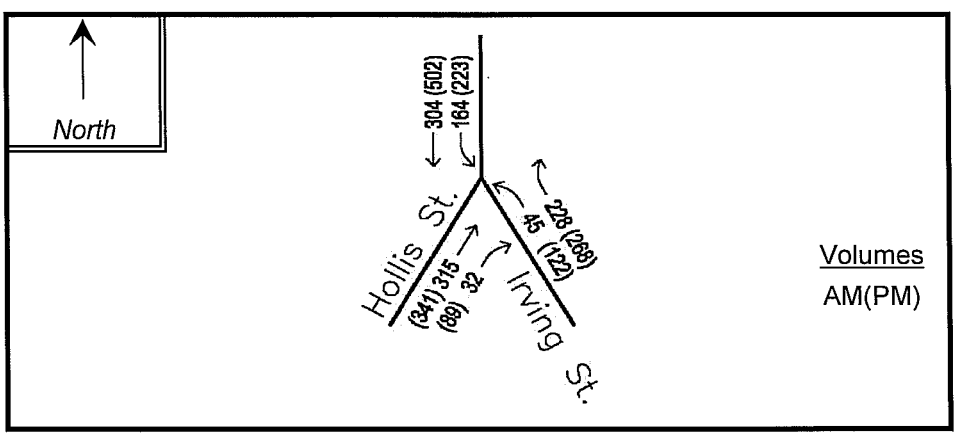
DISTRICT : 3 UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Hollis St / Irving St

MINOR STREET(S) : Irving St

INTERSECTION DIAGRAM
(Label Approaches)



Peak Hour Volumes

APPROACH :	1	2	3	4	5	Total Entering Vehicles
DIRECTION :	NB	SB	WB			
VOLUMES (AM/PM) :	430	725	390			1,545

" K " FACTOR : 0.061 APPROACH ADT : 25,328 ADT = TOTAL VOL/"K" FACT.

TOTAL # OF CRASHES : 41 # OF YEARS : 3 AVERAGE # OF CRASHES (**A**) : 13.67

CRASH RATE CALCULATION : 1.48 RATE = $\frac{(A * 1{,}000{,}000)}{(ADT * 365)}$

Comments : Average Crash Rates for unsignalized intersections: District 3 = 0.79; Statewide = 0.66

Project Title & Date: Framingham Downtown Programatic Plan

APPENDIX C

Signal Warrant Analysis

Warrants Summary

Information			
Analyst	MWW	Intersection	Concord Street @ Union Avenue
Agency/Co	BETA Group, Inc.	Jurisdiction	Framingham, MA
Date Performed	5/16/2008	Units	U.S. Customary
Project ID	3619 - Framingham Programatic	Time Period Analyzed	AM
East/West Street	Union Avenue	North/South Street	Concord Street (Route 126)
File Name	Union@Concord.xhy	Major Street	North-South

Project Description *3619 - Framingham Programatic*

General				Roadway Network	
Major Street Speed (mph)	25	☐	Population < 10,000	Two Major Routes	☐
Nearest Signal (ft)	500	☐	Coordinated Signal System	Weekend Count	☐
Crashes (per year)	17	☐	Adequate Trials of Alternatives	5-yr Growth Factor	0

Geometry and Traffic	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N	1	1	1	0	0	0	0	1	0	0	1	0
Lane usage	L	T	R					T			T	
Vehicle Volume Averages (vph)	0	259	0	0	0	0	0	713	0	0	660	0
Peds (ped/h) / Gaps (gaps/h)	--	/	--	--	/	--	--	/	--	--	/	--
Delay (s/veh) / (veh-hr)	--	/	--	--	/	--	--	/	--	--	/	--

Warrant 1: Eight-Hour Vehicular Volume	☑
1 A. Minimum Vehicular Volumes (Both major approaches --and-- higher minor approach) --or--	☑
1 B. Interruption of Continuous Traffic (Both major approaches --and-- higher minor approach) --or--	☑
1 80% Vehicular --and-- Interruption Volumes (Both major approaches --and-- higher minor approach)	☑
Warrant 2: Four-Hour Vehicular Volume	☑
2 A. Four-Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)	☑
Warrant 3: Peak Hour	☑
3 A. Peak-Hour Conditions (Minor delay --and-- minor volume --and-- total volume) --or--	☐
3 B. Peak- Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)	☑
Warrant 4: Pedestrian Volume	☐
4 A. Pedestrian Volumes (Four hours --or-- one hour) --and--	☐
4 B. Gaps Same Period (Four hours --or-- one hour)	☐
Warrant 5: School Crossing	☐
5. Student Volumes --and--	☐
5. Gaps Same Period	☐
Warrant 6: Coordinated Signal System	☐
6. Degree of Platooning (Predominant direction or both directions)	☐
Warrant 7: Crash Experience	☐
7 A. Adequate trials of alternatives, observance and enforcement failed --and--	☐
7 B. Reported crashes susceptible to correction by signal (12-month period) --and--	☑
7 C. 80% Volumes for Warrants 1A, 1B --or-- 4 are satisfied	☑

Warrant 8: Roadway Network	☐

8 A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2 or 3) --or--	☐
8 B. Weekend Volume (Five hours total)	☐

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Warrants Volume

Information

Analyst	MWW	Intersection	Concord Street @ Union Avenue
Agency/Co	BETA Group, Inc.	Jurisdiction	Framingham, MA
Date Performed	5/16/2008	Units	U.S. Customary
Project ID	3619 - Framingham Programatic	Time Period Analyzed	AM
East/West Street	Union Avenue	North/South Street	Concord Street (Route 126)
File Name	Union@Concord.xhy	Major Street	North-South

Project Description *3619 - Framingham Programatic*

Warrant 1

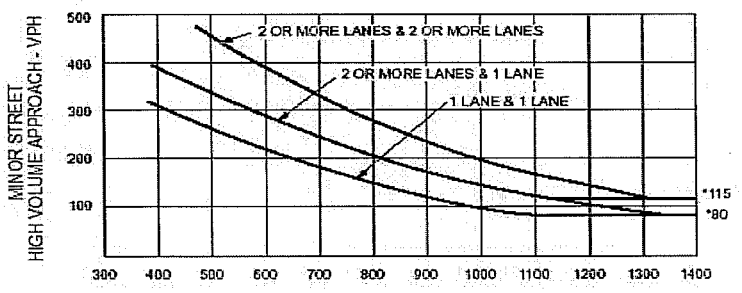
Condition A - Minimum Vehicular Volume

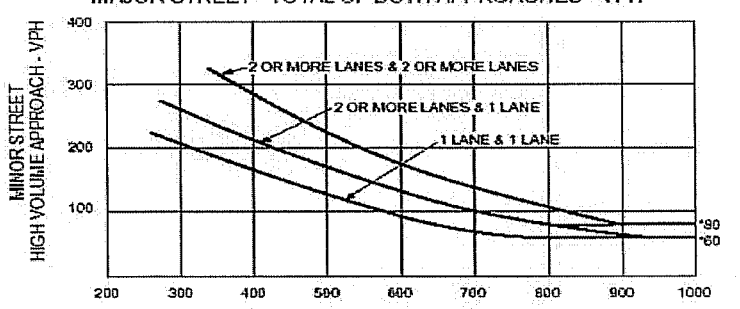
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)		
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1.....	1.....	500	400	350	150	120	105
2 or more...	1.....	600	480	420	150	120	105
2 or more...	2 or more ...	600	480	420	200	160	140
1.....	2 or more	500	400	350	200	160	140

Condition B - Interruption of Continuous Traffic

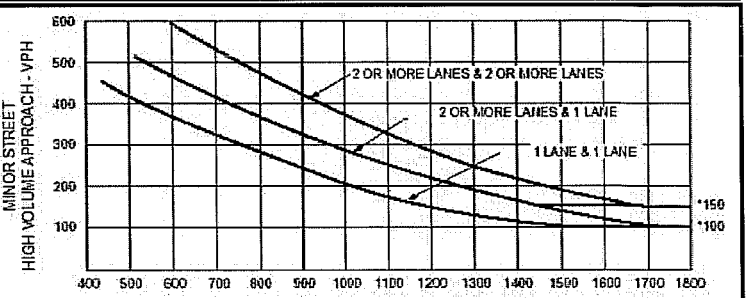
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)		
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1.....	1.....	750	600	525	75	60	53
2 or more...	1.....	900	720	630	75	60	53
2 or more...	2 or more ...	900	720	630	100	80	70
1.....	2 or more	750	600	525	100	80	70

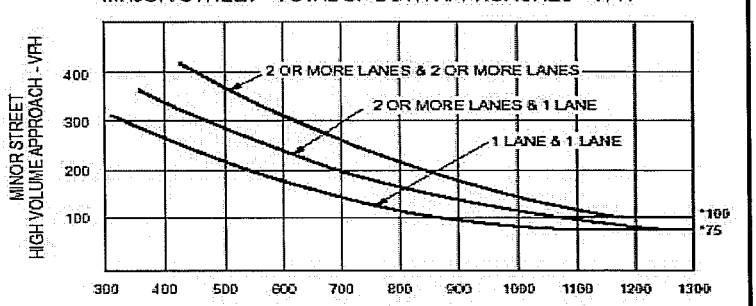
Warrant 2





Warrant 3





Volume Summary

Major Street Lanes 1 **Minor Street Lanes** 2+ **Speed** 25 **Population** 10000+

Hours	Major Volume	Minor Volume	Total Volume	1A (100%)	1A (80%)	1B (100%)	1B (80%)	2 (100%)	3A (100%)	3B (100%)
07-08	1309	267	1576	Yes	Yes	Yes	Yes	Yes	No	Yes
08-09	1317	209	1526	Yes	Yes	Yes	Yes	Yes	No	Yes
09-10	1404	278	1682	Yes	Yes	Yes	Yes	Yes	No	Yes
10-11	1384	253	1637	Yes	Yes	Yes	Yes	Yes	No	Yes
11-12	1362	183	1545	No	Yes	Yes	Yes	Yes	No	Yes
12-13	1354	240	1594	Yes	Yes	Yes	Yes	Yes	No	Yes
13-14	1458	334	1792	Yes	Yes	Yes	Yes	Yes	No	Yes
14-15	1384	200	1584	Yes	Yes	Yes	Yes	Yes	No	Yes
15-16	1392	278	1670	Yes	Yes	Yes	Yes	Yes	No	Yes
16-17	1416	314	1730	Yes	Yes	Yes	Yes	Yes	No	Yes
17-18	1319	236	1555	Yes	Yes	Yes	Yes	Yes	No	Yes

18-19	1383	325	1708	Yes	Yes	Yes	Yes	Yes	No	Yes
Totals	16482	3117	19599	11	12	12	12	12	0	12

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Warrants Summary

Information			
Analyst	MWW	Intersection	Irving Street @ Hollis Street
Agency/Co	BETA Group, Inc.	Jurisdiction	Framingham, MA
Date Performed	5/16/2008	Units	U.S. Customary
Project ID	3619 - Framingham Programatic	Time Period Analyzed	
East/West Street	Irving St	North/South Street	Irving St / Hollis St (Rt 126)
File Name	Irving@Hollis.xhy	Major Street	North-South

Project Description *3619 - Framingham Programatic*

General				Roadway Network	
Major Street Speed (mph)	30	☐	Population < 10,000	Two Major Routes	☐
Nearest Signal (ft)	200	☐	Coordinated Signal System	Weekend Count	☐
Crashes (per year)	13	☐	Adequate Trials of Alternatives	5-yr Growth Factor	0

Geometry and Traffic	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N	0	0	0	0	1	0	0	1	0	0	1	0
Lane usage					T			T			T	
Vehicle Volume Averages (vph)	0	0	0	0	274	0	0	270	0	0	602	0
Peds (ped/h) / Gaps (gaps/h)	--	/	--	--	/	--	--	/	--	--	/	--
Delay (s/veh) / (veh-hr)	--	/	--	--	/	--	--	/	--	--	/	--

Warrant 1: Eight-Hour Vehicular Volume	☑
1 A. Minimum Vehicular Volumes (Both major approaches --and-- higher minor approach) --or--	☑
1 B. Interruption of Continuous Traffic (Both major approaches --and-- higher minor approach) --or--	☑
1 80% Vehicular --and-- Interruption Volumes (Both major approaches --and-- higher minor approach)	☑
Warrant 2: Four-Hour Vehicular Volume	☑
2 A. Four-Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)	☑
Warrant 3: Peak Hour	☑
3 A. Peak-Hour Conditions (Minor delay --and-- minor volume --and-- total volume) --or--	☐
3 B. Peak- Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)	☑
Warrant 4: Pedestrian Volume	☐
4 A. Pedestrian Volumes (Four hours --or-- one hour) --and--	☐
4 B. Gaps Same Period (Four hours --or-- one hour)	☐
Warrant 5: School Crossing	☐
5. Student Volumes --and--	☐
5. Gaps Same Period	☐
Warrant 6: Coordinated Signal System	☐
6. Degree of Platooning (Predominant direction or both directions)	☐
Warrant 7: Crash Experience	☐
7 A. Adequate trials of alternatives, observance and enforcement failed --and--	☐
7 B. Reported crashes susceptible to correction by signal (12-month period) --and--	☑
7 C. 80% Volumes for Warrants 1A, 1B --or-- 4 are satisfied	☑

Warrant 8: Roadway Network	☐

8 A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2 or 3) --or--	
8 B. Weekend Volume (Five hours total)	

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Warrants Volume

Information

Analyst	MWW	Intersection	Irving Street @ Hollis Street
Agency/Co	BETA Group, Inc.	Jurisdiction	Framingham, MA
Date Performed	5/16/2008	Units	U.S. Customary
Project ID	3619 - Framingham Programatic	Time Period Analyzed	
East/West Street	Irving St	North/South Street	Irving St / Hollis St (Rt 126)
File Name	Irving@Hollis.xhy	Major Street	North-South

Project Description *3619 - Framingham Programatic*

Warrant 1

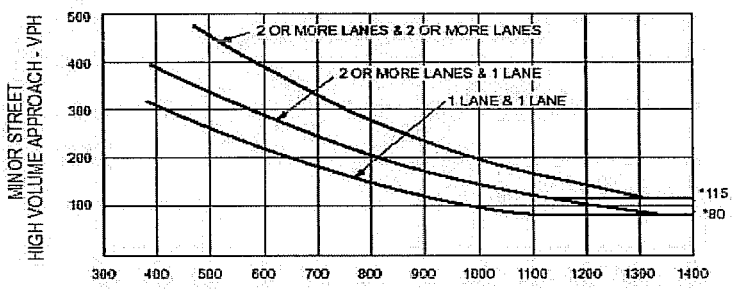
Condition A - Minimum Vehicular Volume

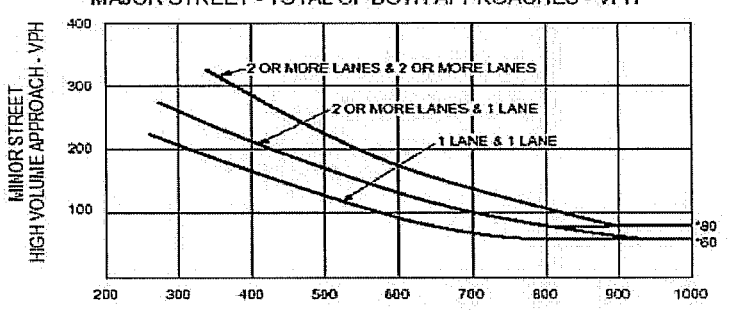
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)		
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1	1	500	400	350	150	120	105
2 or more	1	600	480	420	150	120	105
2 or more	2 or more	600	480	420	200	160	140
1	2 or more	500	400	350	200	160	140

Condition B - Interruption of Continuous Traffic

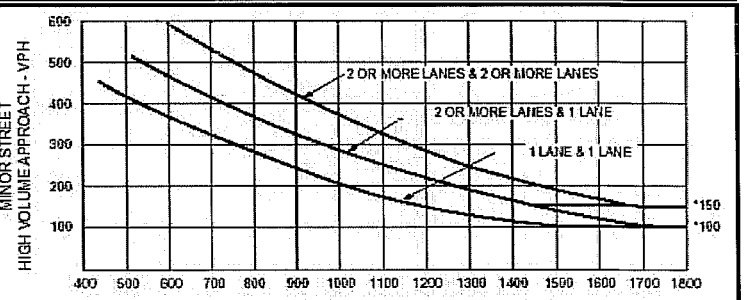
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)		
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1	1	750	600	525	75	60	53
2 or more	1	900	720	630	75	60	53
2 or more	2 or more	900	720	630	100	80	70
1	2 or more	750	600	525	100	80	70

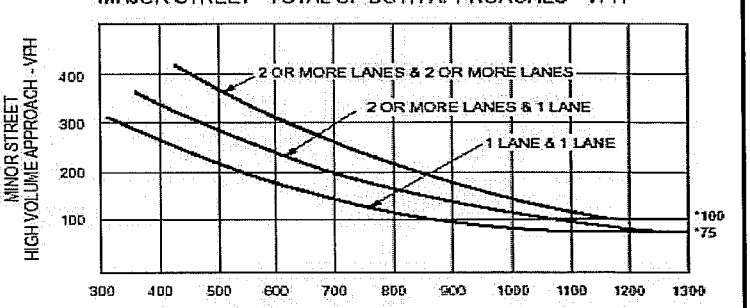
Warrant 2





Warrant 3





Volume Summary

Major Street Lanes 1 **Minor Street Lanes** 1 **Speed** 30 **Population** 10000+

Hours	Major Volume	Minor Volume	Total Volume	1A (100%)	1A (80%)	1B (100%)	1B (80%)	2 (100%)	3A (100%)	3B (100%)
07-08	861	353	1214	Yes	Yes	Yes	Yes	Yes	No	Yes
08-09	866	339	1205	Yes	Yes	Yes	Yes	Yes	No	Yes
09-10	849	276	1125	Yes	Yes	Yes	Yes	Yes	No	Yes
10-11	810	246	1056	Yes	Yes	Yes	Yes	Yes	No	No
11-12	821	232	1053	Yes	Yes	Yes	Yes	Yes	No	No
12-13	818	237	1055	Yes	Yes	Yes	Yes	Yes	No	No
13-14	892	291	1183	Yes	Yes	Yes	Yes	Yes	No	Yes
14-15	846	236	1082	Yes	Yes	Yes	Yes	Yes	No	No
15-16	873	251	1124	Yes	Yes	Yes	Yes	Yes	No	No
16-17	1034	318	1352	Yes	Yes	Yes	Yes	Yes	No	Yes
17-18	836	246	1082	Yes	Yes	Yes	Yes	Yes	No	No

18-19	967	272	1239	Yes	Yes	Yes	Yes	Yes	No	Yes
Totals	10473	3297	13770	12	12	12	12	12	0	6

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APPENDIX D

Intersection Level of Service Analysis Output

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Sign Control	Yield			Yield	Yield	
Volume (vph)	315	32	164	304	45	228
Peak Hour Factor	0.87	0.87	0.89	0.89	0.80	0.80
Hourly flow rate (vph)	362	37	184	342	56	285

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	NW 1
Volume Total (vph)	362	37	184	342	341
Volume Left (vph)	0	0	184	0	56
Volume Right (vph)	0	37	0	0	285
Hadj (s)	0.22	-0.51	0.72	0.17	-0.20
Departure Headway (s)	6.7	6.0	7.1	6.5	6.0
Degree Utilization, x	0.67	0.06	0.36	0.62	0.57
Capacity (veh/h)	517	577	494	533	557
Control Delay (s)	21.3	8.1	12.8	18.1	16.8
Approach Delay (s)	20.1		16.3		16.8
Approach LOS	C		C		C

Intersection Summary			
Delay	17.6		
HCM Level of Service	C		
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		

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Movement Summary

Concord Street (126) @ Union Street - AM

Roundabout

Vehicle Movements

Mov No	Turn	Dem Flow (veh/h)	Cap (veh/h)	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Eff. Stop Rate	Aver Speed (mi/h)	Oper Cost ($/h)
Concord Street NB (126)										
33	L	26	768	0.034	10.8	LOS B	5	1.31	21.0	6
32	T	1146	1736	0.660	5.8	LOS A	208	0.99	22.7	237
Approach		**1172**	**2503**	**0.660**	**6.0**	**LOS A**	**208**	**1.00**	**22.6**	**242**
Concord Street SB (126)										
63	L	14	24	0.625	21.9	LOS C	184	2.15	20.7	3
62	T	368	684	0.632	17.8	LOS B	184	2.11	21.4	90
62	R	64	684	0.632	17.8	LOS B	184	2.11	21.4	90
Approach		**447**	**708**	**0.632**	**18.0**	**LOS B**	**184**	**2.11**	**21.4**	**93**
Union Avenue										
83	L	52	185	0.286	13.2	LOS B	49	1.54	23.6	11
82	T	176	613	0.287	6.5	LOS A	49	1.24	25.9	30
Approach		**229**	**798**	**0.287**	**8.1**	**LOS A**	**49**	**1.31**	**25.3**	**41**
All Vehicles		**1848**	**4008**	**0.660**	**9.1**	**LOS A**	**208**	**1.30**	**22.6**	**376**

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Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Sign Control	Yield			Yield	Yield	
Volume (vph)	341	89	223	502	122	268
Peak Hour Factor	0.90	0.90	0.86	0.86	0.87	0.87
Hourly flow rate (vph)	379	99	259	584	140	308

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	NW 1
Volume Total (vph)	379	99	259	584	448
Volume Left (vph)	0	0	259	0	140
Volume Right (vph)	0	99	0	0	308
Hadj (s)	0.05	-0.60	0.59	0.05	-0.27
Departure Headway (s)	7.4	6.7	7.7	7.1	6.4
Degree Utilization, x	0.78	0.18	0.55	1.16	0.80
Capacity (veh/h)	479	523	462	508	550
Control Delay (s)	30.3	10.0	18.6	114.6	30.5
Approach Delay (s)	26.1		85.1		30.5
Approach LOS	D		F		D

Intersection Summary			
Delay	55.3		
HCM Level of Service	F		
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		

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Movement Summary

Concord Street (126) @ Union Street - PM

Roundabout

Vehicle Movements

Mov No	Turn	Dem Flow (veh/h)	Cap (veh/h)	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Eff. Stop Rate	Aver Speed (mi/h)	Oper Cost ($/h)
Concord Street NB (126)										
33	L	44	795	0.055	10.5	LOS B	8	1.32	21.0	9
32	T	1194	1829	0.653	5.8	LOS A	214	0.99	22.7	235
Approach		**1238**	**2624**	**0.653**	**5.9**	**LOS A**	**214**	**1.00**	**22.6**	**244**
Concord Street SB (126)										
63	L	5	8	0.625	22.1	LOS C	182	2.16	20.6	1
62	T	386	713	0.626	18.1	LOS B	182	2.12	21.3	90
62	R	61	713	0.626	18.1	LOS B	182	2.12	21.3	90
Approach		**451**	**721**	**0.625**	**18.1**	**LOS B**	**182**	**2.12**	**21.3**	**91**
Union Avenue										
83	L	55	143	0.385	13.3	LOS B	71	1.57	23.5	11
82	T	277	723	0.383	6.6	LOS A	71	1.29	25.8	45
Approach		**332**	**866**	**0.383**	**7.8**	**LOS A**	**71**	**1.34**	**25.4**	**55**
All Vehicles		**2021**	**4211**	**0.653**	**9.0**	**LOS A**	**214**	**1.31**	**22.7**	**390**

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