

## MEMORANDUM

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**DATE:** May 25, 2022

**REF:** 9360

**SUBJECT:** Traffic Assessment - Proposed Mixed-Use Development  
184 Water Street, Wakefield, Massachusetts

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Vanasse & Associates, Inc. (VAI) has prepared this memorandum on behalf of One Sylvan, LLC (the “Applicant”) in support of the proposed mixed-use development to be located at 184 Water Street in Wakefield, Massachusetts (hereafter referred to as the “Project”). The purpose of this memorandum is to develop estimates of trip generation for existing and proposed conditions, review sight distances, review existing off-street parking conditions, and evaluate proposed site circulation.

*As documented in this assessment, the Project is expected to result in minimal changes on area traffic volumes during typical weekday morning and evening peak hours. The proposed parking supply is adequate to accommodate the peak demand for the residential uses, with adequate on-street parking provided in close proximity to the site to accommodate the proposed commercial space. Overall, on- and off-site circulation is improved over current conditions with a reduction in curb-cuts and better-defined access/egress for vehicles and pedestrians.*

### **PROPOSED PROJECT**

The Project entails construction of a new two-story building containing seven (7) two-bedroom apartments and 999-square feet (sf) of ground floor retail space. A total of 11 parking spaces will be provided on-site for exclusive use of the residents of the Project, including four (4) garage spaces and seven (7) surface spaces (parking ratio of 1.57 parking spaces per unit, meeting Wakefield Zoning requirements). At present, the Project site consists of a two-story building with one residential unit and a 2,106-sf auto repair shop. Vehicle access to the site is currently provided via one curb-cut onto Water Street and one onto Melvin Street. As part of this development, the existing building will be demolished, and existing curb cuts will be reduced to one full-access driveway to Melvin Street. The new 22-foot wide driveway will provide access to the parking garage and to the surface spaces and will be located at the eastern side of Melvin Street in the rear of the proposed building. The location of the Project site, relative to the surrounding transportation system, is displayed in Figure 1.







Figure 1  
Site Location Map





## TRIP GENERATION

The traffic characteristics of the Project were developed using information obtained from trip-generation statistics published by the Institute of Transportation Engineers (ITE)<sup>1</sup> for land uses similar to those to be contained within the Project. Land Use Code (LUC) 210, *Single-Family Detached Housing* and LUC 942, *Automobile Care Center* were used to establish traffic characteristics for the site's existing uses. LUC 220, *Multifamily Housing (Low-Rise)* and LUC 822, *Strip Retail Plaza (<40k)* were used to establish traffic characteristics for the proposed use. The aforementioned land use codes represent the appropriate categories for the existing and proposed use of the site.

Trip-generation calculations were performed for the weekday morning and weekday evening peak hours, the critical time periods for Project-related traffic activity. The detailed trip-generation calculation is provided in the Appendix. A summary of the expected vehicle-trip generation is provided in Table 1.

**Table 1**  
**TRIP GENERATION COMPARISON**

Time Period/ Directional Distribution	Existing Condition			Proposed Condition			Net Difference
	Existing Residential (1 Unit) <sup>a</sup>	Existing Auto Repair Shop Trips (2,106 sf) <sup>b</sup>	Existing Total Trips	Residential Trips (7 Units) <sup>c</sup>	Retail Trips (999 sf) <sup>d</sup>	Proposed Total Trips	
<i>Weekday Morning Peak Hour:</i>							
Entering	0	3	3	1	1	2	-1
<u>Exiting</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>2</u>	<u>1</u>	<u>3</u>	<u>0</u>
Total	1	5	6	3	2	5	-1
<i>Weekday Evening Peak Hour:</i>							
Entering	1	3	4	2	3	5	1
<u>Exiting</u>	<u>0</u>	<u>4</u>	<u>4</u>	<u>2</u>	<u>4</u>	<u>6</u>	<u>2</u>
Total	1	7	8	4	7	11	3

<sup>a</sup>Based on ITE LUC 210, *Single-Family Detached Housing*.

<sup>b</sup>Based on ITE LUC 942, *Automobile Care Center*.

<sup>c</sup>Based on ITE LUC 220, *Multifamily Housing (Low-Rise)*.

<sup>d</sup>Based on ITE LUC 822, *Strip Retail Plaza (<40k)*.

As summarized in Table 1, in comparison to the existing use of the Project site, the proposed development is expected to generate 1 less vehicle trip (-1 entering and 0 exiting) during the weekday morning peak hour and 3 new vehicle trips (1 entering and 2 exiting) expected during the weekday evening peak hour.

It is important to note that these projections are likely conservative given that a percentage of residential traffic will likely include walking trips to nearby bus and commuter rail service provided by the Massachusetts Bay Transit Authority (MBTA) as well as a percentage of commercial trips occurring via walking trips.

<sup>1</sup>*Trip Generation*, Tenth Edition; Institute of Transportation Engineers; Washington, DC; 2017.



## **PARKING ANALYSIS**

### **Residential Parking Requirements**

Town of Wakefield Zoning (Section 190-41.B) requires a parking rate of 1.5 spaces per residential unit for multifamily attached dwellings providing two bedrooms or fewer. This equates to a requirement of 11 parking spaces to accommodate the proposed residential use.

Additionally, a parking demand analysis was performed to evaluate whether the proposed parking supply will be adequate to accommodate the anticipated parking demand for the residential portion of this Project. Parking demand calculations were also performed based on data published by the ITE. The ITE provides parking generation equations for a number of land use codes as part of their *Parking Generation* manual<sup>2</sup> including LUC 220, *Multifamily Housing (Low-Rise)*. The ITE indicates that the peak-parking demand for seven (7) multifamily units is 8 parking spaces which is below the proposed supply. The ITE data also indicates that multifamily housing located within 1.5-mile of transit service provide 1.50 parking spaces per unit on average. As such, the proposed parking supply of 11 spaces is adequate to accommodate the residential demand for the Project.

### **Commercial Parking Requirements**

The Project will accommodate 999 sf of commercial space. The expected retail use will be community-focused such as food, entertainment, or personal services. Given the location of the Project, the retail space is expected to rely heavily upon existing foot traffic in the area. For mixed-use developments where the commercial component includes small businesses, whose total parking requirement is less than or equal to four (4) spaces based on a one (1) space per 250 sf ratio, the Wakefield Zoning code (Section 190-36.B3)<sup>3</sup> allows for an off-street parking exemption.

Based upon VAI field observations, available on-street parking exists within the site vicinity. Unrestricted parking spaces are provided along Water Street and Melvin Street. Figure 2 graphically depicts available and unrestricted parking within study area. The number of on-street parking spaces located within each street was obtained from Google Earth<sup>®</sup> Street View, as parking spaces are not individually marked. The number of on-street parking spaces was determined by assuming that a parked vehicle would occupy 25 linear feet of curbside space (the length on an on-street parking space) where parking is allowed. Based on this approach, Water Street was found to accommodate approximately 16 unrestricted parking spaces and Melvin Street was found to accommodate 5 parking spaces. Additionally, 20 unrestricted parking spaces are provided along the Nasella Playground field frontage located at the end of Melvin Street, approximately 50 feet north of the site.

Overall, it is expected that this available off-street parking is adequate to accommodate the minimal parking demand expected to be generated by the small establishment space.

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<sup>2</sup>*Parking Generation*, Fifth Edition; Institute of Transportation Engineers; Washington, DC; January 2019.

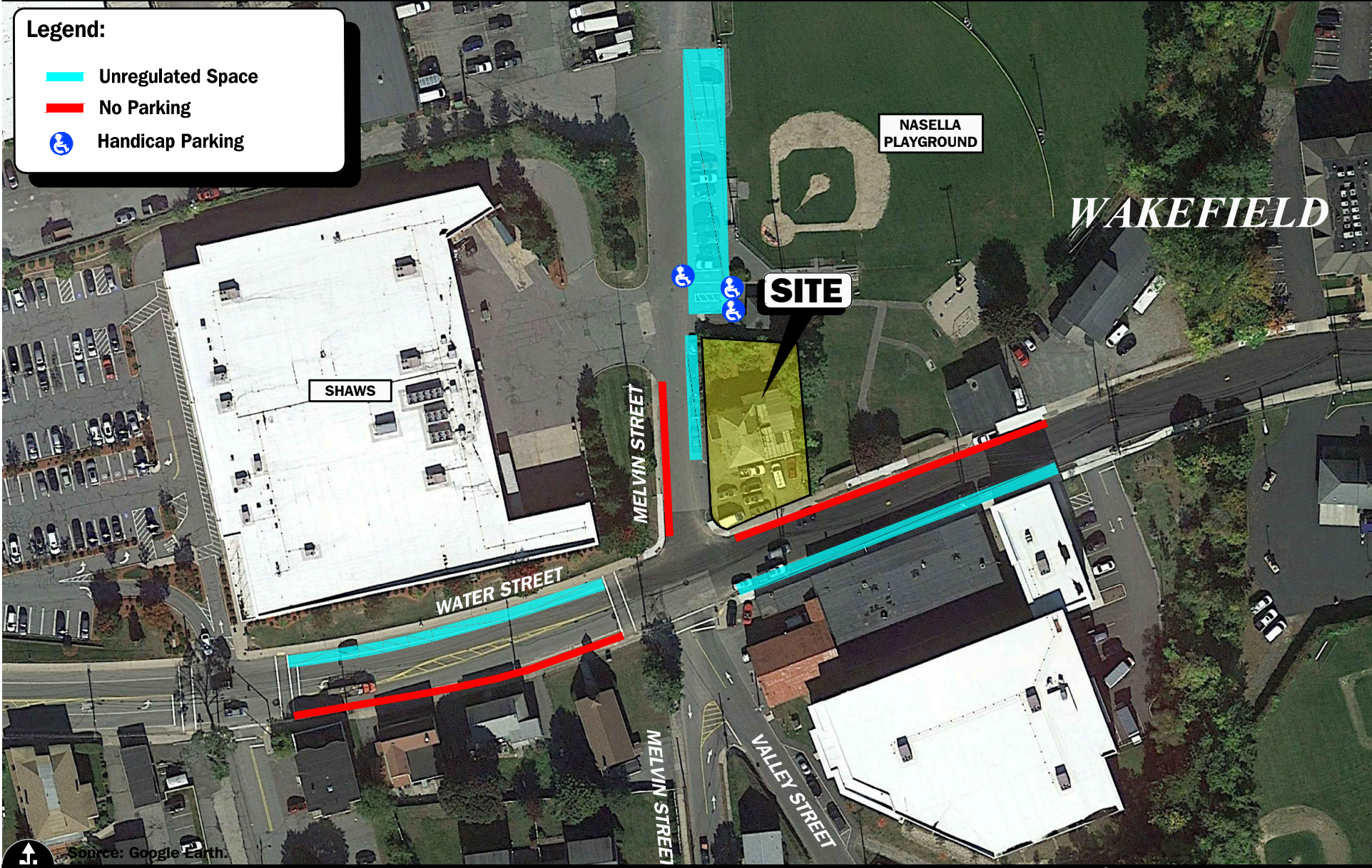
<sup>3</sup>Off-street parking spaces shall not be required for nonresidential uses when the computed requirement results in four spaces or fewer for all the nonresidential uses on the lot.





**Legend:**

- █ Unregulated Space
- █ No Parking
- Handicap Parking



**Figure 2**  
On-Street Parking Regulation



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## **SITE ACCESS AND CIRCULATION**

### **Pedestrians**

Pedestrian access to the building has been carefully planned to avoid or minimize conflicts with vehicle traffic. All pedestrian access will be provided via a main entrance located at Water Street and through an alternative entrance located at Melvin Street. It is recommended that the proposed sidewalk and wheelchair ramp be designed and constructed to meet applicable Americans with Disabilities Act (ADA) design criteria, including provision of a 5-foot sidewalk along the site frontage.

### **Vehicles**

Vehicle access to the parking garage and to the surface spaces will be provided via a new 22-foot full-access driveway onto Melvin Street. The new curb-cut will be located on the eastern side of Melvin Street in the rear of the proposed building. The proposed new location will minimize conflicts with Water Street pedestrian and vehicle traffic. The proposed new site access is adequately sized to accommodate entering and exiting movements. It is recommended that the proposed driveways should be placed under STOP-sign (*Manual on Uniform Traffic Control Devices (MUTCD) R1 1*)<sup>4</sup> control, with a painted STOP-bar included.

## **SIGHT DISTANCE EVALUATION**

Sight distance measurements were performed at the proposed site new driveway intersection with Melvin Street in accordance with Massachusetts Department of Transportation (MassDOT) and American Association of State Highway and Transportation Officials (AASHTO)<sup>5</sup> standards. In brief, SSD is the distance recommended for a vehicle traveling at the design speed of a roadway, on wet pavement, to stop prior to striking an object in its travel path. Melvin Street is a dead-end road that runs for approximately 350 feet from Water Street. Melvin Street mainly provides access to industrial buildings and to the Nasella Playground. As such, vehicle speeds are expected to be low and therefore a 15 miles per hour (mph) speed was used in the sight distance evaluation. Table 2 presents the measured SSD and ISD at the subject intersection.

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<sup>4</sup>*Manual on Uniform Traffic Control Devices (MUTCD)*; Federal Highway Administration; Washington, DC; 2009.

<sup>5</sup>*A Policy on Geometric Design of Highway and Streets*, 7<sup>th</sup> Edition; American Association of State Highway and Transportation Officials (AASHTO); Washington D.C.; 2018.





**Table 2**  
**SIGHT DISTANCE MEASUREMENTS<sup>a</sup>**

Intersection/Sight Distance Measurement	Feet	
	Recommended Distances 15 mph	Field Measured Distances <sup>c</sup>
<b><i>Melvin Street at Site New Driveway</i></b>		
<i>Stopping Sight Distance:</i>		
Melvin Street approaching from the north	80	240 <sup>d</sup>
Melvin Street approaching from the south	80	120 <sup>e</sup>

<sup>a</sup>Recommended values obtained from *A Policy on Geometric Design of Highways and Streets*, 7<sup>th</sup> Edition; American Association of State Highway and Transportation Officials (AASHTO); 2018.

<sup>b</sup>Values shown are the intersection sight distance for a vehicle turning right or left exiting a roadway under STOP control such that motorists approaching the intersection on the major street should not need to adjust their travel speed to less than 70 percent of their initial approach speed.

<sup>c</sup>Assumes no cars parked along site frontage on Melvin Street.

<sup>d</sup>Measured from driveway to the terminus of the Melvin Street.

<sup>e</sup>Measured from driveway to intersection with Water Street.

As can be seen in Table 2, the sight distance at the site driveway was found to exceed the recommended values for SSD in both directions, based on a speed of 15 mph. Therefore, the available lines of sight at the Project site driveway intersection with Melvin Street will meet or exceed the recommended minimum sight distance to function in a safe (SSD) manner. It is important to note that the available sight distances measured and presented assumed no cars were parked in the vicinity of the proposed site driveway on Melvin Street. Therefore, it is our recommendation that on-street parking be prohibited for 20 feet on either side of the site driveway.

**CONCLUSION**

In summary, the proposed 11 parking spaces are adequate for the proposed Project and the 999 sf of commercial space is expected to have a minimal impact to on-street parking in the vicinity of the site. In terms of traffic impact, there will be a minor amount of peak-hour traffic associated with the Project, with peak-hour increases projected to result in only 3 additional trips and only during the weekday evening peak hour as compared to the current use of the site. The proposed access plan improves overall circulation over current conditions with limited curb-cuts and better-defined access and egress and improved pedestrian accommodations. As such, the Project can be accommodated safely as planned with minimal impact to traffic and parking in the area.

cc: File



APPENDIX

TRIP GENERATION

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## TRIP GENERATION

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# Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,  
Peak Hour of Adjacent Street Traffic,  
One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 192

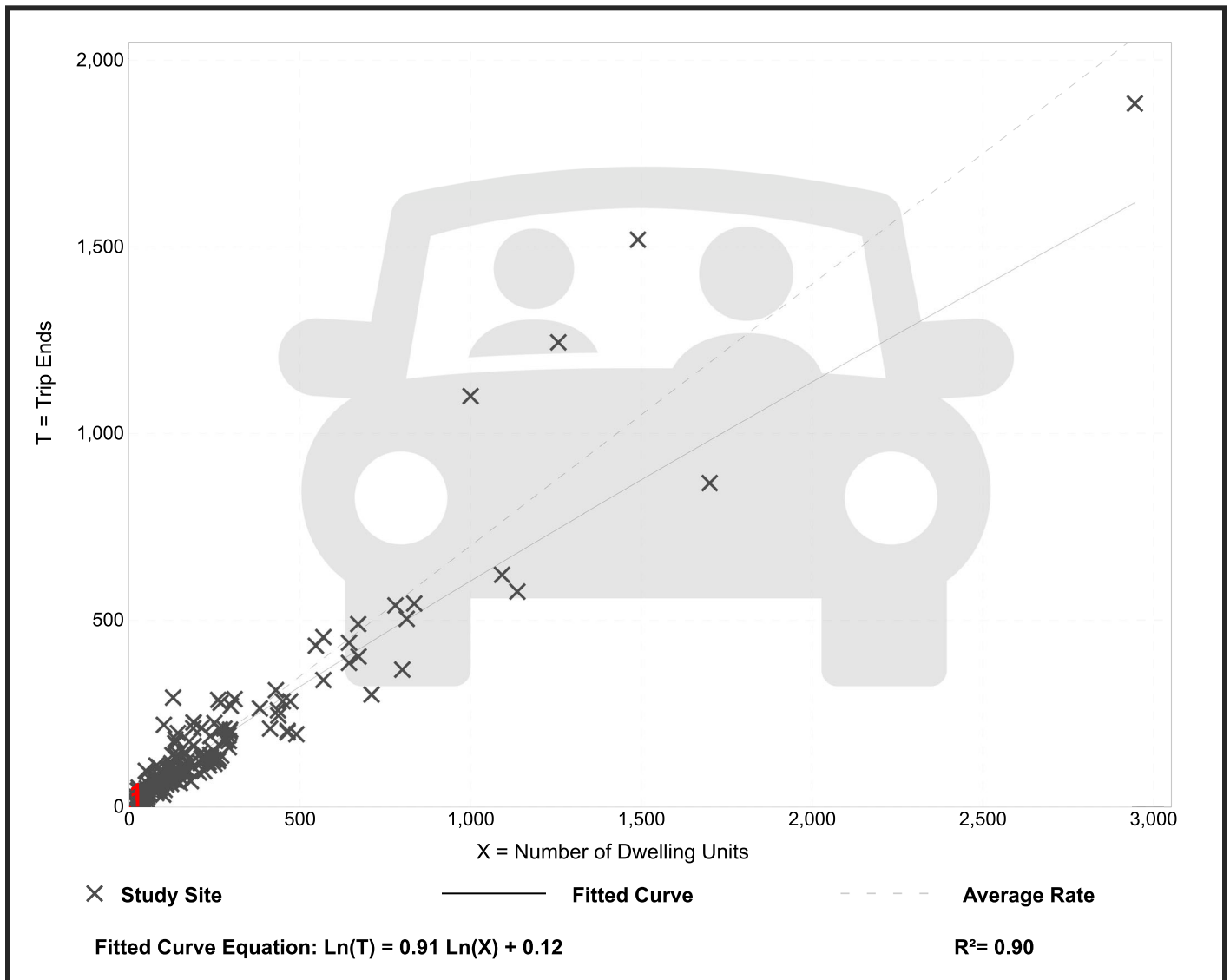
Avg. Num. of Dwelling Units: 226

Directional Distribution: 26% entering, 74% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

## Data Plot and Equation





# Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,  
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 208

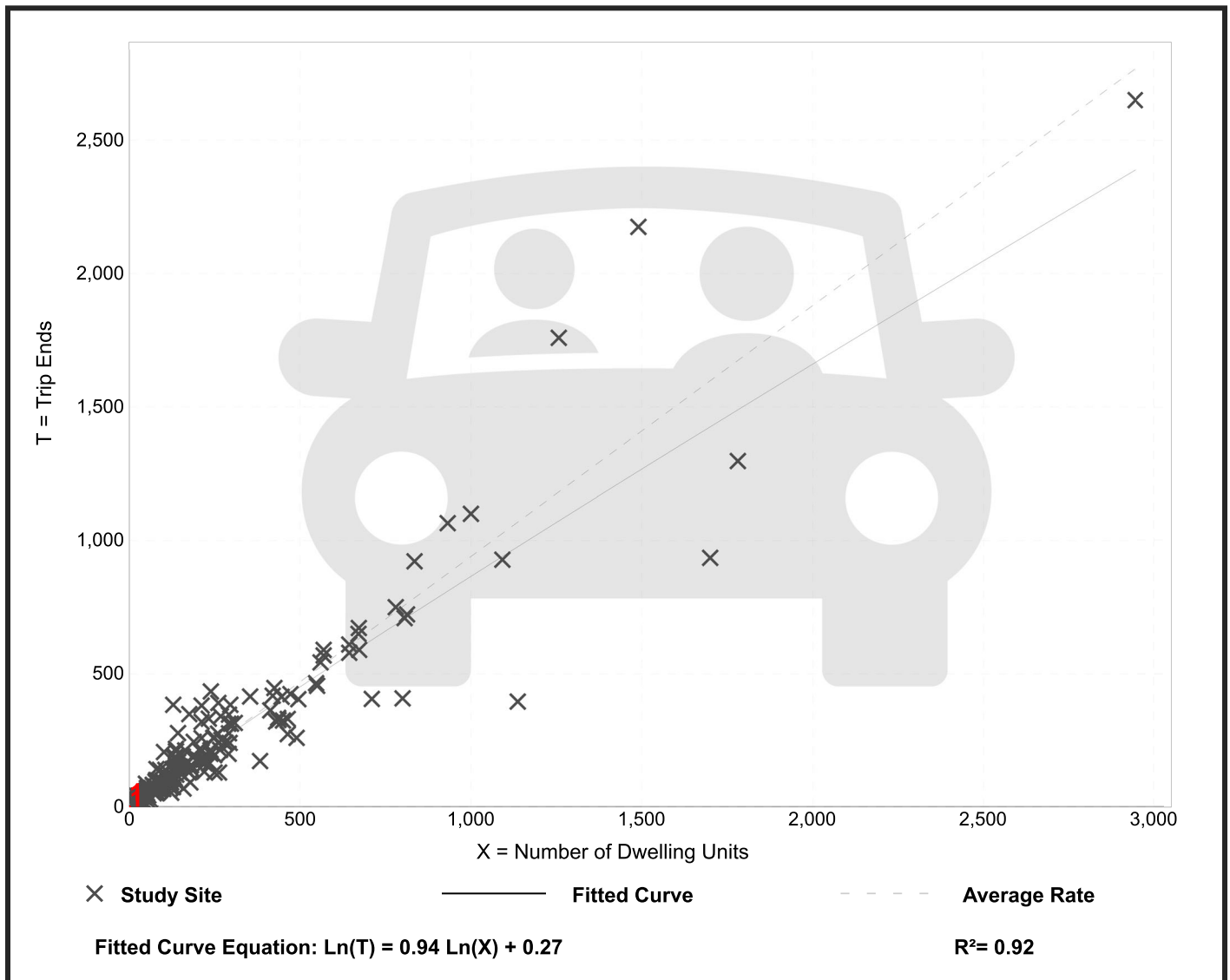
Avg. Num. of Dwelling Units: 248

Directional Distribution: 63% entering, 37% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

## Data Plot and Equation



# Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

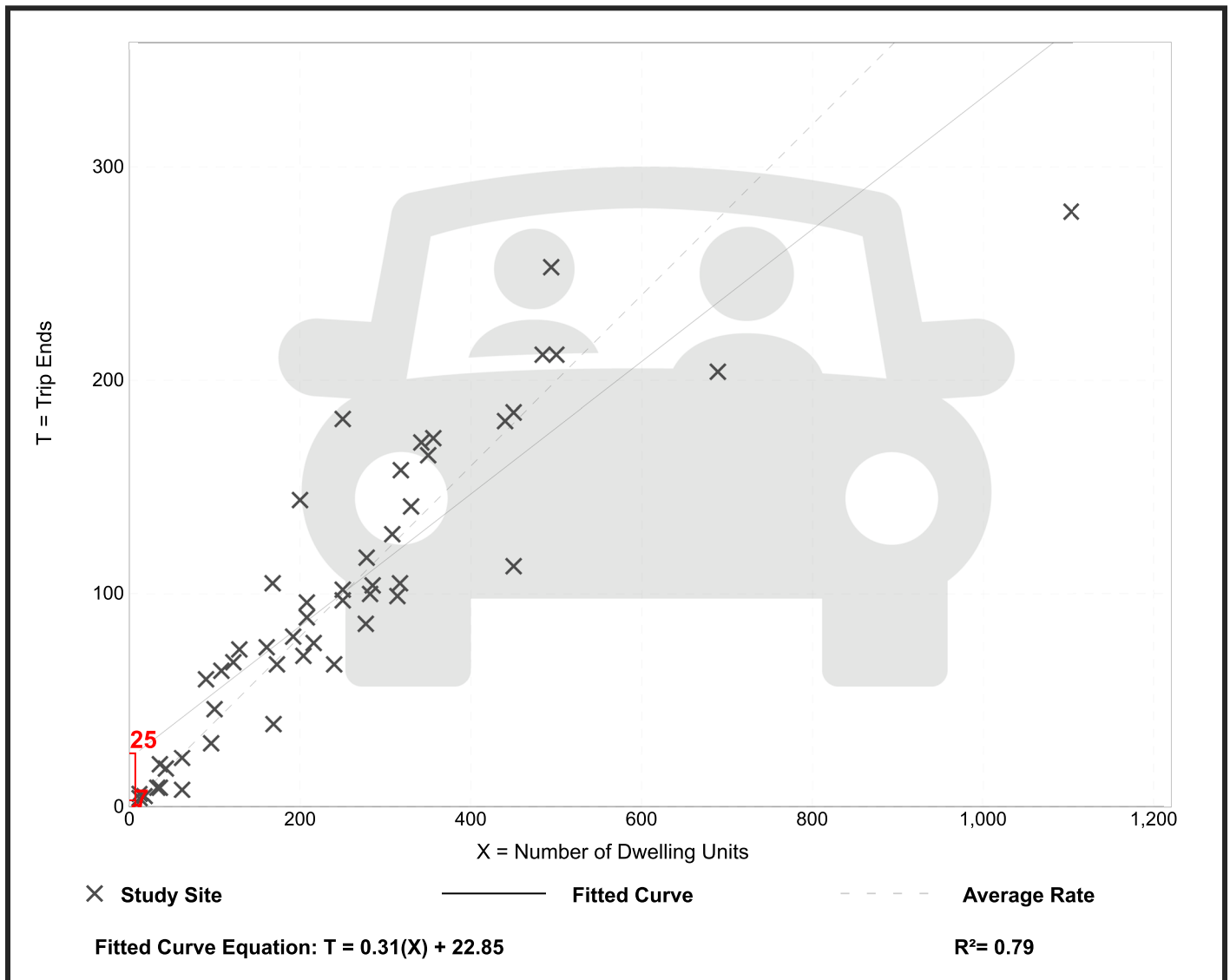
Vehicle Trip Ends vs: Dwelling Units  
 On a: Weekday,  
 Peak Hour of Adjacent Street Traffic,  
 One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban  
 Number of Studies: 49  
 Avg. Num. of Dwelling Units: 249  
 Directional Distribution: 24% entering, 76% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.40	0.13 - 0.73	0.12

## Data Plot and Equation



# Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,  
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 59

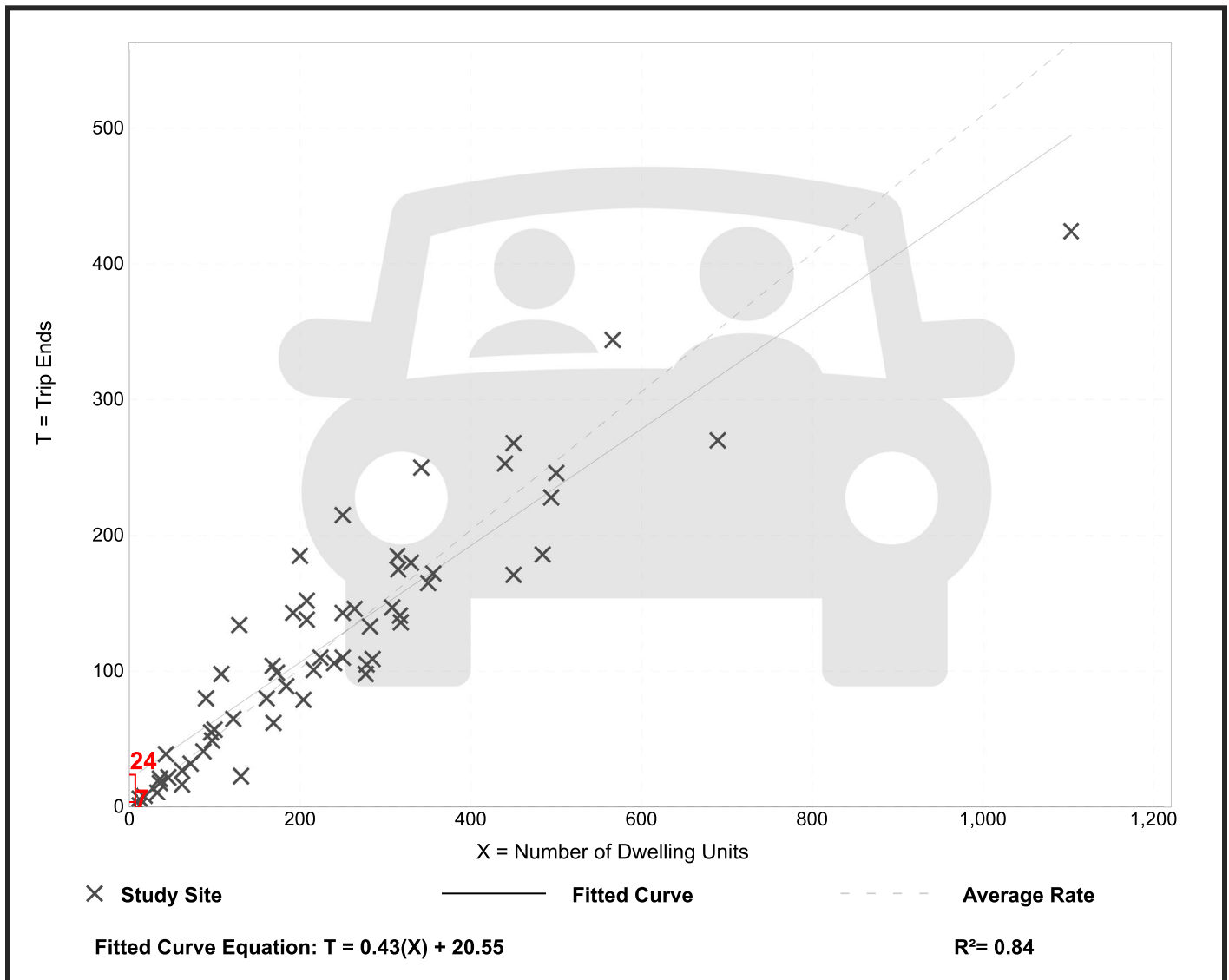
Avg. Num. of Dwelling Units: 241

Directional Distribution: 63% entering, 37% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.51	0.08 - 1.04	0.15

## Data Plot and Equation



# Strip Retail Plaza (<40k) (822)

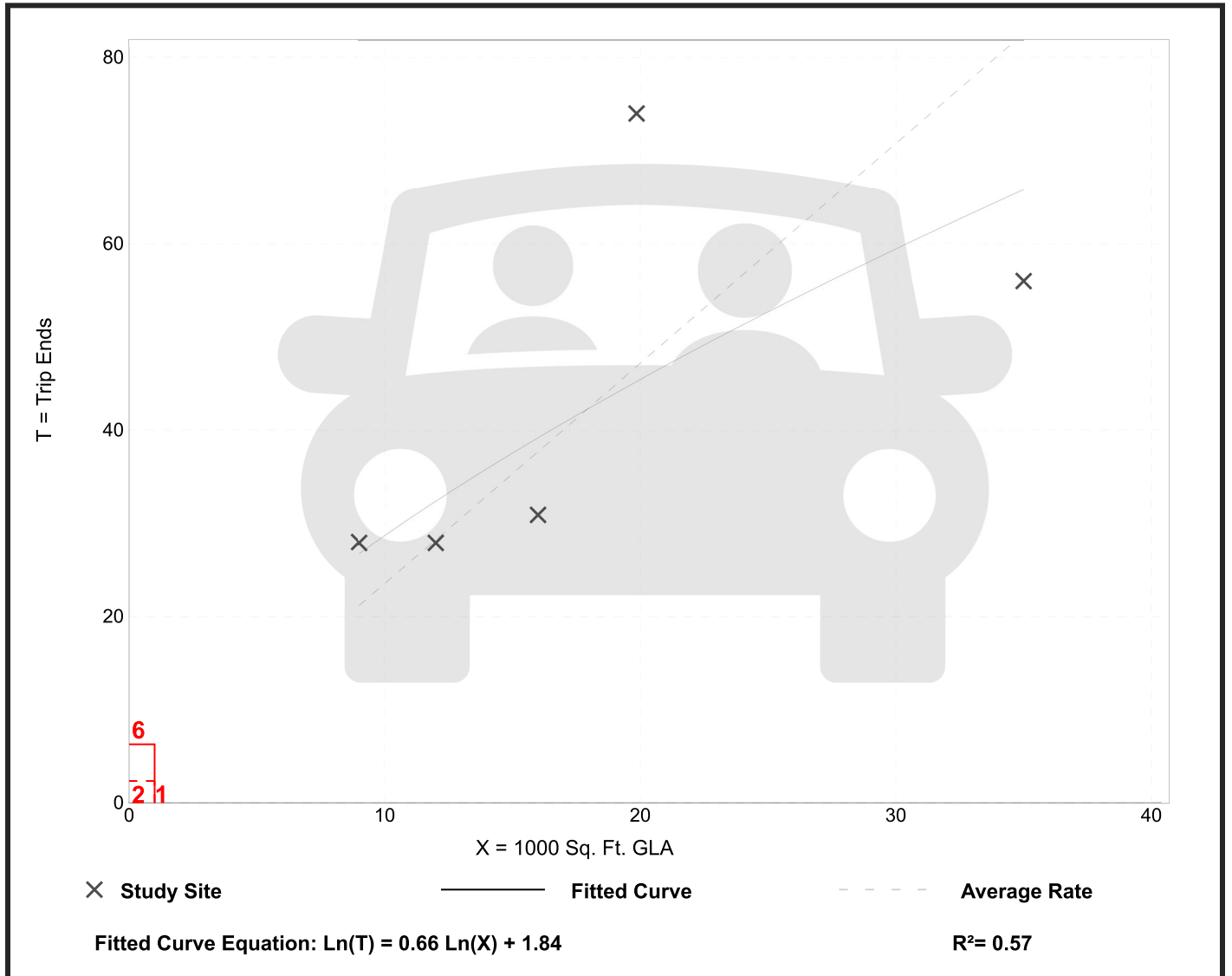
**Vehicle Trip Ends vs: 1000 Sq. Ft. GLA**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 7 and 9 a.m.**  
**Setting/Location: General Urban/Suburban**  
 Number of Studies: 5  
 Avg. 1000 Sq. Ft. GLA: 18  
 Directional Distribution: 60% entering, 40% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
2.36	1.60 - 3.73	0.94

## Data Plot and Equation

*Caution – Small Sample Size*



# Strip Retail Plaza (<40k)

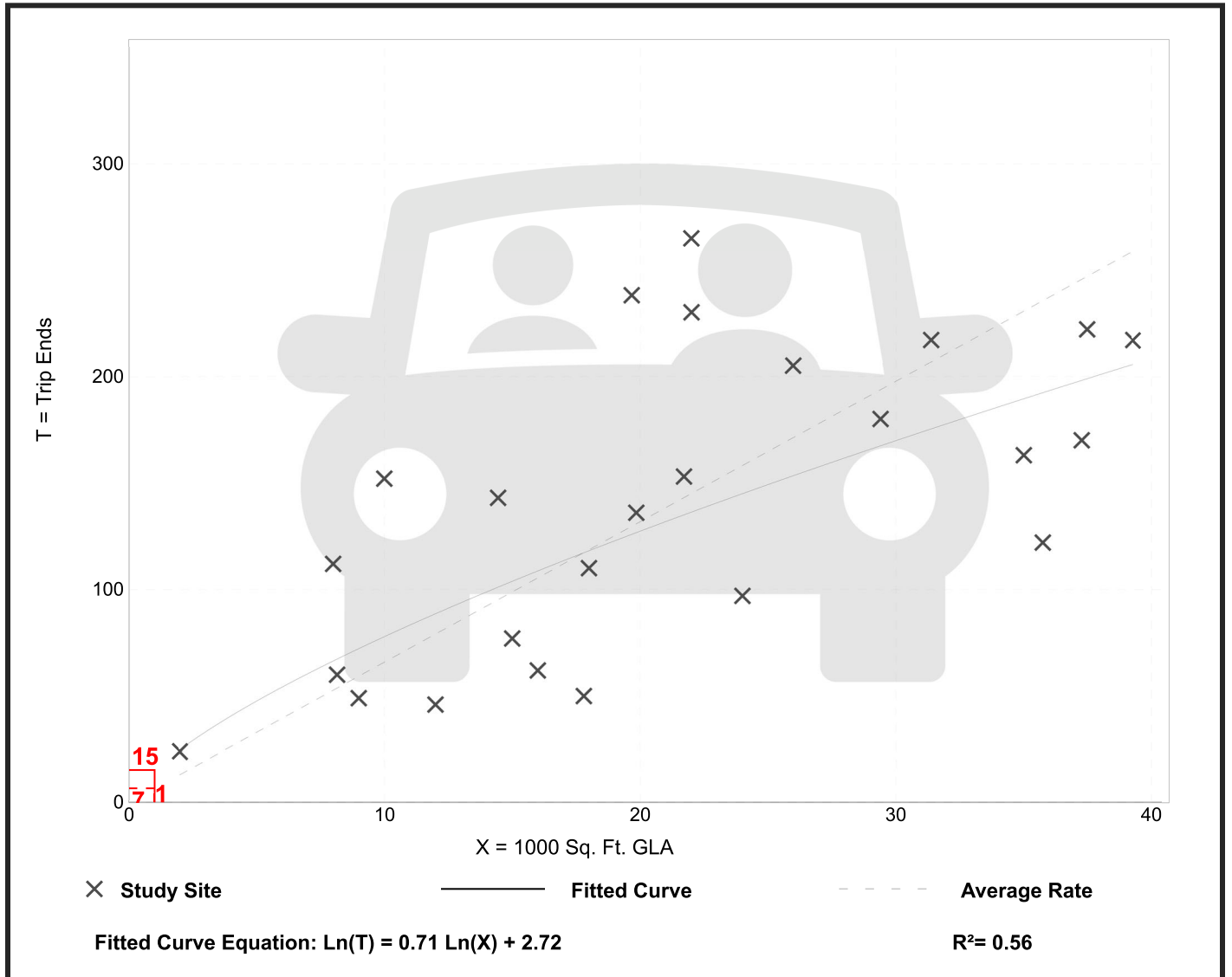
## (822)

**Vehicle Trip Ends vs: 1000 Sq. Ft. GLA**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 4 and 6 p.m.**  
**Setting/Location: General Urban/Suburban**  
 Number of Studies: 25  
 Avg. 1000 Sq. Ft. GLA: 21  
 Directional Distribution: 50% entering, 50% exiting

### Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
6.59	2.81 - 15.20	2.94

### Data Plot and Equation





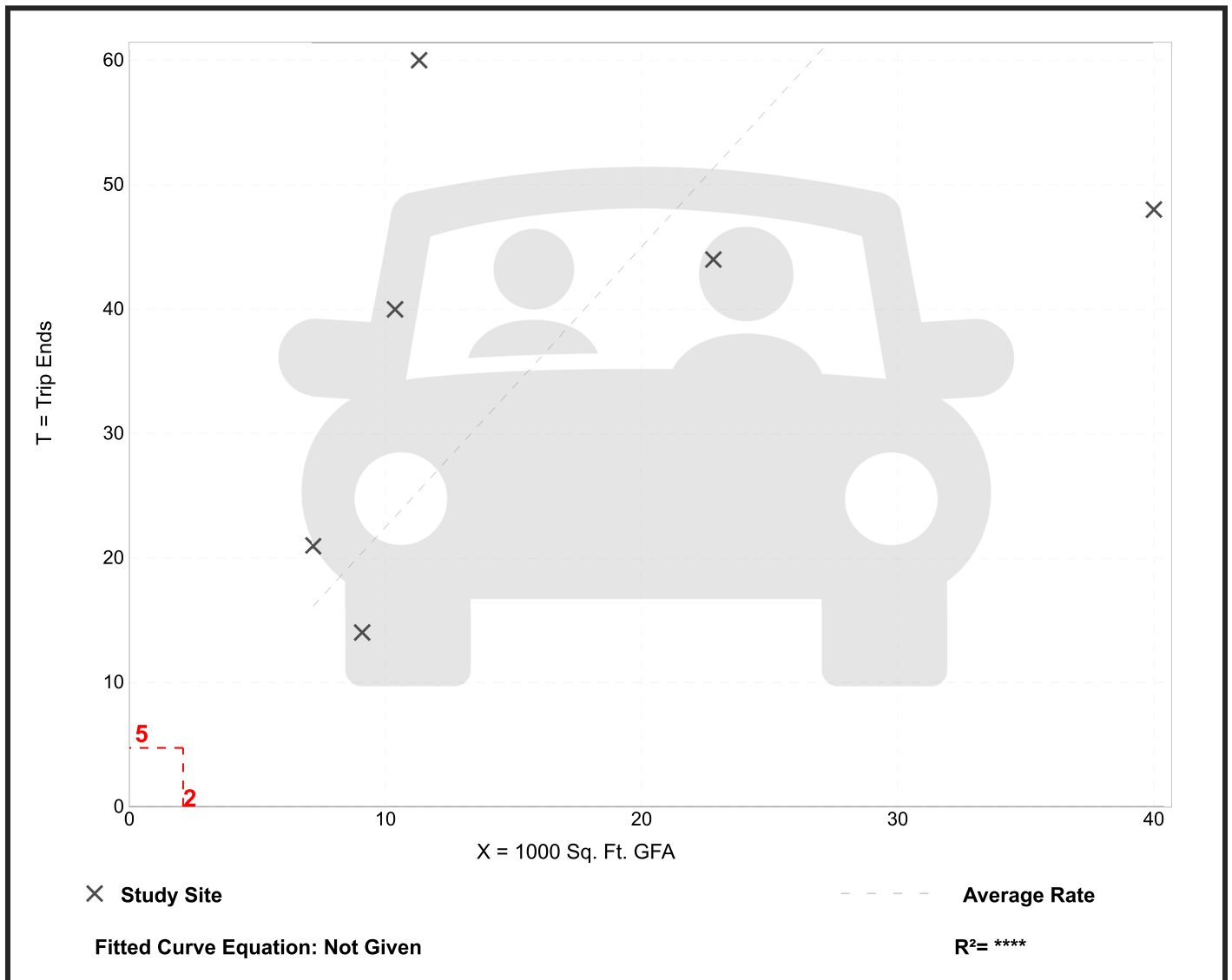
# Automobile Care Center (942)

**Vehicle Trip Ends vs: 1000 Sq. Ft. GFA**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 7 and 9 a.m.**  
**Setting/Location: General Urban/Suburban**  
 Number of Studies: 6  
 Avg. 1000 Sq. Ft. GFA: 17  
 Directional Distribution: 66% entering, 34% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
2.25	1.20 - 5.30	1.49

## Data Plot and Equation



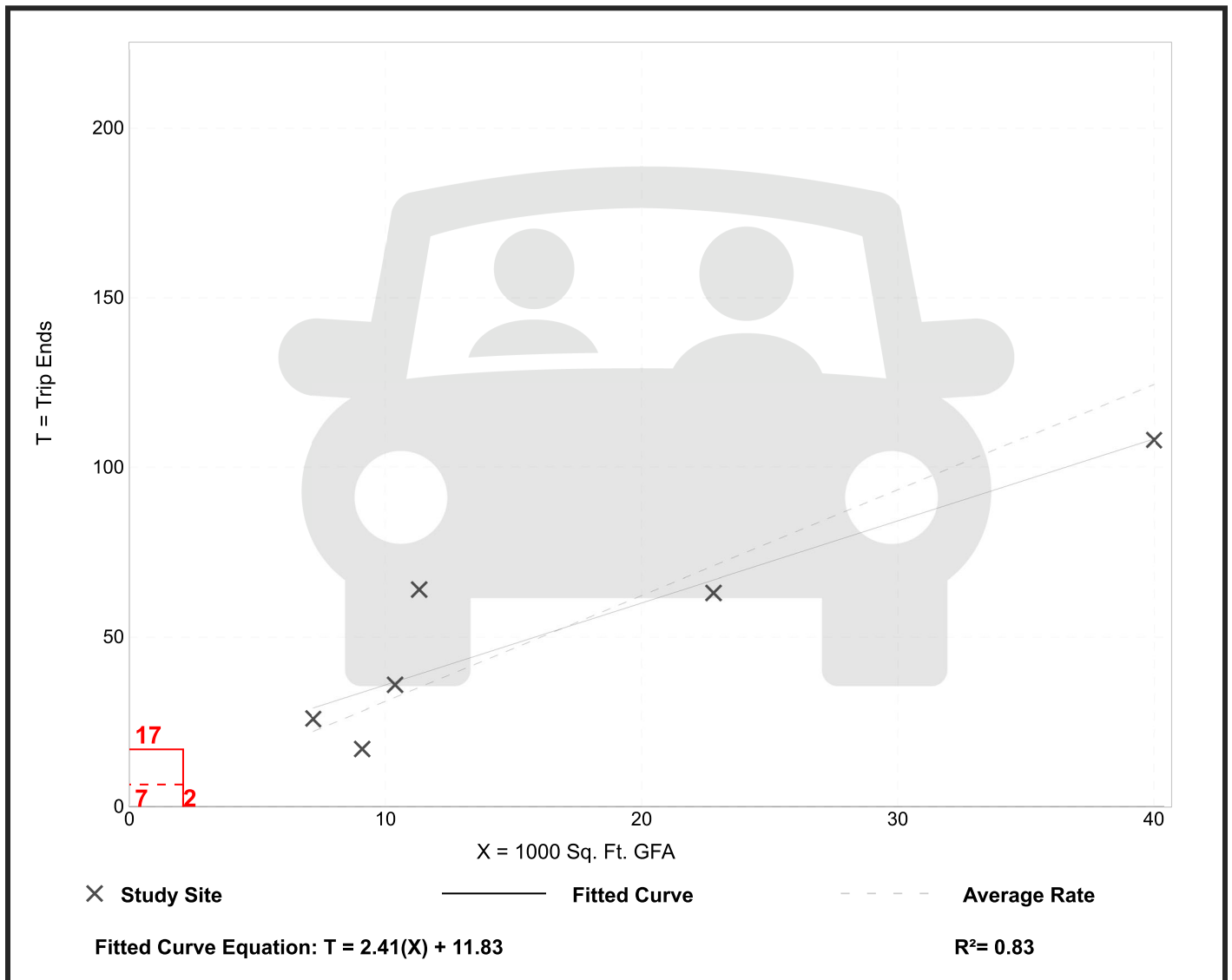
# Automobile Care Center (942)

**Vehicle Trip Ends vs: 1000 Sq. Ft. GFA**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 4 and 6 p.m.**  
**Setting/Location: General Urban/Suburban**  
 Number of Studies: 6  
 Avg. 1000 Sq. Ft. GFA: 17  
 Directional Distribution: 48% entering, 52% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
3.11	1.87 - 5.65	1.09

## Data Plot and Equation



# ***Wakefield Memorial High School***

***60 Farm Street***

**Wakefield, Massachusetts**

## Traffic Study Report

**Prepared For:**

Wakefield Memorial High School

**Prepared by:**

GM2 Associates, Inc.

September 2022

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## 1. EXECUTIVE SUMMARY

### 1.1 Introduction

GM2 Associates, Inc. (GM2) has prepared this Traffic Study Report (“Report”) to analyze the potential impacts that the proposed Wakefield Memorial High School (“WMHS”) redevelopment will have on the local street system, focusing on Farm Street in the vicinity of Nahant Street and Hemlock Road at the existing WMHS.

The new WMHS is expected to be constructed on-site in the location of the existing track and field area. Upon completion of the new school construction, the existing WMHS will be demolished and a new track and field area will be placed in that area. The new school is expected to enroll more students than the existing WMHS and will include new parking areas, new internal traffic circulation and mitigation measures at the intersection of Farm Street/Nahant Street/Hemlock Road, including either signalization or implementation of a roundabout.

The study area is unique in that a second school, the Northeast Metropolitan Regional Vocational High School, (“NEMT”) currently operates with all traffic using the same roadway, Hemlock Road, as the significant portion of the existing WMHS traffic does. There are plans to build a new school to replace the existing one. The new NEMT is expected to be constructed and operational prior to the construction of the new WMHS. The NEMT site will also include a new access road on Farm Street to the south which was expected to reduce traffic at the Farm Street/Nahant Street/Hemlock Road intersection but will have other effects. As such, all future analyses for the WMHS redevelopment have been completed with the new NEMT in place, and the intersection of Farm Street/Nahant Street/Hemlock Road requiring mitigation.

The existing period for this study is the year 2021 and all future conditions are reported with a seven (7) year horizon to the year 2028.

An overview of the existing site is shown in Figure 1.1.1. and a preliminary conceptual plan view of the site is shown in Figure 1.1.2.



Figure 1.1.1: Wakefield Memorial High School Study Area (Image via Google Earth)



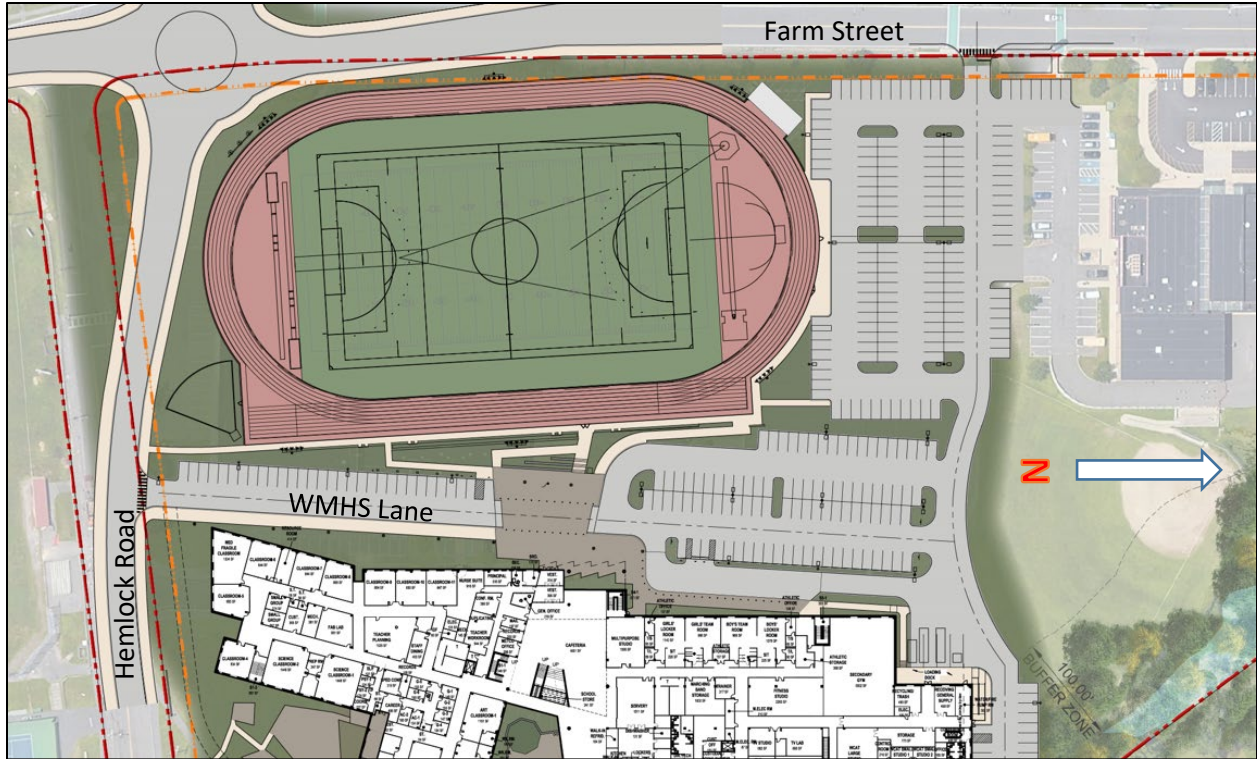


Figure 1.1.2: Wakefield Memorial High School Preliminary Conceptual Plan (SMMA)

The new roadway between the new track and new WMHS is hereby referred to as WMHS Lane, strictly for the purposes of this report.

## 1.2 Study Area

Generally, the study area is bounded by Woodville to the north, Hemlock to the south, town owned land to the immediate east, and NEMT. Roadways include Route 129 (Water Street) to the north, and Old Nahant Road to the southwest. Access to and from the WMHS site is currently via Farm Street and Hemlock Road. There are additional Town owned facilities along Hemlock Road such as the baseball field, the Dobbins Tennis Courts, and Landrigan Field, including several parking lots serving users. Access to the Breakheart Reservation area is also provided via Hemlock Road.

The following intersections were examined in this traffic study. Figure 1.2.1 shows the study intersections and Figure 1.2.2 shows the study intersections relative to the larger transportation network:


- (1) Farm Street at Water Street
- (2 & 3) Farm Street at Woodville School Driveways (2)
- (4 & 5) Farm Street at High School Driveways (2)
- (6) Farm Street at Nahant Street
- (7) Farm Street at Hemlock Road

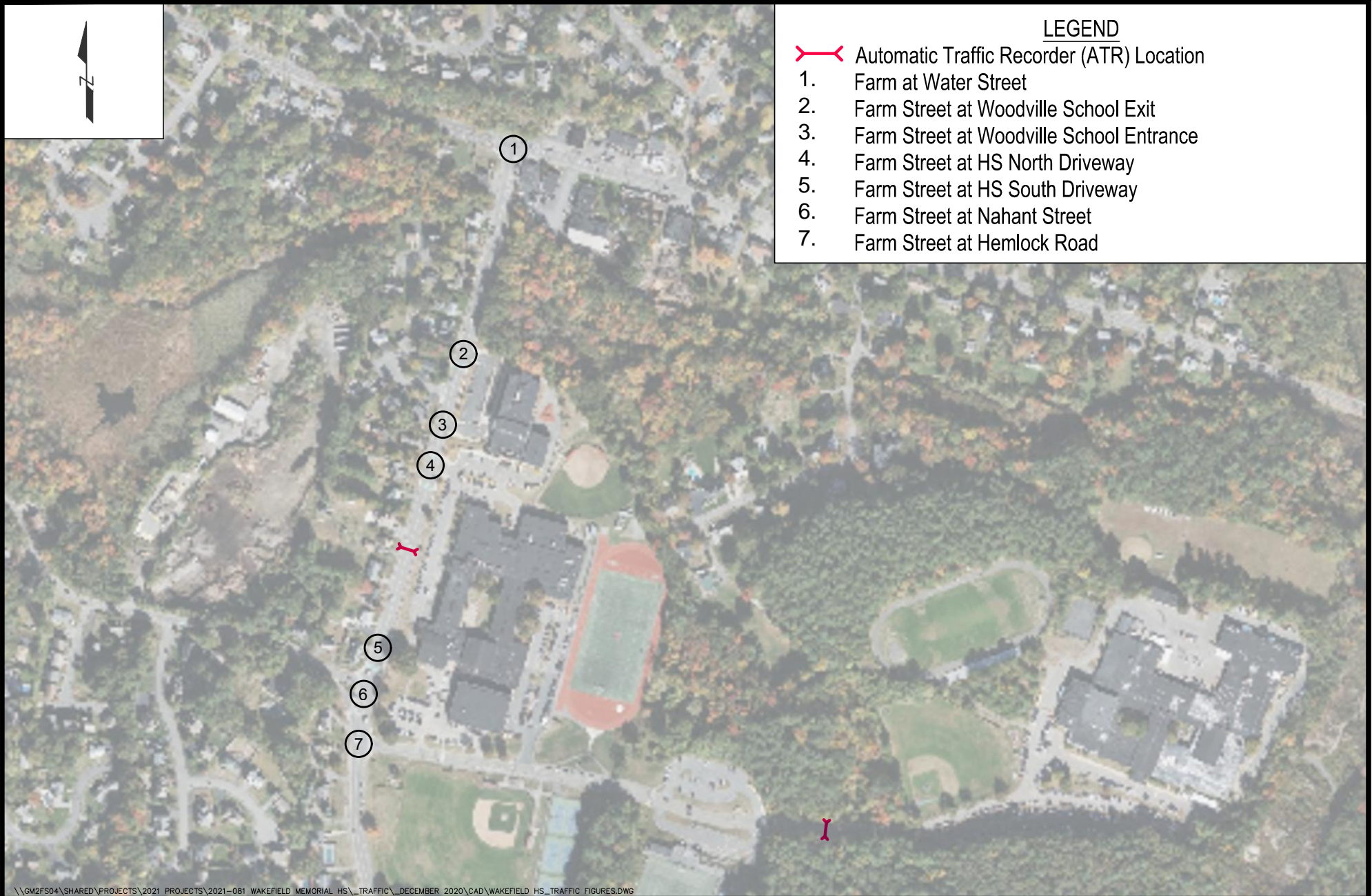
On-site parking as well as pick-up/drop-off areas were also observed and documented.





### LEGEND

-  Automatic Traffic Recorder (ATR) Location
- 1. Farm at Water Street
- 2. Farm Street at Woodville School Exit
- 3. Farm Street at Woodville School Entrance
- 4. Farm Street at HS North Driveway
- 5. Farm Street at HS South Driveway
- 6. Farm Street at Nahant Street
- 7. Farm Street at Hemlock Road



\\GM2FS04\SHARED\PROJECTS\2021 PROJECTS\2021-081 WAKEFIELD MEMORIAL HS\_TRAFFIC\DECEMBER 2020\CAD\WAKEFIELD\_HS\_TRAFFIC FIGURES.DWG



WAKEFIELD MEMORIAL HIGH  
SCHOOL  
WAKEFIELD, MA

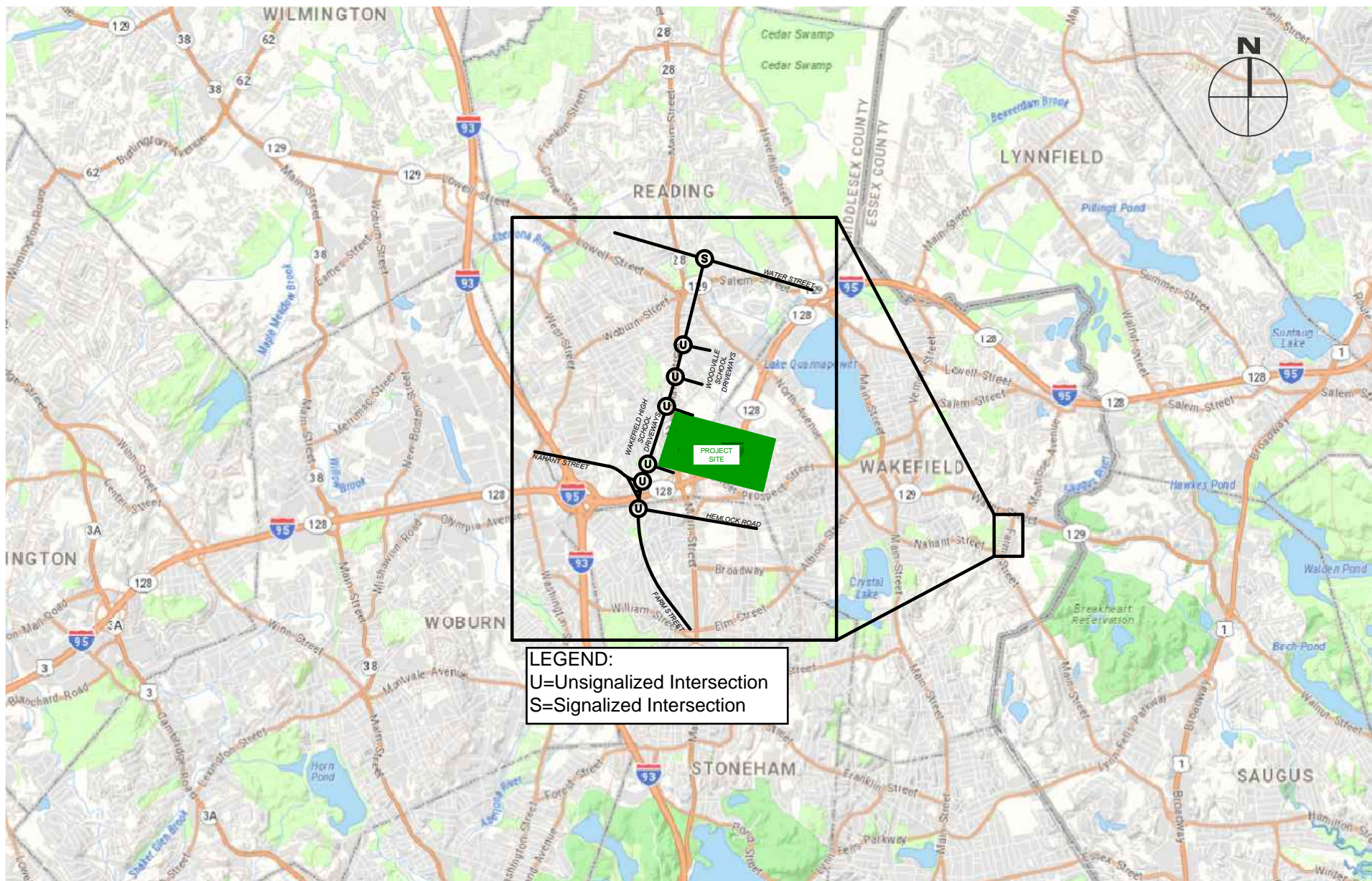
STUDY  
INTERSECTIONS

GM2 PROJECT NO.: 40684

DATE: SEPTEMBER 2022

SCALE: N.T.S. | FIGURE 1.2.1





\\GM2FS04\SHARED\PROJECTS\2021 PROJECTS\2021-081 WAKEFIELD MEMORIAL HS\\_TRAFFIC\\_DECEMBER 2020\CAD\WAKEFIELD\_HS\\_TRAFFIC FIGURES.DWG



WAKEFIELD MEMORIAL HIGH SCHOOL  
 WAKEFIELD, MA

LOCUS MAP

GM2 PROJECT NO.: 40684  
 DATE: SEPTEMBER 2022  
 SCALE: N.T.S. | FIGURE 1.2.2

### 1.3 Safety Analysis

A safety analysis was carried out at each of the study intersections based on crash data from the Massachusetts Department of Transportation (MassDOT) from 2015 to 2019, the most recent full five (5) years of complete data available.

The data were analyzed to determine crash locations and analyze possible contributing factors. Two (2) study intersections had crashes between 2015 and 2019 that involved a pedestrian. There were zero (0) reported fatal crashes.

A sight distance analysis was conducted for all existing high school driveways as well as for Hemlock Road at Farm Street. Although some sight distances do not meet minimum recommendations set forth by the American Association of State Highway Transportation Officials (AASHTO), based on on-site observations, there are no safety concerns based on these site distance limitations.

### 1.4 Trip Generation

Trip generation was completed using empirical data from the existing WMHS and extrapolated for the estimated future capacity. The site is expected to generate an additional 125 AM peak period (7:00am-8:00am) trips and an additional 61 pm peak period (2:45pm-3:45pm) trips compared to the existing conditions. Overall, the expected trips generated by WMHS in the AM peak total 813, and 397 in the PM peak. These trips were distributed across the applicable locations based on the site layout for WMHS and internal circulation.

### 1.5 Intersection Capacity Analysis

Capacity analyses were performed at all select study intersections to assess traffic operations under 2021 Existing Conditions, 2028 Future No-Build Conditions, 2028 Future Build Conditions with a signal, and 2028 Future Build Conditions with a roundabout. Analyses for future conditions were done for the 7-year time horizon from 2021, thus the analysis year becomes 2028. A summary table with the results of the capacity analyses is shown in Table 1.5-1.

Note that the Future No-Build condition operations are expected to be improved at the intersection of Farm Street/Nahant Street/Hemlock Road for Hemlock Road only. Operations on Nahant Street are expected to deteriorate significantly as a result of the new NEMT school traffic, even with the new access southerly on Farm Street, and Farm Street conditions do change significantly. All future conditions were analyzed assuming this project is completed and the school operational.

The proposed WMHS Project is expected to have a significant impact on the surrounding traffic network due to the already congested conditions in the AM peak period. PM peak operations are significantly better, as expected due to the fewer trips and reduced mainline volumes.



Table 1.5-1: Level-of-Service Summary

ID	Roadway	Movement	2028 No-Build Conditions				Roadway	Movement	2028 Buid Conditions - Signalized				Roadway	Movement	2028 Buid Conditions - Roundabout					
			AM Peak Hour		PM Peak Hour				AM Peak Hour		PM Peak Hour				AM Peak Hour		PM Peak Hour			
			LOS	Delay	LOS	Delay			LOS	Delay	LOS	Delay			LOS	Delay	LOS	Delay	LOS	Delay
			LOS	Delay	LOS	Delay			LOS	Delay	LOS	Delay			LOS	Delay	LOS	Delay	LOS	Delay
1	Water Street at Farm Street	EB T	C	34.1	B	19.6	Water Street at Farm Street	EB T	F	106.6	C	24.6	Water Street at Farm Street	EB T	F	106.6	C	24.6		
		EB R	A	2.9	A	1.4		EB R	B	17.9	A	1.6		EB R	B	17.9	A	1.6		
		WB L	B	10.6	A	7.9		WB L	C	28.5	A	9.2		WB L	C	28.5	A	9.2		
		WB T	A	6.6	A	6.2		WB T	A	9.4	A	7.1		WB T	A	9.4	A	7.1		
	SIGNALIZED	NB L	F	108.9	E	65.3	SIGNALIZED	NB L	F	124.9	E	80	SIGNALIZED	NB L	F	124.9	E	80		
		NB R	A	1.7	A	3.5			NB R	A	0.9	A	3.1			NB R	A	0.9	A	3.1
	<b>Overall</b>		<b>C</b>	<b>22.8</b>	<b>B</b>	<b>16.6</b>		<b>Overall</b>		<b>D</b>	<b>39.3</b>	<b>C</b>	<b>21.3</b>		<b>Overall</b>		<b>D</b>	<b>39.3</b>	<b>C</b>	<b>21.3</b>
2	Farm Street at Woodville School Exit Driveway	WB L	F	52.8	D	26.5	Farm Street at Woodville School Exit Driveway	WB L	F	150.8	D	33.8	Farm Street at Woodville School Exit Driveway	WB L	F	150.8	D	33.8		
		WB R	B	13.8	B	14.6		WB R	C	16.6	C	16.4		WB R	C	16.6	C	16.4		
		NB T	-	-	-	-		NB T	-	-	-	-		NB T	-	-	-	-		
	UN SIGNALIZED	SB T	-	-	-	-	UN SIGNALIZED	SB T	-	-	-	-	UN SIGNALIZED	SB T	-	-	-	-		
	<b>Overall</b>		-	-	-	-		<b>Overall</b>		-	-	-	-		<b>Overall</b>		-	-	-	-
3	Farm Street at Woodville School Entrance Driveway	-	-	-	-	Farm Street at Woodville School Entrance Driveway	-	-	-	-	-	Farm Street at Woodville School Entrance Driveway	-	-	-	-	-			
		NB TR	-	-	-		-	NB TR	-	-	-		-	NB TR	-	-	-	-		
		SB TL	A	9.2	A		9.3	SB TL	A	9.9	A		9.7	SB TL	A	9.9	A	9.7		
	UN SIGNALIZED	-	-	-	-	UN SIGNALIZED	-	-	-	-	UN SIGNALIZED	-	-	-	-	-				
	<b>Overall</b>		-	-	-	-		<b>Overall</b>		-	-	-	-		<b>Overall</b>		-	-	-	-
4	Farm Street at WMHS Exit Driveway	WB L	F	173	E	35.1	Farm Street at WMHS Driveway (Entry/Exit)	WB L	F	>300 *	F	85.5	Farm Street at WMHS Driveway (Entry/Exit)	WB L	F	>300 *	F	85.5		
		WB R	B	13.4	B	14.1		WB R	C	17.8	C	17		WB R	C	17.8	C	17		
		NB T	-	-	-	-		NB TR	-	-	-	-		NB TR	-	-	-	-		
	UN SIGNALIZED	SB T	-	-	-	-	UN SIGNALIZED	SB LT	B	10.5	A	9.2	UN SIGNALIZED	SB LT	B	10.5	A	9.2		
	<b>Overall</b>		-	-	-	-		<b>Overall</b>		-	-	-	-		<b>Overall</b>		-	-	-	-
5	Farm Street at WMHS Entrance Driveway	NB T	-	-	-	Farm Street at WMHS Entrance Driveway	NB T	Entrance consolidated with Exit in Build Condition				Farm Street at WMHS Entrance Driveway	SB T	Entrance consolidated with Exit in Build Condition						
		NB R	-	-	-		NB R						-					-	-	
		SB L	A	9.4	A		9.1						SB L					-	-	-
	UN SIGNALIZED	SB T	-	-	-	-	UN SIGNALIZED					SB R	-					-	-	
	<b>Overall</b>		-	-	-	-		<b>Overall</b>		-	-	-	-		<b>Overall</b>		-	-	-	-
6	Farm Street at Nahant Street	SB TR	-	-	-	Farm Street at Nahant Street/ Hemlock Road	EB LTR	F	145.8	F	91.9	Farm Street at Nahant Street/ Hemlock Road	EB LTR	D	28.1	B	10			
		NB LT	B	11.5	B		11.3	WB LTR	E	73.6	F		100.8	WB LTR	A	6.3	B	12.8		
		UN SIGNALIZED	EB LR	F	>300*		F	>300*	NB L	F	108.5		F	96.8	NB LTR	F	104.1	C	15.7	
		<b>Overall</b>		-	-	-		<b>Overall</b>		-	-	-		<b>Overall</b>		-	-	-		
7	Farm Street at Hemlock Road	SB L	B	12.2	B	10.1	SIGNALIZED	SB L	F	162.1	F	82.8	ROUNDABOUT	SB TR	B	11.6	C	19.1		
		NB T	-	-	-	-		SB TR	D	48.1	F	82.2								
		UN SIGNALIZED	WB L	F	184	F		68.5												
		<b>Overall</b>		<b>F</b>	<b>103</b>	<b>E</b>	<b>72.9</b>		<b>Overall</b>		<b>E</b>	<b>47.1</b>	<b>C</b>	<b>15.3</b>						
	<b>Overall</b>		-	-	-	-		<b>Overall</b>		-	-	-	-		<b>Overall</b>		-	-	-	-

Delay is measured in seconds. (-) HCM 6th Edition does not compute this movement/value in TWSC analyses.

\* Delay is greater than 300 seconds. Synchro reports this as an error.

The primary point of concern is the WMHS access onto Farm Street. The lack of acceptable gaps for left-turn vehicles onto Farm Street significantly reduces the capacity of the exiting volume at this driveway. Significant queuing can result in complete blockages leading back to Hemlock Road and spilling back into Farm Street.

The capacity of the WMHS Lane should be maximized to provide stacking capacity for drop-off traffic.

## 1.6 Conclusion

This Traffic Study Report was prepared to assess and analyze any potential impacts the redeveloped WMHS site may have on the surrounding roadway network of Wakefield, MA, specifically in the area of Farm Street.

From a safety perspective, recent collected data shows the study intersections are experiencing fewer crashes than the District average. Two (2) study intersections have crashes between 2015 and 2019 that involve a pedestrian. There were zero (0) reported fatal crashes. Realignment of the intersection of Farm Street/Nahant Street/Hemlock Road to accommodate signalization or a roundabout would be expected to reduce the number of conflict points compared to the existing offset-legged configuration and provide shorter pedestrian crossings. Both improvements would be expected to increase safety at the intersection.

A sight distance analysis was conducted for all existing high school driveways as well as for Hemlock Road at Farm Street. While some sight distances do not meet minimum recommendations set forth by AASHTO, based on on-site observations, there are no safety concerns based on these site distance limitations. The proposed driveway southerly is expected to have sight distances greater than 350 feet in both directions.

During peak periods vehicular travel speeds are very low (15-20 mph) due to the heavy congestion. During off-peak hours, travel speeds increase and were measured in excess of 35 to 40 mph.

The internal circulation issues under the existing conditions are a primary cause of congestion on Farm Street, as queues and stoppages along Hemlock Road result in vehicles on Farm Street being unable to exit into Hemlock Road, causing backups along Farm Street northbound and southbound and on Nahant Street eastbound. Improvements to parking lot locations and access into and out of those areas are key to improving conditions on Farm Street as this will provide relief and capacity on site, enabling vehicles on Farm Street to operate at higher levels of service and reduced delays.

Traffic delays on Hemlock Road are expected to be at LOS F with delays in excess of 300 seconds (actual report is "error") due to the NEMT school traffic. The intersection requires mitigation from that resulting traffic alone. The additional load on the intersection by the WMHS school is less

significant than that of the new NEMT, yet due to the demand already placed on the intersection, the new traffic will result in further degraded levels of service and increased delays.

The introduction of either a traffic signal or a roundabout is consistent with the desire to efficiently move traffic, increase safety and achieve reduced roadway speeds on Farm Street as either type of control is considered to be a safety countermeasure to observed traffic issues including, but not limited to, speeding, crashes, pedestrian safety, and access management. Peak hour operations are anticipated to improve over the No-Build conditions but will still include approaches with significant delays due to the excessive traffic in short intervals. However, for the remaining periods of the day, operations are anticipated to be excellent under either build condition.

The roundabout provides superior levels of service and operations for Farm Street traffic, but delays within the WMHS circulatory roadway may experience congestion. The traffic signal option provides more gaps for exiting traffic at the expense of operations on Farm Street and Water Street. Traffic within WMHS still experiences significant congestion with the signal.

## 1.7 Recommendations

The key findings were noted in the previous section. Based on those findings and analyses, GM2 offers the following recommendations for consideration:

On Farm Street:

1. Construct a roundabout at The Farm Street/Nahant Street/Hemlock Road intersection.
2. At the roundabout, construct a southbound left-turn lane that is at least 300 feet long.
3. Consider adding RRFB crossings for the roundabout.
4. Consolidate the two crosswalks at the existing WMHS exit to one at the new WMHS access. Place this new crosswalk on the north side of the access on Farm Street and add an RRFB.
5. A Crossing Guard that can stop Farm Street traffic to allow WMHS Lane traffic to exit would provide relief as necessary for the buses to exit and for queues on WMHS Lane to Exit.
6. Optimize the signal timings at the intersection of Water Street at Farm Street.
7. Implement driver feedback radar speed signs northbound and southbound on Farm Street.

On Hemlock Road:

8. Construct Hemlock Road with 2 lanes eastbound at least to WMHS Lane and preferably to the 45-space parking lot, then reduce to one lane.

WMHS Circulation:

9. The on-site road, referred to herein as WMHS Lane, requires two lanes for capacity so as not to queue traffic into Hemlock Road and further back into Farm Street. This roadway, originating at Hemlock Road, passing through the site, and terminating at Farm Street is

recommended to be two lanes northbound-only, with one lane ending as an exclusive left-turn onto Farm Street, and one lane as an exclusive right-turn onto Farm Street.

10. The movements from Farm Street into WMHS Lane should be required to turn right immediately entering the site to encourage a counterclockwise vehicular travel pattern.
11. Designate a drop-off area in the parking lot on the north side of the track.
12. Designated/numbered parking spaces to control vehicles searching for empty spaces.
13. If the WMHS and NEMT class start times can be offset as they are currently, consider maintaining this requirement to offset peak demand.

Safe Routes to School Study:

14. Implement recommendations from the “Safe Routes to School Walk Assessment” prepared for the Woodville Elementary School and Galvin Middle School. The applicable recommendations are dependent upon the mitigation measures implemented at WMHS.

\*\*\*

## 2. EXISTING CONDITIONS INVENTORY

GM2 collected existing conditions inventory along each of the study roadways and each of the existing study intersections. This section summarizes the inventory collected.

### 2.1 Study Area

The study area includes the following roadways and intersections.

#### 2.1.1 Study Roadways

- Farm Street (between Water Street and Old Nahant Road)
- Water Street (between Millbrook Lane and Montrose Avenue)
- Nahant Street (between Stark Avenue and Farm Street)
- Hemlock Road (between Farm Street and Northeast Metro Tech)

##### ***Farm Street (between Water Street and Old Nahant Road)***

Farm Street is classified as an Urban Minor Arterial under Town of Wakefield jurisdiction. Between Water Street and Hemlock Road it is a two-way, two-lane roadway with an approximate curb-to-curb width of 38 feet. There is an 18-foot travel lane and one-foot shoulder in each direction. There are 5-foot asphalt sidewalks on each side of the roadway with a 3.5-to-5-foot landscaped buffer on each side. Parking is permitted on the west side of the roadway except between 6:00 AM and 9:00 AM and on the east side of the roadway except on weekdays between 7:00 AM and 8:30 AM. Between Hemlock Road and Old Nahant Road it is a two-way, two-lane roadway with an approximate curb-to-curb width of 43 feet. There is a 13.5-foot travel lane and 8-foot shoulder in each direction. There is a 5-foot asphalt sidewalk with a 3-to 6-foot landscaped buffer on the west side of the roadway and a 6-foot asphalt sidewalk with no buffer on the east side of the roadway. Parking is permitted on both sides of the roadway except between 6:00 AM and 9:00 AM. There are currently no bicycle accommodations along the roadway.

##### ***Water Street (between Millbrook Lane and Montrose Avenue)***

Water Street is classified as an Urban Principal Arterial under Town of Wakefield jurisdiction. Between Farm Street and Millbrook Lane, it is a two-way, two-lane roadway with an approximate curb-to-curb width of 42 feet. There is a 12.5-foot travel lane and 8.5-foot shoulder in each direction. There is a 5-foot asphalt sidewalk with no buffer on the south side of the roadway. Between Montrose Avenue and Farm Street it is a two-way, two-lane roadway with an approximate curb-to-curb width of 40.5 feet. There is a 19.5-foot travel lane and one-foot shoulder in the westbound direction and a 12-foot travel lane with an 8-foot shoulder in the eastbound direction. There are 6-foot asphalt sidewalks on each side of the roadway with no buffer. Between There are currently no bicycle accommodations along the roadway.



***Nahant Street (between Stark Avenue and Farm Street)***

Nahant Street is classified as an Urban Minor Arterial under Town of Wakefield jurisdiction. It is a two-way, two-lane roadway with an approximate curb-to-curb width of 27 feet. There is a 12.5-foot travel lane and 1-foot shoulder in each direction. Along the entire segment there is a 5.5-foot asphalt sidewalk with no buffer on the north side of the roadway. Between Kathleen Drive and Stark Avenue there is a 5-foot asphalt sidewalk with a 2-foot landscaped buffer on the south side. At all intersections along this segment, except for Partridge Lane, Raven Road, and Mt Pleasant Avenue, there are cement concrete sidewalks. There are currently no bicycle accommodations along the roadway.

***Hemlock Road (between Farm Street and Northeast Metro Tech)***

Hemlock Road is classified as Local Road under Department of Conservation and Recreation (DCR) jurisdiction. It is a two-way, two-lane roadway with an approximate curb-to-curb width of 39 feet. There is a 19.5-foot travel lane in each direction. On the north side of the roadway between Farm Street and the rear Wakefield High School parking lot entrance there is a 5-foot wide, yellow-striped fire lane. There is an 8-foot asphalt sidewalk with no buffer on the south side of the roadway between the midblock crosswalk east of Farm Street and the Landrigan Field parking lot. There is a 7-foot asphalt sidewalk with no buffer on the north side of the roadway rear Wakefield High School parking lot entrance and the Landrigan Field parking lot. There are currently no bicycle accommodations along the roadway

**2.1.2 Study Intersections**

- Farm Street at Water Street
- Farm Street at Woodville School Driveways (2)
- Farm Street at High School Driveways (2)
- Farm Street at Nahant Street
- Farm Street at Hemlock Road

***Farm Street at Water Street***

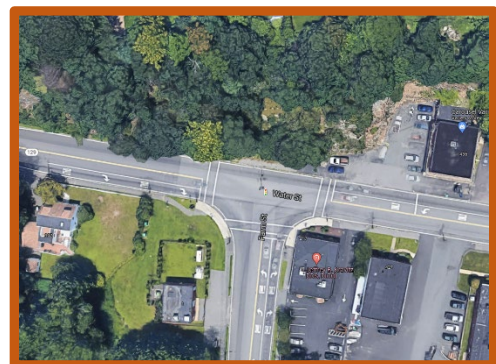
Farm Street at Water Street is a three-legged, signalized intersection. The intersection has the following approach lane configurations:

**Water Street Westbound Approach:**

- One (1) 10.5-foot exclusive left-turn lane
- One (1) 11-foot through lane
- 9-foot parallel striped crosswalk across approach
- One (1) 16.5-foot departure lane

**Water Street Eastbound Approach:**

- One (1) 10-foot through lane
- One (1) 10-foot exclusive right-turn lane



Source: ©2021 Google Earth

- 9-foot parallel striped crosswalk across approach
- One (1) 19.5-foot departure lane

Farm Street Northbound Approach:

- One (1) 10.5-foot exclusive left-turn lane
- One (1) 10.5-foot exclusive right-turn lane
- 9-foot parallel striped crosswalk across approach
- One (1) 26-foot departure lane

Signal Phasing

Farm Street Phase:

- Six (6) seconds of Minimum green time with three (3) second vehicle extension and a 22-second minimum split
- 40 seconds of Maximum 1 (6:00am to 10:00am) green time and 40 seconds of Maximum 2 (4:00pm to 7:00pm) green time
- Four (4) seconds of yellow and two (2) second of red clearance
- Right-Turn on Red is not permitted for the Farm Street approach
- No Recall

Water Street Westbound Phase:

- Exclusive Left Turn and Farm Street Right Turn:
  - o 6 seconds of Minimum green time with two (2) second vehicle extension and a 12-second minimum split
  - o 15 seconds of Maximum 1 (6:00am to 10:00am) green time and 40 seconds of Maximum 2 (4:00pm to 7:00pm) green time
  - o Four (4) seconds of yellow and two (2) second of red clearance
  - o No Recall
- 10 seconds of Minimum green time with two (2) second vehicle extension and a 16-second minimum split
- 30 seconds of Maximum 1 green time and 40 seconds of Maximum 2 green time
- Four (4) seconds of yellow and two (2) seconds of red clearance
- Minimum Recall

Water Street Eastbound Phase:

- 10 seconds of Minimum green time with two (2) second vehicle extension and a 16-second minimum split
- 35 seconds of Maximum 1 green time and 40 seconds of Maximum 2 green time
- Four (4) seconds of yellow and two (2) seconds of red clearance
- Minimum Recall

Exclusive Pedestrian Phase:

- Seven (7) seconds of Walk time and 16 seconds of Flashing Don't Walk time
- Three (3) seconds of red clearance
- Pedestrian Recall

***Farm Street at Woodville School Driveways***

Farm Street at the Woodville School Driveways are three-legged, unsignalized intersections. The intersections have the following approach lane configurations:



Source: ©2021 Google Earth

At Entrance Driveway:

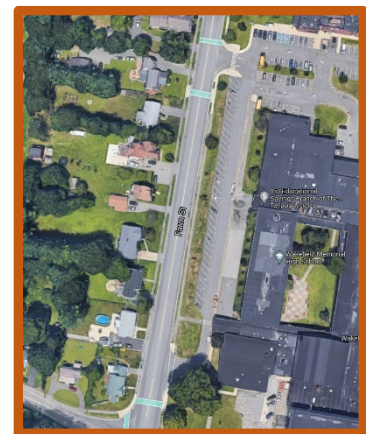
- Farm Street Northbound Approach:
  - o One (1) 18-foot through/right-turn lane
  - o One (1) 18-foot departure lane
- Farm Street Southbound Approach:
  - o One (1) 18-foot through lane
  - o One (1) 18-foot departure lane
- Woodville School Entrance Driveway Eastbound Departure:
  - o 24-foot curb cut
  - o 10-foot zebra-striped crosswalk across driveway

At Exit Driveway

- Farm Street Northbound Approach:
  - o One (1) 18-foot through lane
  - o One (1) 18-foot departure lane
  - o 10-foot parallel striped crosswalk with solid green fill midway between offset intersection
- Farm Street Southbound Approach:
  - o One (1) 18-foot through lane
  - o One (1) 18-foot departure lane
- Woodville School Exit Driveway Westbound Approach:
  - o 24-foot curb cut
  - o 9-foot zebra-striped crosswalk across driveway

***Farm Street at High School Driveways***

Farm Street at the High School Driveways are three-legged, unsignalized intersections. The intersections have the following approach lane configurations:



Source: ©2021 Google Earth

At Entrance Driveway:

- Farm Street Northbound Approach:
  - o One (1) 23-foot through/right-turn lane
  - o One (1) 23-foot departure lane
  - o One (1) 10-foot parallel striped crosswalk with solid green fill
- Farm Street Southbound Approach:
  - o One (1) 20.5-foot through lane
  - o One (1) 21-foot departure lane
- High School Entrance Driveway Eastbound Departure:
  - o 51-foot curb cut

- 9-foot parallel-striped crosswalk across driveway

At Exit Driveway:

- Farm Street Northbound Approach:
  - One (1) 19-foot through lane
  - One (1) 19-foot departure lane
  - One (1) 10-foot parallel striped crosswalk with solid green fill
- Farm Street Southbound Approach:
  - One (1) 19-foot through lane
  - One (1) 19-foot departure lane
  - One (1) 8.5-foot parallel striped crosswalk with solid green fill
- High School Exit Driveway Westbound Approach:
  - 31-foot curb cut
  - 9-foot zebra-striped crosswalk across driveway

***Farm Street at Nahant Street***

Farm Street at Nahant Street is a three-legged, unsignalized intersection. The intersection has the following approach lane configurations:

Farm Street Northbound Approach:

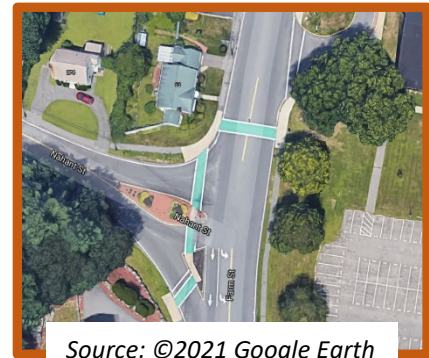
- One (1) 24-foot wide left-turn/through lane
- One (1) 12-foot through-lane departure

Farm Street Southbound Approach:

- One (1) 24-foot through/right-turn lane
- One (1) 24-foot departure lane
- 10.5-foot parallel striped crosswalk with solid green fill

Nahant Street Eastbound Approach:

- One (1) 26-foot approach lane that becomes a 26-foot left-turn slip lane and a 25-foot right-turn slip lane divided by a triangular splitter island
- One (1) 21-foot oval shaped median island
- One (1) 26-foot departure lane
- 8.5-foot parallel striped crosswalk with solid green fill



Source: ©2021 Google Earth

***Farm Street at Hemlock Road***

Farm Street at Hemlock Road is a three-legged, unsignalized intersection. The intersection has the following approach lane configurations:

**Farm Street Northbound Approach:**

- One (1) 16-foot through/right-turn lane
- One (1) 20-foot departure lane

**Farm Street Southbound Approach:**

- One (1) 12-foot through lane
- One (1) 12-foot exclusive left-turn lane
- One (1) 22-foot departure lane



Source: ©2021 Google Earth

**Hemlock Road Westbound Approach:**

- One (1) 14-foot left-turn/right-turn lane
- One (1) 20-foot departure lane
- 9.5-foot parallel striped crosswalk

**2.2 Wakefield Memorial High School Site Observations****Weekday AM Drop-off Observations:**

- Queue Times:
  - o Queues start between 7:15-7:20AM
  - o Queues at drop-off area in front of school clear by 7:30AM
  - o Queues along roadway clear by 7:40 AM
- Queue Locations:
  - o Queues at drop-off area back up onto Farm Street
  - o Queues back up along Hemlock Road (to the east) after drop-off at NEMT as vehicles wait to turn onto Farm Street
  - o Queues back up from Hemlock Road to Woodville School
    - Vehicles waiting to make left-turn and right-turn into drop-off area
    - High volume of left turns from Farm Street to drop-off area
- Conflict Points:
  - o Vehicles trying to make right-turn from Nahant Street onto Farm Street and then an immediate left-turn onto Hemlock Road
- Bus traffic:
  - o High volume of buses turns from Farm Street to Hemlock Road to access NEMT
  - o Most buses leaving NEMT make left turn off Hemlock Road onto Farm Street which causes queueing

**Weekday PM Pick-up Observations**

- Queue Times:
  - o Queues start along Hemlock Road at 2:05pm and cleared by 2:20pm



- Queue Locations:
  - o Queues build up along Hemlock Road. Queues extend past parking lot across from Landrigan Field.
  - o Through vehicles along Farm Street due to volume of students crossing at various crosswalks along Farm Street
- Conflict Points:
  - o Vehicles use the High School driveway entrance as a turn around to wait for pick-up along Farm Street
- Bus Traffic:
  - o Four (4) buses specifically for Wakefield Memorial High School
  - o Buses turning onto Hemlock Road from Farm Street to go to NEMT.
- Pick-up Waiting Areas:
  - o Vehicles arriving for pick up arrived at a steady rate and not all at once
  - o Vehicles parked along both sides of Farm Street
  - o When vehicles waiting to pick-up cannot find space along Farm Street, vehicles begin to wait on Nahant Street
  - o After 2:15 there were some passenger vehicle pick-ups in dedicated AM drop-off area (this area is restricted from 1:45-2:15 for buses only)

### 2.2.1 Study Area Observations

The existing Farm Street/Nahant Street/Hemlock Road intersection is operationally deficient during peak periods due to the lack of formal and physical delineation. Observations indicate motorists have turned the approaches into their own system wherein regular users appear to abide by agreed upon allowable maneuvers and by-passes during peak periods of demand.

There are specific spot conditions that are also undesirable, including:

Motorists exiting the northern parking lot onto Farm Street both northbound and southbound have difficulty finding acceptable gaps to enter due to the congested conditions.

There was an apparent formation of a left-turn lane southbound to access the WMHS drive north of Hemlock Road observed. This causes an uncontrolled intersection with a lack of delineation. Typically some type of left-turn lane would be provided. The condition seems to function due to the congestion and low speeds.

Nahant Street has an overly-wide configuration with a large island that left-turns must maneuver around while right-turn vehicles bypass them to a yield condition. A notable volume of traffic is destined from Nahant Street to Hemlock Road and these vehicles must turn right, then attempt to join the exclusive left-turn lane queue onto Hemlock Road. A small sample observation period revealed that motorists in the left-turn lane as well as the vehicles attempted to pass Nahant Street to continue southerly, are accepting of the movement and operations are better than expected considering without motorist courtesy, Nahant Street traffic would be stopped with few available gaps to enter Farm Street.

Pedestrian access on Farm Street is defined north of Nahant Street with several well marked crosswalks. However, the crosswalks at Nahant Street are excessively long and leave pedestrians exposed to multiple lanes of traffic from both directions. During peak periods, vehicular speeds are very low, thus pedestrians can typically cross safely.

Field observations noted long queues from Farm Street heading into Hemlock Road easterly towards the gate for the NEMT site but at the time no cause was visible. An assumption has been made that there is a guard at the gate near NEMT checking parking stickers for student. This essentially turns that area into a stop-controlled road and every vehicle must stop. This causes queues back out onto Farm Street, exacerbating an already over-capacity condition. Vehicles are unable to get onto or out of Hemlock Road as the eastbound queue exceeds capacity and vehicles have no area to exit from Farm Street, causing Farm Street northbound and southbound to queue, thus making the Hemlock Road westbound exiting turns difficult, resulting in queuing of that westbound traffic easterly on Hemlock Road as well. Note that this was observed early in the school year, and it is anticipated that this would not occur every day.

In the rare occurrence of a northbound left turn on Nahant Street being blocked by southbound traffic, there is total gridlock as no one can pass in any direction. The roadway width is sufficient to allow vehicles to pass to the right, thus the combination of a southbound vehicle blocking and the northbound vehicle being too far right must occur simultaneously for this to take place. This is noteworthy as buses and trucks do pass through this area at these peak times.

Vehicular operations on Hemlock Road are as well as can be expected, but improvements could be made. There is generally enough width on Hemlock Road for eastbound vehicles destined for the NEMT site to pass those that are attempting to turn left into the several parking lots for WMHS. The loss of this width would be detrimental to the capacity of the roadway.

On the Farm Street side at the WMHS drop-off the one-way in and one-way out configuration is typical, and little can be done about adding or modifying this arrangement without some other tradeoff negating whatever the potential benefits might be. This could include making the area longer at the expense of either driveway location or widening to allow to two lanes to stack at the expense of exiting traffic conflicts. Note that the expected Build-Condition includes eliminating this area.

In GM2's observations, motorists were not found to be dropping off directly from Farm Street, ie: pulling into the shoulder, dropping off, and continuing on.

## 2.3 Off-Site Existing Conditions Data Collection

### 2.3.1 Automatic Traffic Recorder (ATR) Counts

Automatic Traffic Recorder (ATR) counts were collected in November 2021. The ATR data is summarized in Table 2.3-1.

**Table 2.3-1: ATR Data Summary**

Location	ADT <sup>1</sup>	Weekday AM Peak Hour			Weekday PM Peak Hour		
		Volume <sup>2</sup>	K <sup>3</sup>	Peak Direction	Volume <sup>2</sup>	K <sup>3</sup>	Peak Direction
Farm Street in Front of Wakefield Memorial High School	12,839	1,050	8.2%	63.7% SB	1,282	10.0%	56.5% NB
Hemlock Road East of Landrigan Field	2,663	731	2.7%	67.8% EB	324	1.7%	72.5% WB

<sup>1</sup>Average Daily Traffic between 11/16/2021, 11/17/2021, and 11/18/2021; <sup>2</sup>Peak hour volumes are calculated based on peak hours from the TMCs (7:00am to 8:00am and 2:45pm to 3:45pm); <sup>4</sup>K = peak hour volume divided by the ADT

### 2.3.2 Pedestrian and Bicycle Counts

Pedestrian and bicycle volume data was determined from the November 2021 data, as described below. The pedestrian turning movement counts are shown graphically in Figure 2.3.1 and the bicycle turning movement counts are shown graphically in Figure 2.3.2. The raw data are attached in Appendix A.

### 2.3.3 Intersection Turning Movement Counts (TMCs)

Turning movement counts (TMCs) were collected during the Weekday AM (7:00am to 9:00am) and Weekday PM (2:00pm to 4:00pm) peak periods for all study intersections in November 2021. These hours encompass peak drop-off and pick-up times at each of the schools. According to the collected data, the overall peak hours at each of the study intersections is between **7:00am and 8:00am** and **2:45pm to 3:45pm**. The peak hours for Farm Street at Hemlock Road and at the high school drop-off/pick-up area are the same as the times listed above during the Weekday AM peak hour but differ slightly (2:30pm to 3:30pm) during the Weekday PM peak hour. The traffic counts included cars, heavy vehicles, pedestrians, and bicycles. The raw traffic data are attached in Appendix A.

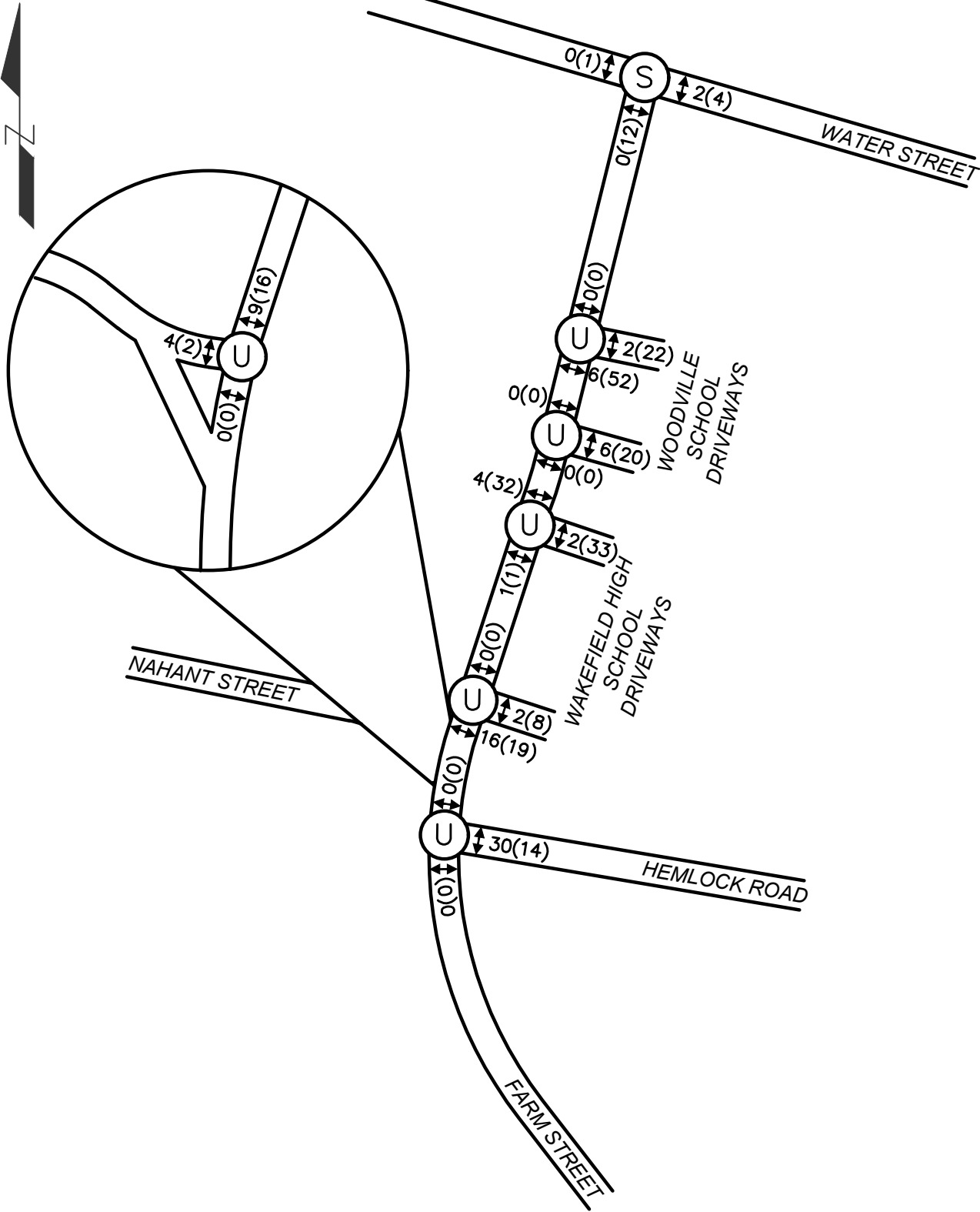
As discussed previously, the NEMT school is expected to be built and operational prior to the WMHS redevelopment project. The NEMT project has a Traffic Impact Study completed and GM2 was provided with this report accordingly. Based on the findings in that report, there are volumes to be added to the WMHS No-Build Condition. Those volumes were generated on top of the NEMT existing conditions volumes, and as such, become the baseline for the WMHS project as well.

The traffic volume data from the NEMT report was used to complete the analyses for the WMHS project, but only after the NEMT study volumes were compared to the volumes collected by GM2. Once the volume data were corroborated, GM2 moved forward with our analyses.

GM2 notes that the NEMT report indicated that the peak hour for their site was 7:15am to 8:15am, however a review of the raw data shows that the **7:00am to 8:00am** data were used. The afternoon peak hour of **2:45pm to 3:45pm** was the same.

The existing turning movement count data, per the NEMT report, are shown graphically in Figures 2.3.3 and 2.3.4.

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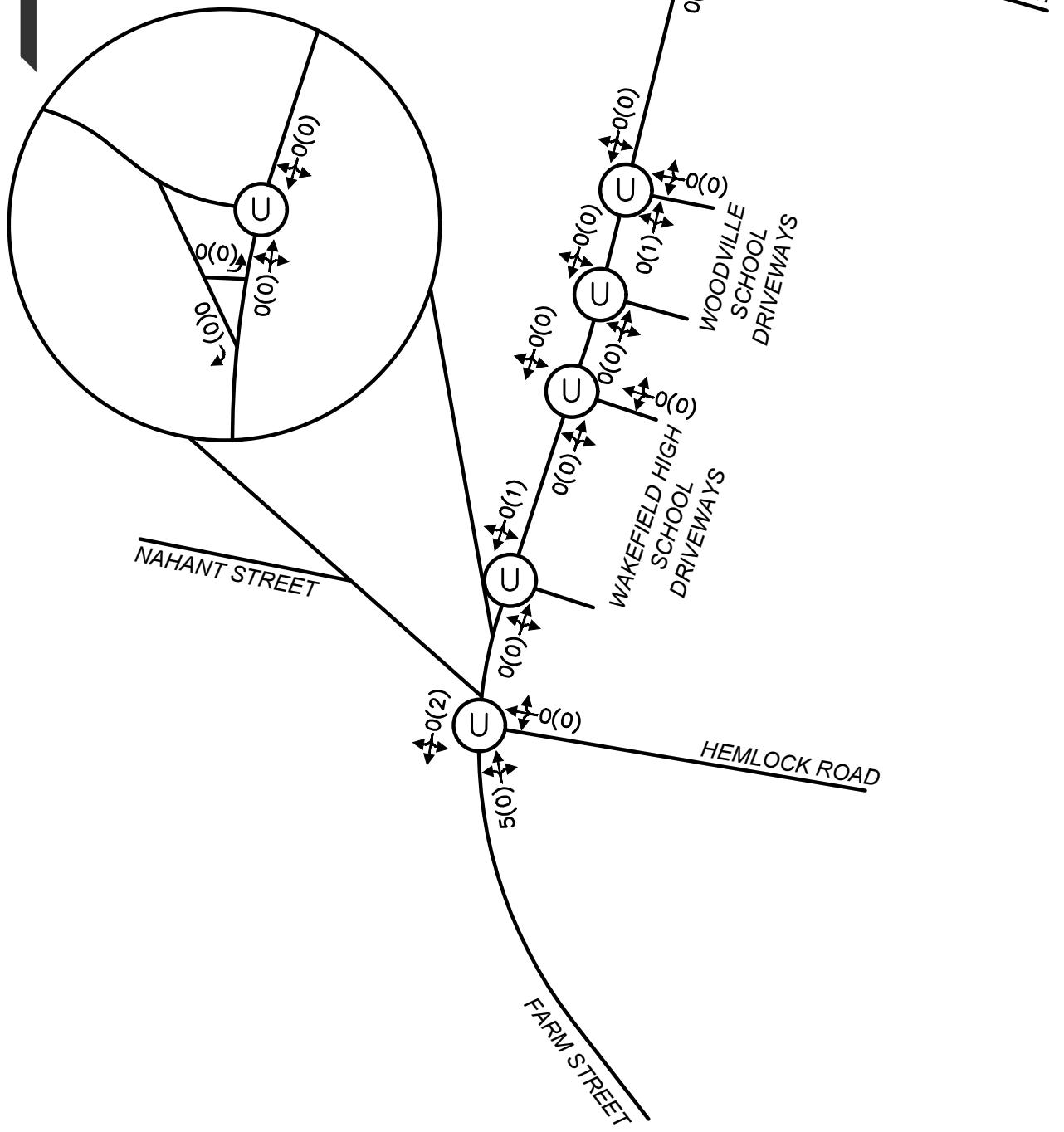
WAKEFIELD MEMORIAL HIGH SCHOOL  
 WAKEFIELD, MA

2021 Existing Weekday Peak Hour Pedestrian Volumes

GM2 PROJECT NO.: 40684  
 DATE: SEPTEMBER 2022  
 SCALE: N.T.S. | Figure 2.3.1



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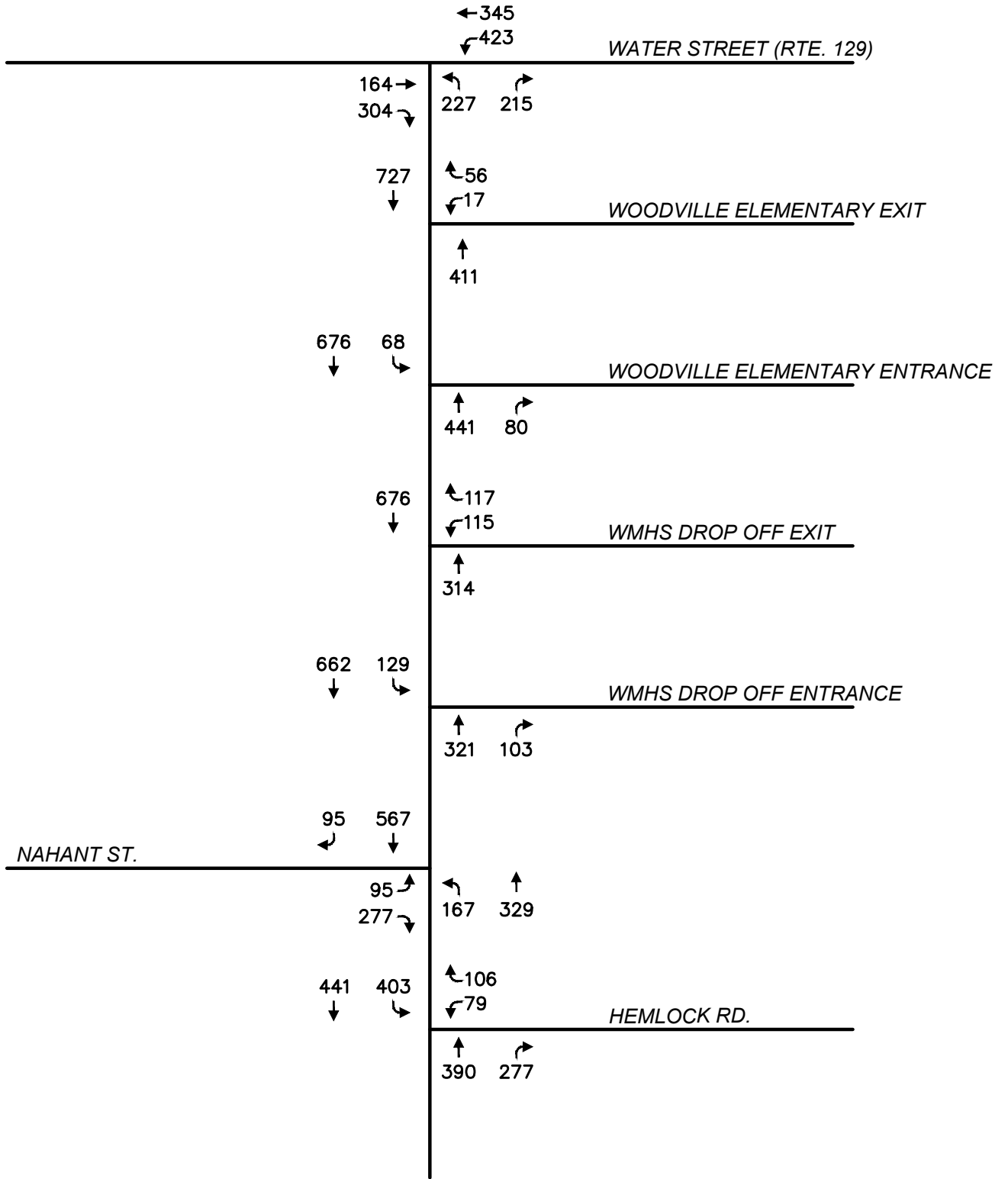
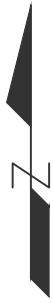


## Legend

XX(YY) → 2021 Existing Weekday AM(Weekday PM) Peak Hour Bicycle Volumes

Note: Imbalances due to numerous pedestrian routes not shown  
 S = Signalized Intersection; U = Unsignalized Intersection

	WAKEFIELD MEMORIAL HIGH SCHOOL WAKEFIELD, MA	2021 Existing Weekday Peak Hour Bicycle Volumes	GM2 PROJECT NO.: 40684	
			DATE: SEPTEMBER 2022	
			SCALE: N.T.S.	Figure 2.3.2



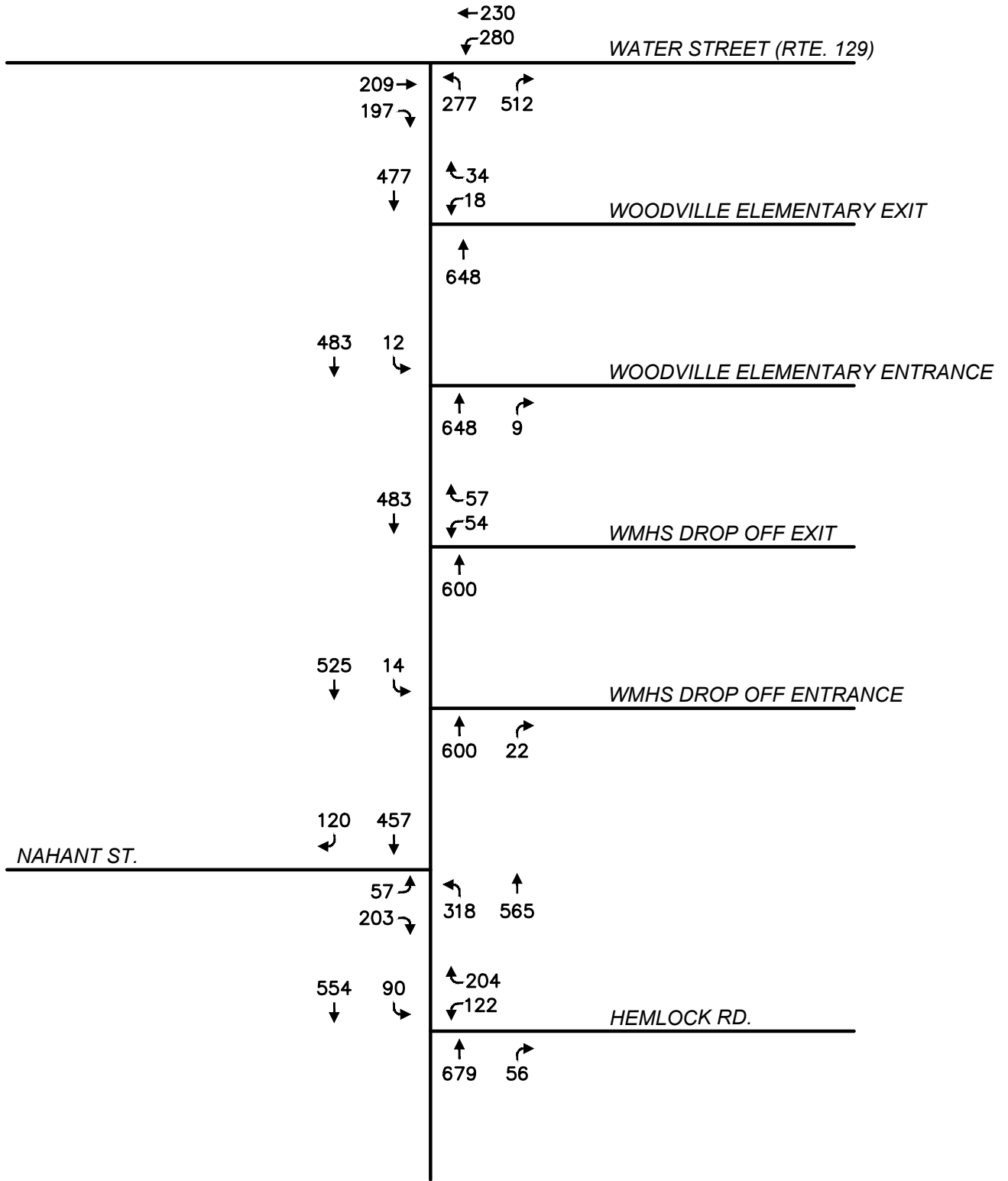
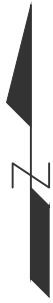
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WAKEFIELD MEMORIAL HIGH SCHOOL  
WAKEFIELD, MA

2021 EXISTING  
AM PEAK

GM2 PROJECT NO.: 40684  
DATE: SEPTEMBER 2022  
SCALE: N.T.S. | Figure 2.3.3



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WAKEFIELD MEMORIAL HIGH  
SCHOOL  
WAKEFIELD, MA

2021 EXISTING  
PM PEAK

GM2 PROJECT NO.: 40684  
DATE: SEPTEMBER 2022  
SCALE: N.T.S. | Figure 2.3.4

## 2.4 On-Site Existing Conditions Data Collection

### 2.4.1 Parking Supply and Demand

Parking count data were collected on November 17, 2021. There are a total of five (5) separate parking lots on the Wakefield Memorial High School site. Between the five (5) parking lots, there are 403 total vehicle parking spaces, including 297 unmarked (standard) spaces, 60 staff spaces, 20 reserved spaces, 15 handicap spaces, eight (8) WCAT spaces, and three (3) visitor spaces. Unmarked (standard) spaces were 84% occupied, “Staff” spaces were 67% occupied, reserved spaces were 40% occupied, handicap spaces were 0% occupied, WCAT spaces were 13% occupied, and visitor spaces were 0% occupied, for a parking total of 74% occupation. Figure 2.4.1 outlines each lot and corresponding flows, as well as the supply and demand for each lot. Figure 2.4.2 shows Weekday AM drop-off flows, queue locations, and conflict points. Figure 2.4.3 shows Weekday PM peak flows, queue locations, and conflict points.



**LEGEND**

- Existing Parking Lots
- Existing Parking Lot Circulation

38 TOTAL PARKING SPACES  
 3 VISITOR SPACES  
 (0 USED)  
 2 HANDICAP SPACES  
 (0 USED)  
 33 STAFF SPACES  
 (18 USED)

21 TOTAL PARKING SPACES  
 19 UNMARKED SPACES  
 (8 USED)  
 2 HANDICAP SPACES  
 (0 USED)

14 TOTAL PARKING SPACES  
 14 UNMARKED SPACES  
 (8 USED)

14 TOTAL PARKING SPACES  
 14 UNMARKED SPACES  
 (7 USED)

125 TOTAL PARKING SPACES  
 27 STAFF SPACES (22 USED)  
 5 HANDICAP SPACES (0 USED)  
 8 WCAT SPACES (1 USED)  
 85 UNMARKED (81 PARKED)

82 TOTAL PARKING SPACES  
 82 UNMARKED SPACES  
 (78 USED)

40 TOTAL PARKING SPACES  
 20 RESERVED SPACES  
 (8 USED)  
 70 UNMARKED SPACES  
 (60 USED)

19 TOTAL PARKING SPACES  
 13 UNMARKED SPACES  
 (7 USED)  
 6 HANDICAP SPACES  
 (0 USED)



**DEVELOPER:**  
 WAKEFIELD MEMORIAL HIGH SCHOOL  
 60 FARM STREET  
 WAKEFIELD, MA 01880

**WAKEFIELD MEMORIAL HIGH SCHOOL**  
 60 FARM STREET  
 WAKEFIELD, MA

**Existing Parking Supply and Demand**

**Figure 2.4.1**

PROJECT TEAM

SITE NAME/ADDRESS

SHEET NAME

SHEET #

DR BY: LV
CHK BY: SGS
GM2 PROJECT NO.: 40684
DATE: SEPTEMBER 2022
SCALE: 1" = 150'

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LEGEND	
	Existing Vehicle Drop-Off Circulation
	Existing Bus Drop-Off Circulation

WHEN QUEUE AT DROP-OFF  
BUILDS UP INTO FARM  
STREET, VEHICLES  
TRAVELING NORTH ALONG  
FARM STREET PULL TO SIDE  
OF THE ROAD TO DROP OFF

DROP-OFF AREA  
QUEUES BEGIN 7:15  
AND CLEAR BY 7:30 AM.  
ALL QUEUES CLEARED  
BY 7:40 AM

QUEUES BUILD UP  
ALONG NAHANT ROAD

CONFLICT POINT:  
VEHICLES TURNING  
RIGHT FROM FARM  
ONTO NAHANT THEN  
LEFT ONTO HEMLOCK

HIGH VOLUME OF  
BUSES TURN FROM  
FARM STREET ONTO  
HEMLOCK ROAD TO  
ACCESS NEMT

QUEUES ALONG  
HEMLOCK ROAD.  
BUSES LEAVING  
NEMT MAKE A LEFT



DEVELOPER:  
WAKEFIELD MEMORIAL HIGH SCHOOL  
60 FARM STREET  
WAKEFIELD, MA 01880

WAKEFIELD MEMORIAL HIGH SCHOOL  
60 FARM STREET  
WAKEFIELD, MA

WEEKDAY AM  
CIRCULATION, QUEUES  
AND CONFLICTS

Figure 2.4.2

DR BY: LV
CHK BY: SGS
GM2 PROJECT NO.: 40684
DATE: SEPTEMBER 2022
SCALE: 1" = 150'

PROJECT TEAM

SITE NAME/ADDRESS

SHEET NAME



SHEET #

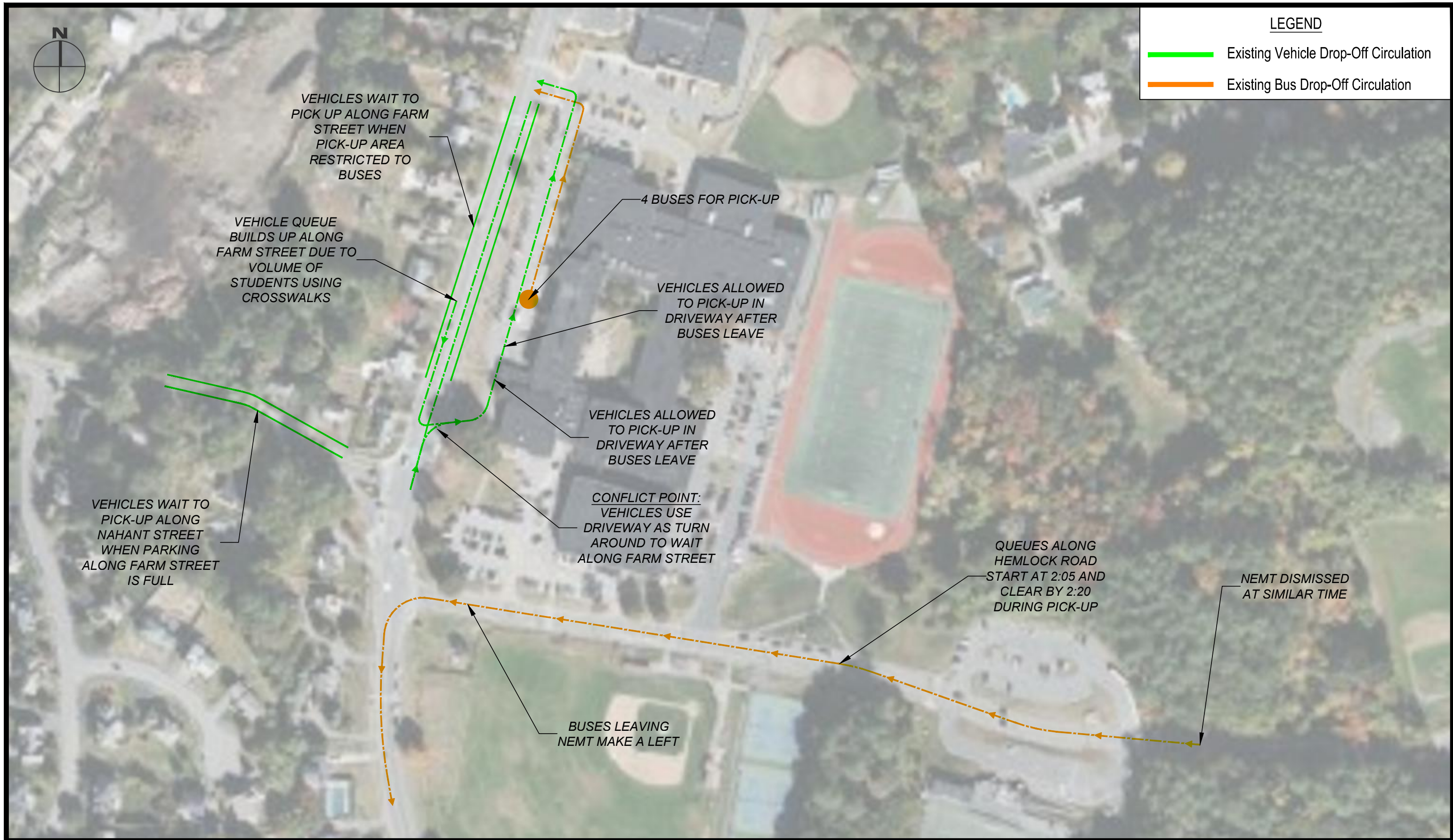
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**LEGEND**

-  Existing Vehicle Drop-Off Circulation
-  Existing Bus Drop-Off Circulation



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**DEVELOPER:**  
WAKEFIELD MEMORIAL HIGH SCHOOL  
60 FARM STREET  
WAKEFIELD, MA 01880

WAKEFIELD MEMORIAL HIGH SCHOOL  
60 FARM STREET  
WAKEFIELD, MA

Weekday PM Circulation,  
Queues, and Conflicts

Figure 2.4.3

DR BY: LV
CHK BY: SGS
GM2 PROJECT NO.: 40684
DATE: SEPTEMBER 2022
SCALE: 1" = 150'

PROJECT TEAM

SITE NAME/ADDRESS

SHEET NAME

SHEET #

### 2.4.1 Sidewalk and Paved Area Inventory

An inventory was taken for each of the sidewalks along the site frontage (Farm Street and Hemlock Road), as well as paved walkways on-site and within the parking areas. Table 2.4-2 summarizes the pavement type, width, and condition for each section of sidewalk, and corresponds to the graphic shown in Figure 2.4.4.

**Table 2.4-2: Sidewalk Inventory Summary**

<i>Sidewalk ID</i>	Type	Pavement	Width	Condition
1	On-Street Sidewalk	Concrete	4' - 8'	Fair
2	On-Site Sidewalk	Asphalt	10' - 30'	Fair
3	On-Site Walkway	Asphalt	10'	Poor
4	On-Site Walkway	Asphalt	16.5'	Good
5	On-Site Sidewalk	Asphalt	7'	Good
6	On-Site Walkway	Concrete	7'	Good
7	On-Site Walkway	Concrete	7'	Good
8	On-Street Sidewalk	Asphalt	7'	Good
9	On-Street Sidewalk	Asphalt	8'	Fair
10	On-Site Sidewalk	Asphalt	10'	Fair
11	On-Site Walkway	Asphalt	7' - 8'	Fair
12	On-Street Sidewalk	Asphalt	5'	Fair
13	On-Site Walkway	Asphalt	7.5'	Fair
14	On-Site Walkway	Concrete	6'	Fair
15	On-Site Sidewalk	Concrete	8'	Good
16	On-Site Walkway	Asphalt	7.5'	Fair



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LEGEND

- GOOD CONDITION
- FAIR CONDITION
- POOR CONDITION
- # SECTION ID



DEVELOPER:  
 WAKEFIELD MEMORIAL HIGH SCHOOL  
 60 FARM STREET  
 WAKEFIELD, MA 01880

WAKEFIELD MEMORIAL HIGH SCHOOL  
 60 FARM STREET  
 WAKEFIELD, MA

Existing Sidewalk and Paved  
 Walkway Inventory

Figure 2.4.4

PROJECT TEAM

SITE NAME/ADDRESS

SHEET NAME

SHEET #

DR BY: SGS

CHK BY: SGS

GM2 PROJECT NO.: 40684

DATE: SEPTEMBER 2022

SCALE: 1" = 150'



## 2.5 Existing Safety Analysis

### 2.5.1 Existing Crash Data

Crash data from the MassDOT database, for years 2015 through 2019, were reviewed for each study intersection. The Town of Wakefield website directs users to the MassDOT website, meaning all crashes within the Town of Wakefield, that are responded to by the Wakefield Police Department, are reported to MassDOT.

This data represents the most recent five (5) full years of complete data available. MassDOT states that crash data for the years after 2019 are subject to change and are not to be considered complete. The crash records offered the following information:

- Crash Date
- Crash Type
- Injury (if applicable)
- Involvement of trucks and/or MBTA buses
- Involvement of pedestrians and/or bicycles (if applicable)
- Lighting/Surface Condition/Weather

The compiled data, in conjunction with engineering judgement, yielded a summary of crashes that may be used to identify general crash patterns and potential factors contributing to the predominant type of incidents at each location. The summary results of the crash analysis are shown in Table 2.5-1. Raw crash data for each intersection for years 2015 through 2019 are contained in Appendix B.



Table 2.5-1: Intersection Crash Summary

	<i>Farm Street at Water Street</i>	<i>Farm Street at Woodville School Exit</i>	<i>Farm Street at Woodville School Ent.</i>	<i>Farm Street at WMHS North Driveway</i>	<i>Farm Street at WMHS South Driveways</i>	<i>Farm Street at Nahant Street</i>	<i>Farm Street at Hemlock Road</i>
<b>Year</b>							
2015	1	0	0	0	1	3	1
2016	4	0	0	0	3	4	0
2017	3	0	0	0	2	2	0
2018	3	0	0	0	3	2	3
2019	1	0	0	0	0	0	6
<b>Total</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>11</b>	<b>10</b>
<b>Crash Type</b>							
Sideswipe, Same Direction	1	0	0	0	1	0	2
Sideswipe, Opposite Direction	0	0	0	0	0	0	1
Angle	3	0	0	0	1	7	4
Rear-end	3	0	0	0	3	4	3
Head-on	0	0	0	0	0	0	0
Single Vehicle	5	0	0	0	3	0	0
Other, not reported	0	0	0	0	1	0	0
<b>Total</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>11</b>	<b>10</b>
<b>Injuries</b>							
None (Property Damage Only)	9	0	0	0	5	9	9
Non-fatal Injury	3	0	0	0	3	2	1
Fatal Injury	0	0	0	0	0	0	0
Not Reported, Unknown	0	0	0	0	1	0	0
<b>Total</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>11</b>	<b>10</b>
<b>Non-Motorist Involved</b>							
Pedestrian	1	0	0	0	2	0	0
Bicyclist	0	0	0	0	0	0	0
Neither	11	0	0	0	7	11	10
<b>Total</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>11</b>	<b>10</b>
<b>Roadway Lighting</b>							
Daylight	7	0	0	0	5	10	7
Dusk	0	0	0	0	1	1	0
Dark - Roadway Lighted	5	0	0	0	3	0	2
Dark - Roadway Not Lighted	0	0	0	0	0	0	0
Other, Not Reported	0	0	0	0	0	0	1
<b>Total</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>11</b>	<b>10</b>
<b>Surface Condition</b>							
Dry	7	0	0	0	6	11	8
Wet	5	0	0	0	3	0	1
Snow/Ice	0	0	0	0	0	0	1
Other, Not Reported	0	0	0	0	0	0	0
<b>Total</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>11</b>	<b>10</b>
<b>Weather</b>							
Clear	9	0	0	0	4	10	7
Cloudy	0	0	0	0	3	1	2
Rain	2	0	0	0	2	0	0
Snow/Sleet	1	0	0	0	0	0	1
Other, Not Reported	0	0	0	0	0	0	0
<b>Total</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>11</b>	<b>10</b>

The intersection of **Farm Street at Water Street** had 12 reported crashes according to the MassDOT crash database during the five-year period from 2015 to 2019. Nine (9) crashes resulted in property damage only and three (3) crashes resulted in non-fatal injuries. One (1) crash involved a pedestrian, and zero (0) crashes involved a bicyclist. The intersection averaged 2.44 crashes per year and has a crash rate of 0.38 crashes/million entering vehicles (c/mev), which is below both the District 4 and Statewide averages for signalized intersections.

The intersection of **Farm Street at Woodville School Exit Driveway** had zero (0) reported crashes according to the MassDOT crash database during the five-year period from 2015 to 2019.

The intersection of **Farm Street at Woodville School Entrance Driveway** had zero (0) reported crashes according to the MassDOT crash database during the five-year period from 2015 to 2019.

The intersection of **Farm Street at High School North Driveway** had zero (0) reported crashes according to the MassDOT crash database during the five-year period from 2015 to 2019.

The intersection of **Farm Street at High School South Driveway** had nine (9) reported crashes according to the MassDOT crash database during the five-year period from 2015 to 2019. Five (5) of the crashes resulted in property damage only, three (3) resulted in a non-fatal injury, and one (1) had an unreported severity. Two (2) of the crashes involved a pedestrian (non-fatal injury) and zero (0) involved a bicyclist. The intersection averaged 1.80 crashes per year and had a crash rate of 0.41 (c/mev), which is below both the District 4 and Statewide averages for unsignalized intersections.

The intersection of **Farm Street at Nahant Street** had 11 reported crashes according to the MassDOT crash database during the five-year period from 2015 to 2019. Nine (9) of the crashes resulted in property damage only and two (2) resulted in a non-fatal injury. Zero (0) crashes involved a pedestrian or bicyclist. The intersection averaged 2.20 crashes per year and had a crash rate of 0.35 (c/mev), which is below both the District 4 and Statewide averages for unsignalized intersections.

The intersection of **Farm Street at Hemlock Street** had ten (10) reported crashes according to the MassDOT crash database during the five-year period from 2015 to 2019. Nine (9) of the crashes resulted in property damage only and one (1) resulted in a non-fatal injury. Zero (0) crashes involved a pedestrian or bicyclist. The intersection averaged 2.00 crashes per year and had a crash rate of 0.32 (c/mev), which is below both the District 4 and Statewide averages for unsignalized intersections.

Two (2) study intersections have crashes between 2015 and 2019 that involve a pedestrian. However, there were zero (0) reported fatal crashes.

### 2.5.2 Existing Sight Distance Analysis

At the existing site driveways along Farm Street and Hemlock Road, as well as along the Hemlock Road approach at its intersection with Farm Street, available stopping sight distance (SSD) and intersection sight distance (ISD) were evaluated. The American Association of State Highway and Transportation Officials (AASHTO) sight distance recommendations for various vehicle speeds are shown in Table 2.5-2. Although some sight distances do not meet minimum recommendations set forth by the American Association of State Highway Transportation Officials (AASHTO), based on on-site observations, there are no safety concerns based on these site distance limitations.

Table 2.5-2: AASHTO Minimum Recommended SSD and ISD

Design Speed (mph)	Stopping Sight Distance (ft)	Intersection Sight Distance for Left-Turn Maneuvers (ft)	Intersection Sight Distance for Right-Turn/Cross Maneuvers (ft)
15	80	170	145
20	115	225	195
25	155	280	240
30	200	335	290
35	250	390	335
40	305	445	385
45	360	500	430
50	425	555	480

#### Pick-up/Drop-off Area Driveway Exit

According to the ATR data collected along Farm Street, the 85<sup>th</sup> percentile speed was measured at 35.9 miles per hour in the northbound direction and 33.5 miles per hour in the southbound direction. The school zone speed limit is 20 miles per hour. Therefore, a design speed of 35 miles per hour was selected for the sight distance analysis along Farm Street. As such, the recommended stopping sight distance along Farm Street is 250 feet. For the left-turn maneuver, looking right from the existing driveway, the recommended sight distance is 390 feet. For the right-turn maneuver, looking left from the proposed driveway, the recommended sight distance is 335 feet. Based on on-site measurements, the available sight distances along Farm Street and at the existing Front High School Exit Driveway on Farm Street are shown in Table 2.5-3.

Table 2.5-3: Measured Sight Distances at Existing Farm Street Driveway Exit

	Stopping Sight Distance (ft)	Intersection Sight Distance for Left-Turn Maneuvers (ft)	Intersection Sight Distance for Right-Turn/Cross Maneuvers (ft)
<b>Recommended at 35 mph</b>	250	390	335
<b>Measured On-Site</b>	590 (From North) 700 (From South)	No Parking: 515 Current Parking: 470 Worst Case Parking: 440	Worst Case: 170 Best Case: 1,300

As seen in Table 2.5-3 the measured stopping sight distance along Farm Street was measured to be 590 feet from the north and greater than 700 feet from the south. The intersection sight distance for the left-turn maneuver is approximately 440 feet and the measured intersection sight distance for the right-turn maneuver is approximately 170 feet. Stopping sight distances for both

directions of travel along Farm Street exceed the minimum recommendations set forth by AASHTO. The left-turn maneuver intersection sight distances meet the minimum recommendations set forth by AASHTO. The right-turn maneuver intersection sight distance does not meet the minimum recommendations set forth by AASHTO. The limiting factor of the intersection sight distance for right-turn maneuvers is how many vehicles are parked on-street in front of the high school. However, according to the AASHTO manual, *“If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. However, in some cases, this may require a major-road vehicle to stop or slow to accommodate the maneuver by a minor-road vehicle. To enhance traffic operations the intersection sight distances that exceed stopping sight distances are desirable along the major road.”* Consequently, the intersection sight distances for both the left-turn and right-turn/cross maneuvers exceed the recommended stopping sight distance along Farm Street, which will allow a driver approaching the site driveway to safely stop. Therefore, there are no salient safety issues with regards to the location of the proposed driveway along Farm Street.

Hemlock Road at Farm Street

Hemlock Road intersects Farm Road. Therefore, a design speed of 35 miles per hour was selected for the sight distance analysis of Hemlock Road at Farm Road. The recommended stopping sight distance along Farm Street is 250 feet. For the left-turn maneuver, looking right from the existing driveway, the recommended sight distance is 390 feet. For the right-turn maneuver, looking left from the proposed driveway, the recommended sight distance is 335 feet. Based on on-site measurements, the available sight distances along Farm Street and at the existing Hemlock Road driveway is shown in Table 2.5-4.

**Table 2.5-4: Measured Sight Distances at Hemlock Road and Farm Street**

	<b>Stopping Sight Distance (ft)</b>	<b>Intersection Sight Distance for Left-Turn Maneuvers (ft)</b>	<b>Intersection Sight Distance for Right-Turn/Cross Maneuvers (ft)</b>
<b>Recommended at 35 mph</b>	250	390	335
<b>Measured On-Site</b>	800 (From North) 350 (From South)	>540	To Crosswalk: 180 To Crosswalk Parking Gap: 215

As shown in Table 2.5-4, the measured stopping sight distance along Farm Street was measured to be 800 feet from the north and 350 feet from the south. The measured intersection sight distance for the left-turn maneuver is approximately 540 feet and the measured intersection sight distance for the right-turn maneuver is approximately 215 feet. Stopping sight distance for traffic in both directions along Farm Street meets the minimum recommendation set forth by AASHTO. The intersection sight distances for both turning maneuvers from the Hemlock Road driveway meet AASHTO recommended distances. The limiting factor of the sight distances for the Hemlock Road Driveway turning maneuvers are vehicles parked on-street north and south of the intersection along Farm Street.

Side and Rear Parking Lot Driveways at Hemlock Road

According to the ATR data collected along Hemlock Road, the 85<sup>th</sup> percentile speed was measured at 29.7 miles per hour in the eastbound direction and 27.9 miles per hour in the westbound direction. The school zone speed limit is 20 miles per hour. Therefore, a design speed of 30 miles per hour was selected for the sight distance analysis for high school driveways along Hemlock Road. The recommended stopping sight distance along Hemlock Road is 200 feet. For the left-turn maneuver, looking right from the proposed driveway, the recommended sight distance is 335 feet. For the right-turn maneuver, looking left from the proposed driveway, the recommended sight distance is 290 feet. Based on on-site measurements, the available sight distances along Hemlock Road and at the existing High School parking lot driveways on Hemlock Road are shown in Tables 2.5-5 and 2.5-6.

**Table 2.5-5: Measured Sight Distances at Existing Side Parking Lot Driveway Along Hemlock Road**

	<b>Stopping Sight Distance (ft)</b>	<b>Intersection Sight Distance for Left-Turn Maneuvers (ft)</b>	<b>Intersection Sight Distance for Right-Turn/Cross Maneuvers (ft)</b>
<b>Recommended at 30 mph</b>	200	335	290
<b>Measured On-Site</b>	850(From East) 150 (From West)	185	440

As seen in Table 2.5-5 the measured stopping sight distance along Hemlock Road was measured to be approximately 850 feet from the east and greater than 150 feet from the west. The intersection sight distance for the left-turn maneuver is approximately 185 feet and the measured intersection sight distance for the right-turn maneuver is approximately 440 feet. Stopping sight distance for westbound travel along Hemlock Road exceeds the minimum recommendations set forth by AASHTO. Stopping sight distance for eastbound travel along Hemlock Road is less than the minimum recommendations set forth by AASHTO. The left-turn maneuver intersection sight distance does not meet the minimum recommendations set forth by AASHTO. The limiting factor of the intersection sight distance for left-turn maneuvers is the distance to Hemlock Road’s T-intersection with Farm Road. The right-turn maneuver intersection sight distance meets the minimum recommendations set forth by AASHTO. However, the measured sight distances for vehicles traveling on Hemlock Road and vehicles exiting the existing Hemlock Road driveway span the length of the roadway between the driveway and the intersection with Farm Street. Drivers exiting the driveway have line of site onto Farm Street to be able to see vehicles that are turning onto Hemlock Road and vice a versa. Therefore, there are no salient safety issues with regards to the location of the existing driveway along Hemlock Road.

**Table 2.5-6: Measured Sight Distances at Existing Rear Parking Lot Driveway Along Hemlock Road**

	<b>Stopping Sight Distance (ft)</b>	<b>Intersection Sight Distance for Left-Turn Maneuvers (ft)</b>	<b>Intersection Sight Distance for Right-Turn/Cross Maneuvers (ft)</b>
<b>Recommended at 30 mph</b>	200	335	290
<b>Measured On-Site</b>	480(From East) 480 (From West)	500	680

As seen in Table 2.5-6 the measured stopping sight distance along Hemlock Road was measured to be approximately 480 feet from the east and greater than 480 feet from the west. The



intersection sight distance for the left-turn maneuver is approximately 500 feet and the measured intersection sight distance for the right-turn maneuver is approximately 680 feet. Stopping sight distances for both directions of travel along Farm Street exceed the minimum recommendations set forth by AASHTO. The left and right-turn maneuver intersection sight distances meet the minimum recommendations set forth by AASHTO.

## 2.6 Signal Warrant Analysis

Utilizing the traffic count data for the major-street and the minor-street approaches, traffic control signal needs (Warrants) were reviewed to determine if signal installation should be considered at the Farm Street/Nahant Street/Hemlock Road intersection in accordance with Chapter 4C of the Manual on Uniform Traffic Control Devices (MUTCD). There are nine warrants that need to be reviewed to determine if any of the conditions are met before a traffic control signal should be considered:

- Warrant 1: Eight-Hour Vehicular Warrant
- Warrant 2: Four-Hour Vehicular Warrant
- 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
- Warrant 9: Intersection Near a Grade Crossing

As noted in the MUTCD, “the satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.” MassDOT prefers that the data satisfies Warrant 1, the Eight-Hour Vehicular Warrant. Traffic control signal warrants were reviewed at the study intersection. Table 2.6-1 summarizes the results of the Traffic Signal Warrant analysis.

**Table 2.6-1: Traffic Signal Warrant Summary**

<b>Warrant</b>	<b>Criteria Met?</b>
<i>Warrant 1: Eight-Hour Vehicular Volume</i>	Yes
<i>Condition A: Minimum Vehicular Volume</i>	No
<i>Condition B: Interruption of Continuous Traffic</i>	Yes
<i>Warrant 2: Four-Hour Vehicular Volume</i>	Yes
<i>Warrant 3: Peak Hour</i>	Yes
<i>Warrant 4: Pedestrian Volume</i>	No
<i>Warrant 5: School Crossing</i>	No
<i>Warrant 6: Coordinated Signal System</i>	No
<i>Warrant 7: Crash Experience</i>	No
<i>Warrant 8: Roadway Network</i>	No
<i>Warrant 9: Intersection Near At-Grade Crossing</i>	No

The conditions of Warrant 1 (Eight-Hour Vehicular Volume), Warrant 2 (Four-Hour Vehicular Volume), and Warrant 3 (Peak Hour Vehicular Volume) were satisfied at the study intersection to verify that a traffic signal should be considered. Warrant 1 Condition A (Minimum Vehicular Volume) is met. The vehicles per hour on both the major-street approaches and the minor street approach satisfy the 100% column when the major street approaches are one lane of traffic or more and the minor street approach is one lane of traffic. For Warrant 2, the plotted point of vehicles per hour on Figure 4C-1 in the MUTCD fall above the curve corresponding to “2 or more Lanes & 1 Lane”. For Warrant 3, the plotted point of vehicles per hour on Figure 4C-3 in the MUTCD fall above the curve corresponding to “2 or more Lanes & 1 Lane”. As indicated in Table 2.6-1, the existing unsignalized intersection satisfies the conditions for Warrant 1 (Eight-Hour Vehicular Volume), Warrant 2 (Four-Hour Vehicular Volume), and Warrant 3 (Peak Hour Vehicular Volume) with the existing traffic volumes.

## 2.7 Roundabout Warrant Analysis

There are currently no industry standard warrants for roundabouts. In general practice engineers use available resources such as the updated TRB National Cooperative Highway Research Program's “NCHRP Report 672: Roundabouts: An Informational Guide – Second Edition” to determine thresholds for lane operations and capacities, as the decision to implement a roundabout is not based on the same parameters as a signal warrant investigation. Roundabouts typically operate under any set of traffic volumes and are sized (number of lanes) accordingly. The primary reason for deciding against a roundabout would be a result of significantly unbalanced volumes.

There are general guidelines that engineers have used as an initial assessment to determine if a single lane roundabout will succeed. The measure is simple and is a sum of all vehicles within the circle crossing an approach and the vehicles at that particular approach. If that value is between 1,100 vehicles per hour and 1,400 vehicles per hour, it is assumed that the roundabout is maximized capacity wise and any additional volume will cause the intersection to fail unless additional turn lanes and/or circulating lanes are added.

This should be considered solely as a preliminary analysis point to begin investigation of a roundabout, with many other factors to be considered.

The values shown in Figure 2.7.1 are a part of the NYSDOT graphic and are for example purposes only and are not volumes associated with the project site.

When applying this rule of thumb to the existing and future conditions at the Farm Street/Nahant Street/Hemlock Road intersection, some of the crossing volumes are near the threshold.

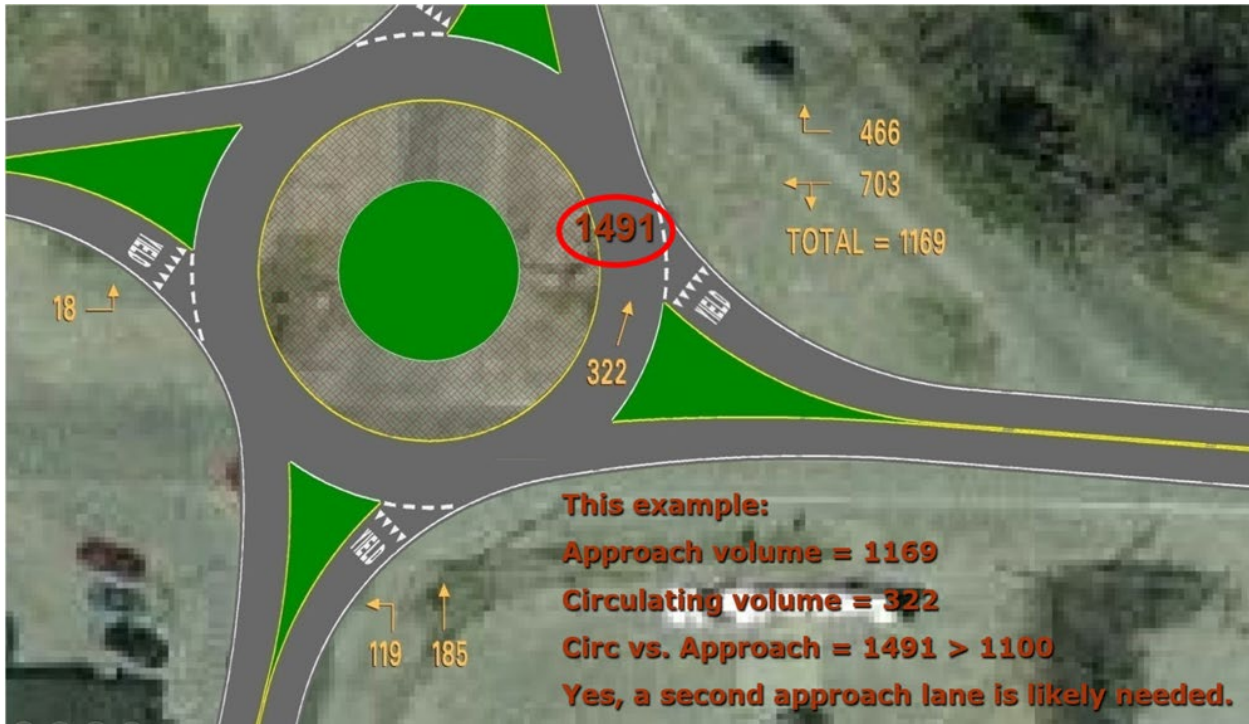


Figure 2.7.1 – Sample of 1,100 VPH rule calculation (Exhibit 26-3, NYSDOT Traffic Design Manual)

## 2.8 Existing Conditions Transportation Analysis

### Traffic Analysis Criteria

The Highway Capacity Manual (HCM), published by the Transportation Research Board, provides methodologies on how to calculate motor vehicle Level of Service (LOS), average delay, and volume-to-capacity (v/c) ratios.

Level of Service (LOS) is a term used to denote different operating conditions that occur under various traffic volume loads. It is a qualitative measure of the effect of multiple factors including geometrics, speed, travel delay, freedom to maneuver, and safety. The LOS is divided into a range of six letter grades, ranging from A to F, with A being the best and F the worst. A LOS of F is generally considered to be inadequate traffic operation in suburban and urban areas. The delay ranges differ slightly between unsignalized and signalized intersections due to driver expectations and behavior for each LOS. Table 2.8-1 summarizes the LOS criteria.

**Table 2.8-1: Intersection Level of Service**

LOS	Signalized	Unsignalized
	Control Delay (sec/veh)	Control Delay (sec/veh)
A	0-10	0-10
B	>10-20	>10-15
C	>20-35	>15-25
D	>35-55	>25-35
E	>55-80	>35-50
F	>80	>50

Source: 2010 Highway Capacity Manual

In this study, intersection performance measures were calculated in the form of average intersection delay, 50<sup>th</sup> and 95<sup>th</sup> percentile queue lengths, level-of-service (LOS) for each approach/movement, and the LOS of the overall intersection operations. *Synchro 11.0* was the software used to execute the intersection analysis. *Synchro 11.0* uses the methodologies and thresholds outlined within the HCM.

Multiple Synchro reports were created to analyze and compare intersection performance:

- Main report – “Int: Lanes, Volumes, Timings”, “Queues”
- HCM Signalized/Unsignalized Report (TWSC)
- HCM 2010 Signals Pedestrian Report

For signalized intersections, LOS is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. The 50<sup>th</sup> and 95<sup>th</sup> percentile queue lengths are estimated and were compared to queues observed in the field.

Note that for analysis purposes, the one-way entering movements at school driveways were coded with a “dummy” exiting lane to force a mainline left-turn calculation

## 2.9 Vehicle Analysis

The data used for analyses was discussed previously. Intersection lane configurations, signal timings, and traffic control were modelled to match existing conditions and representing typical travel conditions. The results of the 2021 Existing conditions analysis are shown in Table 2.9-1. Detailed capacity analysis worksheets are included in Appendix C.

As shown in Table 2.9-1, most movements operate at poor levels of service in the AM peak, with some values so large (LOS F, Delay greater than 150 seconds) that the analysis becomes meaningless as the volume to capacity ratios exceed 1.0 so severely that there is no way to properly evaluate the result. The V/C ratios are shown in the analyses pages in the index. The failure for that movement is total and the queue length is extensive is all that can be determined, and only a true field review can identify the values. In urban areas this can be seen in the form of spillbacks into adjacent intersection. This is common for densely populated urban areas with heavy peak volumes. Note that the PM peak delays are much less than AM peak periods and levels of service are more meaningful under these conditions.



Table 2.9-1: 2021 Existing Conditions Level of Service

ID	Roadway	Movement	2021 Existing Conditions			
			AM Peak Hour		PM Peak Hour	
			LOS	Delay	LOS	Delay
1	Water Street at Farm Street	EB T	D	38.1	B	18.6
		EB R	A	2.0	A	0.7
		WB L	B	13.5	A	9.4
		WB T	B	10.5	A	8.1
		NB L	E	64.5	E	79.6
	NB R	A	1.8	A	5.2	
	<b>SIGNALIZED</b>					
	<b>Overall</b>		<b>B</b>	<b>18.5</b>	<b>B</b>	<b>19.5</b>
2	Farm Street at Woodville School Exit Driveway	WB L	E	40.6	C	24.7
		WB R	B	13	B	13.9
		NB T	-	-	-	-
		UN SIGNALIZED	SB T	-	-	-
	<b>Overall</b>		-	-	-	-
3	Farm Street at Woodville School Entrance Driveway	-	-	-	-	-
		NB TR	-	-	-	-
		SB TL	A	8.9	A	9.1
		UN SIGNALIZED	-	-	-	-
	<b>Overall</b>		-	-	-	-
4	Farm Street at WMHS Exit Driveway	WB L	F	94.9	D	25.7
		WB R	B	12.5	B	13.4
		NB T	-	-	-	-
		UN SIGNALIZED	SB T	-	-	-
	<b>Overall</b>		-	-	-	-
5	Farm Street at WMHS Entrance Driveway	NB T	-	-	-	-
		NB R	-	-	-	-
		SB L	A	9.1	A	8.9
		UN SIGNALIZED	SB T	-	-	-
	<b>Overall</b>		-	-	-	-
6	Farm Street at Nahant Street	SB TR	-	-	-	-
		NB LT	B	10.3	B	10.6
		UN SIGNALIZED	EB LR	F	130.8	F
	<b>Overall</b>		-	-	-	-
7	Farm Street at Hemlock Road	SB L	B	14	A	9.9
		NB T	-	-	-	-
		WB L	F	>300*	F	203
		UN SIGNALIZED	WB R	B	14.5	C
	<b>Overall</b>		-	-	-	-

- HCM 6th Edition does not compute this movement/value

LOS F during Existing Conditions

\* Delay is greater than 300 seconds. Synchro reports this as an error.

### 3. FUTURE TRANSPORTATION ANALYSIS

The projected future conditions for the 2028 design year (7-year period) include three scenarios:

1. No-Build: No WMHS replacement or upgrades, the only metric that changes is background traffic due to growth or decline in census data.
2. Build: WMHS is replaced with increased capacity, the intersection of Farm Street/Nahant Street/Hemlock Road is converted to a signalized intersection. This condition is added on top of the no-build volumes.
3. Build: WMHS is replaced with increased capacity, the intersection of Farm Street/Nahant Street/Hemlock Road is converted to a roundabout. This condition is added on top of the no-build volumes.

The 2028 Build Condition for the NEMT redevelopment (the WMHS 2028 No-Build Condition) results in significantly deteriorated operations at the Farm Street/Nahant Street/Hemlock Road intersection. Adding traffic to this location will result in unacceptable delays and queues, identified in a Synchro test as “Error” indicating delays are beyond 300 seconds at multiple approaches and results provide no discernible information and no ability to quantify what the additional delays due to the increased WMHS trips would be in the AM peak. As a result, there is no consideration for a “2028 Build Condition Without Mitigation” and GM2 assumed that there is no build scenario in which either a signal or roundabout is not provided as mitigation at the Farm Street/Nahant Street/Hemlock Road intersection.

#### 3.1 Future Conditions

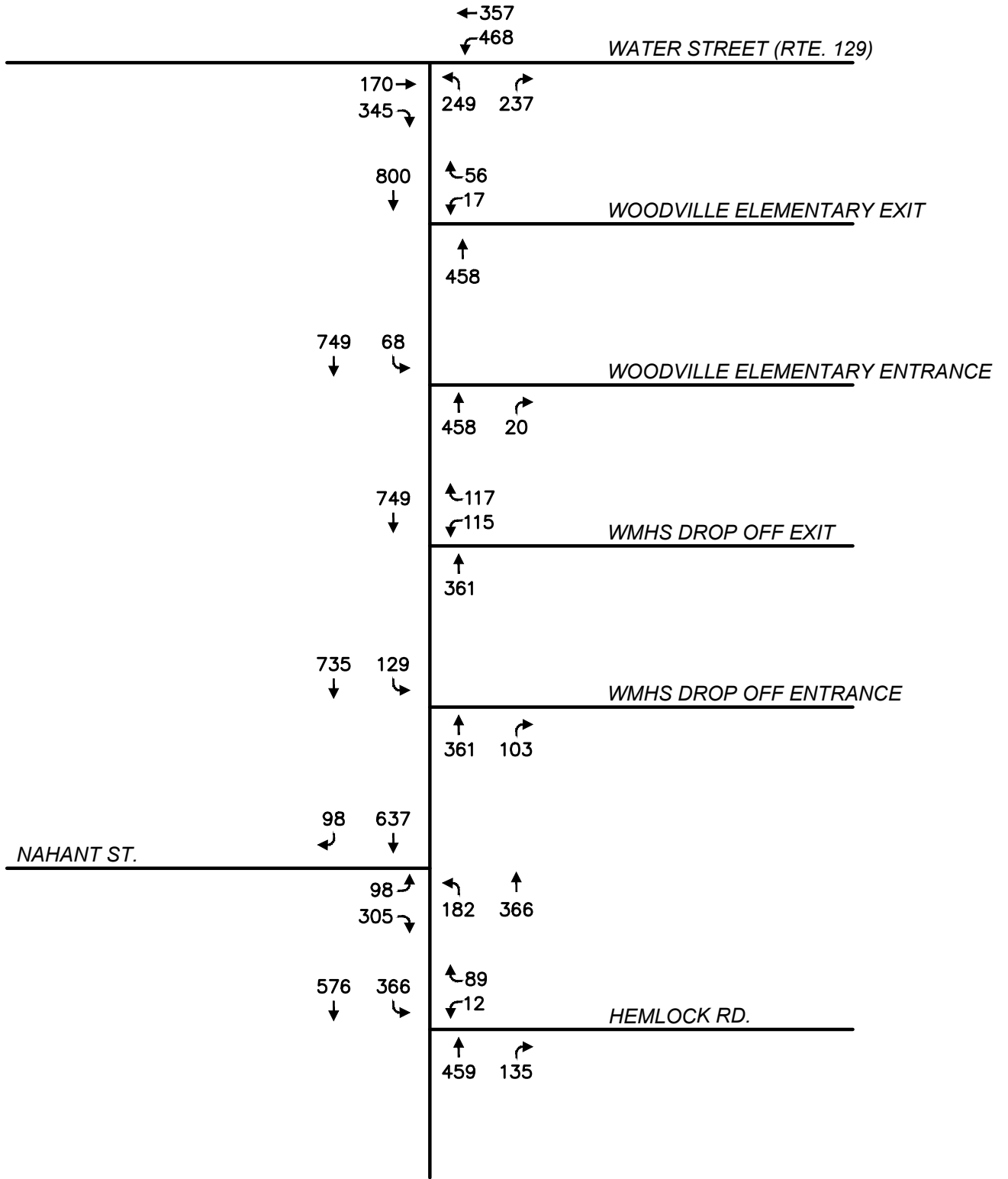
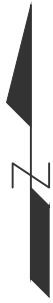
##### 3.1.1 No-Build Condition

In order to properly evaluate any future conditions where roadway volumes may change as a result of a proposed development, the case where nothing changes other than increased background growth due to population growth or other developments within the study area add or decrease traffic must be accounted for.

As discussed previously, the NEMT school is expected to be built and operational prior to the WMHS redevelopment project, thus their Build Condition establishes the No-Build Condition for the WMHS project.

Although the traffic volume data from the NEMT report was used to complete the analyses for the WMHS project, GM2 compared the volume datasets collected in the NEMT report and those by GM2. Once the volume data were corroborated, GM2 moved forward with our analyses.

Projected No-Build Volumes are provided in Figures 3.1.1 (AM) and 3.1.2 (PM). The No-Build Conditions traffic analyses are provided in Table 3.1-1. The existing conditions are included for ready comparison.



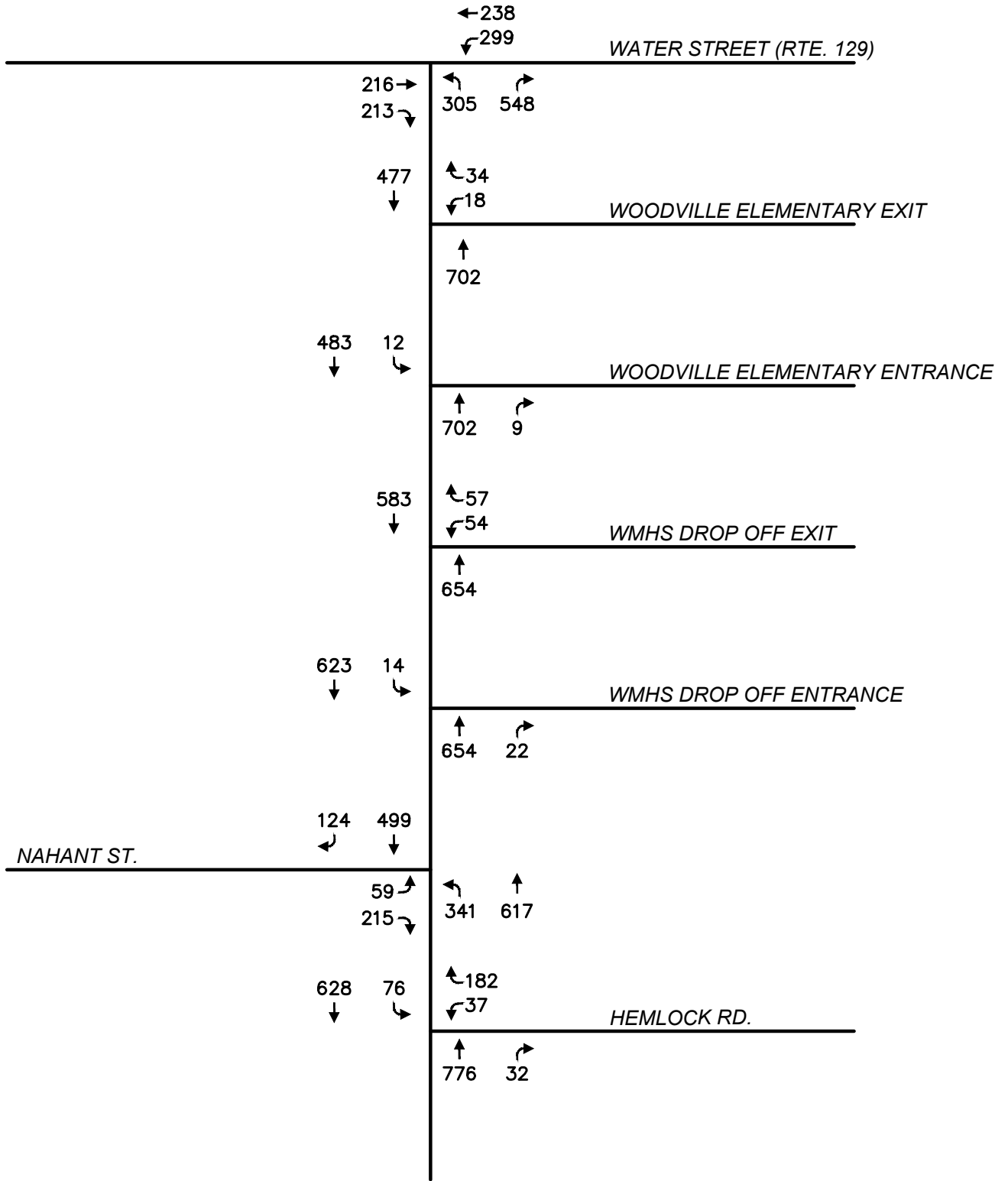
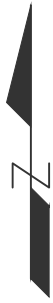
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WAKEFIELD MEMORIAL HIGH SCHOOL  
WAKEFIELD, MA

2028 NO BUILD  
AM PEAK

GM2 PROJECT NO.: 40684  
DATE: SEPTEMBER 2022  
SCALE: N.T.S. | Figure 3.1.1



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WAKEFIELD MEMORIAL HIGH  
SCHOOL  
WAKEFIELD, MA

2028 NO BUILD  
PM PEAK

GM2 PROJECT NO.: 40684	
DATE: SEPTEMBER 2022	
SCALE: N.T.S.	Figure 3.1.2

Table 3.1-1: 2028 No-Build Conditions Level of Service

ID	Roadway	Movement	2021 Existing Conditions				2028 No-Build Conditions			
			AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
			LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
1	Water Street at Farm Street	EB T	D	38.1	B	18.6	C	34.1	B	19.6
		EB R	A	2.0	A	0.7	A	2.9	A	1.4
		WB L	B	13.5	A	9.4	B	10.6	A	7.9
		WB T	B	10.5	A	8.1	A	6.6	A	6.2
		NB L	E	64.5	E	79.6	F	108.9	E	65.3
	SIGNALIZED	NB R	A	1.8	A	5.2	A	1.7	A	3.5
<b>Overall</b>			<b>B</b>	<b>18.5</b>	<b>B</b>	<b>19.5</b>	<b>C</b>	<b>22.8</b>	<b>B</b>	<b>16.6</b>
2	Farm Street at Woodville School Exit Driveway	WB L	E	40.6	C	24.7	F	52.8	D	26.5
		WB R	B	13	B	13.9	B	13.8	B	14.6
		NB T	-	-	-	-	-	-	-	-
		UNSIGNALIZED	SB T	-	-	-	-	-	-	-
<b>Overall</b>			-	-	-	-	-	-	-	
3	Farm Street at Woodville School Entrance Driveway	-	-	-	-	-	-	-	-	
		NB TR	-	-	-	-	-	-	-	
		SB TL	A	8.9	A	9.1	A	9.2	A	9.3
		UNSIGNALIZED	-	-	-	-	-	-	-	
<b>Overall</b>			-	-	-	-	-	-		
4	Farm Street at WMHS Exit Driveway	WB L	F	94.9	D	25.7	F	173	E	35.1
		WB R	B	12.5	B	13.4	B	13.4	B	14.1
		NB T	-	-	-	-	-	-	-	
		UNSIGNALIZED	SB T	-	-	-	-	-	-	
<b>Overall</b>			-	-	-	-	-	-		
5	Farm Street at WMHS Entrance Driveway	NB T	-	-	-	-	-	-	-	
		NB R	-	-	-	-	-	-		
		SB L	A	9.1	A	8.9	A	9.4	A	9.1
		UNSIGNALIZED	SB T	-	-	-	-	-	-	
<b>Overall</b>			-	-	-	-	-	-		
6	Farm Street at Nahant Street	SB TR	-	-	-	-	-	-	-	
		NB LT	B	10.3	B	10.6	B	11.5	B	11.3
		UNSIGNALIZED	EB LR	F	130.8	F	>300*	F	>300*	F
<b>Overall</b>			-	-	-	-	-	-		
7	Farm Street at Hemlock Road	SB L	B	14	A	9.9	B	12.2	B	10.1
		NB T	-	-	-	-	-	-	-	
		WB L	F	>300*	F	203	F	184	F	68.5
		UNSIGNALIZED	WB R	B	14.5	C	23.2	B	14	D
<b>Overall</b>			-	-	-	-	-	-		

\* Delay is greater than 300 seconds. Synchro reports this as an error.

As shown in the results, the effect of the new access road for the NEMT southerly on Farm Street changes traffic navigating through Farm Street to the north. Nahant Street is adversely affected by the additional traffic southbound while Hemlock Road is aided by the reduction northbound. Remaining study area intersections are affected both positively and negatively due to the changes

to volumes for specific movements and crossings. Note that the delay at the WMHS exit on Farm Street nearly doubles, and the northbound left turn from Farm Street to Water Street also nearly doubles.

### 3.1.2 Trip Generation

There are two generally accepted methods for determining trip generation values for a proposed development. When no local data are available the accepted practice is to use rates provided under the appropriate land use code in the Trip Generation Manual, 11th Edition, published by the Institute of Transportation Engineers (ITE) in 2021, a standard publication used in Traffic Engineering. When local data can be collected, this method is preferred as it is assumed to be more applicable.

In the case of WMHS, the site exists and traffic volumes are known based on the number of existing students. As such, those rates can be applied to the new school, which is in the same area, with an increased student capacity. GM2 used this method to determine the trip generation data for the new school and subtracted the existing values to determine the number of new trips expected as a result of the increased school capacity.

Table 3.1-2 shows the number of trips estimated for WMHS.



Table 3.1-2: Trip Generation Calculations WMHS

**Existing - by Students**

<b>Empirical Data</b>	<b>Weekday AM Peak Hour</b>	<b>Weekday PM Peak Hour</b>
Size (per # of Students)	846	846
Average Rate	0.81	0.40
<b>Total Trips</b>	<b>688</b>	<b>336</b>
Entering%	67%	24%
Exiting%	33%	76%
Entering Trips	458	79
Exiting Trips	230	257

**Proposed Land Use - by Students**

<b>Extrapolated Data</b>	<b>Weekday AM Peak Hour</b>	<b>Weekday PM Peak Hour</b>
Size (per # of Students)	1000	1000
Average Rate	0.81	0.40
<b>Total Trips</b>	<b>813</b>	<b>397</b>
Entering%	67%	24%
Exiting%	33%	76%
Entering Trips	541	93
Exiting Trips	272	304

**Total Change - by Students**

<b>Empirical Data</b>	<b>Weekday AM Peak Hour</b>	<b>Weekday PM Peak Hour</b>
<b>New Trips</b>	<b>125</b>	<b>61</b>
Entering%	67%	24%
Exiting%	33%	76%
Entering Trips	83	14
Exiting Trips	42	47

### 3.1.3 Project Trip Distribution

GM2 notes that while there is an existing WMHS and the redevelopment to the new WMHS will add 125 trips in the AM peak and 61 trips in the PM peak, the network and operations of the new WMHS vary significantly from the existing conditions. As such, the analysis should be considered accordingly.

The 2028 No-Build condition was provided. GM2 then removed all existing WMHS trips from the network, revised the network to plan, then distributed the entirety of the new WMHS trips onto the new network. A summary follows:

The redeveloped WMHS will include new and modified parking areas, as well as a revised entry/exit driveway on Farm Street, as shown in Figure 1.1.2. The main WMHS entrance is accessed via a new roadway between the proposed school and the proposed track, hereby noted as “WMHS Lane”. This access road connects to the Farm Street access and parking lots. Origins and destinations have been applied based on certain assumptions. Based on the layouts provided to GM2, these assumptions include:

- In the AM peak there are 813 total trips, with 541 entering and 272 exiting. It is assumed that all 272 exiting trips are drop-offs, and 269 are parking for the school day.
- In the PM peak there are 397 total trips, with 93 entering and 304 exiting. It is assumed that all 93 entering trips are pickups, and 211 are parked vehicles leaving for the day.
- There are 126 parking spaces for WMHS in the northern parking lot (above the track). Any remaining spaces are assumed to be for the Woodville Middle School. All traffic destined to and from this lot is assumed to use to the Farm Street access.
- Drop-offs coming from the north are assumed to use the Farm Street access. It is assumed there will be a designated area within the northern lot towards the east end and vehicles will use the aisles as a loop.
- There are 31 parking spaces in the south portion of the WMHS driveway (from Hemlock, between track and school). There are an additional 101 parking spaces in the north portion. It is assumed that all traffic destined to these 142 spaces will enter via Hemlock Road in the AM peak, as it is also assumed that traffic flow in the AM will be northbound only. The PM peak distribution allows for exit in either direction, thus a distribution to account for this was conducted accordingly.
- There is on-street parking along the east side of Farm Street south of Hemlock Road. This distance is assumed to be approximately 440 feet, to the last driveway on the east side of Farm Street near the Old Nahant Road intersection. It is assumed that approximately 20 vehicles park here, all arriving from the south. These trips do not enter the intersection or the school in the AM peak and are part of non-school “through” traffic in the PM peak as they do not enter the site.

Before determining the new trip patterns, GM2 identified the existing trip patterns. Based on these existing traffic patterns, the following assumptions were made about **existing trips to the existing WMHS**:

- 203 of the 458 entering trips, or 44%, arrive from the north (Farm Street).
- 220 of the 458 entering trips, or 48%, arrive from the south (Farm Street).
- 35 of the 458 entering trips, or 8%, arrive from the west (Nahant Street)
- 260 of the 458 entering trips use the Farm Street WMHS drop-off area (230 drop-off, 30 park)
- Of those 260 entering vehicles at the WMHS drop-off area, 126 (27.5% of total entering trips) arrive from the north, 134 (29% of total entering trips) arrive from the south. No trips were counted as coming from Nahant Street. This was done purposely to distribute trips conservatively.
- The remaining 198 entering trips use Hemlock Road. 77 trips (17% of total entering trips) arrive from the north, 86 trips (19% of total entering trips) arrive from the south, and 35 trips (7.5%) arrive from the west.

With the provided layout of the redeveloped site and the existing trip distribution above, new assumptions about the distribution for the **new trips to the new WMHS** must be made and include the following:

#### AM PEAK

Assume parking spaces in the north lot are numbered/reserved and that the distribution matches traffic patterns. Assume 116 of the 126 spaces get used. The 116 parking spaces in the north lot will be distributed as follows:

- 50 entering vehicles arrive from the north, 60 arrive from the south, 6 arrive from the west. All enter via Farm Street.

Assume the parking spaces in the areas between the track and the school are also numbered and that the distribution matches traffic patterns. Assume 122 of the 142 spaces get used. The 122 parking spaces in the east lots will be distributed as follows:

- 76 entering vehicles arrive from the north, 46 arrive from the south, 10 arrive from the west. All enter via Hemlock Road.

These two lots combine for 238 of the 269 assumed parking-for-the-day trips. GM2 recognizes that currently, the lot east of the existing track is used and is generally at capacity and is expected to be expanded to accommodate 45 spaces. For the purposes of this report, it is assumed that 30 of those 45 spaces are occupied as follows:

- 10 entering vehicles arrive from the north, 20 arrive from the south, 0 arrive from the west. All enter via Hemlock Road.

Of the 272 drop-offs (272 entering, 272 exiting), assume the distribution matches traffic patterns as follows:

- 132 vehicles arrive from the north and use the WMHS Farm Street access.
- 140 vehicles arrive from the south and west and use Hemlock Road to access the easterly school road between the track and the school.

This assumption is logical based on travel origin and destination but does not coincide with the implied capacity of the two areas. Based on the proposed drop-off area directly in front of the school, it would be reasonable to expect more drop-off traffic to occur here than at the northern lot. Note that regardless of distribution between the two areas in the AM peak, all traffic exiting will be required to use the same exit onto Farm Street, which could be problematic. Should the northern lot become too congested, southbound Farm Street motorists may elect to continue on to the Nahant Street/Hemlock Road intersection and turn left onto Hemlock Road. Analyses and recommendations follow later in this report.

All 272 exiting trips in the AM are assumed to be required to use the WMHS Farm Street exit. The distribution is assumed as follows:

- 136 vehicles exit left to the south
- 136 vehicles exit right to the north

A small portion of the southbound exiting trips are destined to Nahant Street.

- Assume 16 of the 136 southbound exiting vehicles turn right onto Nahant Street at the intersection.

### PM PEAK

The PM peak period pick-ups are assumed to differ from the AM drop-offs due to the nature of the action. The drop-offs occur quickly as vehicles arrive onsite, drop-off, then leave immediately. However, pick-ups usually involve vehicles arriving on scene early, parking, and waiting. Due to the assumed concentration of departures as all students exit at the same time, queuing/storage area will be needed for those pick-up vehicles. A reasonable assumption would be that some pick-ups occur in the north lot via Farm Street, but the majority would be expected to use Hemlock Road to the front of the school. There is on-street capacity on Hemlock Road (assumed) on the north side of Hemlock Road east of WMHS Lane, and it is assumed that vehicles may park in the right lane on the south side between Farm Street and the WMHS Lane. The capacity of this on-street parking and the available length of the access road results in the following assumptions:

Of the 93 entering vehicles, 70 use Hemlock Road to access the waiting areas, 23 use the north lot. These are broken down by directions as follows:

- 40 of the 70 vehicles on Hemlock arrive from the south, 20 arrive from the north, and 10 arrive from Nahant Street.
- 10 of the 23 vehicles at the Farm Street access to WMHS arrive from the south, 10 arrive from the north, 3 arrive from Nahant.

There are 304 exiting trips, with 93 assumed to be from pick-ups and 211 from parking. The existing distribution is assumed as follows:

- Of the 93 pick up trips, all are assumed to exit at Farm Street.
- Of the 211 parked vehicles, 31 are assumed to head south from WMHS Lane towards Hemlock Road, 30 head to Hemlock from the small lot near the tennis courts (45-space lot) and the remaining 150 use the exit at Farm Street.

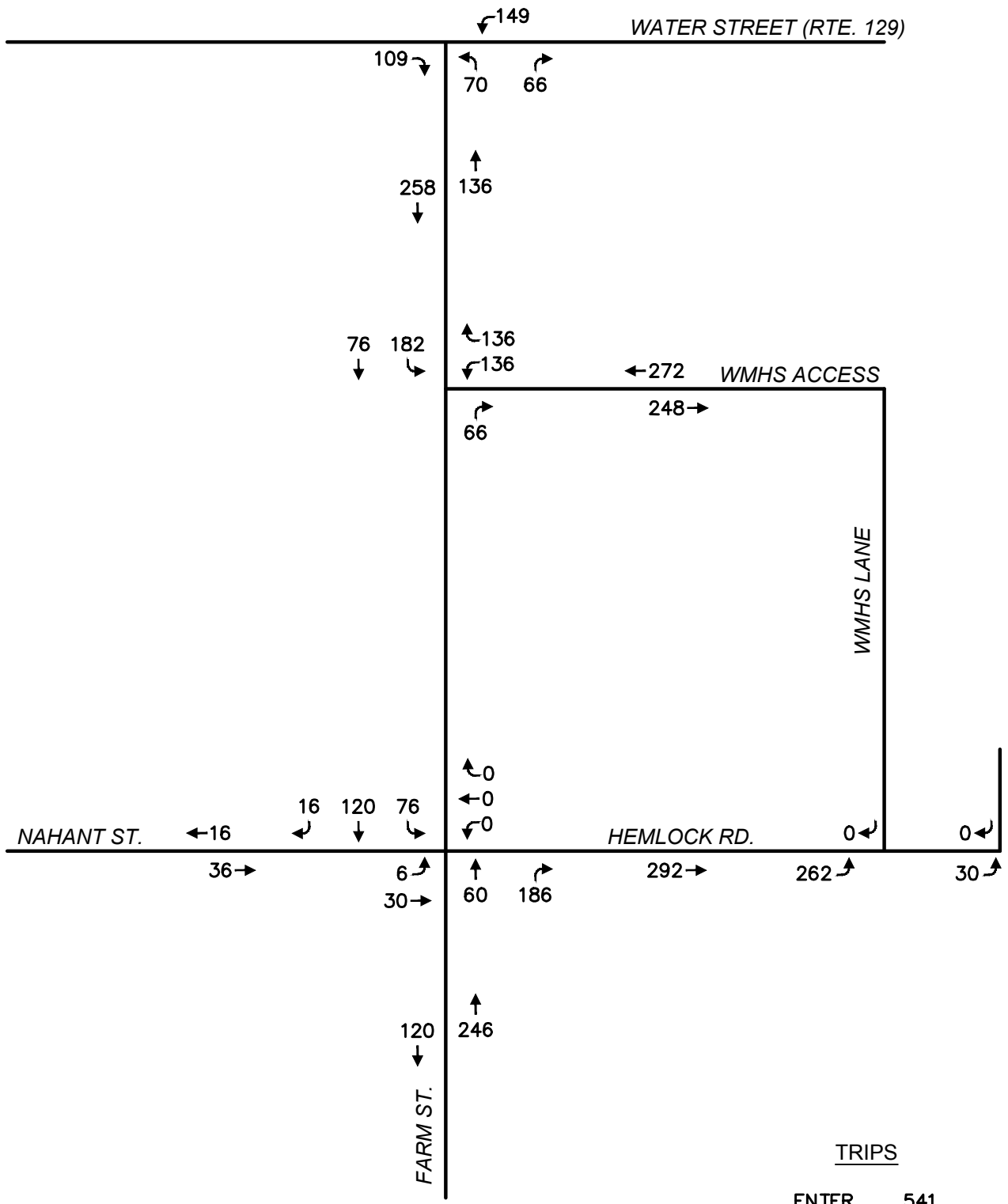
This assumption results in a significant amount of traffic exiting from WMHS onto Farm Street. Also notable is the bus parking location, which is likely to result in buses conflicting with exiting motorists from the easterly lots, then all bus and easterly lot exiting traffic will have to merge/join the north lot circulating and exiting traffic.

The reason more traffic was not assumed to travel south along the access road towards Hemlock is that it appears to be counter-intuitive. GM2 would assume that, should congestion within the parking lot road along the north become congested, some of the exiting parked vehicles from the middle of the large easterly lot may elect to travel south. However, if vehicles picking-up in front of the school attempt to pass on the left, blocking would be expected.

The trip generation data was plotted and shown in Figures 3.1.3 and 3.1.4.

The 2028 Build Conditions for the WMHS redevelopments are traffic volumes are shown in Figures 3.1.5 and 3.1.6.

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TRIPS	
ENTER	541
EXIT	272
<b>TOTAL</b>	<b>813</b>

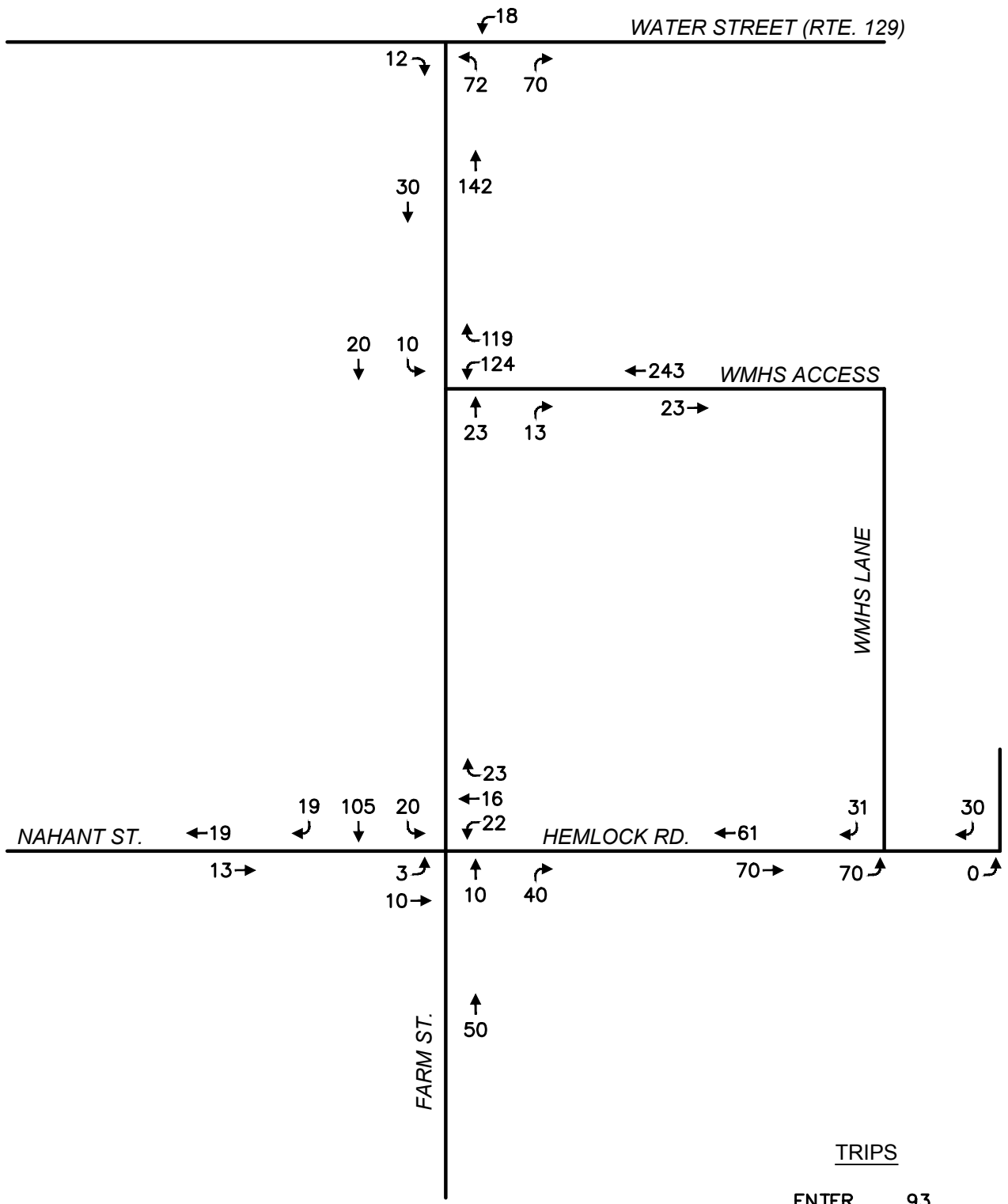


WAKEFIELD MEMORIAL HIGH SCHOOL  
WAKEFIELD, MA

2028 WMHS TRIPS  
AM PEAK

GM2 PROJECT NO.: 40684	
DATE: SEPTEMBER 2022	
SCALE: N.T.S.	Figure 3.1.3





TRIPS

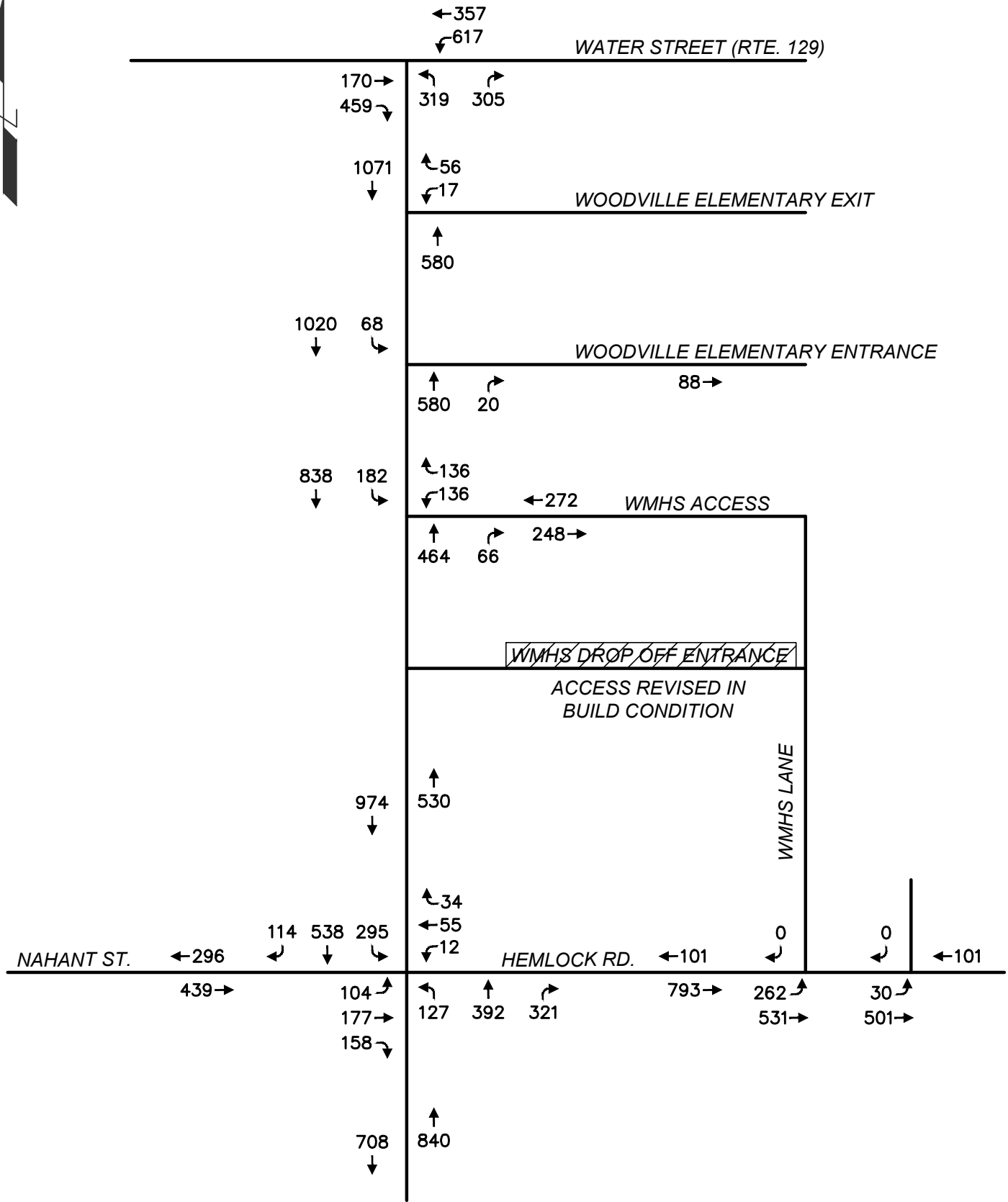
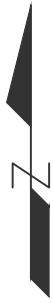
ENTER	93
EXIT	304
TOTAL	<u>397</u>



WAKEFIELD MEMORIAL HIGH SCHOOL  
WAKEFIELD, MA

2028 WMHS TRIPS  
PM PEAK

GM2 PROJECT NO.: 40684  
DATE: SEPTEMBER 2022  
SCALE: N.T.S. | Figure 3.1.4



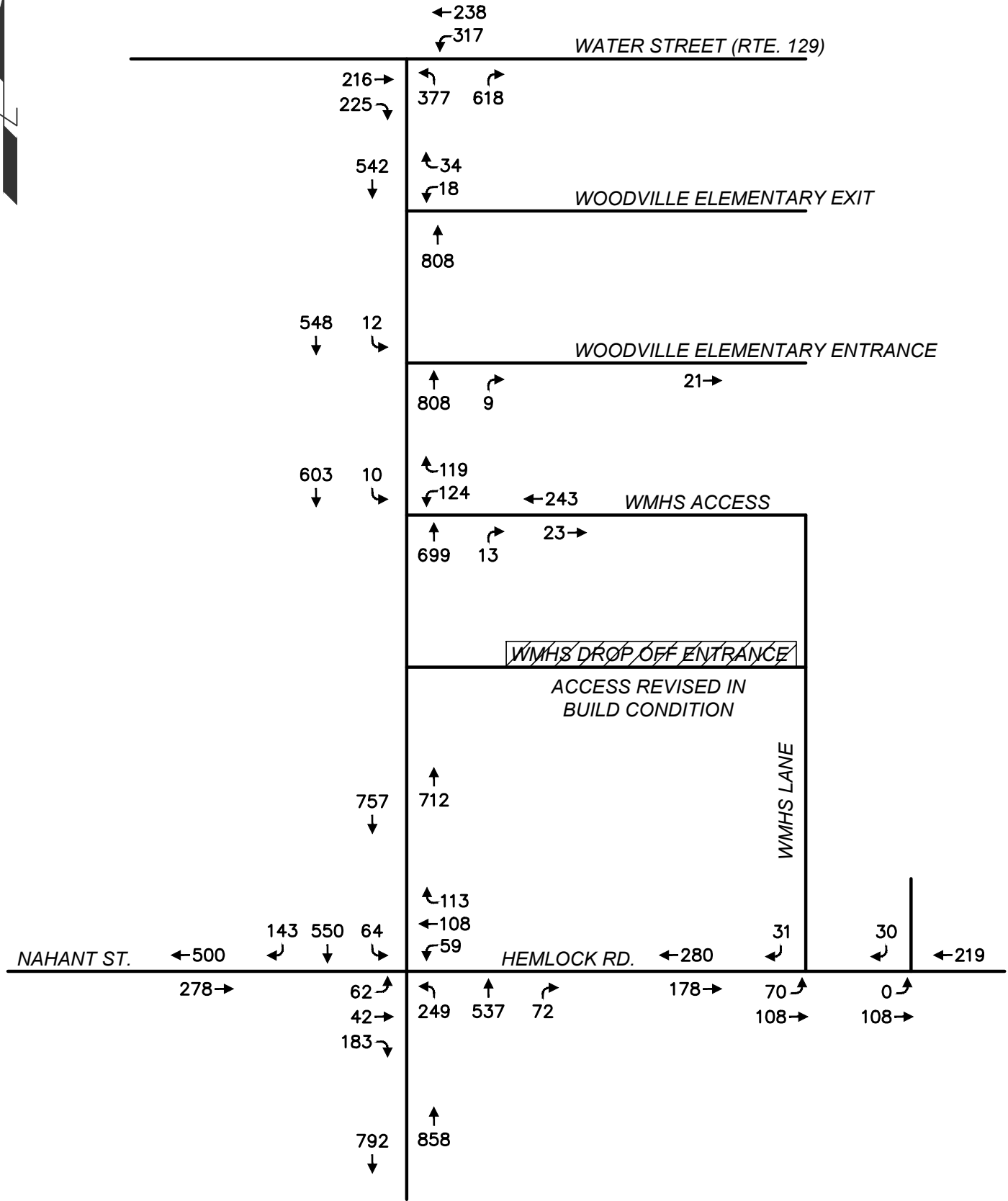
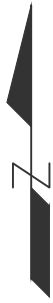
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WAKEFIELD MEMORIAL HIGH SCHOOL  
WAKEFIELD, MA

2028 BUILD  
AM PEAK

GM2 PROJECT NO.: 40684  
DATE: SEPTEMBER 2022  
SCALE: N.T.S. | Figure 3.1.5



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WAKEFIELD MEMORIAL HIGH SCHOOL  
WAKEFIELD, MA

2028 BUILD  
PM PEAK

GM2 PROJECT NO.: 40684  
DATE: SEPTEMBER 2022  
SCALE: N.T.S. | Figure 3.1.6

### 3.2.1 2028 Build Condition – Signal Option

Signalizing the intersection of Farm Street/Nahant Street/Hemlock Road could be completed in two distinct geometries, including maintaining the general offset-legged approaches, or realigning the Hemlock Road approach to create a typical four-way intersection. In general, creating a two-stage crossing to pass Nahant Street and Hemlock Road southbound or northbound, is undesirable as the signal would require strict maintenance to keep timings applicable with appropriate phasing, including split operations that by nature ensure excessive red clearance intervals, and multiple stacking/queuing lanes.

A typical signal installation would allow for reduced conflict areas, reduced crosswalk lanes, and more efficient operations. Note that in a typical signal setup it is easy for the police to come in and manually control the signal if desired.

Given the excessive southbound left-turn volumes, the intersection is expected to fail in the AM peak periods. A trial run was completed with one shared lane at all four approaches and the congestion queued traffic on Water Street significantly, and south of June Circle on Farm Street. Additional capacity is required as the first signal option failed to a condition observed to be worse than the existing conditions.

A single left turn lane in a busy area is typically limited by the available length, not by need. The typical threshold of capacity is a function of turning and crossing traffic, yet general rules of thumb can provide guidance. If the left-turn volume of a single approach exceeds 200 vehicles per hour, a dual left-turn lane should be considered (note this value varies depending on the location, length of bay, etc.). Based on the observed and expected traffic volumes, the southbound left-turn movement is in excess of 300 vehicles per hour. This will require a significant left-turn bay length and/or a second left turn lane, which would require a second receiving lane on the appropriate leg. Note that in this case, the maximum length of the turn lane should be governed by the location of the exiting WMHS traffic at the driveway to the north, a distance of approximately 700 feet.

Attempting to carry a double left-turn lane through an offset intersection is not typical and not preferred if a better option is available. The design is inconsistent with the desire to enhance operability and efficiency in conjunction with a safety and mobility aspect such as pedestrians and cyclists to consider. Pedestrians will cross using pedestrian pushbuttons and intervals. Adding crossings adds more delays to the mainline operations, which in this study area, are at maximum capacity. GM2 was unable to determine if exclusive pedestrian phases are required by the Town, but this condition was observed at the Farm Street/Water Street intersection. GM2's experience has been that generally exclusive pedestrian phases have been provided, but a recommendation, if appropriate, to make pedestrian phasing concurrent is possible. Note that exclusive pedestrian phasing also typically eliminates right-turn-on-red movements.

With the above limitations reviewed, GM2 has proposed that the signal be analyzed as a conventional four-way intersection with a realignment of Hemlock Road. This design is expected to provide the optimal performance available and provide direct pedestrian and bicycle crossings. The analysis was performed with the following parameters:

Southbound:

One shared through-right lane, one exclusive left-turn bay (500-foot length)

Westbound

One shared left/thru/right lane (note the slip lane was eliminated to reduce pedestrian crossing length).

Northbound

One shared through-right lane, one exclusive left-turn bay (150-foot length)

Eastbound

One shared left/thru/right lane

A conceptual design is provided in Figure 3.2.1. Note this is a preliminary draft and not a completed design.

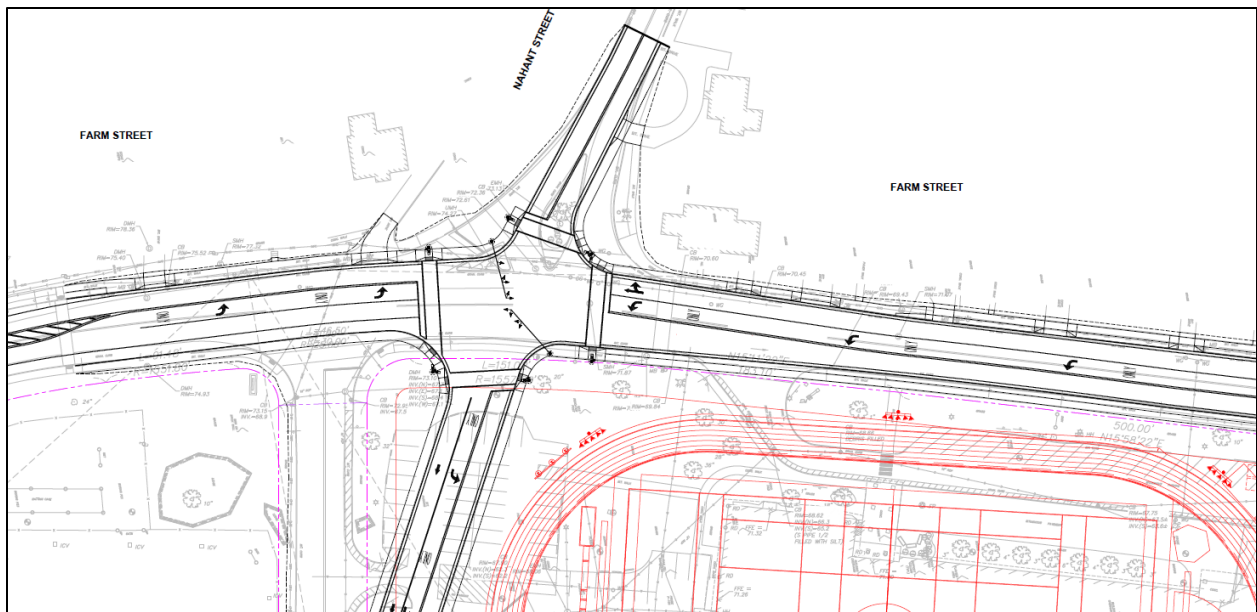


Figure 3.2.1 – Conceptual Signal Design

The signal was set to protected left turns and split phasing on the side streets was chosen due to the left-turn volumes being higher than the through volumes for both eastbound and westbound. Timings were optimized in Synchro.

Note that the analyses were completed allowing right-turn-on-red and no pedestrian crossings. Should exclusive pedestrian phasing be required and a no-right-on-red condition imposed due to that phasing, capacity will be significantly decreased and delays will increase.

GM2 used the Synchro software to model the network and input the data to produce the results shown in the table. What those results do not show is the total network effect, which can only be visualized and check via simulation, which was completed in the partner program SimTraffic. Within SimTraffic the congestion can be viewed and issues can be readily seen and addressed. The key observations from the Build Condition Signal option include:

- Traffic southbound does not need the 500 foot turn lane for storage, it needs that lane length to allow left-turning vehicles to by-pass the through movement queue. The lane is rarely occupied by 10 or more vehicles.
- The southbound queue extends northerly nearly to Water Street, preventing WMHS traffic exiting left to go south from getting any available gaps, causing queuing all along WMHS Lane.
- Nahant Street traffic queues are significant, often in excess of 40 vehicles, not typical of existing conditions.
- In order for the network to relieve congestion, the WMHS Lane roadway was modelled as two lanes northbound from Hemlock Road and around to Farm Street. Exclusive turn lanes are needed for capacity.
- Hemlock Road was also modelled as two lanes eastbound up to WMHS Lane. One exclusive left-turn lane and one through lane.
- The installation and use of a rectangular rapid flashing beacon (RRFB) near the WMHS exit to Farm Street would benefit exiting traffic as it would stop Farm Street southbound traffic and allow a platoon of left-turning vehicles to exit.
- Some simulation runs showed the capacity within Hemlock Road and WMHS lane was insufficient and vehicles unable to exit caused queues back to Farm Street, resulting in the “snake’s head catching its tale”, completely blocking all traffic. This is unlikely to occur unless delay on Farm Street is added, not allowing WMHS exiting traffic onto Farm Street.
- The pm peak operations under the signalized condition are also showing LOS F with high delays but simulated operations indicated no locations with excessive issues. The operations are as expected under these peak period conditions and the signal is capable of serving the demand.

The results of the capacity analyses for the signalized option are shown in Table 3.2-1. The delay at the WMHS exit results in a total failure in the am peak.



Table 3.2-1: Capacity Analysis – 2028 Build Condition Signal Option

ID	Roadway	Movement	2028 Build Conditions - Signalized			
			AM Peak Hour		PM Peak Hour	
			LOS	Delay	LOS	Delay
1	Water Street at Farm Street	EB T	F	106.6	C	24.6
		EB R	B	17.9	A	1.6
		WB L	C	28.5	A	9.2
		WB T	A	9.4	A	7.1
		NB L	F	124.9	E	80
	SIGNALIZED	NB R	A	0.9	A	3.1
	<b>Overall</b>		<b>D</b>	<b>39.3</b>	<b>C</b>	<b>21.3</b>
2	Farm Street at Woodville School Exit Driveway	WB L	F	150.8	D	33.8
		WB R	C	16.6	C	16.4
		NB T	-	-	-	-
		UN SIGNALIZED	SB T	-	-	-
	<b>Overall</b>		-	-	-	-
3	Farm Street at Woodville School Entrance Driveway	-	-	-	-	-
		NB TR	-	-	-	-
		SB TL	A	9.9	A	9.7
		UN SIGNALIZED	-	-	-	-
	<b>Overall</b>		-	-	-	-
4	Farm Street at WMHS Driveway (Entry/Exit)	WB L	F	>300 *	F	85.5
		WB R	C	17.8	C	17
		NB TR	-	-	-	-
		UN SIGNALIZED	SB LT	B	10.5	A
	<b>Overall</b>		-	-	-	-
5	Farm Street at WMHS Entrance Driveway	NB T	Entrance consolidated with Exit in Build Condition			
		NB R				
		SB L				
		UN SIGNALIZED				
	<b>Overall</b>					
6 & 7	Farm Street at Nahant Street/ Hemlock Road	EB LTR	F	145.8	F	91.9
		WB LTR	E	73.6	F	100.8
		NB L	F	108.5	F	96.8
		NB TR	F	106.7	C	29.4
		SB L	F	162.1	F	82.8
		SIGNALIZED	SB TR	D	48.1	F
	<b>Overall</b>		<b>F</b>	<b>103</b>	<b>E</b>	<b>72.9</b>

\* Delay is greater than 300 seconds. Synchro reports this as an error.

### 3.3.1 2028 Build Condition – Roundabout Option

GM2 has experience designing roundabouts and is familiar with all the components that make a roundabout design complete, functional and aesthetically pleasing. MassDOT recently released their “GUIDELINES FOR THE PLANNING AND DESIGN OF ROUNDABOUTS”, which is a comprehensive manual and design standards that GM2 would adhere to and apply at this location. The shape, entry angle, splitter islands, lane widths, truck apron and all other features will require detailed engineering to complete in the final design stages.

The Synchro program was used to analyze the roundabout and this program is not robust enough to handle the variations of lane widths, approach angles, and other design parameters that more extensive programs such as SIDRA or VISSIM may provide, however, the program has been shown to be reasonably accurate for roundabouts. Synchro can reasonably model additional capacity but this would preferably be done with SIDRA or VISSIM to model.

The analysis was performed with the following parameters:

Southbound:

One shared through-right lane, one exclusive left-turn lane (300-foot length)

Westbound

One shared lane

Northbound

One shared lane

Eastbound

One shared lane

A conceptual design is provided in Figure 3.3.1. Note this is a preliminary draft and not a completed engineering design.

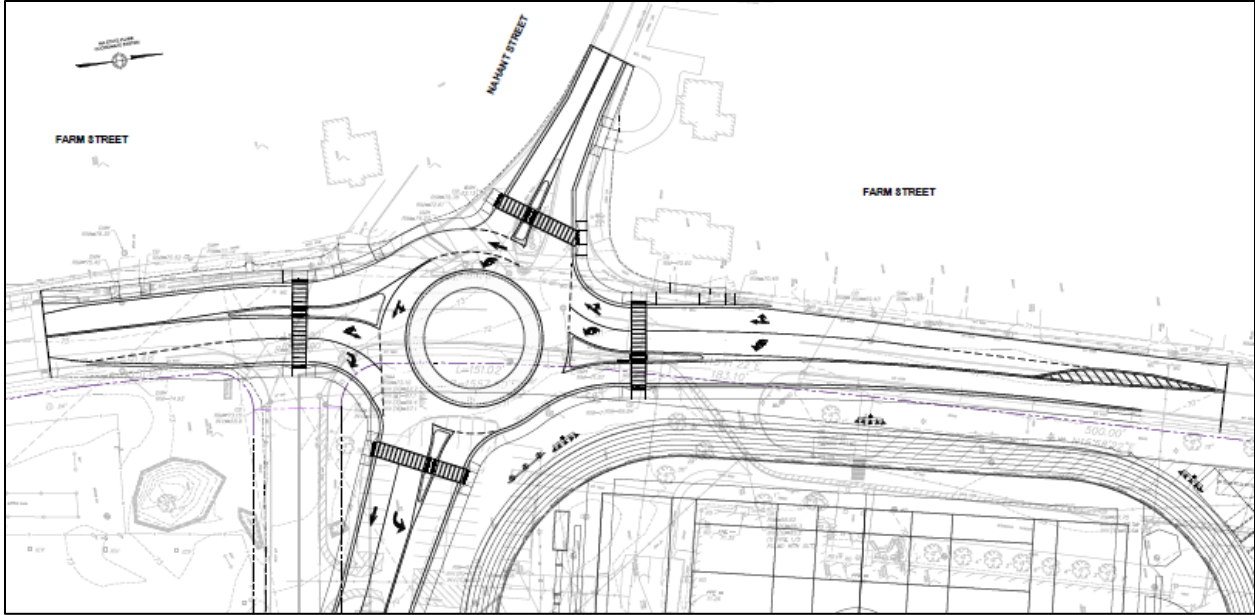


Figure 3.2.1 – Conceptual Roundabout Design (Not to scale)

Note that an exclusive turn lane (left turn) northbound was included in the signal analysis and shown in the conceptual roundabout design (right turn), but not the roundabout analysis. The analysis for the northbound lane only includes one shared lane as listed in the parameters.

GM2 again used SimTraffic to model the network. The key observations from the Build Condition Roundabout option include:

- Traffic southbound does not need the 300-foot turn lane for storage, it needs that lane length to allow left-turning vehicles to by-pass the through movement queue. The lane is rarely occupied by 10 or more vehicles. (Similar to signal option).
- The southbound queue extends northerly nearly to Water Street but is not stagnant and platooning like the signal. The queue is rolling and moving, thus queues that do build can dissipate quickly.
- The roundabout is too efficient at moving traffic northbound and allows a steady stream of traffic to flow. This is detrimental to the WMHS exit onto Farm Street as there are fewer controlled gaps to capture. With signals there is typically a platoon of vehicles and larger gaps.
- The Farm Street network operates well with the roundabout in place, at the cost of queues on WMHS Lane that, rarely but more often than the signal condition, can also result in “snake’s head catching its tail.” (Similar to signal option).
- In order for the network to relieve congestion, the WMHS Lane roadway was modelled as two lanes northbound from Hemlock Road and around to Farm Street. Exclusive turn lanes are needed for capacity. (Similar to signal option).
- Hemlock Road was also modelled as two lanes eastbound up to WMHS Lane. One exclusive left-turn lane and one through lane. (Similar to signal option).

- The installation and use of a rectangular rapid flashing beacon (RRFB) near the WMHS exit to Farm Street would benefit exiting traffic as it would stop Farm Street southbound traffic and allow a platoon of left-turning vehicles to exit. (Similar to signal option).
- The pm peak operations under the roundabout condition show excellent operations and easily serve the demand.

The results of the capacity analyses for the roundabout option are shown in Table 3.3-1.

Table 3.3-1: Capacity Analysis – 2028 Build Condition Roundabout Option

ID	Roadway	Movement	2028 Build Conditions - Roundabout			
			AM Peak Hour		PM Peak Hour	
			LOS	Delay	LOS	Delay
1	Water Street at Farm Street	EB T	F	106.6	C	24.6
		EB R	B	17.9	A	1.6
		WB L	C	28.5	A	9.2
		WB T	A	9.4	A	7.1
		NB L	F	124.9	E	80
	SIGNALIZED	NB R	A	0.9	A	3.1
<b>Overall</b>			<b>D</b>	<b>39.3</b>	<b>C</b>	<b>21.3</b>
2	Farm Street at Woodville School Exit Driveway	WB L	F	150.8	D	33.8
		WB R	C	16.6	C	16.4
		NB T	-	-	-	-
	UNSIGNALIZED	SB T	-	-	-	-
<b>Overall</b>			-	-	-	-
3	Farm Street at Woodville School Entrance Driveway	-	-	-	-	-
		NB TR	-	-	-	-
		SB TL	A	9.9	A	9.7
	UNSIGNALIZED	-	-	-	-	
<b>Overall</b>			-	-	-	-
4	Farm Street at WMHS Driveway (Entry/Exit)	WB L	F	>300 *	F	85.5
		WB R	C	17.8	C	17
		NB TR	-	-	-	-
	UNSIGNALIZED	SB LT	B	10.5	A	9.2
<b>Overall</b>			-	-	-	-
5	Farm Street at WMHS Entrance Driveway	SB T	Entrance consolidated with Exit in Build Condition			
		NB T				
		WB L				
	UNSIGNALIZED	WB R				
<b>Overall</b>						
6 & 7	Farm Street at Nahant Street/ Hemlock Road	EB LTR	D	28.1	B	10
		WB LTR	A	6.3	B	12.8
		NB LTR	F	104.1	C	15.7
		SB LTR	A	6.2	A	4.8
	ROUNDABOUT	SB TR	B	11.6	C	19.1
<b>Overall</b>			<b>E</b>	<b>47.1</b>	<b>C</b>	<b>15.3</b>

\* Delay is greater than 300 seconds. Synchro reports this as an error.

Note that delays at all other intersections are similar to the signal option results.

## 4. CONCLUSIONS

The NEMT Build condition significantly affects traffic operations at the existing location. As previously discussed, this scenario is the No-Build condition for the WMHS redevelopment and as such, the correct comparison to make is between the WMHS 2028 No-Build condition and both WMHS Build Conditions, with no comparison to 2021 existing conditions.

Both Build Conditions options show improvement over the No-Build condition, and both have effects on operations, which are distinct.

Based on the analyses and simulations, the internal operations on WMHS Lane as well as on Hemlock Road will have significant impacts to Farm Street traffic from Water Street to Nahant Street/Hemlock Road.

The analyses show that Hemlock Road has been re-aligned to meet Nahant Street. Based on our engineering experience, this realignment is critical to traffic operations. Any option that proposes no mitigation at this intersection will result in gridlock.

Regardless of which alternative is selected for the intersection configuration, traffic exiting WMHS onto Farm Street will experience significant delays.

WMHS Lane will require two lanes from Hemlock Road to Farm Street in the am peak. Note that the lower portion of the east lot could potentially be converted to allow two-way traffic in the pm peak. The upper portion of the easterly lot would better serve traffic if maintained as two lanes northbound/westbound to Farm Street.

An exclusive turn lane southbound is required at the Farm Street/Nahant Street/Hemlock Road intersection under either condition to facilitate traffic flows. This will require eliminating on-street parking for at least six houses.

There is a need for an exclusive left-turn lane northbound under the signal option. This exclusive lane for the roundabout is not required, and if included, would be an exclusive right-turn lane, not exclusive left.

Hemlock Road under either will require widening to two (2) lanes eastbound between Farm Street and WMHS Lane in order to supply sufficient capacity for eastbound vehicles from Farm Street.

There is no evidence of any notable crash history in this area. Introducing intersection control where none existed before is expected to result in an increase in crashes. In this case there will be a conversion from control only on the side streets (Nahant Street and Hemlock Road) to control at all four approaches.

If the intersection is realigned and signal controlled, head-on and T-bone crashes are possible in locations they were not before. For example, traffic crossing between Hemlock Road and Nahant Street.



If the intersection is realigned and roundabout controlled, an increase in rear-end type crashes would be expected (higher frequency than with signal), but head-on and T-bone crashes would be far less likely to occur.

The capacity analyses clearly demonstrate that the roundabout provides better operations at the intersection of Nahant Street and Hemlock Road, and along Farm Street. Notable in the signal results for the AM peak is the extent of the delays associated with the LOS F movements. These delays result in an overall intersection operation average delay time more than double that of the roundabout.

The northbound approach under the roundabout build option does not require an additional lane but would benefit from an exclusive right-turn lane.

The roundabout levels of service are better and delays lower by significant margins in the PM peak period over the signal option.

The simulation shows better operations on WMHS Lane with the signal, but there are queuing issues to the north on Water Street as a result.

The Synchro reports show identical operations at all intersections under both build conditions for both peaks, except for the Farm Street/Nahant Street/Hemlock Road intersection which varies under the signal option versus roundabout option.

Based on the data for the peak periods, the roundabout would provide better levels of service and lower delays throughout the remaining periods of the day as well.

A primary unknown factor is the effect of pedestrian phasing at the signal. Should the phasing be concurrent, the crossing times are unlikely to match the optimized vehicle times, thus negating the benefits of the optimized timing. The randomness and number of instances are detrimental to efficient operations. Should exclusive pedestrian phasing be required, the system may be unable to handle the additional clearance intervals. In simple terms, if pedestrians keep pushing the button and stopping all vehicular traffic, motorists will get stuck. Crossing guards may be able to assist with this issue. The no-right-on-red issue is a significant component, and if required due to exclusive pedestrian phasing, would have considerable impacts on intersection operations. GM2 notes that the pedestrian and cyclist counts conducted do not show a significant number of pedestrians at this intersection.

The roundabout would provide a less restrictive option in that the splitter islands allow crossing of one direction of traffic at a time, thus allowing vehicles at other approaches or other legs to move more readily.

The redesign of the WMHS campus will remove the drop-off driveway on Farm Street north of Hemlock Road and move that traffic northerly to the new access just south of the Woodville Elementary School, referred to in the report as the WMHS access at Farm Street.

Travel speeds through the study area were observed to be very low due to the heavy congestion in both peak periods.

The relocation of the WMHS access on Farm Street and repaving will impact the crosswalks that currently exist under either condition. A crossing should be provided and the logical location would be the north side of the new access.

Existing mid-block crossings are not equipped with signals or RRFB. Revised crosswalks should be equipped accordingly.

A Crossing Guard placed at the new crosswalk at the WMHS access on Farm Street could provide the necessary means to stop Farm Street traffic at select intervals to allow WMHS Lane exiting traffic to leave the site and to ensure buses are not delayed

There are recommendations from the “Safe Routes to School Walk Assessment” prepared for the Woodville Elementary School and Galvin Middle School that warrant implementation. The specific recommendations to include are dependent upon mitigation measures implemented as a result of this WMHS Report.

## 5. RECOMMENDATIONS

The key findings were noted in the previous section. Based on those findings and analyses, GM2 offers the following recommendations for consideration:

On Farm Street:

1. Construct a roundabout at The Farm Street/Nahant Street/Hemlock Road intersection.
2. At the roundabout, construct a southbound left-turn lane that is at least 300 feet long.
3. Consider adding RRFB crossings for the roundabout.
4. Consolidate the two crosswalks at the existing WMHS exit to one at the new WMHS access. Place this new crosswalk on the north side of the access on Farm Street and add an RRFB.
5. A Crossing Guard that can stop Farm Street traffic to allow WMHS Lane traffic to exit would provide relief as necessary for the buses to exit and for queues on WMHS Lane to Exit.
6. Optimize the signal timings at the intersection of Water Street at Farm Street.
7. Implement driver feedback radar speed signs northbound and southbound on Farm Street.

On Hemlock Road:

8. Construct Hemlock Road with 2 lanes eastbound at least to WMHS Lane and preferably to the 45-space parking lot, then reduce to one lane.

WMHS Circulation:

9. The on-site road, referred to herein as WMHS Lane, requires two lanes for capacity so as not to queue traffic into Hemlock Road and further back into Farm Street. This roadway, originating at Hemlock Road, passing through the site, and terminating at Farm Street is recommended to be two lanes northbound-only, with one lane ending as an exclusive left-turn onto Farm Street, and one lane as an exclusive right-tun onto Farm Street.
10. The movements from Farm Street into WMHS Lane should be required to turn right immediately entering the site to encourage a counterclockwise vehicular travel pattern.
11. Designate a drop-off area in the parking lot on the north side of the track.
12. Designated/numbered parking spaces to control vehicles searching for empty spaces.
13. If the WMHS and NEMT class start times can be offset as they are currently, consider maintaining this requirement to offset peak demand.

Safe Routes to School Study:

14. Implement recommendations from the “Safe Routes to School Walk Assessment” prepared for the Woodville Elementary School and Galvin Middle School. The applicable recommendations are dependent upon the mitigation measures implemented at WMHS.

\*\*\*

# APPENDIX A

## Traffic Volumes

Location : Farm Street in front of  
 Location : High School  
 City/State: Wakefield, MA  
 Direction: SB,

40684001

11/16/2021	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	Total
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	
12:00 AM	0	0	1	5	3	3	1	0	0	0	0	0	0	13
1:00	0	0	0	1	2	1	0	0	0	0	0	0	0	4
2:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1
3:00	0	0	0	1	2	6	0	0	0	0	0	0	0	9
4:00	0	0	0	1	9	2	0	2	0	0	0	0	0	14
5:00	0	0	2	10	18	20	4	0	0	0	0	0	0	54
6:00	0	0	7	50	144	77	10	1	0	0	0	0	0	289
7:00	60	85	192	303	127	8	2	0	0	0	0	0	0	777
8:00	9	78	148	256	123	17	0	0	0	0	0	0	0	631
9:00	1	1	15	84	177	35	5	0	0	0	0	0	0	318
10:00	1	0	19	64	134	46	6	0	0	0	0	0	0	270
11:00	1	0	17	91	150	48	2	1	0	0	0	0	0	310
12:00 PM	1	0	19	125	160	27	6	0	0	0	0	0	0	338
1:00	3	9	50	152	104	19	1	0	0	0	0	0	0	338
2:00	58	102	189	137	23	2	0	0	0	0	0	0	0	511
3:00	0	5	60	177	188	48	2	0	0	0	0	0	0	480
4:00	0	0	27	182	232	63	5	0	0	0	0	0	0	509
5:00	0	1	26	284	228	25	2	1	0	0	0	0	0	567
6:00	0	1	17	115	211	52	3	0	0	0	0	0	0	399
7:00	0	1	7	74	114	24	2	0	0	0	0	0	0	222
8:00	0	0	2	54	84	22	2	1	0	0	0	0	0	165
9:00	0	0	2	36	67	16	5	0	0	0	0	0	0	126
10:00	0	0	5	12	18	9	3	0	0	0	0	0	0	47
11:00	0	0	1	5	11	4	0	0	0	0	0	0	0	21
<b>Total</b>	<b>134</b>	<b>283</b>	<b>806</b>	<b>2220</b>	<b>2329</b>	<b>574</b>	<b>61</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6413</b>

Percentile	15th	50th	85th	95th
Speed	24.1	29.7	34.1	36.6
Mean Speed (Average)	28.9			
10 MPH Pace Speed	25-34			
Number in Pace	4519			
Percent in Pace	70.5%			
Number > 30 MPH	2970			
Percent > 30 MPH	46.3%			

Location : Farm Street in front of  
 Location : High School  
 City/State: Wakefield, MA  
 Direction: SB,

40684001

11/17/2021	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	Total
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	
12:00 AM	0	0	1	7	13	3	1	0	0	0	0	0	0	25
1:00	0	0	0	1	5	0	0	0	0	0	0	0	0	6
2:00	0	0	0	0	2	1	0	0	0	0	0	0	0	3
3:00	0	0	0	0	2	1	1	0	0	0	0	0	0	4
4:00	0	0	0	2	6	7	1	0	0	0	0	0	0	16
5:00	0	0	0	9	21	20	3	1	0	0	0	0	0	54
6:00	0	0	2	67	143	61	15	0	0	0	0	0	0	288
7:00	139	60	151	206	104	21	0	0	0	0	0	0	0	681
8:00	6	84	157	183	116	23	1	0	0	0	0	0	0	570
9:00	3	24	13	95	144	26	8	1	0	0	0	0	0	314
10:00	0	0	23	99	133	55	1	0	0	0	0	0	0	311
11:00	14	25	75	150	68	11	0	0	0	0	0	0	0	343
12:00 PM	6	65	108	120	106	19	1	0	0	0	0	0	0	425
1:00	5	11	100	151	103	16	3	0	0	0	0	0	0	389
2:00	48	30	74	188	87	13	1	0	0	0	0	0	0	441
3:00	0	2	52	186	210	30	5	1	0	0	0	0	1	487
4:00	0	0	56	211	194	26	3	0	0	0	0	0	0	490
5:00	2	1	46	258	226	26	2	0	0	0	0	0	0	561
6:00	2	0	4	134	194	21	3	0	0	0	0	0	0	358
7:00	1	1	4	79	123	28	4	0	0	0	0	0	0	240
8:00	0	0	6	34	68	21	2	0	0	0	0	0	0	131
9:00	0	0	2	27	57	18	4	2	0	0	0	0	0	110
10:00	0	0	1	18	38	10	1	0	0	0	0	0	0	68
11:00	0	0	0	1	15	11	2	0	0	0	0	0	0	29
<b>Total</b>	<b>226</b>	<b>303</b>	<b>875</b>	<b>2226</b>	<b>2178</b>	<b>468</b>	<b>62</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>6344</b>

Percentile	15th	50th	85th	95th
Speed	22.9	29.1	33.5	35.9
Mean Speed (Average)	28.3			
10 MPH Pace Speed	25-34			
Number in Pace	4378			
Percent in Pace	69.0%			
Number > 30 MPH	2714			
Percent > 30 MPH	42.8%			



Location : Farm Street in front of  
 Location : High School  
 City/State: Wakefield, MA  
 Direction: SB,

40684001

11/18/2021	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	Total
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	
12:00 AM	0	0	3	3	2	4	2	0	0	0	0	0	0	14
1:00	0	0	0	2	3	3	0	0	0	0	0	0	0	8
2:00	0	0	1	1	2	0	0	0	0	0	0	0	0	4
3:00	0	0	0	1	5	5	1	0	0	0	0	0	0	12
4:00	0	0	0	1	7	4	0	0	0	0	0	0	0	12
5:00	0	0	1	10	25	22	4	0	0	0	0	0	0	62
6:00	0	1	11	111	113	45	7	1	0	0	0	0	0	289
7:00	212	79	108	97	47	6	0	0	0	0	0	0	0	549
8:00	50	94	111	127	57	10	0	0	0	0	0	0	0	449
9:00	0	1	19	105	118	42	3	2	0	0	0	0	0	290
10:00	1	0	24	94	130	29	2	1	0	0	0	0	0	281
11:00	0	0	31	148	145	40	1	0	0	0	0	0	0	365
12:00 PM	0	0	22	166	136	26	1	0	0	0	0	0	0	351
1:00	1	17	79	137	122	15	3	1	0	0	0	0	0	375
2:00	81	166	199	105	27	3	2	0	0	0	0	0	0	583
3:00	11	26	243	240	58	4	0	0	0	0	0	0	0	582
4:00	0	0	48	232	221	45	2	0	0	0	0	0	0	548
5:00	0	0	53	346	245	26	1	1	0	0	0	0	0	672
6:00	0	2	36	201	186	38	2	0	0	0	0	0	0	465
7:00	0	0	7	75	115	34	3	0	0	0	0	0	0	234
8:00	0	0	0	40	82	26	4	1	0	0	0	0	0	153
9:00	0	0	1	37	62	17	3	0	0	0	0	0	0	120
10:00	0	0	1	19	33	11	0	0	0	0	0	0	0	64
11:00	0	0	0	5	15	11	6	0	0	0	0	0	0	37
<b>Total</b>	<b>356</b>	<b>386</b>	<b>998</b>	<b>2303</b>	<b>1956</b>	<b>466</b>	<b>47</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6519</b>

Percentile	15th	50th	85th	95th
Speed	21.6	28.5	32.8	35.9
Mean Speed (Average)	27.4			
10 MPH Pace Speed	25-34			
Number in Pace	4240			
Percent in Pace	65.0%			
Number > 30 MPH	2476			
Percent > 30 MPH	38.0%			

<b>Grand Total</b>	<b>716</b>	<b>972</b>	<b>2679</b>	<b>6749</b>	<b>6463</b>	<b>1508</b>	<b>170</b>	<b>18</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>19276</b>
Stats														
Percentile				15th	50th	85th	95th							
Speed				22.9	29.1	33.5	35.9							
Mean Speed (Average)				28.2										
10 MPH Pace Speed				25-34										
Number in Pace				13136										
Percent in Pace				68.1%										
Number > 30 MPH				8160										
Percent > 30 MPH				42.3%										

Location : Farm Street in front of  
 Location : High School  
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 Direction: NB,

40684001

11/16/2021	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	Total
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	
12:00 AM	0	0	0	0	9	5	1	0	0	0	0	0	0	15
1:00	0	0	0	0	3	2	0	0	0	0	0	0	0	5
2:00	0	0	0	0	2	2	1	0	0	0	0	0	0	5
3:00	0	0	0	3	2	1	1	0	2	0	0	0	0	9
4:00	0	0	0	1	6	3	1	0	1	0	0	0	0	12
5:00	2	0	0	3	15	21	11	1	0	0	0	0	0	53
6:00	14	8	2	16	54	56	14	2	1	0	0	0	0	167
7:00	48	22	44	108	102	48	7	0	0	1	0	0	1	381
8:00	112	36	43	80	74	31	4	1	0	0	1	0	0	382
9:00	1	4	21	64	115	58	12	0	0	0	0	0	0	275
10:00	0	0	8	64	123	67	9	1	0	0	0	0	0	272
11:00	4	2	15	72	149	87	13	0	0	0	0	0	0	342
12:00 PM	5	2	32	104	146	66	10	0	0	0	0	0	0	365
1:00	8	15	62	131	98	25	2	0	0	0	0	0	0	341
2:00	209	124	136	100	44	6	0	0	0	0	0	0	0	619
3:00	25	14	69	219	301	113	9	0	0	0	0	0	0	750
4:00	0	9	34	171	265	143	24	0	0	0	0	0	1	647
5:00	2	1	13	140	260	108	11	0	1	0	0	0	0	536
6:00	1	3	1	56	152	93	24	1	0	0	0	0	0	331
7:00	1	2	9	31	89	74	14	0	0	0	0	0	0	220
8:00	0	1	0	36	131	63	18	1	0	0	0	0	0	250
9:00	1	4	2	25	87	35	5	0	0	0	0	0	0	159
10:00	0	0	0	5	28	16	6	2	0	0	0	0	0	57
11:00	0	0	1	2	9	16	4	2	0	0	0	0	0	34
<b>Total</b>	<b>433</b>	<b>247</b>	<b>492</b>	<b>1431</b>	<b>2264</b>	<b>1139</b>	<b>201</b>	<b>11</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>6227</b>

Percentile	15th	50th	85th	95th
Speed	23.5	31	35.9	39
Mean Speed (Average)	29.6			
10 MPH Pace Speed	25-34			
Number in Pace	3660			
Percent in Pace	58.8%			
Number > 30 MPH	3624			
Percent > 30 MPH	58.2%			

Location : Farm Street in front of  
 Location : High School  
 City/State: Wakefield, MA  
 Direction: NB,

40684001

11/17/2021	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	Total
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	
12:00 AM	0	0	0	2	7	6	2	0	0	1	0	0	0	18
1:00	0	0	0	0	3	1	1	1	0	0	0	0	0	6
2:00	1	0	0	0	3	0	1	0	0	0	0	0	0	5
3:00	0	0	0	2	3	3	1	0	0	0	0	0	0	9
4:00	0	0	0	0	7	5	2	0	0	1	0	0	0	15
5:00	0	1	0	7	15	25	11	1	1	0	0	0	0	61
6:00	7	3	6	22	55	53	10	3	0	1	0	0	0	160
7:00	20	24	60	114	108	35	1	0	0	1	2	1	0	366
8:00	79	42	77	122	77	29	2	0	0	0	0	0	0	428
9:00	1	6	22	83	146	41	4	0	0	0	0	0	1	304
10:00	2	5	31	91	127	59	9	0	0	0	0	0	0	324
11:00	7	54	90	126	69	21	2	0	0	0	0	0	0	369
12:00 PM	22	36	51	104	90	43	3	1	0	0	0	0	0	350
1:00	6	18	64	149	122	27	4	0	0	0	0	0	0	390
2:00	56	22	88	223	173	37	4	1	0	0	0	0	0	604
3:00	10	7	29	178	352	174	16	0	0	0	0	0	0	766
4:00	5	4	41	195	336	132	12	0	0	0	0	0	0	725
5:00	2	0	29	188	293	113	13	1	0	0	0	0	0	639
6:00	1	0	3	50	161	134	19	2	0	0	0	0	0	370
7:00	3	4	7	24	111	70	11	2	1	0	0	0	0	233
8:00	2	0	1	16	66	59	13	1	0	0	0	0	0	158
9:00	0	1	2	14	40	38	9	3	1	0	0	0	0	108
10:00	0	3	2	0	19	21	6	4	1	0	0	0	1	57
11:00	0	0	0	3	17	12	9	0	0	0	0	0	0	41
<b>Total</b>	<b>224</b>	<b>230</b>	<b>603</b>	<b>1713</b>	<b>2400</b>	<b>1138</b>	<b>165</b>	<b>20</b>	<b>4</b>	<b>4</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>6506</b>

Percentile	15th	50th	85th	95th
Speed	24.8	31	35.9	39
Mean Speed (Average)	30.2			
10 MPH Pace Speed	25-34			
Number in Pace	4077			
Percent in Pace	62.7%			
Number > 30 MPH	3736			
Percent > 30 MPH	57.4%			

Location : Farm Street in front of  
 Location : High School  
 City/State: Wakefield, MA  
 Direction: NB,

40684001

11/18/2021	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	Total
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	
12:00 AM	0	0	0	4	4	6	2	0	0	0	0	0	0	16
1:00	0	0	1	1	4	3	1	0	0	0	0	0	0	10
2:00	0	0	0	0	0	2	0	0	0	0	0	0	0	2
3:00	0	0	0	1	2	4	1	0	0	0	0	0	0	8
4:00	0	0	0	3	6	7	2	4	0	0	0	0	0	22
5:00	0	0	0	7	26	30	4	0	0	0	0	0	0	67
6:00	5	12	3	12	61	53	15	2	2	0	1	0	1	167
7:00	41	38	99	131	73	9	3	1	0	0	1	0	0	396
8:00	72	63	66	90	83	26	5	0	1	0	0	0	0	406
9:00	3	3	25	63	137	59	3	0	0	0	1	0	2	296
10:00	2	3	14	114	138	51	9	0	0	0	0	2	1	334
11:00	1	8	38	74	142	76	5	1	0	0	0	1	0	346
12:00 PM	0	2	46	121	133	58	6	0	0	0	0	0	0	366
1:00	5	9	78	146	101	30	3	0	0	0	0	0	0	372
2:00	167	139	180	103	20	6	1	0	0	0	0	1	0	617
3:00	24	45	57	207	271	96	8	4	0	0	0	0	0	712
4:00	0	2	23	194	331	129	20	2	0	0	0	0	0	701
5:00	0	6	10	110	312	118	5	1	0	0	0	0	1	563
6:00	3	0	16	61	174	128	24	1	0	0	0	0	0	407
7:00	0	4	0	31	107	72	10	0	0	0	0	0	0	224
8:00	0	4	1	24	116	75	22	2	0	0	0	0	0	244
9:00	0	2	9	16	53	45	7	0	0	0	0	0	0	132
10:00	1	0	0	7	22	20	10	0	0	0	0	0	0	60
11:00	0	0	0	4	15	15	5	1	0	0	0	0	1	41
<b>Total</b>	<b>324</b>	<b>340</b>	<b>666</b>	<b>1524</b>	<b>2331</b>	<b>1118</b>	<b>171</b>	<b>19</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>4</b>	<b>6</b>	<b>6509</b>

Percentile	15th	50th	85th	95th
Speed	22.9	30.3	35.9	38.4
Mean Speed (Average)	29.7			
10 MPH Pace Speed	25-34			
Number in Pace	3822			
Percent in Pace	58.7%			
Number > 30 MPH	3655			
Percent > 30 MPH	56.2%			

<b>Grand Total</b>	<b>981</b>	<b>817</b>	<b>1761</b>	<b>4668</b>	<b>6995</b>	<b>3395</b>	<b>537</b>	<b>50</b>	<b>12</b>	<b>5</b>	<b>6</b>	<b>5</b>	<b>10</b>	<b>19242</b>
Stats	Percentile	15th	50th	85th	95th									
	Speed	24.1	31	35.9	39									
	Mean Speed (Average)	29.8												
	10 MPH Pace Speed	25-34												
	Number in Pace	11558												
	Percent in Pace	60.1%												
	Number > 30 MPH	11015												
	Percent > 30 MPH	57.2%												

Location : Farm Street in front of  
 Location : High School  
 City/State: Wakefield, MA  
 Direction: Combined

40684001

11/16/2021	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	Total
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	
12:00 AM	0	0	1	5	12	8	2	0	0	0	0	0	0	28
1:00	0	0	0	1	5	3	0	0	0	0	0	0	0	9
2:00	0	0	0	1	2	2	1	0	0	0	0	0	0	6
3:00	0	0	0	4	4	7	1	0	2	0	0	0	0	18
4:00	0	0	0	2	15	5	1	2	1	0	0	0	0	26
5:00	2	0	2	13	33	41	15	1	0	0	0	0	0	107
6:00	14	8	9	66	198	133	24	3	1	0	0	0	0	456
7:00	108	107	236	411	229	56	9	0	0	1	0	0	1	1158
8:00	121	114	191	336	197	48	4	1	0	0	1	0	0	1013
9:00	2	5	36	148	292	93	17	0	0	0	0	0	0	593
10:00	1	0	27	128	257	113	15	1	0	0	0	0	0	542
11:00	5	2	32	163	299	135	15	1	0	0	0	0	0	652
12:00 PM	6	2	51	229	306	93	16	0	0	0	0	0	0	703
1:00	11	24	112	283	202	44	3	0	0	0	0	0	0	679
2:00	267	226	325	237	67	8	0	0	0	0	0	0	0	1130
3:00	25	19	129	396	489	161	11	0	0	0	0	0	0	1230
4:00	0	9	61	353	497	206	29	0	0	0	0	0	1	1156
5:00	2	2	39	424	488	133	13	1	1	0	0	0	0	1103
6:00	1	4	18	171	363	145	27	1	0	0	0	0	0	730
7:00	1	3	16	105	203	98	16	0	0	0	0	0	0	442
8:00	0	1	2	90	215	85	20	2	0	0	0	0	0	415
9:00	1	4	4	61	154	51	10	0	0	0	0	0	0	285
10:00	0	0	5	17	46	25	9	2	0	0	0	0	0	104
11:00	0	0	2	7	20	20	4	2	0	0	0	0	0	55
<b>Total</b>	<b>567</b>	<b>530</b>	<b>1298</b>	<b>3651</b>	<b>4593</b>	<b>1713</b>	<b>262</b>	<b>17</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>12640</b>

Percentile	15th	50th	85th	95th
Speed	24.1	30.3	35.3	37.8
Mean Speed (Average)	29.3			
10 MPH Pace Speed	25-34			
Number in Pace	8178			
Percent in Pace	64.7%			
Number > 30 MPH	6594			
Percent > 30 MPH	52.2%			

Location : Farm Street in front of  
 Location : High School  
 City/State: Wakefield, MA  
 Direction: Combined

40684001

11/17/2021	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	Total
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	
12:00 AM	0	0	1	9	20	9	3	0	0	1	0	0	0	43
1:00	0	0	0	1	8	1	1	1	0	0	0	0	0	12
2:00	1	0	0	0	5	1	1	0	0	0	0	0	0	8
3:00	0	0	0	2	5	4	2	0	0	0	0	0	0	13
4:00	0	0	0	2	13	12	3	0	0	1	0	0	0	31
5:00	0	1	0	16	36	45	14	2	1	0	0	0	0	115
6:00	7	3	8	89	198	114	25	3	0	1	0	0	0	448
7:00	159	84	211	320	212	56	1	0	0	1	2	1	0	1047
8:00	85	126	234	305	193	52	3	0	0	0	0	0	0	998
9:00	4	30	35	178	290	67	12	1	0	0	0	0	1	618
10:00	2	5	54	190	260	114	10	0	0	0	0	0	0	635
11:00	21	79	165	276	137	32	2	0	0	0	0	0	0	712
12:00 PM	28	101	159	224	196	62	4	1	0	0	0	0	0	775
1:00	11	29	164	300	225	43	7	0	0	0	0	0	0	779
2:00	104	52	162	411	260	50	5	1	0	0	0	0	0	1045
3:00	10	9	81	364	562	204	21	1	0	0	0	0	1	1253
4:00	5	4	97	406	530	158	15	0	0	0	0	0	0	1215
5:00	4	1	75	446	519	139	15	1	0	0	0	0	0	1200
6:00	3	0	7	184	355	155	22	2	0	0	0	0	0	728
7:00	4	5	11	103	234	98	15	2	1	0	0	0	0	473
8:00	2	0	7	50	134	80	15	1	0	0	0	0	0	289
9:00	0	1	4	41	97	56	13	5	1	0	0	0	0	218
10:00	0	3	3	18	57	31	7	4	1	0	0	0	1	125
11:00	0	0	0	4	32	23	11	0	0	0	0	0	0	70
<b>Total</b>	<b>450</b>	<b>533</b>	<b>1478</b>	<b>3939</b>	<b>4578</b>	<b>1606</b>	<b>227</b>	<b>25</b>	<b>4</b>	<b>4</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>12850</b>

Percentile	15th	50th	85th	95th
Speed	24.1	30.3	34.7	37.8
Mean Speed (Average)	29.2			
10 MPH Pace Speed	25-34			
Number in Pace	8455			
Percent in Pace	65.8%			
Number > 30 MPH	6450			
Percent > 30 MPH	50.2%			



Location : Farm Street in front of  
 Location : High School  
 City/State: Wakefield, MA  
 Direction: Combined

40684001

11/18/2021	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	Total
Time	MPH	20 MPH	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH	60 MPH	65 MPH	70 MPH	MPH	
12:00 AM	0	0	3	7	6	10	4	0	0	0	0	0	0	30
1:00	0	0	1	3	7	6	1	0	0	0	0	0	0	18
2:00	0	0	1	1	2	2	0	0	0	0	0	0	0	6
3:00	0	0	0	2	7	9	2	0	0	0	0	0	0	20
4:00	0	0	0	4	13	11	2	4	0	0	0	0	0	34
5:00	0	0	1	17	51	52	8	0	0	0	0	0	0	129
6:00	5	13	14	123	174	98	22	3	2	0	1	0	1	456
7:00	253	117	207	228	120	15	3	1	0	0	1	0	0	945
8:00	122	157	177	217	140	36	5	0	1	0	0	0	0	855
9:00	3	4	44	168	255	101	6	2	0	0	1	0	2	586
10:00	3	3	38	208	268	80	11	1	0	0	0	2	1	615
11:00	1	8	69	222	287	116	6	1	0	0	0	1	0	711
12:00 PM	0	2	68	287	269	84	7	0	0	0	0	0	0	717
1:00	6	26	157	283	223	45	6	1	0	0	0	0	0	747
2:00	248	305	379	208	47	9	3	0	0	0	0	1	0	1200
3:00	35	71	300	447	329	100	8	4	0	0	0	0	0	1294
4:00	0	2	71	426	552	174	22	2	0	0	0	0	0	1249
5:00	0	6	63	456	557	144	6	2	0	0	0	0	1	1235
6:00	3	2	52	262	360	166	26	1	0	0	0	0	0	872
7:00	0	4	7	106	222	106	13	0	0	0	0	0	0	458
8:00	0	4	1	64	198	101	26	3	0	0	0	0	0	397
9:00	0	2	10	53	115	62	10	0	0	0	0	0	0	252
10:00	1	0	1	26	55	31	10	0	0	0	0	0	0	124
11:00	0	0	0	9	30	26	11	1	0	0	0	0	1	78
<b>Total</b>	<b>680</b>	<b>726</b>	<b>1664</b>	<b>3827</b>	<b>4287</b>	<b>1584</b>	<b>218</b>	<b>26</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>4</b>	<b>6</b>	<b>13028</b>

Percentile	15th	50th	85th	95th										
Speed	22.3	29.7	34.7	37.2										
Mean Speed (Average)	28.5													
10 MPH Pace Speed	25-34													
Number in Pace	8062													
Percent in Pace	61.9%													
Number > 30 MPH	6131													
Percent > 30 MPH	47.1%													
<b>Grand Total</b>	<b>1697</b>	<b>1789</b>	<b>4440</b>	<b>11417</b>	<b>13458</b>	<b>4903</b>	<b>707</b>	<b>68</b>	<b>12</b>	<b>5</b>	<b>6</b>	<b>5</b>	<b>11</b>	<b>38518</b>
Stats	Percentile	15th	50th	85th	95th									
Speed	23.5	29.7	34.7	37.8										
Mean Speed (Average)	29.0													
10 MPH Pace Speed	25-34													
Number in Pace	24695													
Percent in Pace	64.1%													
Number > 30 MPH	19175													
Percent > 30 MPH	49.8%													

Location : Farm Street in front of  
 Location : High School  
 City/State: Wakefield, MA

40684001

11/16/2021	SB,		Hour Totals		NB,		Hour Totals		Combined Totals		
	Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		3	88			5	89				
12:15		4	73			6	77				
12:30		3	92			3	103				
12:45		3	85	13	338	1	96	15	365	28	703
1:00		2	100			2	99				
1:15		2	64			2	64				
1:30		0	93			0	77				
1:45		0	81	4	338	1	101	5	341	9	679
2:00		0	112			2	130				
2:15		0	112			1	165				
2:30		0	121			0	177				
2:45		1	166	1	511	2	147	5	619	6	1130
3:00		1	140			2	166				
3:15		1	118			2	195				
3:30		3	123			2	199				
3:45		4	99	9	480	3	190	9	750	18	1230
4:00		0	143			3	166				
4:15		3	129			1	159				
4:30		4	119			5	171				
4:45		7	118	14	509	3	151	12	647	26	1156
5:00		8	137			3	151				
5:15		7	147			14	128				
5:30		20	138			15	138				
5:45		19	145	54	567	21	119	53	536	107	1103
6:00		29	129			24	80				
6:15		53	97			37	98				
6:30		78	79			40	75				
6:45		129	94	289	399	66	78	167	331	456	730
7:00		209	89			92	81				
7:15		211	43			92	58				
7:30		194	42			99	43				
7:45		163	48	777	222	98	38	381	220	1158	442
8:00		139	53			93	30				
8:15		151	45			121	79				
8:30		217	28			86	81				
8:45		124	39	631	165	82	60	382	250	1013	415
9:00		90	35			71	85				
9:15		86	38			66	36				
9:30		58	24			65	28				
9:45		84	29	318	126	73	10	275	159	593	285
10:00		62	18			59	15				
10:15		63	13			68	20				
10:30		74	7			84	14				
10:45		71	9	270	47	61	8	272	57	542	104
11:00		58	5			69	10				
11:15		74	5			96	8				
11:30		88	5			88	11				
11:45		90	6	310	21	89	5	342	34	652	55
Total		2690	3723			1918	4309			4608	8032
Percent		41.9%	58.1%			30.8%	69.2%			36.5%	63.5%

Location : Farm Street in front of  
 Location : High School  
 City/State: Wakefield, MA

40684001

11/17/2021 Time	SB,		Hour Totals		NB,		Hour Totals		Combined Totals	
	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	6	169			6	95				
12:15	7	92			7	89				
12:30	7	86			2	87				
12:45	5	78	25	425	3	79	18	350	43	775
1:00	3	101			1	79				
1:15	1	99			1	105				
1:30	1	82			2	106				
1:45	1	107	6	389	2	100	6	390	12	779
2:00	0	101			1	107				
2:15	0	127			0	138				
2:30	2	105			2	182				
2:45	1	108	3	441	2	177	5	604	8	1045
3:00	1	142			3	172				
3:15	2	128			3	209				
3:30	0	103			1	195				
3:45	1	114	4	487	2	190	9	766	13	1253
4:00	1	126			1	179				
4:15	4	116			1	195				
4:30	5	132			5	191				
4:45	6	116	16	490	8	160	15	725	31	1215
5:00	7	130			4	163				
5:15	13	154			15	168				
5:30	18	153			12	161				
5:45	16	124	54	561	30	147	61	639	115	1200
6:00	42	113			24	120				
6:15	49	99			35	99				
6:30	61	80			39	79				
6:45	136	66	288	358	62	72	160	370	448	728
7:00	222	65			88	59				
7:15	180	53			75	60				
7:30	145	57			85	57				
7:45	134	65	681	240	118	57	366	233	1047	473
8:00	139	40			99	51				
8:15	140	33			112	36				
8:30	183	24			117	34				
8:45	108	34	570	131	100	37	428	158	998	289
9:00	81	33			78	26				
9:15	91	30			66	37				
9:30	85	26			81	22				
9:45	57	21	314	110	79	23	304	108	618	218
10:00	76	23			83	18				
10:15	78	24			78	19				
10:30	72	12			80	10				
10:45	85	9	311	68	83	10	324	57	635	125
11:00	70	10			77	15				
11:15	77	5			91	13				
11:30	91	4			112	7				
11:45	105	10	343	29	89	6	369	41	712	70
Total	2615	3729			2065	4441			4680	8170
Percent	41.2%	58.8%			31.7%	68.3%			36.4%	63.6%

Location : Farm Street in front of  
 Location : High School  
 City/State: Wakefield, MA

40684001

11/18/2021	SB,		Hour Totals		NB,		Hour Totals		Combined Totals	
	Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning
12:00	5	83			8	100				
12:15	4	97			4	78				
12:30	3	90			2	87				
12:45	2	81	14	351	2	101	16	366	30	717
1:00	3	86			5	102				
1:15	3	86			3	88				
1:30	1	103			0	89				
1:45	1	100	8	375	2	93	10	372	18	747
2:00	0	110			0	111				
2:15	1	135			2	174				
2:30	0	142			0	169				
2:45	3	196	4	583	0	163	2	617	6	1200
3:00	3	166			0	173				
3:15	3	135			4	186				
3:30	5	149			1	189				
3:45	1	132	12	582	3	164	8	712	20	1294
4:00	3	134			5	148				
4:15	1	133			2	180				
4:30	2	131			7	177				
4:45	6	150	12	548	8	196	22	701	34	1249
5:00	7	161			9	126				
5:15	9	140			21	141				
5:30	19	184			17	157				
5:45	27	187	62	672	20	139	67	563	129	1235
6:00	33	152			30	125				
6:15	43	119			31	125				
6:30	75	98			47	102				
6:45	138	96	289	465	59	55	167	407	456	872
7:00	214	66			94	67				
7:15	150	52			94	68				
7:30	93	66			88	32				
7:45	92	50	549	234	120	57	396	224	945	458
8:00	94	32			107	55				
8:15	113	45			110	78				
8:30	163	38			103	53				
8:45	79	38	449	153	86	58	406	244	855	397
9:00	80	29			77	59				
9:15	68	35			69	26				
9:30	86	24			78	29				
9:45	56	32	290	120	72	18	296	132	586	252
10:00	61	19			67	23				
10:15	69	21			88	8				
10:30	72	14			83	20				
10:45	79	10	281	64	96	9	334	60	615	124
11:00	82	15			76	15				
11:15	82	13			90	15				
11:30	102	8			94	4				
11:45	99	1	365	37	86	7	346	41	711	78
Total	2335	4184			2070	4439			4405	8623
Percent	35.8%	64.2%			31.8%	68.2%			33.8%	66.2%
Grand Total	7640	11636			6053	13189			13693	24825
Percent	39.6%	60.4%			31.5%	68.5%			35.5%	64.5%
ADT		ADT: 12,839		AADT: 12,839						



Location : Hemlock Road  
 Location : East of Landrigan Field  
 City/State: Wakefield, MA  
 Direction: EB,

40684002

11/16/2021	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	1	0	0	1	0	0	2
6:00	0	0	0	0	0	0	2	1	13	15	14	8	0	0	53
7:00	0	0	74	22	30	24	49	83	97	81	18	3	1	0	482
8:00	0	0	1	0	0	2	1	5	20	7	11	4	0	2	53
9:00	0	0	1	0	0	0	4	11	11	4	5	1	1	0	38
10:00	0	0	0	0	1	2	2	5	14	7	3	0	0	0	34
11:00	0	0	0	0	0	0	6	10	12	10	2	0	0	0	40
12:00 PM	0	0	0	0	0	0	4	9	10	6	0	2	0	0	31
1:00	0	0	0	1	0	1	7	13	16	10	5	0	0	0	53
2:00	0	0	1	1	7	6	13	20	35	17	6	1	0	0	107
3:00	0	0	1	1	1	1	7	11	20	24	15	6	0	0	87
4:00	0	0	0	0	0	0	2	2	7	6	4	5	1	0	27
5:00	0	0	2	0	2	3	8	25	62	69	30	2	2	0	205
6:00	0	0	0	0	0	0	0	4	14	36	29	6	6	1	96
7:00	0	0	0	0	0	0	1	4	5	9	1	0	1	0	21
8:00	0	0	0	0	1	0	2	1	7	2	0	0	0	0	13
9:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
10:00	0	0	0	0	0	0	0	3	1	1	0	0	0	0	5
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>80</b>	<b>25</b>	<b>42</b>	<b>39</b>	<b>108</b>	<b>207</b>	<b>346</b>	<b>304</b>	<b>143</b>	<b>39</b>	<b>12</b>	<b>3</b>	<b>1348</b>

Percentile 15th 50th 85th 95th  
 Speed 18.5 25.4 29.7 32.2  
 Mean Speed (Average) 24.6  
 10 MPH Pace Speed 21-30  
 Number in Pace 903  
 Percent in Pace 67.0%  
 Number > 21 MPH 1054  
 Percent > 21 MPH 78.2%



Location : Hemlock Road  
 Location : East of Landrigan Field  
 City/State: Wakefield, MA  
 Direction: EB,

40684002

11/17/2021	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	1	1	0	1	0	0	0	3
6:00	0	0	1	0	0	0	1	1	13	14	12	5	1	0	48
7:00	0	0	133	43	13	8	13	59	110	90	30	2	1	0	502
8:00	0	0	0	0	0	0	2	4	13	12	12	0	1	0	44
9:00	0	0	0	0	0	0	3	10	18	11	2	1	1	0	46
10:00	0	0	1	0	0	3	4	10	14	9	6	0	0	0	47
11:00	0	0	0	0	0	0	2	8	16	5	0	0	0	0	31
12:00 PM	0	0	0	0	0	1	1	11	9	8	2	3	0	0	35
1:00	0	0	2	0	4	3	9	13	18	6	2	1	0	0	58
2:00	0	0	0	1	3	5	11	30	30	18	6	2	1	0	107
3:00	0	0	1	3	0	0	5	10	13	13	15	3	2	0	65
4:00	0	0	0	0	0	0	0	0	9	3	8	1	0	0	21
5:00	0	0	1	0	5	2	2	11	14	19	11	2	0	0	67
6:00	0	0	0	0	0	0	1	6	21	14	7	1	0	0	50
7:00	0	0	0	0	0	0	0	2	4	3	0	0	2	0	11
8:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
9:00	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	139	47	25	22	54	176	308	225	114	21	9	0	1140

Percentile 15th 50th 85th 95th  
 Speed 9.8 24.8 29.7 32.2  
 Mean Speed (Average) 23.0  
 10 MPH Pace Speed 21-30  
 Number in Pace 745  
 Percent in Pace 65.4%  
 Number > 21 MPH 853  
 Percent > 21 MPH 74.8%

Location : Hemlock Road  
 Location : East of Landrigan Field  
 City/State: Wakefield, MA  
 Direction: EB,

40684002

11/18/2021	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	2
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	1	2	1	1	0	0	0	5
6:00	0	0	1	0	0	0	0	7	11	22	11	2	2	1	57
7:00	0	0	141	32	13	31	51	75	86	45	17	6	2	0	499
8:00	0	0	0	0	0	0	8	13	10	13	7	0	1	0	52
9:00	0	0	0	0	0	1	7	15	14	8	10	1	0	0	56
10:00	0	0	0	0	3	0	8	14	12	9	1	1	0	0	48
11:00	0	0	1	0	0	0	4	10	18	5	3	0	0	0	41
12:00 PM	0	0	0	0	2	3	4	14	15	12	1	0	0	0	51
1:00	0	0	1	1	3	5	16	20	22	8	4	1	0	0	81
2:00	0	0	4	0	5	1	12	28	48	38	5	1	0	0	142
3:00	0	0	2	0	3	0	1	8	32	24	7	0	0	1	78
4:00	0	0	0	0	0	0	1	3	10	8	9	2	0	1	34
5:00	0	0	3	3	0	0	5	26	70	65	32	10	1	0	215
6:00	0	0	0	0	0	0	3	7	33	42	27	8	3	1	124
7:00	0	0	0	0	0	0	0	3	4	6	5	2	2	0	22
8:00	0	0	0	0	0	0	0	1	1	3	1	0	0	0	6
9:00	0	0	0	0	0	0	0	0	1	1	1	0	0	0	3
10:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
11:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Total	0	0	153	36	29	41	120	246	392	311	142	34	11	4	1519

Percentile 15th 50th 85th 95th  
 Speed 16.1 24.8 29.7 32.2  
 Mean Speed (Average) 23.7  
 10 MPH Pace Speed 21-30  
 Number in Pace 996  
 Percent in Pace 65.6%  
 Number > 21 MPH 1140  
 Percent > 21 MPH 75.0%

Grand Total	0	0	372	108	96	102	282	629	1046	840	399	94	32	7	4007
Stats	Percentile		15th	50th	85th	95th									
	Speed		16.1	24.8	29.7	32.2									
	Mean Speed (Average)		23.8												
	10 MPH Pace Speed		21-30												
	Number in Pace		2644												
	Percent in Pace		66.0%												
	Number > 21 MPH		3047												
	Percent > 21 MPH		76.0%												

Location : Hemlock Road  
 Location : East of Landrigan Field  
 City/State: Wakefield, MA  
 Direction: WB,

40684002

11/16/2021	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
6:00	0	0	0	0	0	0	0	1	0	0	1	0	0	0	2
7:00	0	0	1	7	11	14	48	67	57	19	5	0	1	0	230
8:00	0	0	0	0	0	0	3	4	14	5	2	0	1	0	29
9:00	0	0	0	0	3	0	1	5	15	5	4	0	0	0	33
10:00	0	0	0	0	1	0	3	7	19	6	1	0	0	1	38
11:00	0	0	0	0	2	3	2	9	8	5	2	1	0	0	32
12:00 PM	0	0	0	0	1	0	6	4	14	7	1	1	0	0	34
1:00	0	0	0	0	0	0	3	9	8	5	4	0	0	0	29
2:00	0	0	50	43	21	28	46	40	37	19	6	1	0	0	291
3:00	0	0	1	1	0	0	11	34	49	42	14	3	3	1	159
4:00	0	0	0	0	0	0	4	6	18	12	6	0	0	0	46
5:00	0	0	0	0	1	0	2	12	15	14	3	1	0	0	48
6:00	0	0	0	0	0	0	1	8	14	14	3	1	0	1	42
7:00	0	0	0	0	1	3	6	4	9	6	3	0	0	0	32
8:00	0	0	0	0	1	9	32	108	95	21	10	0	2	0	278
9:00	0	0	0	0	0	0	3	1	1	1	1	0	0	0	7
10:00	0	0	0	0	0	0	3	0	0	2	0	0	0	0	5
11:00	0	0	0	0	0	0	0	0	0	0	2	0	1	0	3
<b>Total</b>	<b>0</b>	<b>0</b>	<b>52</b>	<b>52</b>	<b>42</b>	<b>57</b>	<b>174</b>	<b>319</b>	<b>373</b>	<b>183</b>	<b>68</b>	<b>8</b>	<b>8</b>	<b>3</b>	<b>1339</b>

Percentile 15th 50th 85th 95th  
 Speed 17.3 23.5 27.9 30.3  
 Mean Speed (Average) 23.1  
 10 MPH Pace Speed 20-29  
 Number in Pace 933  
 Percent in Pace 69.7%  
 Number > 21 MPH 962  
 Percent > 21 MPH 71.8%

Location : Hemlock Road  
 Location : East of Landrigan Field  
 City/State: Wakefield, MA  
 Direction: WB,

40684002

11/17/2021	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	1	0	1	0	0	0	0	1	3
6:00	0	0	0	1	0	0	0	0	2	0	0	0	0	0	3
7:00	0	0	0	2	7	22	44	57	61	32	12	1	0	0	238
8:00	0	0	0	0	0	0	3	11	9	8	1	0	1	2	35
9:00	0	0	1	1	1	0	7	7	8	5	2	0	0	0	32
10:00	0	0	0	0	2	7	8	6	7	5	1	0	0	0	36
11:00	0	0	1	0	2	1	11	13	13	6	3	0	0	1	51
12:00 PM	0	0	1	0	0	2	7	7	8	9	2	0	0	0	36
1:00	0	0	0	0	0	0	6	8	15	12	1	0	0	0	42
2:00	0	0	47	27	42	28	24	27	54	33	5	3	0	0	290
3:00	0	0	1	2	0	3	8	28	63	39	16	4	3	0	167
4:00	0	0	0	0	0	0	1	6	22	12	4	4	0	1	50
5:00	0	0	0	0	0	1	1	10	10	10	5	0	0	0	37
6:00	0	0	0	0	2	0	3	2	5	3	4	3	0	0	22
7:00	0	0	0	0	3	0	2	18	12	9	2	0	0	0	46
8:00	0	0	0	0	0	1	4	14	4	11	4	0	1	1	40
9:00	0	0	0	0	0	0	1	3	5	4	1	0	0	0	14
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3
<b>Total</b>	<b>0</b>	<b>0</b>	<b>51</b>	<b>33</b>	<b>59</b>	<b>65</b>	<b>131</b>	<b>219</b>	<b>299</b>	<b>198</b>	<b>66</b>	<b>15</b>	<b>5</b>	<b>6</b>	<b>1147</b>

Percentile 15th 50th 85th 95th  
 Speed 16.7 24.1 28.5 31  
 Mean Speed (Average) 23.6  
 10 MPH Pace Speed 20-29  
 Number in Pace 757  
 Percent in Pace 66.0%  
 Number > 21 MPH 808  
 Percent > 21 MPH 70.4%

Location : Hemlock Road  
 Location : East of Landrigan Field  
 City/State: Wakefield, MA  
 Direction: WB,

40684002

11/18/2021	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
6:00	0	0	0	0	0	0	0	1	1	1	0	0	0	0	3
7:00	0	0	1	11	15	21	60	50	58	19	5	1	0	0	241
8:00	0	0	0	0	1	0	6	10	9	6	4	0	0	0	36
9:00	0	0	0	0	0	1	5	10	14	9	2	1	0	0	42
10:00	0	0	0	0	1	1	8	11	15	2	2	0	0	0	40
11:00	0	0	1	0	2	3	9	12	24	6	1	0	0	0	58
12:00 PM	0	0	0	1	1	2	13	14	14	6	1	0	1	1	54
1:00	0	0	0	1	2	10	7	12	18	7	4	2	0	0	63
2:00	0	0	50	22	30	31	32	56	57	14	6	2	1	1	302
3:00	0	0	0	0	0	1	15	32	57	39	13	2	2	1	162
4:00	0	0	0	1	2	3	10	11	30	10	4	0	0	0	71
5:00	0	0	0	1	0	1	3	10	8	9	5	2	0	0	39
6:00	0	0	0	0	0	0	4	11	11	9	1	0	1	0	37
7:00	0	0	0	0	1	0	7	10	13	8	4	0	3	1	47
8:00	0	0	0	0	1	2	13	38	100	69	21	9	1	2	256
9:00	0	0	0	0	0	0	4	7	11	6	5	1	0	0	34
10:00	0	0	0	0	0	1	0	0	0	0	2	0	0	0	3
11:00	0	0	0	0	0	0	0	0	1	0	3	0	0	0	4
Total	0	0	52	37	57	77	196	296	444	220	83	20	9	6	1497

Percentile	15th	50th	85th	95th
Speed	17.9	24.1	27.9	31
Mean Speed (Average)	23.7			
10 MPH Pace Speed	20-29			
Number in Pace	1025			
Percent in Pace	68.5%			
Number > 21 MPH	1078			
Percent > 21 MPH	72.0%			

Grand Total	0	0	155	122	158	199	501	834	1116	601	217	43	22	15	3983
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Stats	Percentile	15th	50th	85th	95th
	Speed	17.3	24.1	27.9	31
Mean Speed (Average)	23.5				
10 MPH Pace Speed	20-29				
Number in Pace	2715				
Percent in Pace	68.2%				
Number > 21 MPH	2848				
Percent > 21 MPH	71.5%				

Location : Hemlock Road  
 Location : East of Landrigan Field  
 City/State: Wakefield, MA  
 Direction: Combined

40684002

11/16/2021	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	1	0	0	0	0	1	0	0	1	0	0	3
6:00	0	0	0	0	0	0	2	2	13	15	15	8	0	0	55
7:00	0	0	75	29	41	38	97	150	154	100	23	3	2	0	712
8:00	0	0	1	0	0	2	4	9	34	12	13	4	1	2	82
9:00	0	0	1	0	3	0	5	16	26	9	9	1	1	0	71
10:00	0	0	0	0	2	2	5	12	33	13	4	0	0	1	72
11:00	0	0	0	0	2	3	8	19	20	15	4	1	0	0	72
12:00 PM	0	0	0	0	1	0	10	13	24	13	1	3	0	0	65
1:00	0	0	0	1	0	1	10	22	24	15	9	0	0	0	82
2:00	0	0	51	44	28	34	59	60	72	36	12	2	0	0	398
3:00	0	0	2	2	1	1	18	45	69	66	29	9	3	1	246
4:00	0	0	0	0	0	0	6	8	25	18	10	5	1	0	73
5:00	0	0	2	0	3	3	10	37	77	83	33	3	2	0	253
6:00	0	0	0	0	0	0	1	12	28	50	32	7	6	2	138
7:00	0	0	0	0	1	3	7	8	14	15	4	0	1	0	53
8:00	0	0	0	0	2	9	34	109	102	23	10	0	2	0	291
9:00	0	0	0	0	0	0	3	1	2	1	1	0	0	0	8
10:00	0	0	0	0	0	0	3	3	1	3	0	0	0	0	10
11:00	0	0	0	0	0	0	0	0	0	0	2	0	1	0	3
Total	0	0	132	77	84	96	282	526	719	487	211	47	20	6	2687

Percentile 15th 50th 85th 95th  
 Speed 17.9 24.1 29.1 31.6  
 Mean Speed (Average) 23.9  
 10 MPH Pace Speed 20-29  
 Number in Pace 1819  
 Percent in Pace 67.7%  
 Number > 21 MPH 2016  
 Percent > 21 MPH 75.0%

Location : Hemlock Road  
 Location : East of Landrigan Field  
 City/State: Wakefield, MA  
 Direction: Combined

40684002

11/17/2021	0 - 3	> 3 - 6	> 6 - 9	> 9 - 12	> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39	Total
Time	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	1	1	2	0	1	0	0	1	6
6:00	0	0	1	1	0	0	1	1	15	14	12	5	1	0	51
7:00	0	0	133	45	20	30	57	116	171	122	42	3	1	0	740
8:00	0	0	0	0	0	0	5	15	22	20	13	0	2	2	79
9:00	0	0	1	1	1	0	10	17	26	16	4	1	1	0	78
10:00	0	0	1	0	2	10	12	16	21	14	7	0	0	0	83
11:00	0	0	1	0	2	1	13	21	29	11	3	0	0	1	82
12:00 PM	0	0	1	0	0	3	8	18	17	17	4	3	0	0	71
1:00	0	0	2	0	4	3	15	21	33	18	3	1	0	0	100
2:00	0	0	47	28	45	33	35	57	84	51	11	5	1	0	397
3:00	0	0	2	5	0	3	13	38	76	52	31	7	5	0	232
4:00	0	0	0	0	0	0	1	6	31	15	12	5	0	1	71
5:00	0	0	1	0	5	3	3	21	24	29	16	2	0	0	104
6:00	0	0	0	0	2	0	4	8	26	17	11	4	0	0	72
7:00	0	0	0	0	3	0	2	20	16	12	2	0	2	0	57
8:00	0	0	0	0	0	1	4	14	5	11	4	0	1	1	41
9:00	0	0	0	0	0	0	1	3	7	4	1	0	0	0	16
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3
<b>Total</b>	<b>0</b>	<b>0</b>	<b>190</b>	<b>80</b>	<b>84</b>	<b>87</b>	<b>185</b>	<b>395</b>	<b>607</b>	<b>423</b>	<b>180</b>	<b>36</b>	<b>14</b>	<b>6</b>	<b>2287</b>

Percentile	15th	50th	85th	95th
Speed	14.8	24.1	29.1	31.6
Mean Speed (Average)	23.3			
10 MPH Pace Speed	21-30			
Number in Pace	1485			
Percent in Pace	64.9%			
Number > 21 MPH	1661			
Percent > 21 MPH	72.6%			







Location : Hemlock Road  
 Location : East of Landrigan Field  
 City/State: Wakefield, MA

40684002

11/16/2021 Time	EB,		Hour Totals		WB,		Hour Totals		Combined Totals	
	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	0	7			0	6				
12:15	0	5			0	7				
12:30	0	10			0	14				
12:45	0	9	0	31	0	7	0	34	0	65
1:00	0	5			0	10				
1:15	0	10			0	6				
1:30	0	7			0	6				
1:45	0	31	0	53	0	7	0	29	0	82
2:00	0	26			0	17				
2:15	0	34			0	18				
2:30	0	32			0	164				
2:45	0	15	0	107	0	92	0	291	0	398
3:00	0	18			0	45				
3:15	0	28			0	40				
3:30	0	28			0	47				
3:45	0	13	0	87	0	27	0	159	0	246
4:00	0	8			0	18				
4:15	0	7			0	13				
4:30	0	6			0	9				
4:45	0	6	0	27	0	6	0	46	0	73
5:00	0	16			0	8				
5:15	0	25			1	5				
5:30	1	68			0	27				
5:45	1	96	2	205	0	8	1	48	3	253
6:00	4	63			0	9				
6:15	5	18			0	15				
6:30	14	8			0	9				
6:45	30	7	53	96	2	9	2	42	55	138
7:00	56	11			3	18				
7:15	109	5			39	7				
7:30	202	4			94	2				
7:45	115	1	482	21	94	5	230	32	712	53
8:00	21	2			8	10				
8:15	12	7			4	111				
8:30	8	3			10	123				
8:45	12	1	53	13	7	34	29	278	82	291
9:00	11	0			4	4				
9:15	4	1			8	3				
9:30	6	0			8	0				
9:45	17	0	38	1	13	0	33	7	71	8
10:00	5	0			10	0				
10:15	8	3			12	0				
10:30	8	0			9	1				
10:45	13	2	34	5	7	4	38	5	72	10
11:00	7	0			7	3				
11:15	12	0			9	0				
11:30	10	0			9	0				
11:45	11	0	40	0	7	0	32	3	72	3
Total	702	646			365	974			1067	1620
Percent	52.1%	47.9%			27.3%	72.7%			39.7%	60.3%

Location : Hemlock Road  
 Location : East of Landrigan Field  
 City/State: Wakefield, MA

40684002

11/17/2021 Time	EB,		Hour Totals		WB,		Hour Totals		Combined Totals	
	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	0	9			0	11				
12:15	0	7			0	12				
12:30	0	10			0	8				
12:45	0	9	0	35	0	5	0	36	0	71
1:00	0	10			0	14				
1:15	0	6			0	5				
1:30	1	13			1	11				
1:45	0	29	1	58	0	12	1	42	2	100
2:00	0	29			0	13				
2:15	0	35			0	16				
2:30	0	21			0	157				
2:45	0	22	0	107	0	104	0	290	0	397
3:00	0	20			0	61				
3:15	1	23			1	32				
3:30	0	18			0	50				
3:45	0	4	1	65	0	24	1	167	2	232
4:00	0	12			0	18				
4:15	0	3			0	12				
4:30	0	3			0	15				
4:45	0	3	0	21	0	5	0	50	0	71
5:00	2	7			3	7				
5:15	0	14			0	3				
5:30	1	20			0	8				
5:45	0	26	3	67	0	19	3	37	6	104
6:00	3	17			0	5				
6:15	3	9			1	9				
6:30	16	9			0	2				
6:45	26	15	48	50	2	6	3	22	51	72
7:00	67	7			8	31				
7:15	107	3			37	5				
7:30	198	0			79	2				
7:45	130	1	502	11	114	8	238	46	740	57
8:00	17	0			9	9				
8:15	10	0			11	1				
8:30	11	0			11	19				
8:45	6	1	44	1	4	11	35	40	79	41
9:00	15	2			11	11				
9:15	12	0			4	3				
9:30	9	0			9	0				
9:45	10	0	46	2	8	0	32	14	78	16
10:00	18	0			6	0				
10:15	10	0			11	0				
10:30	11	0			8	0				
10:45	8	0	47	0	11	0	36	0	83	0
11:00	10	0			12	3				
11:15	9	0			11	0				
11:30	7	0			15	0				
11:45	5	0	31	0	13	0	51	3	82	3
Total	723	417			400	747			1123	1164
Percent	63.4%	36.6%			34.9%	65.1%			49.1%	50.9%

Location : Hemlock Road  
 Location : East of Landrigan Field  
 City/State: Wakefield, MA

40684002

11/18/2021	EB,		Hour Totals		WB,		Hour Totals		Combined Totals		
	Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		1	15			1	6				
12:15		1	16			1	19				
12:30		0	11			0	18				
12:45		0	9	2	51	0	11	2	54	4	105
1:00		0	15			0	10				
1:15		0	20			0	18				
1:30		0	19			0	17				
1:45		0	27	0	81	0	18	0	63	0	144
2:00		0	27			0	20				
2:15		0	45			0	20				
2:30		0	39			0	161				
2:45		0	31	0	142	0	101	0	302	0	444
3:00		1	16			2	56				
3:15		0	22			0	30				
3:30		0	25			0	47				
3:45		0	15	1	78	0	29	2	162	3	240
4:00		0	12			0	16				
4:15		0	7			0	26				
4:30		0	10			0	10				
4:45		0	5	0	34	0	19	0	71	0	105
5:00		0	13			0	2				
5:15		0	36			0	9				
5:30		2	75			1	5				
5:45		3	91	5	215	0	23	1	39	6	254
6:00		6	90			0	18				
6:15		10	19			0	12				
6:30		13	6			1	3				
6:45		28	9	57	124	2	4	3	37	60	161
7:00		65	5			8	18				
7:15		113	13			40	3				
7:30		183	3			82	11				
7:45		138	1	499	22	111	15	241	47	740	69
8:00		15	2			12	77				
8:15		11	0			9	96				
8:30		18	3			7	50				
8:45		8	1	52	6	8	33	36	256	88	262
9:00		13	2			11	25				
9:15		18	0			16	5				
9:30		14	0			1	3				
9:45		11	1	56	3	14	1	42	34	98	37
10:00		12	1			6	3				
10:15		8	0			16	0				
10:30		13	0			12	0				
10:45		15	0	48	1	6	0	40	3	88	4
11:00		14	0			19	3				
11:15		13	0			15	0				
11:30		7	1			11	0				
11:45		7	0	41	1	13	1	58	4	99	5
Total		761	758			425	1072			1186	1830
Percent		50.1%	49.9%			28.4%	71.6%			39.3%	60.7%
Grand Total		2186	1821			1190	2793			3376	4614
Percent		54.6%	45.4%			29.9%	70.1%			42.3%	57.7%
ADT			ADT: 2,663		AADT: 2,663						

# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Water Street  
 City/State : Wakefield, MA  
 Weather : Clear

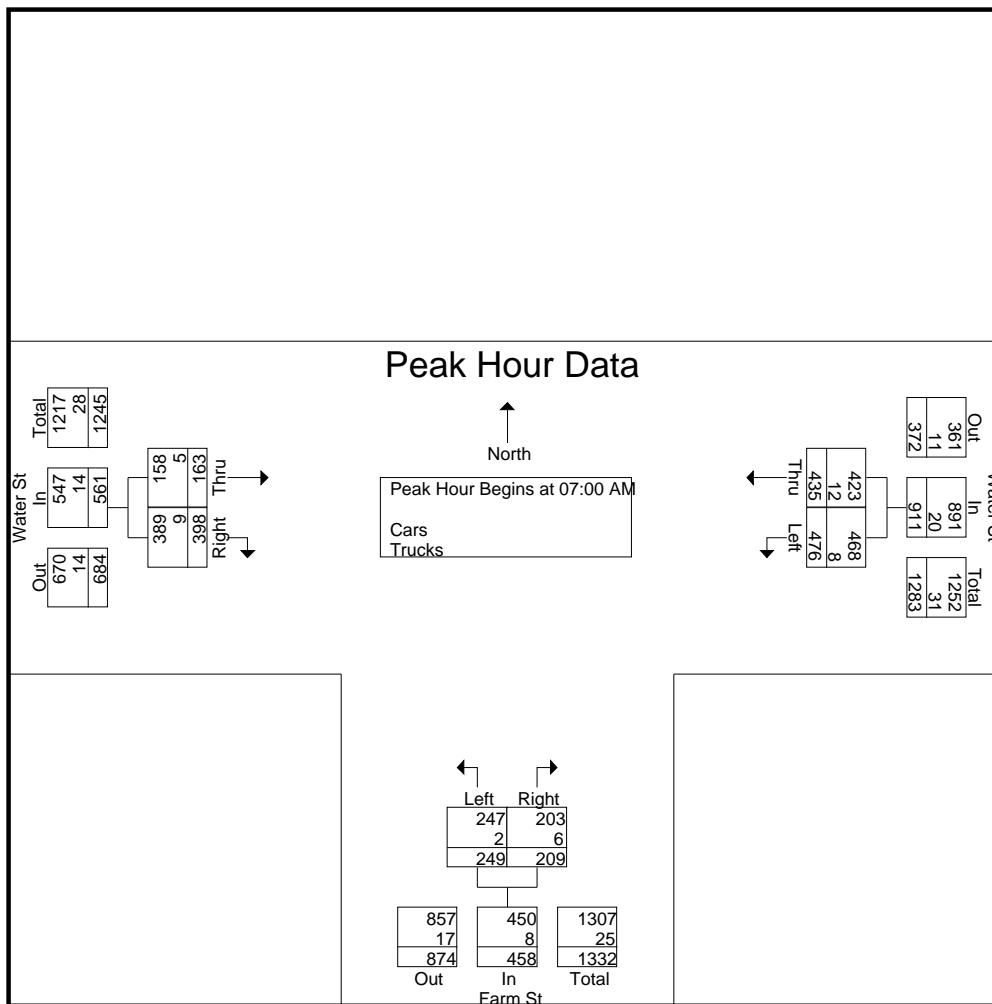
File Name : 40684001  
 Site Code : 40684001  
 Start Date : 11/16/2021  
 Page No : 1

### Groups Printed- Cars - Trucks

Start Time	Water St From East		Farm St From South			Water St From West			Int. Total
	Left	Thru	Left	Right	Thru	Right			
07:00 AM	106	92	40	42	30	107	417		
07:15 AM	121	142	119	46	32	157	617		
07:30 AM	121	76	49	64	51	90	451		
07:45 AM	128	125	41	57	50	44	445		
<b>Total</b>	<b>476</b>	<b>435</b>	<b>249</b>	<b>209</b>	<b>163</b>	<b>398</b>	<b>1930</b>		
08:00 AM	103	78	24	59	26	32	322		
08:15 AM	113	125	37	63	23	46	407		
08:30 AM	110	105	72	84	34	45	450		
08:45 AM	71	88	37	50	39	42	327		
<b>Total</b>	<b>397</b>	<b>396</b>	<b>170</b>	<b>256</b>	<b>122</b>	<b>165</b>	<b>1506</b>		
<b>Grand Total</b>	<b>873</b>	<b>831</b>	<b>419</b>	<b>465</b>	<b>285</b>	<b>563</b>	<b>3436</b>		
Apprch %	51.2	48.8	47.4	52.6	33.6	66.4			
Total %	25.4	24.2	12.2	13.5	8.3	16.4			
Cars	864	816	413	455	277	551	3376		
% Cars	99	98.2	98.6	97.8	97.2	97.9	98.3		
Trucks	9	15	6	10	8	12	60		
% Trucks	1	1.8	1.4	2.2	2.8	2.1	1.7		

Start Time	Water St From East			Farm St From South			Water St From West			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. 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	106	92	198	40	42	82	30	107	137	417
07:15 AM	121	<b>142</b>	<b>263</b>	<b>119</b>	46	<b>165</b>	32	<b>157</b>	<b>189</b>	<b>617</b>
07:30 AM	121	76	197	49	<b>64</b>	113	<b>51</b>	90	141	451
07:45 AM	<b>128</b>	125	253	41	57	98	50	44	94	445
Total Volume	476	435	911	249	209	458	163	398	561	1930
% App. Total	52.3	47.7		54.4	45.6		29.1	70.9		
PHF	.930	.766	.866	.523	.816	.694	.799	.634	.742	.782
Cars	468	423	891	247	203	450	158	389	547	1888
% Cars	98.3	97.2	97.8	99.2	97.1	98.3	96.9	97.7	97.5	97.8
Trucks	8	12	20	2	6	8	5	9	14	42
% Trucks	1.7	2.8	2.2	0.8	2.9	1.7	3.1	2.3	2.5	2.2

N/S Street : Farm Street  
E/W Street : Water Street  
City/State : Wakefield, MA  
Weather : Clear

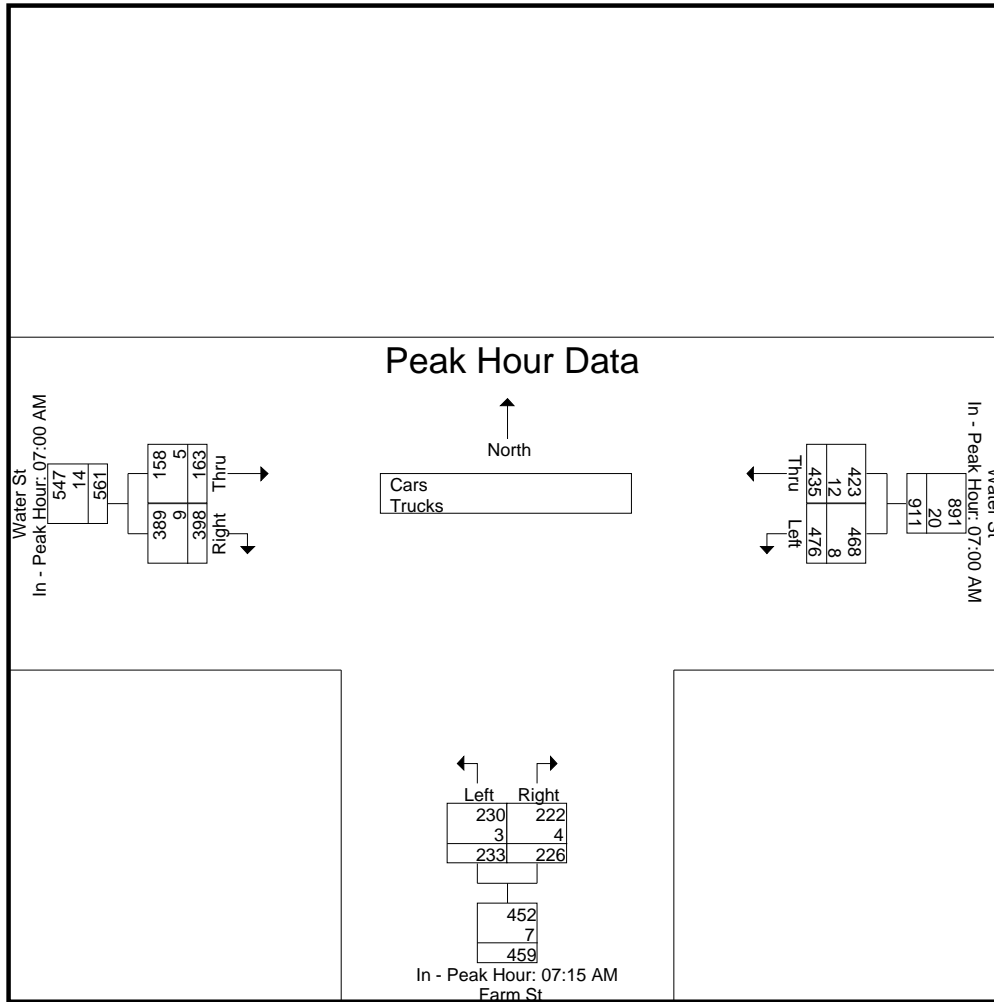


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	07:00 AM			07:15 AM			07:00 AM		
+0 mins.	106	92	198	<b>119</b>	46	<b>165</b>	30	107	137
+15 mins.	121	<b>142</b>	<b>263</b>	49	<b>64</b>	113	32	<b>157</b>	<b>189</b>
+30 mins.	121	76	197	41	57	98	<b>51</b>	90	141
+45 mins.	<b>128</b>	125	253	24	59	83	50	44	94
Total Volume	476	435	911	233	226	459	163	398	561
% App. Total	52.3	47.7		50.8	49.2		29.1	70.9	
PHF	.930	.766	.866	.489	.883	.695	.799	.634	.742
Cars	468	423	891	230	222	452	158	389	547
% Cars	98.3	97.2	97.8	98.7	98.2	98.5	96.9	97.7	97.5
Trucks	8	12	20	3	4	7	5	9	14
% Trucks	1.7	2.8	2.2	1.3	1.8	1.5	3.1	2.3	2.5



N/S Street : Farm Street  
E/W Street : Water Street  
City/State : Wakefield, MA  
Weather : Clear



**Accurate Counts**  
978-664-2565

N/S Street : Farm Street  
E/W Street : Water Street  
City/State : Wakefield, MA  
Weather : Clear

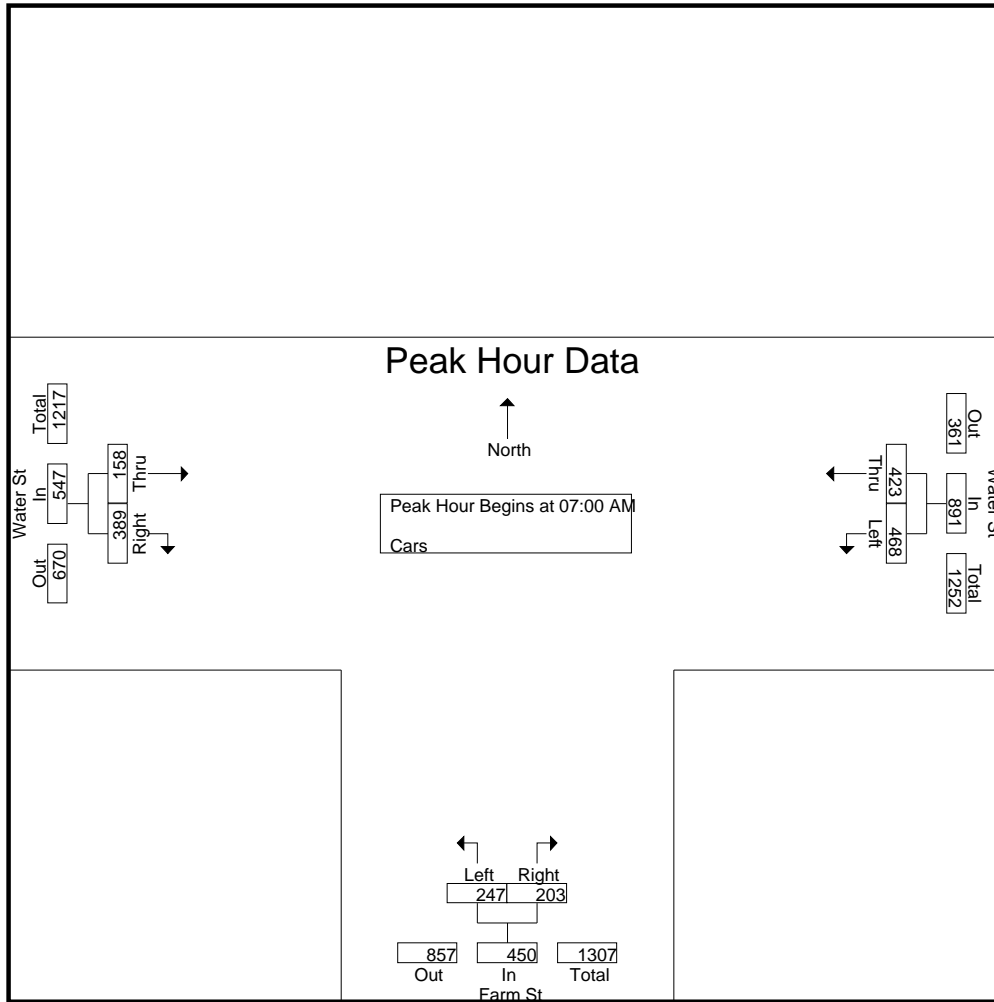
File Name : 40684001  
Site Code : 40684001  
Start Date : 11/16/2021  
Page No : 4

Groups Printed- Cars

Start Time	Water St From East		Farm St From South		Water St From West		Int. Total
	Left	Thru	Left	Right	Thru	Right	
07:00 AM	104	90	40	40	29	106	409
07:15 AM	120	139	118	46	32	155	610
07:30 AM	119	71	48	63	49	85	435
07:45 AM	125	123	41	54	48	43	434
Total	468	423	247	203	158	389	1888
08:00 AM	103	76	23	59	25	31	317
08:15 AM	112	124	36	59	22	44	397
08:30 AM	110	105	71	84	34	45	449
08:45 AM	71	88	36	50	38	42	325
Total	396	393	166	252	119	162	1488
Grand Total	864	816	413	455	277	551	3376
Apprch %	51.4	48.6	47.6	52.4	33.5	66.5	
Total %	25.6	24.2	12.2	13.5	8.2	16.3	

Start Time	Water St From East			Farm St From South			Water St From West			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. 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	104	90	194	40	40	80	29	106	135	409
07:15 AM	120	<b>139</b>	<b>259</b>	<b>118</b>	46	<b>164</b>	32	<b>155</b>	<b>187</b>	<b>610</b>
07:30 AM	119	71	190	48	<b>63</b>	111	<b>49</b>	85	134	435
07:45 AM	<b>125</b>	123	248	41	54	95	48	43	91	434
Total Volume	468	423	891	247	203	450	158	389	547	1888
% App. Total	52.5	47.5		54.9	45.1		28.9	71.1		
PHF	.936	.761	.860	.523	.806	.686	.806	.627	.731	.774

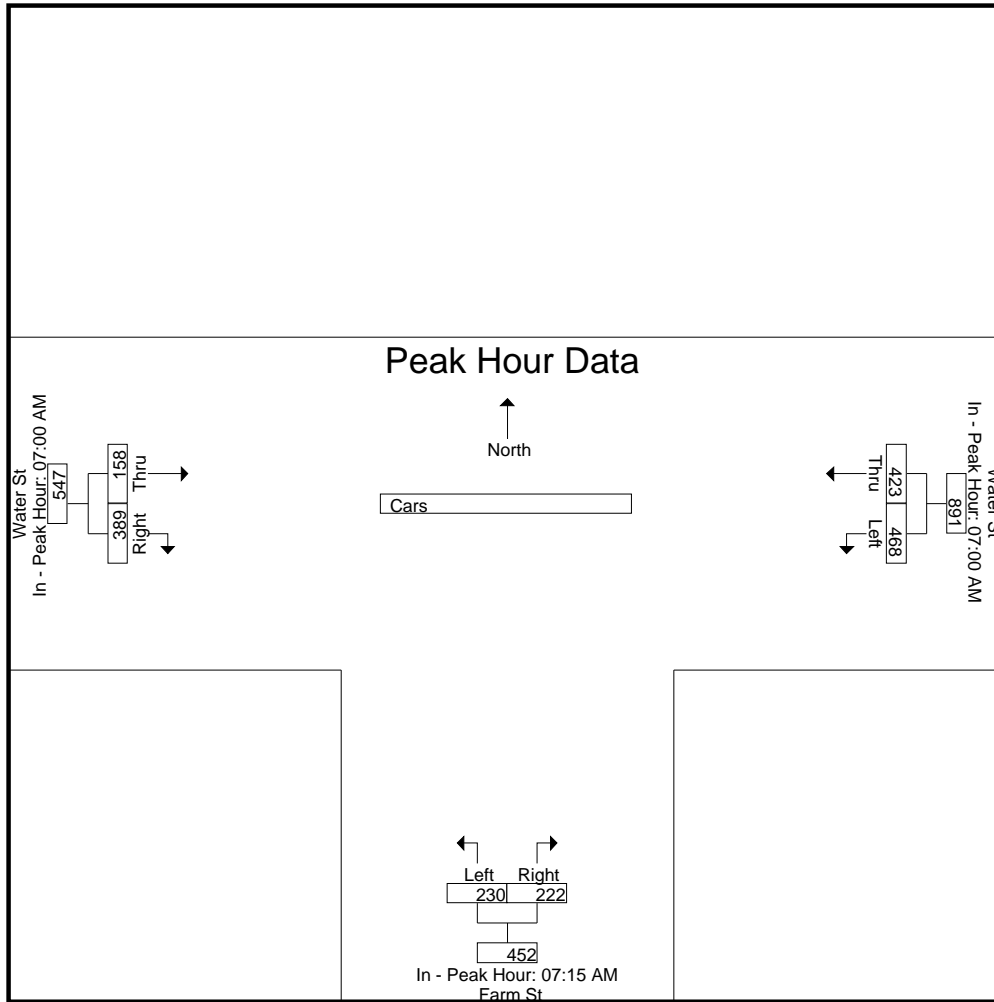
N/S Street : Farm Street  
E/W Street : Water Street  
City/State : Wakefield, MA  
Weather : Clear



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			07:15 AM			07:00 AM		
+0 mins.	104	90	194	<b>118</b>	46	<b>164</b>	29	106	135
+15 mins.	120	<b>139</b>	<b>259</b>	48	<b>63</b>	111	32	<b>155</b>	<b>187</b>
+30 mins.	119	71	190	41	54	95	<b>49</b>	85	134
+45 mins.	<b>125</b>	123	248	23	59	82	48	43	91
Total Volume	468	423	891	230	222	452	158	389	547
% App. Total	52.5	47.5		50.9	49.1		28.9	71.1	
PHF	.936	.761	.860	.487	.881	.689	.806	.627	.731

N/S Street : Farm Street  
E/W Street : Water Street  
City/State : Wakefield, MA  
Weather : Clear



**Accurate Counts**  
978-664-2565

N/S Street : Farm Street  
E/W Street : Water Street  
City/State : Wakefield, MA  
Weather : Clear

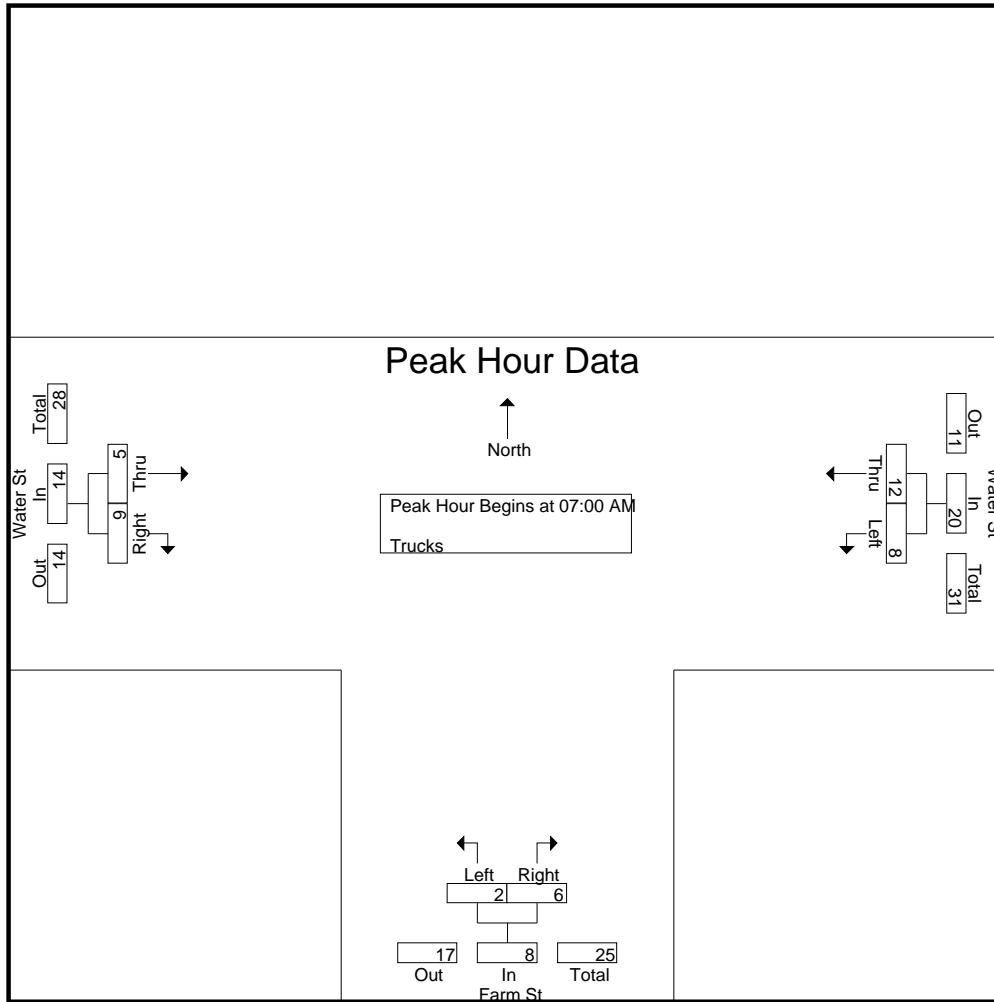
File Name : 40684001  
Site Code : 40684001  
Start Date : 11/16/2021  
Page No : 7

Groups Printed- Trucks

Start Time	Water St From East		Farm St From South		Water St From West		Int. Total
	Left	Thru	Left	Right	Thru	Right	
07:00 AM	2	2	0	2	1	1	8
07:15 AM	1	3	1	0	0	2	7
07:30 AM	2	5	1	1	2	5	16
07:45 AM	3	2	0	3	2	1	11
<b>Total</b>	<b>8</b>	<b>12</b>	<b>2</b>	<b>6</b>	<b>5</b>	<b>9</b>	<b>42</b>
08:00 AM	0	2	1	0	1	1	5
08:15 AM	1	1	1	4	1	2	10
08:30 AM	0	0	1	0	0	0	1
08:45 AM	0	0	1	0	1	0	2
<b>Total</b>	<b>1</b>	<b>3</b>	<b>4</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>18</b>
<b>Grand Total</b>	<b>9</b>	<b>15</b>	<b>6</b>	<b>10</b>	<b>8</b>	<b>12</b>	<b>60</b>
Apprch %	37.5	62.5	37.5	62.5	40	60	
Total %	15	25	10	16.7	13.3	20	

Start Time	Water St From East			Farm St From South			Water St From West			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. 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	2	2	4	0	2	2	1	1	2	8
07:15 AM	1	3	4	1	0	1	0	2	2	7
07:30 AM	2	5	7	1	1	2	2	5	7	16
07:45 AM	3	2	5	0	3	3	2	1	3	11
<b>Total Volume</b>	<b>8</b>	<b>12</b>	<b>20</b>	<b>2</b>	<b>6</b>	<b>8</b>	<b>5</b>	<b>9</b>	<b>14</b>	<b>42</b>
<b>% App. Total</b>	<b>40</b>	<b>60</b>		<b>25</b>	<b>75</b>		<b>35.7</b>	<b>64.3</b>		
PHF	.667	.600	.714	.500	.500	.667	.625	.450	.500	.656

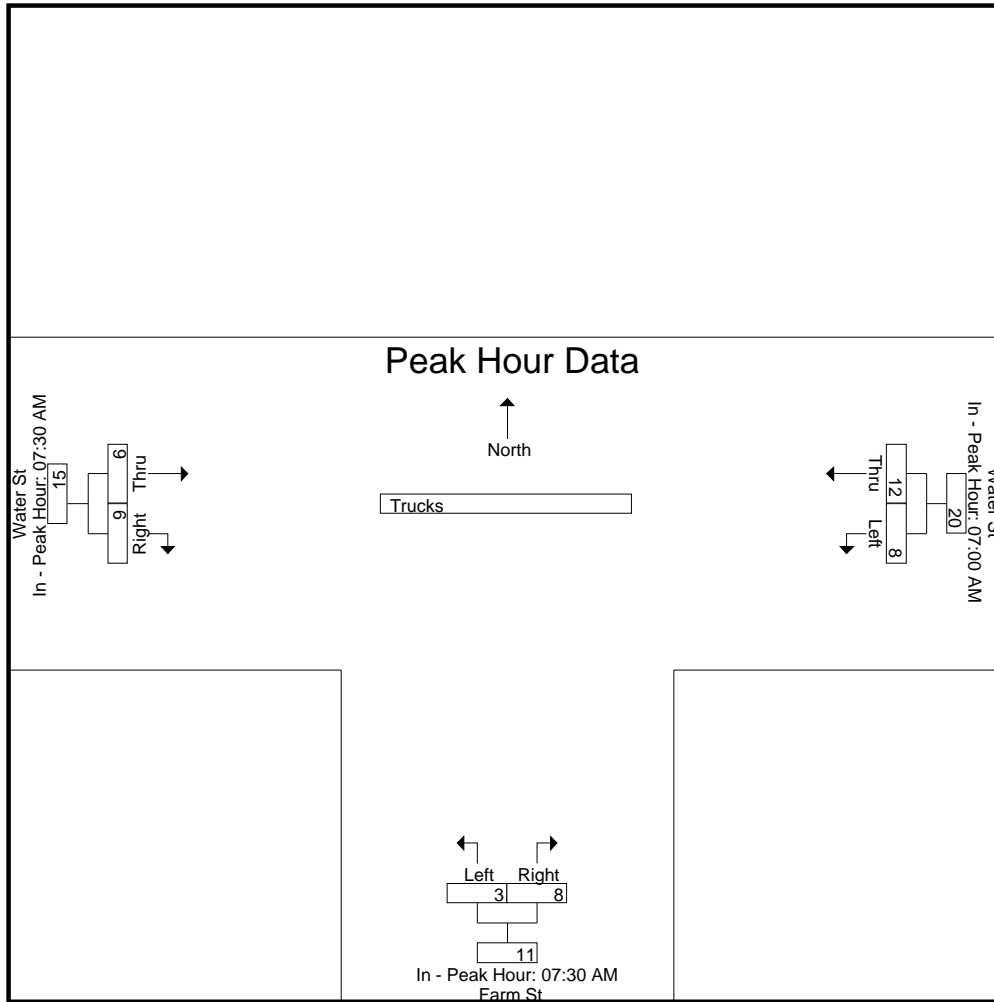
N/S Street : Farm Street  
E/W Street : Water Street  
City/State : Wakefield, MA  
Weather : Clear



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			07:30 AM			07:30 AM		
+0 mins.	2	2	4	1	1	2	2	5	7
+15 mins.	1	3	4	0	3	3	2	1	3
+30 mins.	2	5	7	1	0	1	1	1	2
+45 mins.	3	2	5	1	4	5	1	2	3
Total Volume	8	12	20	3	8	11	6	9	15
% App. Total	40	60		27.3	72.7		40	60	
PHF	.667	.600	.714	.750	.500	.550	.750	.450	.536

N/S Street : Farm Street  
E/W Street : Water Street  
City/State : Wakefield, MA  
Weather : Clear





**Accurate Counts**  
978-664-2565

N/S Street : Farm Street  
E/W Street : Water Street  
City/State : Wakefield, MA  
Weather : Clear

File Name : 40684001  
Site Code : 40684001  
Start Date : 11/16/2021  
Page No : 10

Groups Printed- Bikes Peds

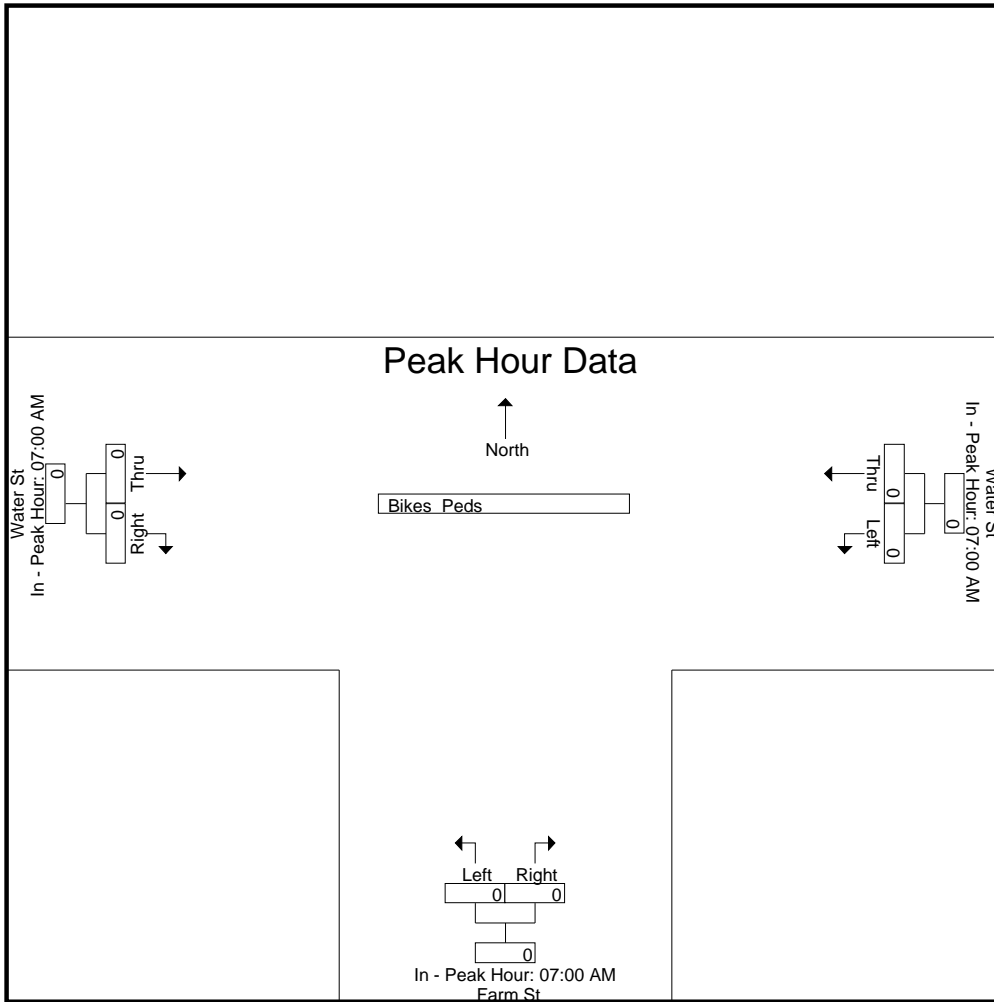
Start Time	Water St From East			Farm St From South			Water St From West			Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds			
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	2	0	0	0	0	0	0	2	0	2
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	2	0	0	0	0	0	0	2	0	2
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	2	0	0	0	0	0	0	2	0	2
Apprch %	0	0		0	0		0	0				
Total %										100	0	

Start Time	Water St From East			Farm St From South			Water St From West			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
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

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



N/S Street : Farm Street  
E/W Street : Water Street  
City/State : Wakefield, MA  
Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Water Street  
 City/State : Wakefield, MA  
 Weather : Clear

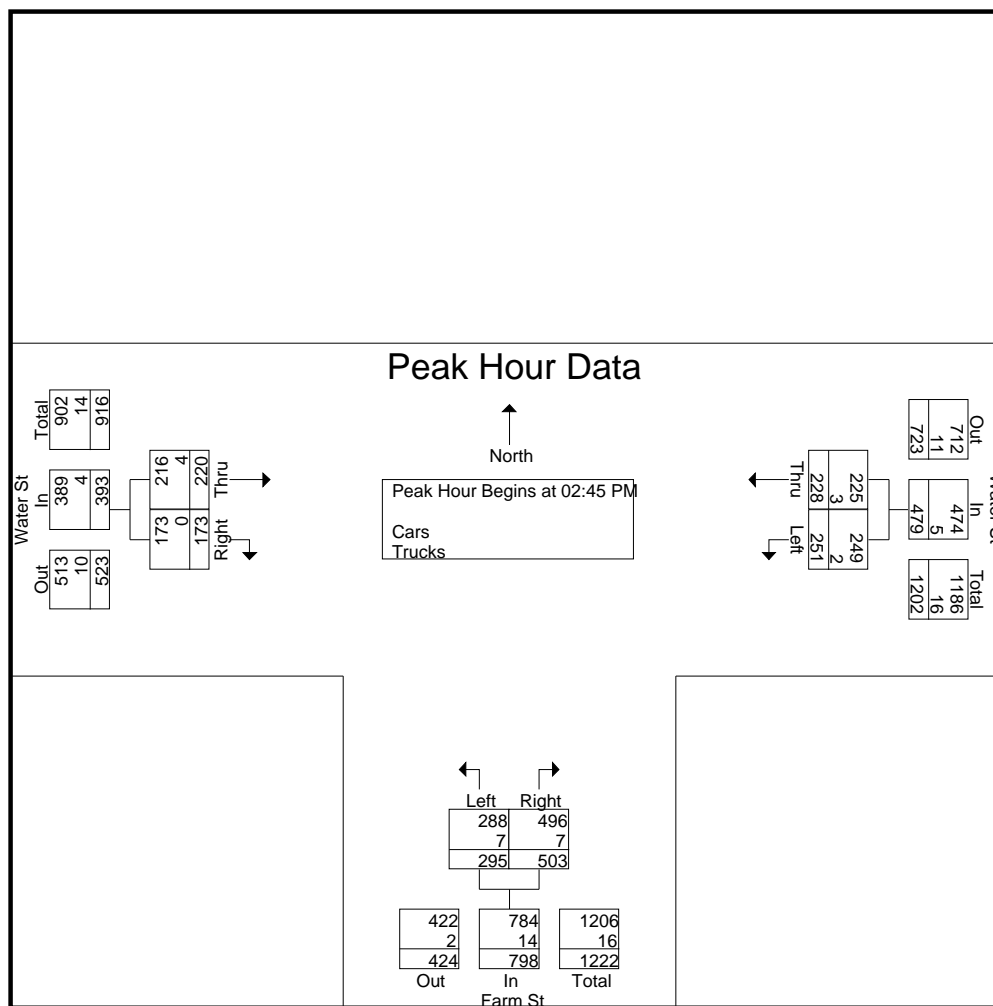
File Name : 40684001  
 Site Code : 40684001  
 Start Date : 11/16/2021  
 Page No : 1

### Groups Printed- Cars - Trucks

Start Time	Water St From East		Farm St From South			Water St From West		Int. Total
	Left	Thru	Left	Right	Thru	Right		
02:00 PM	60	63	76	74	40	44	357	
02:15 PM	63	56	81	78	54	47	379	
02:30 PM	69	61	59	106	34	65	394	
02:45 PM	57	51	82	126	43	37	396	
<b>Total</b>	<b>249</b>	<b>231</b>	<b>298</b>	<b>384</b>	<b>171</b>	<b>193</b>	<b>1526</b>	
03:00 PM	71	61	78	107	63	39	419	
03:15 PM	67	65	69	137	49	37	424	
03:30 PM	56	51	66	133	65	60	431	
03:45 PM	67	57	64	117	56	35	396	
<b>Total</b>	<b>261</b>	<b>234</b>	<b>277</b>	<b>494</b>	<b>233</b>	<b>171</b>	<b>1670</b>	
<b>Grand Total</b>	<b>510</b>	<b>465</b>	<b>575</b>	<b>878</b>	<b>404</b>	<b>364</b>	<b>3196</b>	
Apprch %	52.3	47.7	39.6	60.4	52.6	47.4		
Total %	16	14.5	18	27.5	12.6	11.4		
Cars	503	458	561	867	396	363	3148	
% Cars	98.6	98.5	97.6	98.7	98	99.7	98.5	
Trucks	7	7	14	11	8	1	48	
% Trucks	1.4	1.5	2.4	1.3	2	0.3	1.5	

Start Time	Water St From East			Farm St From South			Water St From West			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:45 PM										
02:45 PM	57	51	108	<b>82</b>	126	<b>208</b>	43	37	80	396
03:00 PM	<b>71</b>	61	<b>132</b>	78	107	185	63	39	102	419
03:15 PM	67	<b>65</b>	132	69	<b>137</b>	206	49	37	86	424
03:30 PM	56	51	107	66	133	199	<b>65</b>	<b>60</b>	<b>125</b>	<b>431</b>
Total Volume	251	228	479	295	503	798	220	173	393	1670
% App. Total	52.4	47.6		37	63		56	44		
PHF	.884	.877	.907	.899	.918	.959	.846	.721	.786	.969
Cars	249	225	474	288	496	784	216	173	389	1647
% Cars	99.2	98.7	99.0	97.6	98.6	98.2	98.2	100	99.0	98.6
Trucks	2	3	5	7	7	14	4	0	4	23
% Trucks	0.8	1.3	1.0	2.4	1.4	1.8	1.8	0	1.0	1.4

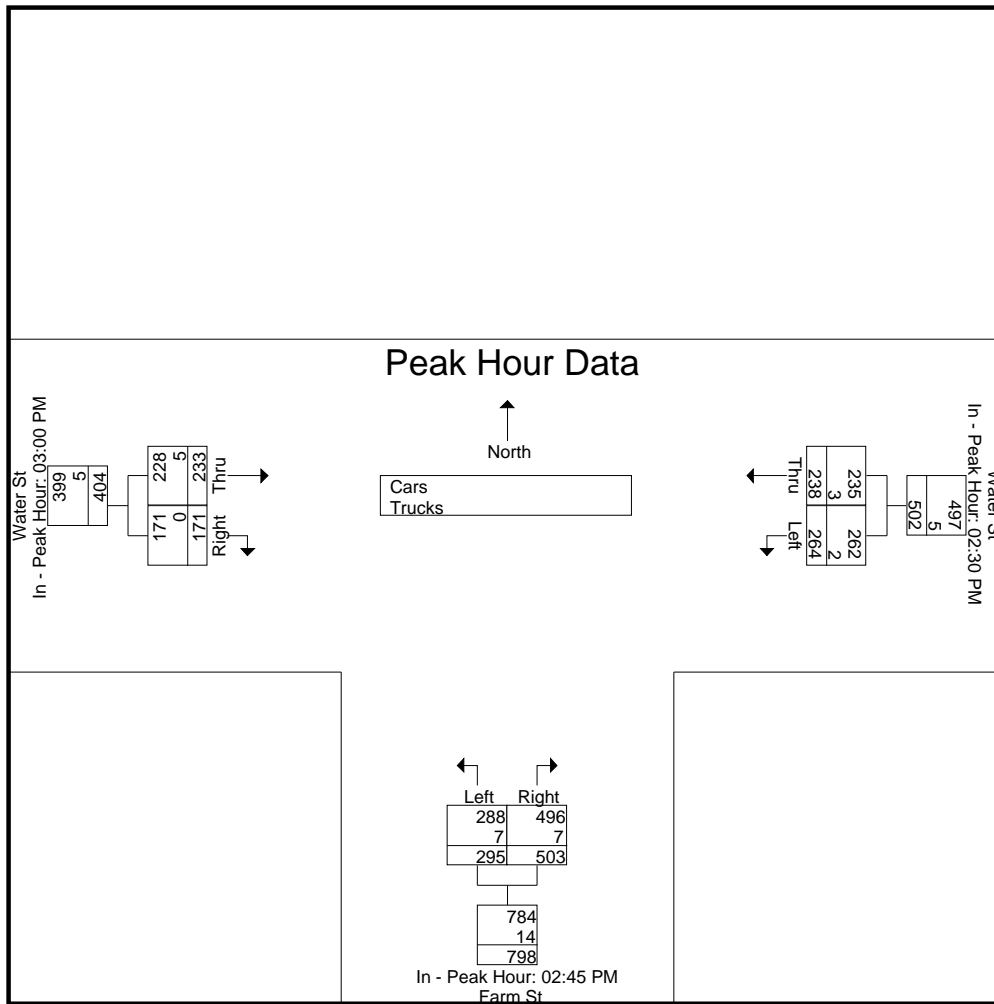
N/S Street : Farm Street  
E/W Street : Water Street  
City/State : Wakefield, MA  
Weather : Clear



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	02:30 PM			02:45 PM			03:00 PM		
+0 mins.	69	61	130	<b>82</b>	126	<b>208</b>	63	39	102
+15 mins.	57	51	108	78	107	185	49	37	86
+30 mins.	<b>71</b>	61	<b>132</b>	69	<b>137</b>	206	<b>65</b>	<b>60</b>	<b>125</b>
+45 mins.	67	<b>65</b>	132	66	133	199	56	35	91
Total Volume	264	238	502	295	503	798	233	171	404
% App. Total	52.6	47.4		37	63		57.7	42.3	
PHF	.930	.915	.951	.899	.918	.959	.896	.713	.808
Cars	262	235	497	288	496	784	228	171	399
% Cars	99.2	98.7	99	97.6	98.6	98.2	97.9	100	98.8
Trucks	2	3	5	7	7	14	5	0	5
% Trucks	0.8	1.3	1	2.4	1.4	1.8	2.1	0	1.2

N/S Street : Farm Street  
E/W Street : Water Street  
City/State : Wakefield, MA  
Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Water Street  
 City/State : Wakefield, MA  
 Weather : Clear

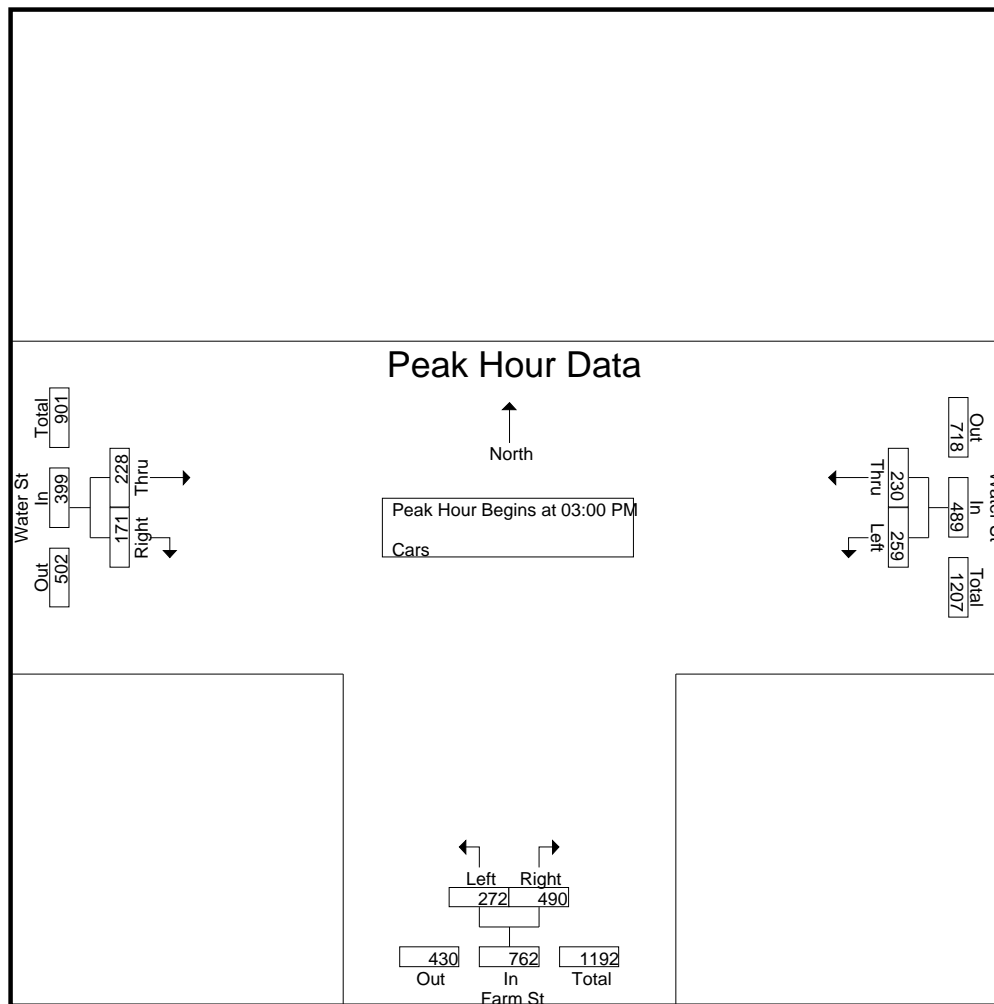
File Name : 40684001  
 Site Code : 40684001  
 Start Date : 11/16/2021  
 Page No : 4

### Groups Printed- Cars

Start Time	Water St From East		Farm St From South		Water St From West		Int. Total
	Left	Thru	Left	Right	Thru	Right	
02:00 PM	58	63	75	72	39	44	351
02:15 PM	62	54	79	78	54	46	373
02:30 PM	69	61	57	106	32	65	390
02:45 PM	55	50	78	121	43	37	384
<b>Total</b>	<b>244</b>	<b>228</b>	<b>289</b>	<b>377</b>	<b>168</b>	<b>192</b>	<b>1498</b>
03:00 PM	71	59	78	107	61	39	415
03:15 PM	67	65	67	136	49	37	421
03:30 PM	56	51	65	132	63	60	427
03:45 PM	65	55	62	115	55	35	387
<b>Total</b>	<b>259</b>	<b>230</b>	<b>272</b>	<b>490</b>	<b>228</b>	<b>171</b>	<b>1650</b>
<b>Grand Total</b>	<b>503</b>	<b>458</b>	<b>561</b>	<b>867</b>	<b>396</b>	<b>363</b>	<b>3148</b>
Apprch %	52.3	47.7	39.3	60.7	52.2	47.8	
Total %	16	14.5	17.8	27.5	12.6	11.5	

Start Time	Water St From East			Farm St From South			Water St From West			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 03:00 PM										
03:00 PM	<b>71</b>	59	130	<b>78</b>	107	185	61	39	100	415
03:15 PM	67	<b>65</b>	<b>132</b>	67	<b>136</b>	<b>203</b>	49	37	86	421
03:30 PM	56	51	107	65	132	197	<b>63</b>	<b>60</b>	<b>123</b>	<b>427</b>
03:45 PM	65	55	120	62	115	177	55	35	90	387
Total Volume	259	230	489	272	490	762	228	171	399	1650
% App. Total	53	47		35.7	64.3		57.1	42.9		
PHF	.912	.885	.926	.872	.901	.938	.905	.713	.811	.966

N/S Street : Farm Street  
E/W Street : Water Street  
City/State : Wakefield, MA  
Weather : Clear

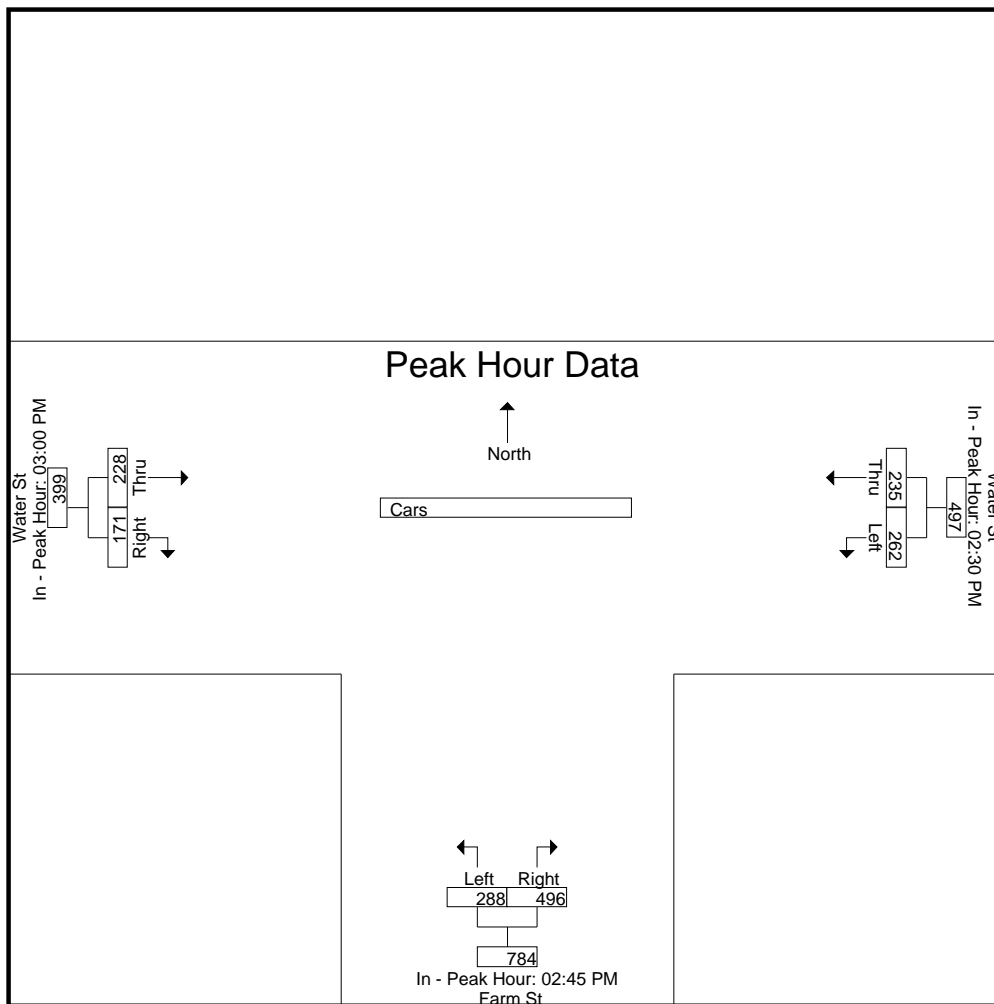


Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	02:30 PM			02:45 PM			03:00 PM		
+0 mins.	69	61	130	<b>78</b>	121	199	61	39	100
+15 mins.	55	50	105	78	107	185	49	37	86
+30 mins.	<b>71</b>	59	130	67	<b>136</b>	<b>203</b>	<b>63</b>	<b>60</b>	<b>123</b>
+45 mins.	67	<b>65</b>	<b>132</b>	65	132	197	55	35	90
Total Volume	262	235	497	288	496	784	228	171	399
% App. Total	52.7	47.3		36.7	63.3		57.1	42.9	
PHF	.923	.904	.941	.923	.912	.966	.905	.713	.811



N/S Street : Farm Street  
E/W Street : Water Street  
City/State : Wakefield, MA  
Weather : Clear



**Accurate Counts**  
978-664-2565

N/S Street : Farm Street  
E/W Street : Water Street  
City/State : Wakefield, MA  
Weather : Clear

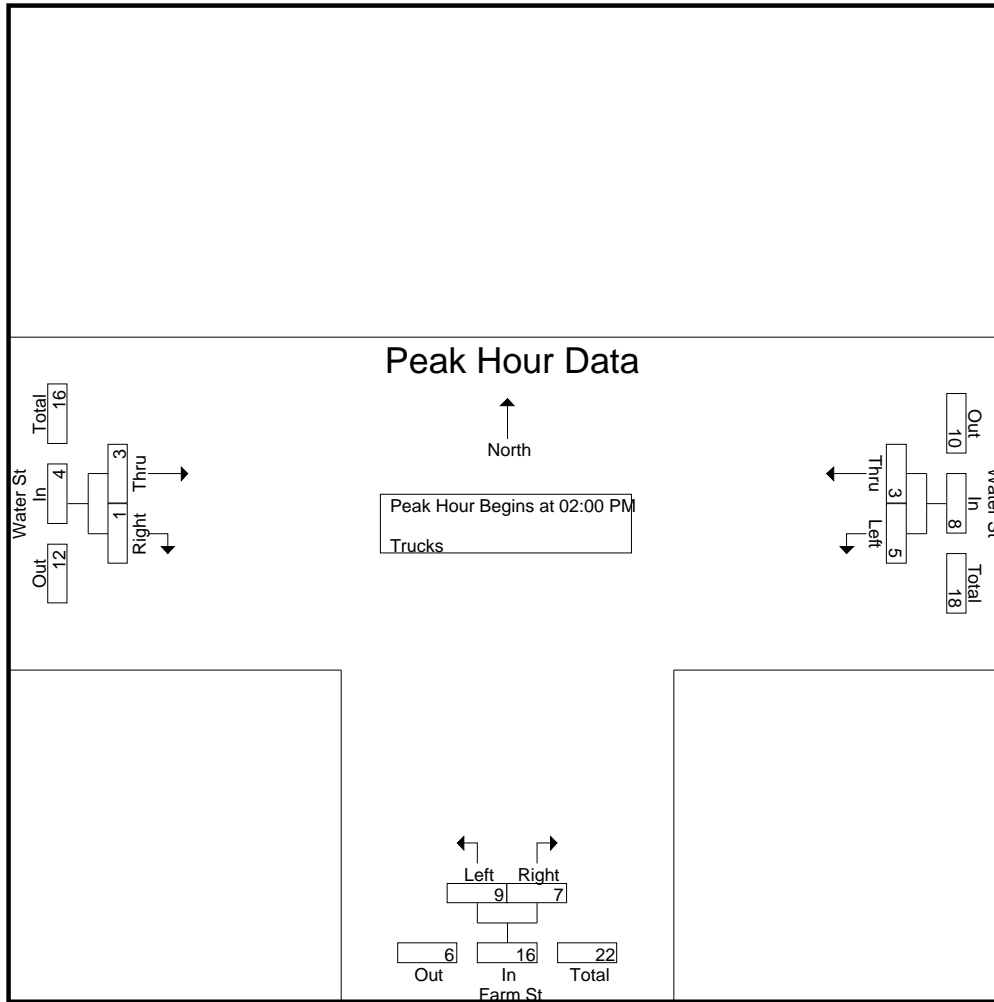
File Name : 40684001  
Site Code : 40684001  
Start Date : 11/16/2021  
Page No : 7

Groups Printed- Trucks

Start Time	Water St From East		Farm St From South		Water St From West		Int. Total
	Left	Thru	Left	Right	Thru	Right	
02:00 PM	2	0	1	2	1	0	6
02:15 PM	1	2	2	0	0	1	6
02:30 PM	0	0	2	0	2	0	4
02:45 PM	2	1	4	5	0	0	12
<b>Total</b>	<b>5</b>	<b>3</b>	<b>9</b>	<b>7</b>	<b>3</b>	<b>1</b>	<b>28</b>
03:00 PM	0	2	0	0	2	0	4
03:15 PM	0	0	2	1	0	0	3
03:30 PM	0	0	1	1	2	0	4
03:45 PM	2	2	2	2	1	0	9
<b>Total</b>	<b>2</b>	<b>4</b>	<b>5</b>	<b>4</b>	<b>5</b>	<b>0</b>	<b>20</b>
<b>Grand Total</b>	<b>7</b>	<b>7</b>	<b>14</b>	<b>11</b>	<b>8</b>	<b>1</b>	<b>48</b>
Apprch %	50	50	56	44	88.9	11.1	
Total %	14.6	14.6	29.2	22.9	16.7	2.1	

Start Time	Water St From East			Farm St From South			Water St From West			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:00 PM										
02:00 PM	2	0	2	1	2	3	1	0	1	6
02:15 PM	1	2	3	2	0	2	0	1	1	6
02:30 PM	0	0	0	2	0	2	2	0	2	4
02:45 PM	2	1	3	4	5	9	0	0	0	12
<b>Total Volume</b>	<b>5</b>	<b>3</b>	<b>8</b>	<b>9</b>	<b>7</b>	<b>16</b>	<b>3</b>	<b>1</b>	<b>4</b>	<b>28</b>
<b>% App. Total</b>	<b>62.5</b>	<b>37.5</b>		<b>56.2</b>	<b>43.8</b>		<b>75</b>	<b>25</b>		
PHF	.625	.375	.667	.563	.350	.444	.375	.250	.500	.583

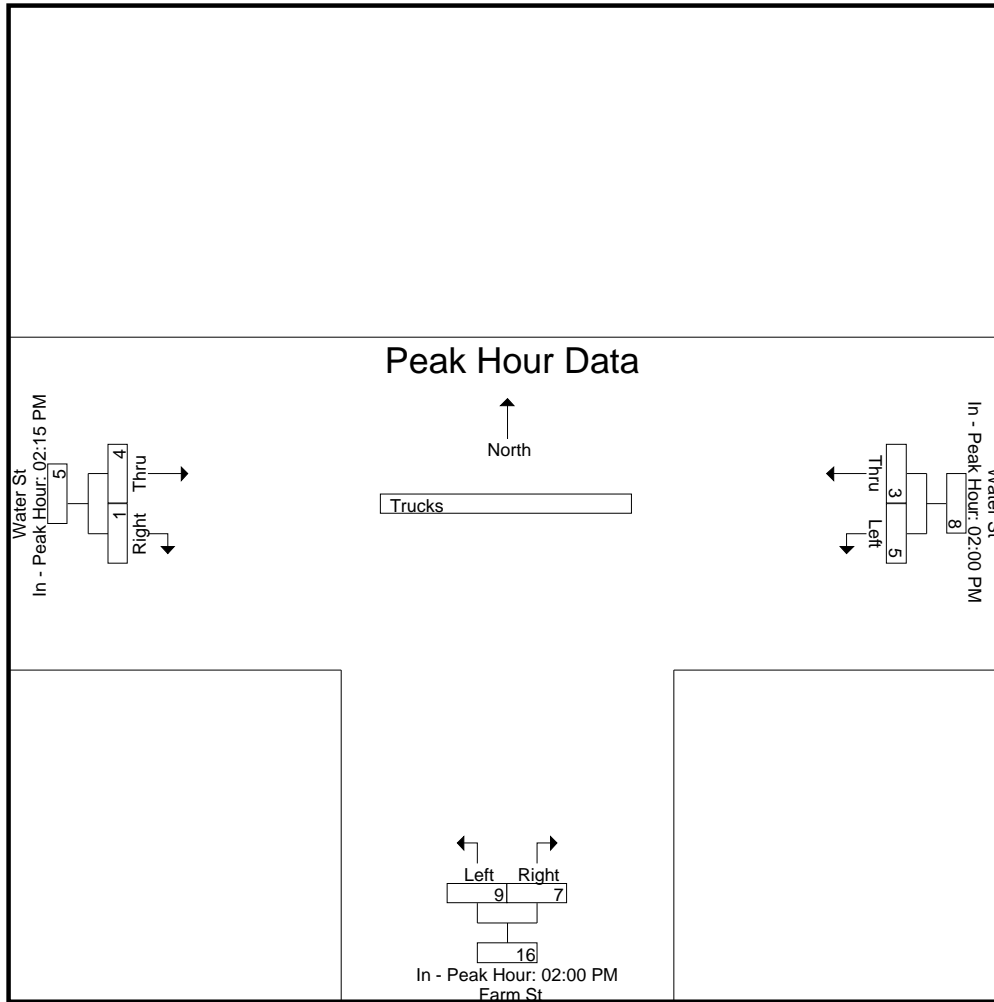
N/S Street : Farm Street  
E/W Street : Water Street  
City/State : Wakefield, MA  
Weather : Clear



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	02:00 PM			02:00 PM			02:15 PM		
+0 mins.	2	0	2	1	2	3	0	1	1
+15 mins.	1	2	3	2	0	2	2	0	2
+30 mins.	0	0	0	2	0	2	0	0	0
+45 mins.	2	1	3	4	5	9	2	0	2
Total Volume	5	3	8	9	7	16	4	1	5
% App. Total	62.5	37.5		56.2	43.8		80	20	
PHF	.625	.375	.667	.563	.350	.444	.500	.250	.625

N/S Street : Farm Street  
E/W Street : Water Street  
City/State : Wakefield, MA  
Weather : Clear



**Accurate Counts**  
978-664-2565

File Name : 40684001  
Site Code : 40684001  
Start Date : 11/16/2021  
Page No : 10

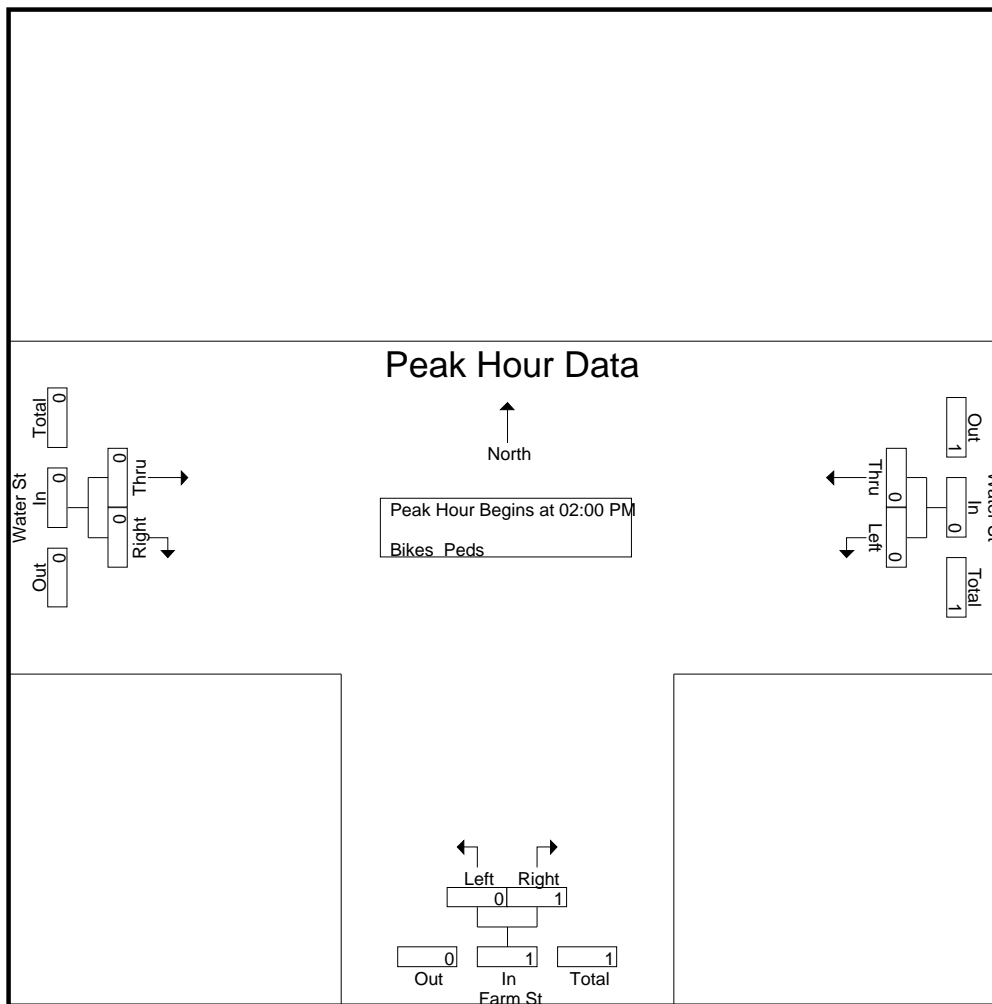
N/S Street : Farm Street  
E/W Street : Water Street  
City/State : Wakefield, MA  
Weather : Clear

Groups Printed- Bikes Peds

Start Time	Water St From East			Farm St From South			Water St From West			Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds			
02:00 PM	0	0	5	0	0	0	0	0	0	5	0	5
02:15 PM	0	0	2	0	1	1	0	0	0	3	1	4
02:30 PM	0	0	1	0	0	0	0	0	0	1	0	1
02:45 PM	0	0	1	0	0	1	0	0	0	2	0	2
Total	0	0	9	0	1	2	0	0	0	11	1	12
03:00 PM	0	0	1	0	0	1	0	0	1	3	0	3
03:15 PM	0	0	2	0	0	1	1	0	0	3	1	4
03:30 PM	0	0	0	0	0	9	0	0	0	9	0	9
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	3	0	0	11	1	0	1	15	1	16
Grand Total	0	0	12	0	1	13	1	0	1	26	2	28
Apprch %	0	0		0	100		100	0				
Total %	0	0		0	50		50	0		92.9	7.1	

Start Time	Water St From East			Farm St From South			Water St From West			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:00 PM										
02:00 PM	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	1	1	0	0	0	1
02:30 PM	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	1	1	0	0	0	1
% App. Total	0	0		0	100		0	0		
PHF	.000	.000	.000	.000	.250	.250	.000	.000	.000	.250

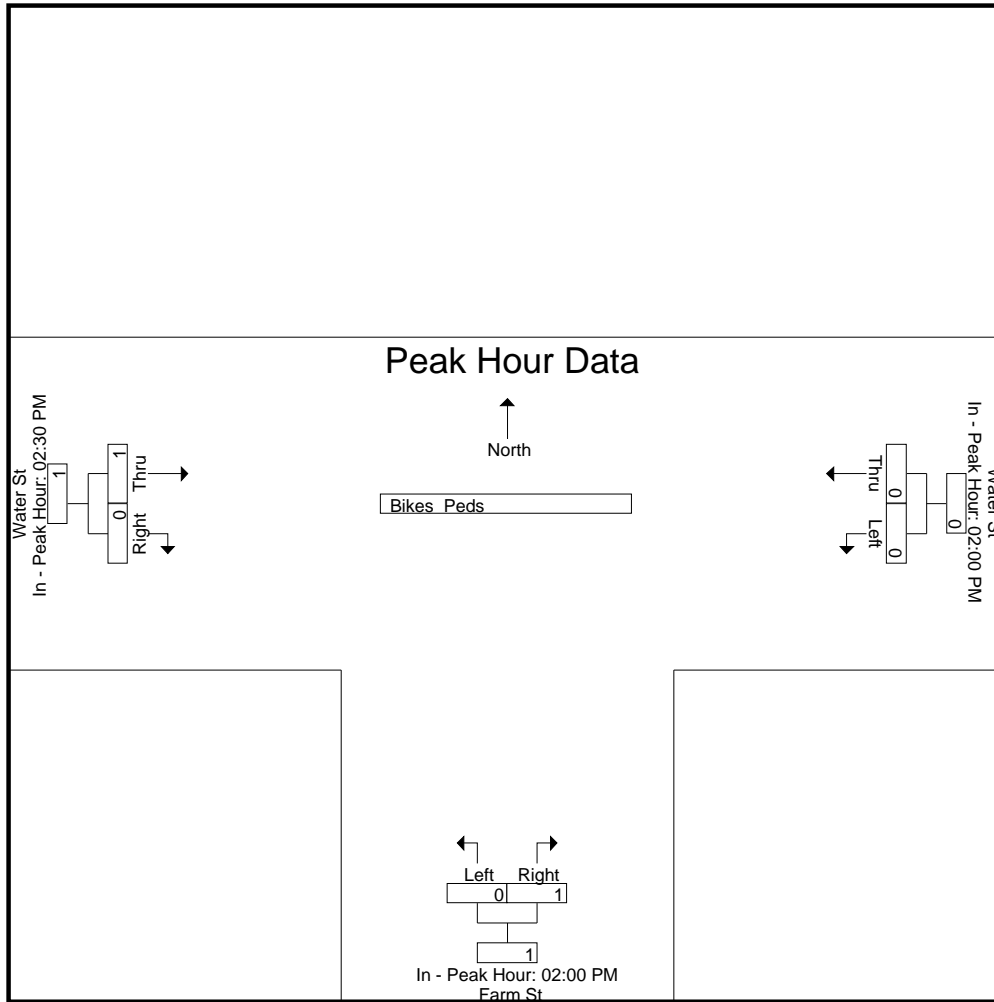
N/S Street : Farm Street  
E/W Street : Water Street  
City/State : Wakefield, MA  
Weather : Clear



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	02:00 PM			02:00 PM			02:30 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	1	1	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	1	0	1
Total Volume	0	0	0	0	1	1	1	0	1
% App. Total	0	0		0	100		100	0	
PHF	.000	.000	.000	.000	.250	.250	.250	.000	.250

N/S Street : Farm Street  
E/W Street : Water Street  
City/State : Wakefield, MA  
Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Woodville School Entrance  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 40684002  
 Site Code : 40684002  
 Start Date : 11/16/2021  
 Page No : 1

### Groups Printed- Cars - Trucks

Start Time	Farm Street From North		Woodville School Entrance From East			Farm Street From South		Int. Total
	Left	Thru	Left	Right	Thru	Right		
07:00 AM	6	205	0	0	81	2	294	
07:15 AM	43	249	0	0	141	3	436	
07:30 AM	9	205	0	0	99	4	317	
07:45 AM	10	165	0	0	88	11	274	
<b>Total</b>	<b>68</b>	<b>824</b>	<b>0</b>	<b>0</b>	<b>409</b>	<b>20</b>	<b>1321</b>	
08:00 AM	6	134	0	0	84	5	229	
08:15 AM	13	131	0	0	104	10	258	
08:30 AM	14	162	0	0	137	1	314	
08:45 AM	2	115	0	0	85	2	204	
<b>Total</b>	<b>35</b>	<b>542</b>	<b>0</b>	<b>0</b>	<b>410</b>	<b>18</b>	<b>1005</b>	
<b>Grand Total</b>	<b>103</b>	<b>1366</b>	<b>0</b>	<b>0</b>	<b>819</b>	<b>38</b>	<b>2326</b>	
Apprch %	7	93	0	0	95.6	4.4		
Total %	4.4	58.7	0	0	35.2	1.6		
Cars	101	1344	0	0	804	36	2285	
% Cars	98.1	98.4	0	0	98.2	94.7	98.2	
Trucks	2	22	0	0	15	2	41	
% Trucks	1.9	1.6	0	0	1.8	5.3	1.8	

Start Time	Farm Street From North			Woodville School Entrance From East			Farm Street From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. 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	6	205	211	0	0	0	81	2	83	294
07:15 AM	<b>43</b>	<b>249</b>	<b>292</b>	0	0	0	<b>141</b>	3	<b>144</b>	<b>436</b>
07:30 AM	9	205	214	0	0	0	99	4	103	317
07:45 AM	10	165	175	0	0	0	88	<b>11</b>	99	274
<b>Total Volume</b>	<b>68</b>	<b>824</b>	<b>892</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>409</b>	<b>20</b>	<b>429</b>	<b>1321</b>
% App. Total	7.6	92.4		0	0		95.3	4.7		
PHF	.395	.827	.764	.000	.000	.000	.725	.455	.745	.757
Cars	68	804	872	0	0	0	401	19	420	1292
% Cars	100	97.6	97.8	0	0	0	98.0	95.0	97.9	97.8
Trucks	0	20	20	0	0	0	8	1	9	29
% Trucks	0	2.4	2.2	0	0	0	2.0	5.0	2.1	2.2

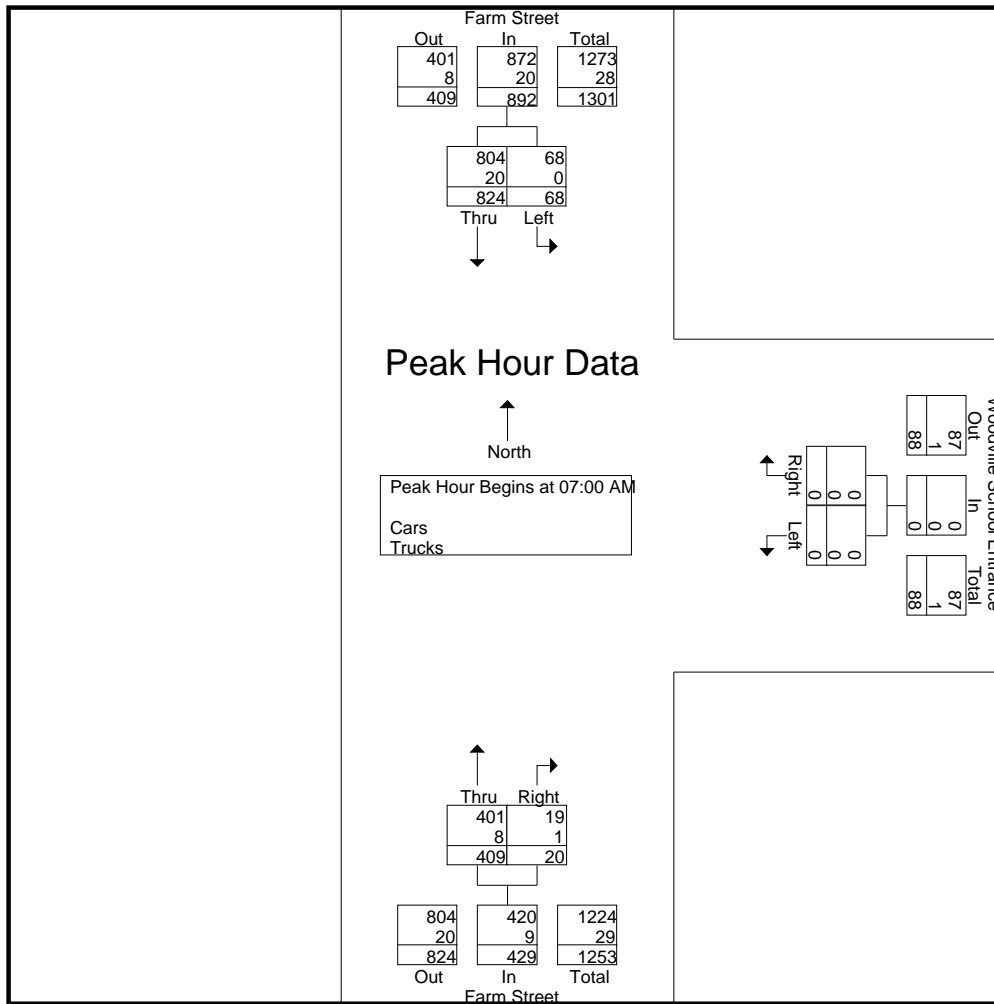


# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Woodville School Entrance  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 40684002  
 Site Code : 40684002  
 Start Date : 11/16/2021  
 Page No : 2



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

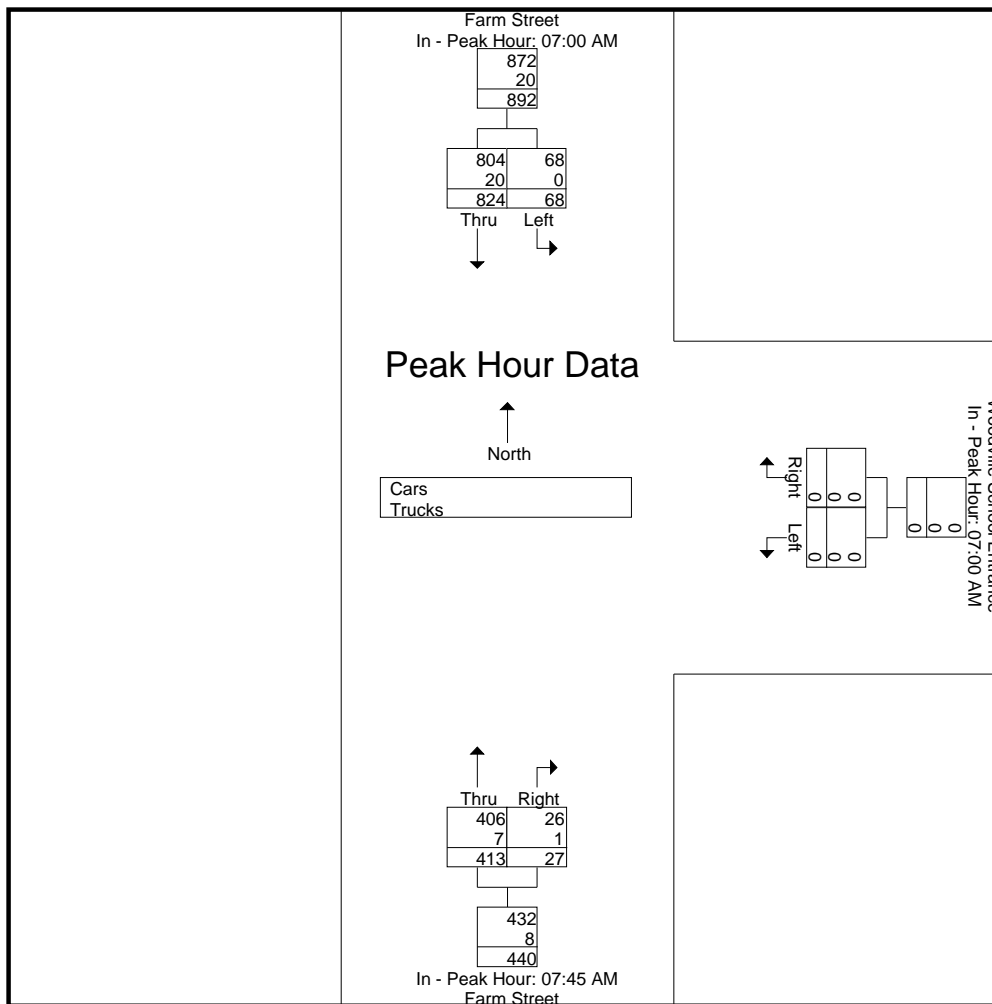
	07:00 AM			07:00 AM			07:45 AM		
+0 mins.	6	205	211	0	0	0	88	11	99
+15 mins.	<b>43</b>	<b>249</b>	<b>292</b>	0	0	0	84	5	89
+30 mins.	9	205	214	0	0	0	104	10	114
+45 mins.	10	165	175	0	0	0	<b>137</b>	<b>1</b>	<b>138</b>
Total Volume	68	824	892	0	0	0	413	27	440
% App. Total	7.6	92.4		0	0		93.9	6.1	
PHF	.395	.827	.764	.000	.000	.000	.754	.614	.797
Cars	68	804	872	0	0	0	406	26	432
% Cars	100	97.6	97.8	0	0	0	98.3	96.3	98.2
Trucks	0	20	20	0	0	0	7	1	8
% Trucks	0	2.4	2.2	0	0	0	1.7	3.7	1.8

# Accurate Counts

978-664-2565

File Name : 40684002  
 Site Code : 40684002  
 Start Date : 11/16/2021  
 Page No : 3

N/S Street : Farm Street  
 E/W Street : Woodville School Entrance  
 City/State : Wakefield, MA  
 Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Woodville School Entrance  
 City/State : Wakefield, MA  
 Weather : Clear

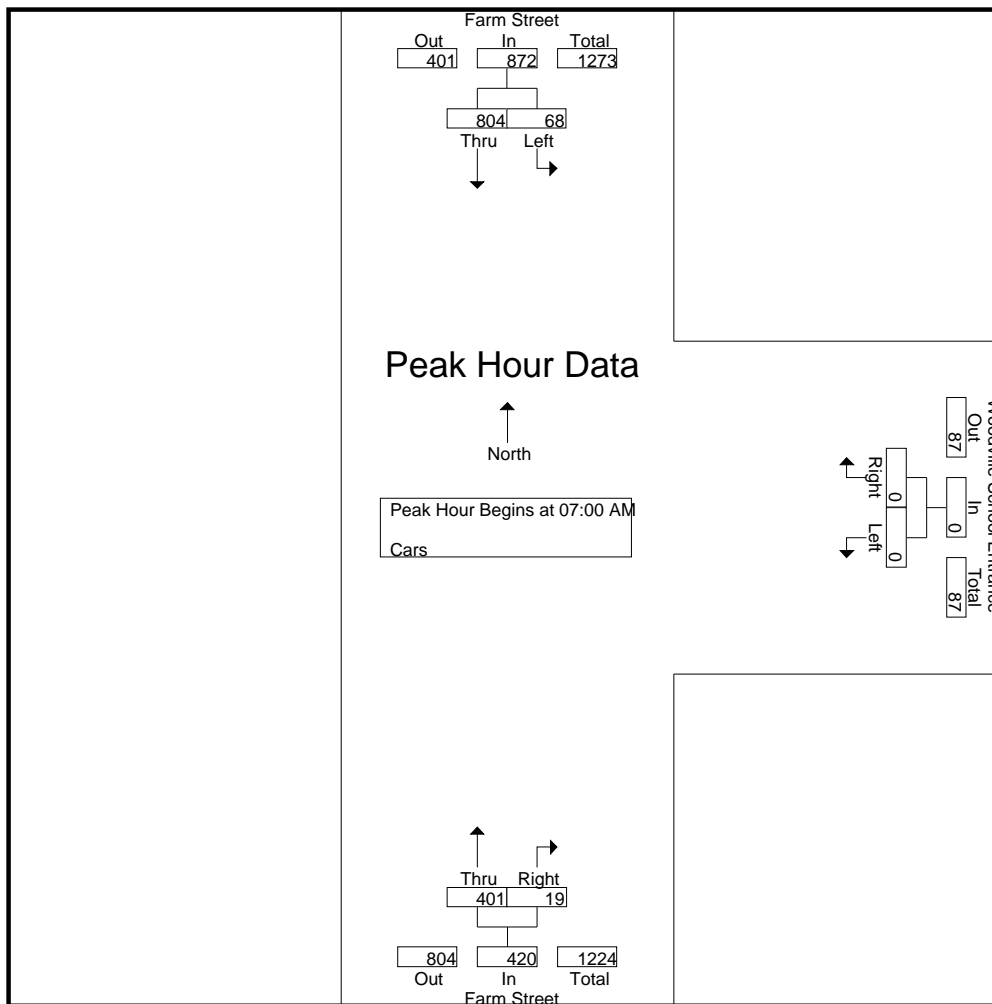
File Name : 40684002  
 Site Code : 40684002  
 Start Date : 11/16/2021  
 Page No : 4

### Groups Printed- Cars

Start Time	Farm Street From North		Woodville School Entrance From East		Farm Street From South		Int. Total
	Left	Thru	Left	Right	Thru	Right	
07:00 AM	6	202	0	0	79	2	289
07:15 AM	43	245	0	0	139	3	430
07:30 AM	9	197	0	0	97	3	306
07:45 AM	10	160	0	0	86	11	267
<b>Total</b>	<b>68</b>	<b>804</b>	<b>0</b>	<b>0</b>	<b>401</b>	<b>19</b>	<b>1292</b>
08:00 AM	6	133	0	0	83	5	227
08:15 AM	11	130	0	0	102	9	252
08:30 AM	14	162	0	0	135	1	312
08:45 AM	2	115	0	0	83	2	202
<b>Total</b>	<b>33</b>	<b>540</b>	<b>0</b>	<b>0</b>	<b>403</b>	<b>17</b>	<b>993</b>
<b>Grand Total</b>	<b>101</b>	<b>1344</b>	<b>0</b>	<b>0</b>	<b>804</b>	<b>36</b>	<b>2285</b>
Apprch %	7	93	0	0	95.7	4.3	
Total %	4.4	58.8	0	0	35.2	1.6	

Start Time	Farm Street From North			Woodville School Entrance From East			Farm Street From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. 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	6	202	208	0	0	0	79	2	81	289
07:15 AM	<b>43</b>	<b>245</b>	<b>288</b>	0	0	0	<b>139</b>	3	<b>142</b>	<b>430</b>
07:30 AM	9	197	206	0	0	0	97	3	100	306
07:45 AM	10	160	170	0	0	0	86	<b>11</b>	97	267
Total Volume	68	804	872	0	0	0	401	19	420	1292
% App. Total	7.8	92.2		0	0		95.5	4.5		
PHF	.395	.820	.757	.000	.000	.000	.721	.432	.739	.751

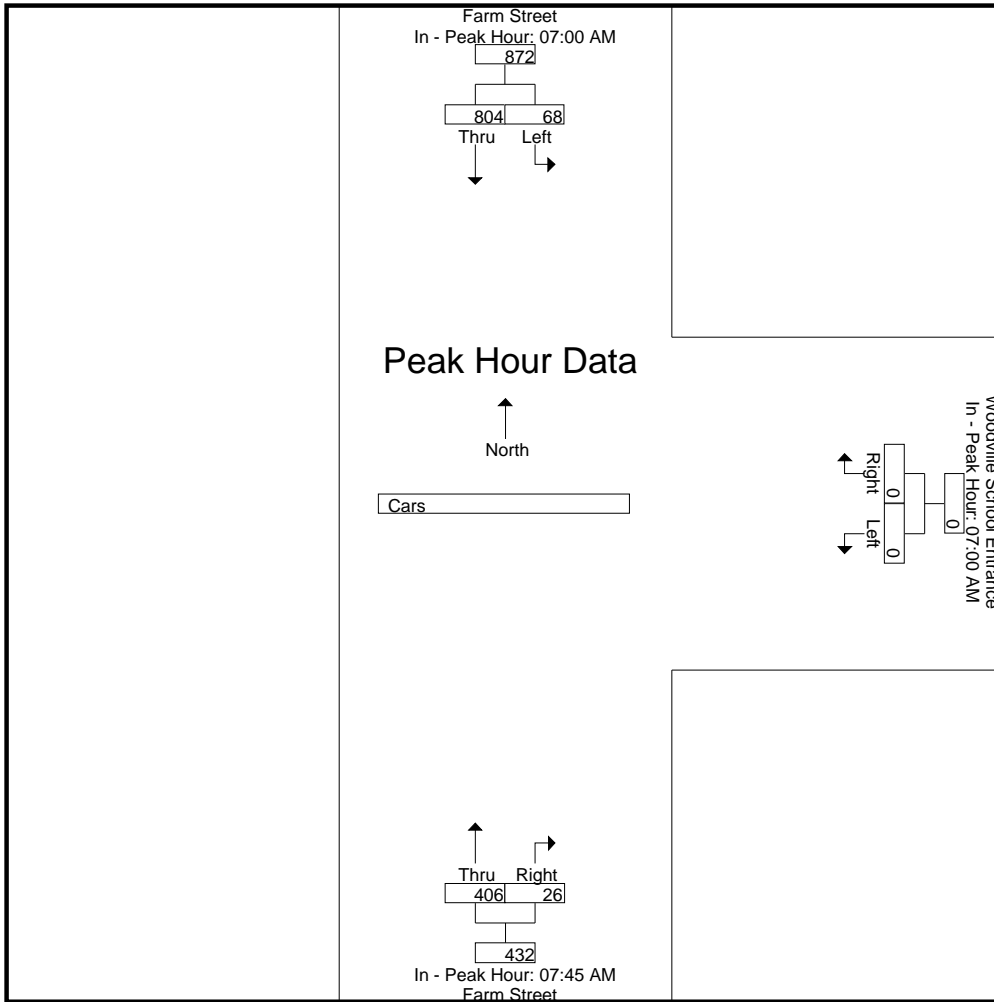
N/S Street : Farm Street  
E/W Street : Woodville School Entrance  
City/State : Wakefield, MA  
Weather : Clear



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			07:45 AM		
+0 mins.	6	202	208	0	0	0	86	11	97
+15 mins.	<b>43</b>	<b>245</b>	<b>288</b>	0	0	0	83	5	88
+30 mins.	9	197	206	0	0	0	102	9	111
+45 mins.	10	160	170	0	0	0	<b>135</b>	1	<b>136</b>
Total Volume	68	804	872	0	0	0	406	26	432
% App. Total	7.8	92.2		0	0		94	6	
PHF	.395	.820	.757	.000	.000	.000	.752	.591	.794

N/S Street : Farm Street  
E/W Street : Woodville School Entrance  
City/State : Wakefield, MA  
Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Woodville School Entrance  
 City/State : Wakefield, MA  
 Weather : Clear

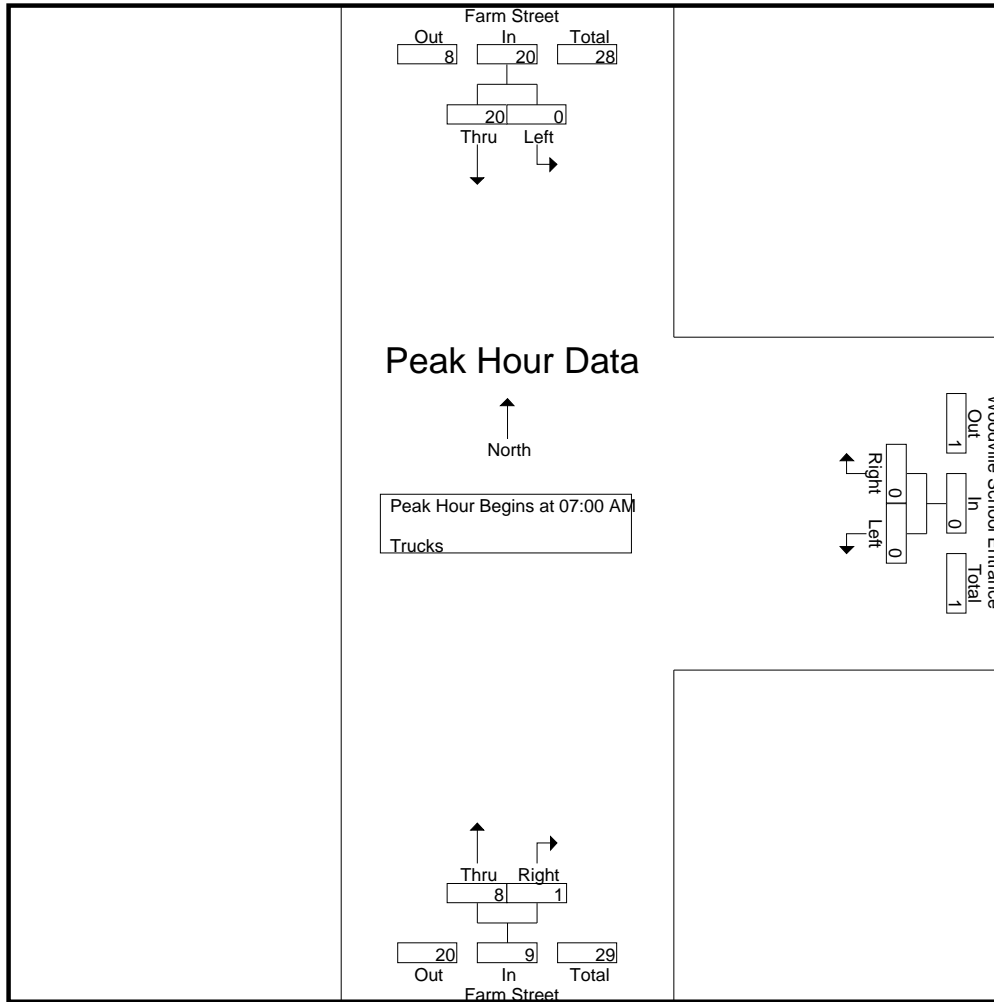
File Name : 40684002  
 Site Code : 40684002  
 Start Date : 11/16/2021  
 Page No : 7

### Groups Printed- Trucks

Start Time	Farm Street From North		Woodville School Entrance From East		Farm Street From South		Int. Total
	Left	Thru	Left	Right	Thru	Right	
07:00 AM	0	3	0	0	2	0	5
07:15 AM	0	4	0	0	2	0	6
07:30 AM	0	8	0	0	2	1	11
07:45 AM	0	5	0	0	2	0	7
<b>Total</b>	<b>0</b>	<b>20</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>1</b>	<b>29</b>
08:00 AM	0	1	0	0	1	0	2
08:15 AM	2	1	0	0	2	1	6
08:30 AM	0	0	0	0	2	0	2
08:45 AM	0	0	0	0	2	0	2
<b>Total</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>1</b>	<b>12</b>
<b>Grand Total</b>	<b>2</b>	<b>22</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>2</b>	<b>41</b>
Apprch %	8.3	91.7	0	0	88.2	11.8	
Total %	4.9	53.7	0	0	36.6	4.9	

Start Time	Farm Street From North			Woodville School Entrance From East			Farm Street From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. 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	3	3	0	0	0	2	0	2	5
07:15 AM	0	4	4	0	0	0	2	0	2	6
07:30 AM	0	8	8	0	0	0	2	1	3	11
07:45 AM	0	5	5	0	0	0	2	0	2	7
<b>Total Volume</b>	<b>0</b>	<b>20</b>	<b>20</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>1</b>	<b>9</b>	<b>29</b>
<b>% App. Total</b>	<b>0</b>	<b>100</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>88.9</b>	<b>11.1</b>	<b>11.1</b>	<b>11.1</b>
PHF	.000	.625	.625	.000	.000	.000	1.00	.250	.750	.659

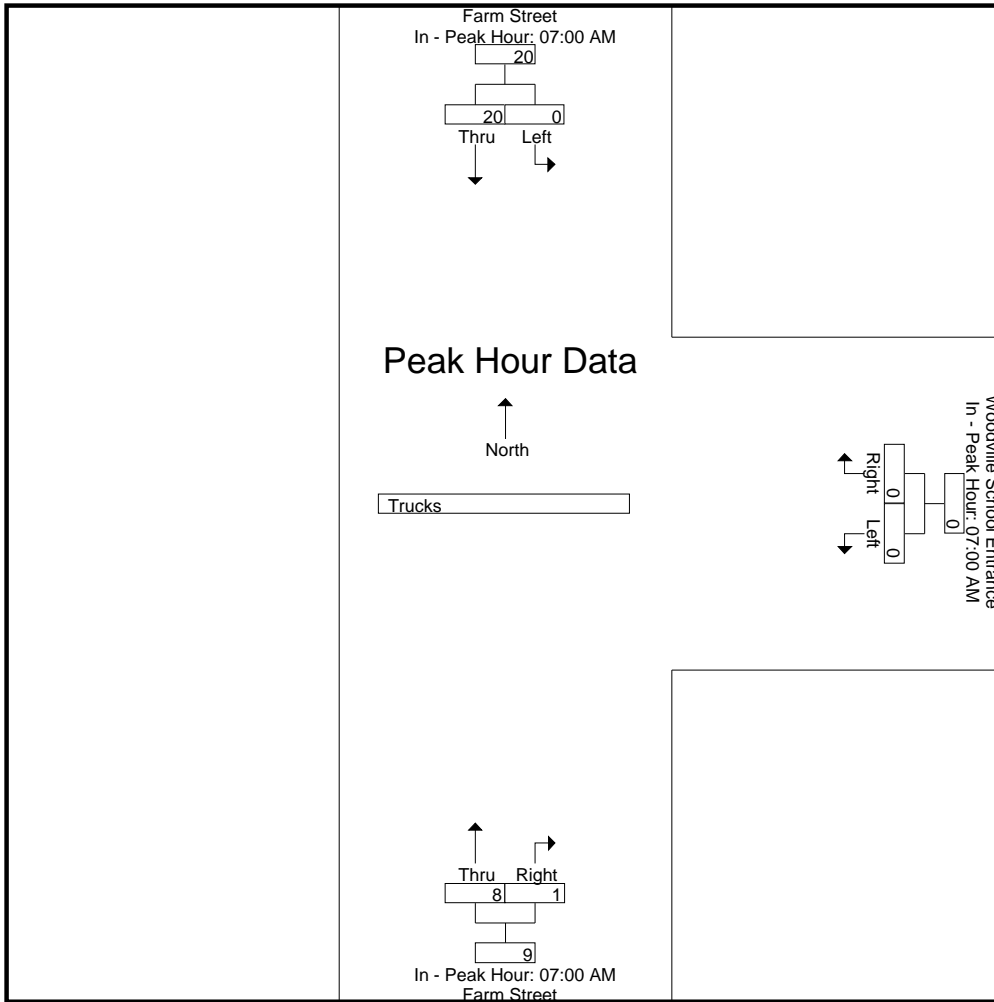
N/S Street : Farm Street  
E/W Street : Woodville School Entrance  
City/State : Wakefield, MA  
Weather : Clear



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		
+0 mins.	0	3	3	0	0	0	2	0	2
+15 mins.	0	4	4	0	0	0	2	0	2
+30 mins.	0	8	8	0	0	0	2	1	3
+45 mins.	0	5	5	0	0	0	2	0	2
Total Volume	0	20	20	0	0	0	8	1	9
% App. Total	0	100		0	0		88.9	11.1	
PHF	.000	.625	.625	.000	.000	.000	1.000	.250	.750

N/S Street : Farm Street  
E/W Street : Woodville School Entrance  
City/State : Wakefield, MA  
Weather : Clear

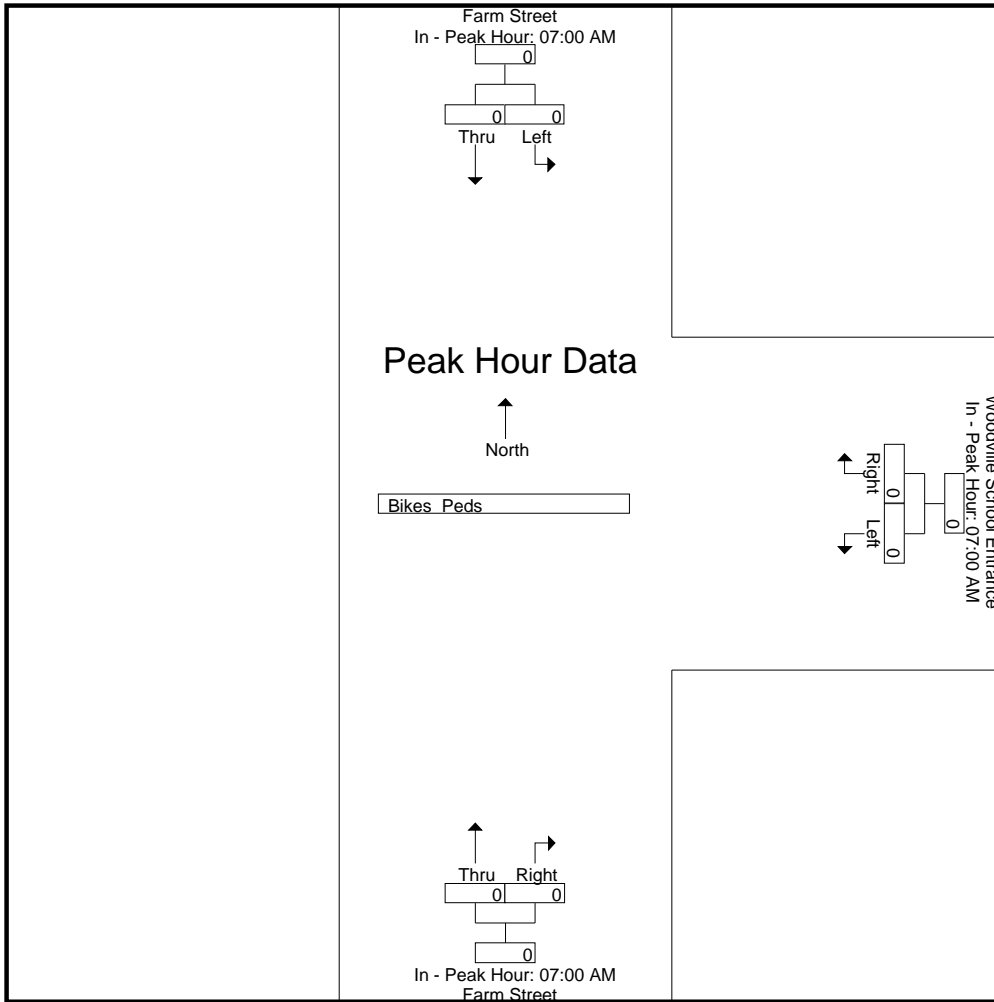








N/S Street : Farm Street  
E/W Street : Woodville School Entrance  
City/State : Wakefield, MA  
Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Woodville School Entrance  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 40684002  
 Site Code : 40684002  
 Start Date : 11/16/2021  
 Page No : 1

### Groups Printed- Cars - Trucks

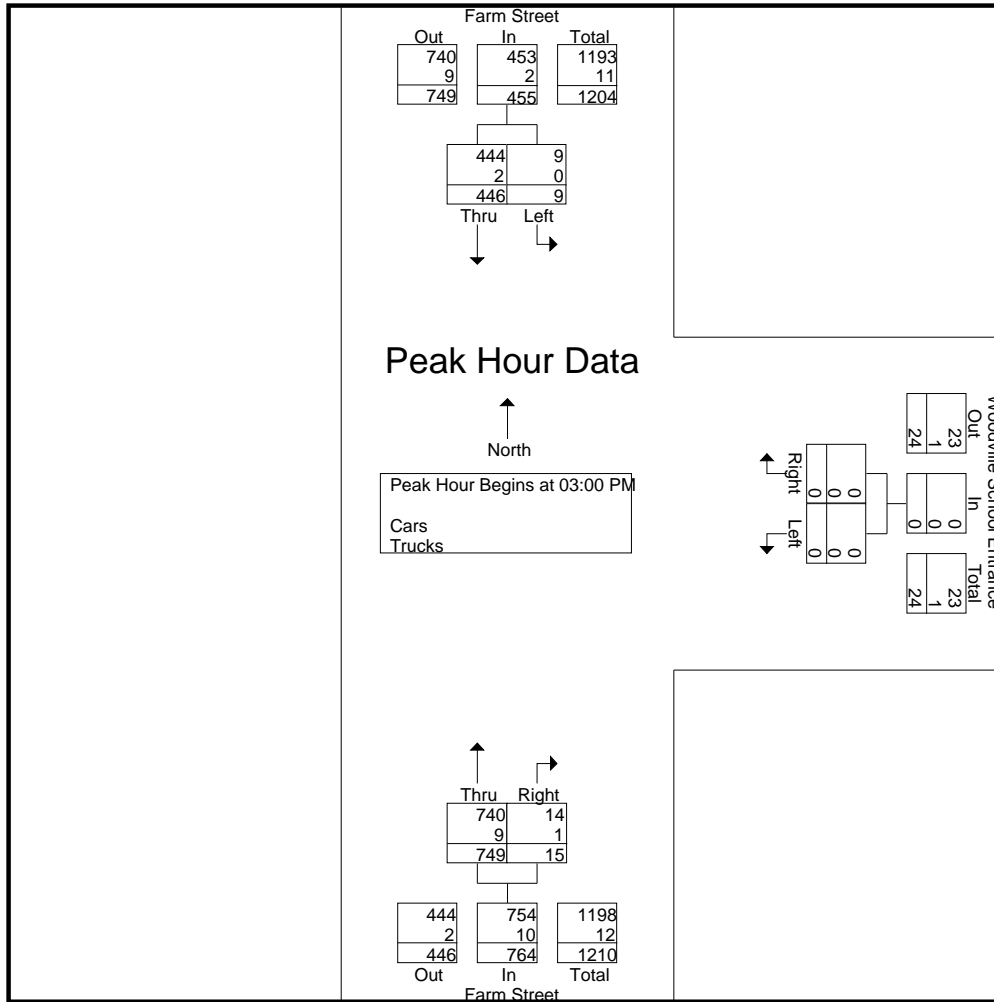
Start Time	Farm Street From North		Woodville School Entrance From East			Farm Street From South		Int. Total
	Left	Thru	Left	Right	Thru	Right		
02:00 PM	12	85	0	0	149	1	247	
02:15 PM	9	96	0	1	155	2	263	
02:30 PM	9	115	0	0	171	7	302	
02:45 PM	7	108	0	0	173	0	288	
<b>Total</b>	<b>37</b>	<b>404</b>	<b>0</b>	<b>1</b>	<b>648</b>	<b>10</b>	<b>1100</b>	
03:00 PM	1	125	0	0	173	4	303	
03:15 PM	2	102	0	0	193	3	300	
03:30 PM	2	122	0	0	197	2	323	
03:45 PM	4	97	0	0	186	6	293	
<b>Total</b>	<b>9</b>	<b>446</b>	<b>0</b>	<b>0</b>	<b>749</b>	<b>15</b>	<b>1219</b>	
<b>Grand Total</b>	<b>46</b>	<b>850</b>	<b>0</b>	<b>1</b>	<b>1397</b>	<b>25</b>	<b>2319</b>	
Apprch %	5.1	94.9	0	100	98.2	1.8		
Total %	2	36.7	0	0	60.2	1.1		
Cars	44	842	0	1	1373	21	2281	
% Cars	95.7	99.1	0	100	98.3	84	98.4	
Trucks	2	8	0	0	24	4	38	
% Trucks	4.3	0.9	0	0	1.7	16	1.6	

Start Time	Farm Street From North			Woodville School Entrance From East			Farm Street From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
<b>Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1</b>										
<b>Peak Hour for Entire Intersection Begins at 03:00 PM</b>										
03:00 PM	1	<b>125</b>	<b>126</b>	0	0	0	173	4	177	303
03:15 PM	2	102	104	0	0	0	193	3	196	300
03:30 PM	2	122	124	0	0	0	<b>197</b>	2	<b>199</b>	<b>323</b>
03:45 PM	<b>4</b>	97	101	0	0	0	186	<b>6</b>	192	293
<b>Total Volume</b>	<b>9</b>	<b>446</b>	<b>455</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>749</b>	<b>15</b>	<b>764</b>	<b>1219</b>
% App. Total	2	98		0	0		98	2		
PHF	.563	.892	.903	.000	.000	.000	.951	.625	.960	.943
Cars	9	444	453	0	0	0	740	14	754	1207
% Cars	100	99.6	99.6	0	0	0	98.8	93.3	98.7	99.0
Trucks	0	2	2	0	0	0	9	1	10	12
% Trucks	0	0.4	0.4	0	0	0	1.2	6.7	1.3	1.0

**Accurate Counts**  
978-664-2565

File Name : 40684002  
Site Code : 40684002  
Start Date : 11/16/2021  
Page No : 2

N/S Street : Farm Street  
E/W Street : Woodville School Entrance  
City/State : Wakefield, MA  
Weather : Clear



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

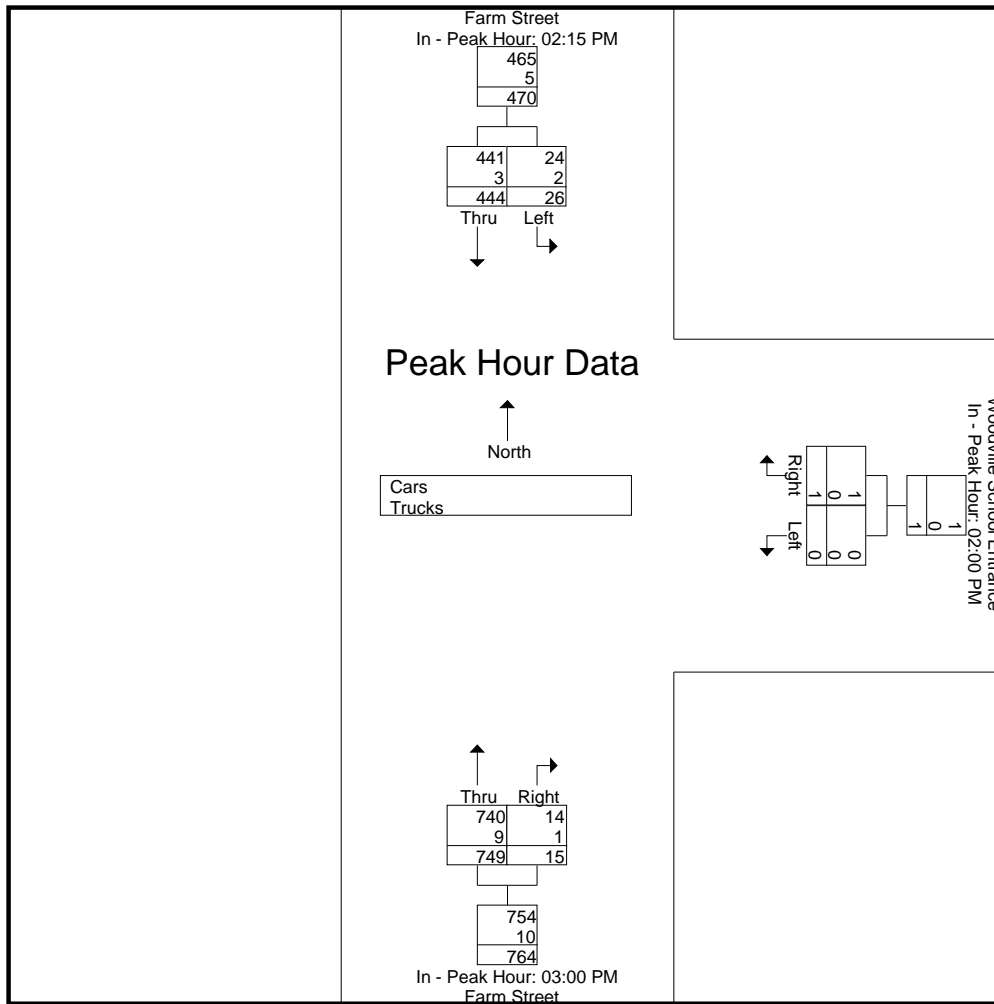
	02:15 PM			02:00 PM			03:00 PM		
+0 mins.	9	96	105	0	0	0	173	4	177
+15 mins.	9	115	124	0	1	1	193	3	196
+30 mins.	7	108	115	0	0	0	197	2	199
+45 mins.	1	125	126	0	0	0	186	6	192
Total Volume	26	444	470	0	1	1	749	15	764
% App. Total	5.5	94.5		0	100		98	2	
PHF	.722	.888	.933	.000	.250	.250	.951	.625	.960
Cars	24	441	465	0	1	1	740	14	754
% Cars	92.3	99.3	98.9	0	100	100	98.8	93.3	98.7
Trucks	2	3	5	0	0	0	9	1	10
% Trucks	7.7	0.7	1.1	0	0	0	1.2	6.7	1.3

# Accurate Counts

978-664-2565

File Name : 40684002  
 Site Code : 40684002  
 Start Date : 11/16/2021  
 Page No : 3

N/S Street : Farm Street  
 E/W Street : Woodville School Entrance  
 City/State : Wakefield, MA  
 Weather : Clear



**Accurate Counts**  
978-664-2565

N/S Street : Farm Street  
E/W Street : Woodville School Entrance  
City/State : Wakefield, MA  
Weather : Clear

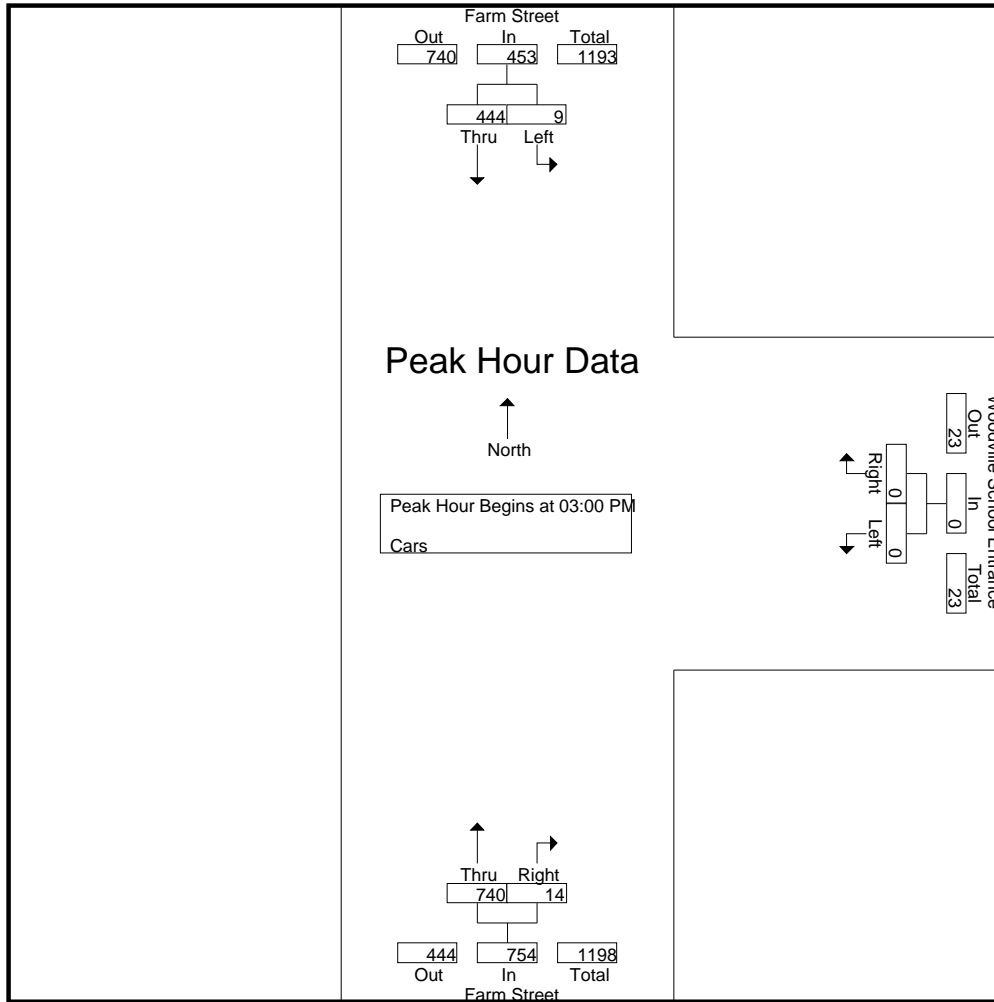
File Name : 40684002  
Site Code : 40684002  
Start Date : 11/16/2021  
Page No : 4

Groups Printed- Cars

Start Time	Farm Street From North		Woodville School Entrance From East		Farm Street From South		Int. Total
	Left	Thru	Left	Right	Thru	Right	
02:00 PM	12	82	0	0	145	1	240
02:15 PM	9	95	0	1	152	1	258
02:30 PM	8	115	0	0	169	5	297
02:45 PM	6	106	0	0	167	0	279
<b>Total</b>	<b>35</b>	<b>398</b>	<b>0</b>	<b>1</b>	<b>633</b>	<b>7</b>	<b>1074</b>
03:00 PM	1	125	0	0	173	3	302
03:15 PM	2	102	0	0	191	3	298
03:30 PM	2	122	0	0	195	2	321
03:45 PM	4	95	0	0	181	6	286
<b>Total</b>	<b>9</b>	<b>444</b>	<b>0</b>	<b>0</b>	<b>740</b>	<b>14</b>	<b>1207</b>
<b>Grand Total</b>	<b>44</b>	<b>842</b>	<b>0</b>	<b>1</b>	<b>1373</b>	<b>21</b>	<b>2281</b>
Apprch %	5	95	0	100	98.5	1.5	
Total %	1.9	36.9	0	0	60.2	0.9	

Start Time	Farm Street From North			Woodville School Entrance From East			Farm Street From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 03:00 PM										
03:00 PM	1	<b>125</b>	<b>126</b>	0	0	0	173	3	176	302
03:15 PM	2	102	104	0	0	0	191	3	194	298
03:30 PM	2	122	124	0	0	0	<b>195</b>	2	<b>197</b>	<b>321</b>
03:45 PM	<b>4</b>	95	99	0	0	0	181	<b>6</b>	187	286
Total Volume	9	444	453	0	0	0	740	14	754	1207
% App. Total	2	98		0	0		98.1	1.9		
PHF	.563	.888	.899	.000	.000	.000	.949	.583	.957	.940

N/S Street : Farm Street  
E/W Street : Woodville School Entrance  
City/State : Wakefield, MA  
Weather : Clear



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	02:45 PM			02:00 PM			03:00 PM		
+0 mins.	6	106	112	0	0	0	173	3	176
+15 mins.	1	125	126	0	1	1	191	3	194
+30 mins.	2	102	104	0	0	0	195	2	197
+45 mins.	2	122	124	0	0	0	181	6	187
Total Volume	11	455	466	0	1	1	740	14	754
% App. Total	2.4	97.6		0	100		98.1	1.9	
PHF	.458	.910	.925	.000	.250	.250	.949	.583	.957



# Accurate Counts

978-664-2565

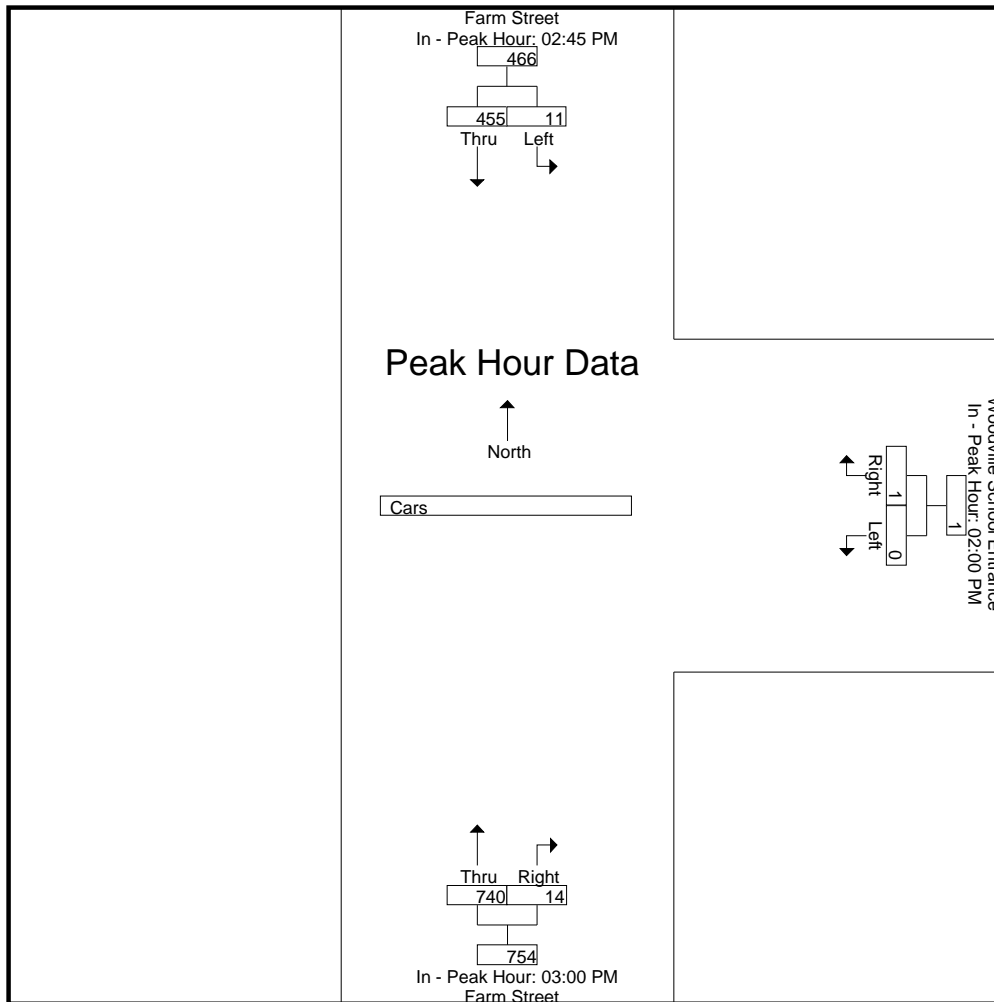
File Name : 40684002

Site Code : 40684002

Start Date : 11/16/2021

Page No : 6

N/S Street : Farm Street  
E/W Street : Woodville School Entrance  
City/State : Wakefield, MA  
Weather : Clear



**Accurate Counts**  
978-664-2565

N/S Street : Farm Street  
E/W Street : Woodville School Entrance  
City/State : Wakefield, MA  
Weather : Clear

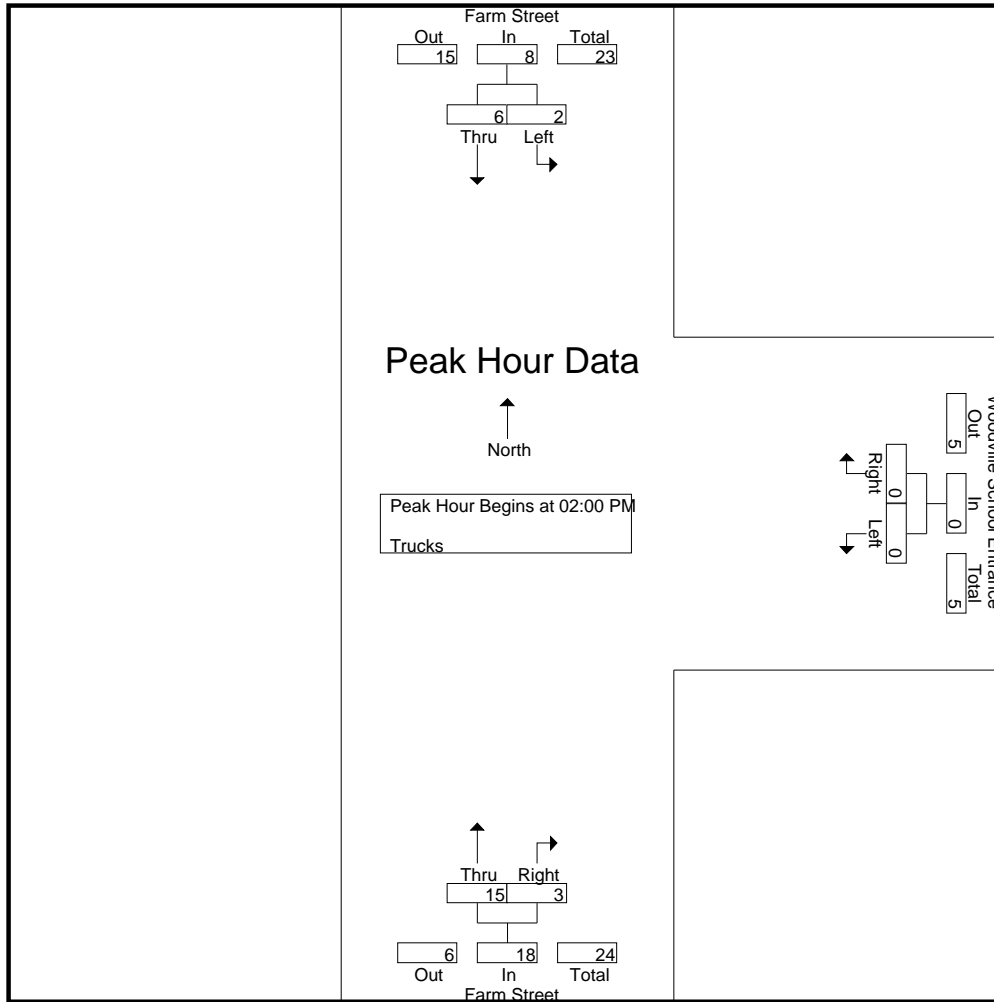
File Name : 40684002  
Site Code : 40684002  
Start Date : 11/16/2021  
Page No : 7

Groups Printed- Trucks

Start Time	Farm Street From North		Woodville School Entrance From East		Farm Street From South		Int. Total
	Left	Thru	Left	Right	Thru	Right	
02:00 PM	0	3	0	0	4	0	7
02:15 PM	0	1	0	0	3	1	5
02:30 PM	1	0	0	0	2	2	5
02:45 PM	1	2	0	0	6	0	9
<b>Total</b>	<b>2</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>3</b>	<b>26</b>
03:00 PM	0	0	0	0	0	1	1
03:15 PM	0	0	0	0	2	0	2
03:30 PM	0	0	0	0	2	0	2
03:45 PM	0	2	0	0	5	0	7
<b>Total</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>1</b>	<b>12</b>
<b>Grand Total</b>	<b>2</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>24</b>	<b>4</b>	<b>38</b>
Apprch %	20	80	0	0	85.7	14.3	
Total %	5.3	21.1	0	0	63.2	10.5	

Start Time	Farm Street From North			Woodville School Entrance From East			Farm Street From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:00 PM										
02:00 PM	0	<b>3</b>	<b>3</b>	0	0	0	4	0	4	7
02:15 PM	0	1	1	0	0	0	3	1	4	5
02:30 PM	<b>1</b>	0	1	0	0	0	2	<b>2</b>	4	5
02:45 PM	1	2	3	0	0	0	<b>6</b>	0	<b>6</b>	<b>9</b>
Total Volume	2	6	8	0	0	0	15	3	18	26
% App. Total	25	75		0	0		83.3	16.7		
PHF	.500	.500	.667	.000	.000	.000	.625	.375	.750	.722

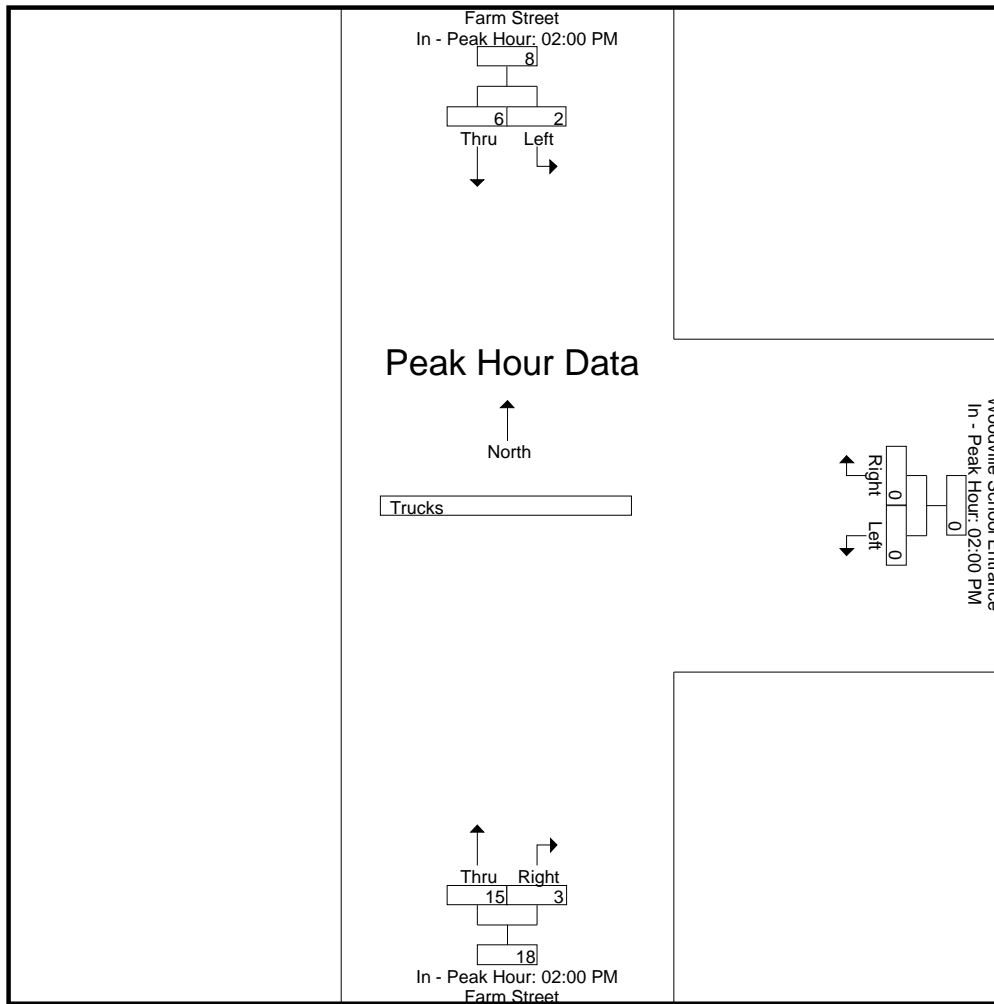
N/S Street : Farm Street  
E/W Street : Woodville School Entrance  
City/State : Wakefield, MA  
Weather : Clear



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	02:00 PM			02:00 PM			02:00 PM		
+0 mins.	0	<b>3</b>	<b>3</b>	0	0	0	4	0	4
+15 mins.	0	1	1	0	0	0	3	1	4
+30 mins.	1	0	1	0	0	0	2	<b>2</b>	4
+45 mins.	1	2	3	0	0	0	<b>6</b>	0	<b>6</b>
Total Volume	2	6	8	0	0	0	15	3	18
% App. Total	25	75		0	0		83.3	16.7	
PHF	.500	.500	.667	.000	.000	.000	.625	.375	.750

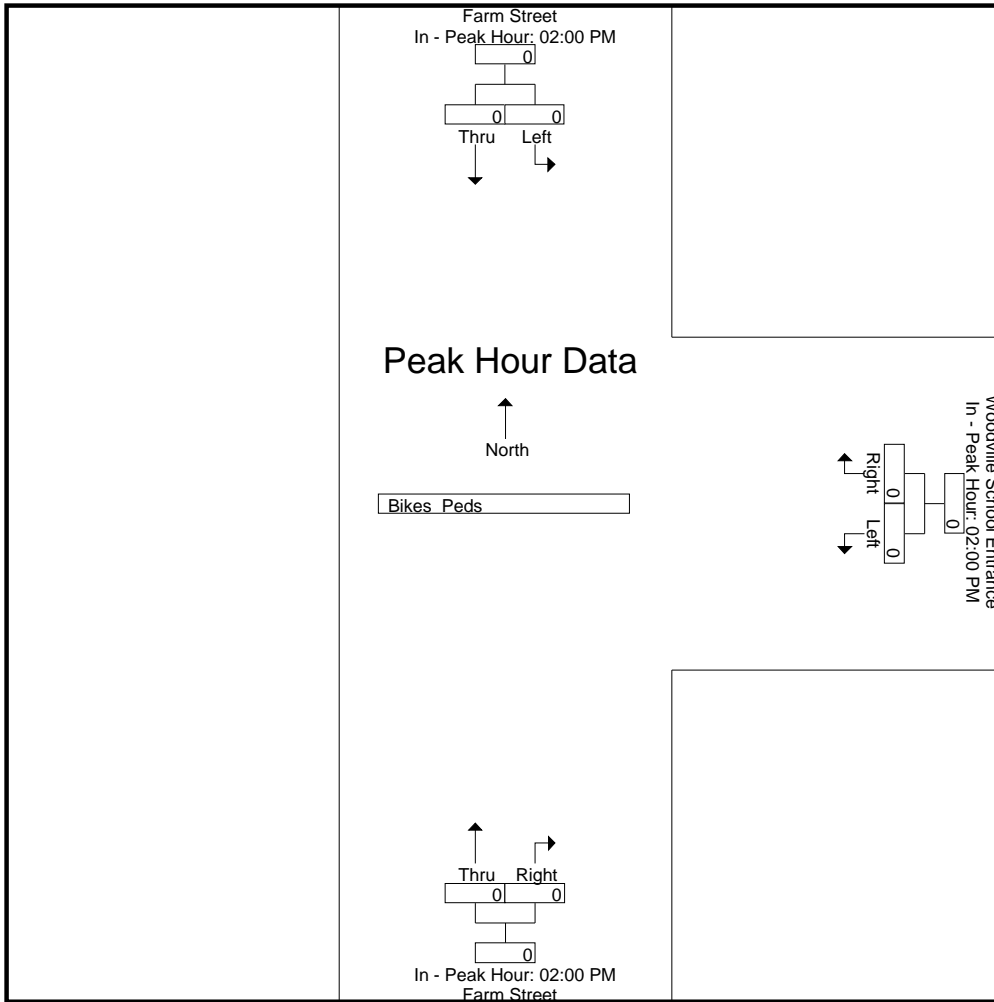
N/S Street : Farm Street  
E/W Street : Woodville School Entrance  
City/State : Wakefield, MA  
Weather : Clear







N/S Street : Farm Street  
E/W Street : Woodville School Entrance  
City/State : Wakefield, MA  
Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Woodville School Exit  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 40684003  
 Site Code : 40684003  
 Start Date : 11/16/2021  
 Page No : 1

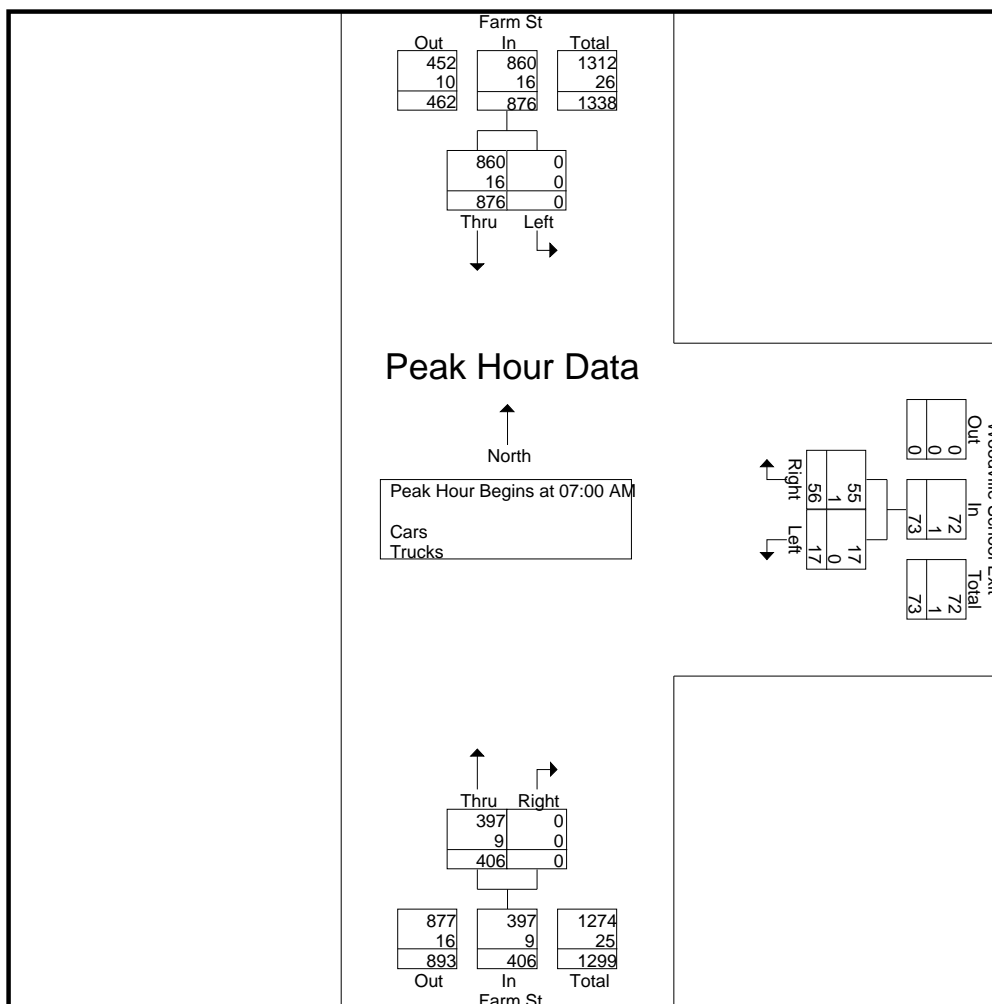
### Groups Printed- Cars - Trucks

Start Time	Farm St From North		Woodville School Exit From East			Farm St From South		Int. Total
	Left	Thru	Left	Right	Thru	Right		
07:00 AM	0	211	2	6	82	0	301	
07:15 AM	0	284	7	34	136	0	461	
07:30 AM	0	213	4	9	100	0	326	
07:45 AM	0	168	4	7	88	0	267	
<b>Total</b>	<b>0</b>	<b>876</b>	<b>17</b>	<b>56</b>	<b>406</b>	<b>0</b>	<b>1355</b>	
08:00 AM	0	136	3	3	83	0	225	
08:15 AM	0	146	4	8	95	0	253	
08:30 AM	0	164	4	12	141	0	321	
08:45 AM	0	114	3	3	85	0	205	
<b>Total</b>	<b>0</b>	<b>560</b>	<b>14</b>	<b>26</b>	<b>404</b>	<b>0</b>	<b>1004</b>	
<b>Grand Total</b>	<b>0</b>	<b>1436</b>	<b>31</b>	<b>82</b>	<b>810</b>	<b>0</b>	<b>2359</b>	
Apprch %	0	100	27.4	72.6	100	0		
Total %	0	60.9	1.3	3.5	34.3	0		
Cars	0	1415	31	78	797	0	2321	
% Cars	0	98.5	100	95.1	98.4	0	98.4	
Trucks	0	21	0	4	13	0	38	
% Trucks	0	1.5	0	4.9	1.6	0	1.6	

Start Time	Farm St From North			Woodville School Exit From East			Farm St From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. 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	211	211	2	6	8	82	0	82	301
07:15 AM	0	<b>284</b>	<b>284</b>	<b>7</b>	<b>34</b>	<b>41</b>	<b>136</b>	<b>0</b>	<b>136</b>	<b>461</b>
07:30 AM	0	213	213	4	9	13	100	0	100	326
07:45 AM	0	168	168	4	7	11	88	0	88	267
<b>Total Volume</b>	<b>0</b>	<b>876</b>	<b>876</b>	<b>17</b>	<b>56</b>	<b>73</b>	<b>406</b>	<b>0</b>	<b>406</b>	<b>1355</b>
% App. Total	0	100		23.3	76.7		100	0		
PHF	.000	.771	.771	.607	.412	.445	.746	.000	.746	.735
Cars	0	860	860	17	55	72	397	0	397	1329
% Cars	0	98.2	98.2	100	98.2	98.6	97.8	0	97.8	98.1
Trucks	0	16	16	0	1	1	9	0	9	26
% Trucks	0	1.8	1.8	0	1.8	1.4	2.2	0	2.2	1.9



N/S Street : Farm Street  
E/W Street : Woodville School Exit  
City/State : Wakefield, MA  
Weather : Clear



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			07:15 AM		
+0 mins.	0	211	211	2	6	8
+15 mins.	0	<b>284</b>	<b>284</b>	<b>7</b>	<b>34</b>	<b>41</b>
+30 mins.	0	213	213	4	9	13
+45 mins.	0	168	168	4	7	11
Total Volume	0	876	876	17	56	73
% App. Total	0	100		23.3	76.7	
PHF	.000	.771	.771	.607	.412	.445
Cars	0	860	860	17	55	72
% Cars	0	98.2	98.2	100	98.2	98.6
Trucks	0	16	16	0	1	1
% Trucks	0	1.8	1.8	0	1.8	1.4

# Accurate Counts

978-664-2565

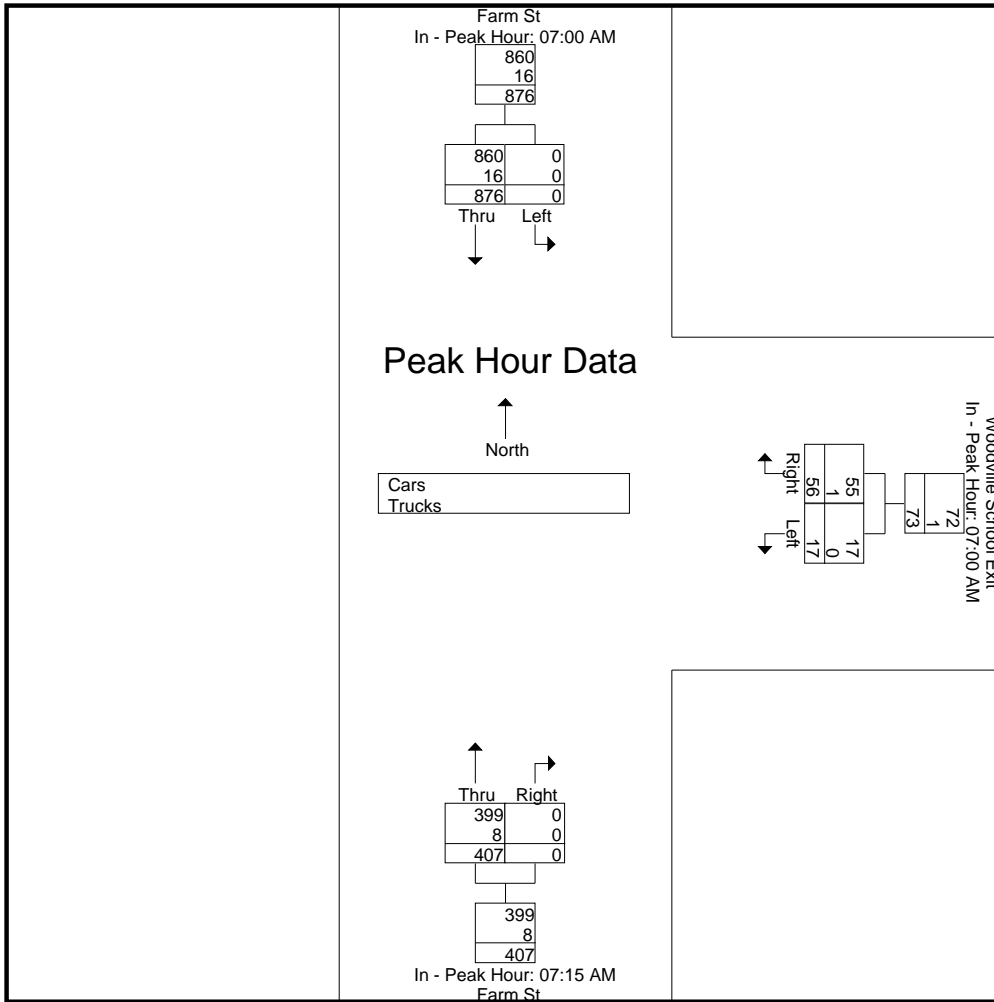
File Name : 40684003

Site Code : 40684003

Start Date : 11/16/2021

Page No : 3

N/S Street : Farm Street  
 E/W Street : Woodville School Exit  
 City/State : Wakefield, MA  
 Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Woodville School Exit  
 City/State : Wakefield, MA  
 Weather : Clear

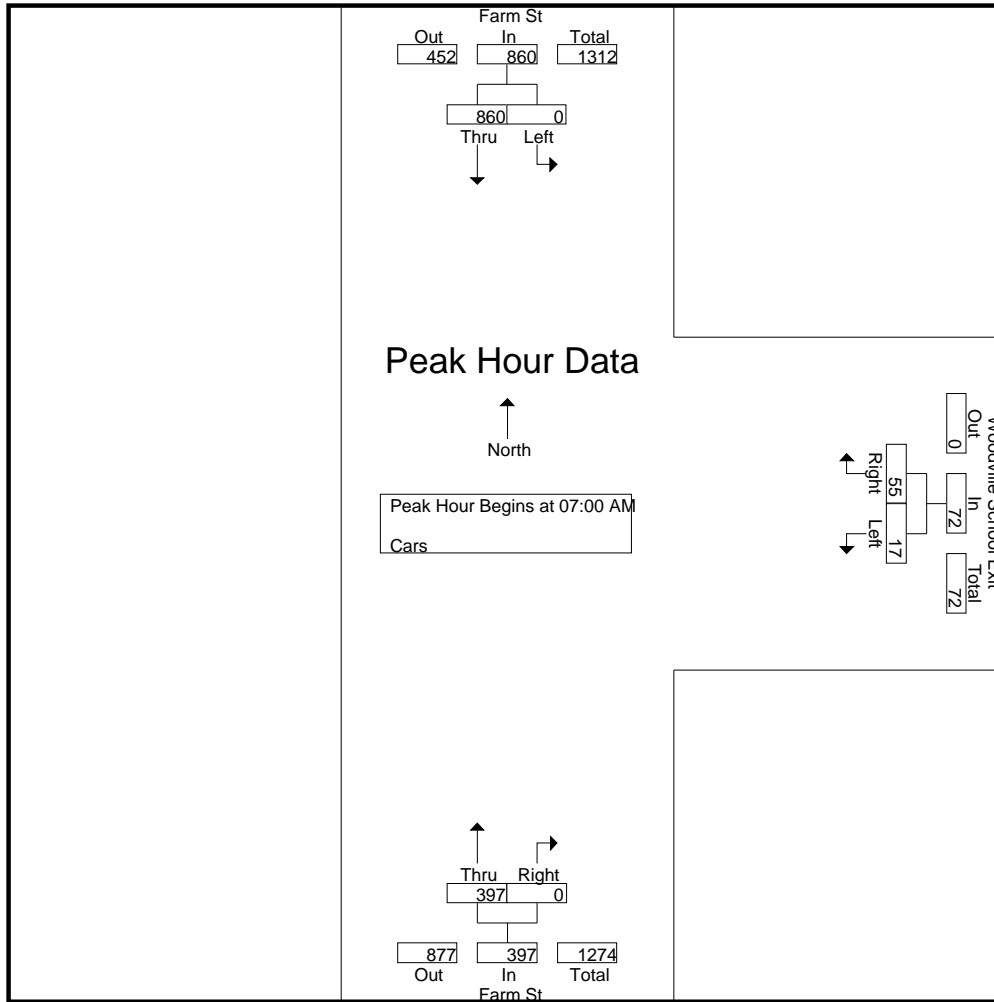
File Name : 40684003  
 Site Code : 40684003  
 Start Date : 11/16/2021  
 Page No : 4

### Groups Printed- Cars

Start Time	Farm St From North		Woodville School Exit From East		Farm St From South		Int. Total
	Left	Thru	Left	Right	Thru	Right	
07:00 AM	0	208	2	6	80	0	296
07:15 AM	0	281	7	34	133	0	455
07:30 AM	0	208	4	8	98	0	318
07:45 AM	0	163	4	7	86	0	260
<b>Total</b>	<b>0</b>	<b>860</b>	<b>17</b>	<b>55</b>	<b>397</b>	<b>0</b>	<b>1329</b>
08:00 AM	0	135	3	3	82	0	223
08:15 AM	0	142	4	5	94	0	245
08:30 AM	0	164	4	12	140	0	320
08:45 AM	0	114	3	3	84	0	204
<b>Total</b>	<b>0</b>	<b>555</b>	<b>14</b>	<b>23</b>	<b>400</b>	<b>0</b>	<b>992</b>
<b>Grand Total</b>	<b>0</b>	<b>1415</b>	<b>31</b>	<b>78</b>	<b>797</b>	<b>0</b>	<b>2321</b>
Apprch %	0	100	28.4	71.6	100	0	
Total %	0	61	1.3	3.4	34.3	0	

Start Time	Farm St From North			Woodville School Exit From East			Farm St From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. 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	208	208	2	6	8	80	0	80	296
07:15 AM	0	<b>281</b>	<b>281</b>	<b>7</b>	<b>34</b>	<b>41</b>	<b>133</b>	0	<b>133</b>	<b>455</b>
07:30 AM	0	208	208	4	8	12	98	0	98	318
07:45 AM	0	163	163	4	7	11	86	0	86	260
Total Volume	0	860	860	17	55	72	397	0	397	1329
% App. Total	0	100		23.6	76.4		100	0		
PHF	.000	.765	.765	.607	.404	.439	.746	.000	.746	.730

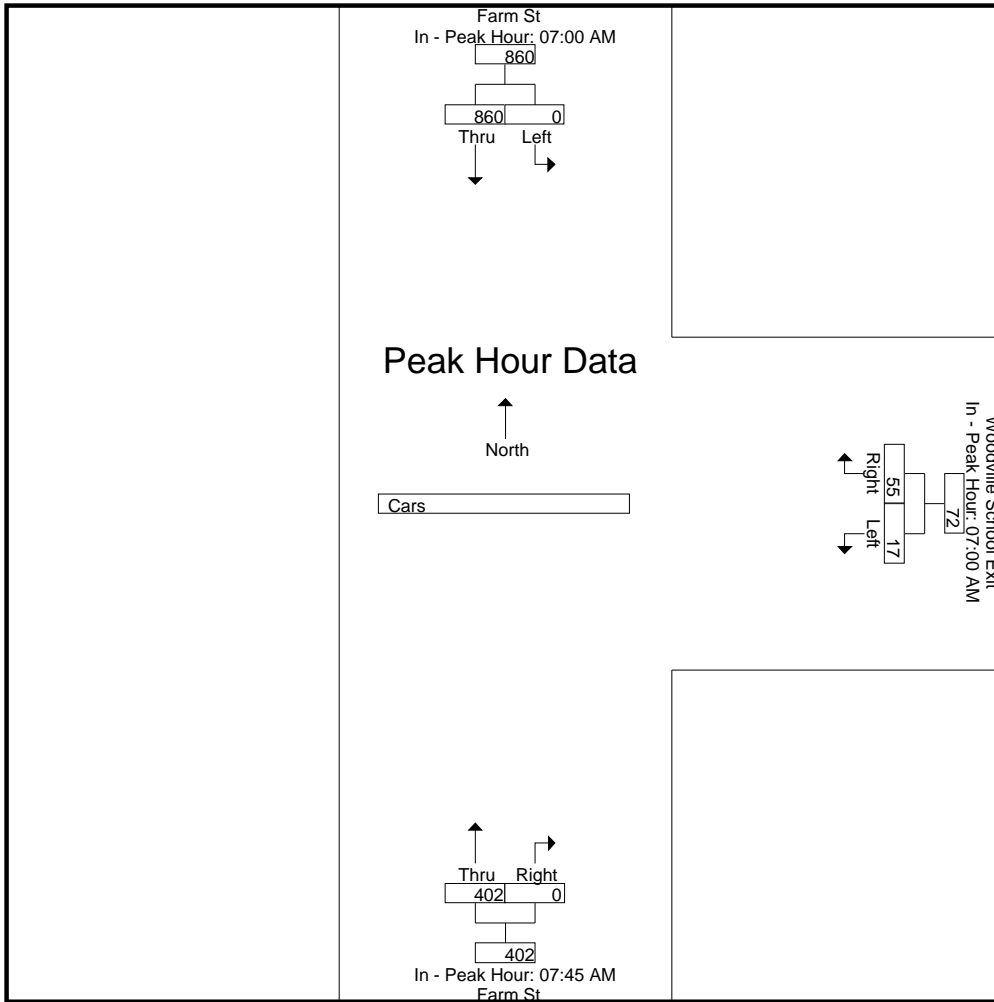
N/S Street : Farm Street  
E/W Street : Woodville School Exit  
City/State : Wakefield, MA  
Weather : Clear



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			07:45 AM		
+0 mins.	0	208	208	2	6	8	86	0	86
+15 mins.	0	<b>281</b>	<b>281</b>	<b>7</b>	<b>34</b>	<b>41</b>	82	0	82
+30 mins.	0	208	208	4	8	12	94	0	94
+45 mins.	0	163	163	4	7	11	<b>140</b>	0	<b>140</b>
Total Volume	0	860	860	17	55	72	402	0	402
% App. Total	0	100		23.6	76.4		100	0	
PHF	.000	.765	.765	.607	.404	.439	.718	.000	.718

N/S Street : Farm Street  
E/W Street : Woodville School Exit  
City/State : Wakefield, MA  
Weather : Clear



**Accurate Counts**  
978-664-2565

N/S Street : Farm Street  
E/W Street : Woodville School Exit  
City/State : Wakefield, MA  
Weather : Clear

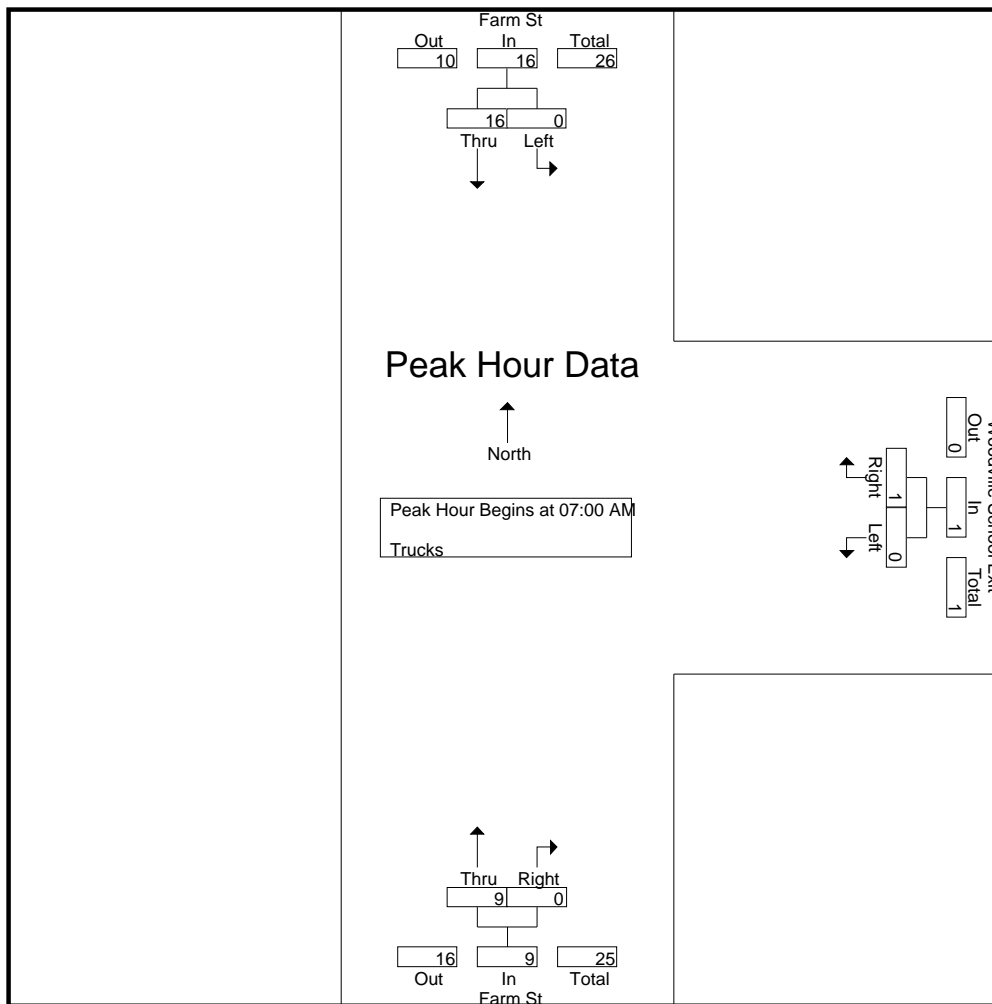
File Name : 40684003  
Site Code : 40684003  
Start Date : 11/16/2021  
Page No : 7

Groups Printed- Trucks

Start Time	Farm St From North		Woodville School Exit From East		Farm St From South		Int. Total
	Left	Thru	Left	Right	Thru	Right	
07:00 AM	0	3	0	0	2	0	5
07:15 AM	0	3	0	0	3	0	6
07:30 AM	0	5	0	1	2	0	8
07:45 AM	0	5	0	0	2	0	7
Total	0	16	0	1	9	0	26
08:00 AM	0	1	0	0	1	0	2
08:15 AM	0	4	0	3	1	0	8
08:30 AM	0	0	0	0	1	0	1
08:45 AM	0	0	0	0	1	0	1
Total	0	5	0	3	4	0	12
Grand Total	0	21	0	4	13	0	38
Apprch %	0	100	0	100	100	0	
Total %	0	55.3	0	10.5	34.2	0	

Start Time	Farm St From North			Woodville School Exit From East			Farm St From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. 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	3	3	0	0	0	2	0	2	5
07:15 AM	0	3	3	0	0	0	3	0	3	6
07:30 AM	0	5	5	0	1	1	2	0	2	8
07:45 AM	0	5	5	0	0	0	2	0	2	7
Total Volume	0	16	16	0	1	1	9	0	9	26
% App. Total	0	100		0	100		100	0		
PHF	.000	.800	.800	.000	.250	.250	.750	.000	.750	.813

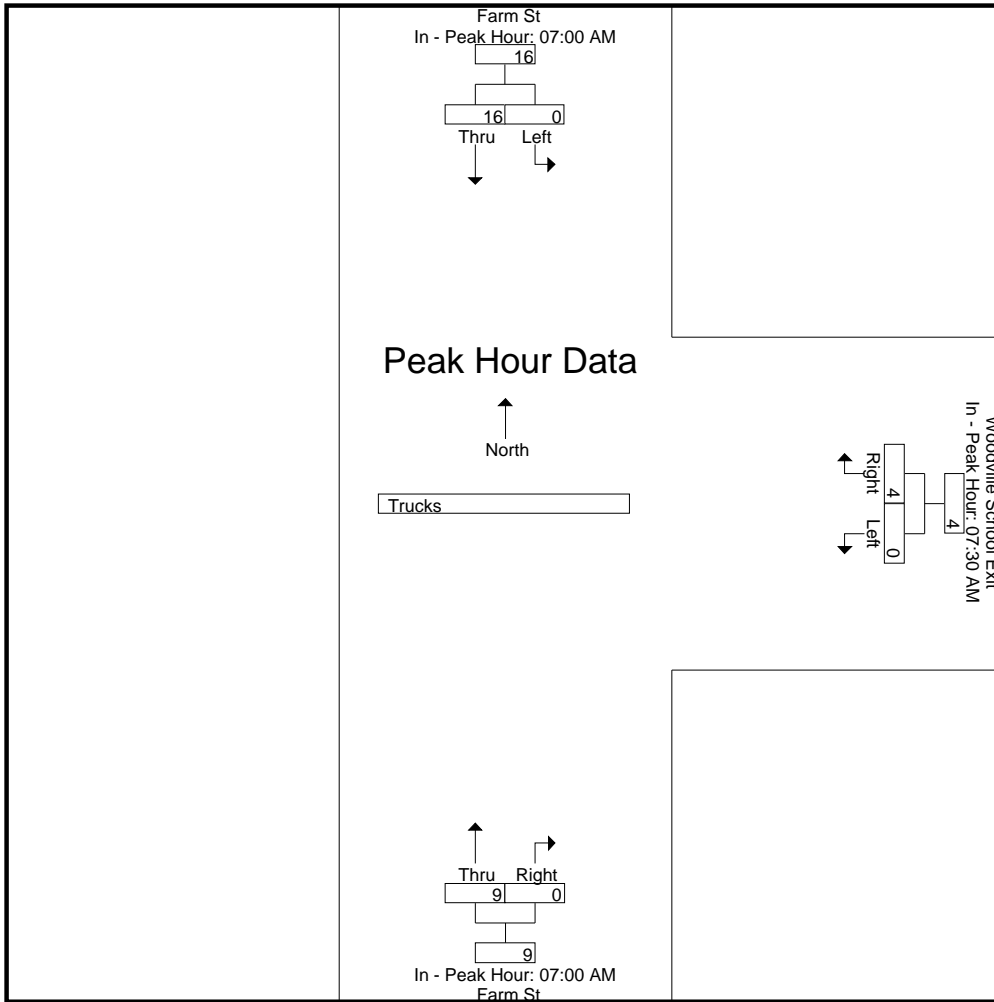
N/S Street : Farm Street  
E/W Street : Woodville School Exit  
City/State : Wakefield, MA  
Weather : Clear



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			07:30 AM			07:00 AM		
+0 mins.	0	3	3	0	1	1	2	0	2
+15 mins.	0	3	3	0	0	0	<b>3</b>	0	<b>3</b>
+30 mins.	0	<b>5</b>	<b>5</b>	0	0	0	2	0	2
+45 mins.	0	5	5	0	<b>3</b>	<b>3</b>	2	0	2
Total Volume	0	16	16	0	4	4	9	0	9
% App. Total	0	100		0	100		100	0	
PHF	.000	.800	.800	.000	.333	.333	.750	.000	.750

N/S Street : Farm Street  
E/W Street : Woodville School Exit  
City/State : Wakefield, MA  
Weather : Clear





**Accurate Counts**  
978-664-2565

N/S Street : Farm Street  
E/W Street : Woodville School Exit  
City/State : Wakefield, MA  
Weather : Clear

File Name : 40684003  
Site Code : 40684003  
Start Date : 11/16/2021  
Page No : 10

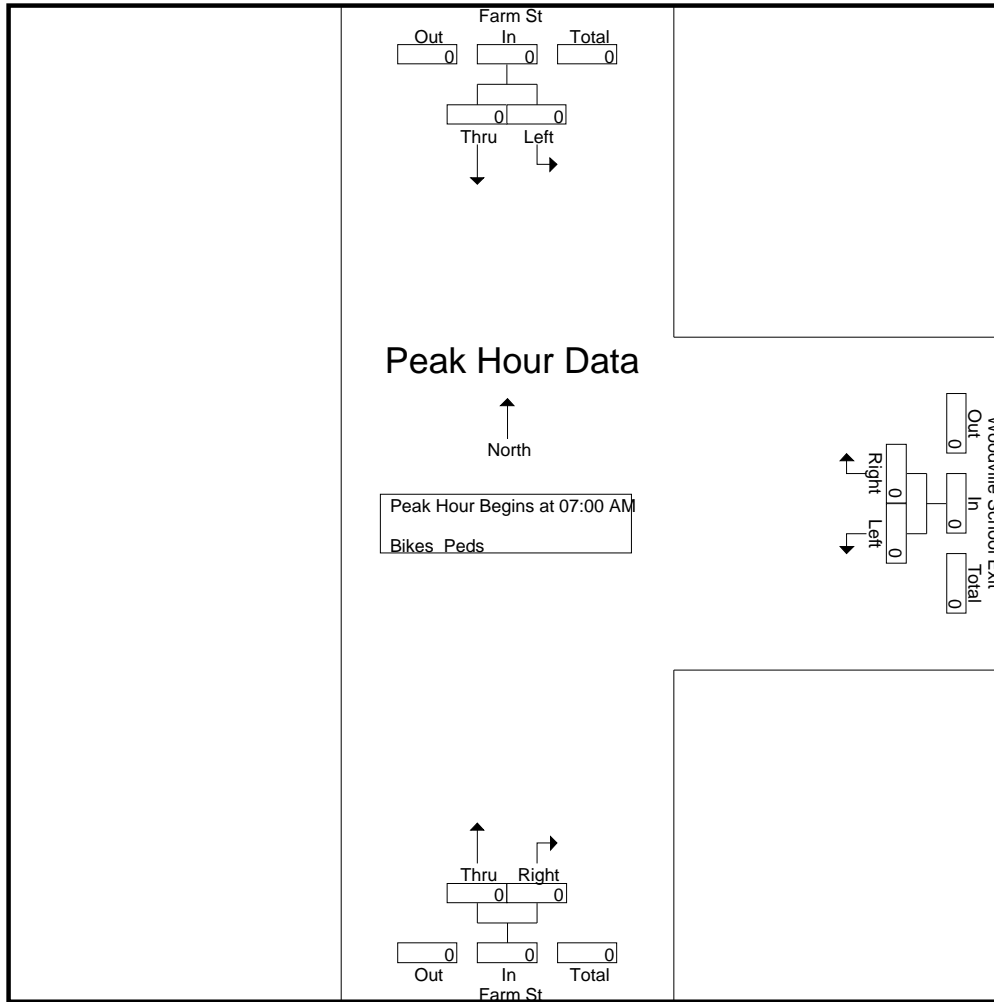
Groups Printed- Bikes Peds

Start Time	Farm St From North			Woodville School Exit From East			Farm St From South			Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds			
07:00 AM	0	0	0	0	0	0	0	0	3	3	0	3
07:15 AM	0	0	0	0	0	2	0	0	1	3	0	3
07:30 AM	0	0	0	0	0	0	0	0	1	1	0	1
07:45 AM	0	0	0	0	0	0	0	0	1	1	0	1
Total	0	0	0	0	0	2	0	0	6	8	0	8
08:00 AM	0	0	0	0	0	0	0	0	2	2	0	2
08:15 AM	0	0	0	0	0	10	0	0	19	29	0	29
08:30 AM	0	0	0	0	0	4	0	0	26	30	0	30
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	14	0	0	47	61	0	61
Grand Total	0	0	0	0	0	16	0	0	53	69	0	69
Apprch %	0	0		0	0		0	0				
Total %										100	0	

Start Time	Farm St From North			Woodville School Exit From East			Farm St From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
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

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

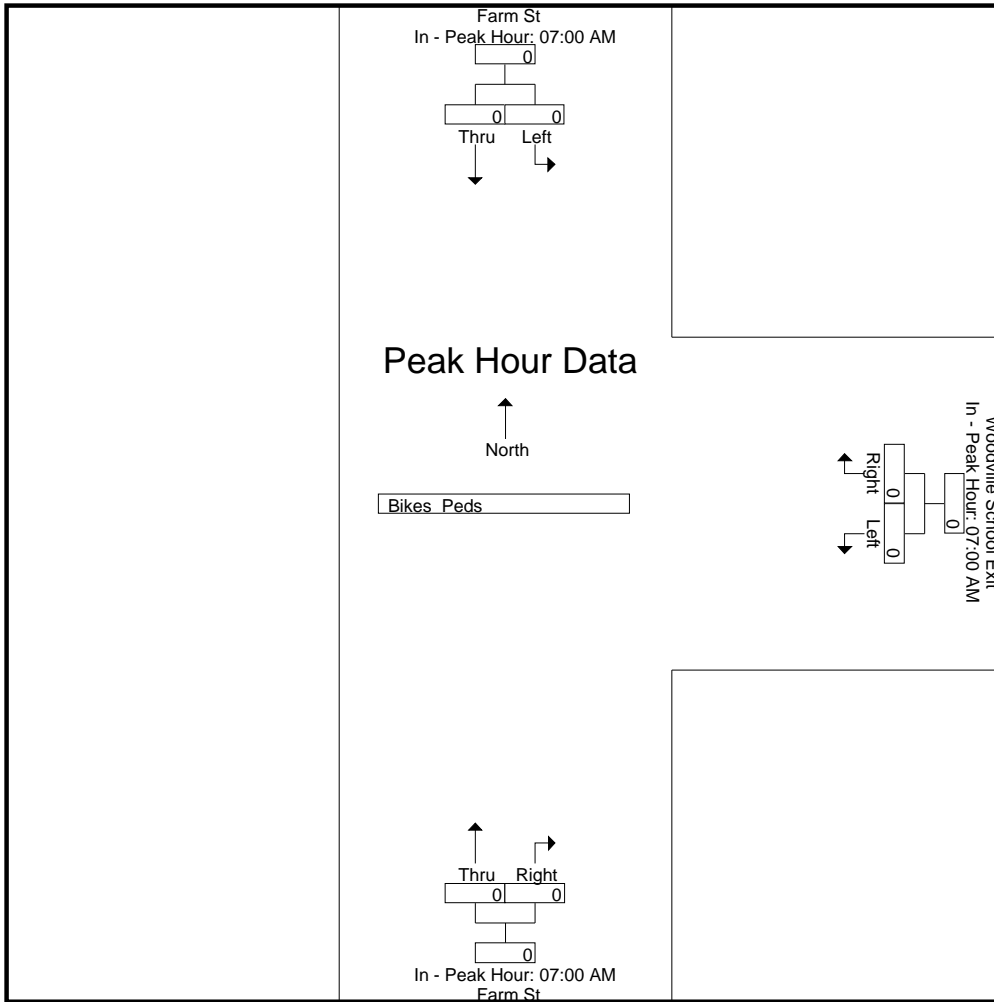
N/S Street : Farm Street  
E/W Street : Woodville School Exit  
City/State : Wakefield, MA  
Weather : Clear



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		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	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

N/S Street : Farm Street  
E/W Street : Woodville School Exit  
City/State : Wakefield, MA  
Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Woodville School Exit  
 City/State : Wakefield, MA  
 Weather : Clear

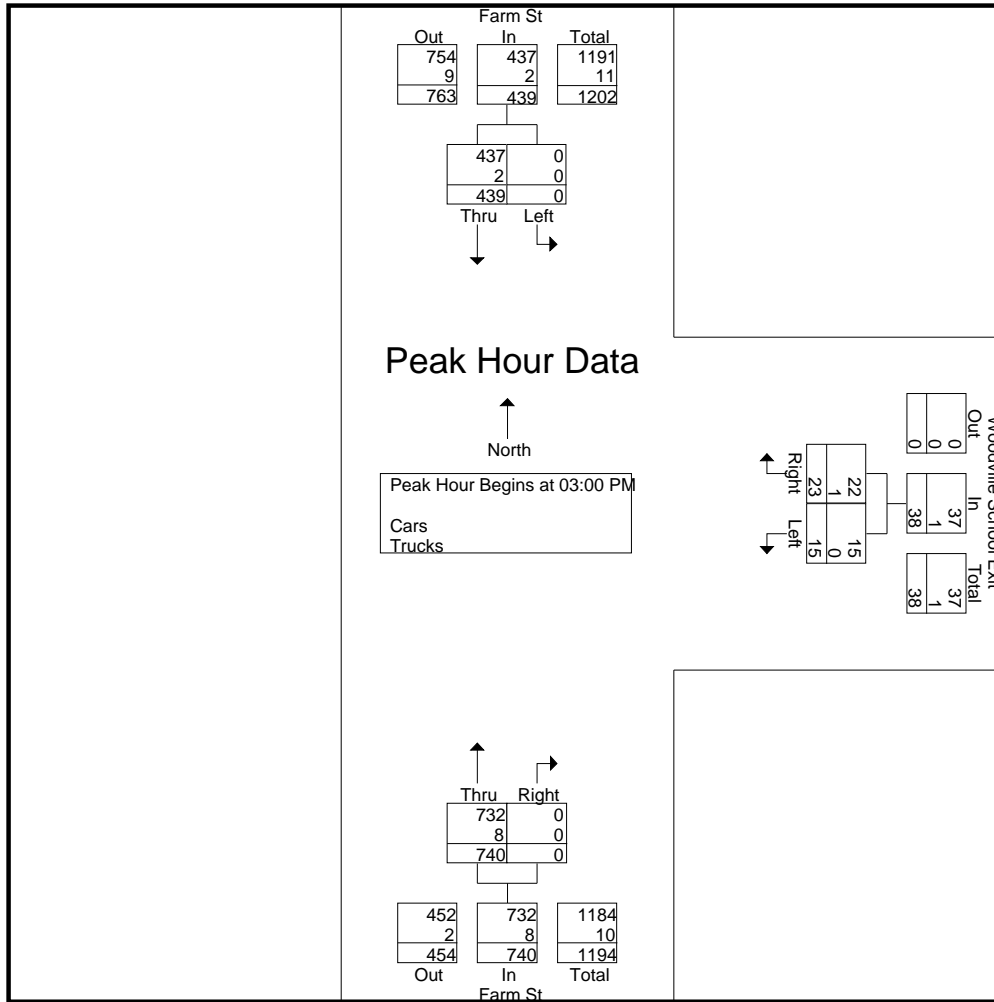
File Name : 40684003  
 Site Code : 40684003  
 Start Date : 11/16/2021  
 Page No : 1

### Groups Printed- Cars - Trucks

Start Time	Farm St From North		Woodville School Exit From East			Farm St From South		Int. Total
	Left	Thru	Left	Right	Thru	Right		
02:00 PM	0	105	2	15	147	0	269	
02:15 PM	0	105	0	9	154	0	268	
02:30 PM	0	129	2	4	161	0	296	
02:45 PM	0	100	4	16	169	0	289	
<b>Total</b>	<b>0</b>	<b>439</b>	<b>8</b>	<b>44</b>	<b>631</b>	<b>0</b>	<b>1122</b>	
03:00 PM	0	119	6	6	167	0	298	
03:15 PM	0	98	3	9	190	0	300	
03:30 PM	0	119	5	3	199	0	326	
03:45 PM	0	103	1	5	184	0	293	
<b>Total</b>	<b>0</b>	<b>439</b>	<b>15</b>	<b>23</b>	<b>740</b>	<b>0</b>	<b>1217</b>	
<b>Grand Total</b>	<b>0</b>	<b>878</b>	<b>23</b>	<b>67</b>	<b>1371</b>	<b>0</b>	<b>2339</b>	
Apprch %	0	100	25.6	74.4	100	0		
Total %	0	37.5	1	2.9	58.6	0		
Cars	0	870	22	63	1352	0	2307	
% Cars	0	99.1	95.7	94	98.6	0	98.6	
Trucks	0	8	1	4	19	0	32	
% Trucks	0	0.9	4.3	6	1.4	0	1.4	

Start Time	Farm St From North			Woodville School Exit From East			Farm St From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
<b>Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1</b>										
<b>Peak Hour for Entire Intersection Begins at 03:00 PM</b>										
03:00 PM	0	<b>119</b>	<b>119</b>	<b>6</b>	6	<b>12</b>	167	0	167	298
03:15 PM	0	98	98	3	<b>9</b>	12	190	0	190	300
03:30 PM	0	119	119	5	3	8	<b>199</b>	0	<b>199</b>	<b>326</b>
03:45 PM	0	103	103	1	5	6	184	0	184	293
<b>Total Volume</b>	0	439	439	15	23	38	740	0	740	1217
% App. Total	0	100		39.5	60.5		100	0		
PHF	.000	.922	.922	.625	.639	.792	.930	.000	.930	.933
Cars	0	437	437	15	22	37	732	0	732	1206
% Cars	0	99.5	99.5	100	95.7	97.4	98.9	0	98.9	99.1
Trucks	0	2	2	0	1	1	8	0	8	11
% Trucks	0	0.5	0.5	0	4.3	2.6	1.1	0	1.1	0.9

N/S Street : Farm Street  
E/W Street : Woodville School Exit  
City/State : Wakefield, MA  
Weather : Clear



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

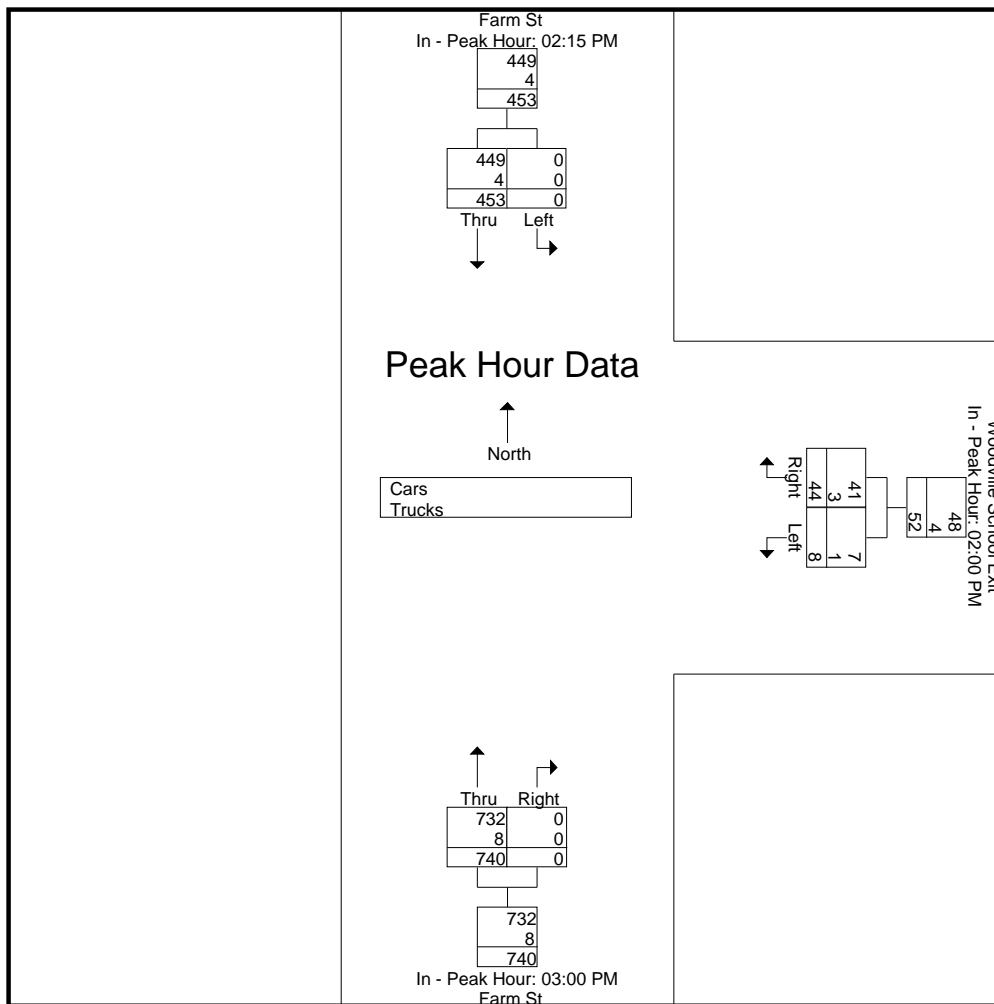
	02:15 PM			02:00 PM			03:00 PM		
+0 mins.	0	105	105	2	15	17	167	0	167
+15 mins.	0	<b>129</b>	<b>129</b>	0	9	9	190	0	190
+30 mins.	0	100	100	2	4	6	<b>199</b>	0	<b>199</b>
+45 mins.	0	119	119	<b>4</b>	<b>16</b>	<b>20</b>	184	0	184
Total Volume	0	453	453	8	44	52	740	0	740
% App. Total	0	100		15.4	84.6		100	0	
PHF	.000	.878	.878	.500	.688	.650	.930	.000	.930
Cars	0	449	449	7	41	48	732	0	732
% Cars	0	99.1	99.1	87.5	93.2	92.3	98.9	0	98.9
Trucks	0	4	4	1	3	4	8	0	8
% Trucks	0	0.9	0.9	12.5	6.8	7.7	1.1	0	1.1

# Accurate Counts

978-664-2565

File Name : 40684003  
 Site Code : 40684003  
 Start Date : 11/16/2021  
 Page No : 3

N/S Street : Farm Street  
 E/W Street : Woodville School Exit  
 City/State : Wakefield, MA  
 Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Woodville School Exit  
 City/State : Wakefield, MA  
 Weather : Clear

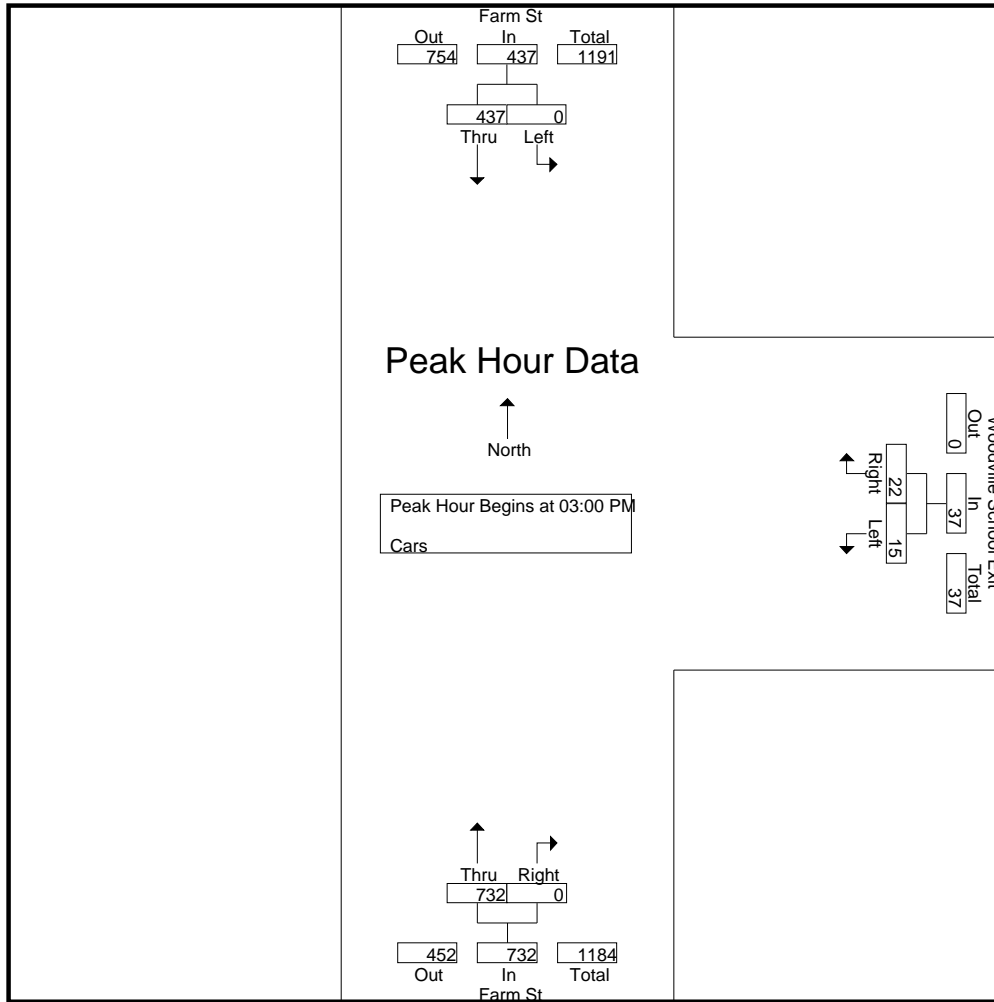
File Name : 40684003  
 Site Code : 40684003  
 Start Date : 11/16/2021  
 Page No : 4

### Groups Printed- Cars

Start Time	Farm St From North		Woodville School Exit From East		Farm St From South		Int. Total
	Left	Thru	Left	Right	Thru	Right	
02:00 PM	0	103	2	15	144	0	264
02:15 PM	0	105	0	9	153	0	267
02:30 PM	0	128	2	4	160	0	294
02:45 PM	0	97	3	13	163	0	276
<b>Total</b>	<b>0</b>	<b>433</b>	<b>7</b>	<b>41</b>	<b>620</b>	<b>0</b>	<b>1101</b>
03:00 PM	0	119	6	6	167	0	298
03:15 PM	0	98	3	8	188	0	297
03:30 PM	0	119	5	3	197	0	324
03:45 PM	0	101	1	5	180	0	287
<b>Total</b>	<b>0</b>	<b>437</b>	<b>15</b>	<b>22</b>	<b>732</b>	<b>0</b>	<b>1206</b>
<b>Grand Total</b>	<b>0</b>	<b>870</b>	<b>22</b>	<b>63</b>	<b>1352</b>	<b>0</b>	<b>2307</b>
Apprch %	0	100	25.9	74.1	100	0	
Total %	0	37.7	1	2.7	58.6	0	

Start Time	Farm St From North			Woodville School Exit From East			Farm St From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 03:00 PM										
03:00 PM	0	<b>119</b>	<b>119</b>	<b>6</b>	<b>6</b>	<b>12</b>	167	0	167	298
03:15 PM	0	98	98	3	<b>8</b>	11	188	0	188	297
03:30 PM	0	119	119	5	3	8	<b>197</b>	0	<b>197</b>	<b>324</b>
03:45 PM	0	101	101	1	5	6	180	0	180	287
Total Volume	0	437	437	15	22	37	732	0	732	1206
% App. Total	0	100		40.5	59.5		100	0		
PHF	.000	.918	.918	.625	.688	.771	.929	.000	.929	.931

N/S Street : Farm Street  
E/W Street : Woodville School Exit  
City/State : Wakefield, MA  
Weather : Clear



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	02:15 PM			02:00 PM			03:00 PM		
+0 mins.	0	105	105	2	15	17	167	0	167
+15 mins.	0	<b>128</b>	<b>128</b>	0	9	9	188	0	188
+30 mins.	0	97	97	2	4	6	<b>197</b>	0	<b>197</b>
+45 mins.	0	119	119	<b>3</b>	13	16	180	0	180
Total Volume	0	449	449	7	41	48	732	0	732
% App. Total	0	100		14.6	85.4		100	0	
PHF	.000	.877	.877	.583	.683	.706	.929	.000	.929



# Accurate Counts

978-664-2565

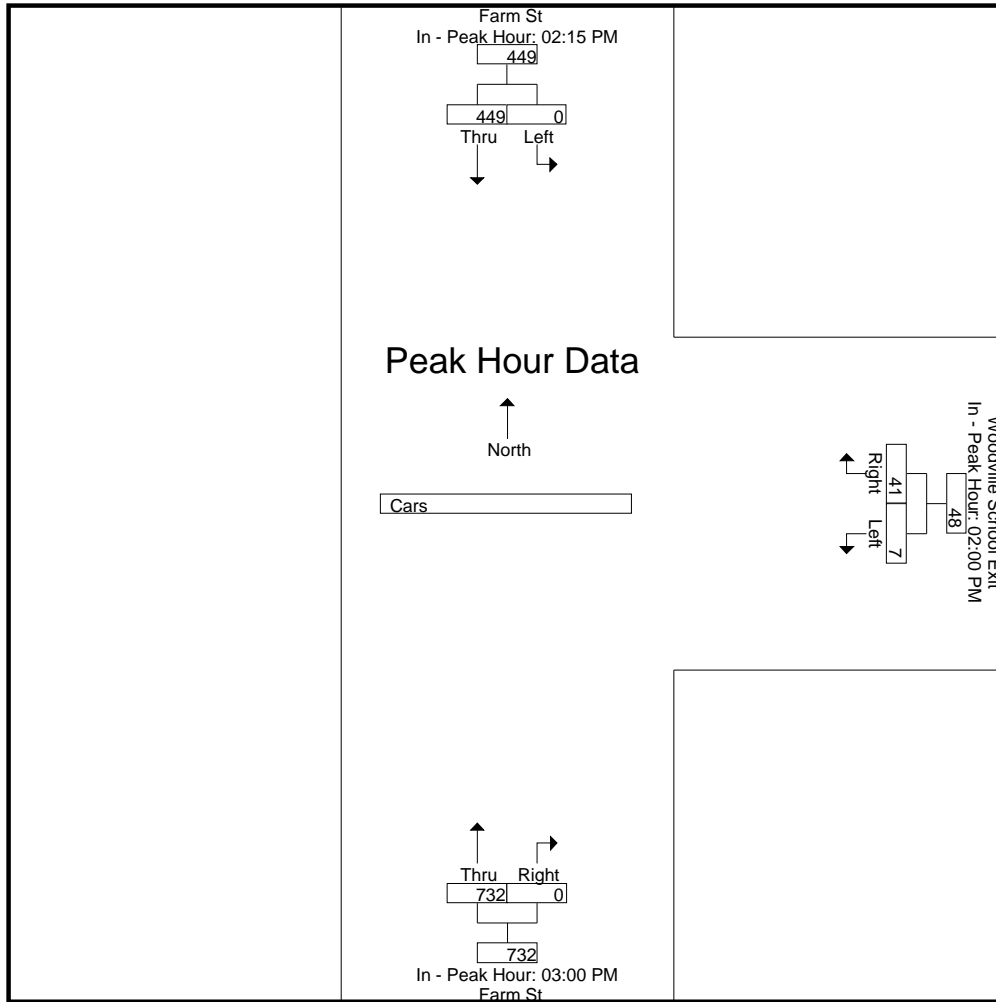
File Name : 40684003

Site Code : 40684003

Start Date : 11/16/2021

Page No : 6

N/S Street : Farm Street  
E/W Street : Woodville School Exit  
City/State : Wakefield, MA  
Weather : Clear



**Accurate Counts**  
978-664-2565

N/S Street : Farm Street  
E/W Street : Woodville School Exit  
City/State : Wakefield, MA  
Weather : Clear

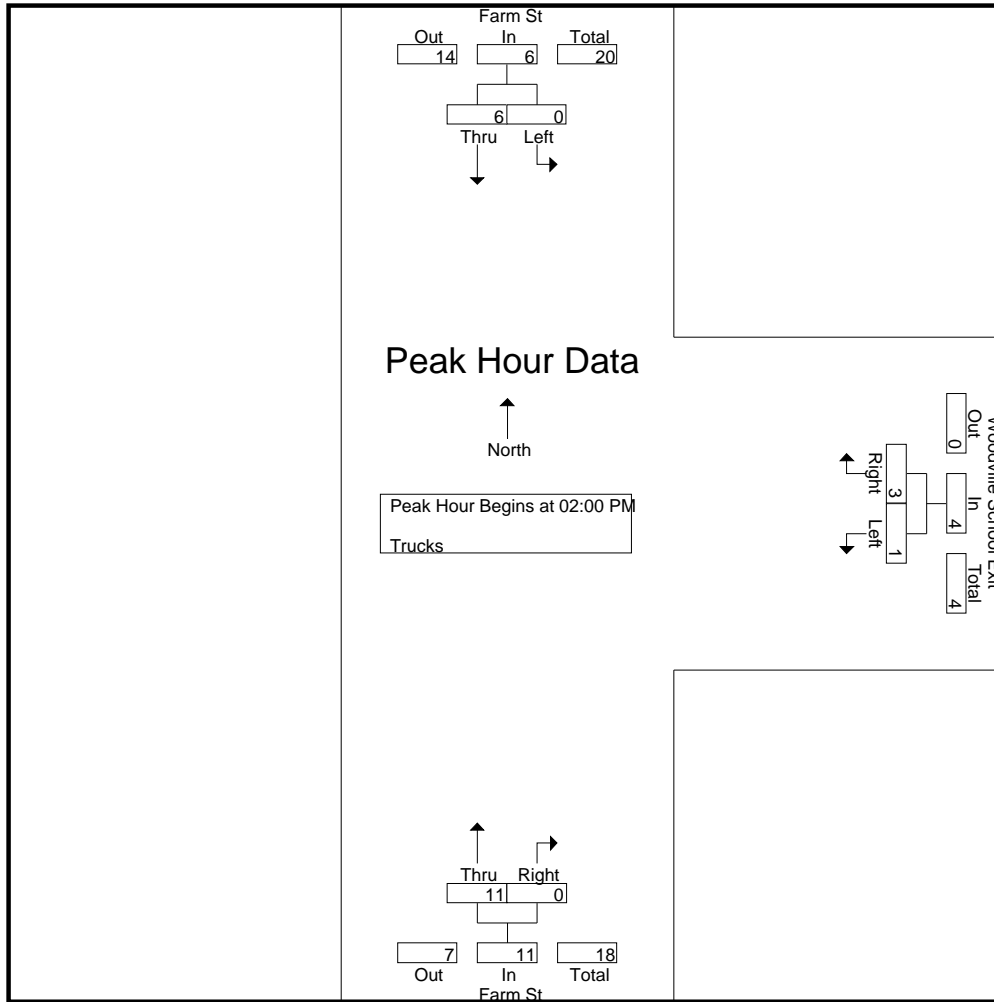
File Name : 40684003  
Site Code : 40684003  
Start Date : 11/16/2021  
Page No : 7

Groups Printed- Trucks

Start Time	Farm St From North		Woodville School Exit From East		Farm St From South		Int. Total
	Left	Thru	Left	Right	Thru	Right	
02:00 PM	0	2	0	0	3	0	5
02:15 PM	0	0	0	0	1	0	1
02:30 PM	0	1	0	0	1	0	2
02:45 PM	0	3	1	3	6	0	13
<b>Total</b>	<b>0</b>	<b>6</b>	<b>1</b>	<b>3</b>	<b>11</b>	<b>0</b>	<b>21</b>
03:00 PM	0	0	0	0	0	0	0
03:15 PM	0	0	0	1	2	0	3
03:30 PM	0	0	0	0	2	0	2
03:45 PM	0	2	0	0	4	0	6
<b>Total</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>8</b>	<b>0</b>	<b>11</b>
<b>Grand Total</b>	<b>0</b>	<b>8</b>	<b>1</b>	<b>4</b>	<b>19</b>	<b>0</b>	<b>32</b>
Apprch %	0	100	20	80	100	0	
Total %	0	25	3.1	12.5	59.4	0	

Start Time	Farm St From North			Woodville School Exit From East			Farm St From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:00 PM										
02:00 PM	0	2	2	0	0	0	3	0	3	5
02:15 PM	0	0	0	0	0	0	1	0	1	1
02:30 PM	0	1	1	0	0	0	1	0	1	2
02:45 PM	0	<b>3</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>4</b>	<b>6</b>	<b>0</b>	<b>6</b>	<b>13</b>
Total Volume	0	6	6	1	3	4	11	0	11	21
% App. Total	0	100		25	75		100	0		
PHF	.000	.500	.500	.250	.250	.250	.458	.000	.458	.404

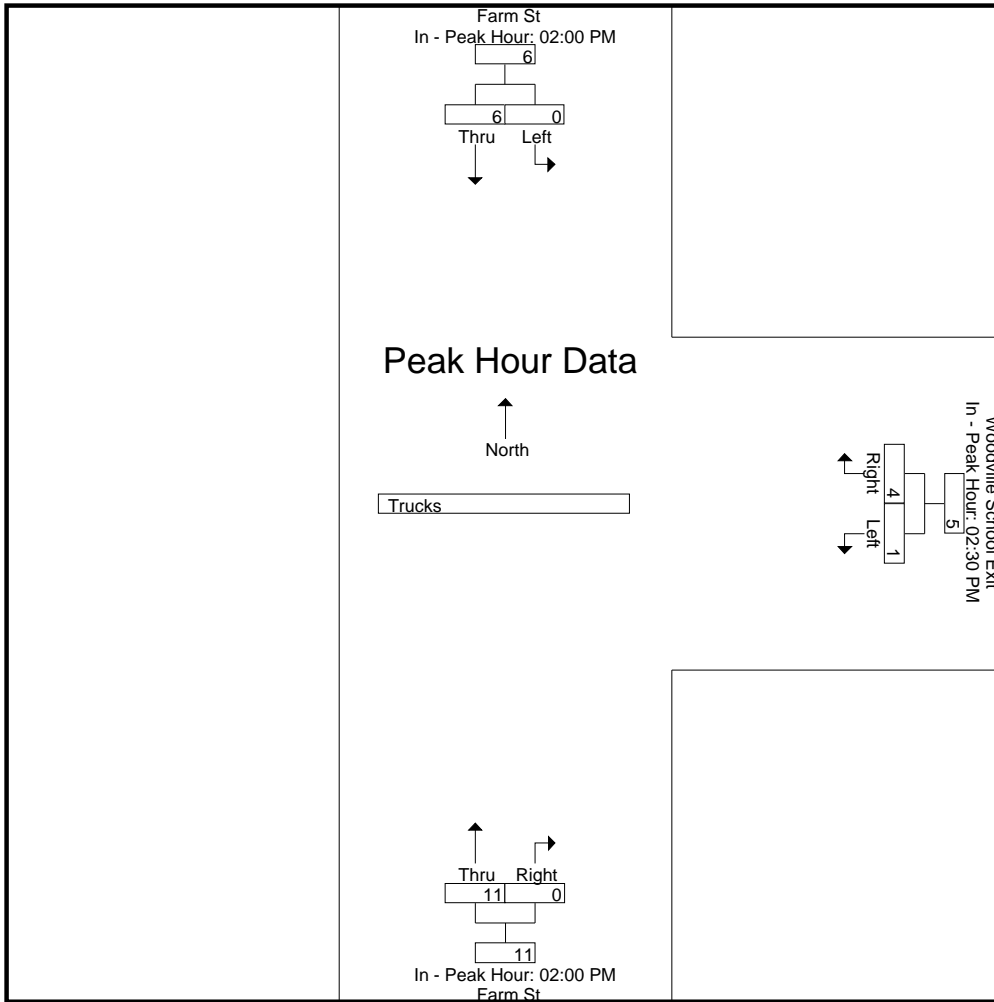
N/S Street : Farm Street  
E/W Street : Woodville School Exit  
City/State : Wakefield, MA  
Weather : Clear



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	02:00 PM			02:30 PM			02:00 PM		
+0 mins.	0	2	2	0	0	0	3	0	3
+15 mins.	0	0	0	1	3	4	1	0	1
+30 mins.	0	1	1	0	0	0	1	0	1
+45 mins.	0	3	3	0	1	1	6	0	6
Total Volume	0	6	6	1	4	5	11	0	11
% App. Total	0	100		20	80		100	0	
PHF	.000	.500	.500	.250	.333	.313	.458	.000	.458

N/S Street : Farm Street  
E/W Street : Woodville School Exit  
City/State : Wakefield, MA  
Weather : Clear



**Accurate Counts**  
978-664-2565

N/S Street : Farm Street  
E/W Street : Woodville School Exit  
City/State : Wakefield, MA  
Weather : Clear

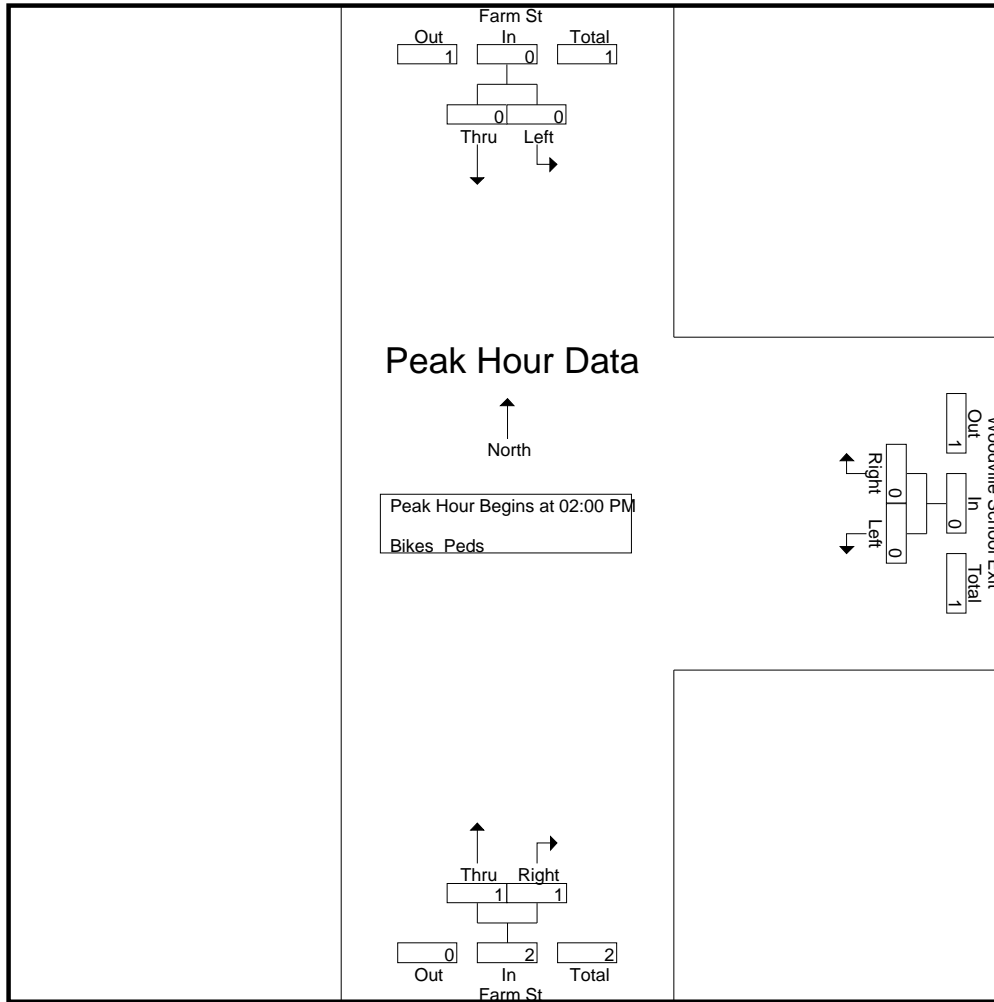
File Name : 40684003  
Site Code : 40684003  
Start Date : 11/16/2021  
Page No : 10

Groups Printed- Bikes Peds

Start Time	Farm St From North			Woodville School Exit From East			Farm St From South			Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds			
02:00 PM	0	0	0	0	0	9	0	0	4	13	0	13
02:15 PM	0	0	0	0	0	1	0	0	0	1	0	1
02:30 PM	0	0	0	0	0	10	0	1	25	35	1	36
02:45 PM	0	0	0	0	0	4	1	0	44	48	1	49
Total	0	0	0	0	0	24	1	1	73	97	2	99
03:00 PM	0	0	0	0	0	12	0	0	8	20	0	20
03:15 PM	0	0	0	0	0	3	0	0	0	3	0	3
03:30 PM	0	0	0	0	0	3	0	0	0	3	0	3
03:45 PM	0	0	0	0	0	0	0	0	1	1	0	1
Total	0	0	0	0	0	18	0	0	9	27	0	27
Grand Total	0	0	0	0	0	42	1	1	82	124	2	126
Apprch %	0	0		0	0		50	50				
Total %	0	0		0	0		50	50		98.4	1.6	

Start Time	Farm St From North			Woodville School Exit From East			Farm St From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:00 PM										
02:00 PM	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	1	1	1
02:45 PM	0	0	0	0	0	0	1	0	1	1
Total Volume	0	0	0	0	0	0	1	1	2	2
% App. Total	0	0		0	0		50	50		
PHF	.000	.000	.000	.000	.000	.000	.250	.250	.500	.500

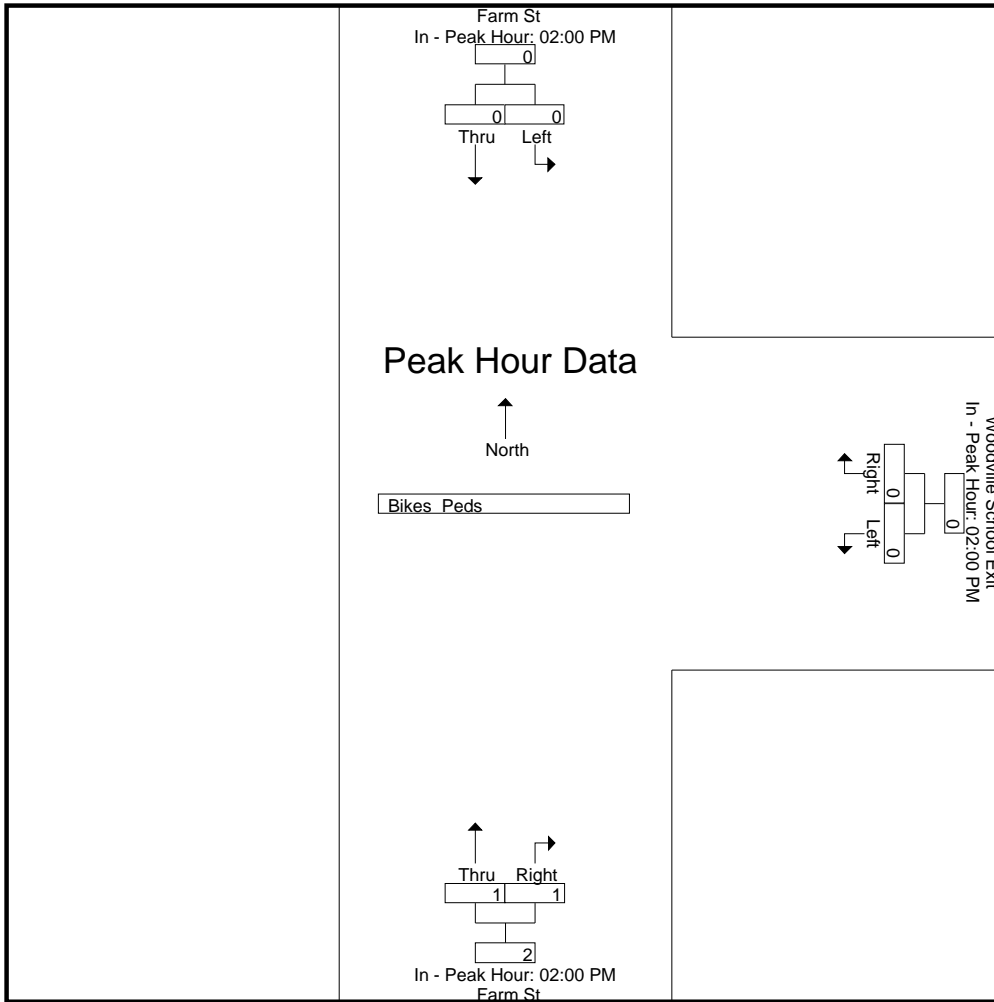
N/S Street : Farm Street  
E/W Street : Woodville School Exit  
City/State : Wakefield, MA  
Weather : Clear



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	02:00 PM			02:00 PM			02:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	1	1
+45 mins.	0	0	0	0	0	0	1	0	1
Total Volume	0	0	0	0	0	0	1	1	2
% App. Total	0	0	0	0	0	0	50	50	
PHF	.000	.000	.000	.000	.000	.000	.250	.250	.500

N/S Street : Farm Street  
E/W Street : Woodville School Exit  
City/State : Wakefield, MA  
Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 40684004  
 Site Code : 40684004  
 Start Date : 11/16/2021  
 Page No : 1

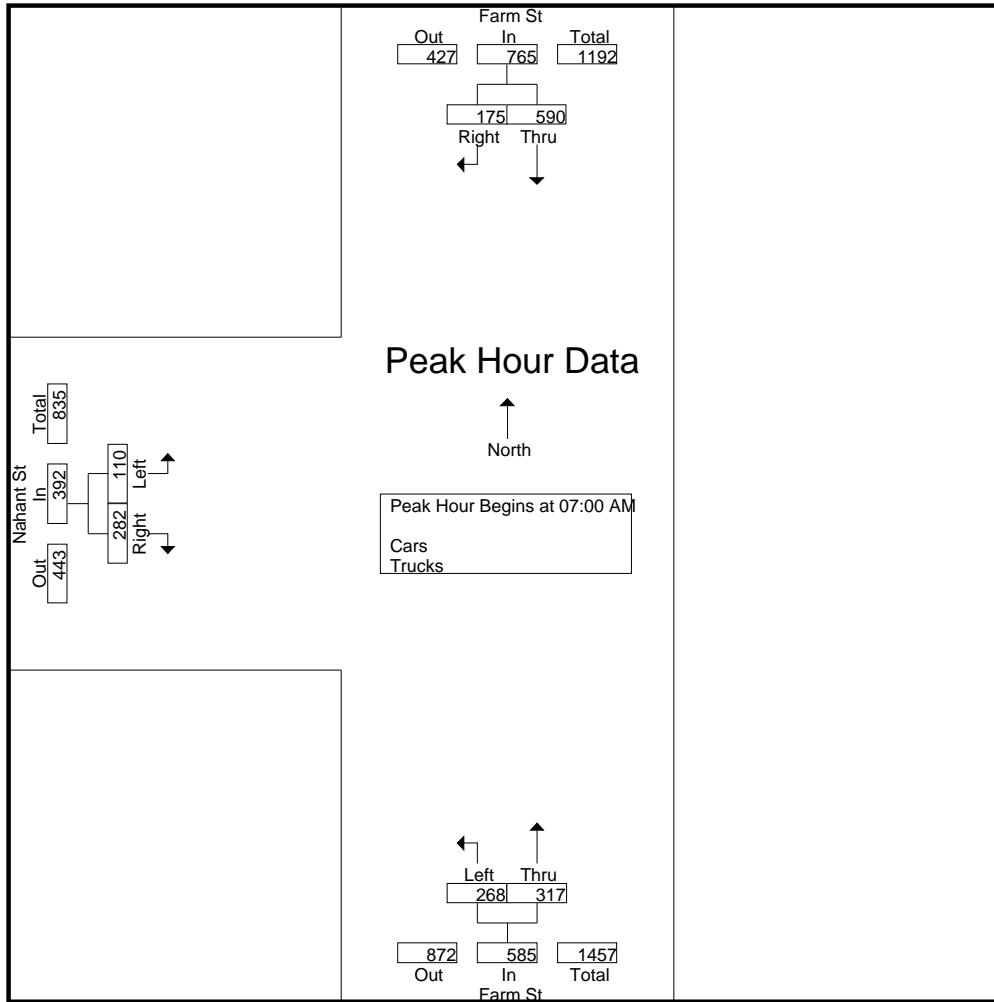
### Groups Printed- Cars - Trucks

Start Time	Farm St From North		Farm St From South		Nahant St From West		Int. Total
	Thru	Right	Left	Thru	Left	Right	
07:00 AM	153	31	66	55	38	83	426
07:15 AM	151	60	70	93	46	67	487
07:30 AM	163	52	50	86	6	74	431
07:45 AM	123	32	82	83	20	58	398
<b>Total</b>	<b>590</b>	<b>175</b>	<b>268</b>	<b>317</b>	<b>110</b>	<b>282</b>	<b>1742</b>
08:00 AM	100	30	82	83	19	46	360
08:15 AM	102	30	65	116	49	49	411
08:30 AM	144	54	61	82	34	40	415
08:45 AM	94	24	43	73	12	40	286
<b>Total</b>	<b>440</b>	<b>138</b>	<b>251</b>	<b>354</b>	<b>114</b>	<b>175</b>	<b>1472</b>
<b>Grand Total</b>	<b>1030</b>	<b>313</b>	<b>519</b>	<b>671</b>	<b>224</b>	<b>457</b>	<b>3214</b>
Apprch %	76.7	23.3	43.6	56.4	32.9	67.1	
Total %	32	9.7	16.1	20.9	7	14.2	
Cars	1010	312	514	655	223	448	3162
% Cars	98.1	99.7	99	97.6	99.6	98	98.4
Trucks	20	1	5	16	1	9	52
% Trucks	1.9	0.3	1	2.4	0.4	2	1.6

Start Time	Farm St From North			Farm St From South			Nahant St From West			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. 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	153	31	184	66	55	121	38	<b>83</b>	<b>121</b>	426
07:15 AM	151	<b>60</b>	211	70	<b>93</b>	163	<b>46</b>	67	113	<b>487</b>
07:30 AM	<b>163</b>	52	<b>215</b>	50	86	136	6	74	80	431
07:45 AM	123	32	155	<b>82</b>	83	<b>165</b>	20	58	78	398
Total Volume	590	175	765	268	317	585	110	282	392	1742
% App. Total	77.1	22.9		45.8	54.2		28.1	71.9		
PHF	.905	.729	.890	.817	.852	.886	.598	.849	.810	.894



N/S Street : Farm Street  
E/W Street : Nahant Street  
City/State : Wakefield, MA  
Weather : Clear



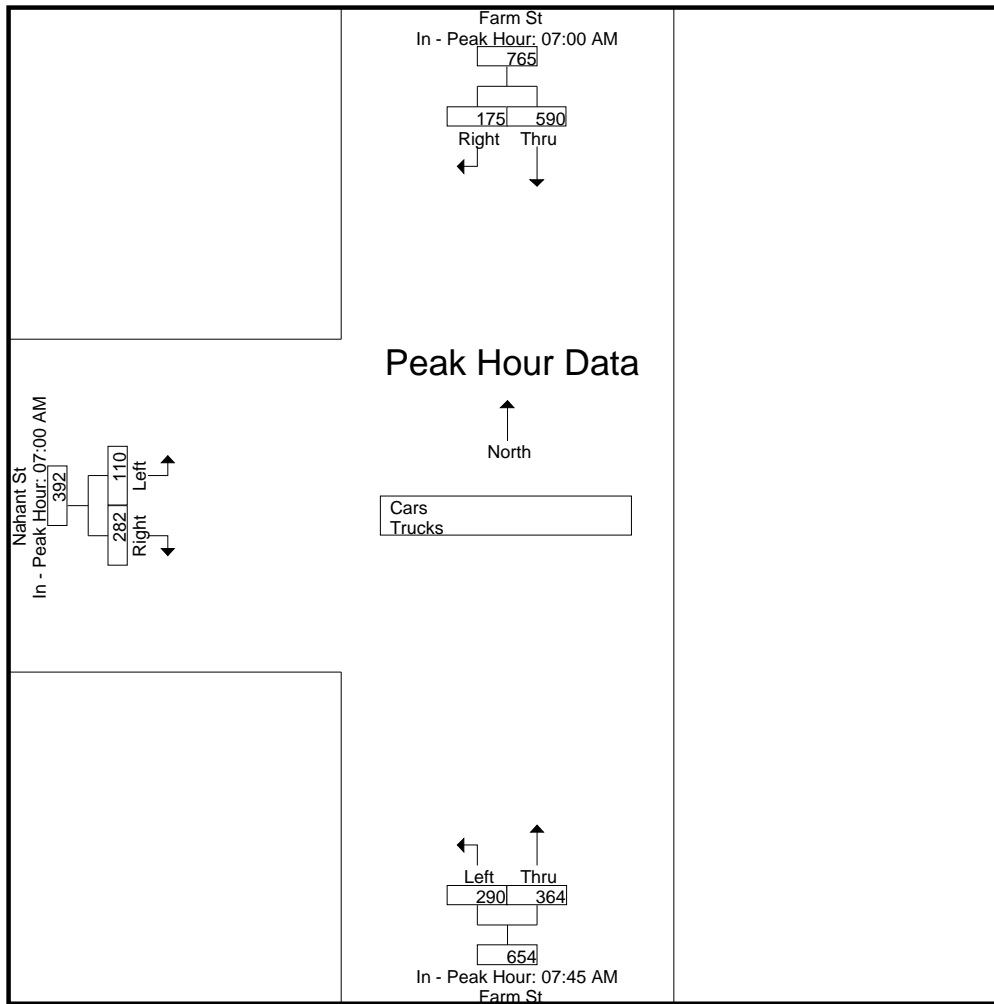
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	07:00 AM			07:45 AM			07:00 AM		
+0 mins.	153	31	184	<b>82</b>	83	165	38	<b>83</b>	<b>121</b>
+15 mins.	151	<b>60</b>	211	82	83	165	<b>46</b>	67	113
+30 mins.	<b>163</b>	52	<b>215</b>	65	<b>116</b>	<b>181</b>	6	74	80
+45 mins.	123	32	155	61	82	143	20	58	78
Total Volume	590	175	765	290	364	654	110	282	392
% App. Total	77.1	22.9		44.3	55.7		28.1	71.9	
PHF	.905	.729	.890	.884	.784	.903	.598	.849	.810

Accurate Counts  
978-664-2565

File Name : 40684004  
Site Code : 40684004  
Start Date : 11/16/2021  
Page No : 3

N/S Street : Farm Street  
E/W Street : Nahant Street  
City/State : Wakefield, MA  
Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

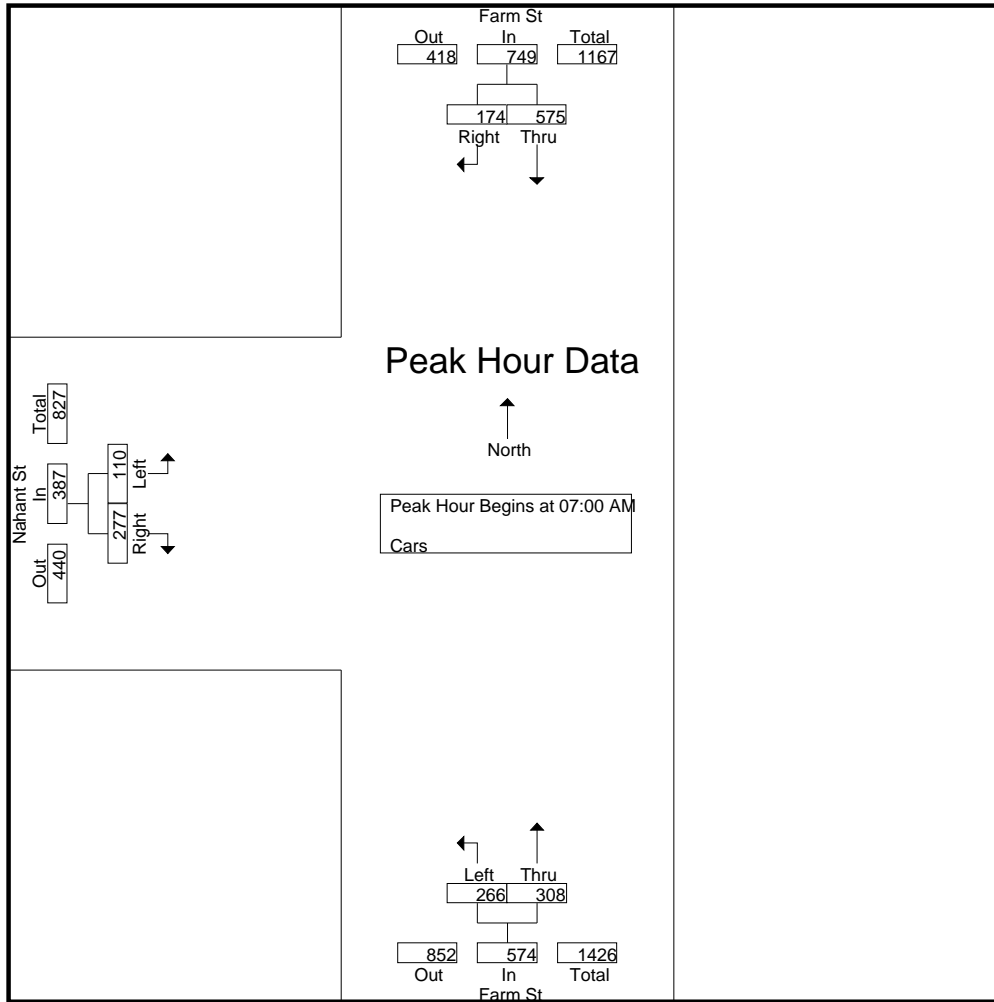
File Name : 40684004  
 Site Code : 40684004  
 Start Date : 11/16/2021  
 Page No : 4

### Groups Printed- Cars

Start Time	Farm St From North		Farm St From South		Nahant St From West		Int. Total
	Thru	Right	Left	Thru	Left	Right	
07:00 AM	150	31	66	53	38	83	421
07:15 AM	150	60	70	90	46	67	483
07:30 AM	156	52	48	84	6	70	416
07:45 AM	119	31	82	81	20	57	390
<b>Total</b>	<b>575</b>	<b>174</b>	<b>266</b>	<b>308</b>	<b>110</b>	<b>277</b>	<b>1710</b>
08:00 AM	97	30	82	82	19	45	355
08:15 AM	100	30	64	114	48	49	405
08:30 AM	144	54	59	81	34	38	410
08:45 AM	94	24	43	70	12	39	282
<b>Total</b>	<b>435</b>	<b>138</b>	<b>248</b>	<b>347</b>	<b>113</b>	<b>171</b>	<b>1452</b>
<b>Grand Total</b>	<b>1010</b>	<b>312</b>	<b>514</b>	<b>655</b>	<b>223</b>	<b>448</b>	<b>3162</b>
Apprch %	76.4	23.6	44	56	33.2	66.8	
Total %	31.9	9.9	16.3	20.7	7.1	14.2	

Start Time	Farm St From North			Farm St From South			Nahant St From West			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. 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	150	31	181	66	53	119	38	<b>83</b>	<b>121</b>	421
07:15 AM	150	<b>60</b>	<b>210</b>	70	<b>90</b>	160	<b>46</b>	67	113	<b>483</b>
07:30 AM	<b>156</b>	52	208	48	84	132	6	70	76	416
07:45 AM	119	31	150	<b>82</b>	81	<b>163</b>	20	57	77	390
Total Volume	575	174	749	266	308	574	110	277	387	1710
% App. Total	76.8	23.2		46.3	53.7		28.4	71.6		
PHF	.921	.725	.892	.811	.856	.880	.598	.834	.800	.885

N/S Street : Farm Street  
E/W Street : Nahant Street  
City/State : Wakefield, MA  
Weather : Clear



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			07:45 AM			07:00 AM		
+0 mins.	150	31	181	<b>82</b>	81	163	38	<b>83</b>	<b>121</b>
+15 mins.	150	<b>60</b>	<b>210</b>	82	82	164	<b>46</b>	67	113
+30 mins.	<b>156</b>	52	208	64	<b>114</b>	<b>178</b>	6	70	76
+45 mins.	119	31	150	59	81	140	20	57	77
Total Volume	575	174	749	287	358	645	110	277	387
% App. Total	76.8	23.2		44.5	55.5		28.4	71.6	
PHF	.921	.725	.892	.875	.785	.906	.598	.834	.800

# Accurate Counts

978-664-2565

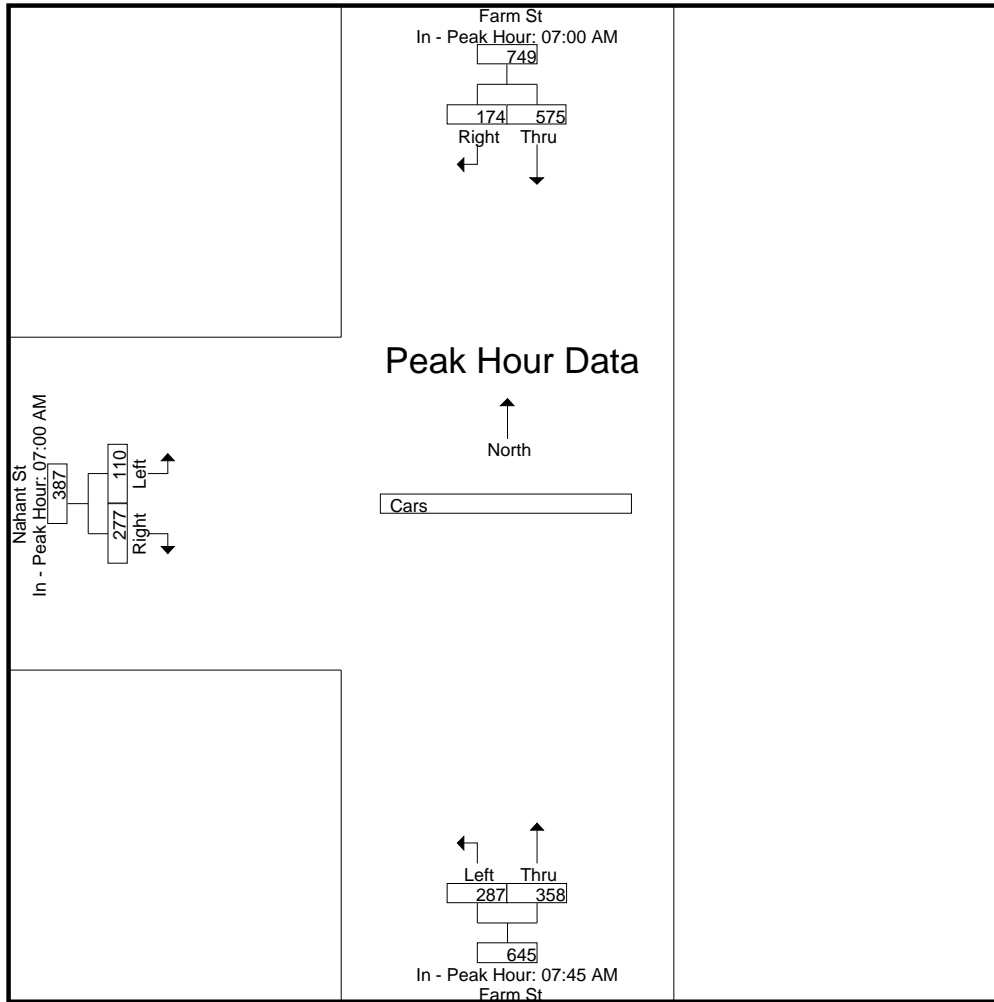
File Name : 40684004

Site Code : 40684004

Start Date : 11/16/2021

Page No : 6

N/S Street : Farm Street  
E/W Street : Nahant Street  
City/State : Wakefield, MA  
Weather : Clear



**Accurate Counts**  
978-664-2565

N/S Street : Farm Street  
E/W Street : Nahant Street  
City/State : Wakefield, MA  
Weather : Clear

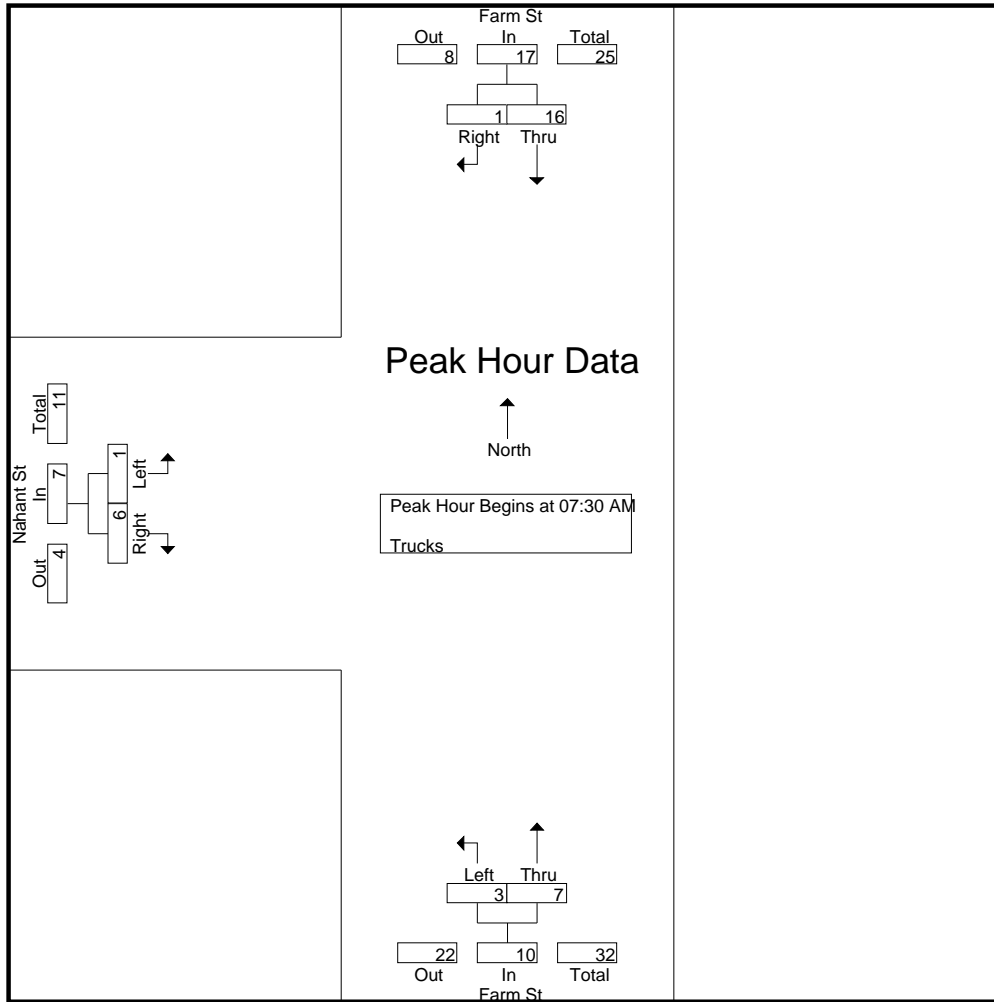
File Name : 40684004  
Site Code : 40684004  
Start Date : 11/16/2021  
Page No : 7

Groups Printed- Trucks

Start Time	Farm St From North		Farm St From South		Nahant St From West		Int. Total
	Thru	Right	Left	Thru	Left	Right	
07:00 AM	3	0	0	2	0	0	5
07:15 AM	1	0	0	3	0	0	4
07:30 AM	7	0	2	2	0	4	15
07:45 AM	4	1	0	2	0	1	8
<b>Total</b>	<b>15</b>	<b>1</b>	<b>2</b>	<b>9</b>	<b>0</b>	<b>5</b>	<b>32</b>
08:00 AM	3	0	0	1	0	1	5
08:15 AM	2	0	1	2	1	0	6
08:30 AM	0	0	2	1	0	2	5
08:45 AM	0	0	0	3	0	1	4
<b>Total</b>	<b>5</b>	<b>0</b>	<b>3</b>	<b>7</b>	<b>1</b>	<b>4</b>	<b>20</b>
<b>Grand Total</b>	<b>20</b>	<b>1</b>	<b>5</b>	<b>16</b>	<b>1</b>	<b>9</b>	<b>52</b>
Apprch %	95.2	4.8	23.8	76.2	10	90	
Total %	38.5	1.9	9.6	30.8	1.9	17.3	

Start Time	Farm St From North			Farm St From South			Nahant St From West			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. 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	7	0	7	2	2	4	0	4	4	15
07:45 AM	4	1	5	0	2	2	0	1	1	8
08:00 AM	3	0	3	0	1	1	0	1	1	5
08:15 AM	2	0	2	1	2	3	1	0	1	6
<b>Total Volume</b>	<b>16</b>	<b>1</b>	<b>17</b>	<b>3</b>	<b>7</b>	<b>10</b>	<b>1</b>	<b>6</b>	<b>7</b>	<b>34</b>
<b>% App. Total</b>	<b>94.1</b>	<b>5.9</b>		<b>30</b>	<b>70</b>		<b>14.3</b>	<b>85.7</b>		
PHF	.571	.250	.607	.375	.875	.625	.250	.375	.438	.567

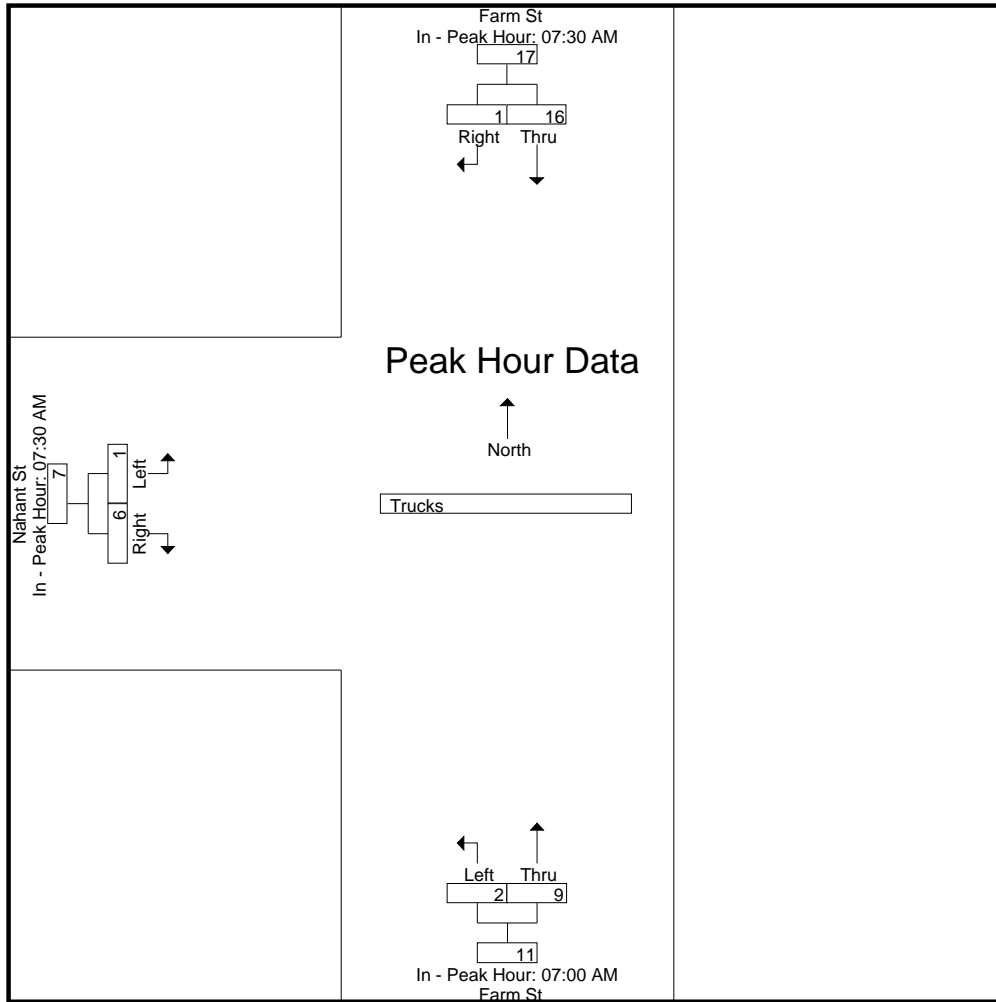
N/S Street : Farm Street  
E/W Street : Nahant Street  
City/State : Wakefield, MA  
Weather : Clear



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			07:30 AM		
+0 mins.	7	0	7	0	2	2	0	4	4
+15 mins.	4	1	5	0	3	3	0	1	1
+30 mins.	3	0	3	2	2	4	0	1	1
+45 mins.	2	0	2	0	2	2	1	0	1
Total Volume	16	1	17	2	9	11	1	6	7
% App. Total	94.1	5.9		18.2	81.8		14.3	85.7	
PHF	.571	.250	.607	.250	.750	.688	.250	.375	.438

N/S Street : Farm Street  
E/W Street : Nahant Street  
City/State : Wakefield, MA  
Weather : Clear





**Accurate Counts**  
978-664-2565

N/S Street : Farm Street  
E/W Street : Nahant Street  
City/State : Wakefield, MA  
Weather : Clear

File Name : 40684004  
Site Code : 40684004  
Start Date : 11/16/2021  
Page No : 10

Groups Printed- Bikes Peds

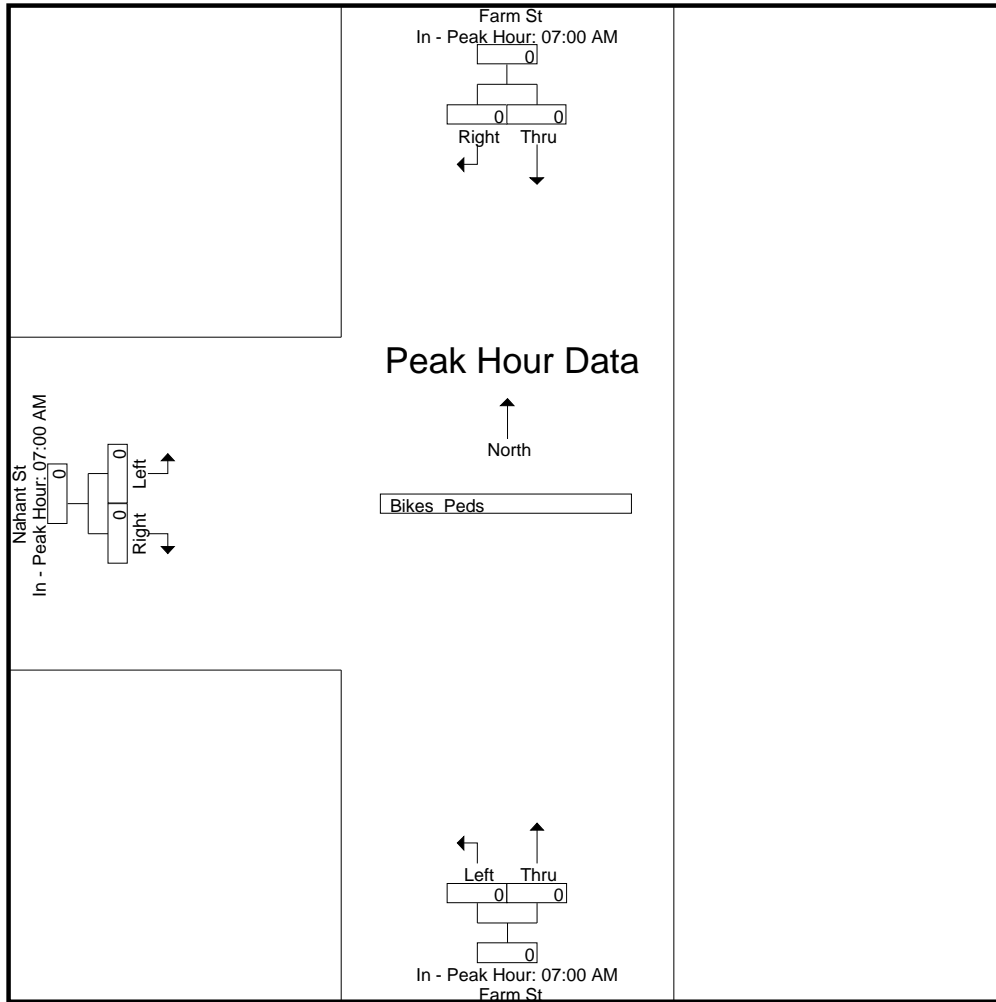
Start Time	Farm St From North			Farm St From South			Nahant St From West			Exclu. Total	Inclu. Total	Int. Total
	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds			
07:00 AM	0	0	3	0	0	0	0	0	4	7	0	7
07:15 AM	0	0	5	0	0	0	0	0	0	5	0	5
07:30 AM	0	0	1	0	0	0	0	0	0	1	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	9	0	0	0	0	0	4	13	0	13
08:00 AM	0	0	0	0	0	0	0	0	2	2	0	2
08:15 AM	0	0	2	0	0	0	0	0	0	2	0	2
08:30 AM	0	0	0	0	0	0	0	0	4	4	0	4
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	2	0	0	0	0	0	6	8	0	8
Grand Total	0	0	11	0	0	0	0	0	10	21	0	21
Apprch %	0	0		0	0		0	0				
Total %										100	0	

Start Time	Farm St From North			Farm St From South			Nahant St From West			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
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

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



N/S Street : Farm Street  
E/W Street : Nahant Street  
City/State : Wakefield, MA  
Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

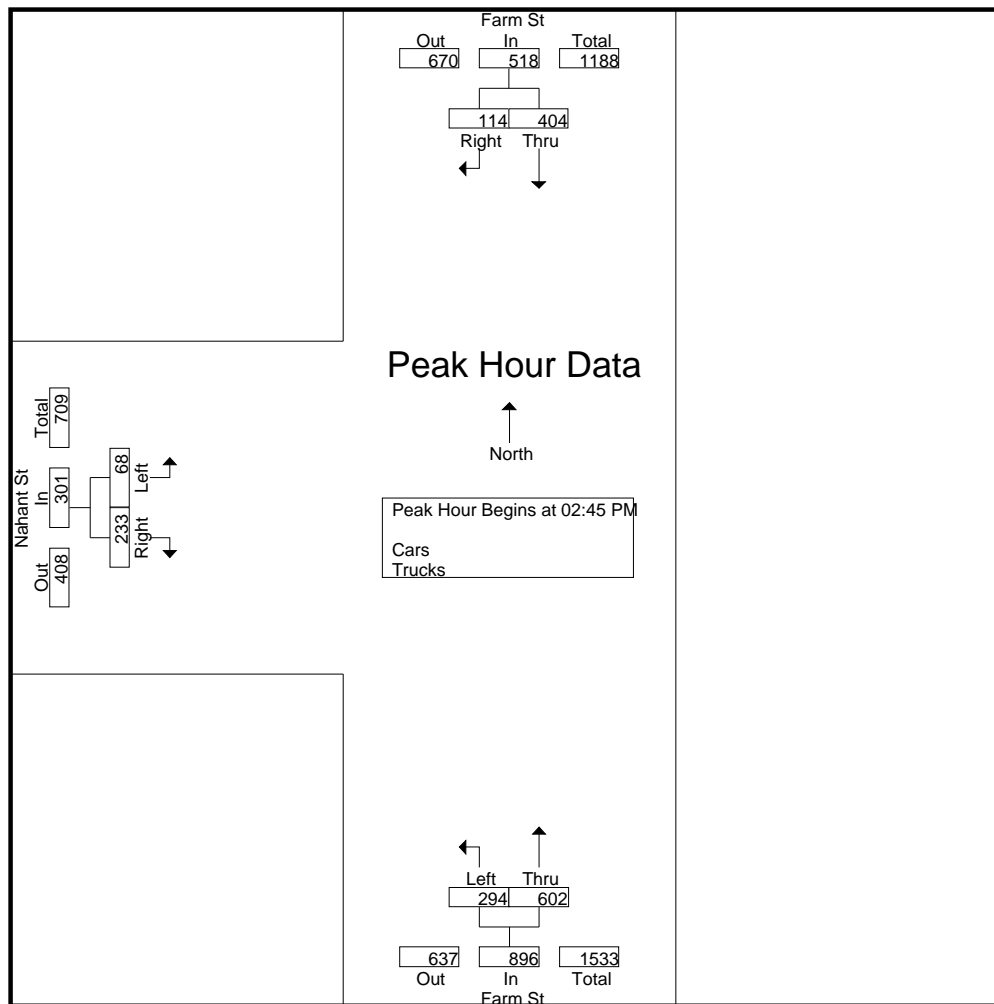
File Name : 40684004  
 Site Code : 40684004  
 Start Date : 11/16/2021  
 Page No : 1

### Groups Printed- Cars - Trucks

Start Time	Farm St From North		Farm St From South		Nahant St From West		Int. Total
	Thru	Right	Left	Thru	Left	Right	
02:00 PM	73	43	66	104	24	48	358
02:15 PM	77	22	78	128	36	53	394
02:30 PM	86	16	89	156	44	55	446
02:45 PM	101	46	98	127	12	43	427
<b>Total</b>	<b>337</b>	<b>127</b>	<b>331</b>	<b>515</b>	<b>116</b>	<b>199</b>	<b>1625</b>
03:00 PM	107	28	66	138	14	66	419
03:15 PM	93	21	52	164	23	67	420
03:30 PM	103	19	78	173	19	57	449
03:45 PM	85	14	51	160	24	53	387
<b>Total</b>	<b>388</b>	<b>82</b>	<b>247</b>	<b>635</b>	<b>80</b>	<b>243</b>	<b>1675</b>
<b>Grand Total</b>	<b>725</b>	<b>209</b>	<b>578</b>	<b>1150</b>	<b>196</b>	<b>442</b>	<b>3300</b>
Apprch %	77.6	22.4	33.4	66.6	30.7	69.3	
Total %	22	6.3	17.5	34.8	5.9	13.4	
Cars	714	207	571	1124	193	439	3248
% Cars	98.5	99	98.8	97.7	98.5	99.3	98.4
Trucks	11	2	7	26	3	3	52
% Trucks	1.5	1	1.2	2.3	1.5	0.7	1.6

Start Time	Farm St From North			Farm St From South			Nahant St From West			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:45 PM										
02:45 PM	101	<b>46</b>	<b>147</b>	<b>98</b>	127	225	12	43	55	427
03:00 PM	<b>107</b>	28	135	66	138	204	14	66	80	419
03:15 PM	93	21	114	52	164	216	<b>23</b>	<b>67</b>	<b>90</b>	420
03:30 PM	103	19	122	78	<b>173</b>	<b>251</b>	19	57	76	<b>449</b>
Total Volume	404	114	518	294	602	896	68	233	301	1715
% App. Total	78	22		32.8	67.2		22.6	77.4		
PHF	.944	.620	.881	.750	.870	.892	.739	.869	.836	.955

N/S Street : Farm Street  
E/W Street : Nahant Street  
City/State : Wakefield, MA  
Weather : Clear



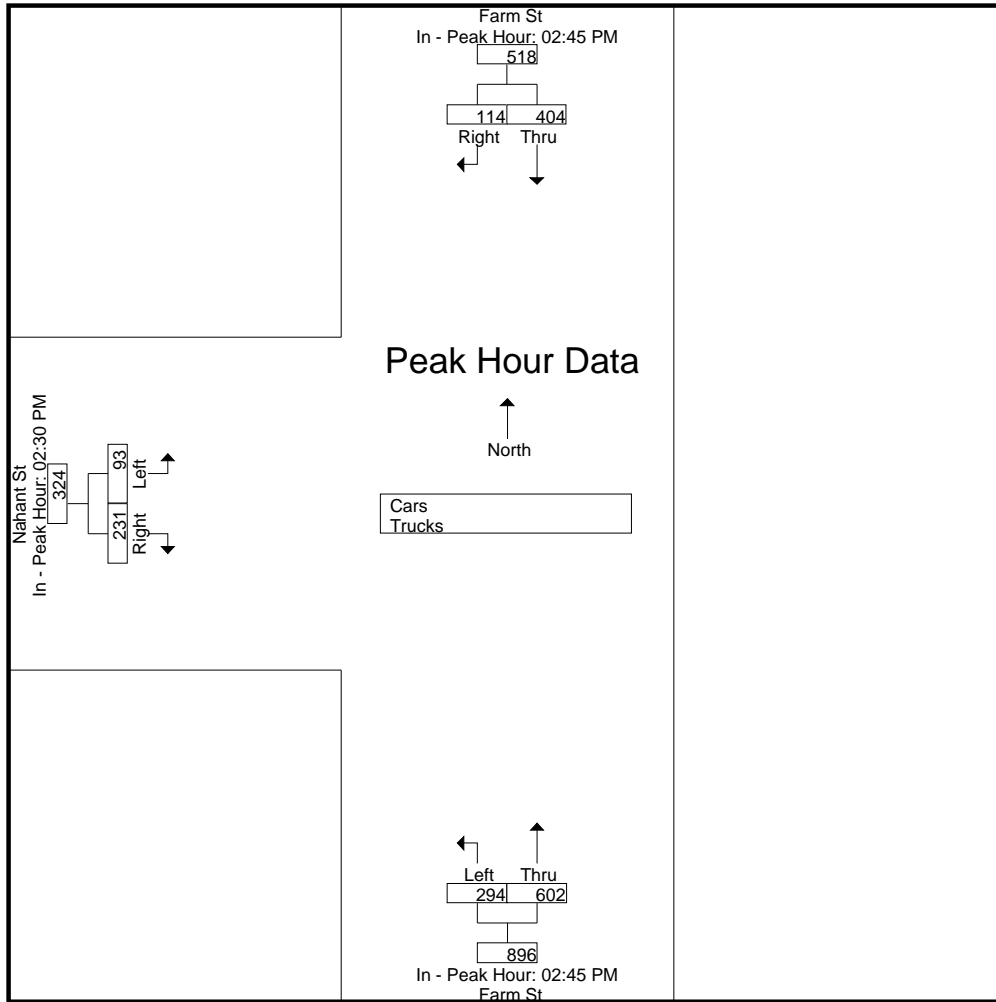
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	02:45 PM			02:45 PM			02:30 PM		
+0 mins.	101	<b>46</b>	<b>147</b>	<b>98</b>	127	225	<b>44</b>	55	<b>99</b>
+15 mins.	<b>107</b>	28	135	66	138	204	12	43	55
+30 mins.	93	21	114	52	164	216	14	66	80
+45 mins.	103	19	122	78	<b>173</b>	<b>251</b>	23	<b>67</b>	90
Total Volume	404	114	518	294	602	896	93	231	324
% App. Total	78	22		32.8	67.2		28.7	71.3	
PHF	.944	.620	.881	.750	.870	.892	.528	.862	.818

Accurate Counts  
978-664-2565

File Name : 40684004  
Site Code : 40684004  
Start Date : 11/16/2021  
Page No : 3

N/S Street : Farm Street  
E/W Street : Nahant Street  
City/State : Wakefield, MA  
Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

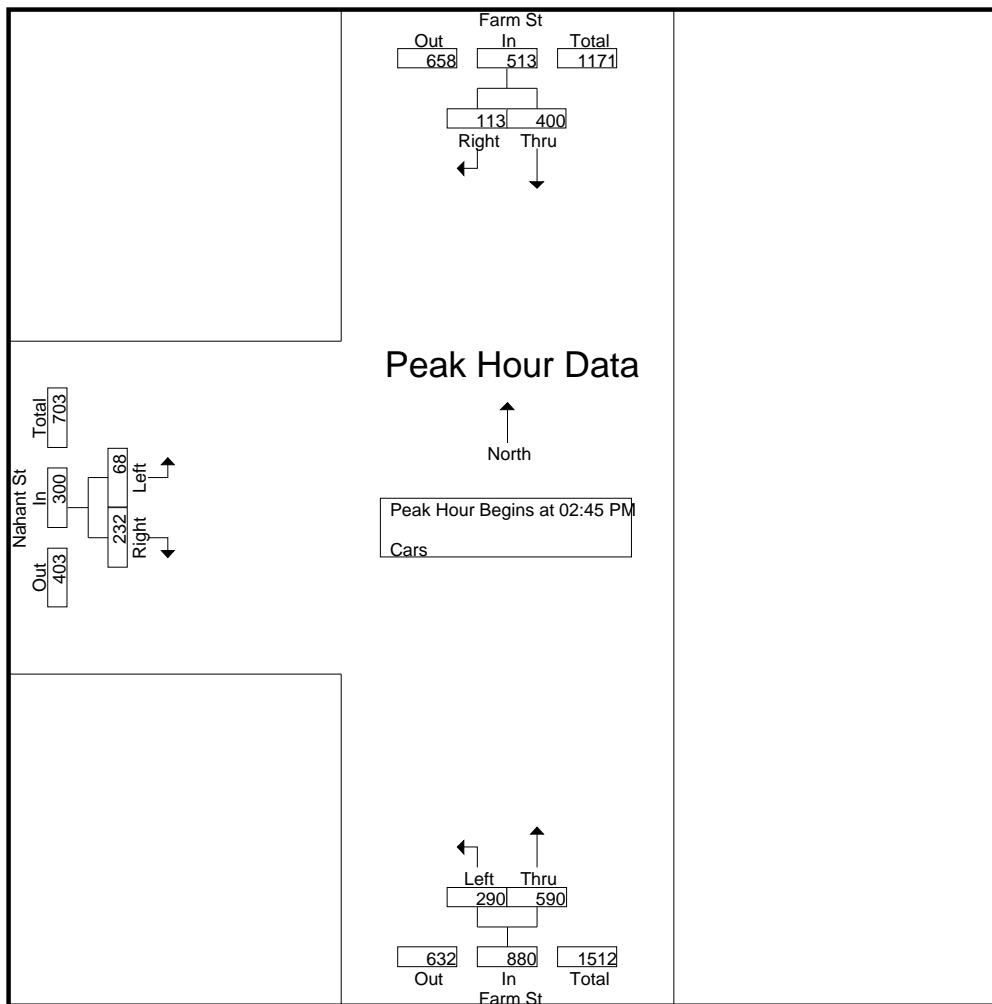
File Name : 40684004  
 Site Code : 40684004  
 Start Date : 11/16/2021  
 Page No : 4

### Groups Printed- Cars

Start Time	Farm St From North		Farm St From South		Nahant St From West		Int. Total
	Thru	Right	Left	Thru	Left	Right	
02:00 PM	70	43	65	103	24	46	351
02:15 PM	76	21	78	124	35	53	387
02:30 PM	86	16	89	153	43	55	442
02:45 PM	100	45	94	122	12	43	416
<b>Total</b>	<b>332</b>	<b>125</b>	<b>326</b>	<b>502</b>	<b>114</b>	<b>197</b>	<b>1596</b>
03:00 PM	106	28	66	137	14	66	417
03:15 PM	91	21	52	161	23	66	414
03:30 PM	103	19	78	170	19	57	446
03:45 PM	82	14	49	154	23	53	375
<b>Total</b>	<b>382</b>	<b>82</b>	<b>245</b>	<b>622</b>	<b>79</b>	<b>242</b>	<b>1652</b>
<b>Grand Total</b>	<b>714</b>	<b>207</b>	<b>571</b>	<b>1124</b>	<b>193</b>	<b>439</b>	<b>3248</b>
Apprch %	77.5	22.5	33.7	66.3	30.5	69.5	
Total %	22	6.4	17.6	34.6	5.9	13.5	

Start Time	Farm St From North			Farm St From South			Nahant St From West			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:45 PM										
02:45 PM	100	<b>45</b>	<b>145</b>	<b>94</b>	122	216	12	43	55	416
03:00 PM	<b>106</b>	28	134	66	137	203	14	<b>66</b>	80	417
03:15 PM	91	21	112	52	161	213	<b>23</b>	66	<b>89</b>	414
03:30 PM	103	19	122	78	<b>170</b>	<b>248</b>	19	57	76	<b>446</b>
Total Volume	400	113	513	290	590	880	68	232	300	1693
% App. Total	78	22		33	67		22.7	77.3		
PHF	.943	.628	.884	.771	.868	.887	.739	.879	.843	.949

N/S Street : Farm Street  
E/W Street : Nahant Street  
City/State : Wakefield, MA  
Weather : Clear

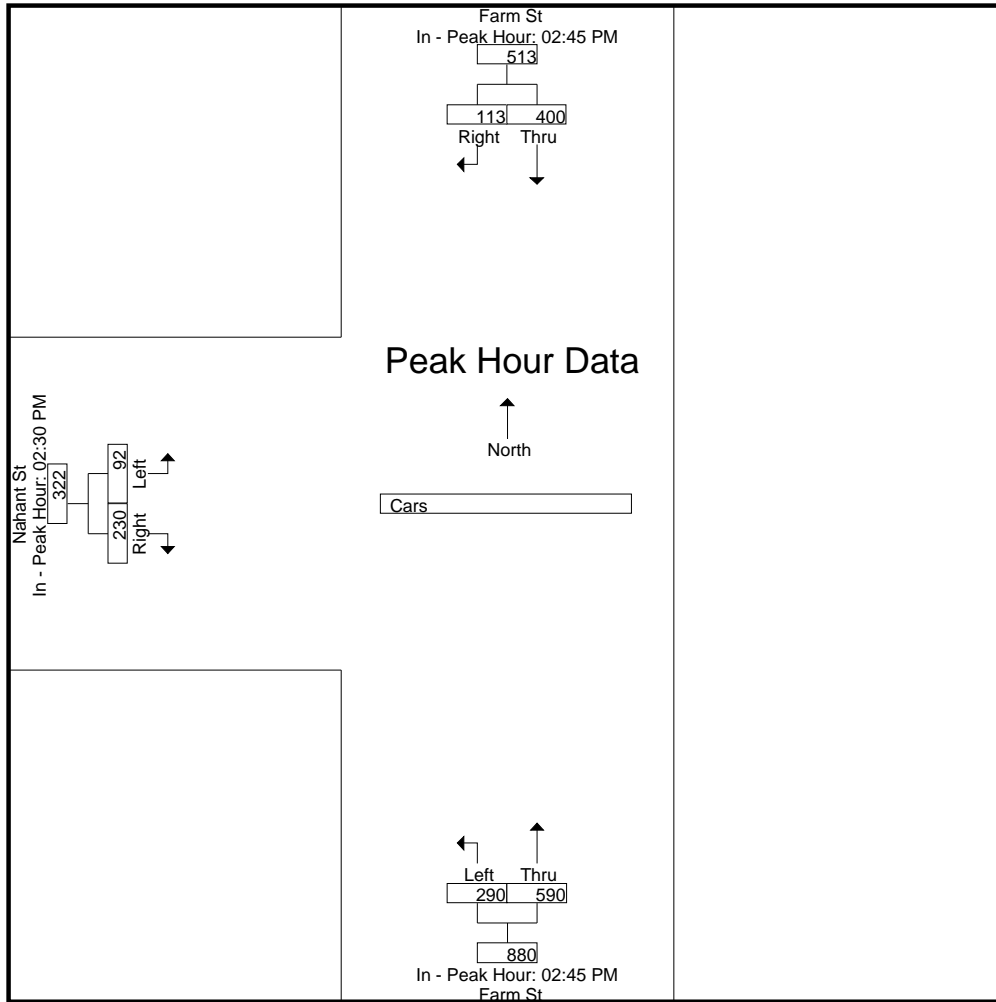


Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	02:45 PM			02:45 PM			02:30 PM		
+0 mins.	100	45	145	94	122	216	43	55	98
+15 mins.	106	28	134	66	137	203	12	43	55
+30 mins.	91	21	112	52	161	213	14	66	80
+45 mins.	103	19	122	78	170	248	23	66	89
Total Volume	400	113	513	290	590	880	92	230	322
% App. Total	78	22		33	67		28.6	71.4	
PHF	.943	.628	.884	.771	.868	.887	.535	.871	.821



N/S Street : Farm Street  
E/W Street : Nahant Street  
City/State : Wakefield, MA  
Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Nahant Street  
 City/State : Wakefield, MA  
 Weather : Clear

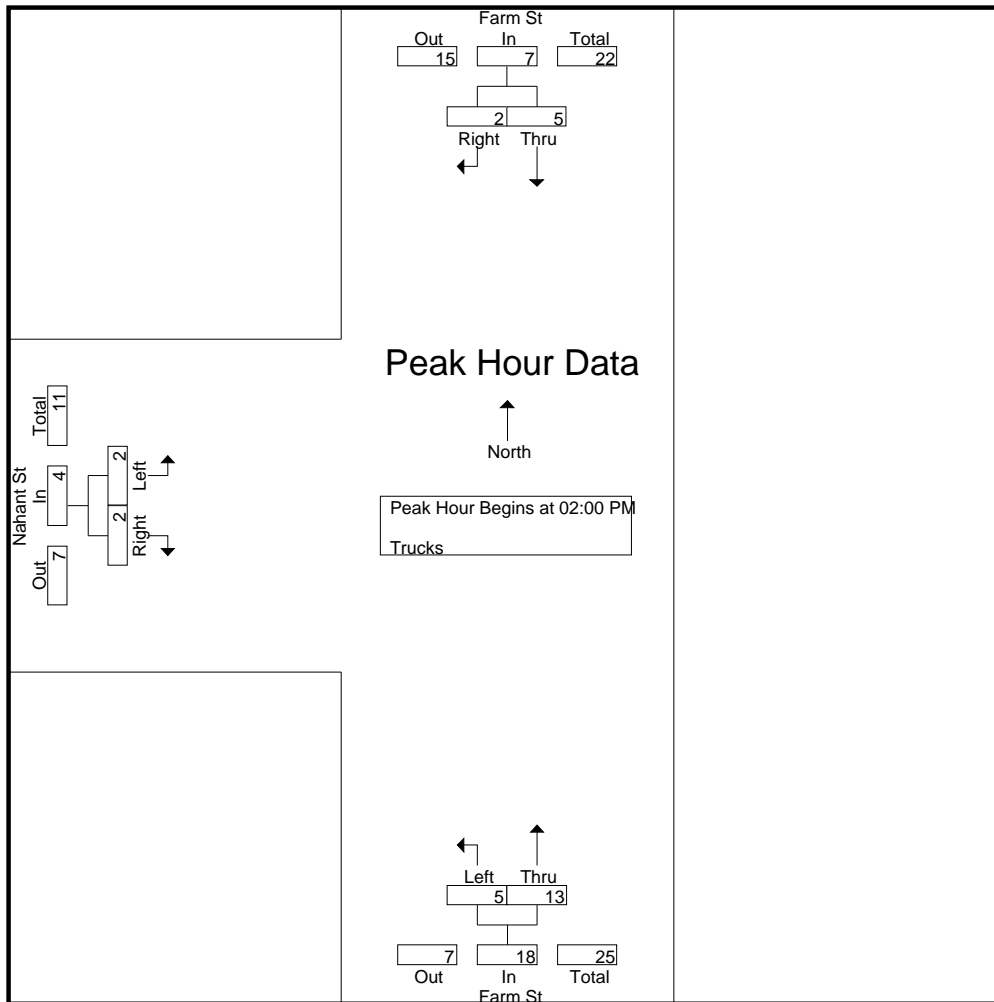
File Name : 40684004  
 Site Code : 40684004  
 Start Date : 11/16/2021  
 Page No : 7

### Groups Printed- Trucks

Start Time	Farm St From North		Farm St From South		Nahant St From West		Int. Total
	Thru	Right	Left	Thru	Left	Right	
02:00 PM	3	0	1	1	0	2	7
02:15 PM	1	1	0	4	1	0	7
02:30 PM	0	0	0	3	1	0	4
02:45 PM	1	1	4	5	0	0	11
<b>Total</b>	<b>5</b>	<b>2</b>	<b>5</b>	<b>13</b>	<b>2</b>	<b>2</b>	<b>29</b>
03:00 PM	1	0	0	1	0	0	2
03:15 PM	2	0	0	3	0	1	6
03:30 PM	0	0	0	3	0	0	3
03:45 PM	3	0	2	6	1	0	12
<b>Total</b>	<b>6</b>	<b>0</b>	<b>2</b>	<b>13</b>	<b>1</b>	<b>1</b>	<b>23</b>
<b>Grand Total</b>	<b>11</b>	<b>2</b>	<b>7</b>	<b>26</b>	<b>3</b>	<b>3</b>	<b>52</b>
Apprch %	84.6	15.4	21.2	78.8	50	50	
Total %	21.2	3.8	13.5	50	5.8	5.8	

Start Time	Farm St From North			Farm St From South			Nahant St From West			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:00 PM										
02:00 PM	3	0	3	1	1	2	0	2	2	7
02:15 PM	1	1	2	0	4	4	1	0	1	7
02:30 PM	0	0	0	0	3	3	1	0	1	4
02:45 PM	1	1	2	4	5	9	0	0	0	11
<b>Total Volume</b>	<b>5</b>	<b>2</b>	<b>7</b>	<b>5</b>	<b>13</b>	<b>18</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>29</b>
<b>% App. Total</b>	<b>71.4</b>	<b>28.6</b>		<b>27.8</b>	<b>72.2</b>		<b>50</b>	<b>50</b>		
PHF	.417	.500	.583	.313	.650	.500	.500	.250	.500	.659

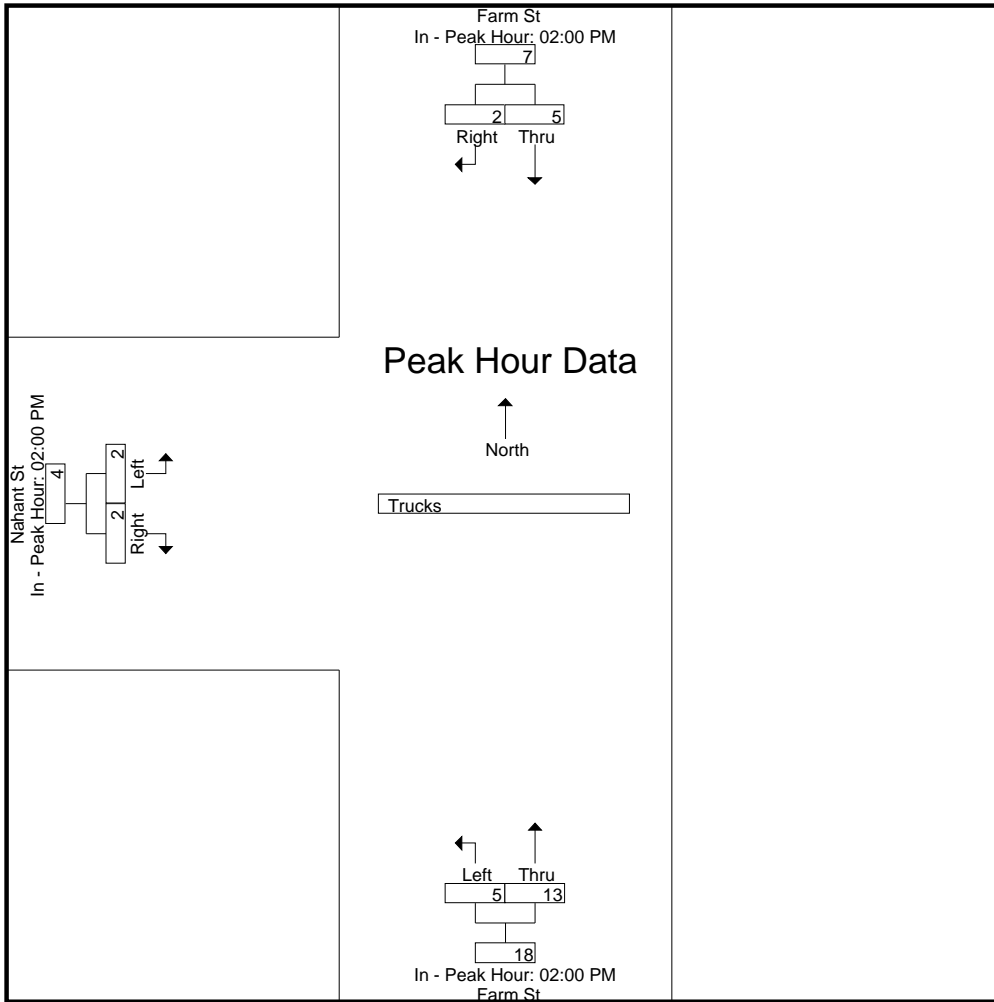
N/S Street : Farm Street  
E/W Street : Nahant Street  
City/State : Wakefield, MA  
Weather : Clear



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	02:00 PM			02:00 PM			02:00 PM		
+0 mins.	3	0	3	1	1	2	0	2	2
+15 mins.	1	1	2	0	4	4	1	0	1
+30 mins.	0	0	0	0	3	3	1	0	1
+45 mins.	1	1	2	4	5	9	0	0	0
Total Volume	5	2	7	5	13	18	2	2	4
% App. Total	71.4	28.6		27.8	72.2		50	50	
PHF	.417	.500	.583	.313	.650	.500	.500	.250	.500

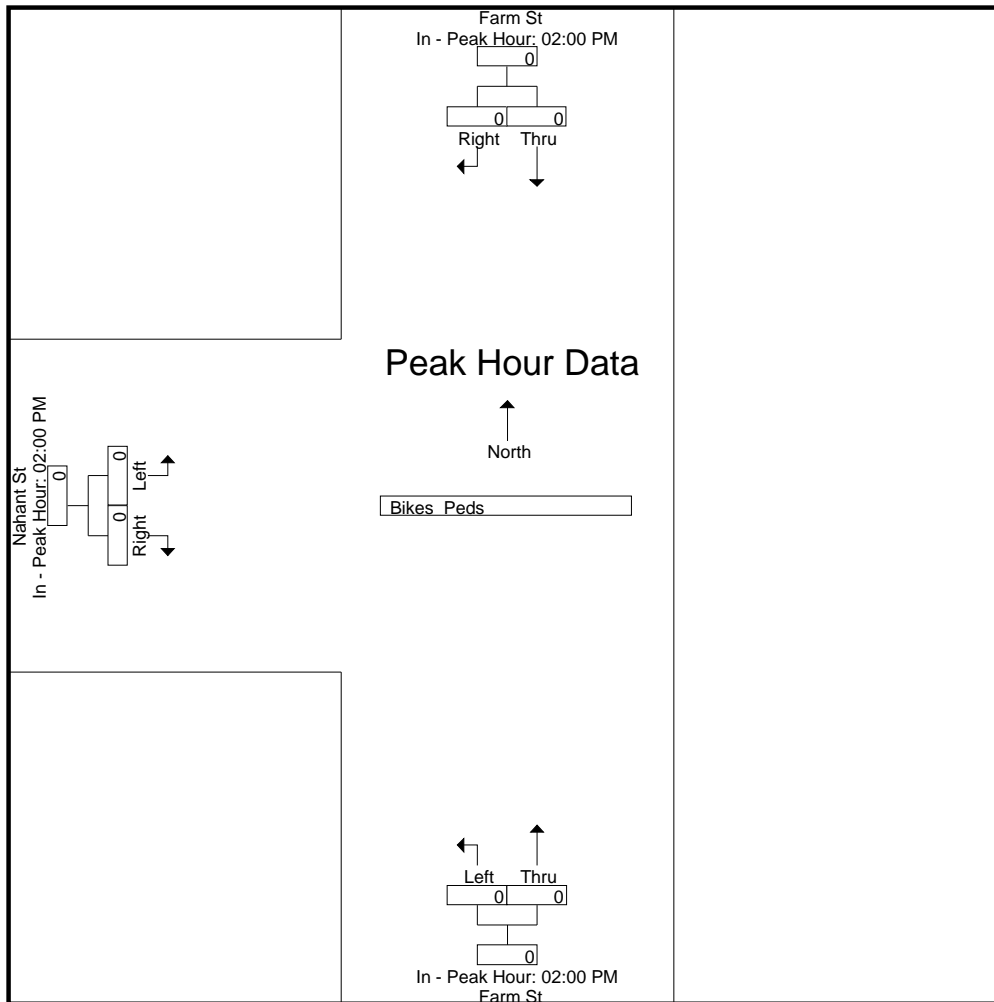
N/S Street : Farm Street  
E/W Street : Nahant Street  
City/State : Wakefield, MA  
Weather : Clear







N/S Street : Farm Street  
E/W Street : Nahant Street  
City/State : Wakefield, MA  
Weather : Clear



**Accurate Counts**  
978-664-2565

N/S Street : Farm Street  
E/W Street : Hemlock Road  
City/State : Wakefield, MA  
Weather : Clear

File Name : 40684005  
Site Code : 40684005  
Start Date : 11/16/2021  
Page No : 1

Groups Printed- Cars - Trucks

Start Time	Farm St From North		Hemlock Rd From East		Farm St From South		Int. Total
	Left	Thru	Left	Right	Thru	Right	
07:00 AM	131	107	3	4	118	46	409
07:15 AM	111	130	17	25	153	90	526
07:30 AM	96	151	45	32	112	115	551
07:45 AM	45	139	51	51	113	46	445
Total	383	527	116	112	496	297	1931
08:00 AM	20	128	6	4	165	7	330
08:15 AM	11	142	1	5	174	3	336
08:30 AM	6	180	8	8	133	2	337
08:45 AM	10	126	2	7	106	6	257
Total	47	576	17	24	578	18	1260
09:00 AM	13	97	4	4	89	5	212
09:15 AM	12	93	3	8	75	1	192
09:30 AM	8	77	4	7	75	2	173
09:45 AM	14	90	4	10	86	5	209
Total	47	357	15	29	325	13	786
10:00 AM	4	85	2	7	79	1	178
10:15 AM	6	68	5	7	83	4	173
10:30 AM	4	82	2	9	94	5	196
10:45 AM	13	85	6	10	84	3	201
Total	27	320	15	33	340	13	748
11:00 AM	9	72	4	13	91	4	193
11:15 AM	8	83	5	5	103	7	211
11:30 AM	10	99	8	10	101	6	234
11:45 AM	14	93	0	14	114	4	239
Total	41	347	17	42	409	21	877
12:00 PM	9	91	1	9	100	1	211
12:15 PM	4	85	2	7	108	3	209
12:30 PM	11	105	6	11	100	2	235
12:45 PM	6	97	1	8	115	3	230
Total	30	378	10	35	423	9	885
01:00 PM	9	108	5	9	93	1	225
01:15 PM	3	89	2	8	76	8	186
01:30 PM	7	107	1	9	97	8	229
01:45 PM	23	89	3	14	121	13	263
Total	42	393	11	40	387	30	903
02:00 PM	17	106	26	49	125	20	343
02:15 PM	27	109	26	99	114	23	398
02:30 PM	31	107	64	119	141	14	476
02:45 PM	16	132	65	109	125	10	457
Total	91	454	181	376	505	67	1674
03:00 PM	25	150	20	45	155	11	406
03:15 PM	28	132	15	41	179	9	404
03:30 PM	21	140	22	43	209	12	447
03:45 PM	8	133	14	20	195	5	375
Total	82	555	71	149	738	37	1632
Grand Total	790	3907	453	840	4201	505	10696
Apprch %	16.8	83.2	35	65	89.3	10.7	
Total %	7.4	36.5	4.2	7.9	39.3	4.7	
Cars	767	3858	423	820	4135	479	10482
% Cars	97.1	98.7	93.4	97.6	98.4	94.9	98
Trucks	23	49	30	20	66	26	214
% Trucks	2.9	1.3	6.6	2.4	1.6	5.1	2

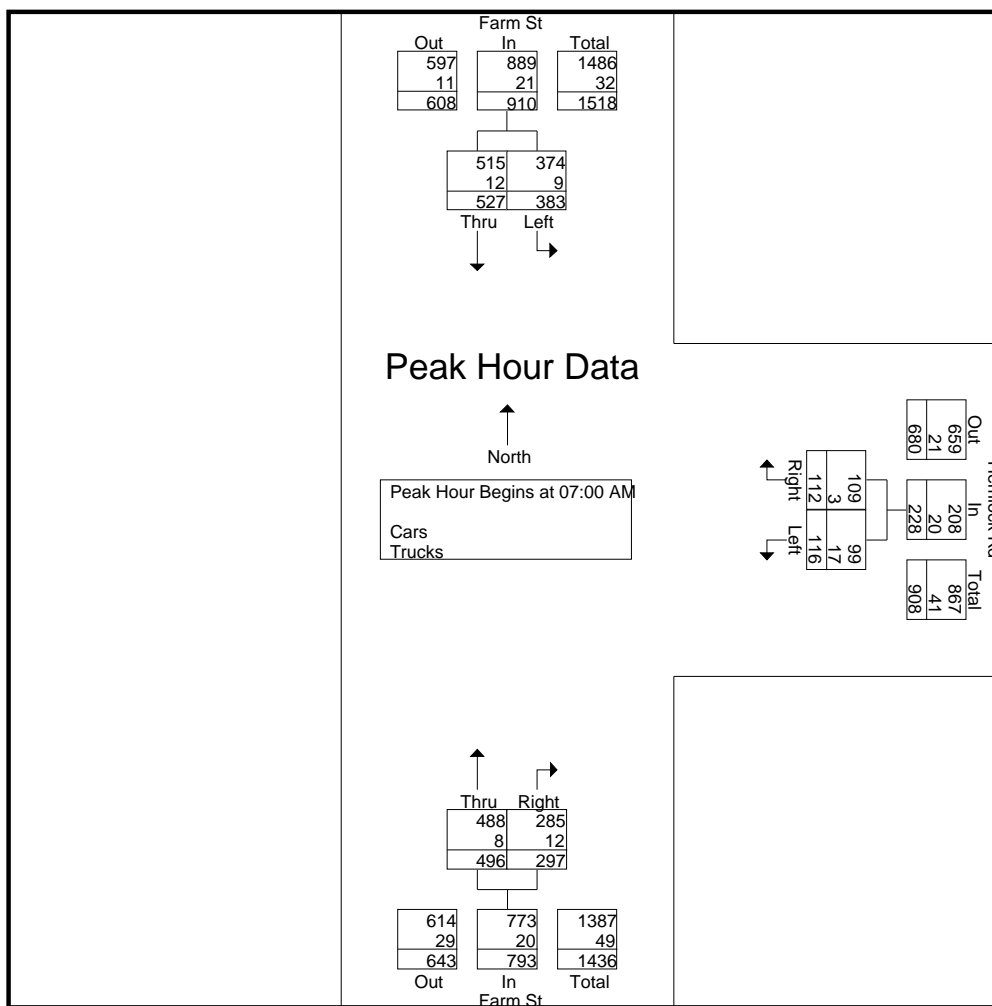


**Accurate Counts**  
978-664-2565

File Name : 40684005  
Site Code : 40684005  
Start Date : 11/16/2021  
Page No : 2

N/S Street : Farm Street  
E/W Street : Hemlock Road  
City/State : Wakefield, MA  
Weather : Clear

Start Time	Farm St From North			Hemlock Rd From East			Farm St From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	131	107	238	3	4	7	118	46	164	409
07:15 AM	111	130	241	17	25	42	153	90	243	526
07:30 AM	96	151	247	45	32	77	112	115	227	551
07:45 AM	45	139	184	51	51	102	113	46	159	445
Total Volume	383	527	910	116	112	228	496	297	793	1931
% App. Total	42.1	57.9		50.9	49.1		62.5	37.5		
PHF	.731	.873	.921	.569	.549	.559	.810	.646	.816	.876
Cars	374	515	889	99	109	208	488	285	773	1870
% Cars	97.7	97.7	97.7	85.3	97.3	91.2	98.4	96.0	97.5	96.8
Trucks	9	12	21	17	3	20	8	12	20	61
% Trucks	2.3	2.3	2.3	14.7	2.7	8.8	1.6	4.0	2.5	3.2



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Hemlock Road  
 City/State : Wakefield, MA  
 Weather : Clear

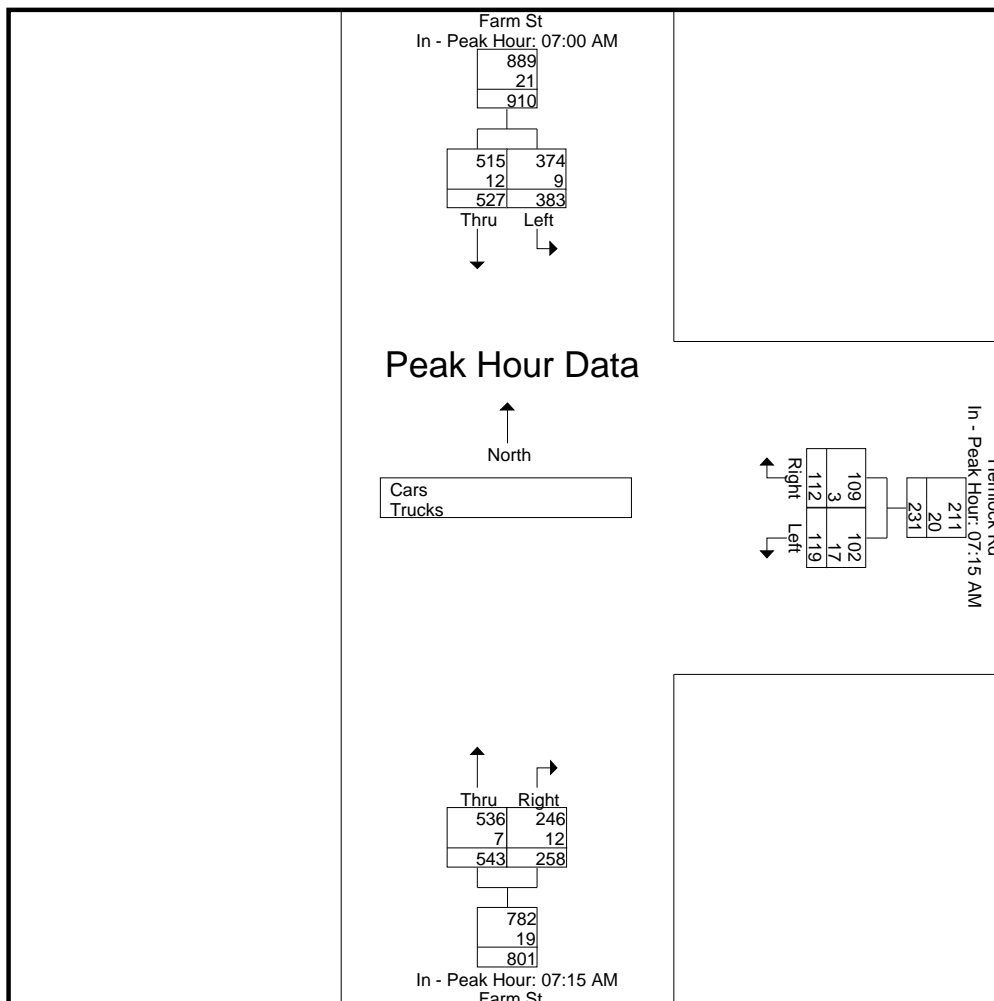
File Name : 40684005  
 Site Code : 40684005  
 Start Date : 11/16/2021  
 Page No : 3

Start Time	Farm St From North			Hemlock Rd From East			Farm St From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	

Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM			07:15 AM			07:15 AM		
+0 mins.	131	107	238	17	25	42	153	90	243
+15 mins.	111	130	241	45	32	77	112	115	227
+30 mins.	96	151	247	51	51	102	113	46	159
+45 mins.	45	139	184	6	4	10	165	7	172
Total Volume	383	527	910	119	112	231	543	258	801
% App. Total	42.1	57.9		51.5	48.5		67.8	32.2	
PHF	.731	.873	.921	.583	.549	.566	.823	.561	.824
Cars	374	515	889	102	109	211	536	246	782
% Cars	97.7	97.7	97.7	85.7	97.3	91.3	98.7	95.3	97.6
Trucks	9	12	21	17	3	20	7	12	19
% Trucks	2.3	2.3	2.3	14.3	2.7	8.7	1.3	4.7	2.4



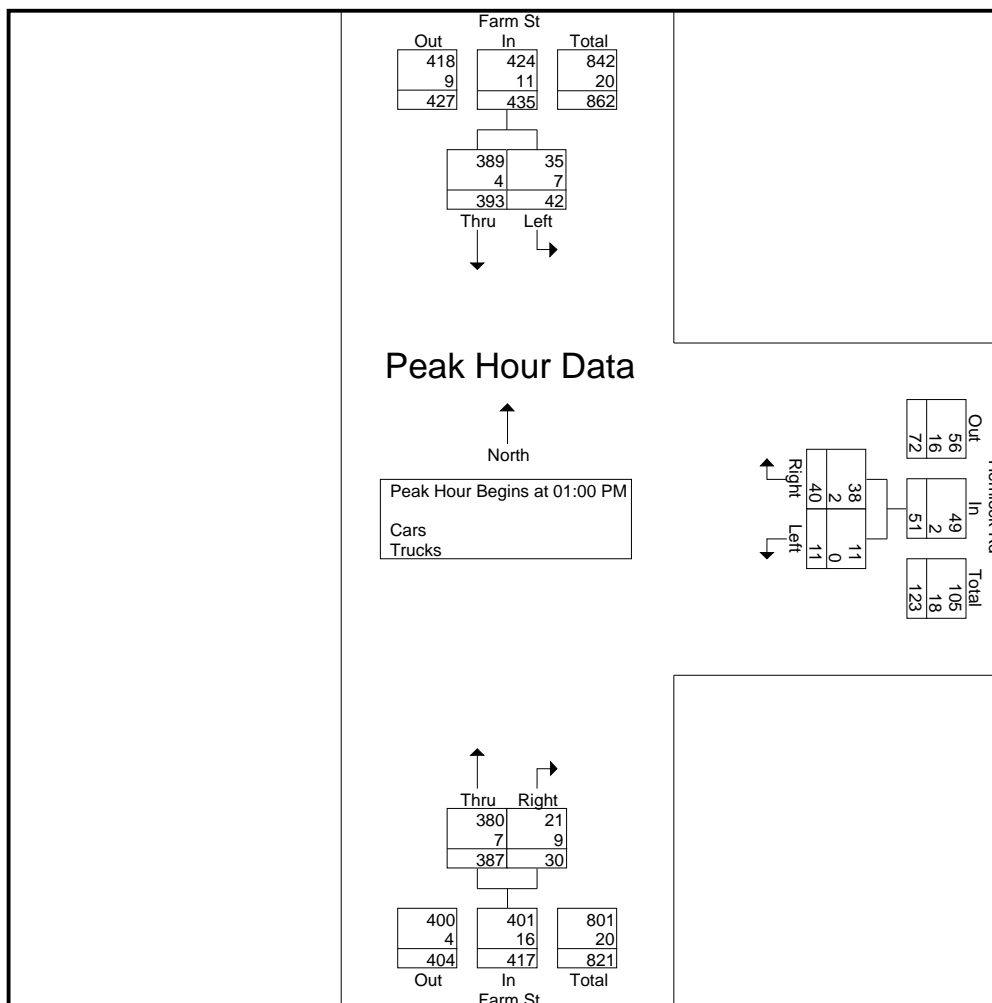
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 01:00 PM

01:00 PM	9	108	117	5	9	14	93	1	94	225
01:15 PM	3	89	92	2	8	10	76	8	84	186
01:30 PM	7	107	114	1	9	10	97	8	105	229
01:45 PM	23	89	112	3	14	17	121	13	134	263
Total Volume	42	393	435	11	40	51	387	30	417	903
% App. Total	9.7	90.3		21.6	78.4		92.8	7.2		
PHF	.457	.910	.929	.550	.714	.750	.800	.577	.778	.858
Cars	35	389	424	11	38	49	380	21	401	874
% Cars	83.3	99.0	97.5	100	95.0	96.1	98.2	70.0	96.2	96.8
Trucks	7	4	11	0	2	2	7	9	16	29

**Accurate Counts**  
978-664-2565

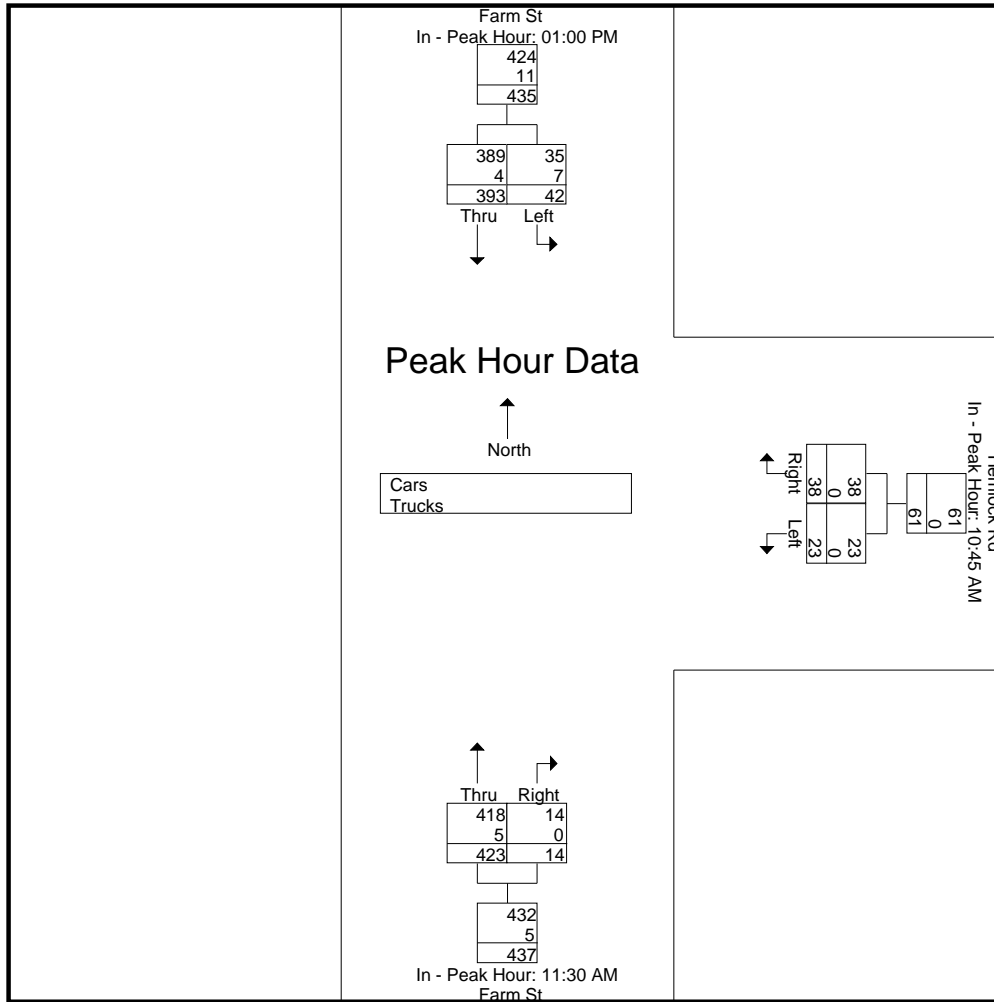
% Trucks | 16.7 | 1.0 | 2.5 | 0 | 5.0 | 3.9 | 1.8 | 30.0 | 3.8 | 3.2



Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	01:00 PM			10:45 AM			11:30 AM		
+0 mins.	9	<b>108</b>	<b>117</b>	6	10	16	101	<b>6</b>	107
+15 mins.	3	89	92	4	<b>13</b>	17	<b>114</b>	4	<b>118</b>
+30 mins.	7	107	114	5	5	10	100	1	101
+45 mins.	<b>23</b>	89	112	<b>8</b>	10	<b>18</b>	108	3	111
Total Volume	42	393	435	23	38	61	423	14	437
% App. Total	9.7	90.3		37.7	62.3		96.8	3.2	
PHF	.457	.910	.929	.719	.731	.847	.928	.583	.926
Cars	35	389	424	23	38	61	418	14	432
% Cars	83.3	99	97.5	100	100	100	98.8	100	98.9
Trucks	7	4	11	0	0	0	5	0	5
% Trucks	16.7	1	2.5	0	0	0	1.2	0	1.1

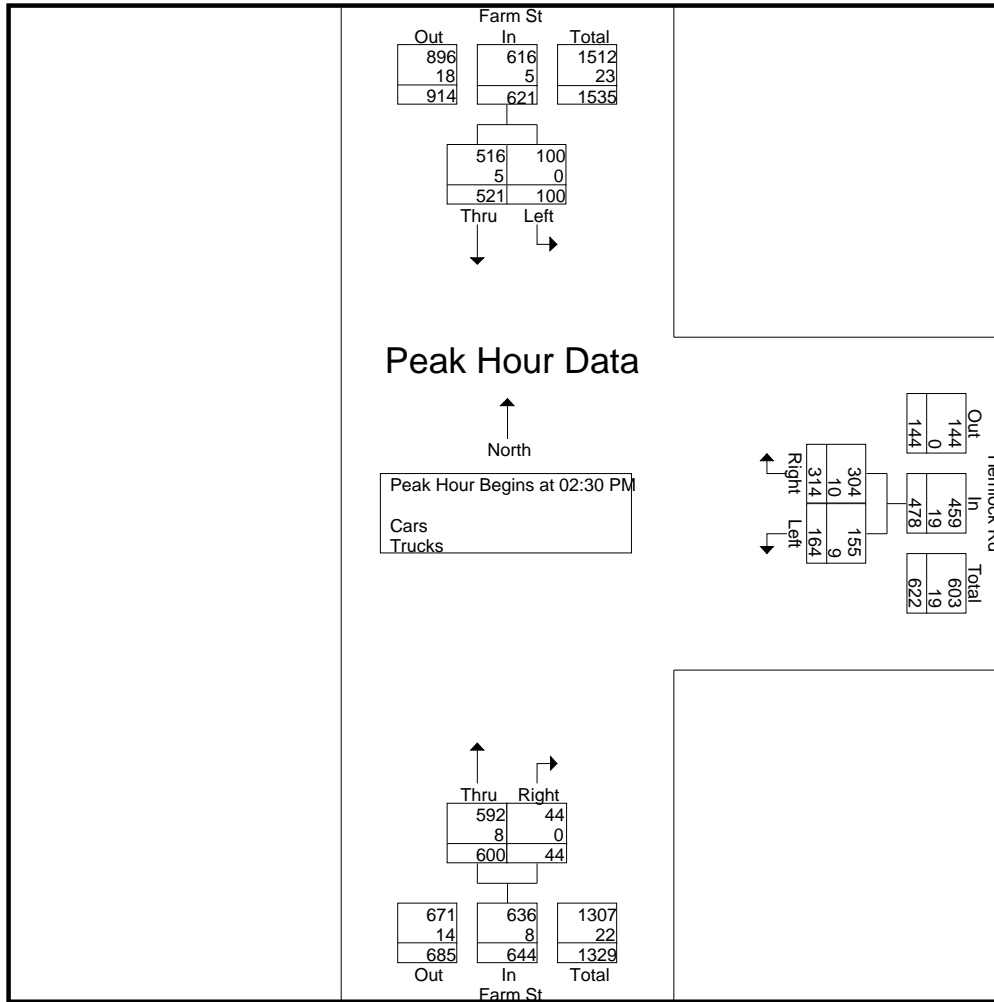
N/S Street : Farm Street  
E/W Street : Hemlock Road  
City/State : Wakefield, MA  
Weather : Clear



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Entire Intersection Begins at 02:30 PM

02:30 PM	<b>31</b>	107	138	64	<b>119</b>	<b>183</b>	141	<b>14</b>	155	<b>476</b>
02:45 PM	16	132	148	<b>65</b>	109	174	125	10	135	457
03:00 PM	25	<b>150</b>	<b>175</b>	20	45	65	155	11	166	406
03:15 PM	28	132	160	15	41	56	<b>179</b>	9	<b>188</b>	404
Total Volume	100	521	621	164	314	478	600	44	644	1743
% App. Total	16.1	83.9		34.3	65.7		93.2	6.8		
PHF	.806	.868	.887	.631	.660	.653	.838	.786	.856	.915
Cars	100	516	616	155	304	459	592	44	636	1711
% Cars	100	99.0	99.2	94.5	96.8	96.0	98.7	100	98.8	98.2
Trucks	0	5	5	9	10	19	8	0	8	32
% Trucks	0	1.0	0.8	5.5	3.2	4.0	1.3	0	1.2	1.8

N/S Street : Farm Street  
E/W Street : Hemlock Road  
City/State : Wakefield, MA  
Weather : Clear



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

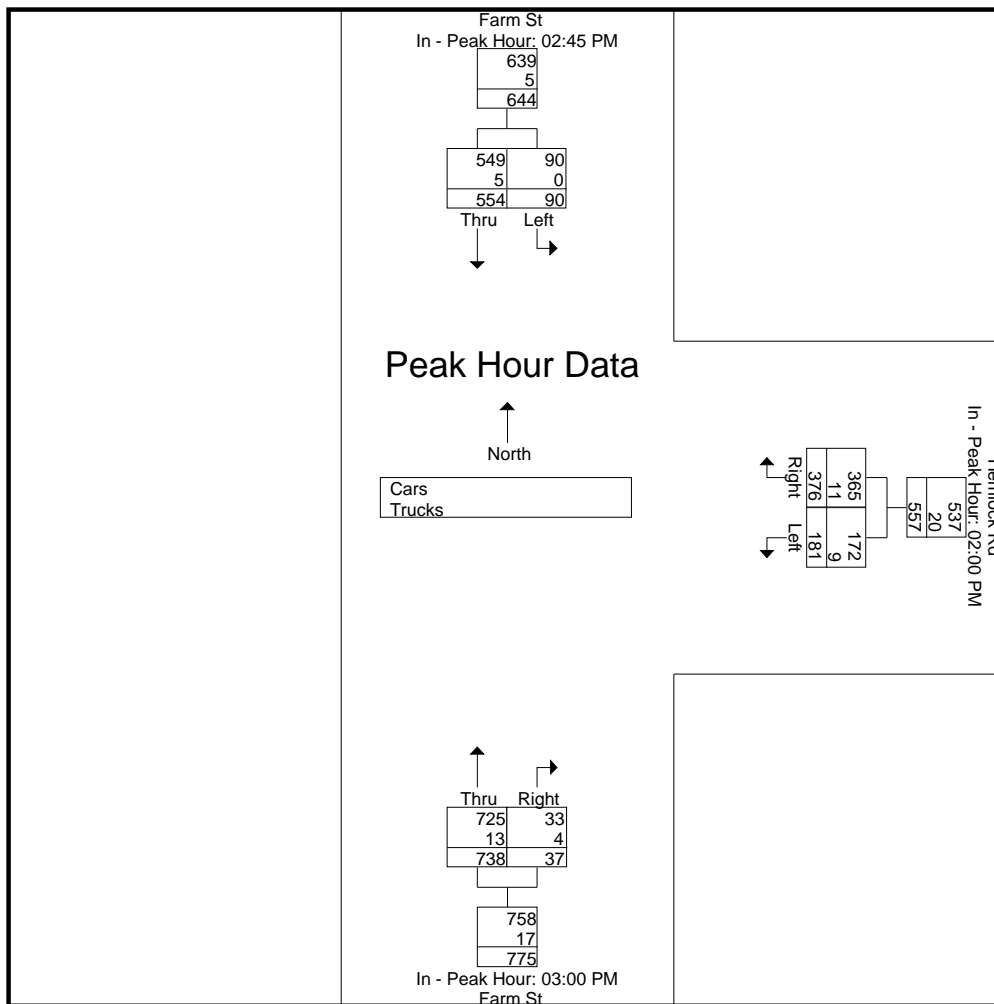
	02:45 PM			02:00 PM			03:00 PM		
+0 mins.	16	132	148	26	49	75	155	11	166
+15 mins.	25	<b>150</b>	<b>175</b>	26	99	125	179	9	188
+30 mins.	<b>28</b>	132	160	64	<b>119</b>	<b>183</b>	<b>209</b>	<b>12</b>	<b>221</b>
+45 mins.	21	140	161	<b>65</b>	109	174	195	5	200
Total Volume	90	554	644	181	376	557	738	37	775
% App. Total	14	86		32.5	67.5		95.2	4.8	
PHF	.804	.923	.920	.696	.790	.761	.883	.771	.877
Cars	90	549	639	172	365	537	725	33	758
% Cars	100	99.1	99.2	95	97.1	96.4	98.2	89.2	97.8
Trucks	0	5	5	9	11	20	13	4	17
% Trucks	0	0.9	0.8	5	2.9	3.6	1.8	10.8	2.2

# Accurate Counts

978-664-2565

File Name : 40684005  
 Site Code : 40684005  
 Start Date : 11/16/2021  
 Page No : 7

N/S Street : Farm Street  
 E/W Street : Hemlock Road  
 City/State : Wakefield, MA  
 Weather : Clear



**Accurate Counts**  
978-664-2565

N/S Street : Farm Street  
E/W Street : Hemlock Road  
City/State : Wakefield, MA  
Weather : Clear

File Name : 40684005  
Site Code : 40684005  
Start Date : 11/16/2021  
Page No : 8

Groups Printed- Cars

Start Time	Farm St From North		Hemlock Rd From East		Farm St From South		Int. Total
	Left	Thru	Left	Right	Thru	Right	
07:00 AM	130	105	3	4	116	46	404
07:15 AM	111	129	15	25	151	84	515
07:30 AM	88	147	36	30	109	110	520
07:45 AM	45	134	45	50	112	45	431
Total	374	515	99	109	488	285	1870
08:00 AM	19	125	6	4	164	7	325
08:15 AM	11	140	1	5	171	3	331
08:30 AM	6	178	8	7	131	2	332
08:45 AM	10	125	2	7	104	6	254
Total	46	568	17	23	570	18	1242
09:00 AM	13	96	4	4	89	5	211
09:15 AM	12	92	2	8	74	1	189
09:30 AM	7	75	4	6	74	2	168
09:45 AM	14	88	4	10	83	5	204
Total	46	351	14	28	320	13	772
10:00 AM	4	83	2	7	77	1	174
10:15 AM	6	68	5	7	83	4	173
10:30 AM	4	81	2	9	91	5	192
10:45 AM	12	85	6	10	82	3	198
Total	26	317	15	33	333	13	737
11:00 AM	9	71	4	13	90	4	191
11:15 AM	8	82	5	5	101	7	208
11:30 AM	10	97	8	10	100	6	231
11:45 AM	13	92	0	14	114	4	237
Total	40	342	17	42	405	21	867
12:00 PM	9	91	0	9	97	1	207
12:15 PM	4	85	2	7	107	3	208
12:30 PM	11	105	6	11	99	2	234
12:45 PM	5	97	1	8	113	3	227
Total	29	378	9	35	416	9	876
01:00 PM	9	106	5	8	92	1	221
01:15 PM	3	89	2	8	73	6	181
01:30 PM	3	105	1	9	96	5	219
01:45 PM	20	89	3	13	119	9	253
Total	35	389	11	38	380	21	874
02:00 PM	15	104	26	49	122	19	335
02:15 PM	27	108	26	98	112	23	394
02:30 PM	31	107	63	118	139	14	472
02:45 PM	16	131	57	100	125	10	439
Total	89	450	172	365	498	66	1640
03:00 PM	25	149	20	45	154	11	404
03:15 PM	28	129	15	41	174	9	396
03:30 PM	21	140	21	43	206	9	440
03:45 PM	8	130	13	18	191	4	364
Total	82	548	69	147	725	33	1604
Grand Total	767	3858	423	820	4135	479	10482
Aprch %	16.6	83.4	34	66	89.6	10.4	
Total %	7.3	36.8	4	7.8	39.4	4.6	

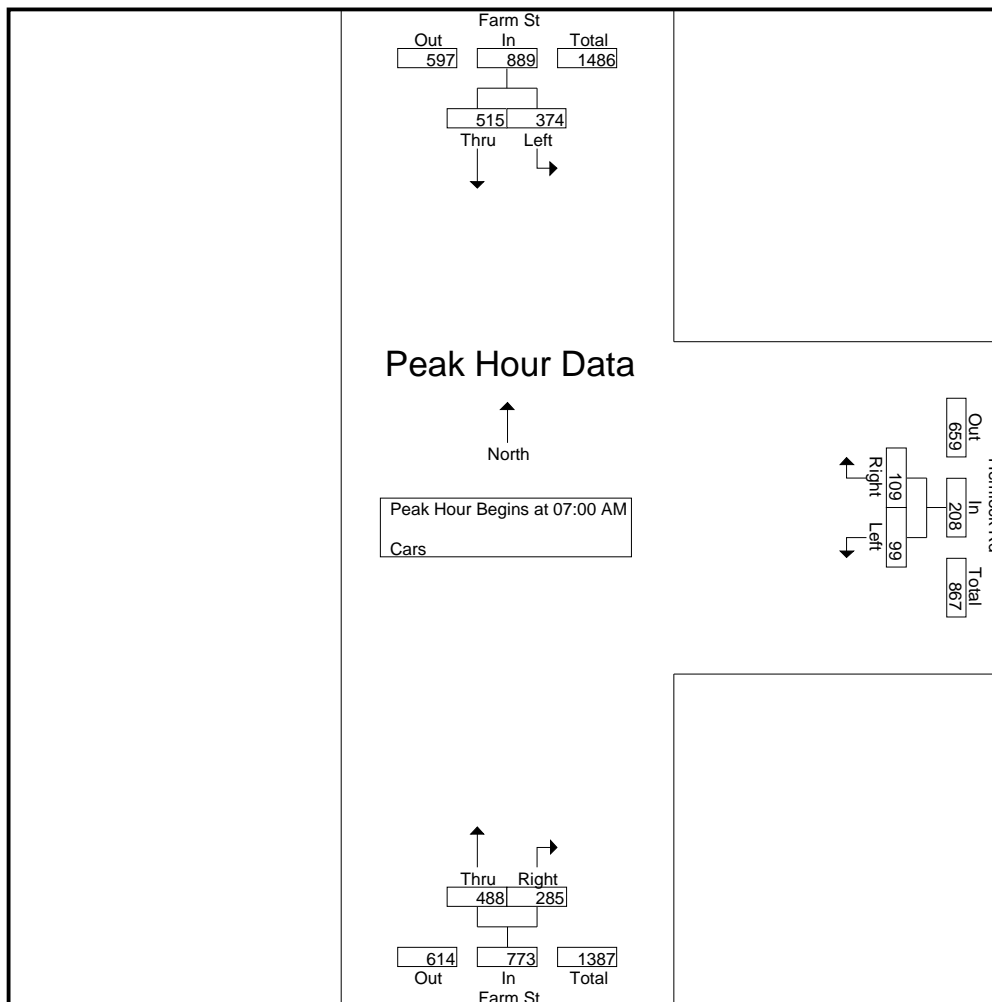
# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Hemlock Road  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 40684005  
 Site Code : 40684005  
 Start Date : 11/16/2021  
 Page No : 9

Start Time	Farm St From North			Hemlock Rd From East			Farm St From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	130	105	235	3	4	7	116	46	162	404
07:15 AM	111	129	240	15	25	40	151	84	235	515
07:30 AM	88	147	235	36	30	66	109	110	219	520
07:45 AM	45	134	179	45	50	95	112	45	157	431
Total Volume	374	515	889	99	109	208	488	285	773	1870
% App. Total	42.1	57.9		47.6	52.4		63.1	36.9		
PHF	.719	.876	.926	.550	.545	.547	.808	.648	.822	.899



Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

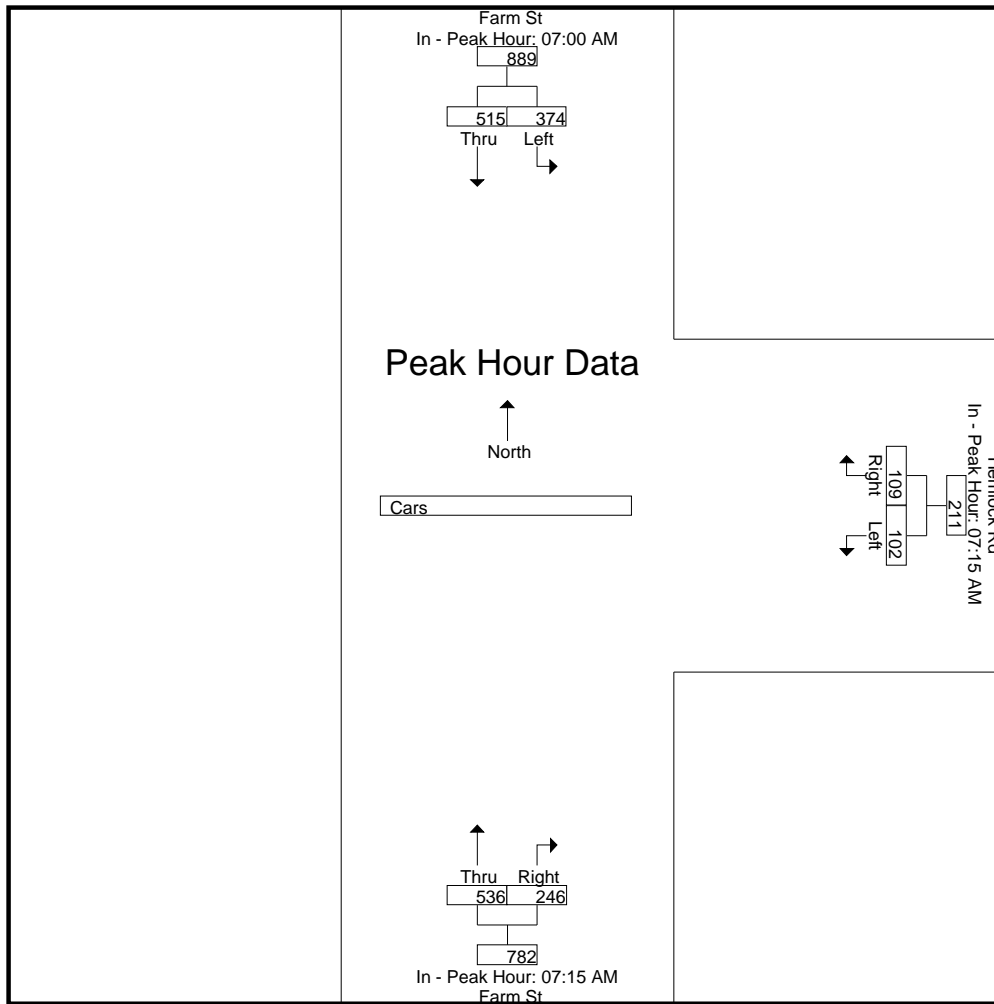
	07:00 AM			07:15 AM			07:45 AM		
+0 mins.	130	105	235	15	25	40	151	84	235
+15 mins.	111	129	240	36	30	66	109	110	219
+30 mins.	88	147	235	45	50	95	112	45	157
+45 mins.	45	134	179	6	4	10	164	7	171
Total Volume	374	515	889	102	109	211	536	246	782
% App. Total	42.1	57.9		48.3	51.7		68.5	31.5	
PHF	.719	.876	.926	.567	.545	.555	.817	.559	.832



**Accurate Counts**  
978-664-2565

File Name : 40684005  
Site Code : 40684005  
Start Date : 11/16/2021  
Page No : 10

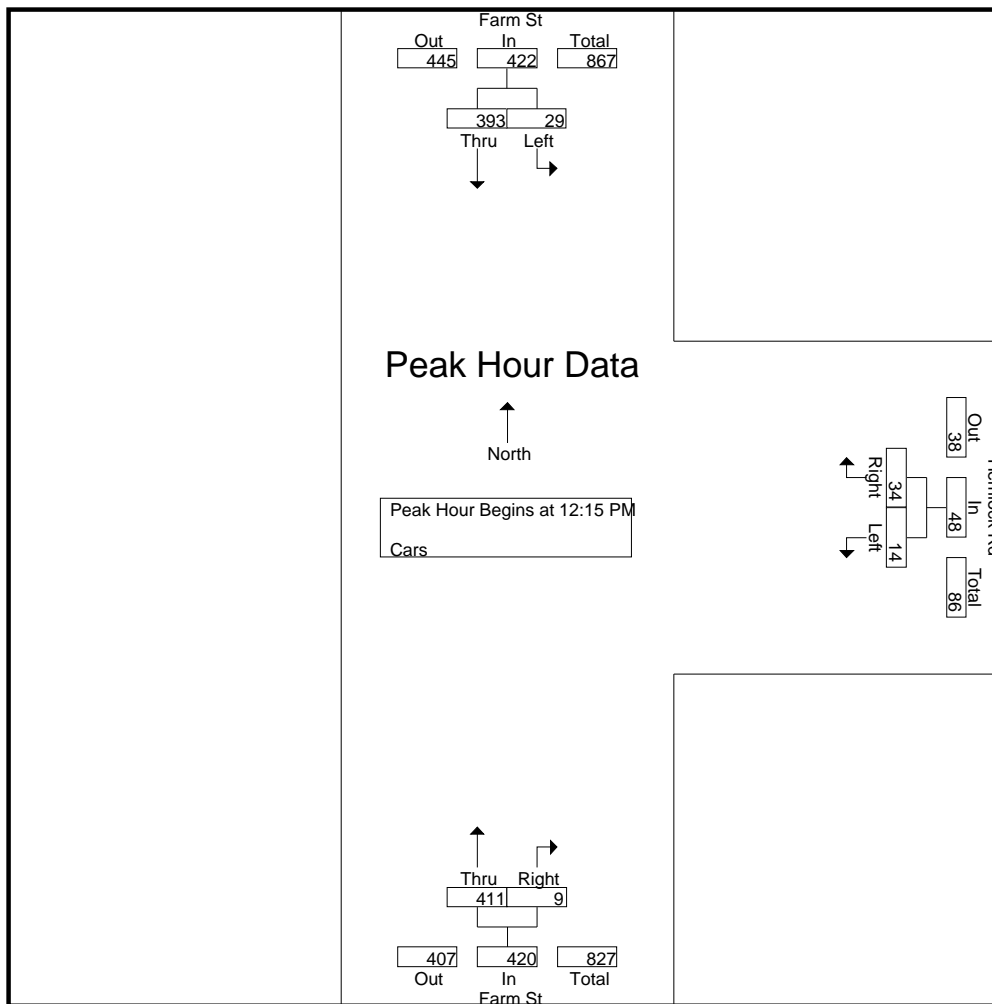
N/S Street : Farm Street  
E/W Street : Hemlock Road  
City/State : Wakefield, MA  
Weather : Clear



Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1  
Peak Hour for Entire Intersection Begins at 12:15 PM

12:15 PM	4	85	89	2	7	9	107	3	110	208
12:30 PM	11	105	116	6	11	17	99	2	101	234
12:45 PM	5	97	102	1	8	9	113	3	116	227
01:00 PM	9	106	115	5	8	13	92	1	93	221
Total Volume	29	393	422	14	34	48	411	9	420	890
% App. Total	6.9	93.1		29.2	70.8		97.9	2.1		
PHF	.659	.927	.909	.583	.773	.706	.909	.750	.905	.951

N/S Street : Farm Street  
E/W Street : Hemlock Road  
City/State : Wakefield, MA  
Weather : Clear



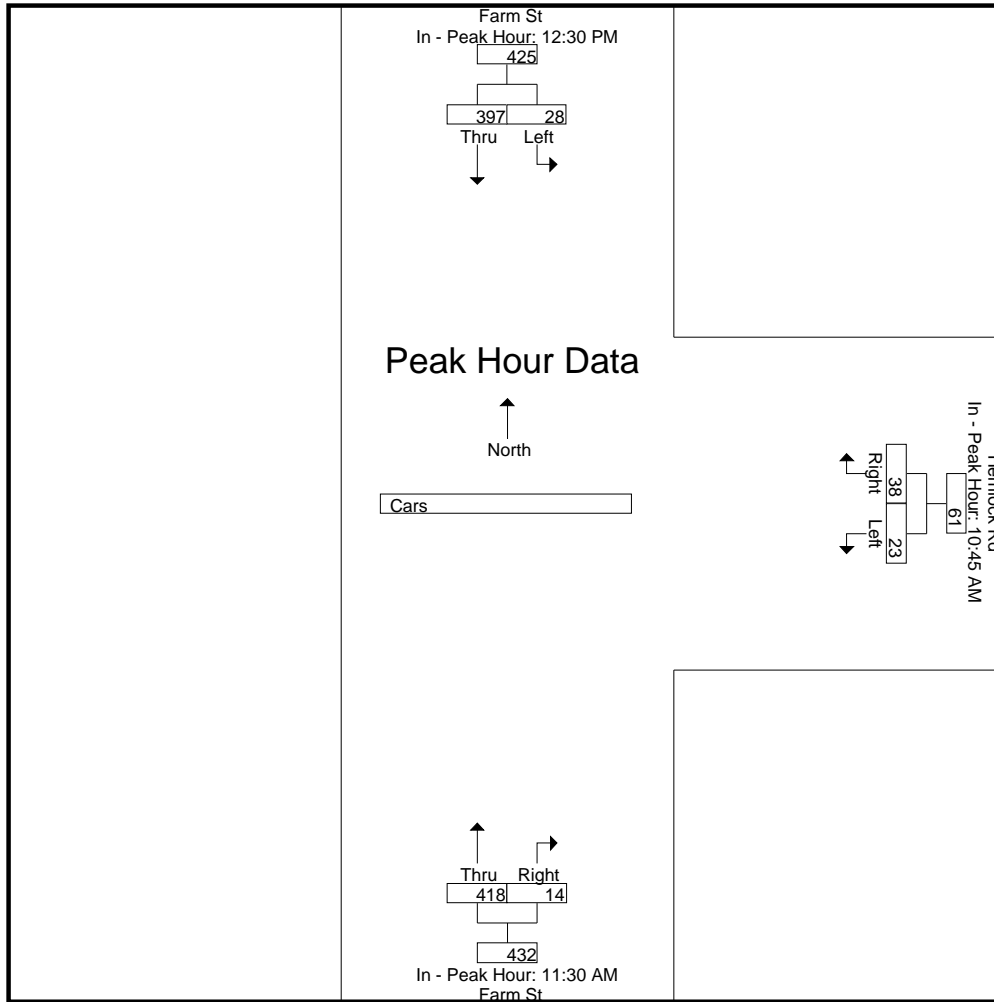
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	12:30 PM			10:45 AM			11:30 AM		
+0 mins.	<b>11</b>	105	<b>116</b>	6	10	16	100	<b>6</b>	106
+15 mins.	5	97	102	4	<b>13</b>	17	<b>114</b>	4	<b>118</b>
+30 mins.	9	<b>106</b>	115	5	5	10	97	1	98
+45 mins.	3	89	92	<b>8</b>	10	<b>18</b>	107	3	110
Total Volume	28	397	425	23	38	61	418	14	432
% App. Total	6.6	93.4		37.7	62.3		96.8	3.2	
PHF	.636	.936	.916	.719	.731	.847	.917	.583	.915

**Accurate Counts**  
978-664-2565

File Name : 40684005  
Site Code : 40684005  
Start Date : 11/16/2021  
Page No : 12

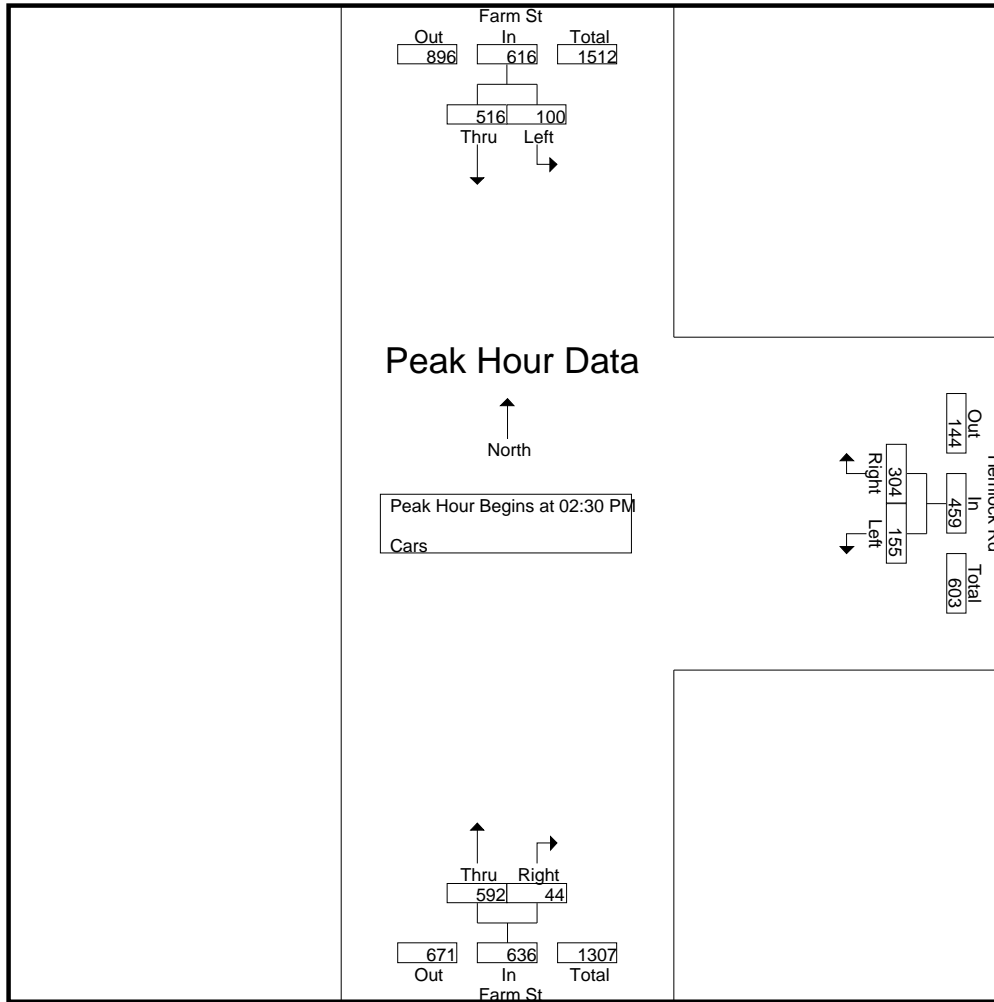
N/S Street : Farm Street  
E/W Street : Hemlock Road  
City/State : Wakefield, MA  
Weather : Clear



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Entire Intersection Begins at 02:30 PM

02:30 PM	<b>31</b>	107	138	<b>63</b>	<b>118</b>	<b>181</b>	139	<b>14</b>	153	<b>472</b>
02:45 PM	16	131	147	57	100	157	125	10	135	439
03:00 PM	25	<b>149</b>	<b>174</b>	20	45	65	154	11	165	404
03:15 PM	28	129	157	15	41	56	<b>174</b>	9	<b>183</b>	396
Total Volume	100	516	616	155	304	459	592	44	636	1711
% App. Total	16.2	83.8		33.8	66.2		93.1	6.9		
PHF	.806	.866	.885	.615	.644	.634	.851	.786	.869	.906

N/S Street : Farm Street  
E/W Street : Hemlock Road  
City/State : Wakefield, MA  
Weather : Clear



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

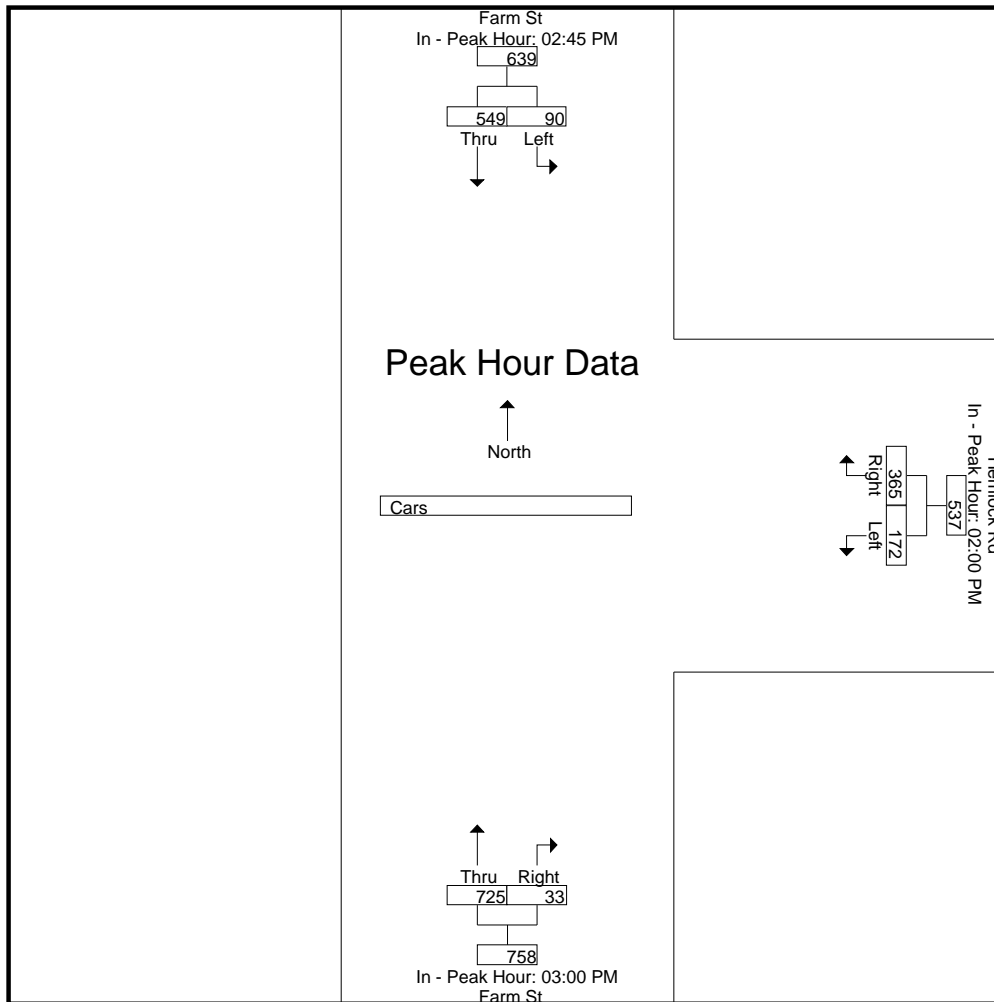
	02:45 PM			02:00 PM			03:00 PM		
+0 mins.	16	131	147	26	49	75	154	11	165
+15 mins.	25	<b>149</b>	<b>174</b>	26	98	124	174	9	183
+30 mins.	<b>28</b>	129	157	<b>63</b>	<b>118</b>	<b>181</b>	<b>206</b>	9	<b>215</b>
+45 mins.	21	140	161	57	100	157	191	4	195
Total Volume	90	549	639	172	365	537	725	33	758
% App. Total	14.1	85.9		32	68		95.6	4.4	
PHF	.804	.921	.918	.683	.773	.742	.880	.750	.881

# Accurate Counts

978-664-2565

N/S Street : Farm Street  
E/W Street : Hemlock Road  
City/State : Wakefield, MA  
Weather : Clear

File Name : 40684005  
Site Code : 40684005  
Start Date : 11/16/2021  
Page No : 14



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : Hemlock Road  
 City/State : Wakefield, MA  
 Weather : Clear

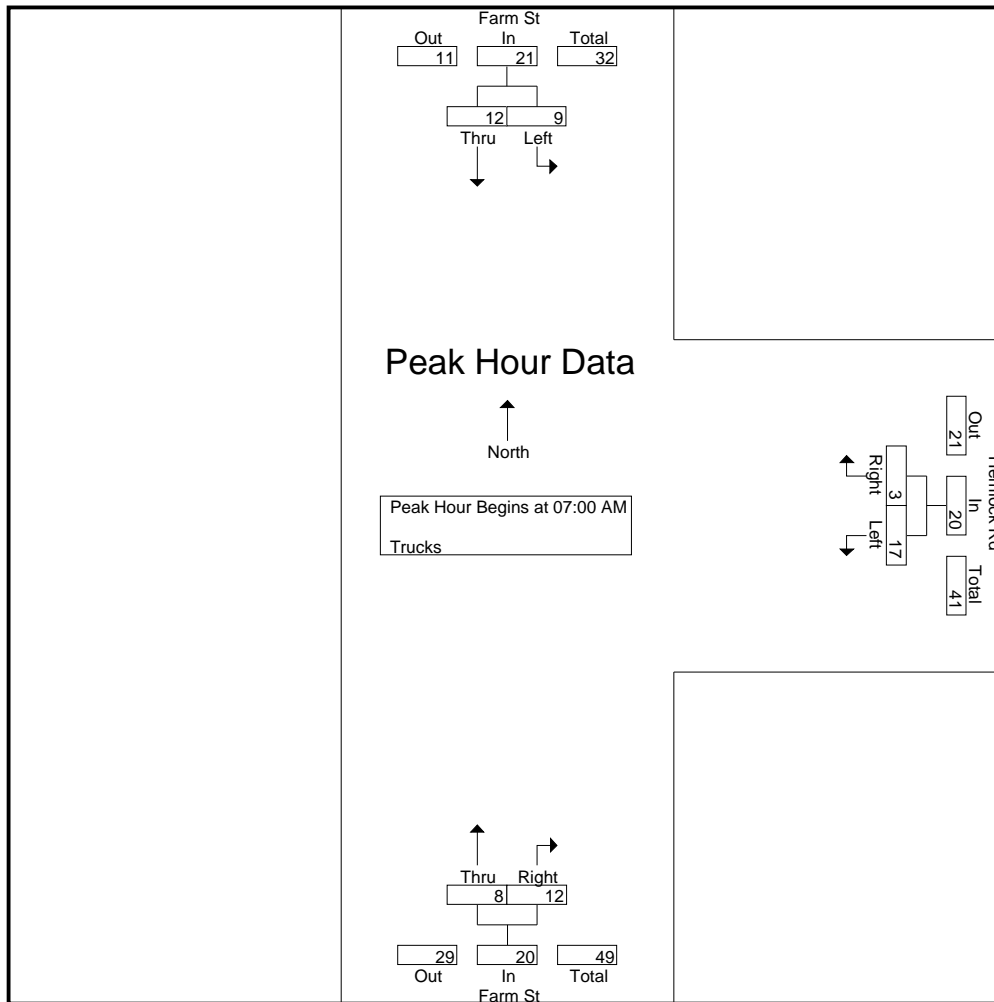
File Name : 40684005  
 Site Code : 40684005  
 Start Date : 11/16/2021  
 Page No : 15

## Groups Printed- Trucks

Start Time	Farm St From North		Hemlock Rd From East		Farm St From South		Int. Total
	Left	Thru	Left	Right	Thru	Right	
07:00 AM	1	2	0	0	2	0	5
07:15 AM	0	1	2	0	2	6	11
07:30 AM	8	4	9	2	3	5	31
07:45 AM	0	5	6	1	1	1	14
<b>Total</b>	<b>9</b>	<b>12</b>	<b>17</b>	<b>3</b>	<b>8</b>	<b>12</b>	<b>61</b>
08:00 AM	1	3	0	0	1	0	5
08:15 AM	0	2	0	0	3	0	5
08:30 AM	0	2	0	1	2	0	5
08:45 AM	0	1	0	0	2	0	3
<b>Total</b>	<b>1</b>	<b>8</b>	<b>0</b>	<b>1</b>	<b>8</b>	<b>0</b>	<b>18</b>
09:00 AM	0	1	0	0	0	0	1
09:15 AM	0	1	1	0	1	0	3
09:30 AM	1	2	0	1	1	0	5
09:45 AM	0	2	0	0	3	0	5
<b>Total</b>	<b>1</b>	<b>6</b>	<b>1</b>	<b>1</b>	<b>5</b>	<b>0</b>	<b>14</b>
10:00 AM	0	2	0	0	2	0	4
10:15 AM	0	0	0	0	0	0	0
10:30 AM	0	1	0	0	3	0	4
10:45 AM	1	0	0	0	2	0	3
<b>Total</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>11</b>
11:00 AM	0	1	0	0	1	0	2
11:15 AM	0	1	0	0	2	0	3
11:30 AM	0	2	0	0	1	0	3
11:45 AM	1	1	0	0	0	0	2
<b>Total</b>	<b>1</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>10</b>
12:00 PM	0	0	1	0	3	0	4
12:15 PM	0	0	0	0	1	0	1
12:30 PM	0	0	0	0	1	0	1
12:45 PM	1	0	0	0	2	0	3
<b>Total</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>9</b>
01:00 PM	0	2	0	1	1	0	4
01:15 PM	0	0	0	0	3	2	5
01:30 PM	4	2	0	0	1	3	10
01:45 PM	3	0	0	1	2	4	10
<b>Total</b>	<b>7</b>	<b>4</b>	<b>0</b>	<b>2</b>	<b>7</b>	<b>9</b>	<b>29</b>
02:00 PM	2	2	0	0	3	1	8
02:15 PM	0	1	0	1	2	0	4
02:30 PM	0	0	1	1	2	0	4
02:45 PM	0	1	8	9	0	0	18
<b>Total</b>	<b>2</b>	<b>4</b>	<b>9</b>	<b>11</b>	<b>7</b>	<b>1</b>	<b>34</b>
03:00 PM	0	1	0	0	1	0	2
03:15 PM	0	3	0	0	5	0	8
03:30 PM	0	0	1	0	3	3	7
03:45 PM	0	3	1	2	4	1	11
<b>Total</b>	<b>0</b>	<b>7</b>	<b>2</b>	<b>2</b>	<b>13</b>	<b>4</b>	<b>28</b>
<b>Grand Total</b>	<b>23</b>	<b>49</b>	<b>30</b>	<b>20</b>	<b>66</b>	<b>26</b>	<b>214</b>
<b>Apprch %</b>	<b>31.9</b>	<b>68.1</b>	<b>60</b>	<b>40</b>	<b>71.7</b>	<b>28.3</b>	
<b>Total %</b>	<b>10.7</b>	<b>22.9</b>	<b>14</b>	<b>9.3</b>	<b>30.8</b>	<b>12.1</b>	

N/S Street : Farm Street  
E/W Street : Hemlock Road  
City/State : Wakefield, MA  
Weather : Clear

Start Time	Farm St From North			Hemlock Rd From East			Farm St From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	1	2	3	0	0	0	2	0	2	5
07:15 AM	0	1	1	2	0	2	2	6	8	11
07:30 AM	8	4	12	9	2	11	3	5	8	31
07:45 AM	0	5	5	6	1	7	1	1	2	14
Total Volume	9	12	21	17	3	20	8	12	20	61
% App. Total	42.9	57.1		85	15		40	60		
PHF	.281	.600	.438	.472	.375	.455	.667	.500	.625	.492



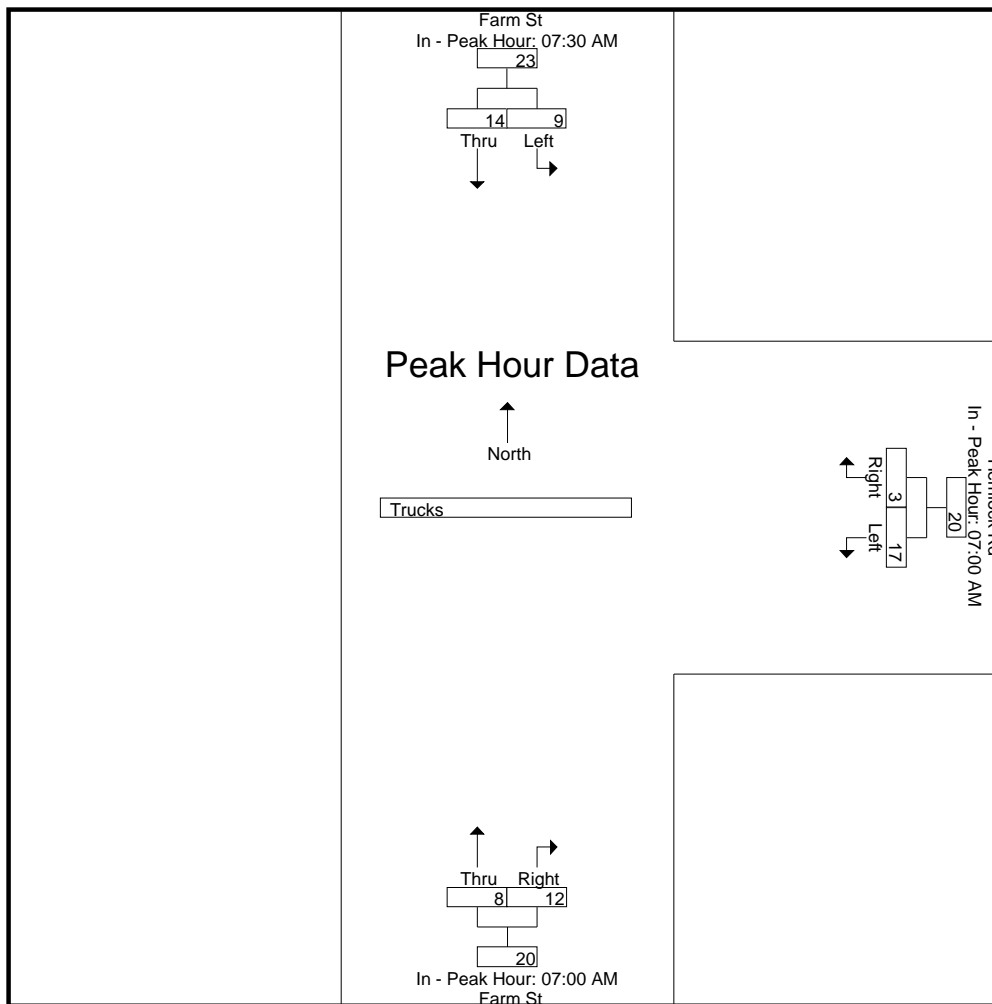
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	07:30 AM			07:00 AM			07:00 AM		
+0 mins.	8	4	12	0	0	0	2	0	2
+15 mins.	0	5	5	2	0	2	2	6	8
+30 mins.	1	3	4	9	2	11	3	5	8
+45 mins.	0	2	2	6	1	7	1	1	2
Total Volume	9	14	23	17	3	20	8	12	20
% App. Total	39.1	60.9		85	15		40	60	
PHF	.281	.700	.479	.472	.375	.455	.667	.500	.625

**Accurate Counts**  
978-664-2565

File Name : 40684005  
Site Code : 40684005  
Start Date : 11/16/2021  
Page No : 17

N/S Street : Farm Street  
E/W Street : Hemlock Road  
City/State : Wakefield, MA  
Weather : Clear

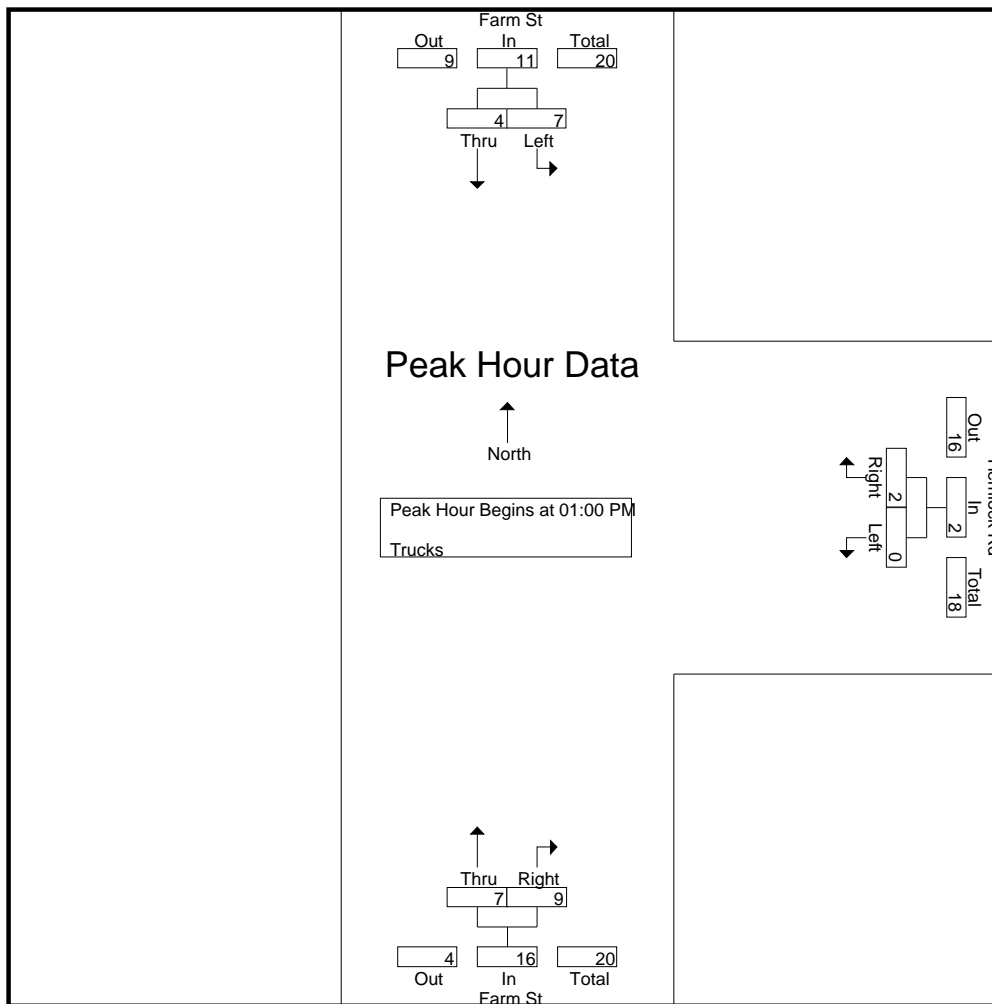


Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1  
Peak Hour for Entire Intersection Begins at 01:00 PM

01:00 PM	0	2	2	0	1	1	1	0	1	4
01:15 PM	0	0	0	0	0	0	3	2	5	5
01:30 PM	4	2	6	0	0	0	1	3	4	10
01:45 PM	3	0	3	0	1	1	2	4	6	10
Total Volume	7	4	11	0	2	2	7	9	16	29
% App. Total	63.6	36.4		0	100		43.8	56.2		
PHF	.438	.500	.458	.000	.500	.500	.583	.563	.667	.725



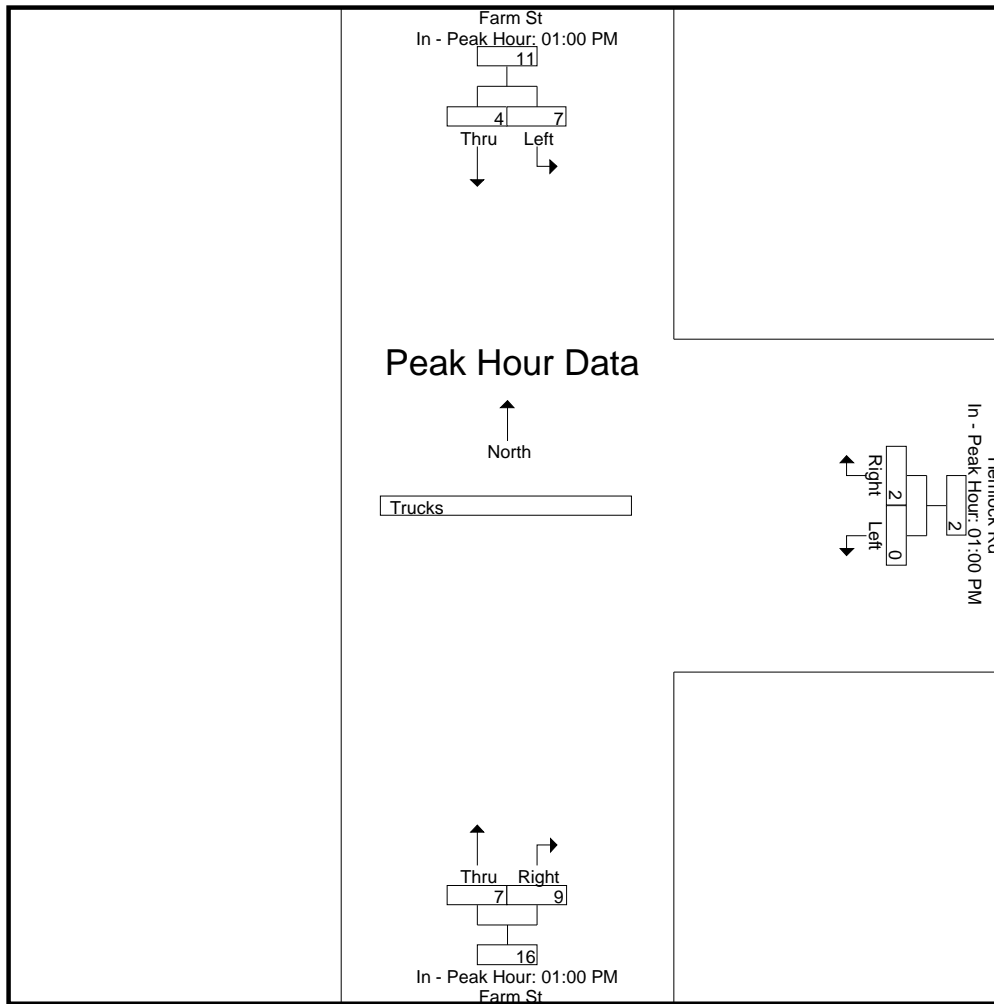
N/S Street : Farm Street  
E/W Street : Hemlock Road  
City/State : Wakefield, MA  
Weather : Clear



Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	01:00 PM			01:00 PM			01:00 PM		
+0 mins.	0	2	2	0	1	1	1	0	1
+15 mins.	0	0	0	0	0	0	3	2	5
+30 mins.	4	2	6	0	0	0	1	3	4
+45 mins.	3	0	3	0	1	1	2	4	6
Total Volume	7	4	11	0	2	2	7	9	16
% App. Total	63.6	36.4		0	100		43.8	56.2	
PHF	.438	.500	.458	.000	.500	.500	.583	.563	.667

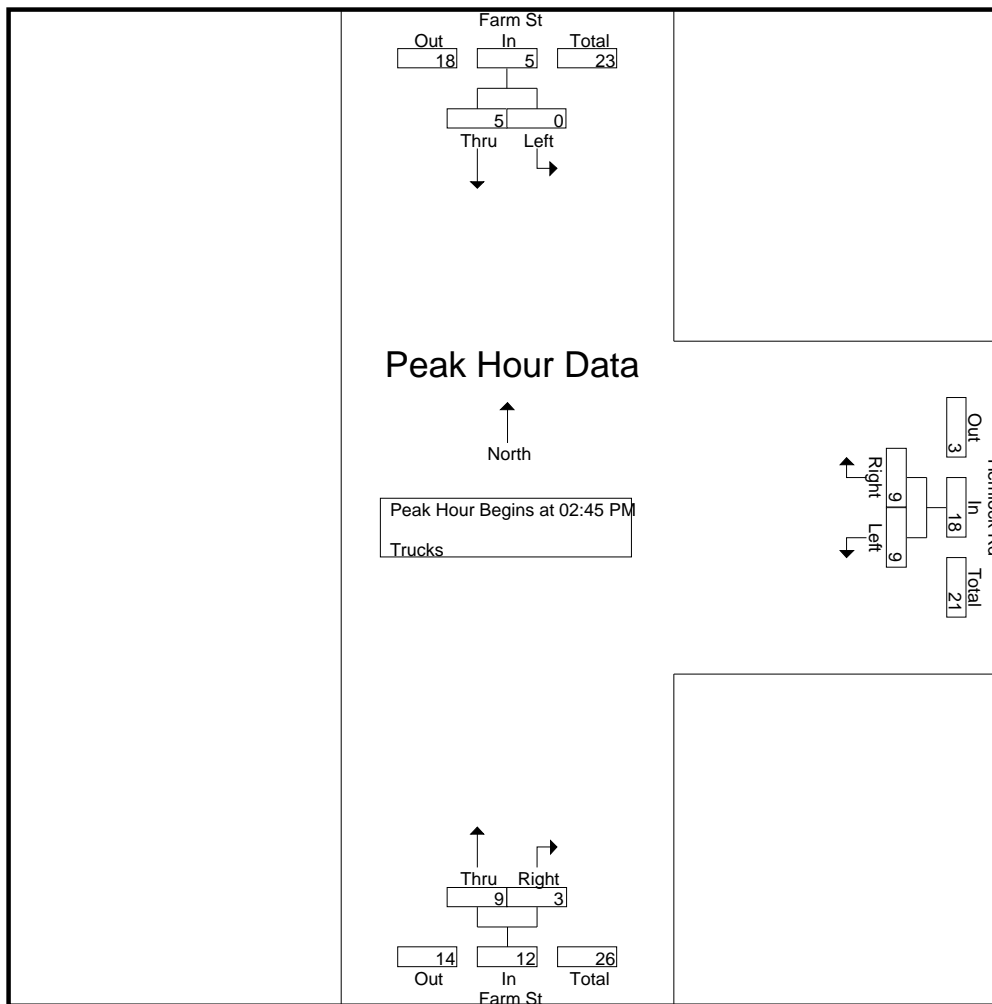
N/S Street : Farm Street  
E/W Street : Hemlock Road  
City/State : Wakefield, MA  
Weather : Clear



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Entire Intersection Begins at 02:45 PM

02:45 PM	0	1	1	8	9	17	0	0	0	18
03:00 PM	0	1	1	0	0	0	1	0	1	2
03:15 PM	0	3	3	0	0	0	5	0	5	8
03:30 PM	0	0	0	1	0	1	3	3	6	7
Total Volume	0	5	5	9	9	18	9	3	12	35
% App. Total	0	100		50	50		75	25		
PHF	.000	.417	.417	.281	.250	.265	.450	.250	.500	.486

N/S Street : Farm Street  
E/W Street : Hemlock Road  
City/State : Wakefield, MA  
Weather : Clear



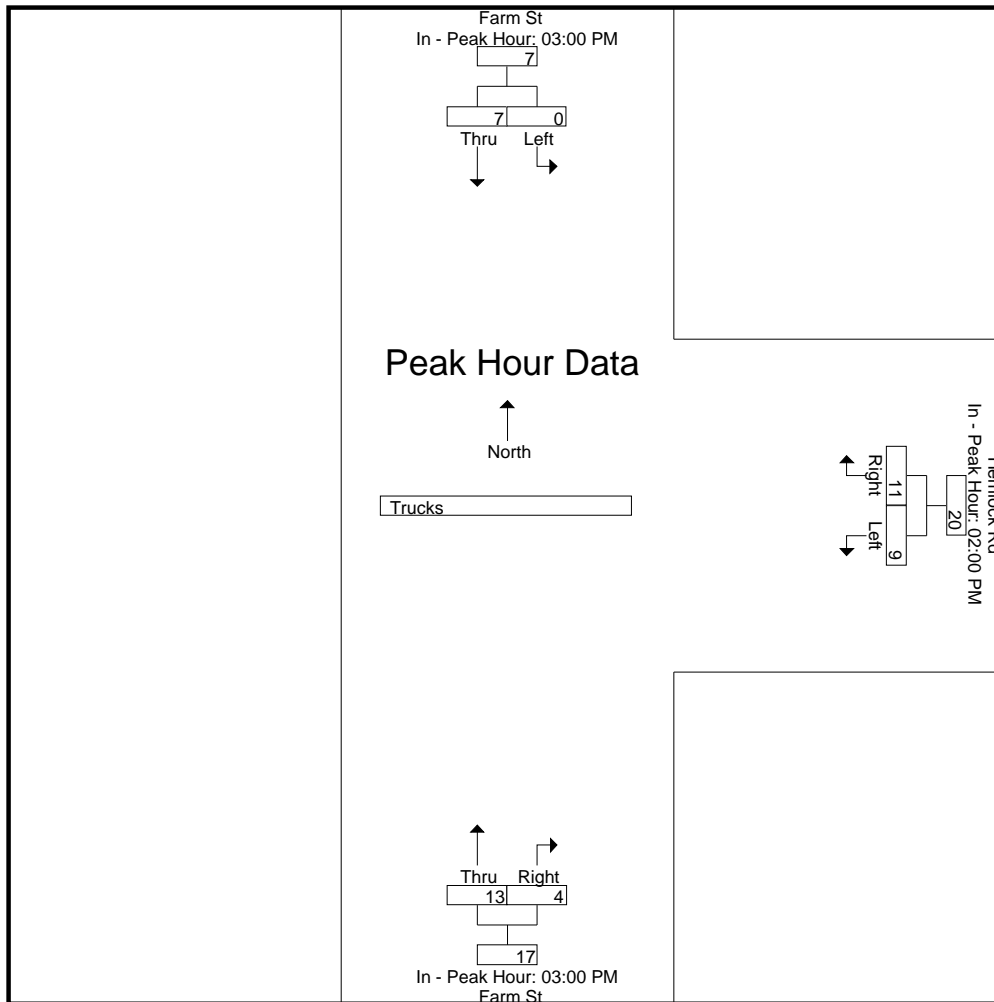
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	03:00 PM			02:00 PM			03:00 PM		
+0 mins.	0	1	1	0	0	0	1	0	1
+15 mins.	0	3	3	0	1	1	5	0	5
+30 mins.	0	0	0	1	1	2	3	3	6
+45 mins.	0	3	3	8	9	17	4	1	5
Total Volume	0	7	7	9	11	20	13	4	17
% App. Total	0	100		45	55		76.5	23.5	
PHF	.000	.583	.583	.281	.306	.294	.650	.333	.708

Accurate Counts  
978-664-2565

File Name : 40684005  
Site Code : 40684005  
Start Date : 11/16/2021  
Page No : 21

N/S Street : Farm Street  
E/W Street : Hemlock Road  
City/State : Wakefield, MA  
Weather : Clear



**Accurate Counts**  
978-664-2565

N/S Street : Farm Street  
E/W Street : Hemlock Road  
City/State : Wakefield, MA  
Weather : Clear

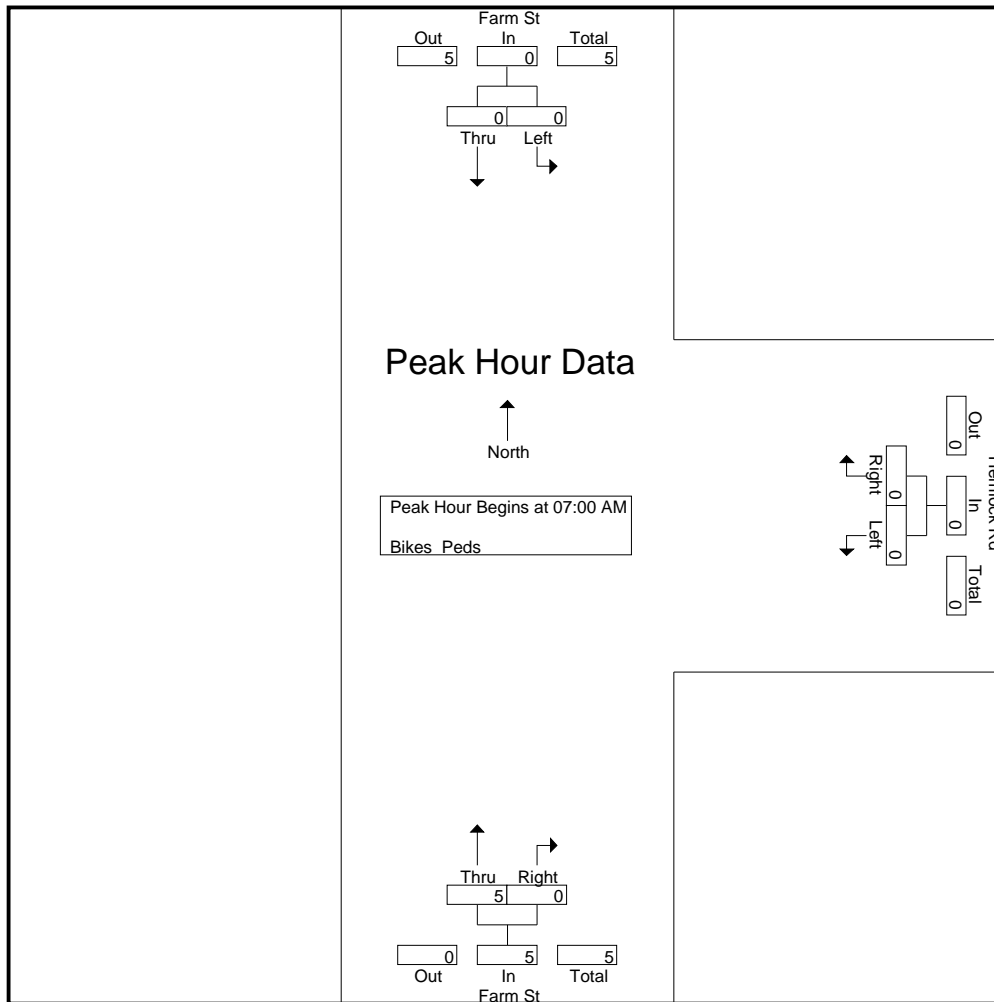
File Name : 40684005  
Site Code : 40684005  
Start Date : 11/16/2021  
Page No : 22

Groups Printed- Bikes Peds

Start Time	Farm St From North			Hemlock Rd From East			Farm St From South			Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds			
07:00 AM	0	0	0	0	0	10	0	0	0	10	0	10
07:15 AM	0	0	0	0	0	19	5	0	0	19	5	24
07:30 AM	0	0	0	0	0	1	0	0	0	1	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	30	5	0	0	30	5	35
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	9	0	0	0	9	0	9
08:30 AM	0	0	0	0	0	3	1	0	0	3	1	4
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	12	1	0	0	12	1	13
09:00 AM	0	0	0	0	0	1	0	0	0	1	0	1
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	1	0	0	0	1	1
Total	0	0	0	0	0	1	1	0	0	1	1	2
10:00 AM	0	0	0	0	0	1	0	0	0	1	0	1
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	1	0	0	0	0	0	0	1	0	1
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	0	0	1	0	0	0	2	0	2
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	1	1	0	0	1	1	2
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	1	0	0	1	1	2
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	1	0	0	0	1	0	1
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	1	0	0	0	1	0	1
Total	0	0	0	0	0	2	0	0	0	2	0	2
01:00 PM	0	0	0	0	0	2	0	0	0	2	0	2
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	1	0	0	0	1	1
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	2	1	0	0	2	1	3
02:00 PM	0	3	0	0	0	25	0	0	0	25	3	28
02:15 PM	0	0	0	0	0	5	0	0	0	5	0	5
02:30 PM	0	0	0	1	0	5	0	0	0	5	1	6
02:45 PM	0	2	0	0	0	6	0	0	0	6	2	8
Total	0	5	0	1	0	41	0	0	0	41	6	47
03:00 PM	0	0	0	0	0	4	0	0	0	4	0	4
03:15 PM	0	0	0	0	0	4	0	0	0	4	0	4
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	8	0	0	0	8	0	8
Grand Total	0	5	1	1	0	98	9	0	0	99	15	114
Apprch %	0	100		100	0		100	0				
Total %	0	33.3		6.7	0		60	0		86.8	13.2	

N/S Street : Farm Street  
E/W Street : Hemlock Road  
City/State : Wakefield, MA  
Weather : Clear

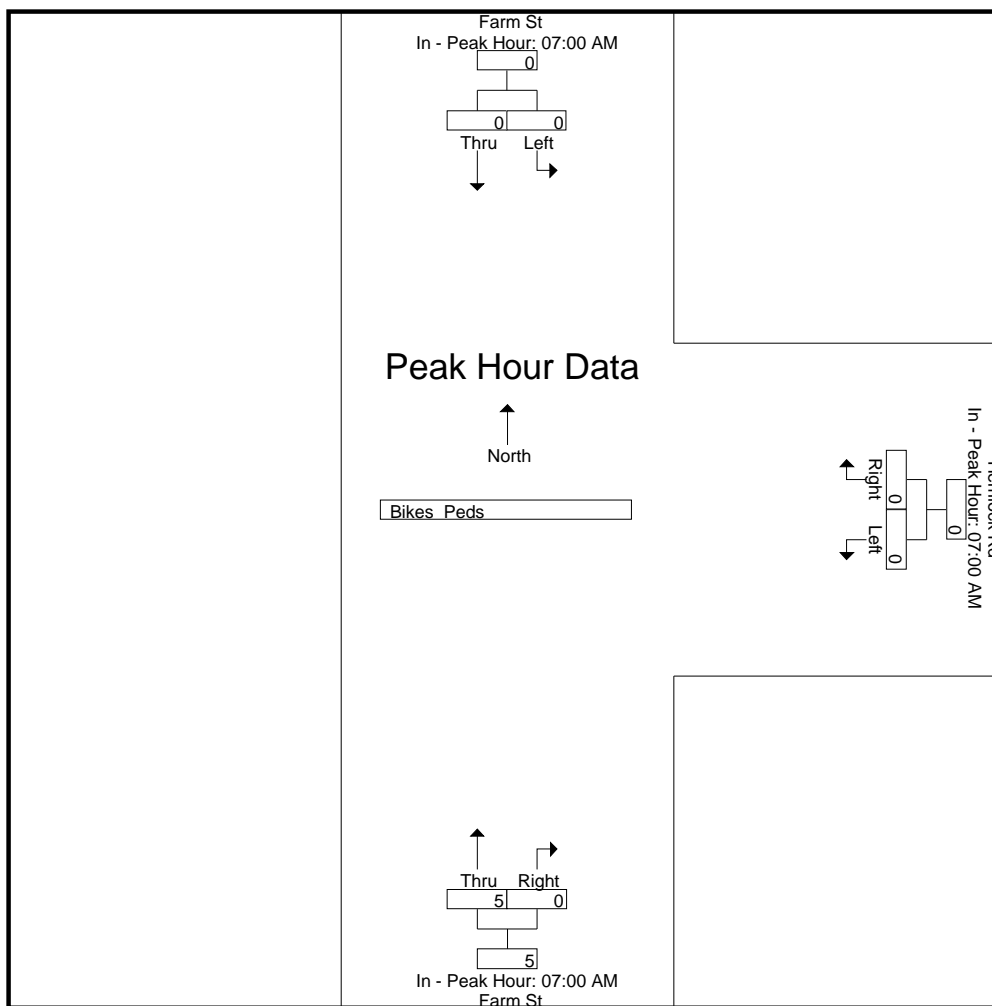
Start Time	Farm St From North			Hemlock Rd From East			Farm St From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	5	0	5	5
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	5	0	5	5
% App. Total	0	0		0	0		100	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250



Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	5	0	5
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	5	0	5
% App. Total	0	0		0	0		100	0	
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.250

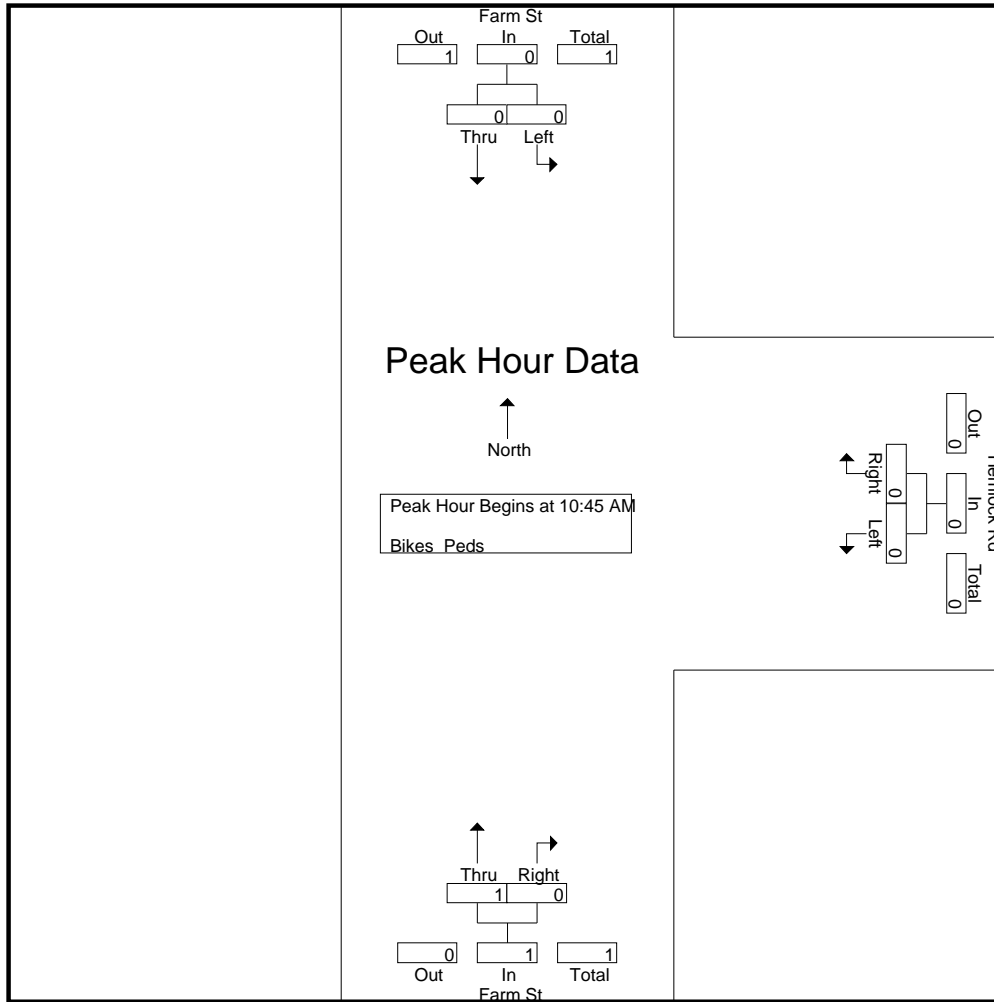
N/S Street : Farm Street  
E/W Street : Hemlock Road  
City/State : Wakefield, MA  
Weather : Clear



Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1  
Peak Hour for Entire Intersection Begins at 10:45 AM

10:45 AM	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0
11:30 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	0	0	100	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250

N/S Street : Farm Street  
E/W Street : Hemlock Road  
City/State : Wakefield, MA  
Weather : Clear

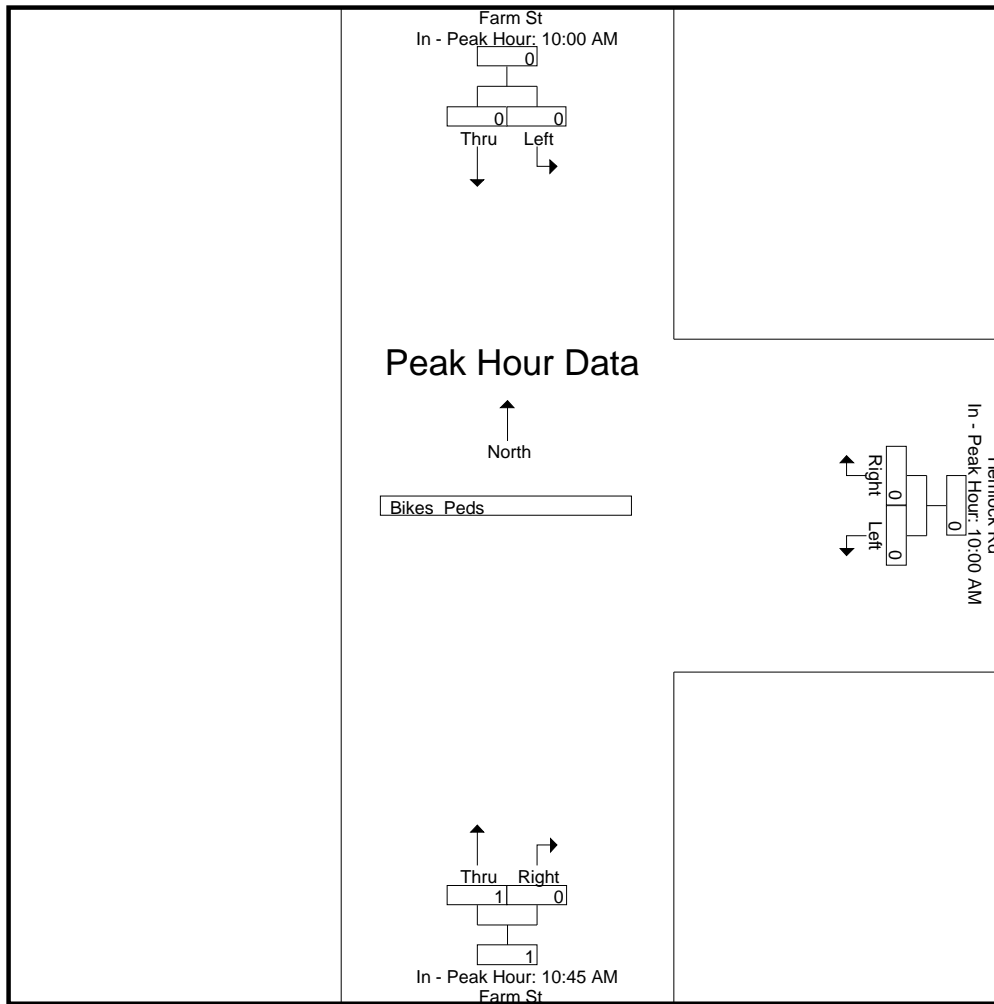


Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	10:00 AM			10:00 AM			10:45 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	1	0	1
Total Volume	0	0	0	0	0	0	1	0	1
% App. Total	0	0	0	0	0	0	100	0	100
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.250



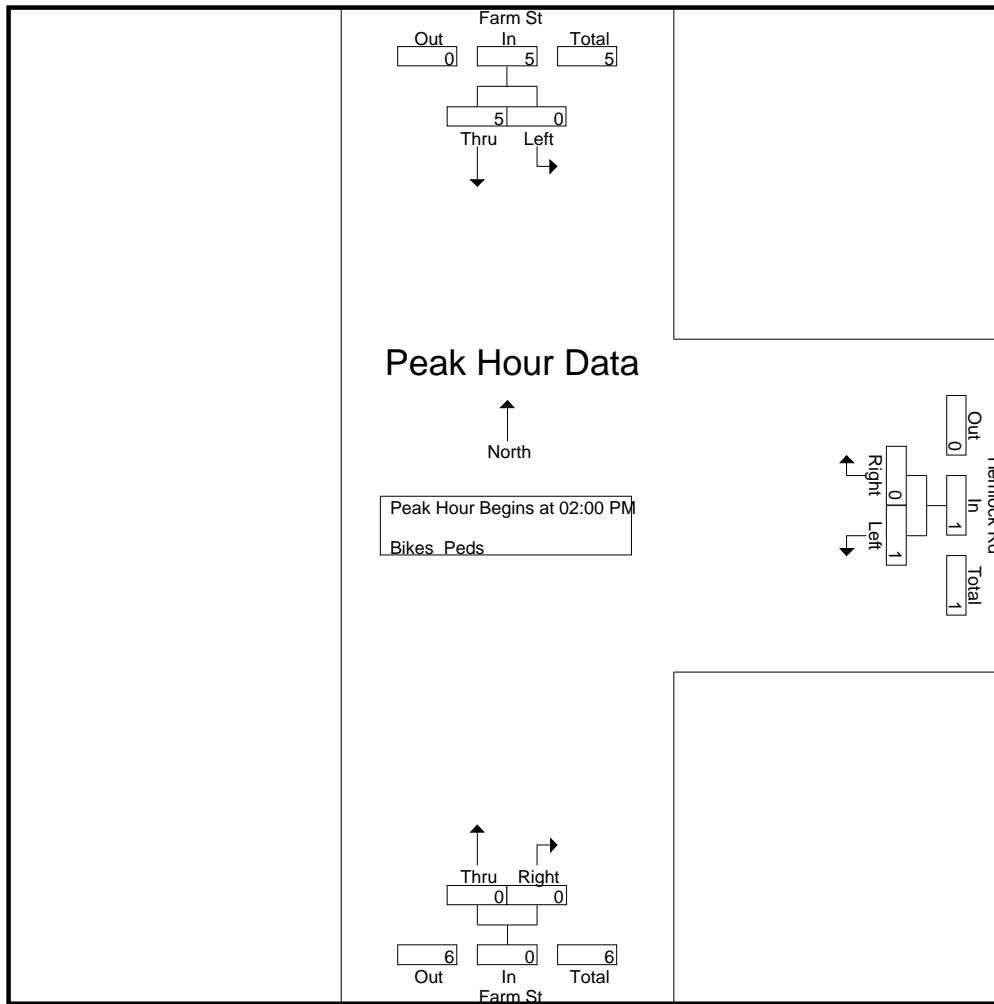
N/S Street : Farm Street  
E/W Street : Hemlock Road  
City/State : Wakefield, MA  
Weather : Clear



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Entire Intersection Begins at 02:00 PM

02:00 PM	0	<b>3</b>	<b>3</b>	0	0	0	0	0	0	<b>3</b>
02:15 PM	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	<b>1</b>	0	<b>1</b>	0	0	0	<b>1</b>
02:45 PM	0	2	2	0	0	0	0	0	0	2
Total Volume	0	5	5	1	0	1	0	0	0	6
% App. Total	0	100		100	0		0	0		
PHF	.000	.417	.417	.250	.000	.250	.000	.000	.000	.500

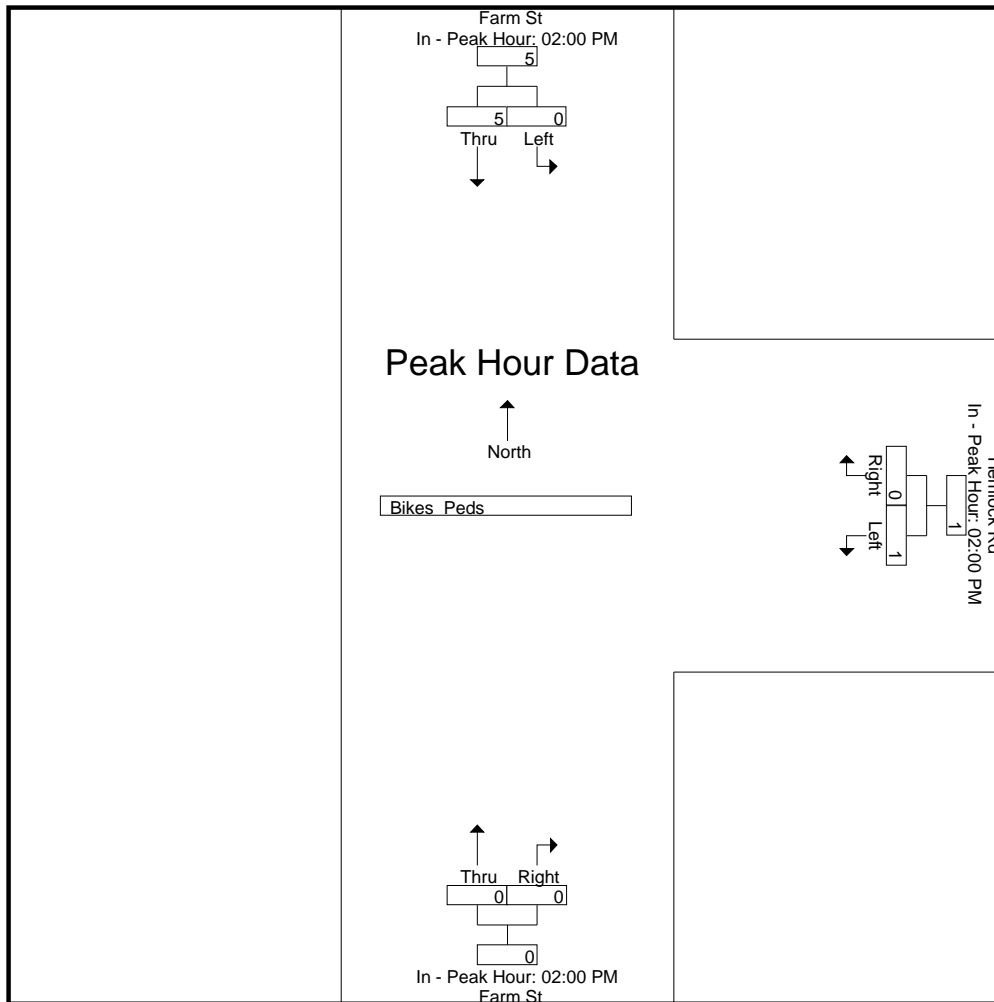
N/S Street : Farm Street  
E/W Street : Hemlock Road  
City/State : Wakefield, MA  
Weather : Clear



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	02:00 PM			02:00 PM			02:00 PM		
+0 mins.	0	<b>3</b>	<b>3</b>	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	<b>1</b>	0	<b>1</b>	0	0	0
+45 mins.	0	2	2	0	0	0	0	0	0
Total Volume	0	5	5	1	0	1	0	0	0
% App. Total	0	100		100	0		0	0	
PHF	.000	.417	.417	.250	.000	.250	.000	.000	.000

N/S Street : Farm Street  
E/W Street : Hemlock Road  
City/State : Wakefield, MA  
Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : High School North Driveway  
 City/State : Wakefield, MA  
 Weather : Clear

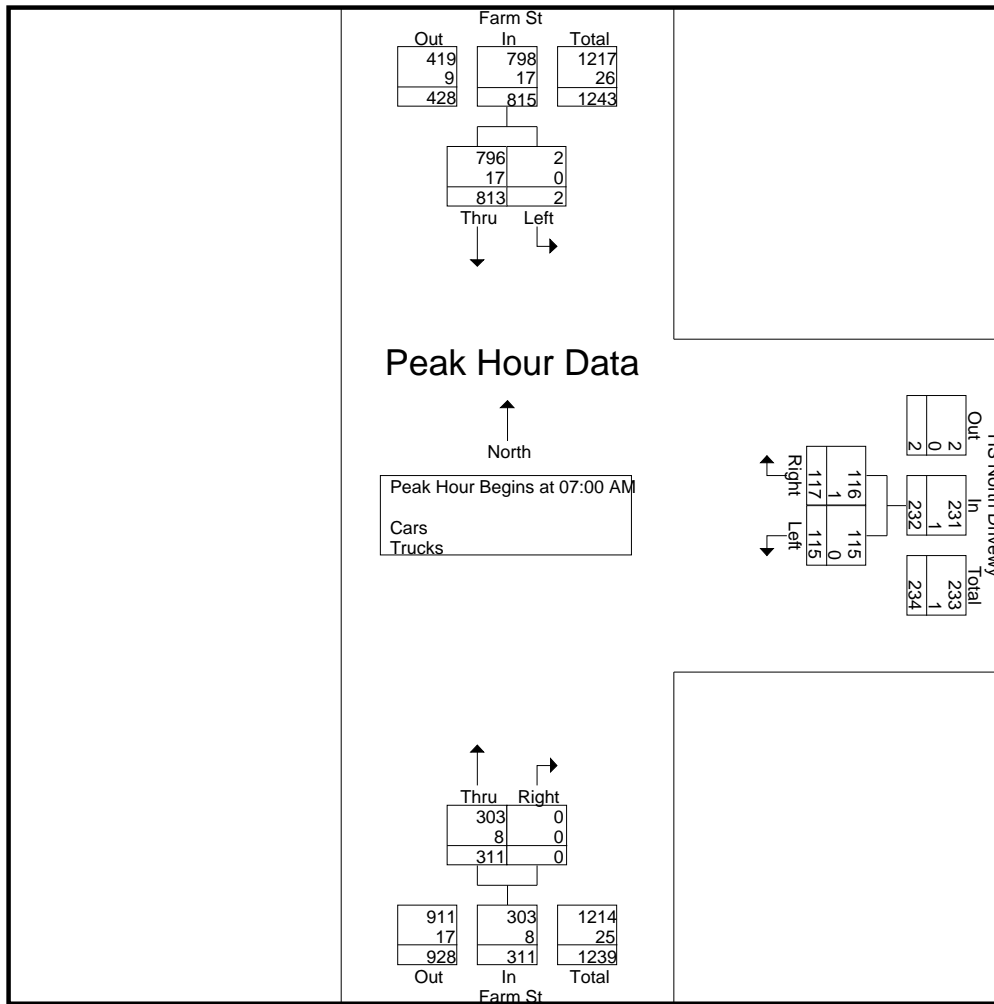
File Name : 40684006  
 Site Code : 40684006  
 Start Date : 11/16/2021  
 Page No : 1

### Groups Printed- Cars - Trucks

Start Time	Farm St From North		HS North Driveway From East			Farm St From South		Int. Total
	Left	Thru	Left	Right	Thru	Right		
07:00 AM	0	205	29	28	54	0	316	
07:15 AM	0	240	66	74	72	0	452	
07:30 AM	1	205	19	11	91	0	327	
07:45 AM	1	163	1	4	94	0	263	
<b>Total</b>	<b>2</b>	<b>813</b>	<b>115</b>	<b>117</b>	<b>311</b>	<b>0</b>	<b>1358</b>	
08:00 AM	0	134	3	2	88	0	227	
08:15 AM	0	126	21	9	103	0	259	
08:30 AM	0	166	33	27	110	0	336	
08:45 AM	0	115	4	6	81	0	206	
<b>Total</b>	<b>0</b>	<b>541</b>	<b>61</b>	<b>44</b>	<b>382</b>	<b>0</b>	<b>1028</b>	
<b>Grand Total</b>	<b>2</b>	<b>1354</b>	<b>176</b>	<b>161</b>	<b>693</b>	<b>0</b>	<b>2386</b>	
Apprch %	0.1	99.9	52.2	47.8	100	0		
Total %	0.1	56.7	7.4	6.7	29	0		
Cars	2	1334	176	160	679	0	2351	
% Cars	100	98.5	100	99.4	98	0	98.5	
Trucks	0	20	0	1	14	0	35	
% Trucks	0	1.5	0	0.6	2	0	1.5	

Start Time	Farm St From North			HS North Driveway From East			Farm St From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. 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	205	205	29	28	57	54	0	54	316
07:15 AM	0	<b>240</b>	<b>240</b>	<b>66</b>	<b>74</b>	<b>140</b>	72	0	72	<b>452</b>
07:30 AM	1	205	206	19	11	30	91	0	91	327
07:45 AM	1	163	164	1	4	5	<b>94</b>	0	<b>94</b>	263
<b>Total Volume</b>	<b>2</b>	<b>813</b>	<b>815</b>	<b>115</b>	<b>117</b>	<b>232</b>	<b>311</b>	<b>0</b>	<b>311</b>	<b>1358</b>
% App. Total	0.2	99.8		49.6	50.4		100	0		
PHF	.500	.847	.849	.436	.395	.414	.827	.000	.827	.751
Cars	2	796	798	115	116	231	303	0	303	1332
% Cars	100	97.9	97.9	100	99.1	99.6	97.4	0	97.4	98.1
Trucks	0	17	17	0	1	1	8	0	8	26
% Trucks	0	2.1	2.1	0	0.9	0.4	2.6	0	2.6	1.9

N/S Street : Farm Street  
E/W Street : High School North Driveway  
City/State : Wakefield, MA  
Weather : Clear



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

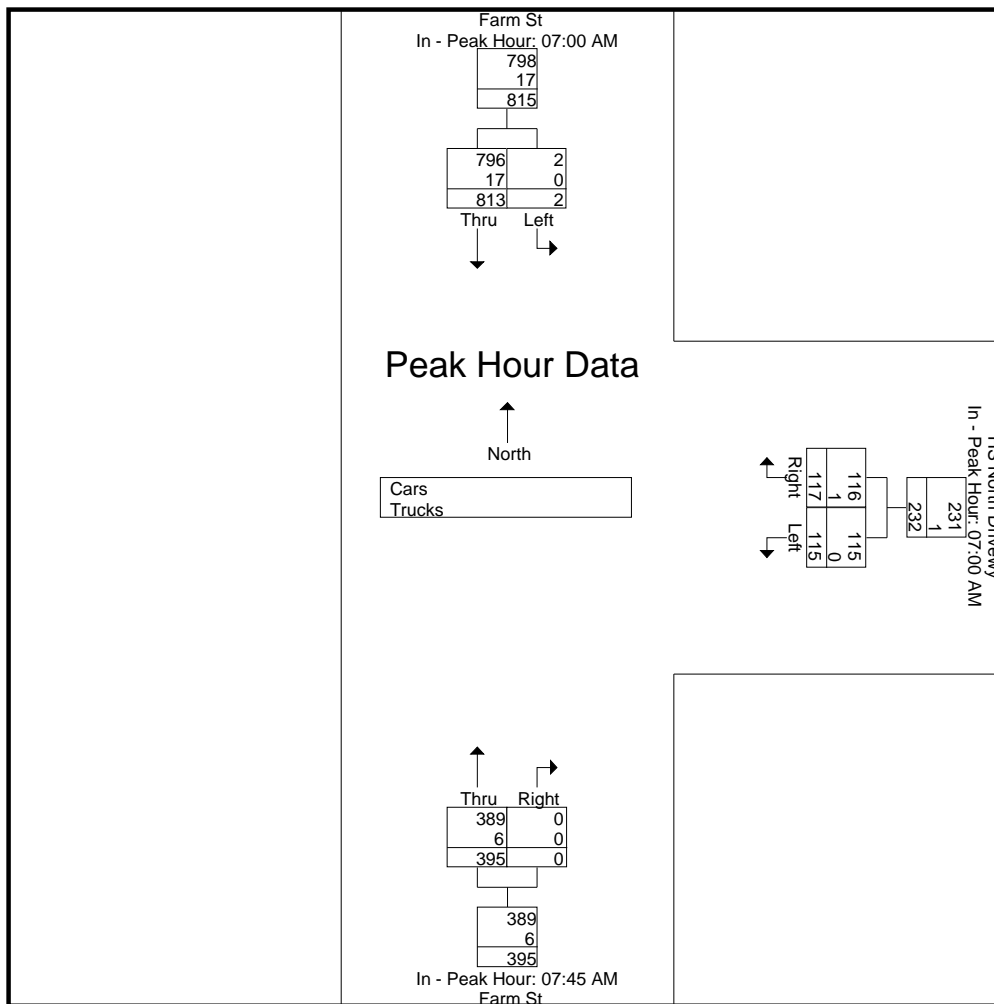
	07:00 AM			07:00 AM			07:45 AM		
+0 mins.	0	205	205	29	28	57	94	0	94
+15 mins.	0	<b>240</b>	<b>240</b>	<b>66</b>	<b>74</b>	<b>140</b>	88	0	88
+30 mins.	1	205	206	19	11	30	103	0	103
+45 mins.	1	163	164	1	4	5	<b>110</b>	0	<b>110</b>
Total Volume	2	813	815	115	117	232	395	0	395
% App. Total	0.2	99.8		49.6	50.4		100	0	
PHF	.500	.847	.849	.436	.395	.414	.898	.000	.898
Cars	2	796	798	115	116	231	389	0	389
% Cars	100	97.9	97.9	100	99.1	99.6	98.5	0	98.5
Trucks	0	17	17	0	1	1	6	0	6
% Trucks	0	2.1	2.1	0	0.9	0.4	1.5	0	1.5

# Accurate Counts

978-664-2565

File Name : 40684006  
 Site Code : 40684006  
 Start Date : 11/16/2021  
 Page No : 3

N/S Street : Farm Street  
 E/W Street : High School North Driveway  
 City/State : Wakefield, MA  
 Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : High School North Driveway  
 City/State : Wakefield, MA  
 Weather : Clear

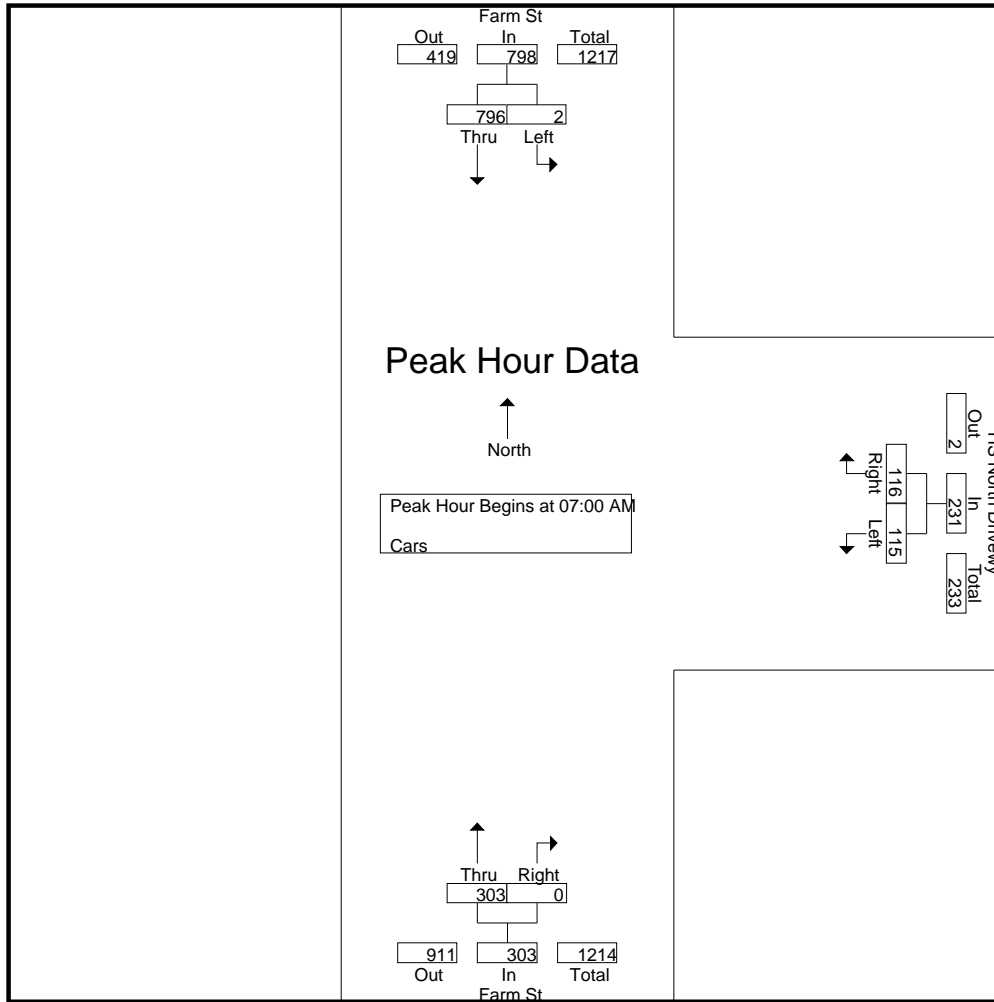
File Name : 40684006  
 Site Code : 40684006  
 Start Date : 11/16/2021  
 Page No : 4

### Groups Printed- Cars

Start Time	Farm St From North		HS North Driveway From East		Farm St From South		Int. Total
	Left	Thru	Left	Right	Thru	Right	
07:00 AM	0	202	29	27	53	0	311
07:15 AM	0	236	66	74	70	0	446
07:30 AM	1	200	19	11	88	0	319
07:45 AM	1	158	1	4	92	0	256
<b>Total</b>	<b>2</b>	<b>796</b>	<b>115</b>	<b>116</b>	<b>303</b>	<b>0</b>	<b>1332</b>
08:00 AM	0	133	3	2	87	0	225
08:15 AM	0	124	21	9	101	0	255
08:30 AM	0	166	33	27	109	0	335
08:45 AM	0	115	4	6	79	0	204
<b>Total</b>	<b>0</b>	<b>538</b>	<b>61</b>	<b>44</b>	<b>376</b>	<b>0</b>	<b>1019</b>
<b>Grand Total</b>	<b>2</b>	<b>1334</b>	<b>176</b>	<b>160</b>	<b>679</b>	<b>0</b>	<b>2351</b>
Apprch %	0.1	99.9	52.4	47.6	100	0	
Total %	0.1	56.7	7.5	6.8	28.9	0	

Start Time	Farm St From North			HS North Driveway From East			Farm St From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. 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	202	202	29	27	56	53	0	53	311
07:15 AM	0	<b>236</b>	<b>236</b>	<b>66</b>	<b>74</b>	<b>140</b>	70	0	70	<b>446</b>
07:30 AM	<b>1</b>	200	201	19	11	30	88	0	88	319
07:45 AM	1	158	159	1	4	5	<b>92</b>	0	<b>92</b>	256
Total Volume	2	796	798	115	116	231	303	0	303	1332
% App. Total	0.3	99.7		49.8	50.2		100	0		
PHF	.500	.843	.845	.436	.392	.413	.823	.000	.823	.747

N/S Street : Farm Street  
E/W Street : High School North Driveway  
City/State : Wakefield, MA  
Weather : Clear



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

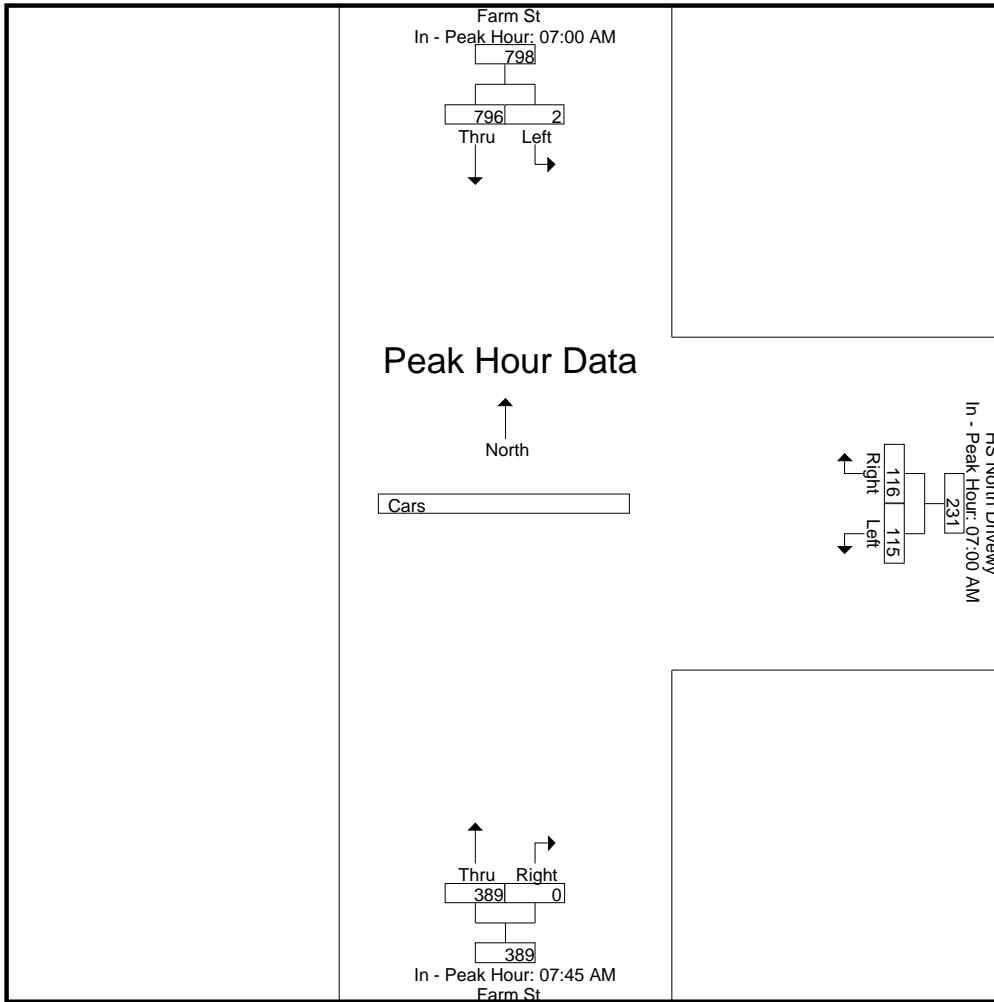
	07:00 AM			07:00 AM			07:45 AM		
+0 mins.	0	202	202	29	27	56	92	0	92
+15 mins.	0	<b>236</b>	<b>236</b>	<b>66</b>	<b>74</b>	<b>140</b>	87	0	87
+30 mins.	<b>1</b>	200	201	19	11	30	101	0	101
+45 mins.	1	158	159	1	4	5	<b>109</b>	0	<b>109</b>
Total Volume	2	796	798	115	116	231	389	0	389
% App. Total	0.3	99.7		49.8	50.2		100	0	
PHF	.500	.843	.845	.436	.392	.413	.892	.000	.892



Accurate Counts  
978-664-2565

File Name : 40684006  
Site Code : 40684006  
Start Date : 11/16/2021  
Page No : 6

N/S Street : Farm Street  
E/W Street : High School North Driveway  
City/State : Wakefield, MA  
Weather : Clear



**Accurate Counts**  
978-664-2565

N/S Street : Farm Street  
E/W Street : High School North Driveway  
City/State : Wakefield, MA  
Weather : Clear

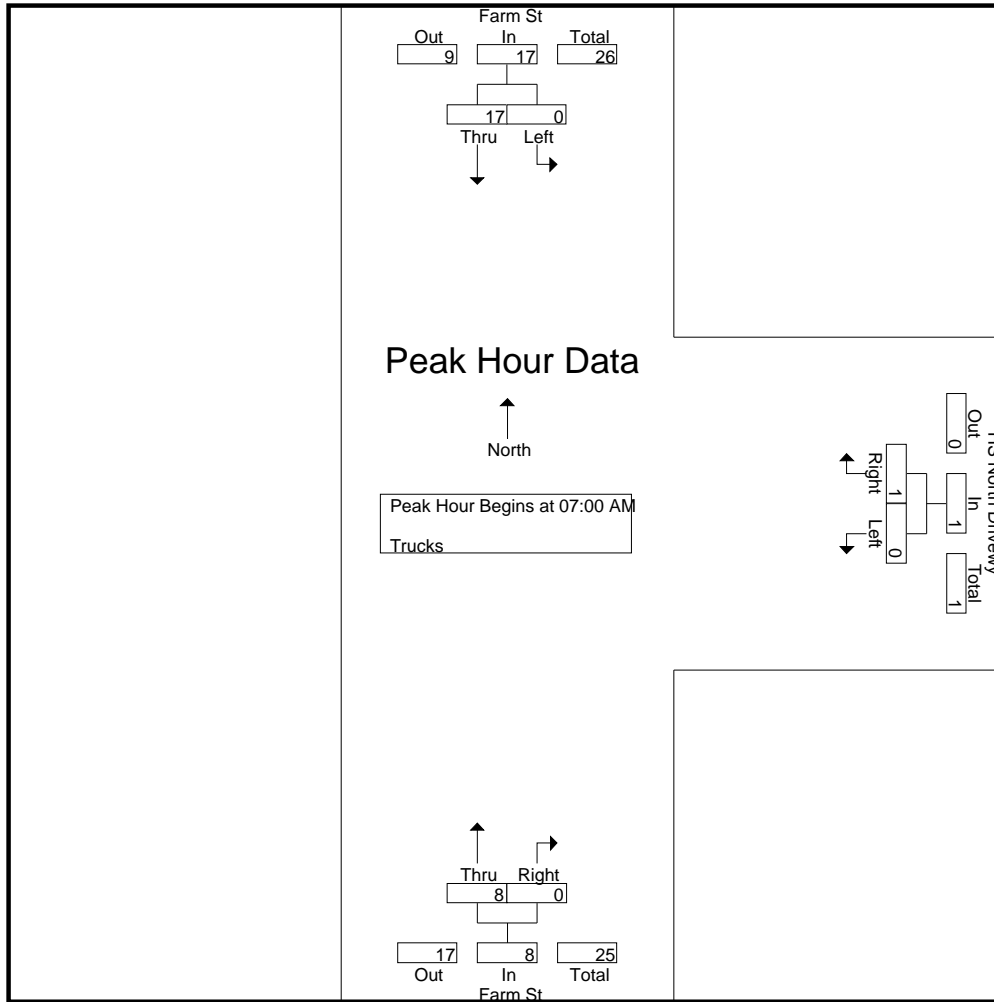
File Name : 40684006  
Site Code : 40684006  
Start Date : 11/16/2021  
Page No : 7

Groups Printed- Trucks

Start Time	Farm St From North		HS North Driveway From East		Farm St From South		Int. Total
	Left	Thru	Left	Right	Thru	Right	
07:00 AM	0	3	0	1	1	0	5
07:15 AM	0	4	0	0	2	0	6
07:30 AM	0	5	0	0	3	0	8
07:45 AM	0	5	0	0	2	0	7
<b>Total</b>	<b>0</b>	<b>17</b>	<b>0</b>	<b>1</b>	<b>8</b>	<b>0</b>	<b>26</b>
08:00 AM	0	1	0	0	1	0	2
08:15 AM	0	2	0	0	2	0	4
08:30 AM	0	0	0	0	1	0	1
08:45 AM	0	0	0	0	2	0	2
<b>Total</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>9</b>
<b>Grand Total</b>	<b>0</b>	<b>20</b>	<b>0</b>	<b>1</b>	<b>14</b>	<b>0</b>	<b>35</b>
Apprch %	0	100	0	100	100	0	
Total %	0	57.1	0	2.9	40	0	

Start Time	Farm St From North			HS North Driveway From East			Farm St From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. 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	3	3	0	1	1	1	0	1	5
07:15 AM	0	4	4	0	0	0	2	0	2	6
07:30 AM	0	5	5	0	0	0	3	0	3	8
07:45 AM	0	5	5	0	0	0	2	0	2	7
<b>Total Volume</b>	<b>0</b>	<b>17</b>	<b>17</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>8</b>	<b>0</b>	<b>8</b>	<b>26</b>
<b>% App. Total</b>	<b>0</b>	<b>100</b>	<b>100</b>	<b>0</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b>100</b>
PHF	.000	.850	.850	.000	.250	.250	.667	.000	.667	.813

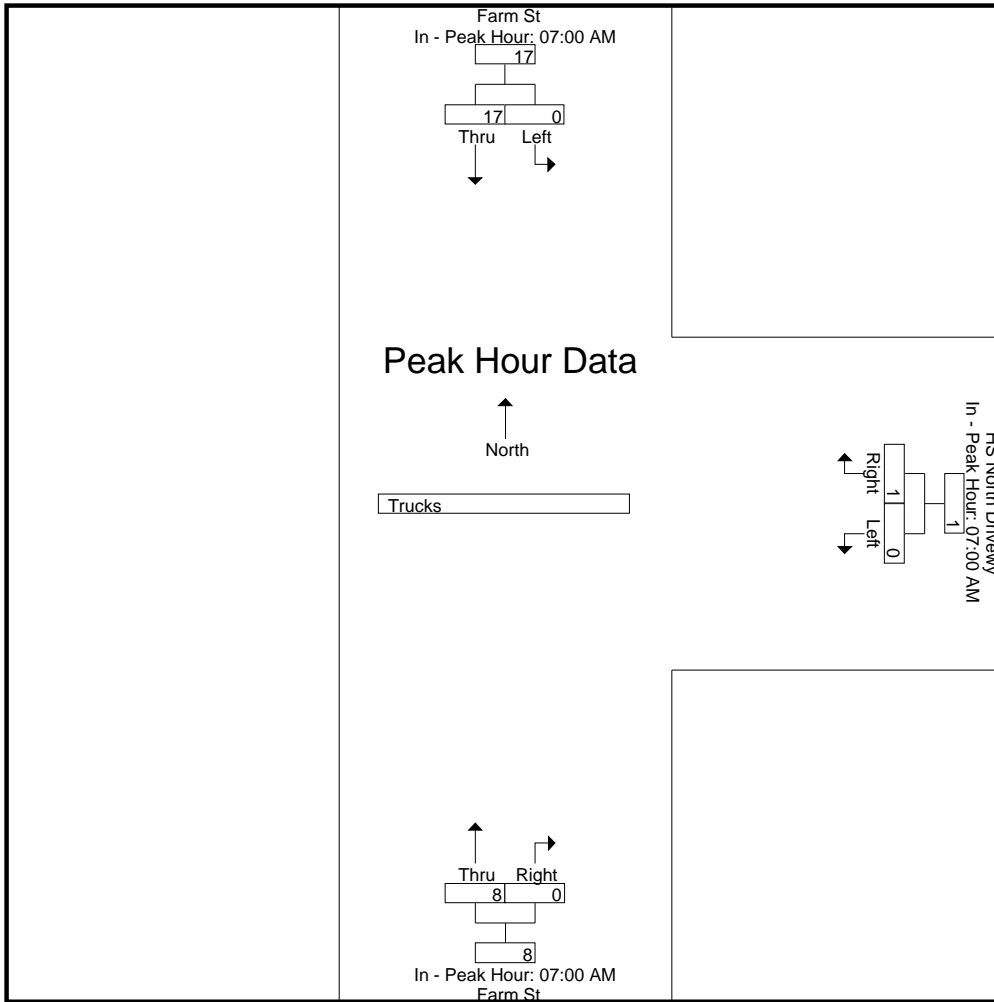
N/S Street : Farm Street  
E/W Street : High School North Driveway  
City/State : Wakefield, MA  
Weather : Clear



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		
+0 mins.	0	3	3	0	1	1	1	0	1
+15 mins.	0	4	4	0	0	0	2	0	2
+30 mins.	0	5	5	0	0	0	3	0	3
+45 mins.	0	5	5	0	0	0	2	0	2
Total Volume	0	17	17	0	1	1	8	0	8
% App. Total	0	100		0	100		100	0	
PHF	.000	.850	.850	.000	.250	.250	.667	.000	.667

N/S Street : Farm Street  
E/W Street : High School North Driveway  
City/State : Wakefield, MA  
Weather : Clear



**Accurate Counts**  
978-664-2565

N/S Street : Farm Street  
E/W Street : High School North Driveway  
City/State : Wakefield, MA  
Weather : Clear

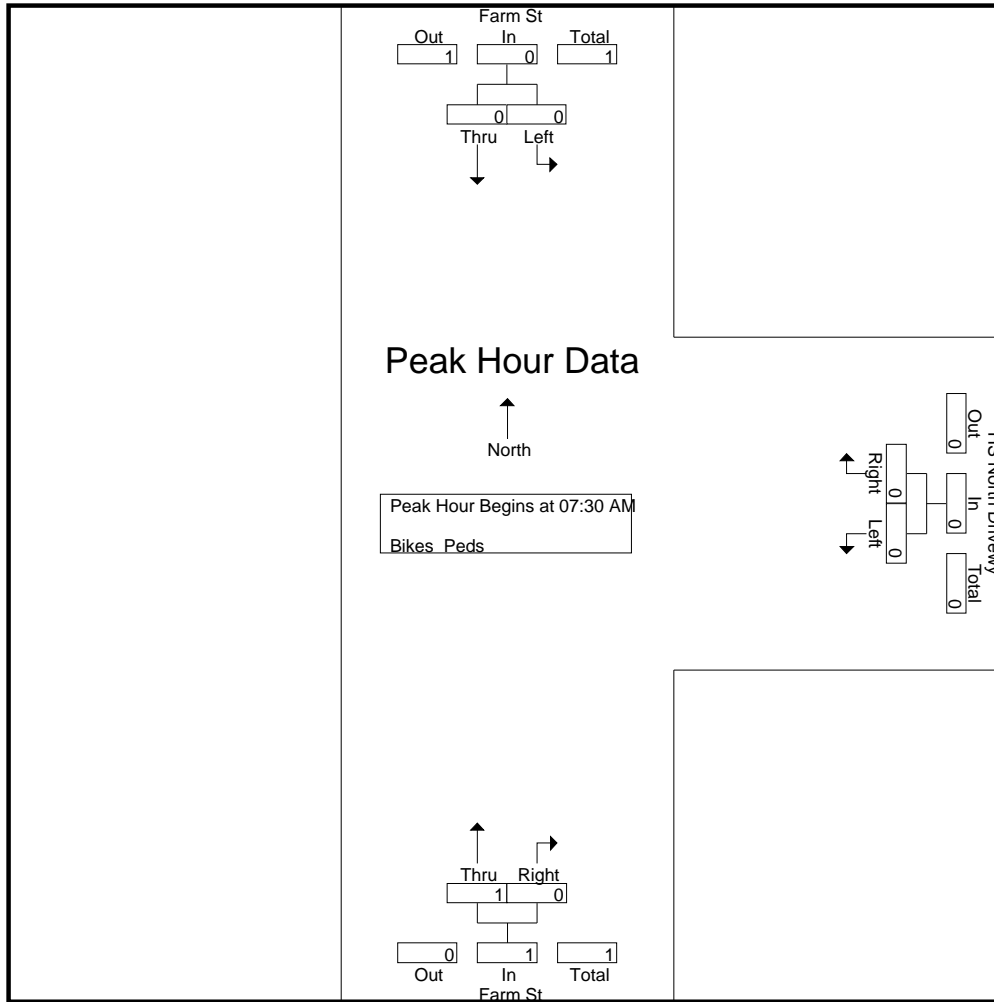
File Name : 40684006  
Site Code : 40684006  
Start Date : 11/16/2021  
Page No : 10

Groups Printed- Bikes Peds

Start Time	Farm St From North			HS North Driveway From East			Farm St From South			Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds			
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	3	0	0	0	0	0	1	4	0	4
07:30 AM	0	0	1	0	0	1	0	0	0	2	0	2
07:45 AM	0	0	0	0	0	1	0	0	0	1	0	1
Total	0	0	4	0	0	2	0	0	1	7	0	7
08:00 AM	0	0	0	0	0	3	0	0	0	3	0	3
08:15 AM	0	0	32	0	0	60	1	0	0	92	1	93
08:30 AM	0	0	39	0	0	19	0	0	0	58	0	58
08:45 AM	0	0	0	0	0	2	0	0	0	2	0	2
Total	0	0	71	0	0	84	1	0	0	155	1	156
Grand Total	0	0	75	0	0	86	1	0	1	162	1	163
Apprch %	0	0		0	0		100	0				
Total %	0	0		0	0		100	0		99.4	0.6	

Start Time	Farm St From North			HS North Driveway From East			Farm St From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. 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
07:45 AM	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 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

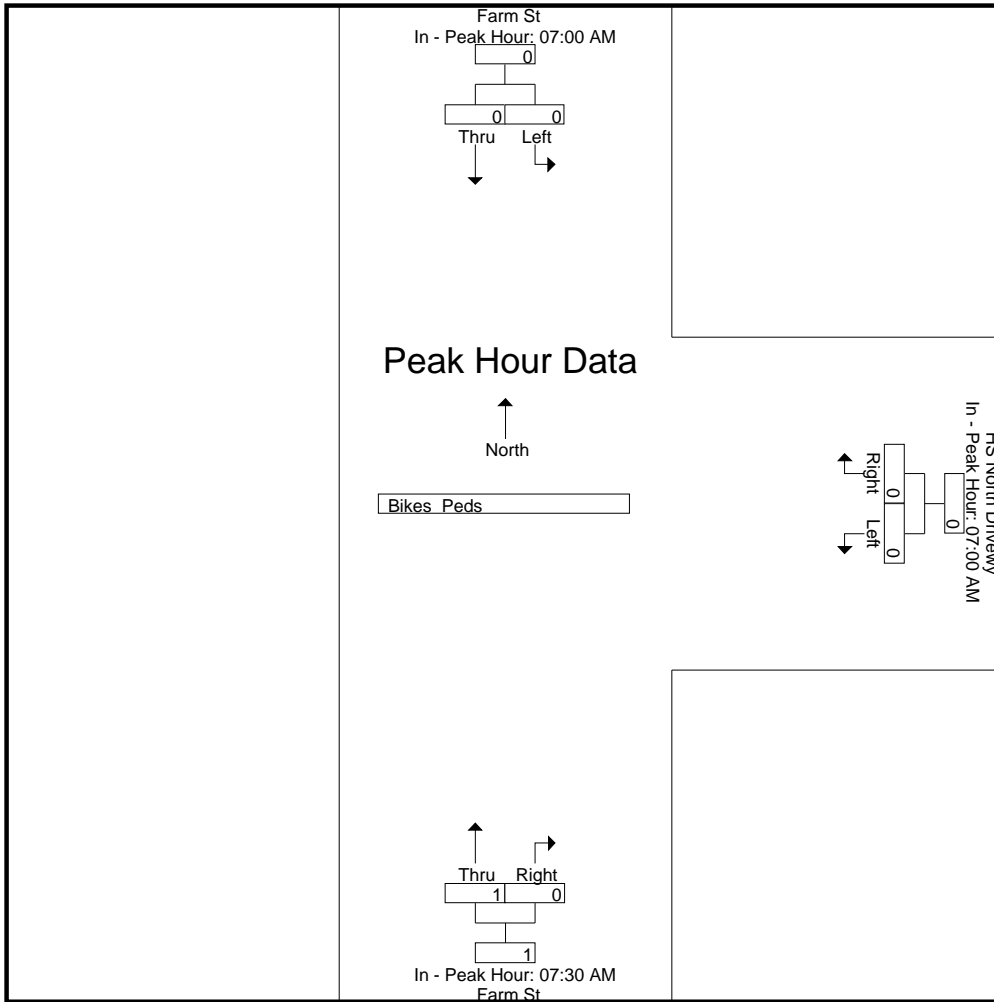
N/S Street : Farm Street  
E/W Street : High School North Driveway  
City/State : Wakefield, MA  
Weather : Clear



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			07:30 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	1	0	1
Total Volume	0	0	0	0	0	0	1	0	1
% App. Total	0	0		0	0		100	0	
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.250

N/S Street : Farm Street  
E/W Street : High School North Driveway  
City/State : Wakefield, MA  
Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : High School North Driveway  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 40684006  
 Site Code : 40684006  
 Start Date : 11/16/2021  
 Page No : 1

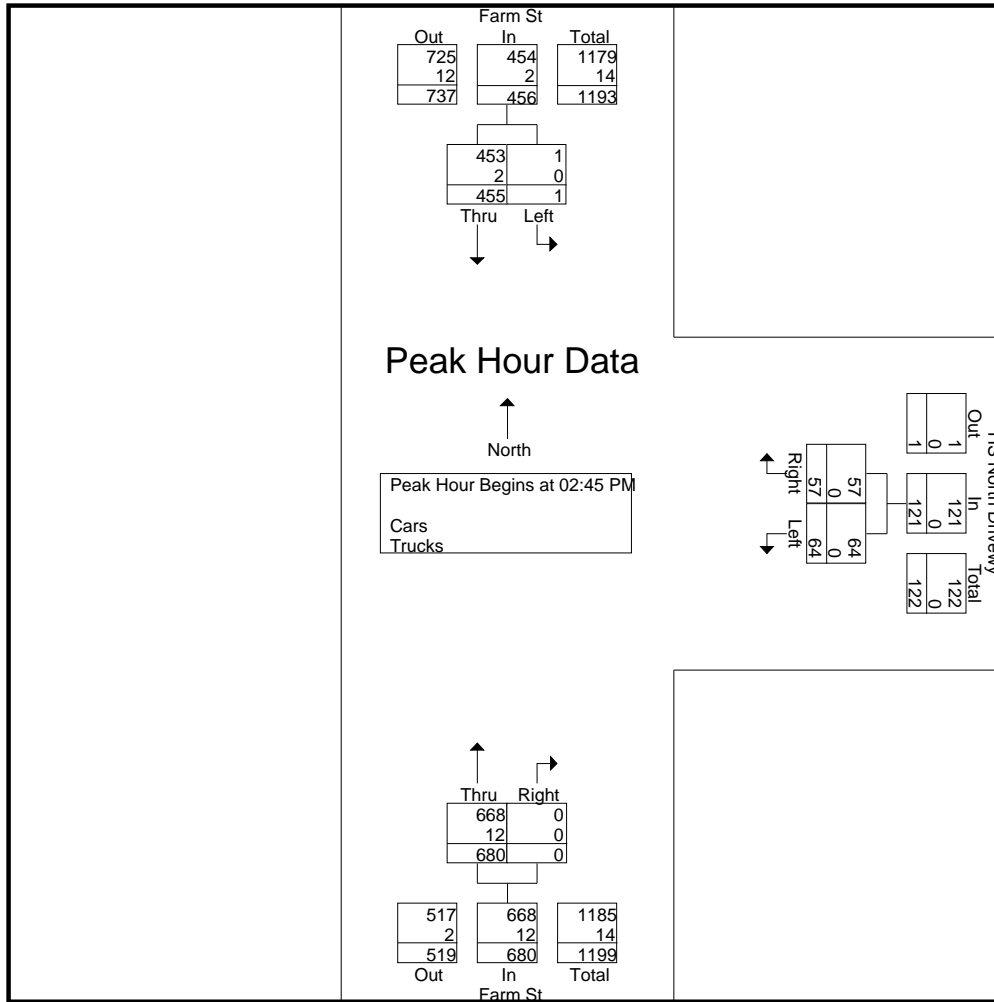
### Groups Printed- Cars - Trucks

Start Time	Farm St From North		HS North Driveway From East			Farm St From South		Int. Total
	Left	Thru	Left	Right	Thru	Right		
02:00 PM	1	87	14	17	129	1	249	
02:15 PM	0	97	15	16	141	0	269	
02:30 PM	0	109	8	16	158	0	291	
02:45 PM	0	110	34	27	140	0	311	
<b>Total</b>	<b>1</b>	<b>403</b>	<b>71</b>	<b>76</b>	<b>568</b>	<b>1</b>	<b>1120</b>	
03:00 PM	0	123	14	11	163	0	311	
03:15 PM	1	102	12	15	182	0	312	
03:30 PM	0	120	4	4	195	0	323	
03:45 PM	0	95	4	5	185	0	289	
<b>Total</b>	<b>1</b>	<b>440</b>	<b>34</b>	<b>35</b>	<b>725</b>	<b>0</b>	<b>1235</b>	
<b>Grand Total</b>	<b>2</b>	<b>843</b>	<b>105</b>	<b>111</b>	<b>1293</b>	<b>1</b>	<b>2355</b>	
Apprch %	0.2	99.8	48.6	51.4	99.9	0.1		
Total %	0.1	35.8	4.5	4.7	54.9	0		
Cars	2	835	102	109	1267	1	2316	
% Cars	100	99.1	97.1	98.2	98	100	98.3	
Trucks	0	8	3	2	26	0	39	
% Trucks	0	0.9	2.9	1.8	2	0	1.7	

Start Time	Farm St From North			HS North Driveway From East			Farm St From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
<b>Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1</b>										
<b>Peak Hour for Entire Intersection Begins at 02:45 PM</b>										
02:45 PM	0	110	110	<b>34</b>	<b>27</b>	<b>61</b>	140	0	140	311
03:00 PM	0	<b>123</b>	<b>123</b>	14	11	25	163	0	163	311
03:15 PM	1	102	103	12	15	27	182	0	182	312
03:30 PM	0	120	120	4	4	8	<b>195</b>	0	<b>195</b>	<b>323</b>
<b>Total Volume</b>	<b>1</b>	<b>455</b>	<b>456</b>	<b>64</b>	<b>57</b>	<b>121</b>	<b>680</b>	<b>0</b>	<b>680</b>	<b>1257</b>
<b>% App. Total</b>	<b>0.2</b>	<b>99.8</b>		<b>52.9</b>	<b>47.1</b>		<b>100</b>	<b>0</b>		
PHF	.250	.925	.927	.471	.528	.496	.872	.000	.872	.973
Cars	1	453	454	64	57	121	668	0	668	1243
% Cars	100	99.6	99.6	100	100	100	98.2	0	98.2	98.9
Trucks	0	2	2	0	0	0	12	0	12	14
% Trucks	0	0.4	0.4	0	0	0	1.8	0	1.8	1.1



N/S Street : Farm Street  
E/W Street : High School North Driveway  
City/State : Wakefield, MA  
Weather : Clear



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

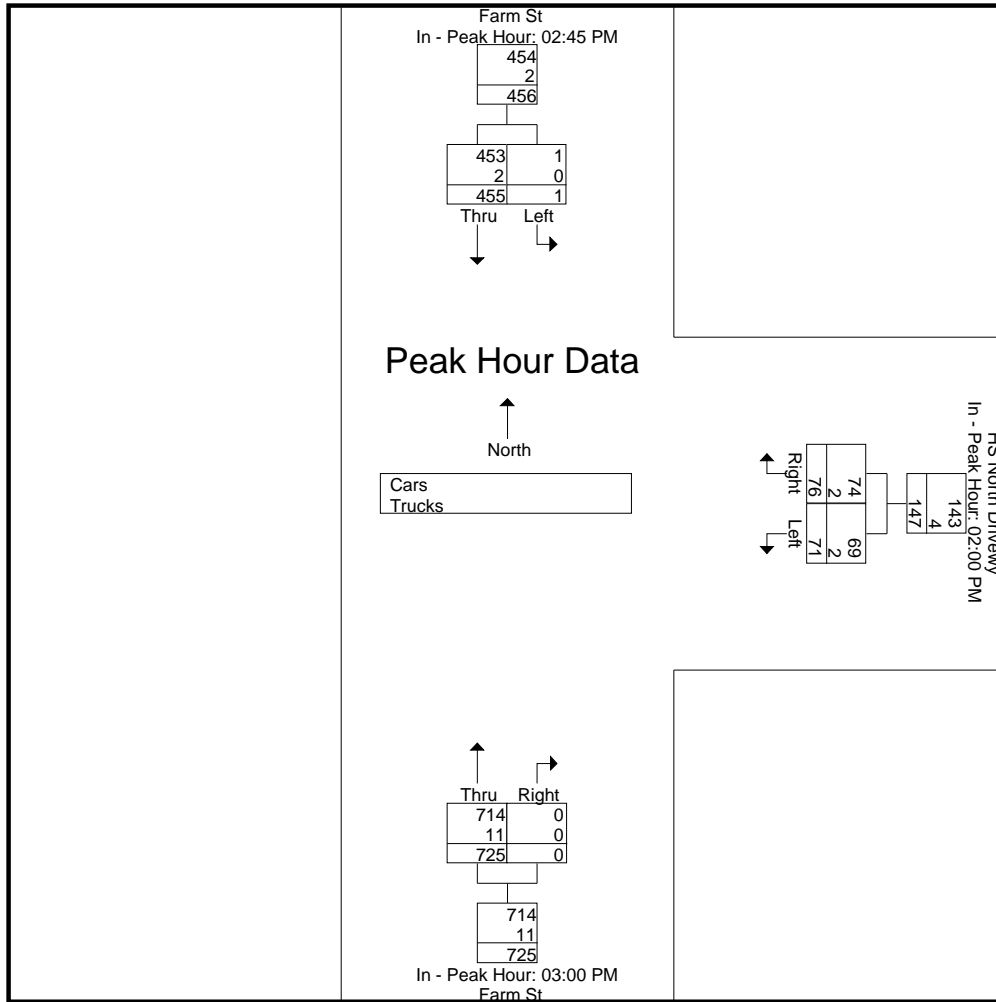
	02:45 PM			02:00 PM			03:00 PM		
+0 mins.	0	110	110	14	17	31	163	0	163
+15 mins.	0	<b>123</b>	<b>123</b>	15	16	31	182	0	182
+30 mins.	<b>1</b>	102	103	8	16	24	<b>195</b>	0	<b>195</b>
+45 mins.	0	120	120	<b>34</b>	<b>27</b>	<b>61</b>	185	0	185
Total Volume	1	455	456	71	76	147	725	0	725
% App. Total	0.2	99.8		48.3	51.7		100	0	
PHF	.250	.925	.927	.522	.704	.602	.929	.000	.929
Cars	1	453	454	69	74	143	714	0	714
% Cars	100	99.6	99.6	97.2	97.4	97.3	98.5	0	98.5
Trucks	0	2	2	2	2	4	11	0	11
% Trucks	0	0.4	0.4	2.8	2.6	2.7	1.5	0	1.5

# Accurate Counts

978-664-2565

File Name : 40684006  
 Site Code : 40684006  
 Start Date : 11/16/2021  
 Page No : 3

N/S Street : Farm Street  
 E/W Street : High School North Driveway  
 City/State : Wakefield, MA  
 Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : High School North Driveway  
 City/State : Wakefield, MA  
 Weather : Clear

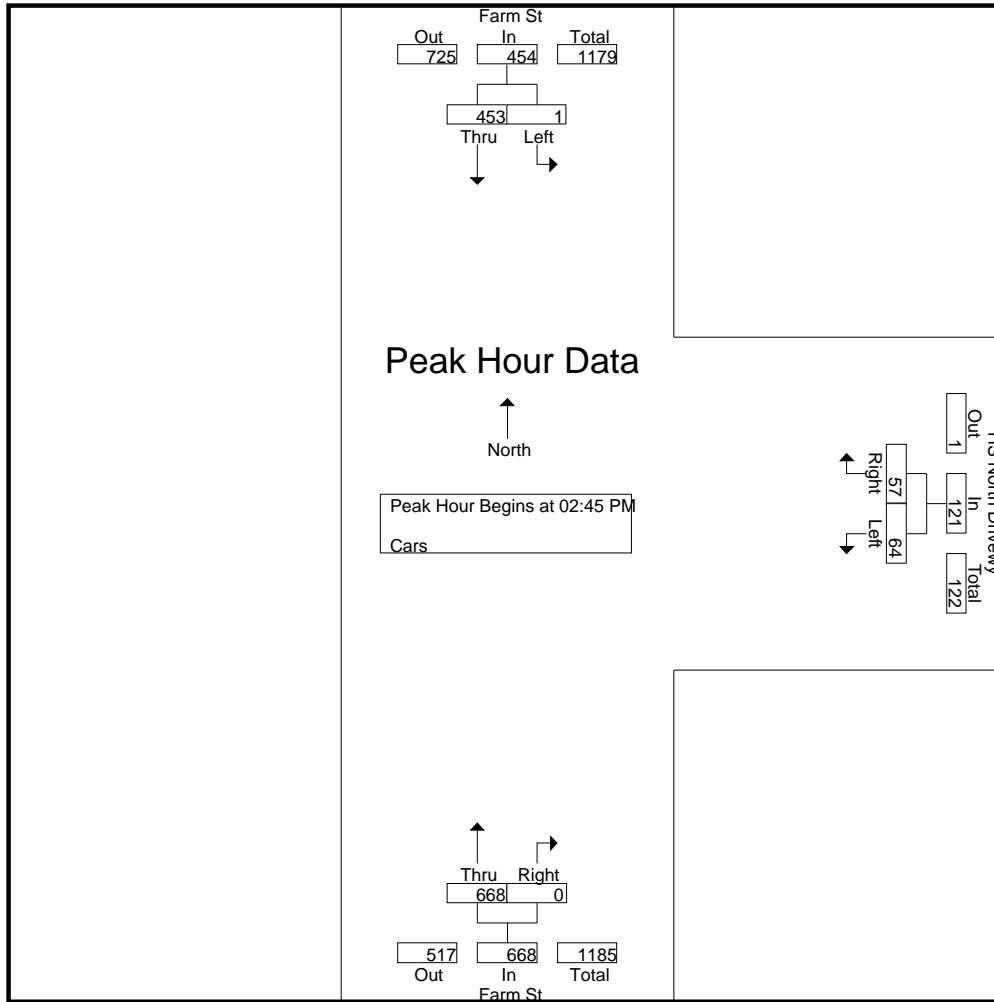
File Name : 40684006  
 Site Code : 40684006  
 Start Date : 11/16/2021  
 Page No : 4

## Groups Printed- Cars

Start Time	Farm St From North		HS North Driveway From East		Farm St From South		Int. Total
	Left	Thru	Left	Right	Thru	Right	
02:00 PM	1	84	13	15	127	1	241
02:15 PM	0	96	14	16	137	0	263
02:30 PM	0	109	8	16	155	0	288
02:45 PM	0	108	34	27	134	0	303
<b>Total</b>	<b>1</b>	<b>397</b>	<b>69</b>	<b>74</b>	<b>553</b>	<b>1</b>	<b>1095</b>
03:00 PM	0	123	14	11	162	0	310
03:15 PM	1	102	12	15	179	0	309
03:30 PM	0	120	4	4	193	0	321
03:45 PM	0	93	3	5	180	0	281
<b>Total</b>	<b>1</b>	<b>438</b>	<b>33</b>	<b>35</b>	<b>714</b>	<b>0</b>	<b>1221</b>
<b>Grand Total</b>	<b>2</b>	<b>835</b>	<b>102</b>	<b>109</b>	<b>1267</b>	<b>1</b>	<b>2316</b>
Apprch %	0.2	99.8	48.3	51.7	99.9	0.1	
Total %	0.1	36.1	4.4	4.7	54.7	0	

Start Time	Farm St From North			HS North Driveway From East			Farm St From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:45 PM										
02:45 PM	0	108	108	<b>34</b>	<b>27</b>	<b>61</b>	134	0	134	303
03:00 PM	0	<b>123</b>	<b>123</b>	14	11	25	162	0	162	310
03:15 PM	<b>1</b>	102	103	12	15	27	179	0	179	309
03:30 PM	0	120	120	4	4	8	<b>193</b>	0	<b>193</b>	<b>321</b>
Total Volume	1	453	454	64	57	121	668	0	668	1243
% App. Total	0.2	99.8		52.9	47.1		100	0		
PHF	.250	.921	.923	.471	.528	.496	.865	.000	.865	.968

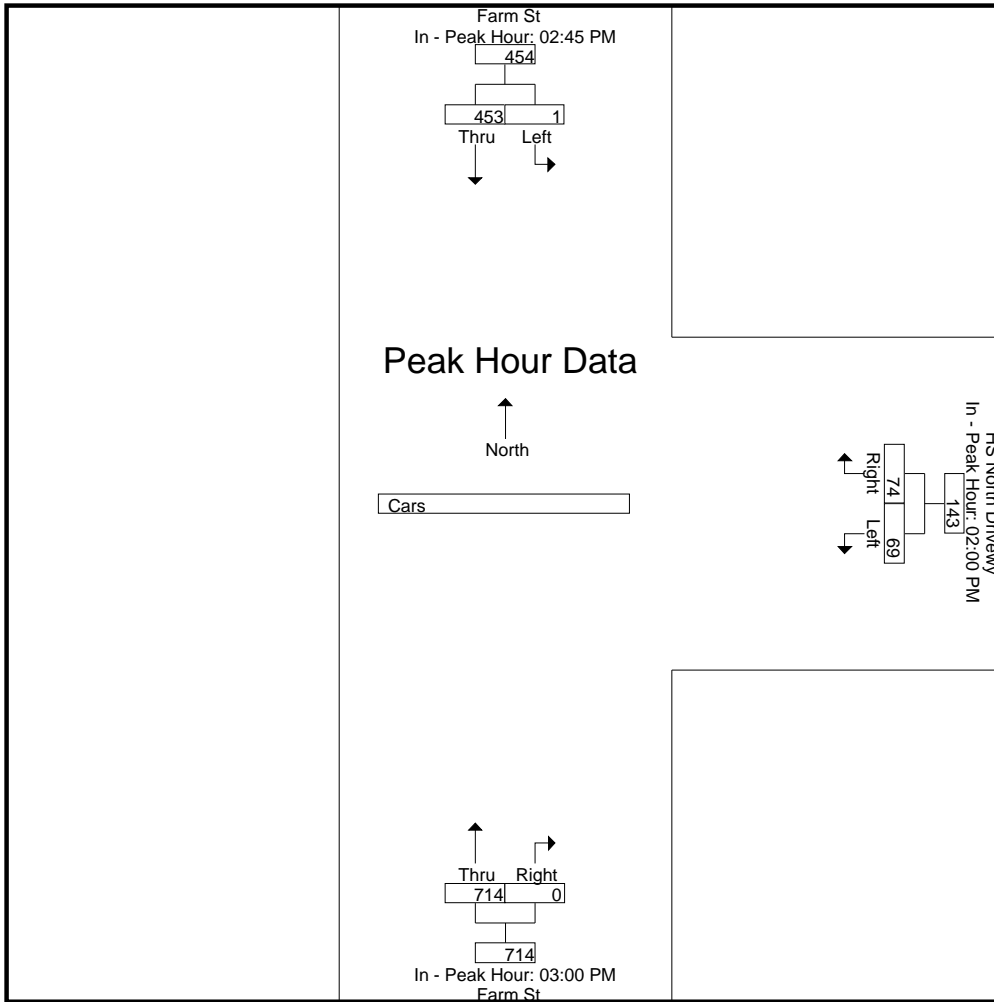
N/S Street : Farm Street  
E/W Street : High School North Driveway  
City/State : Wakefield, MA  
Weather : Clear



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	02:45 PM			02:00 PM			03:00 PM		
+0 mins.	0	108	108	13	15	28	162	0	162
+15 mins.	0	<b>123</b>	<b>123</b>	14	16	30	179	0	179
+30 mins.	<b>1</b>	102	103	8	16	24	<b>193</b>	0	<b>193</b>
+45 mins.	0	120	120	<b>34</b>	<b>27</b>	<b>61</b>	180	0	180
Total Volume	1	453	454	69	74	143	714	0	714
% App. Total	0.2	99.8		48.3	51.7		100	0	
PHF	.250	.921	.923	.507	.685	.586	.925	.000	.925

N/S Street : Farm Street  
E/W Street : High School North Driveway  
City/State : Wakefield, MA  
Weather : Clear



**Accurate Counts**  
978-664-2565

N/S Street : Farm Street  
E/W Street : High School North Driveway  
City/State : Wakefield, MA  
Weather : Clear

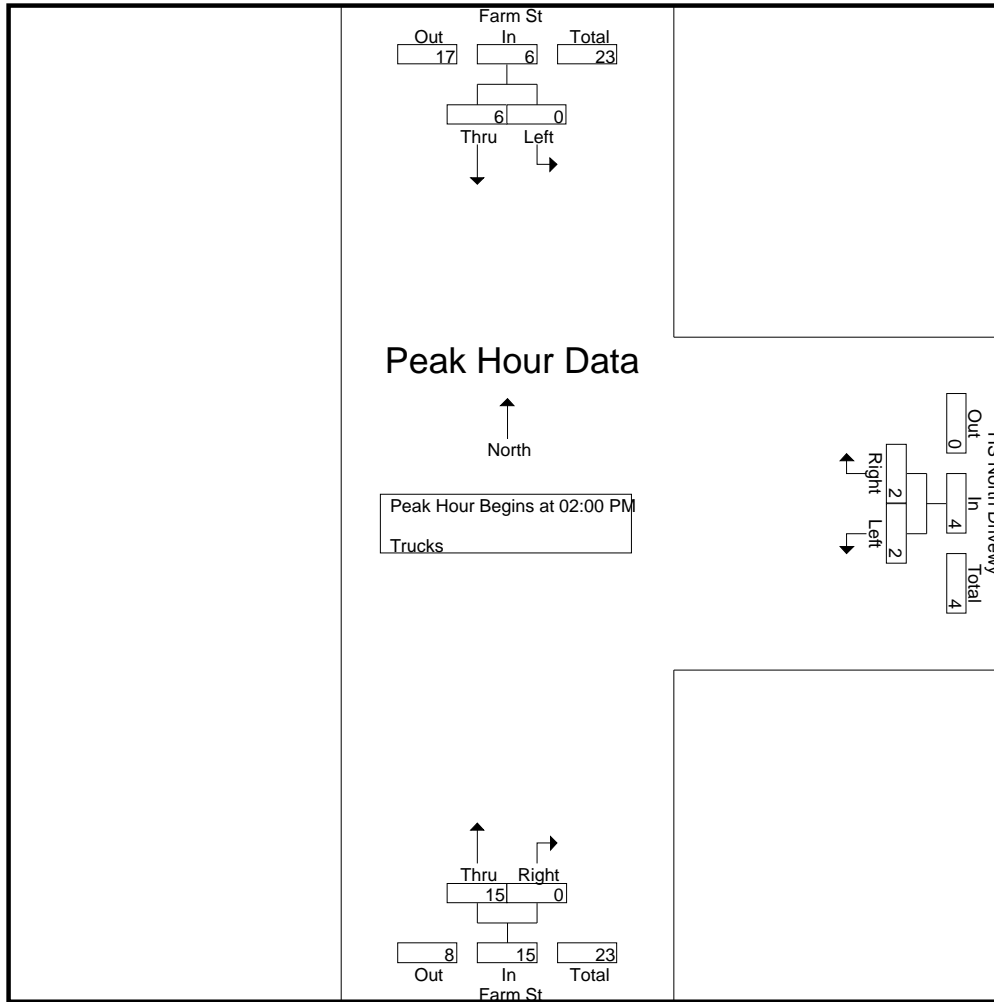
File Name : 40684006  
Site Code : 40684006  
Start Date : 11/16/2021  
Page No : 7

Groups Printed- Trucks

Start Time	Farm St From North		HS North Driveway From East		Farm St From South		Int. Total
	Left	Thru	Left	Right	Thru	Right	
02:00 PM	0	3	1	2	2	0	8
02:15 PM	0	1	1	0	4	0	6
02:30 PM	0	0	0	0	3	0	3
02:45 PM	0	2	0	0	6	0	8
<b>Total</b>	<b>0</b>	<b>6</b>	<b>2</b>	<b>2</b>	<b>15</b>	<b>0</b>	<b>25</b>
03:00 PM	0	0	0	0	1	0	1
03:15 PM	0	0	0	0	3	0	3
03:30 PM	0	0	0	0	2	0	2
03:45 PM	0	2	1	0	5	0	8
<b>Total</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>11</b>	<b>0</b>	<b>14</b>
<b>Grand Total</b>	<b>0</b>	<b>8</b>	<b>3</b>	<b>2</b>	<b>26</b>	<b>0</b>	<b>39</b>
Apprch %	0	100	60	40	100	0	
Total %	0	20.5	7.7	5.1	66.7	0	

Start Time	Farm St From North			HS North Driveway From East			Farm St From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:00 PM										
02:00 PM	0	<b>3</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>3</b>	2	0	2	<b>8</b>
02:15 PM	0	1	1	1	0	1	4	0	4	6
02:30 PM	0	0	0	0	0	0	3	0	3	3
02:45 PM	0	2	2	0	0	0	<b>6</b>	0	<b>6</b>	8
Total Volume	0	6	6	2	2	4	15	0	15	25
% App. Total	0	100		50	50		100	0		
PHF	.000	.500	.500	.500	.250	.333	.625	.000	.625	.781

N/S Street : Farm Street  
E/W Street : High School North Driveway  
City/State : Wakefield, MA  
Weather : Clear



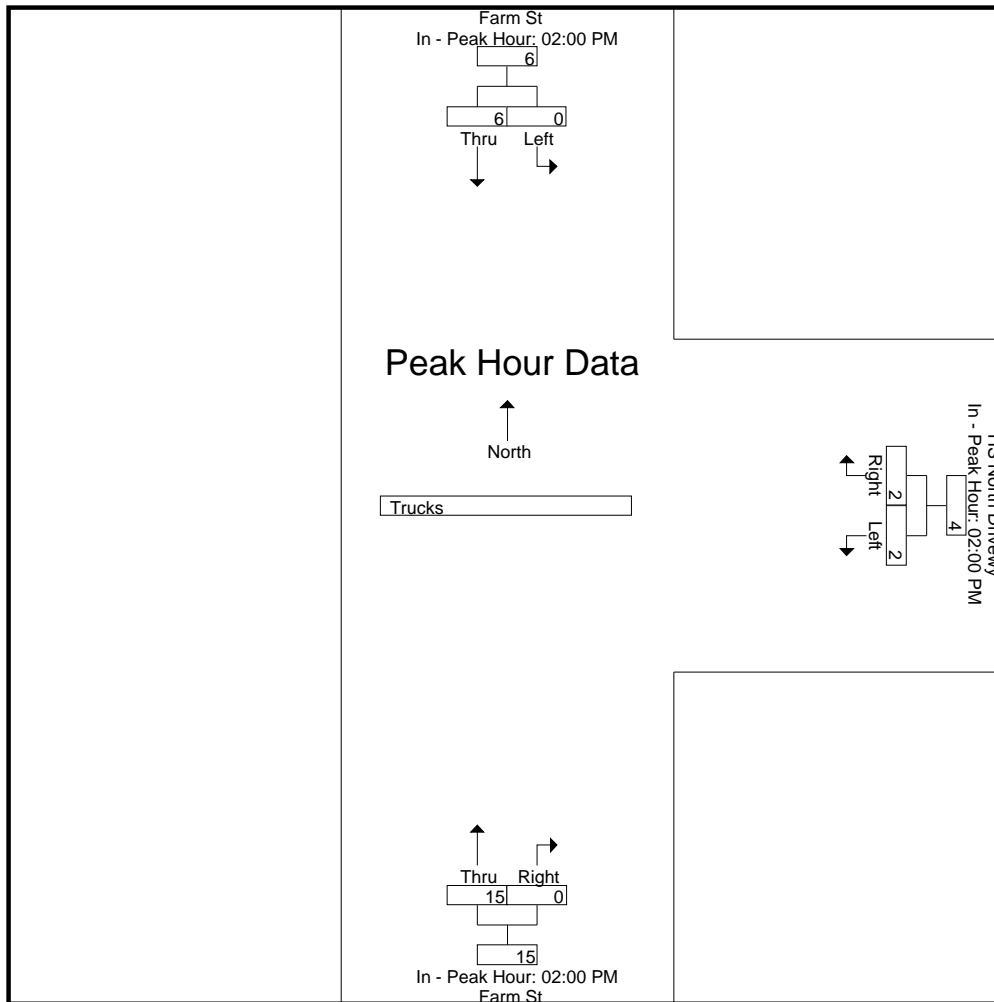
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	02:00 PM			02:00 PM			02:00 PM		
+0 mins.	0	<b>3</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>3</b>	2	0	2
+15 mins.	0	1	1	1	0	1	4	0	4
+30 mins.	0	0	0	0	0	0	3	0	3
+45 mins.	0	2	2	0	0	0	<b>6</b>	0	<b>6</b>
Total Volume	0	6	6	2	2	4	15	0	15
% App. Total	0	100		50	50		100	0	
PHF	.000	.500	.500	.500	.250	.333	.625	.000	.625

Accurate Counts  
978-664-2565

File Name : 40684006  
Site Code : 40684006  
Start Date : 11/16/2021  
Page No : 9

N/S Street : Farm Street  
E/W Street : High School North Driveway  
City/State : Wakefield, MA  
Weather : Clear

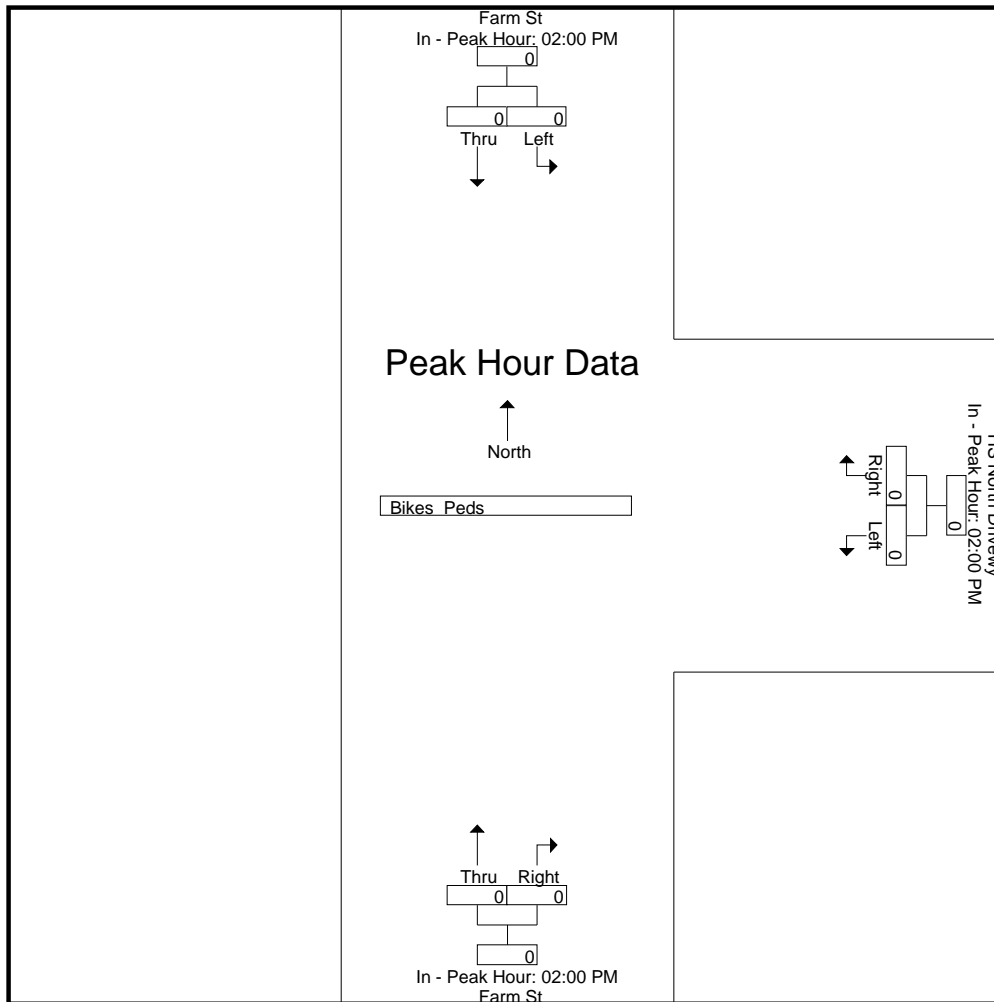








N/S Street : Farm Street  
E/W Street : High School North Driveway  
City/State : Wakefield, MA  
Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : High School South Driveway  
 City/State : Wakefield, MA  
 Weather : Clear

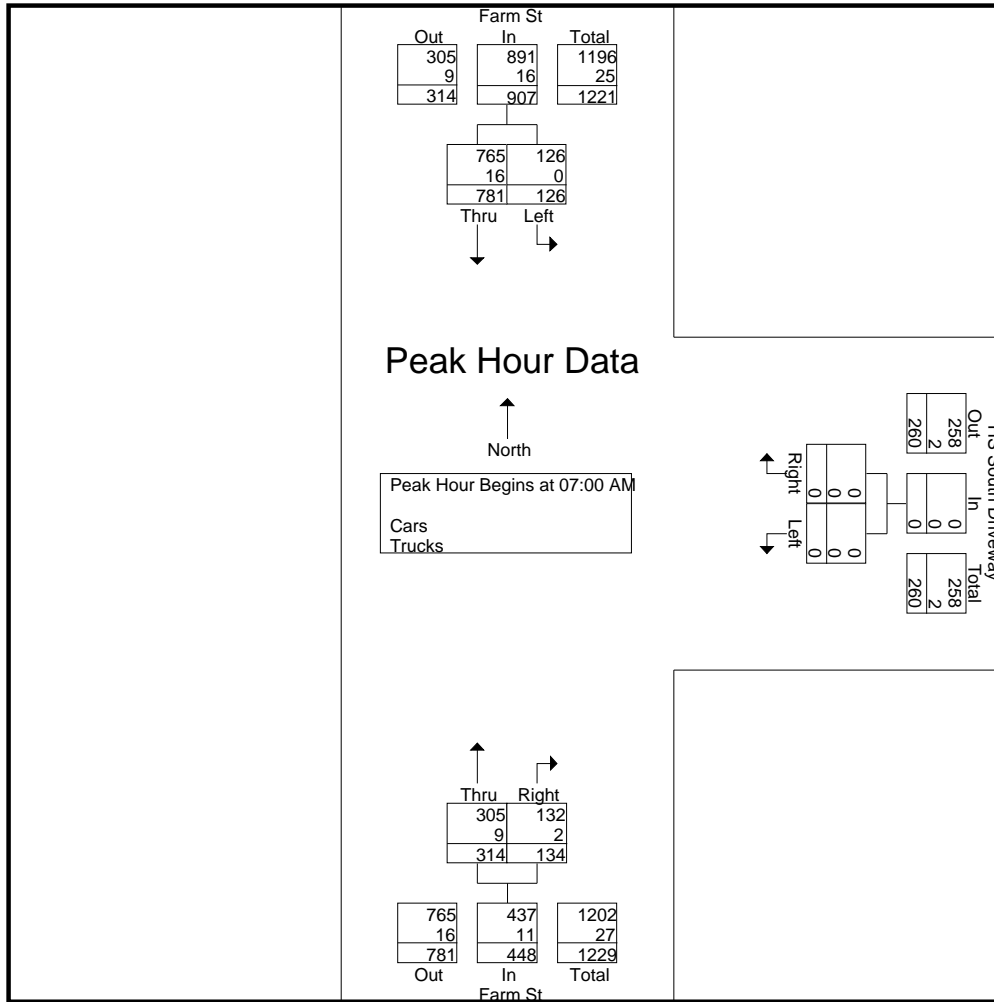
File Name : 40684007  
 Site Code : 40684007  
 Start Date : 11/16/2021  
 Page No : 1

### Groups Printed- Cars - Trucks

Start Time	Farm St From North		HS South Driveway From East			Farm St From South		Int. Total
	Left	Thru	Left	Right	Thru	Right		
07:00 AM	38	193	0	0	57	39	327	
07:15 AM	69	211	0	0	72	78	430	
07:30 AM	10	221	0	0	90	7	328	
07:45 AM	9	156	0	0	95	10	270	
<b>Total</b>	<b>126</b>	<b>781</b>	<b>0</b>	<b>0</b>	<b>314</b>	<b>134</b>	<b>1355</b>	
08:00 AM	8	135	0	0	96	13	252	
08:15 AM	12	132	0	0	120	40	304	
08:30 AM	14	192	0	0	91	26	323	
08:45 AM	4	117	0	0	81	2	204	
<b>Total</b>	<b>38</b>	<b>576</b>	<b>0</b>	<b>0</b>	<b>388</b>	<b>81</b>	<b>1083</b>	
<b>Grand Total</b>	<b>164</b>	<b>1357</b>	<b>0</b>	<b>0</b>	<b>702</b>	<b>215</b>	<b>2438</b>	
Apprch %	10.8	89.2	0	0	76.6	23.4		
Total %	6.7	55.7	0	0	28.8	8.8		
Cars	164	1339	0	0	690	213	2406	
% Cars	100	98.7	0	0	98.3	99.1	98.7	
Trucks	0	18	0	0	12	2	32	
% Trucks	0	1.3	0	0	1.7	0.9	1.3	

Start Time	Farm St From North			HS South Driveway From East			Farm St From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. 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	38	193	231	0	0	0	57	39	96	327
07:15 AM	<b>69</b>	211	<b>280</b>	0	0	0	72	<b>78</b>	<b>150</b>	<b>430</b>
07:30 AM	10	<b>221</b>	231	0	0	0	90	7	97	328
07:45 AM	9	156	165	0	0	0	<b>95</b>	10	105	270
<b>Total Volume</b>	<b>126</b>	<b>781</b>	<b>907</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>314</b>	<b>134</b>	<b>448</b>	<b>1355</b>
% App. Total	13.9	86.1		0	0		70.1	29.9		
PHF	.457	.883	.810	.000	.000	.000	.826	.429	.747	.788
Cars	126	765	891	0	0	0	305	132	437	1328
% Cars	100	98.0	98.2	0	0	0	97.1	98.5	97.5	98.0
Trucks	0	16	16	0	0	0	9	2	11	27
% Trucks	0	2.0	1.8	0	0	0	2.9	1.5	2.5	2.0

N/S Street : Farm Street  
E/W Street : High School South Driveway  
City/State : Wakefield, MA  
Weather : Clear



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

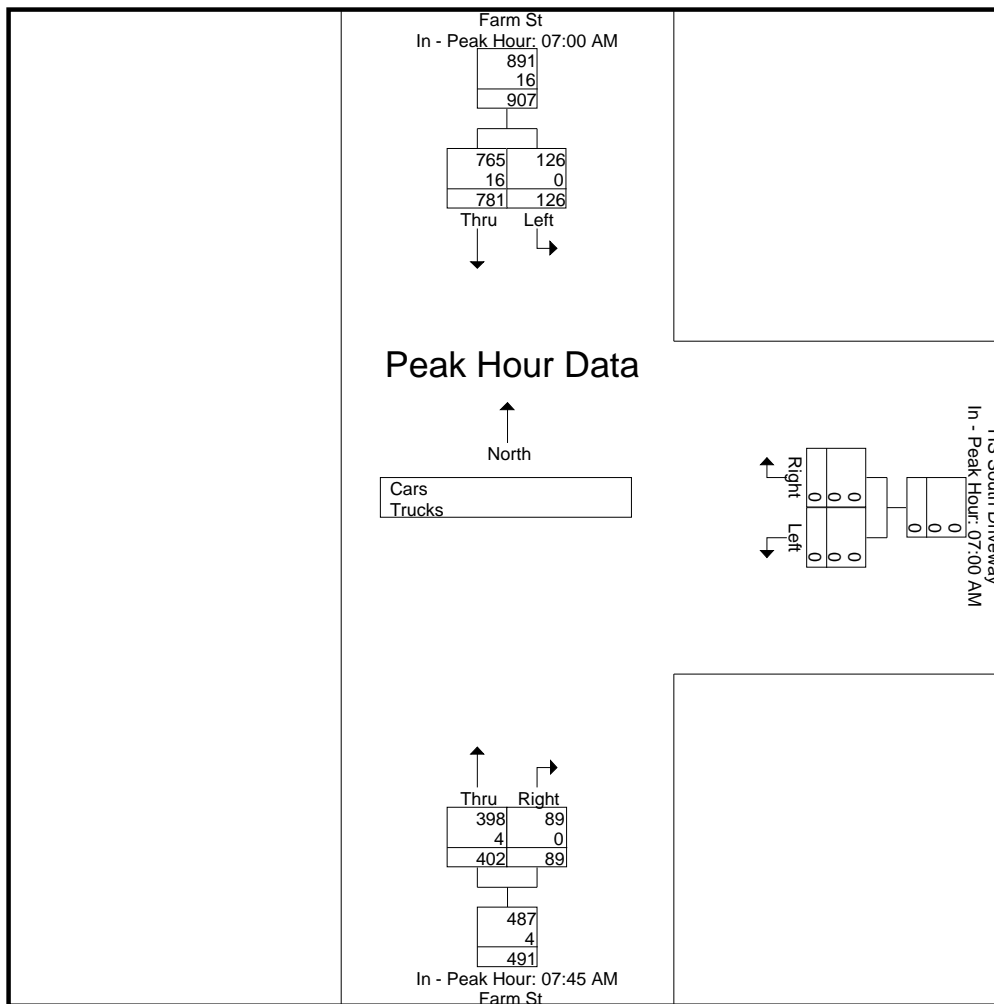
	07:00 AM			07:00 AM			07:45 AM		
+0 mins.	38	193	231	0	0	0	95	10	105
+15 mins.	<b>69</b>	211	<b>280</b>	0	0	0	96	13	109
+30 mins.	10	<b>221</b>	231	0	0	0	<b>120</b>	<b>40</b>	<b>160</b>
+45 mins.	9	156	165	0	0	0	91	26	117
Total Volume	126	781	907	0	0	0	402	89	491
% App. Total	13.9	86.1		0	0		81.9	18.1	
PHF	.457	.883	.810	.000	.000	.000	.838	.556	.767
Cars	126	765	891	0	0	0	398	89	487
% Cars	100	98	98.2	0	0	0	99	100	99.2
Trucks	0	16	16	0	0	0	4	0	4
% Trucks	0	2	1.8	0	0	0	1	0	0.8

# Accurate Counts

978-664-2565

File Name : 40684007  
Site Code : 40684007  
Start Date : 11/16/2021  
Page No : 3

N/S Street : Farm Street  
E/W Street : High School South Driveway  
City/State : Wakefield, MA  
Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : High School South Driveway  
 City/State : Wakefield, MA  
 Weather : Clear

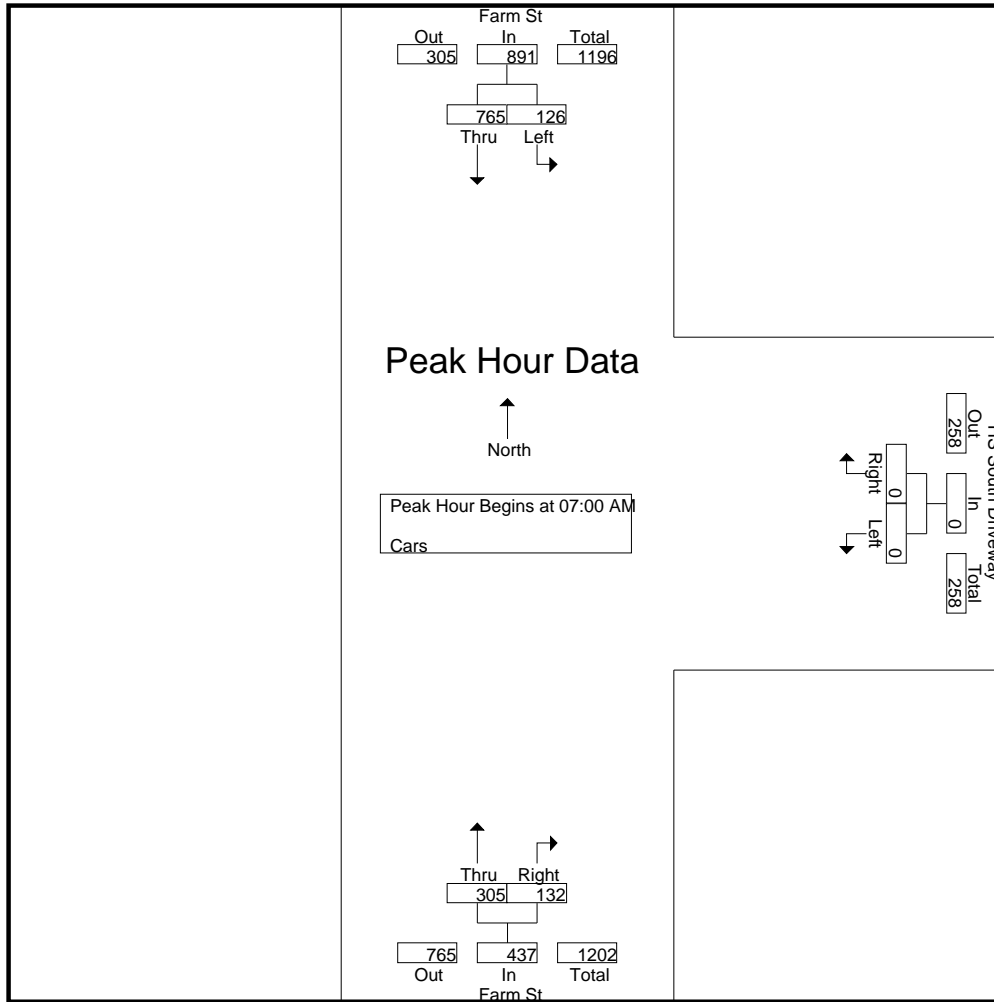
File Name : 40684007  
 Site Code : 40684007  
 Start Date : 11/16/2021  
 Page No : 4

### Groups Printed- Cars

Start Time	Farm St From North		HS South Driveway From East		Farm St From South		Int. Total
	Left	Thru	Left	Right	Thru	Right	
07:00 AM	38	190	0	0	56	38	322
07:15 AM	69	209	0	0	71	77	426
07:30 AM	10	214	0	0	85	7	316
07:45 AM	9	152	0	0	93	10	264
<b>Total</b>	<b>126</b>	<b>765</b>	<b>0</b>	<b>0</b>	<b>305</b>	<b>132</b>	<b>1328</b>
08:00 AM	8	134	0	0	95	13	250
08:15 AM	12	131	0	0	119	40	302
08:30 AM	14	192	0	0	91	26	323
08:45 AM	4	117	0	0	80	2	203
<b>Total</b>	<b>38</b>	<b>574</b>	<b>0</b>	<b>0</b>	<b>385</b>	<b>81</b>	<b>1078</b>
<b>Grand Total</b>	<b>164</b>	<b>1339</b>	<b>0</b>	<b>0</b>	<b>690</b>	<b>213</b>	<b>2406</b>
Apprch %	10.9	89.1	0	0	76.4	23.6	
Total %	6.8	55.7	0	0	28.7	8.9	

Start Time	Farm St From North			HS South Driveway From East			Farm St From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. 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	38	190	228	0	0	0	56	38	94	322
07:15 AM	<b>69</b>	209	<b>278</b>	0	0	0	71	<b>77</b>	<b>148</b>	<b>426</b>
07:30 AM	10	<b>214</b>	224	0	0	0	85	7	92	316
07:45 AM	9	152	161	0	0	0	<b>93</b>	10	103	264
Total Volume	126	765	891	0	0	0	305	132	437	1328
% App. Total	14.1	85.9		0	0		69.8	30.2		
PHF	.457	.894	.801	.000	.000	.000	.820	.429	.738	.779

N/S Street : Farm Street  
E/W Street : High School South Driveway  
City/State : Wakefield, MA  
Weather : Clear



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

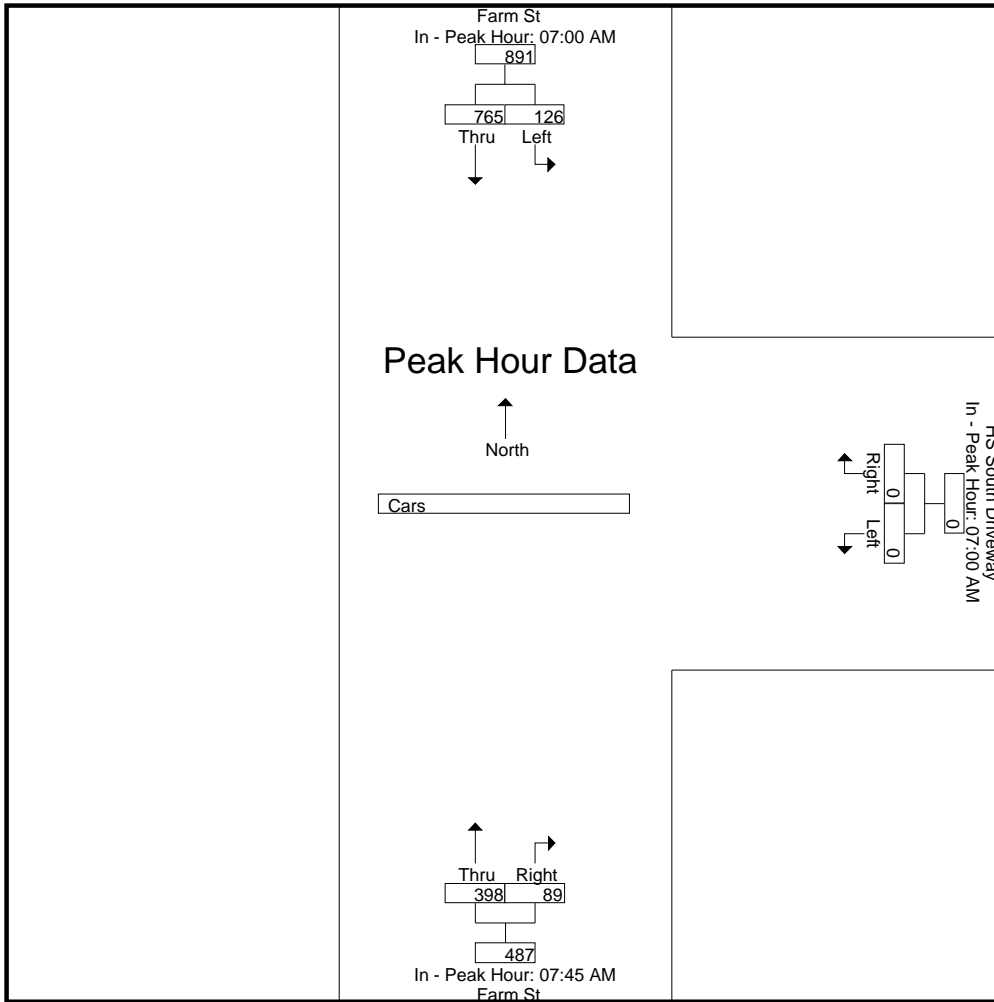
	07:00 AM			07:00 AM			07:45 AM		
+0 mins.	38	190	228	0	0	0	93	10	103
+15 mins.	<b>69</b>	209	<b>278</b>	0	0	0	95	13	108
+30 mins.	10	<b>214</b>	224	0	0	0	<b>119</b>	<b>40</b>	<b>159</b>
+45 mins.	9	152	161	0	0	0	91	26	117
Total Volume	126	765	891	0	0	0	398	89	487
% App. Total	14.1	85.9		0	0		81.7	18.3	
PHF	.457	.894	.801	.000	.000	.000	.836	.556	.766



Accurate Counts  
978-664-2565

File Name : 40684007  
Site Code : 40684007  
Start Date : 11/16/2021  
Page No : 6

N/S Street : Farm Street  
E/W Street : High School South Driveway  
City/State : Wakefield, MA  
Weather : Clear



**Accurate Counts**  
978-664-2565

N/S Street : Farm Street  
E/W Street : High School South Driveway  
City/State : Wakefield, MA  
Weather : Clear

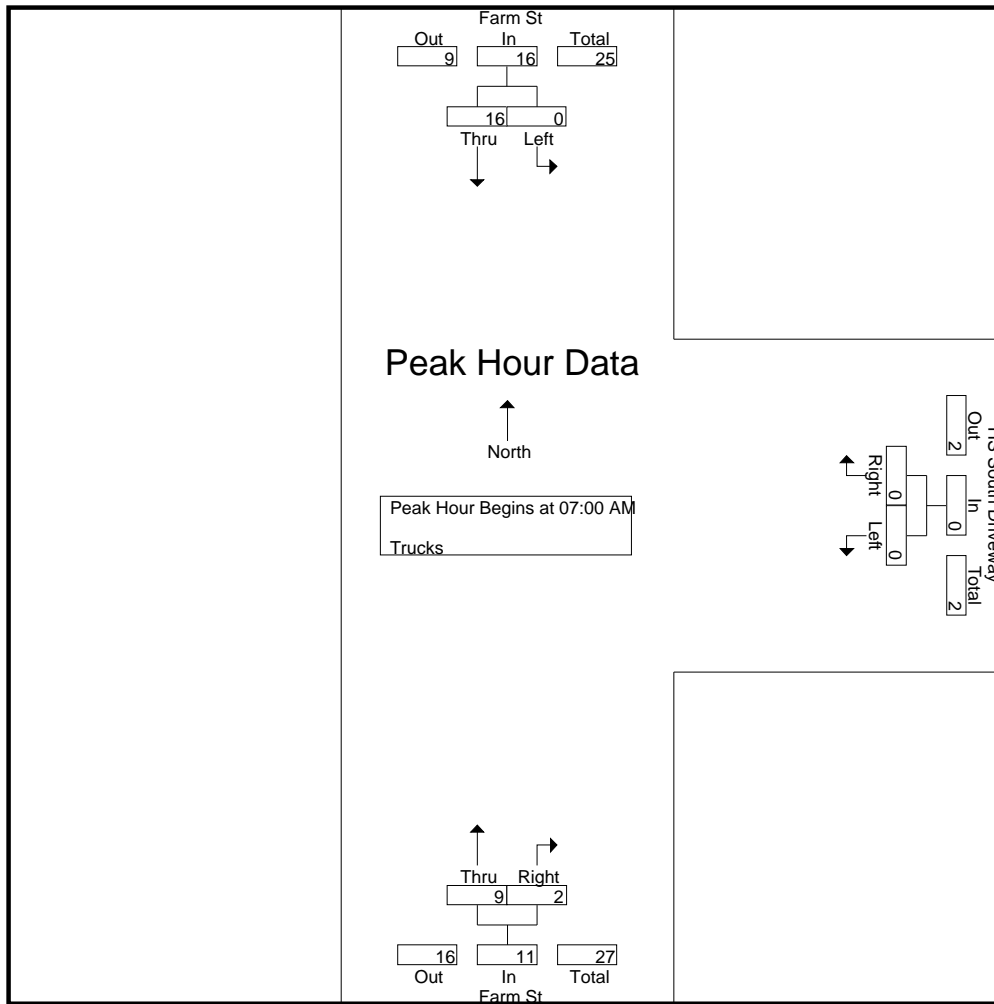
File Name : 40684007  
Site Code : 40684007  
Start Date : 11/16/2021  
Page No : 7

Groups Printed- Trucks

Start Time	Farm St From North		HS South Driveway From East		Farm St From South		Int. Total
	Left	Thru	Left	Right	Thru	Right	
07:00 AM	0	3	0	0	1	1	5
07:15 AM	0	2	0	0	1	1	4
07:30 AM	0	7	0	0	5	0	12
07:45 AM	0	4	0	0	2	0	6
<b>Total</b>	<b>0</b>	<b>16</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>2</b>	<b>27</b>
08:00 AM	0	1	0	0	1	0	2
08:15 AM	0	1	0	0	1	0	2
08:30 AM	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	1	0	1
<b>Total</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>5</b>
<b>Grand Total</b>	<b>0</b>	<b>18</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>2</b>	<b>32</b>
Apprch %	0	100	0	0	85.7	14.3	
Total %	0	56.2	0	0	37.5	6.2	

Start Time	Farm St From North			HS South Driveway From East			Farm St From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. 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	3	3	0	0	0	1	1	2	5
07:15 AM	0	2	2	0	0	0	1	1	2	4
07:30 AM	0	7	7	0	0	0	5	0	5	12
07:45 AM	0	4	4	0	0	0	2	0	2	6
<b>Total Volume</b>	<b>0</b>	<b>16</b>	<b>16</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>2</b>	<b>11</b>	<b>27</b>
<b>% App. Total</b>	<b>0</b>	<b>100</b>		<b>0</b>	<b>0</b>		<b>81.8</b>	<b>18.2</b>		
PHF	.000	.571	.571	.000	.000	.000	.450	.500	.550	.563

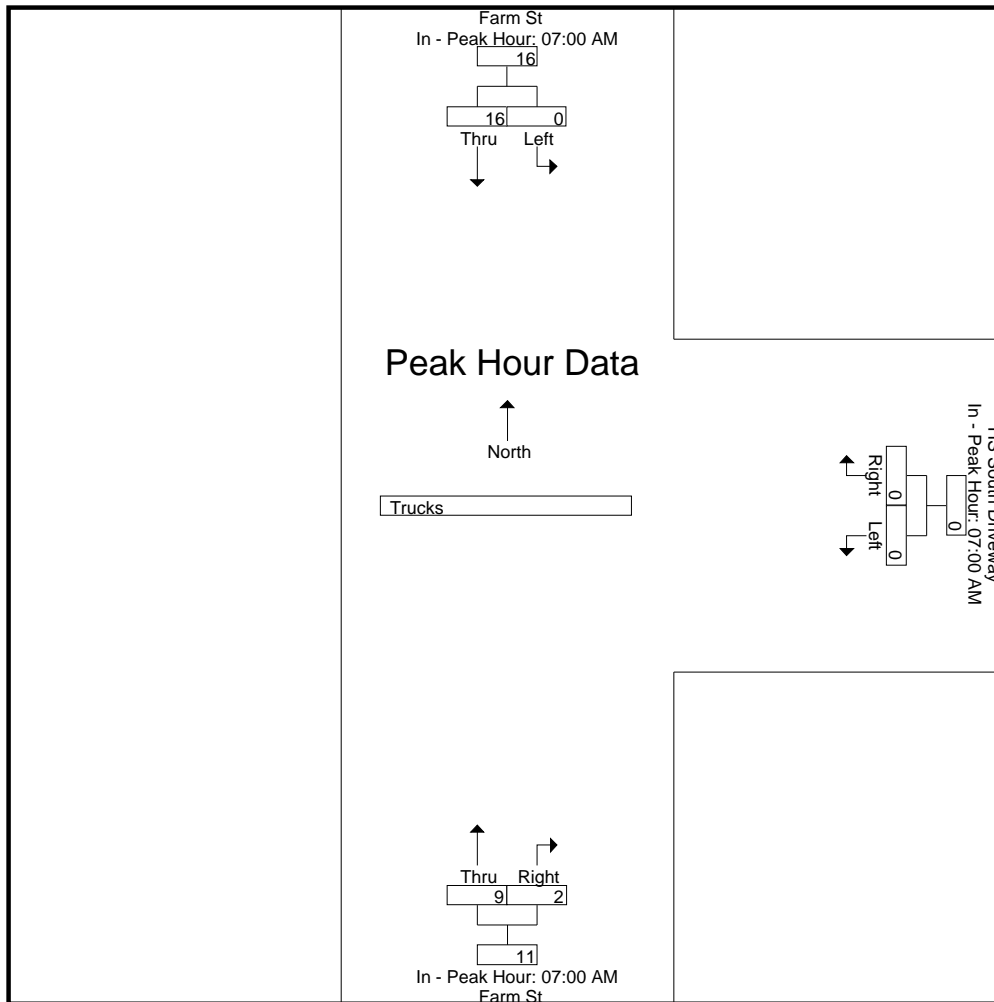
N/S Street : Farm Street  
E/W Street : High School South Driveway  
City/State : Wakefield, MA  
Weather : Clear



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		
+0 mins.	0	3	3	0	0	0	1	1	2
+15 mins.	0	2	2	0	0	0	1	1	2
+30 mins.	0	7	7	0	0	0	5	0	5
+45 mins.	0	4	4	0	0	0	2	0	2
Total Volume	0	16	16	0	0	0	9	2	11
% App. Total	0	100		0	0		81.8	18.2	
PHF	.000	.571	.571	.000	.000	.000	.450	.500	.550

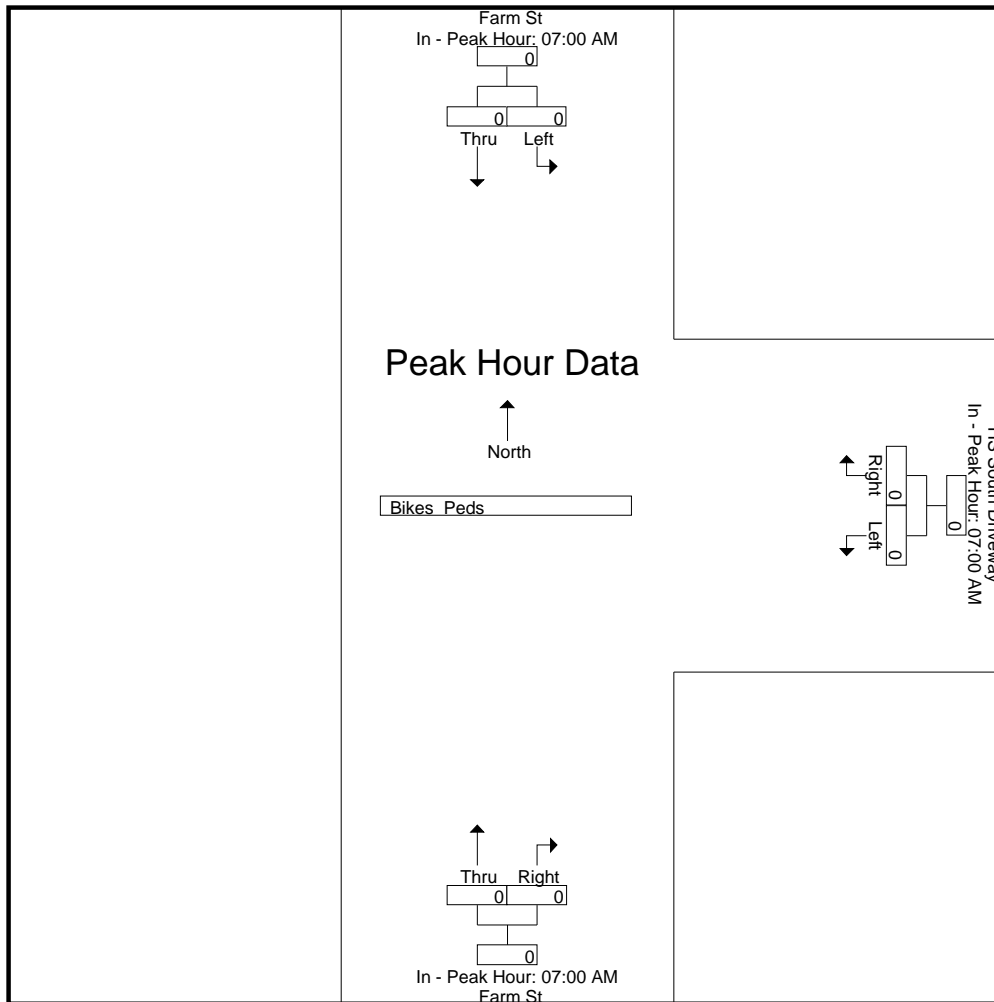
N/S Street : Farm Street  
E/W Street : High School South Driveway  
City/State : Wakefield, MA  
Weather : Clear







N/S Street : Farm Street  
E/W Street : High School South Driveway  
City/State : Wakefield, MA  
Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : Farm Street  
 E/W Street : High School South Driveway  
 City/State : Wakefield, MA  
 Weather : Clear

File Name : 40684007  
 Site Code : 40684007  
 Start Date : 11/16/2021  
 Page No : 1

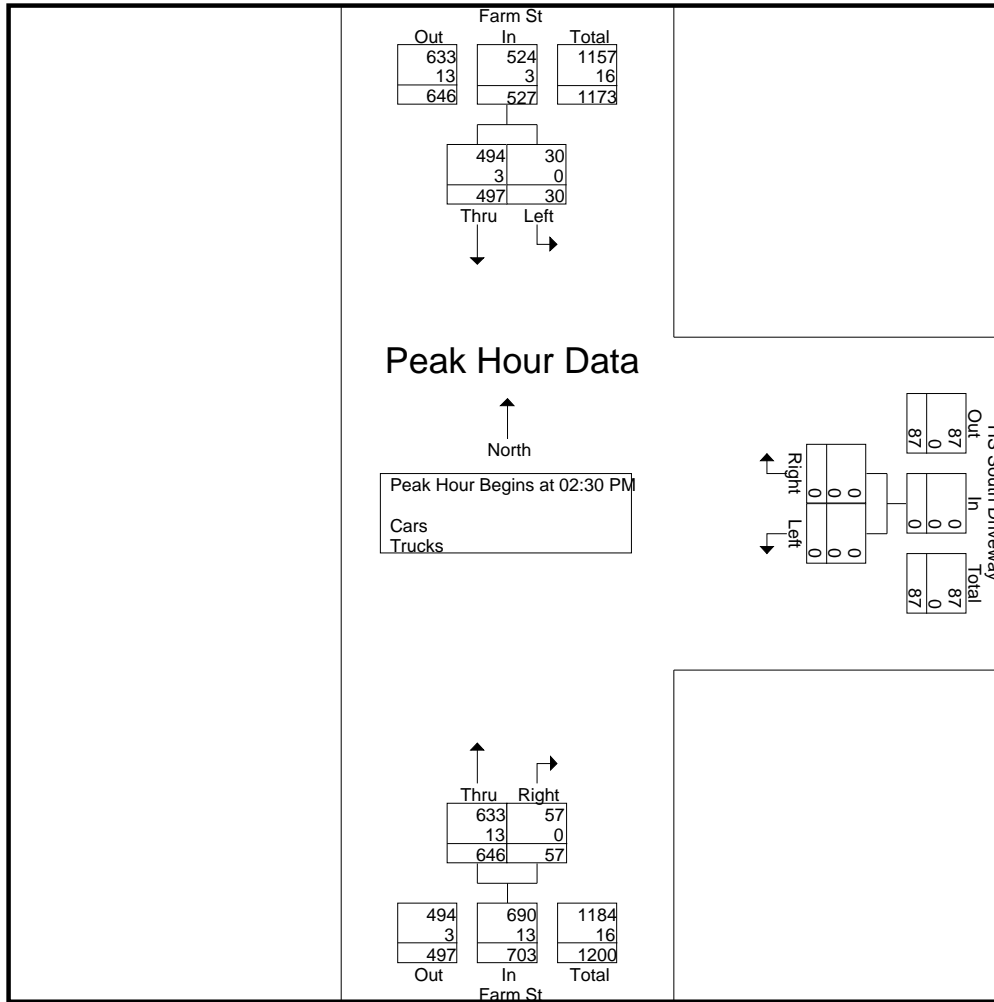
### Groups Printed- Cars - Trucks

Start Time	Farm St From North		HS South Driveway From East			Farm St From South		Int. Total
	Left	Thru	Left	Right	Thru	Right		
02:00 PM	5	114	0	0	121	17	257	
02:15 PM	13	100	0	0	147	25	285	
02:30 PM	16	104	0	0	171	39	330	
02:45 PM	6	146	0	0	140	4	296	
<b>Total</b>	<b>40</b>	<b>464</b>	<b>0</b>	<b>0</b>	<b>579</b>	<b>85</b>	<b>1168</b>	
03:00 PM	3	134	0	0	151	6	294	
03:15 PM	5	113	0	0	184	8	310	
03:30 PM	0	122	0	0	191	4	317	
03:45 PM	2	100	0	0	183	3	288	
<b>Total</b>	<b>10</b>	<b>469</b>	<b>0</b>	<b>0</b>	<b>709</b>	<b>21</b>	<b>1209</b>	
<b>Grand Total</b>	<b>50</b>	<b>933</b>	<b>0</b>	<b>0</b>	<b>1288</b>	<b>106</b>	<b>2377</b>	
Apprch %	5.1	94.9	0	0	92.4	7.6		
Total %	2.1	39.3	0	0	54.2	4.5		
Cars	50	923	0	0	1264	105	2342	
% Cars	100	98.9	0	0	98.1	99.1	98.5	
Trucks	0	10	0	0	24	1	35	
% Trucks	0	1.1	0	0	1.9	0.9	1.5	

Start Time	Farm St From North			HS South Driveway From East			Farm St From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:30 PM										
02:30 PM	<b>16</b>	104	120	0	0	0	171	<b>39</b>	<b>210</b>	<b>330</b>
02:45 PM	6	<b>146</b>	<b>152</b>	0	0	0	140	4	144	296
03:00 PM	3	134	137	0	0	0	151	6	157	294
03:15 PM	5	113	118	0	0	0	<b>184</b>	8	192	310
<b>Total Volume</b>	<b>30</b>	<b>497</b>	<b>527</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>646</b>	<b>57</b>	<b>703</b>	<b>1230</b>
% App. Total	5.7	94.3		0	0		91.9	8.1		
PHF	.469	.851	.867	.000	.000	.000	.878	.365	.837	.932
Cars	30	494	524	0	0	0	633	57	690	1214
% Cars	100	99.4	99.4	0	0	0	98.0	100	98.2	98.7
Trucks	0	3	3	0	0	0	13	0	13	16
% Trucks	0	0.6	0.6	0	0	0	2.0	0	1.8	1.3



N/S Street : Farm Street  
E/W Street : High School South Driveway  
City/State : Wakefield, MA  
Weather : Clear



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

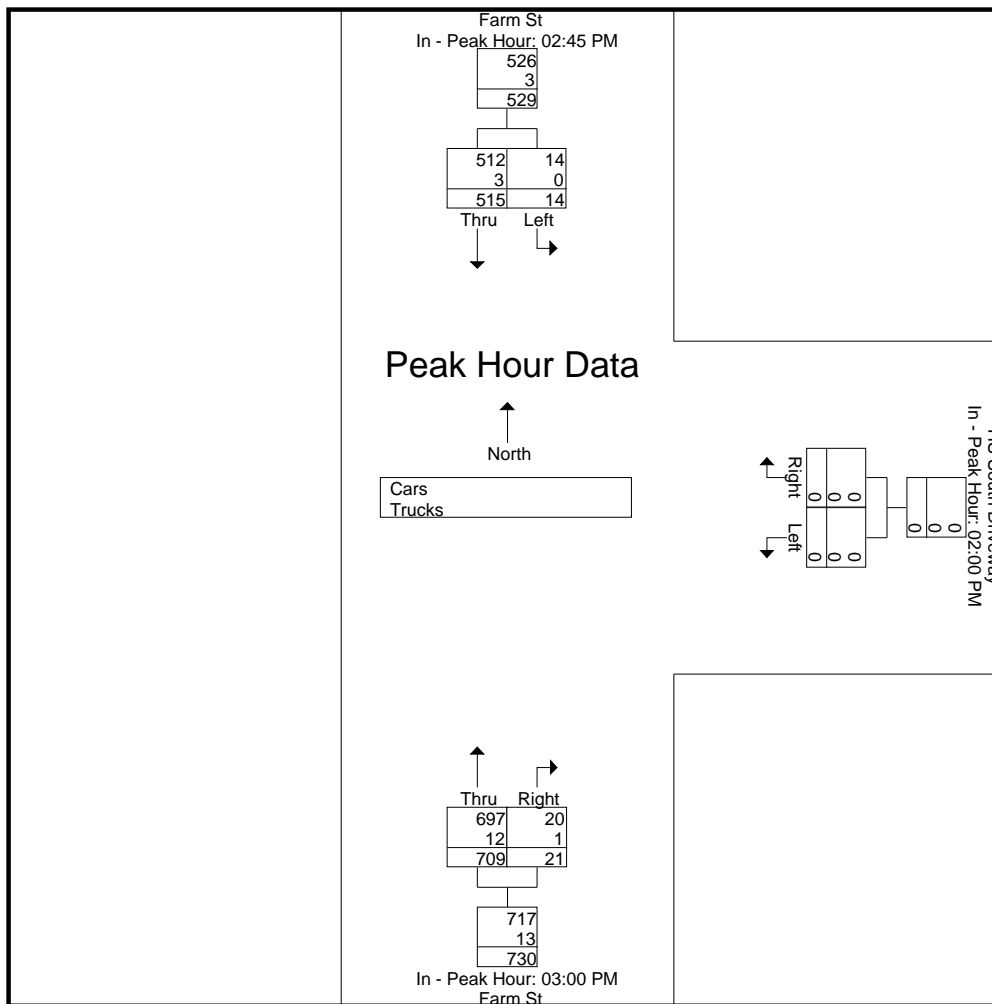
	02:45 PM			02:00 PM			03:00 PM		
+0 mins.	<b>6</b>	<b>146</b>	<b>152</b>	0	0	0	151	6	157
+15 mins.	3	134	137	0	0	0	184	8	192
+30 mins.	5	113	118	0	0	0	<b>191</b>	4	<b>195</b>
+45 mins.	0	122	122	0	0	0	183	3	186
Total Volume	14	515	529	0	0	0	709	21	730
% App. Total	2.6	97.4		0	0		97.1	2.9	
PHF	.583	.882	.870	.000	.000	.000	.928	.656	.936
Cars	14	512	526	0	0	0	697	20	717
% Cars	100	99.4	99.4	0	0	0	98.3	95.2	98.2
Trucks	0	3	3	0	0	0	12	1	13
% Trucks	0	0.6	0.6	0	0	0	1.7	4.8	1.8

# Accurate Counts

978-664-2565

File Name : 40684007  
 Site Code : 40684007  
 Start Date : 11/16/2021  
 Page No : 3

N/S Street : Farm Street  
 E/W Street : High School South Driveway  
 City/State : Wakefield, MA  
 Weather : Clear



**Accurate Counts**  
978-664-2565

N/S Street : Farm Street  
E/W Street : High School South Driveway  
City/State : Wakefield, MA  
Weather : Clear

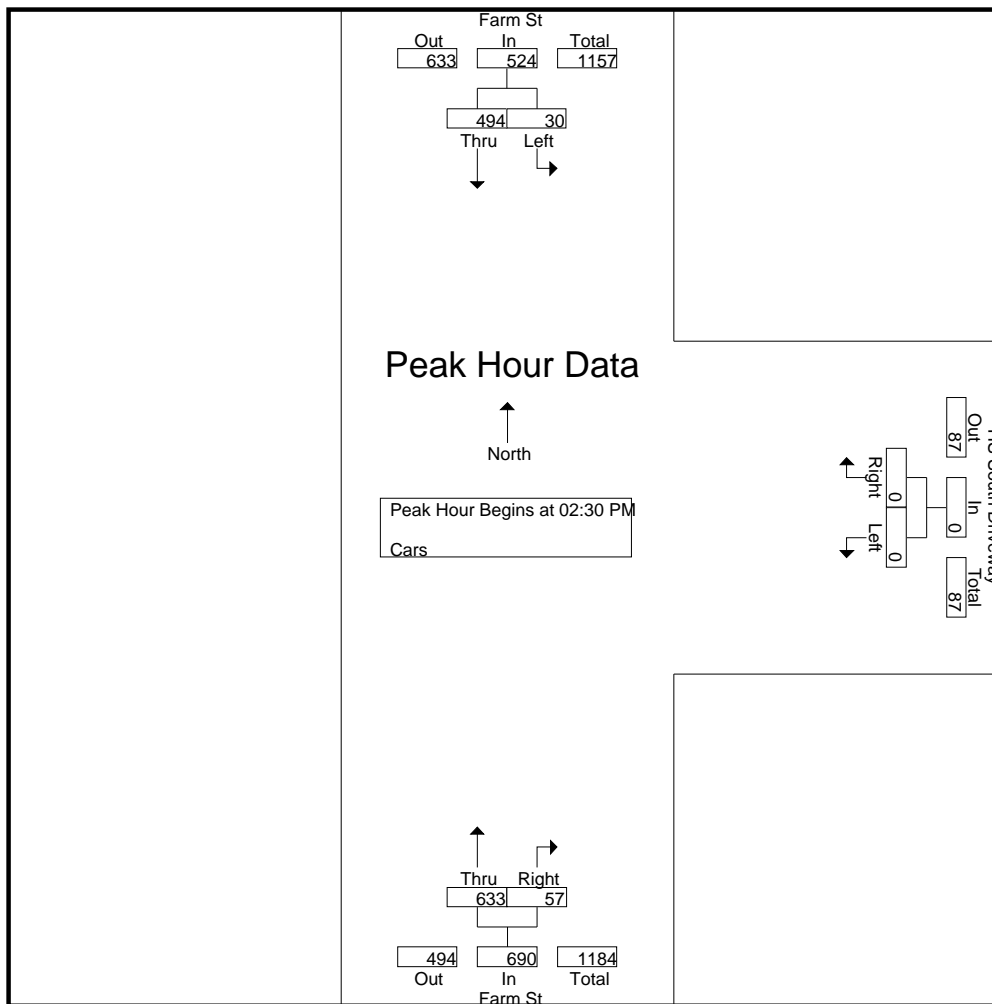
File Name : 40684007  
Site Code : 40684007  
Start Date : 11/16/2021  
Page No : 4

Groups Printed- Cars

Start Time	Farm St From North		HS South Driveway From East		Farm St From South		Int. Total
	Left	Thru	Left	Right	Thru	Right	
02:00 PM	5	111	0	0	120	17	253
02:15 PM	13	99	0	0	145	25	282
02:30 PM	16	104	0	0	167	39	326
02:45 PM	6	145	0	0	135	4	290
Total	40	459	0	0	567	85	1151
03:00 PM	3	133	0	0	150	6	292
03:15 PM	5	112	0	0	181	8	306
03:30 PM	0	122	0	0	189	4	315
03:45 PM	2	97	0	0	177	2	278
Total	10	464	0	0	697	20	1191
Grand Total	50	923	0	0	1264	105	2342
Apprch %	5.1	94.9	0	0	92.3	7.7	
Total %	2.1	39.4	0	0	54	4.5	

Start Time	Farm St From North			HS South Driveway From East			Farm St From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:30 PM										
02:30 PM	<b>16</b>	104	120	0	0	0	167	<b>39</b>	<b>206</b>	<b>326</b>
02:45 PM	6	<b>145</b>	<b>151</b>	0	0	0	135	4	139	290
03:00 PM	3	133	136	0	0	0	150	6	156	292
03:15 PM	5	112	117	0	0	0	<b>181</b>	8	189	306
Total Volume	30	494	524	0	0	0	633	57	690	1214
% App. Total	5.7	94.3		0	0		91.7	8.3		
PHF	.469	.852	.868	.000	.000	.000	.874	.365	.837	.931

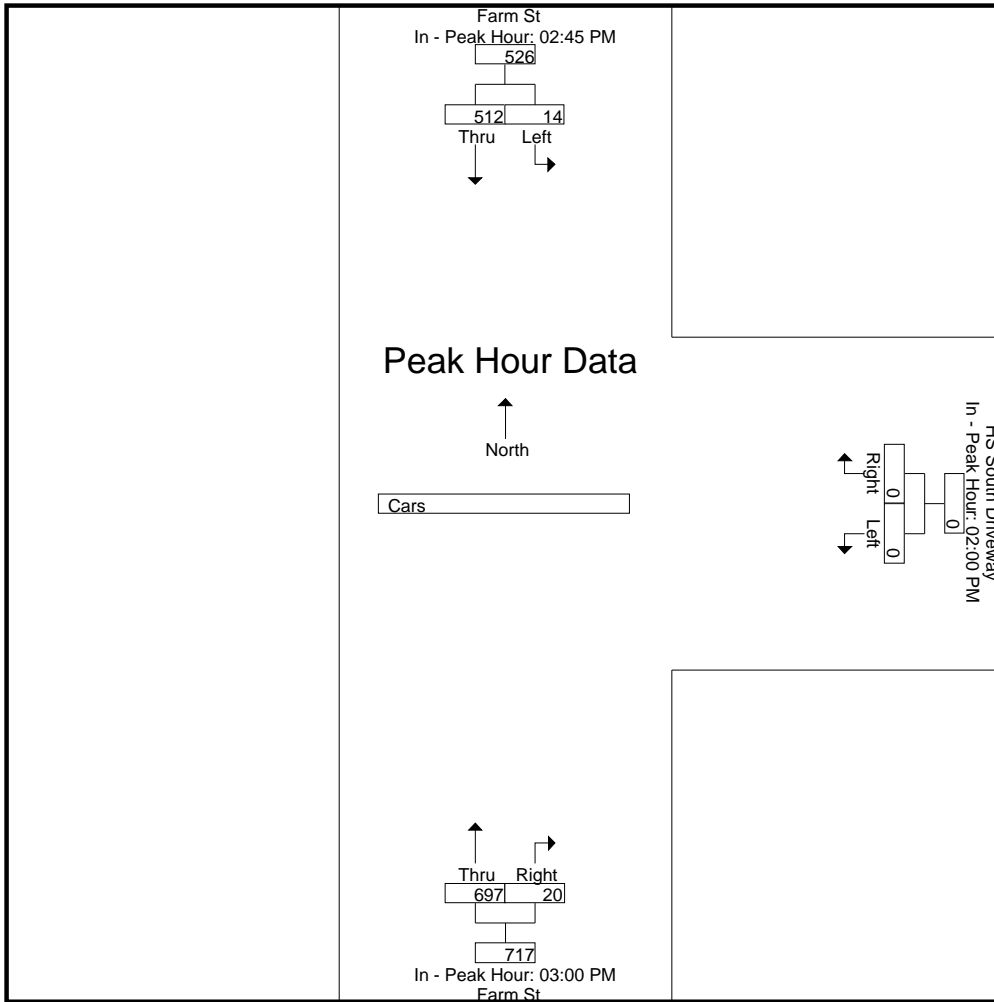
N/S Street : Farm Street  
E/W Street : High School South Driveway  
City/State : Wakefield, MA  
Weather : Clear



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	02:45 PM			02:00 PM			03:00 PM		
+0 mins.	6	145	151	0	0	0	150	6	156
+15 mins.	3	133	136	0	0	0	181	8	189
+30 mins.	5	112	117	0	0	0	189	4	193
+45 mins.	0	122	122	0	0	0	177	2	179
Total Volume	14	512	526	0	0	0	697	20	717
% App. Total	2.7	97.3		0	0		97.2	2.8	
PHF	.583	.883	.871	.000	.000	.000	.922	.625	.929

N/S Street : Farm Street  
E/W Street : High School South Driveway  
City/State : Wakefield, MA  
Weather : Clear



**Accurate Counts**  
978-664-2565

N/S Street : Farm Street  
E/W Street : High School South Driveway  
City/State : Wakefield, MA  
Weather : Clear

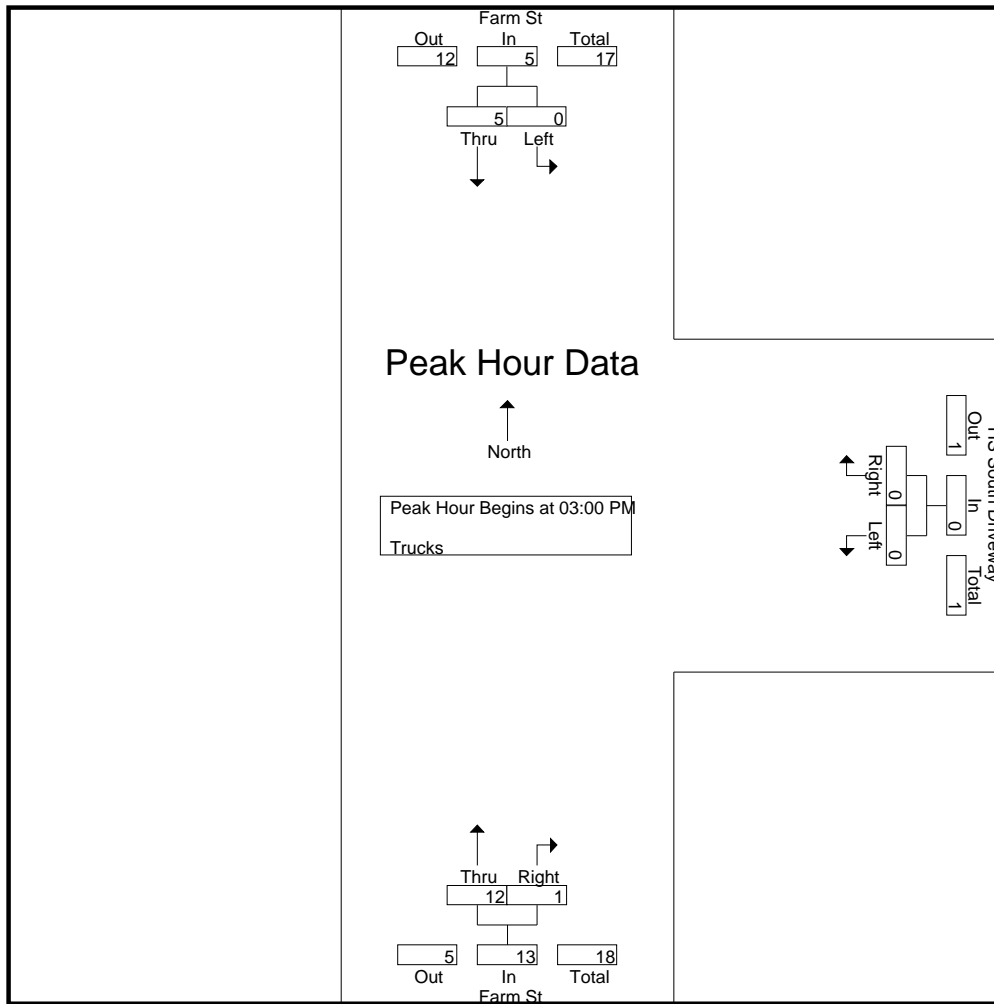
File Name : 40684007  
Site Code : 40684007  
Start Date : 11/16/2021  
Page No : 7

Groups Printed- Trucks

Start Time	Farm St From North		HS South Driveway From East		Farm St From South		Int. Total
	Left	Thru	Left	Right	Thru	Right	
02:00 PM	0	3	0	0	1	0	4
02:15 PM	0	1	0	0	2	0	3
02:30 PM	0	0	0	0	4	0	4
02:45 PM	0	1	0	0	5	0	6
<b>Total</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>0</b>	<b>17</b>
03:00 PM	0	1	0	0	1	0	2
03:15 PM	0	1	0	0	3	0	4
03:30 PM	0	0	0	0	2	0	2
03:45 PM	0	3	0	0	6	1	10
<b>Total</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>1</b>	<b>18</b>
<b>Grand Total</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>24</b>	<b>1</b>	<b>35</b>
Apprch %	0	100	0	0	96	4	
Total %	0	28.6	0	0	68.6	2.9	

Start Time	Farm St From North			HS South Driveway From East			Farm St From South			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 03:00 PM										
03:00 PM	0	1	1	0	0	0	1	0	1	2
03:15 PM	0	1	1	0	0	0	3	0	3	4
03:30 PM	0	0	0	0	0	0	2	0	2	2
03:45 PM	0	<b>3</b>	<b>3</b>	0	0	0	<b>6</b>	<b>1</b>	<b>7</b>	<b>10</b>
Total Volume	0	5	5	0	0	0	12	1	13	18
% App. Total	0	100		0	0		92.3	7.7		
PHF	.000	.417	.417	.000	.000	.000	.500	.250	.464	.450

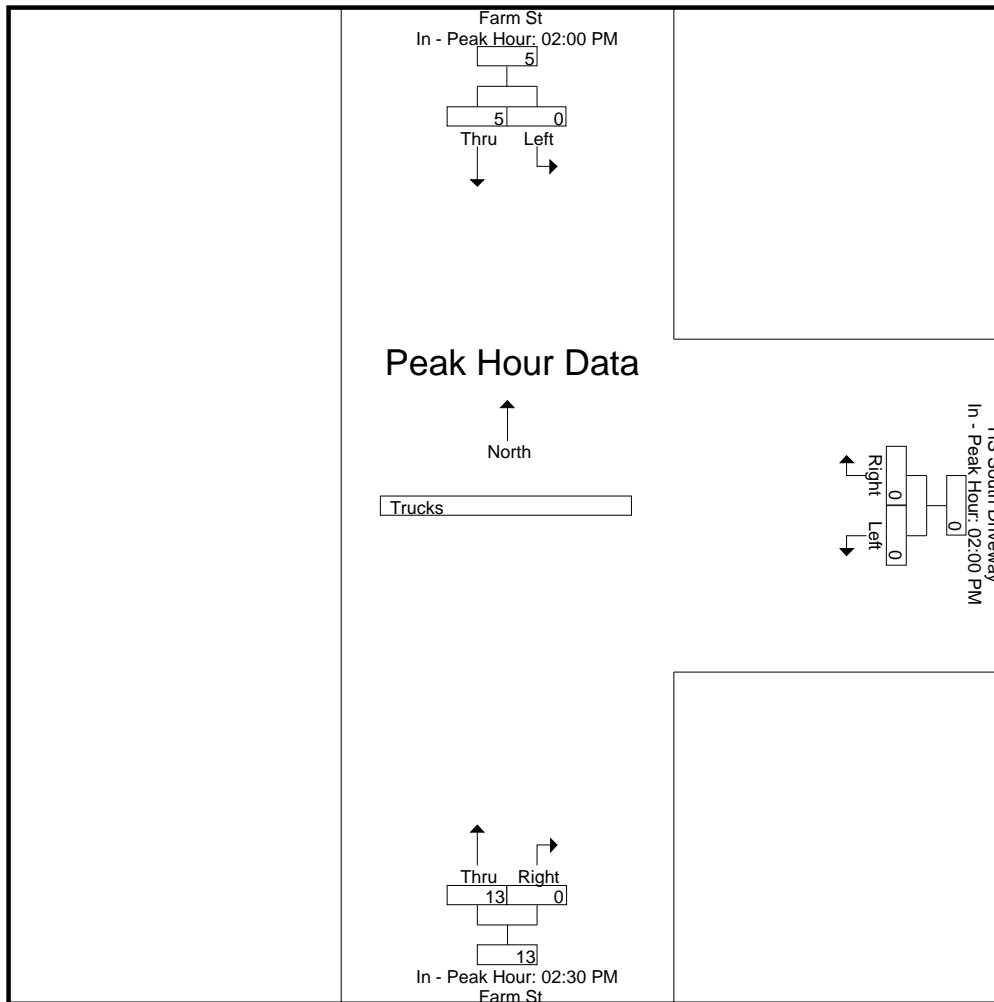
N/S Street : Farm Street  
E/W Street : High School South Driveway  
City/State : Wakefield, MA  
Weather : Clear



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	02:00 PM			02:00 PM			02:30 PM		
+0 mins.	0	<b>3</b>	<b>3</b>	0	0	0	4	0	4
+15 mins.	0	1	1	0	0	0	<b>5</b>	0	<b>5</b>
+30 mins.	0	0	0	0	0	0	1	0	1
+45 mins.	0	1	1	0	0	0	3	0	3
Total Volume	0	5	5	0	0	0	13	0	13
% App. Total	0	100		0	0		100	0	
PHF	.000	.417	.417	.000	.000	.000	.650	.000	.650

N/S Street : Farm Street  
E/W Street : High School South Driveway  
City/State : Wakefield, MA  
Weather : Clear

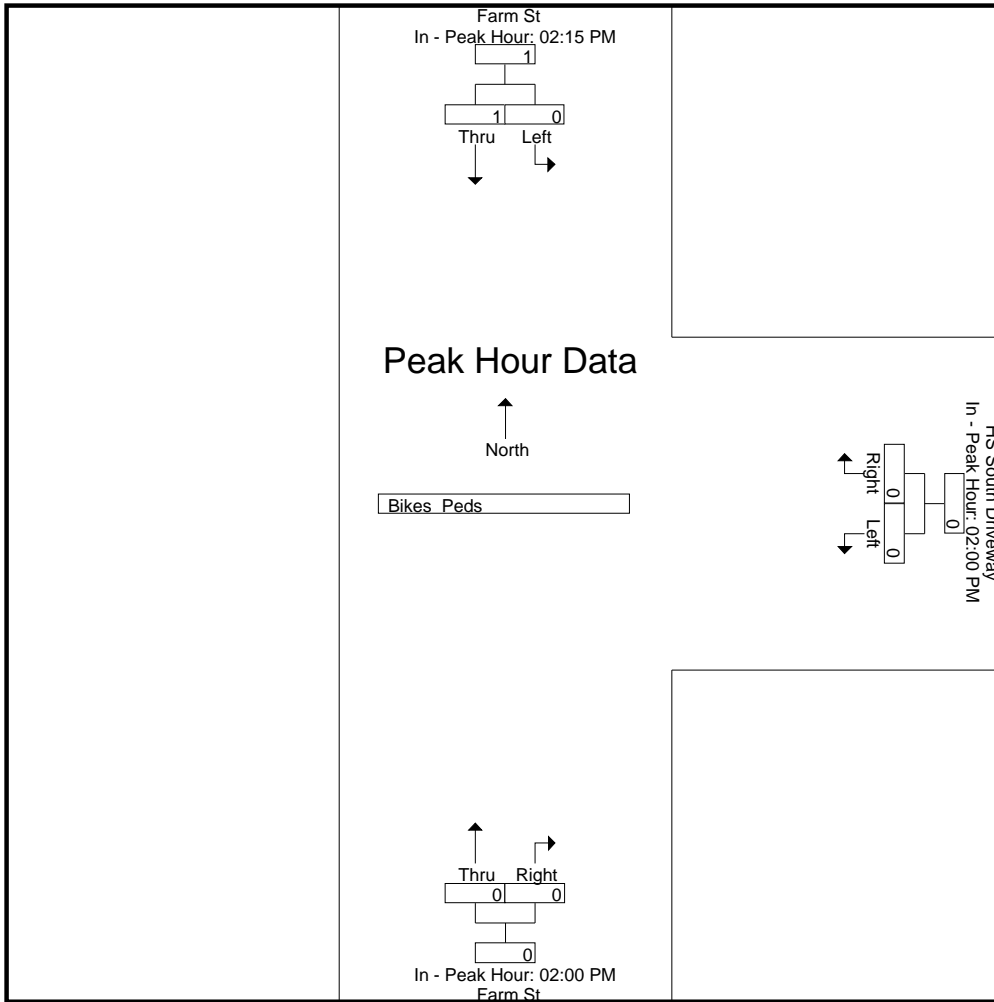








N/S Street : Farm Street  
E/W Street : High School South Driveway  
City/State : Wakefield, MA  
Weather : Clear



# APPENDIX B

## Safety Analysis

Farm Street at Hemlock Road														
Crash Number	City Town Name	Crash Date	Crash Severity	Crash Time	Light Conditions	Manner of Collision	Non-Motorist Type (All Persons)	Road Surface Condition	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Configuration (All Vehicles)	Vehicle Travel Directions (All Vehicles)	Weather Conditions	Latitude	Longitude
4016849	WAKEFIELD	03/04/2015	Property damage only (none)	7:45 AM	Daylight	Angle		Wet	V1: Travelling straight ahead / V2: Turning left	V1:(Passenger car) / V2:(Passenger car)	V1: E / V2: N	Cloudy	42.49518	-71.052365
4517333	WAKEFIELD	03/22/2018	Property damage only (none)	7:38 AM	Other	Angle		Snow	V1: Travelling straight ahead / V2: Entering traffic lane	V1:(Passenger car) / V2:(Passenger car)	V1: N / V2: W	Snow	42.49519	-71.052362
4595155	WAKEFIELD	09/13/2018	Property damage only (none)	8:30 AM	Daylight	Angle		Dry	V1: Turning left / V2: Turning left	V1:(Passenger car) / V2:(Passenger car)	V1: N / V2: E	Cloudy	42.49519	-71.052362
4596299	WAKEFIELD	09/14/2018	Non-fatal injury	3:47 PM	Daylight	Rear-end		Dry	V1: Slowing or stopped in traffic / V2: Travelling straight ahead / V3:	V1:(Passenger car) / V2:(Passenger car) / V3:(Passenger car)	V1: S / V2: S / V3: S	Clear	42.49524	-71.052355
4651231	WAKEFIELD	01/15/2019	Property damage only (none)	8:46 PM	Dark - lighted roadway	Sideswipe, opposite direction		Dry	V1: Turning left / V2: Turning left	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: N	Clear	42.49519	-71.052362
4652758	WAKEFIELD	01/15/2019	Property damage only (none)	8:09 PM	Daylight	Angle		Dry	V1: Travelling straight ahead / V2: Turning left	V1:(Passenger car) / V2:(Passenger car)	V1: N / V2: W	Clear	42.49519	-71.052362
4674251	WAKEFIELD	03/05/2019	Property damage only (none)	3:16 PM	Daylight	Sideswipe, same direction		Dry	V1: Turning left	V1:(Passenger car)	V1: S	Clear	42.49519	-71.052362
4674254	WAKEFIELD	03/08/2019	Property damage only (none)	6:31 PM	Dark - lighted roadway	Sideswipe, same direction		Dry	V1: Turning right	V1:(Passenger car)	V1: E	Clear	42.49519	-71.052362
4683092	WAKEFIELD	03/06/2019	Property damage only (none)	7:05 AM	Daylight	Rear-end		Dry	V1: Slowing or stopped in traffic	V1:(Passenger car)	V1: N	Clear	42.49519	-71.052362
4705424	WAKEFIELD	05/09/2019	Property damage only (none)	9:25 AM	Daylight	Rear-end		Dry	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: S	Clear	42.49519	-71.052362

Data Level: CRASH

Query Type Spatial

Criteria: If you conducted an Advanced Query your SQL statement will be listed here

**Farm Street at Nahant Street**

Crash Number	City Town Name	Crash Date	Crash Severity	Crash Time	Light Conditions	Manner of Collision	Non-Motorist Type (All Persons)	Road Surface Condition	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Configuration (All Vehicles)	Vehicle Travel Directions	Weather Conditions	Latitude	Longitude
4042641	WAKEFIELD	05/15/2015	Property damage only (none)	7:45 AM	Daylight	Angle		Dry	V1: Travelling straight ahead / V2: Turning left	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: S	Clear	42.49571	-71.052252
4047458	WAKEFIELD	05/27/2015	Non-fatal injury	5:17 PM	Daylight	Rear-end		Dry	V1: Travelling straight ahead / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: S	Clear	42.49584	-71.05219
4062229	WAKEFIELD	07/10/2015	Property damage only (none)	4:51 PM	Daylight	Angle		Dry	V1: Turning left / V2: Turning left	V1:(Passenger car) / V2:(Passenger car)	V1: N / V2: E	Clear	42.49571	-71.052252
4169249	WAKEFIELD	03/29/2016	Non-fatal injury	8:03 AM	Daylight	Angle		Dry	V1: Turning left / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: E / V2: S	Clear	42.49571	-71.052252
4190241	WAKEFIELD	04/15/2016	Property damage only (none)	7:28 AM	Daylight	Angle		Dry	V1: Travelling straight ahead / V2: Turning left	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: E	Clear	42.49571	-71.052252
4190242	WAKEFIELD	05/10/2016	Property damage only (none)	7:47 AM	Daylight	Angle		Dry	V1: Travelling straight ahead / V2: Turning left	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: E	Clear	42.49571	-71.052252
4229742	WAKEFIELD	08/07/2016	Property damage only (none)	10:45 AM	Daylight	Rear-end		Dry	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: S	Clear	42.49571	-71.052252
4349539	WAKEFIELD	04/08/2017	Property damage only (none)	1:00 PM	Daylight	Rear-end		Dry	V1: Travelling straight ahead / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Passenger car)	V1: E / V2: E	Clear	42.49571	-71.052252
4351297	WAKEFIELD	04/10/2017	Property damage only (none)	10:09 AM	Daylight	Rear-end		Dry	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: E / V2: E	Clear	42.49571	-71.052252
4493656	WAKEFIELD	01/26/2018	Property damage only (none)	5:02 PM	Dusk	Angle		Dry	V1: Turning left / V2: Turning left	V1:(Passenger car) / V2:(Light truck(van, mini-van, pickup,	V1: W / V2: N	Clear	42.49571	-71.052249
4554531	WAKEFIELD	06/15/2018	Property damage only (none)	7:37 AM	Daylight	Angle		Dry	V1: Travelling straight ahead / V2: Turning left	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: W	Cloudy	42.49571	-71.052249
4555855	WAKEFIELD	06/20/2018	Property damage only (none)	10:15 AM	Daylight	Angle		Dry	V1: Turning left / V2: Turning left	V1:(Passenger car) / V2:(Passenger car)	V1: N / V2: E	Clear	42.49571	-71.052249

Data Level: CRASH

Query Type Spatial

Criteria: If you conducted an Advanced Query your SQL statement will be listed here

**Farm Street at Wakefield High School South Driveway**

Crash Number	City Town Name	Crash Date	Crash Severity	Crash Time	Light Conditions	Manner of Collision	Non-Motorist Type (All	Road Surface Condition	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Configuration (All Vehicles)	Vehicle Travel Directions (All Vehicles)	Weather Conditions	Latitude	Longitude
4079648	WAKEFIELD	04/10/2015	Property damage only (none	2:21 PM	Daylight	Rear-end		Dry	V1: Travelling straight ahead / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: S	Cloudy	42.49606	-71.052103
4168306	WAKEFIELD	03/23/2016	Property damage only (none	11:56 AM	Daylight	Sideswipe, same direction		Dry	V1: Travelling straight ahead / V2: Parked	V1:(Truck/trailer) / V2:(Passenger car)	V1: S / V2: Not Reported	Cloudy	42.49606	-71.052103
4181345	WAKEFIELD	04/14/2016	Property damage only (none	8:05 PM	Dark - lighted roadway	Single vehicle crash		Dry	V1: Parked	V1:(Passenger car)	V1: S	Clear	42.49606	-71.052103
4251077	WAKEFIELD	09/15/2016	Property damage only (none	2:38 PM	Daylight	Rear-end		Dry	V1: Travelling straight ahead / V2: Overtaking/passing	V1:(Bus (seats for 16 or more, including driver)) / V2:(Passenger car)	V1: N / V2: N	Clear	42.49606	-71.052103
4439846	WAKEFIELD	10/06/2017	Not Reported	8:55 AM	Dark - lighted roadway	Unknown		Dry	V1: Parked	V1:(Passenger car)	V1: S	Clear	42.49606	-71.052103
4470215	WAKEFIELD	12/18/2017	Property damage only (none	6:41 PM	Dusk	Angle		Dry	V1: Travelling straight ahead	V1:(Passenger car)	V1: N	Clear	42.49606	-71.052103
4483914	WAKEFIELD	01/10/2018	Non-fatal injury	3:04 PM	Daylight	Single vehicle crash	P2: Pedestrian	Wet	V1: Travelling straight ahead	V1:(Passenger car)	V1: N	Cloudy	42.49606	-71.052106
4493654	WAKEFIELD	01/22/2018	Non-fatal injury	5:25 PM	Dark - lighted roadway	Single vehicle crash	P2: Pedestrian	Wet	V1: Travelling straight ahead	V1:(Passenger car)	V1: N	Rain	42.49606	-71.052106
4588575	WAKEFIELD	08/17/2018	Non-fatal injury	5:54 PM	Daylight	Rear-end		Wet	V1: Travelling straight ahead / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: S	Rain/Cloudy	42.49607	-71.052103

Data Level: CRASH

Query Type Spatial

Criteria: If you conducted an Advanced Query your SQL statement will be listed here

Farm Street at Water Street														
Crash Number	City Town Name	Crash Date	Crash Severity	Crash Time	Light Conditions	Manner of Collision	Non-Motorist Type (All Persons)	Road Surface Condition	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Configuration (All Vehicles)	Vehicle Travel Directions	Weather Conditions	Latitude	Longitude
4010240	WAKEFIELD	02/19/2015	Property damage only (none injured)	6:28 PM	Dark - lighted roadway	Rear-end		Wet	V1: Travelling straight ahead / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: N / V2: N	Clear/Blowing sand, snow	42.50018	-71.050565
4187566	WAKEFIELD	05/08/2016	Property damage only (none injured)	11:27 AM	Daylight	Single vehicle crash		Wet	V1: Turning left / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: W	Rain/Cloudy	42.50018	-71.050565
4190245	WAKEFIELD	05/14/2016	Property damage only (none injured)	1:33 AM	Dark - lighted roadway	Rear-end		Wet	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: N / V2: N	Clear	42.50018	-71.050565
4208981	WAKEFIELD	06/26/2016	Property damage only (none injured)	6:34 AM	Daylight	Single vehicle crash		Dry	V1: Travelling straight ahead	V1:(Passenger car)	V1: W	Clear	42.50021	-71.050662
4300891	WAKEFIELD	12/15/2016	Property damage only (none injured)	5:03 PM	Dark - lighted roadway	Single vehicle crash	P1: Pedestrian	Dry	V1: Travelling straight ahead	V1:(Passenger car)	V1: W	Clear	42.50018	-71.050565
4362722	WAKEFIELD	05/13/2017	Non-fatal injury	2:39 AM	Dark - lighted roadway	Single vehicle crash		Dry	V1: Turning right	V1:(Passenger car)	V1: E	Clear	42.50018	-71.050565
4371638	WAKEFIELD	05/23/2017	Property damage only (none injured)	5:24 PM	Daylight	Sideswipe, same direction		Dry	V1: Changing lanes / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: W / V2: W	Clear	42.50018	-71.050565
4407022	WAKEFIELD	08/08/2017	Non-fatal injury	1:50 PM	Daylight	Angle		Dry	V1: Travelling straight ahead / V2: Turning left	V1:(Passenger car) / V2:(Light truck(van, mini-van, pickup, sport utility))	V1: W / V2: W	Clear	42.50017	-71.050517
4493655	WAKEFIELD	01/25/2018	Non-fatal injury	8:28 AM	Daylight	Single vehicle crash		Dry	V2: Travelling straight ahead / V1: Turning left	V2:(Passenger car) / V1:(Single-unit truck (3-or-more axles))	V2: E / V1: W	Clear	42.50018	-71.05057
4605270	WAKEFIELD	10/03/2018	Property damage only (none injured)	8:24 AM	Daylight	Rear-end		Wet	V1: Turning left / V2: Turning left	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Passenger car)	V1: W / V2: W	Rain	42.50018	-71.05057
4651220	WAKEFIELD	12/14/2018	Property damage only (none injured)	7:05 AM	Daylight	Angle		Dry	V1: Turning left / V2: Turning right	V1:(Passenger car) / V2:(Passenger car)	V1: E / V2: W	Clear	42.50018	-71.05057
4784526	WAKEFIELD	12/06/2019	Property damage only (none injured)	8:28 PM	Dark - lighted roadway	Angle		Wet	V1: Travelling straight ahead / V2: Making U-turn	V1:(Passenger car) / V2:(Passenger car)	V1: E / V2: E	Clear/Snow	42.50018	-71.05057

Data Level: CRASH

Query Type: Spatial

Criteria: If you conducted an Advanced Query your SQL statement will be listed here



## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wakefield COUNTY : \_\_\_\_\_ COUNT DATE : November 2021

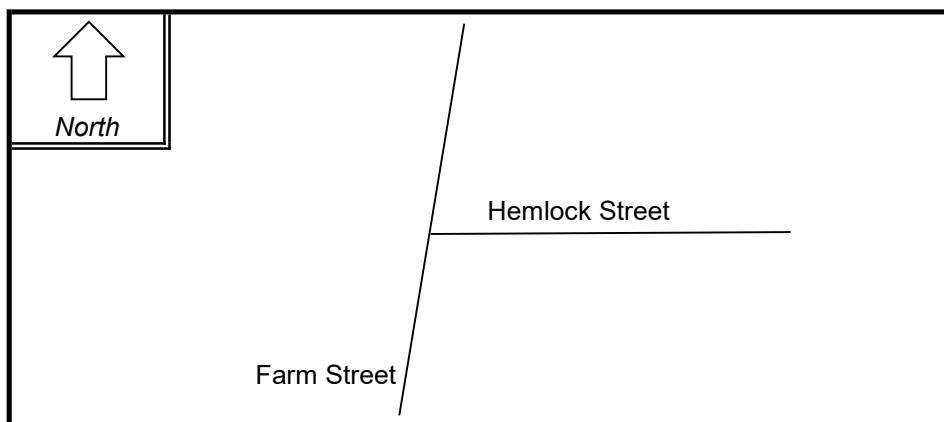
DISTRICT : 4 UNSIGNALIZED :  SIGNALIZED :

### ~ INTERSECTION DATA ~

MAJOR STREET : Farm Street

MINOR STREET(S) : Hemlock Street

**INTERSECTION DIAGRAM**  
(Label Approaches)



#### PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	SB	WB	NB	EB		
PEAK HOURLY VOLUMES (PM) :	644	360	710			1,714

" K " FACTOR :  INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME :

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

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

Comments : \_\_\_\_\_

Project Title & Date: Wakefield Memorial High School TIAS December 2021

## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wakefield COUNT DATE : November 2021

DISTRICT : 4 UNSIGNALIZED :  SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Farm Street

MINOR STREET(S) : Exit Driveway

**INTERSECTION  
 DIAGRAM**  
 (Label Approaches)



**PEAK HOUR VOLUMES**

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	SB	WB	NB	EB		
PEAK HOURLY VOLUMES (PM) :	455	121	680			1,256

" K " FACTOR :  INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME :

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

**CRASH RATE CALCULATION :**

**0.00**

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

Comments : \_\_\_\_\_

Project Title & Date: Wakefield Memorial High School TIAS December 2021

## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wakefield COUNTY : \_\_\_\_\_ DATE : November 2021

DISTRICT : 4 UNSIGNALIZED :  X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Farm Street

MINOR STREET(S) : Entrance Driveway

**INTERSECTION  
 DIAGRAM  
 (Label Approaches)**



**PEAK HOUR VOLUMES**

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	SB	WB	NB	EB		
PEAK HOURLY VOLUMES (PM) :	529		688			1,217

" K " FACTOR :  INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME :

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

**CRASH RATE CALCULATION :**

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

Comments : \_\_\_\_\_

Project Title & Date: Wakefield Memorial High School TIAS December 2021

## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wakefield                                  COUNT DATE : November 2021

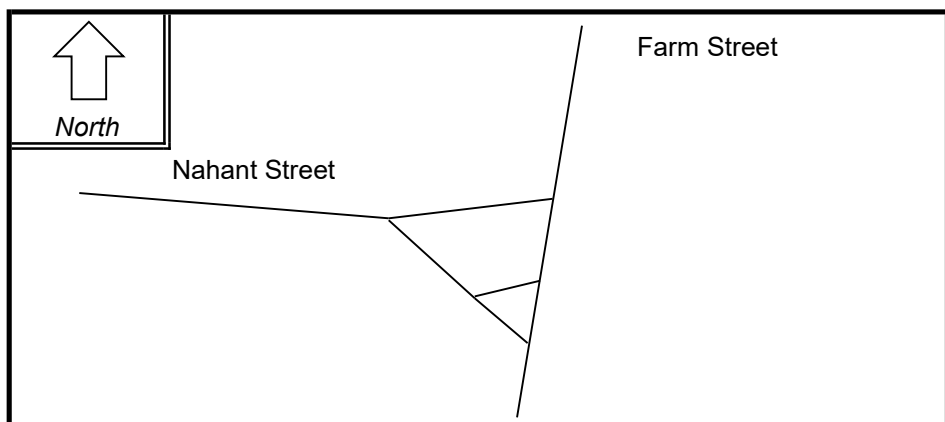
DISTRICT : 4                  UNSIGNALIZED :                   SIGNALIZED :

### ~ INTERSECTION DATA ~

MAJOR STREET : Farm Street

MINOR STREET(S) : Nahant Street

**INTERSECTION  
DIAGRAM**  
(Label Approaches)



### PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	<b>Total Peak Hourly Approach Volume</b>
DIRECTION :	SB	WB	NB	EB		
PEAK HOURLY VOLUMES (PM) :	518		896	301		<b>1,715</b>

" K " FACTOR :                   INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME :

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

**CRASH RATE CALCULATION :**                 

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

Comments : \_\_\_\_\_

Project Title & Date: Wakefield Memorial High School TIAS                  December 2021

# INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Wakefield COUNT DATE : November 2021

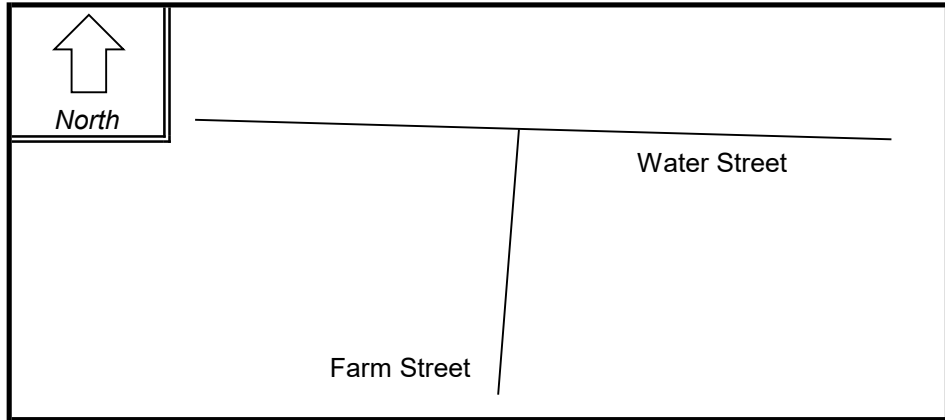
DISTRICT : 4 UNSIGNALIZED :  SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Water Street

MINOR STREET(S) : Farm Street

**INTERSECTION  
DIAGRAM  
(Label Approaches)**



**PEAK HOUR VOLUMES**

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	SB	WB	NB	EB		
PEAK HOURLY VOLUMES (PM) :		533	798	393		1,724

" K " FACTOR : **0.100** INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME : **17,240**

TOTAL # OF CRASHES : **12** # OF YEARS : **5** AVERAGE # OF CRASHES PER YEAR ( A ) : **2.40**

**CRASH RATE CALCULATION :**

**0.38**

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

Comments : \_\_\_\_\_

Project Title & Date: Wakefield Memorial High School TIAS December 2021

















# APPENDIX C

## Intersection Capacity Analyses





Lanes, Volumes, Timings  
1: Farm St & Water St

							Ø2	Ø9
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations								
Traffic Volume (vph)	164	304	423	345	227	215		
Future Volume (vph)	164	304	423	345	227	215		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Storage Length (ft)		225	250		250	0		
Storage Lanes		1	1		1	1		
Taper Length (ft)			25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Frt		0.850				0.850		
Flt Protected			0.950		0.950			
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583		
Flt Permitted			0.537		0.950			
Satd. Flow (perm)	1863	1583	1000	1863	1770	1583		
Right Turn on Red		Yes				Yes		
Satd. Flow (RTOR)		390				276		
Link Speed (mph)	30			30	30			
Link Distance (ft)	636			1028	649			
Travel Time (s)	14.5			23.4	14.8			
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78		
Adj. Flow (vph)	210	390	542	442	291	276		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	210	390	542	442	291	276		
Turn Type	NA	pm+ov	custom	NA	Prot	pt+ov		
Protected Phases	6	8	5	5 2	8	8 5	2	9
Permitted Phases		6	2					
Detector Phase	6	8	5	5 2	8	8 5		
Switch Phase								
Minimum Initial (s)	10.0	6.0	6.0		6.0		5.0	23.0
Minimum Split (s)	16.0	12.0	12.0		12.0		22.5	26.0
Total Split (s)	46.0	46.0	21.0		46.0		46.0	26.0
Total Split (%)	33.1%	33.1%	15.1%		33.1%		33%	19%
Maximum Green (s)	40.0	40.0	15.0		40.0		40.0	23.0
Yellow Time (s)	4.0	4.0	4.0		4.0		4.0	2.0
All-Red Time (s)	2.0	2.0	2.0		2.0		2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0			
Total Lost Time (s)	6.0	6.0	6.0		6.0			
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0
Recall Mode	C-Min	None	Min		None		C-Max	None
Walk Time (s)								7.0
Flash Dont Walk (s)								16.0
Pedestrian Calls (#/hr)								0
Act Effct Green (s)	45.0	80.7	91.3	97.3	29.7	82.0		
Actuated g/C Ratio	0.32	0.58	0.66	0.70	0.21	0.59		
v/c Ratio	0.35	0.36	0.59	0.34	0.77	0.26		
Control Delay	38.1	2.0	13.5	10.0	64.5	1.8		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	38.1	2.0	13.5	10.0	64.5	1.8		

Lanes, Volumes, Timings  
1: Farm St & Water St

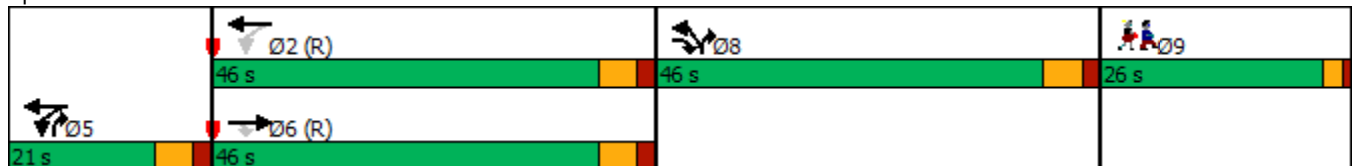


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø2	Ø9
LOS	D	A	B	B	E	A		
Approach Delay	14.6			11.9	34.0			
Approach LOS	B			B	C			
Queue Length 50th (ft)	137	0	195	145	249	0		
Queue Length 95th (ft)	194	15	269	205	272	16		
Internal Link Dist (ft)	556			948	569			
Turn Bay Length (ft)		225	250		250			
Base Capacity (vph)	603	1171	912	1303	509	1036		
Starvation Cap Reductn	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0		
Reduced v/c Ratio	0.35	0.33	0.59	0.34	0.57	0.27		

Intersection Summary

Area Type:	Other
Cycle Length:	139
Actuated Cycle Length:	139
Offset:	0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.77
Intersection Signal Delay:	18.5
Intersection LOS:	B
Intersection Capacity Utilization	59.6%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 1: Farm St & Water St





Intersection						
Int Delay, s/veh	32.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	95	277	167	329	567	95
Future Vol, veh/h	95	277	167	329	567	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	107	311	188	370	637	107

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1437	691	744	0	-	0
Stage 1	691	-	-	-	-	-
Stage 2	746	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	147	445	864	-	-	-
Stage 1	497	-	-	-	-	-
Stage 2	469	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	107	445	864	-	-	-
Mov Cap-2 Maneuver	107	-	-	-	-	-
Stage 1	361	-	-	-	-	-
Stage 2	469	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	130.8	3.5	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	864	-	361	-	-
HCM Lane V/C Ratio	0.217	-	1.158	-	-
HCM Control Delay (s)	10.3	0	130.8	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	0.8	-	16.6	-	-

Intersection						
Int Delay, s/veh	59					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↖		↙	↗
Traffic Vol, veh/h	79	106	390	277	403	441
Future Vol, veh/h	79	106	390	277	403	441
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	50	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	90	120	443	315	458	501

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	2018	601	0	0	758
Stage 1	601	-	-	-	-
Stage 2	1417	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	~ 64	500	-	-	853
Stage 1	547	-	-	-	-
Stage 2	224	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	~ 30	500	-	-	853
Mov Cap-2 Maneuver	~ 30	-	-	-	-
Stage 1	547	-	-	-	-
Stage 2	104	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	510.2	0	6.7
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	30	500	853	-
HCM Lane V/C Ratio	-	-	2.992	0.241	0.537	-
HCM Control Delay (s)	-	-	\$ 1175.4	14.5	14	-
HCM Lane LOS	-	-	F	B	B	-
HCM 95th %tile Q(veh)	-	-	10.6	0.9	3.3	-

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

Intersection						
Int Delay, s/veh	1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↘			↖
Traffic Vol, veh/h	0	0	321	103	129	662
Future Vol, veh/h	0	0	321	103	129	662
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	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	406	130	163	838

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	-	471	0	0	536
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	2.218
Pot Cap-1 Maneuver	0	593	-	-	1032
Stage 1	0	-	-	-	-
Stage 2	0	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	-	593	-	-	1032
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	1.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1032
HCM Lane V/C Ratio	-	-	-	0.158
HCM Control Delay (s)	-	-	0	9.1
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0.6

Intersection						
Int Delay, s/veh	10.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑			↑
Traffic Vol, veh/h	115	117	314	0	0	676
Future Vol, veh/h	115	117	314	0	0	676
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	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	153	156	419	0	0	901

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1320	419	0	-	-	-
Stage 1	419	-	-	-	-	-
Stage 2	901	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	173	634	-	0	0	-
Stage 1	664	-	-	0	0	-
Stage 2	396	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	173	634	-	-	-	-
Mov Cap-2 Maneuver	173	-	-	-	-	-
Stage 1	664	-	-	-	-	-
Stage 2	396	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	53.3	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBTWBLn1	WBLn2	SBT
Capacity (veh/h)	-	173	634
HCM Lane V/C Ratio	-	0.886	0.246
HCM Control Delay (s)	-	94.9	12.5
HCM Lane LOS	-	F	B
HCM 95th %tile Q(veh)	-	6.5	1

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↘			↙
Traffic Vol, veh/h	0	0	411	20	68	676
Future Vol, veh/h	0	0	411	20	68	676
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	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	541	26	89	889

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	-	554	0	0	567
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	2.218
Pot Cap-1 Maneuver	0	532	-	-	1005
Stage 1	0	-	-	-	-
Stage 2	0	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	-	532	-	-	1005
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1005
HCM Lane V/C Ratio	-	-	-	0.089
HCM Control Delay (s)	-	-	0	8.9
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0.3



Intersection						
Int Delay, s/veh	1.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑			↑
Traffic Vol, veh/h	17	56	411	0	0	727
Future Vol, veh/h	17	56	411	0	0	727
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	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	73	73	73	73	73	73
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	77	563	0	0	996













Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1559	563	0	-	-	-
Stage 1	563	-	-	-	-	-
Stage 2	996	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	124	526	-	0	0	-
Stage 1	570	-	-	0	0	-
Stage 2	357	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	124	526	-	-	-	-
Mov Cap-2 Maneuver	124	-	-	-	-	-
Stage 1	570	-	-	-	-	-
Stage 2	357	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBTWBLn1	WBLn2	SBT
Capacity (veh/h)	-	124	526
HCM Lane V/C Ratio	-	0.188	0.146
HCM Control Delay (s)	-	40.6	13
HCM Lane LOS	-	E	B
HCM 95th %tile Q(veh)	-	0.7	0.5



Lanes, Volumes, Timings  
1: Farm St & Water St

							Ø2	Ø9
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations								
Traffic Volume (vph)	209	197	280	230	277	512		
Future Volume (vph)	209	197	280	230	277	512		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Storage Length (ft)		225	250		250	0		
Storage Lanes		1	1		1	1		
Taper Length (ft)			25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Frt		0.850				0.850		
Flt Protected			0.950		0.950			
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583		
Flt Permitted			0.603		0.950			
Satd. Flow (perm)	1863	1583	1123	1863	1770	1583		
Right Turn on Red		Yes				Yes		
Satd. Flow (RTOR)		203				528		
Link Speed (mph)	30			30	30			
Link Distance (ft)	636			1028	649			
Travel Time (s)	14.5			23.4	14.8			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97		
Adj. Flow (vph)	215	203	289	237	286	528		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	215	203	289	237	286	528		
Turn Type	NA	pm+ov	custom	NA	Prot	pt+ov		
Protected Phases	6	8	5	5 2	8	8 5	2	9
Permitted Phases		6	2					
Detector Phase	6	8	5	5 2	8	8 5		
Switch Phase								
Minimum Initial (s)	10.0	6.0	6.0		6.0		5.0	23.0
Minimum Split (s)	16.0	12.0	12.0		12.0		22.5	26.0
Total Split (s)	46.0	46.0	46.0		46.0		46.0	26.0
Total Split (%)	28.0%	28.0%	28.0%		28.0%		28%	16%
Maximum Green (s)	40.0	40.0	40.0		40.0		40.0	23.0
Yellow Time (s)	4.0	4.0	4.0		4.0		4.0	2.0
All-Red Time (s)	2.0	2.0	2.0		2.0		2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0			
Total Lost Time (s)	6.0	6.0	6.0		6.0			
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0
Recall Mode	C-Min	None	Min		None		C-Max	None
Walk Time (s)								7.0
Flash Dont Walk (s)								16.0
Pedestrian Calls (#/hr)								0
Act Effct Green (s)	95.9	134.8	113.2	119.2	32.8	56.1		
Actuated g/C Ratio	0.58	0.82	0.69	0.73	0.20	0.34		
v/c Ratio	0.20	0.15	0.34	0.18	0.81	0.59		
Control Delay	18.6	0.7	9.4	8.1	79.6	5.2		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	18.6	0.7	9.4	8.1	79.6	5.2		

Lanes, Volumes, Timings  
1: Farm St & Water St

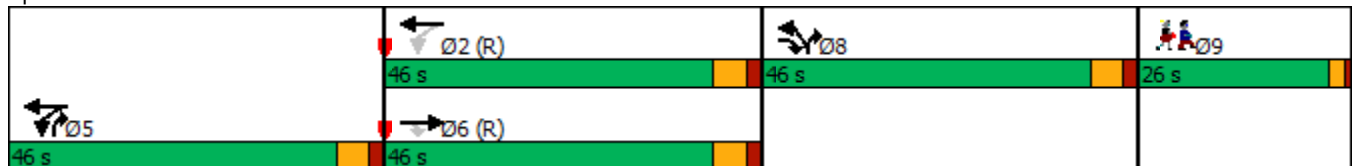


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø2	Ø9
LOS	B	A	A	A	E	A		
Approach Delay	9.9			8.8	31.3			
Approach LOS	A			A	C			
Queue Length 50th (ft)	104	0	94	74	295	0		
Queue Length 95th (ft)	188	18	154	124	389	71		
Internal Link Dist (ft)	556			948	569			
Turn Bay Length (ft)		225	250		250			
Base Capacity (vph)	1089	1397	973	1353	431	1030		
Starvation Cap Reductn	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0		
Reduced v/c Ratio	0.20	0.15	0.30	0.18	0.66	0.51		

Intersection Summary

Area Type:	Other
Cycle Length:	164
Actuated Cycle Length:	164
Offset:	0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
Natural Cycle:	80
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.81
Intersection Signal Delay:	19.5
Intersection LOS:	B
Intersection Capacity Utilization:	56.9%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 1: Farm St & Water St





Intersection						
Int Delay, s/veh	54					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T		T		T	
Traffic Vol, veh/h	57	203	318	565	457	120
Future Vol, veh/h	57	203	318	565	457	120
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	60	214	335	595	481	126

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1809	544	607	0	-	0
Stage 1	544	-	-	-	-	-
Stage 2	1265	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	87	539	971	-	-	-
Stage 1	582	-	-	-	-	-
Stage 2	265	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 42	539	971	-	-	-
Mov Cap-2 Maneuver	~ 42	-	-	-	-	-
Stage 1	282	-	-	-	-	-
Stage 2	265	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	\$ 344	3.8	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	971	-	171	-	-
HCM Lane V/C Ratio	0.345	-	1.6	-	-
HCM Control Delay (s)	10.6	0	\$ 344	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	1.5	-	18.4	-	-

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

Intersection						
Int Delay, s/veh	17.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↖		↙	↗
Traffic Vol, veh/h	122	204	679	56	90	554
Future Vol, veh/h	122	204	679	56	90	554
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	50	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	130	217	722	60	96	589

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1533	752	0	0	782	0
Stage 1	752	-	-	-	-	-
Stage 2	781	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	~ 128	410	-	-	836	-
Stage 1	466	-	-	-	-	-
Stage 2	451	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 113	410	-	-	836	-
Mov Cap-2 Maneuver	~ 113	-	-	-	-	-
Stage 1	466	-	-	-	-	-
Stage 2	399	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	90.4	0	1.4
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	113	410	836	-
HCM Lane V/C Ratio	-	-	1.149	0.529	0.115	-
HCM Control Delay (s)	-	-	202.9	23.2	9.9	-
HCM Lane LOS	-	-	F	C	A	-
HCM 95th %tile Q(veh)	-	-	8.1	3	0.4	-

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↖			↙
Traffic Vol, veh/h	0	0	600	22	14	525
Future Vol, veh/h	0	0	600	22	14	525
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	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	625	23	15	547

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	-	637	0	0	648
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	2.218
Pot Cap-1 Maneuver	0	477	-	-	938
Stage 1	0	-	-	-	-
Stage 2	0	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	-	477	-	-	938
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	938
HCM Lane V/C Ratio	-	-	-	0.016
HCM Control Delay (s)	-	-	0	8.9
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0

Intersection						
Int Delay, s/veh	1.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑			↑
Traffic Vol, veh/h	54	57	600	0	0	483
Future Vol, veh/h	54	57	600	0	0	483
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	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	56	59	619	0	0	498

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1117	619	0	-	-	-
Stage 1	619	-	-	-	-	-
Stage 2	498	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	229	489	-	0	0	-
Stage 1	537	-	-	0	0	-
Stage 2	611	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	229	489	-	-	-	-
Mov Cap-2 Maneuver	229	-	-	-	-	-
Stage 1	537	-	-	-	-	-
Stage 2	611	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBTWBLn1	WBLn2	SBT
Capacity (veh/h)	-	229	489
HCM Lane V/C Ratio	-	0.243	0.12
HCM Control Delay (s)	-	25.7	13.4
HCM Lane LOS	-	D	B
HCM 95th %tile Q(veh)	-	0.9	0.4



Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↘			↖
Traffic Vol, veh/h	0	0	648	9	12	483
Future Vol, veh/h	0	0	648	9	12	483
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	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	689	10	13	514

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	694	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.22	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.318	-
Pot Cap-1 Maneuver	0	443	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	-	443	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	898
HCM Lane V/C Ratio	-	-	-	0.014
HCM Control Delay (s)	-	-	0	9.1
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0

Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑			↑
Traffic Vol, veh/h	18	34	648	0	0	477
Future Vol, veh/h	18	34	648	0	0	477
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	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	19	37	697	0	0	513













Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1210	697	0	-	-	-
Stage 1	697	-	-	-	-	-
Stage 2	513	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	202	441	-	0	0	-
Stage 1	494	-	-	0	0	-
Stage 2	601	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	202	441	-	-	-	-
Mov Cap-2 Maneuver	202	-	-	-	-	-
Stage 1	494	-	-	-	-	-
Stage 2	601	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.6	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBTWBLn1	WBLn2	SBT
Capacity (veh/h)	-	202	441
HCM Lane V/C Ratio	-	0.096	0.083
HCM Control Delay (s)	-	24.7	13.9
HCM Lane LOS	-	C	B
HCM 95th %tile Q(veh)	-	0.3	0.3



Lanes, Volumes, Timings  
1: Farm St & Water St

							Ø2	Ø9
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations								
Traffic Volume (vph)	170	345	468	357	249	237		
Future Volume (vph)	170	345	468	357	249	237		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Storage Length (ft)		225	250		250	0		
Storage Lanes		1	1		1	1		
Taper Length (ft)			25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Frt		0.850				0.850		
Flt Protected			0.950		0.950			
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583		
Flt Permitted			0.533		0.950			
Satd. Flow (perm)	1863	1583	993	1863	1770	1583		
Right Turn on Red		Yes				Yes		
Satd. Flow (RTOR)		442				304		
Link Speed (mph)	30			30	30			
Link Distance (ft)	636			1028	649			
Travel Time (s)	14.5			23.4	14.8			
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78		
Adj. Flow (vph)	218	442	600	458	319	304		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	218	442	600	458	319	304		
Turn Type	NA	pm+ov	custom	NA	Prot	pt+ov		
Protected Phases	6	8	5	5 2	8	8 5	2	9
Permitted Phases		6	2					
Detector Phase	6	8	5	5 2	8	8 5		
Switch Phase								
Minimum Initial (s)	10.0	6.0	6.0		6.0		5.0	23.0
Minimum Split (s)	16.0	12.0	12.0		12.0		22.5	26.0
Total Split (s)	25.0	25.0	34.0		25.0		25.0	26.0
Total Split (%)	22.7%	22.7%	30.9%		22.7%		23%	24%
Maximum Green (s)	19.0	19.0	28.0		19.0		19.0	23.0
Yellow Time (s)	4.0	4.0	4.0		4.0		4.0	2.0
All-Red Time (s)	2.0	2.0	2.0		2.0		2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0			
Total Lost Time (s)	6.0	6.0	6.0		6.0			
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0
Recall Mode	C-Min	None	Min		None		C-Max	None
Walk Time (s)								7.0
Flash Dont Walk (s)								16.0
Pedestrian Calls (#/hr)								0
Act Effct Green (s)	32.7	57.7	73.0	79.0	19.0	65.3		
Actuated g/C Ratio	0.30	0.52	0.66	0.72	0.17	0.59		
v/c Ratio	0.39	0.42	0.64	0.34	1.05	0.29		
Control Delay	34.1	2.9	10.6	6.6	108.9	1.7		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	34.1	2.9	10.6	6.6	108.9	1.7		



Lanes, Volumes, Timings  
1: Farm St & Water St

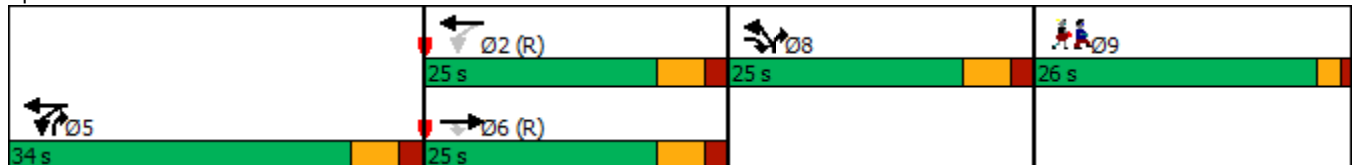


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø2	Ø9
LOS	C	A	B	A	F	A		
Approach Delay	13.2			8.9	56.6			
Approach LOS	B			A	E			
Queue Length 50th (ft)	119	0	158	106	~245	0		
Queue Length 95th (ft)	175	21	178	123	#335	15		
Internal Link Dist (ft)	556			948	569			
Turn Bay Length (ft)		225	250		250			
Base Capacity (vph)	554	1040	943	1337	305	1062		
Starvation Cap Reductn	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0		
Reduced v/c Ratio	0.39	0.42	0.64	0.34	1.05	0.29		

Intersection Summary

Area Type: Other  
 Cycle Length: 110  
 Actuated Cycle Length: 110  
 Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.05  
 Intersection Signal Delay: 22.8  
 Intersection LOS: C  
 Intersection Capacity Utilization 63.7%  
 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: 1: Farm St & Water St



Intersection						
Int Delay, s/veh	103.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			L		R
Traffic Vol, veh/h	98	305	182	366	637	98
Future Vol, veh/h	98	305	182	366	637	98
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	110	343	204	411	716	110

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1590	771	826	0	-	0
Stage 1	771	-	-	-	-	-
Stage 2	819	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	118	400	805	-	-	-
Stage 1	456	-	-	-	-	-
Stage 2	433	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 79	400	805	-	-	-
Mov Cap-2 Maneuver	~ 79	-	-	-	-	-
Stage 1	306	-	-	-	-	-
Stage 2	433	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	427.7	3.6	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	805	-	246	-	-
HCM Lane V/C Ratio	0.254	-	1.841	-	-
HCM Control Delay (s)	11		427.7	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	1	-	31.3	-	-

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

Intersection						
Int Delay, s/veh	4.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	12	89	459	135	366	576
Future Vol, veh/h	12	89	459	135	366	576
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	50	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	101	522	153	416	655

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	2086	599	0	0	675
Stage 1	599	-	-	-	-
Stage 2	1487	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	58	502	-	-	916
Stage 1	549	-	-	-	-
Stage 2	207	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	32	502	-	-	916
Mov Cap-2 Maneuver	32	-	-	-	-
Stage 1	549	-	-	-	-
Stage 2	113	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	34.2	0	4.7
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	32	502	916
HCM Lane V/C Ratio	-	-	0.426	0.201	0.454
HCM Control Delay (s)	-	-	183.9	14	12.2
HCM Lane LOS	-	-	F	B	B
HCM 95th %tile Q(veh)	-	-	1.4	0.7	2.4

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↖			↘
Traffic Vol, veh/h	0	0	361	103	129	735
Future Vol, veh/h	0	0	361	103	129	735
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	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	457	130	163	930

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	-	522	0	0	587
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	2.218
Pot Cap-1 Maneuver	0	555	-	-	988
Stage 1	0	-	-	-	-
Stage 2	0	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	-	555	-	-	988
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	1.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	988
HCM Lane V/C Ratio	-	-	-	0.165
HCM Control Delay (s)	-	-	0	9.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0.6



Intersection						
Int Delay, s/veh	16					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑			↑
Traffic Vol, veh/h	115	117	361	0	0	749
Future Vol, veh/h	115	117	361	0	0	749
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	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	153	156	481	0	0	999

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1480	481	0	-	-	-
Stage 1	481	-	-	-	-	-
Stage 2	999	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	~ 138	585	-	0	0	-
Stage 1	622	-	-	0	0	-
Stage 2	356	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	~ 138	585	-	-	-	-
Mov Cap-2 Maneuver	~ 138	-	-	-	-	-
Stage 1	622	-	-	-	-	-
Stage 2	356	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	92.5	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBTWBLn1	WBLn2	SBT
Capacity (veh/h)	-	138	585
HCM Lane V/C Ratio	-	1.111	0.267
HCM Control Delay (s)	-	173	13.4
HCM Lane LOS	-	F	B
HCM 95th %tile Q(veh)	-	8.6	1.1

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↘			↖
Traffic Vol, veh/h	0	0	458	20	68	749
Future Vol, veh/h	0	0	458	20	68	749
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	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	603	26	89	986

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	-	616	0	0	629
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	2.218
Pot Cap-1 Maneuver	0	491	-	-	953
Stage 1	0	-	-	-	-
Stage 2	0	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	-	491	-	-	953
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0.8
HCM LOS	A		

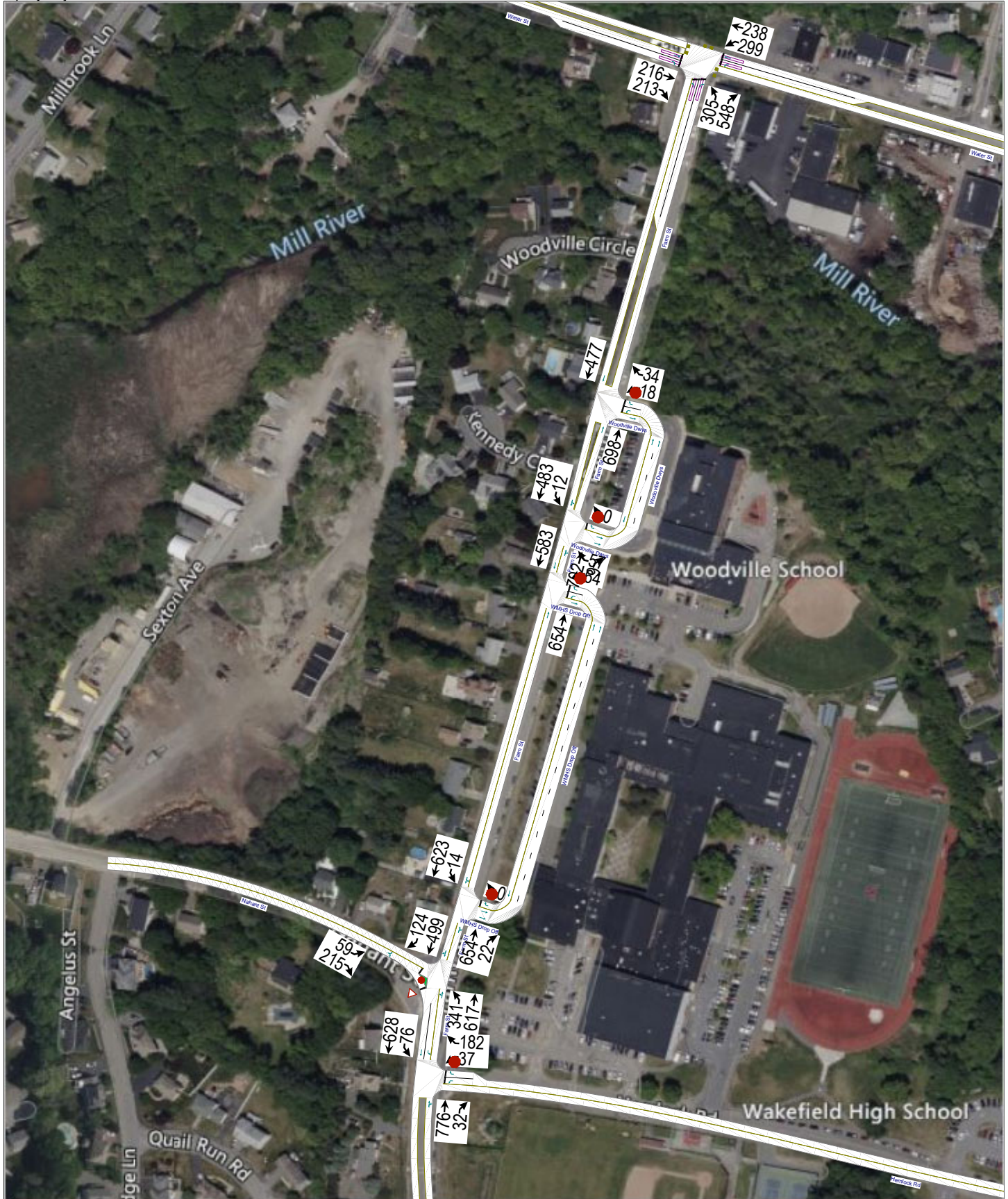
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	953
HCM Lane V/C Ratio	-	-	-	0.094
HCM Control Delay (s)	-	-	0	9.2
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0.3

Intersection						
Int Delay, s/veh	1.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑			↑
Traffic Vol, veh/h	17	56	458	0	0	800
Future Vol, veh/h	17	56	458	0	0	800
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	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	73	73	73	73	73	73
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	77	627	0	0	1096

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1723	627	0	-	-	-
Stage 1	627	-	-	-	-	-
Stage 2	1096	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	98	484	-	0	0	-
Stage 1	532	-	-	0	0	-
Stage 2	320	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	98	484	-	-	-	-
Mov Cap-2 Maneuver	98	-	-	-	-	-
Stage 1	532	-	-	-	-	-
Stage 2	320	-	-	-	-	-













Approach	WB	NB	SB
HCM Control Delay, s	22.9	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBTWBLn1	WBLn2	SBT
Capacity (veh/h)	-	98	484
HCM Lane V/C Ratio	-	0.238	0.158
HCM Control Delay (s)	-	52.8	13.8
HCM Lane LOS	-	F	B
HCM 95th %tile Q(veh)	-	0.9	0.6





Lanes, Volumes, Timings  
1: Farm St & Water St

							Ø2	Ø9
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations								
Traffic Volume (vph)	216	213	299	238	305	548		
Future Volume (vph)	216	213	299	238	305	548		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Storage Length (ft)		225	250		250	0		
Storage Lanes		1	1		1	1		
Taper Length (ft)			25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Frt		0.850				0.850		
Flt Protected			0.950		0.950			
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583		
Flt Permitted			0.597		0.950			
Satd. Flow (perm)	1863	1583	1112	1863	1770	1583		
Right Turn on Red		Yes				Yes		
Satd. Flow (RTOR)		220				565		
Link Speed (mph)	30			30	30			
Link Distance (ft)	636			1028	649			
Travel Time (s)	14.5			23.4	14.8			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97		
Adj. Flow (vph)	223	220	308	245	314	565		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	223	220	308	245	314	565		
Turn Type	NA	pm+ov	custom	NA	Prot	pt+ov		
Protected Phases	6	8	5	5 2	8	8 5	2	9
Permitted Phases		6	2					
Detector Phase	6	8	5	5 2	8	8 5		
Switch Phase								
Minimum Initial (s)	10.0	6.0	6.0		6.0		5.0	23.0
Minimum Split (s)	16.0	12.0	12.0		12.0		22.5	26.0
Total Split (s)	25.0	24.0	15.0		24.0		25.0	26.0
Total Split (%)	27.8%	26.7%	16.7%		26.7%		28%	29%
Maximum Green (s)	19.0	18.0	9.0		18.0		19.0	23.0
Yellow Time (s)	4.0	4.0	4.0		4.0		4.0	2.0
All-Red Time (s)	2.0	2.0	2.0		2.0		2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0			
Total Lost Time (s)	6.0	6.0	6.0		6.0			
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0
Recall Mode	C-Min	None	Min		None		C-Max	None
Walk Time (s)								7.0
Flash Dont Walk (s)								16.0
Pedestrian Calls (#/hr)								0
Act Effct Green (s)	37.9	61.7	54.2	60.2	17.8	40.1		
Actuated g/C Ratio	0.42	0.69	0.60	0.67	0.20	0.45		
v/c Ratio	0.28	0.19	0.39	0.20	0.90	0.56		
Control Delay	19.6	1.4	7.9	6.2	65.3	3.5		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	19.6	1.4	7.9	6.2	65.3	3.5		

Lanes, Volumes, Timings  
1: Farm St & Water St

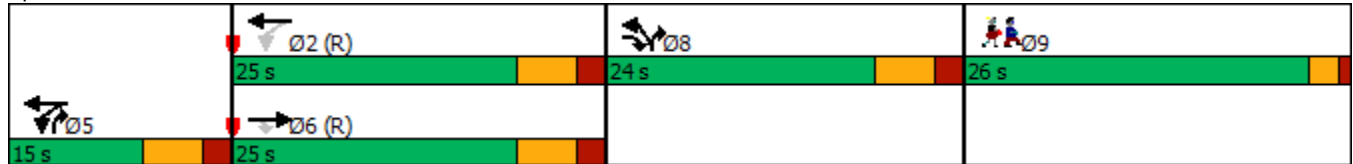


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø2	Ø9
LOS	B	A	A	A	E	A		
Approach Delay	10.5			7.1	25.6			
Approach LOS	B			A	C			
Queue Length 50th (ft)	82	0	62	47	175	0		
Queue Length 95th (ft)	149	24	98	76	#324	49		
Internal Link Dist (ft)	556			948	569			
Turn Bay Length (ft)		225	250		250			
Base Capacity (vph)	785	1157	789	1247	354	1007		
Starvation Cap Reductn	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0		
Reduced v/c Ratio	0.28	0.19	0.39	0.20	0.89	0.56		

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 16.6  
 Intersection LOS: B  
 Intersection Capacity Utilization 59.8%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Farm St & Water St



Intersection						
Int Delay, s/veh	116.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			L		R
Traffic Vol, veh/h	59	215	341	617	499	124
Future Vol, veh/h	59	215	341	617	499	124
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Yield	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	62	226	359	649	525	131

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1958	591	656	0	-	0
Stage 1	591	-	-	-	-	-
Stage 2	1367	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	70	507	931	-	-	-
Stage 1	553	-	-	-	-	-
Stage 2	237	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 28	507	931	-	-	-
Mov Cap-2 Maneuver	~ 28	-	-	-	-	-
Stage 1	220	-	-	-	-	-
Stage 2	237	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	773.8	4	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	931	-	114	-	-
HCM Lane V/C Ratio	0.386	-	2.53	-	-
HCM Control Delay (s)	11.3		773.8	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	1.8	-	26	-	-

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

Intersection						
Int Delay, s/veh	4.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↖		↙	↗
Traffic Vol, veh/h	37	182	776	32	76	628
Future Vol, veh/h	37	182	776	32	76	628
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	50	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	39	194	826	34	81	668

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1673	843	0	0	860	0
Stage 1	843	-	-	-	-	-
Stage 2	830	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	105	364	-	-	781	-
Stage 1	422	-	-	-	-	-
Stage 2	428	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	94	364	-	-	781	-
Mov Cap-2 Maneuver	94	-	-	-	-	-
Stage 1	422	-	-	-	-	-
Stage 2	383	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	32.8	0	1.1
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	94	364	781	-
HCM Lane V/C Ratio	-	-	0.419	0.532	0.104	-
HCM Control Delay (s)	-	-	68.5	25.6	10.1	-
HCM Lane LOS	-	-	F	D	B	-
HCM 95th %tile Q(veh)	-	-	1.7	3	0.3	-



Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↖			↙
Traffic Vol, veh/h	0	0	654	22	14	623
Future Vol, veh/h	0	0	654	22	14	623
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	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	681	23	15	649

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	-	693	0	0	704
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	2.218
Pot Cap-1 Maneuver	0	443	-	-	894
Stage 1	0	-	-	-	-
Stage 2	0	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	-	443	-	-	894
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	894
HCM Lane V/C Ratio	-	-	-	0.016
HCM Control Delay (s)	-	-	0	9.1
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0.1

Intersection						
Int Delay, s/veh	2.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑			↑
Traffic Vol, veh/h	64	57	654	0	0	583
Future Vol, veh/h	64	57	654	0	0	583
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	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	66	59	674	0	0	601

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1275	674	0	-	-	-
Stage 1	674	-	-	-	-	-
Stage 2	601	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	184	455	-	0	0	-
Stage 1	506	-	-	0	0	-
Stage 2	547	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	184	455	-	-	-	-
Mov Cap-2 Maneuver	184	-	-	-	-	-
Stage 1	506	-	-	-	-	-
Stage 2	547	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	25.2	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBTWBLn1	WBLn2	SBT
Capacity (veh/h)	-	184	455
HCM Lane V/C Ratio	-	0.359	0.129
HCM Control Delay (s)	-	35.1	14.1
HCM Lane LOS	-	E	B
HCM 95th %tile Q(veh)	-	1.5	0.4

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↘			↖
Traffic Vol, veh/h	0	0	702	9	12	483
Future Vol, veh/h	0	0	702	9	12	483
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	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	747	10	13	514

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	-	752	0	0	757
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	2.218
Pot Cap-1 Maneuver	0	410	-	-	854
Stage 1	0	-	-	-	-
Stage 2	0	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	-	410	-	-	854
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	854
HCM Lane V/C Ratio	-	-	-	0.015
HCM Control Delay (s)	-	-	0	9.3
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0

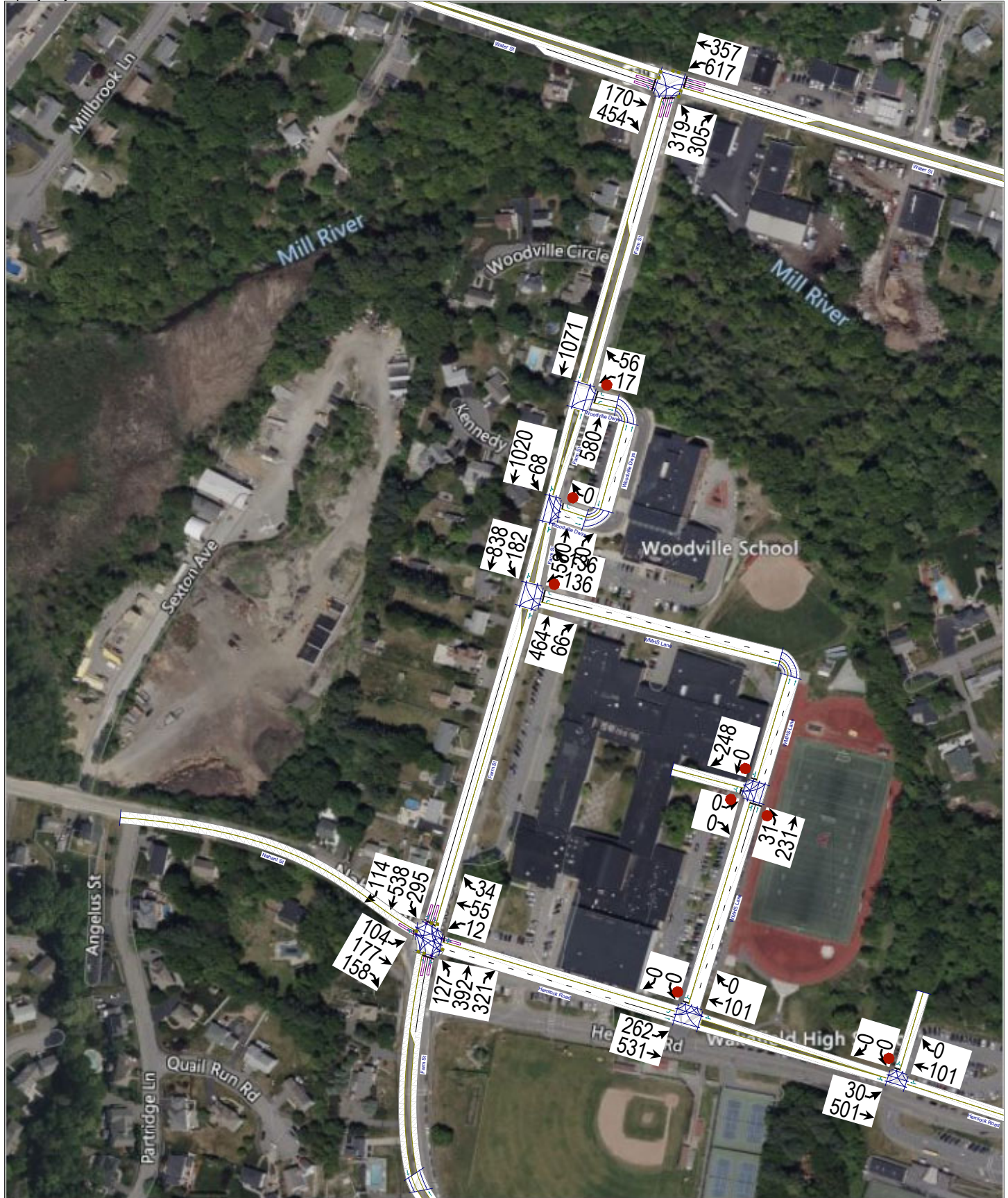
Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑			↑
Traffic Vol, veh/h	18	34	698	0	0	477
Future Vol, veh/h	18	34	698	0	0	477
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	19	37	751	0	0	513

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1264	751	0	-	-	-
Stage 1	751	-	-	-	-	-
Stage 2	513	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	187	411	-	0	0	-
Stage 1	466	-	-	0	0	-
Stage 2	601	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	187	411	-	-	-	-
Mov Cap-2 Maneuver	187	-	-	-	-	-
Stage 1	466	-	-	-	-	-
Stage 2	601	-	-	-	-	-







Approach	WB	NB	SB
HCM Control Delay, s	18.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBTWBLn1	WBLn2	SBT
Capacity (veh/h)	-	187	411
HCM Lane V/C Ratio	-	0.104	0.089
HCM Control Delay (s)	-	26.5	14.6
HCM Lane LOS	-	D	B
HCM 95th %tile Q(veh)	-	0.3	0.3





Lanes, Volumes, Timings  
1: Farm St & Water St

							Ø2	Ø9
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑	↗	↖	↑	↖	↗		
Traffic Volume (vph)	170	454	617	357	319	305		
Future Volume (vph)	170	454	617	357	319	305		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Storage Length (ft)		225	250		250	0		
Storage Lanes		1	1		1	1		
Taper Length (ft)			25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Frt		0.850				0.850		
Flt Protected			0.950		0.950			
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583		
Flt Permitted			0.227		0.950			
Satd. Flow (perm)	1863	1583	423	1863	1770	1583		
Right Turn on Red		Yes				Yes		
Satd. Flow (RTOR)		376				391		
Link Speed (mph)	30			30	30			
Link Distance (ft)	636			1028	649			
Travel Time (s)	14.5			23.4	14.8			
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78		
Adj. Flow (vph)	218	582	791	458	409	391		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	218	582	791	458	409	391		
Turn Type	NA	pm+ov	custom	NA	Prot	pt+ov		
Protected Phases	6	8	5	5 2	8	8 5	2	9
Permitted Phases		6	2					
Detector Phase	6	8	5	5 2	8	8 5		
Switch Phase								
Minimum Initial (s)	10.0	6.0	6.0		6.0		5.0	23.0
Minimum Split (s)	16.0	12.0	12.0		12.0		22.5	26.0
Total Split (s)	25.0	38.0	61.0		38.0		25.0	26.0
Total Split (%)	16.7%	25.3%	40.7%		25.3%		17%	17%
Maximum Green (s)	19.0	32.0	55.0		32.0		19.0	23.0
Yellow Time (s)	4.0	4.0	4.0		4.0		4.0	2.0
All-Red Time (s)	2.0	2.0	2.0		2.0		2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0			
Total Lost Time (s)	6.0	6.0	6.0		6.0			
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0
Recall Mode	C-Min	None	Min		None		C-Max	None
Walk Time (s)								7.0
Flash Dont Walk (s)								16.0
Pedestrian Calls (#/hr)								0
Act Effct Green (s)	19.0	57.0	100.0	106.0	32.0	119.0		
Actuated g/C Ratio	0.13	0.38	0.67	0.71	0.21	0.79		
v/c Ratio	0.93	0.70	0.78	0.35	1.08	0.29		
Control Delay	106.6	17.9	28.5	9.4	124.9	0.9		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	106.6	17.9	28.5	9.4	124.9	0.9		

Lanes, Volumes, Timings  
1: Farm St & Water St

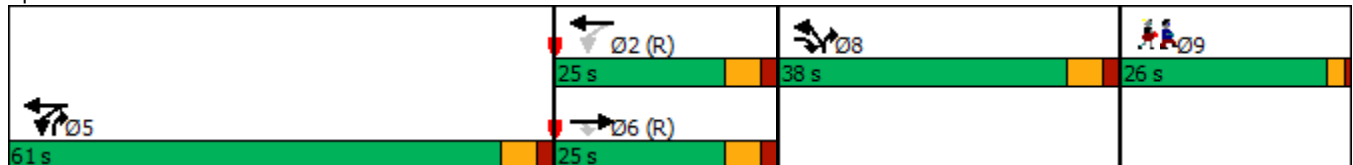


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø2	Ø9
LOS	F	B	C	A	F	A		
Approach Delay	42.1			21.5	64.3			
Approach LOS	D			C	E			
Queue Length 50th (ft)	214	172	525	160	~447	0		
Queue Length 95th (ft)	#294	199	528	176	#522	7		
Internal Link Dist (ft)	556			948	569			
Turn Bay Length (ft)		225	250		250			
Base Capacity (vph)	235	834	1009	1316	377	1336		
Starvation Cap Reductn	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0		
Reduced v/c Ratio	0.93	0.70	0.78	0.35	1.08	0.29		

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.08  
 Intersection Signal Delay: 39.3  
 Intersection LOS: D  
 Intersection Capacity Utilization 75.8%  
 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: 1: Farm St & Water St





Lanes, Volumes, Timings  
2: Farm St & Nahant St/Hemlock Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Traffic Volume (vph)	104	177	158	12	55	34	127	392	321	295	538	114
Future Volume (vph)	104	177	158	12	55	34	127	392	321	295	538	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	150		0	600		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.951			0.955			0.934			0.974	
Flt Protected		0.988			0.994		0.950			0.950		
Satd. Flow (prot)	0	1750	0	0	1768	0	1770	1740	0	1770	1814	0
Flt Permitted		0.988			0.994		0.950			0.950		
Satd. Flow (perm)	0	1750	0	0	1768	0	1770	1740	0	1770	1814	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			14			31			9	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		668			523			489			704	
Travel Time (s)		15.2			11.9			11.1			16.0	
Peak Hour Factor	0.89	0.92	0.89	0.88	0.88	0.88	0.89	0.89	0.92	0.92	0.89	0.89
Adj. Flow (vph)	117	192	178	14	63	39	143	440	349	321	604	128
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	487	0	0	116	0	143	789	0	321	732	0
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	38.0	38.0		22.5	22.5		18.1	62.5		27.0	71.4	
Total Split (%)	25.3%	25.3%		15.0%	15.0%		12.1%	41.7%		18.0%	47.6%	
Maximum Green (s)	33.5	33.5		18.0	18.0		13.6	58.0		22.5	66.9	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?								Yes			Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0			0	
Act Effct Green (s)		33.5			13.5		13.5	58.0		22.5	67.1	
Actuated g/C Ratio		0.23			0.09		0.09	0.40		0.15	0.46	
v/c Ratio		1.17			0.66		0.88	1.11		1.18	0.87	
Control Delay		145.8			73.6		108.5	106.7		162.1	48.1	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		145.8			73.6		108.5	106.7		162.1	48.1	



Lanes, Volumes, Timings  
2: Farm St & Nahant St/Hemlock Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		F			E		F	F		F		D
Approach Delay		145.8			73.6			107.0				82.8
Approach LOS		F			E			F				F
Queue Length 50th (ft)		~538			95		136	~839		~364		614
Queue Length 95th (ft)		#795			160		#269	#1116		#581		#886
Internal Link Dist (ft)		588			443			409				624
Turn Bay Length (ft)							150			600		
Base Capacity (vph)		416			231		165	712		273		840
Starvation Cap Reductn		0			0		0	0		0		0
Spillback Cap Reductn		0			0		0	0		0		0
Storage Cap Reductn		0			0		0	0		0		0
Reduced v/c Ratio		1.17			0.50		0.87	1.11		1.18		0.87

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 145.6  
 Natural Cycle: 150  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.18  
 Intersection Signal Delay: 103.0  
 Intersection LOS: F  
 Intersection Capacity Utilization 99.2%  
 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: 2: Farm St & Nahant St/Hemlock Road



Intersection						
Int Delay, s/veh	479.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	136	136	464	66	182	838
Future Vol, veh/h	136	136	464	66	182	838
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	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	181	181	619	88	243	1117

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	2266	663	0	0	707	0
Stage 1	663	-	-	-	-	-
Stage 2	1603	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	~ 45	461	-	-	891	-
Stage 1	512	-	-	-	-	-
Stage 2	~ 181	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	~ 13	461	-	-	891	-
Mov Cap-2 Maneuver	~ 13	-	-	-	-	-
Stage 1	512	-	-	-	-	-
Stage 2	~ 51	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	3205.6	0	1.9
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	13	461	891	-
HCM Lane V/C Ratio	-	-	13.949	0.393	0.272	-
HCM Control Delay (s)	-	-	\$ 6393.3	17.8	10.5	0
HCM Lane LOS	-	-	F	C	B	A
HCM 95th %tile Q(veh)	-	-	23.9	1.8	1.1	-

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↘			↖
Traffic Vol, veh/h	0	0	580	20	68	1020
Future Vol, veh/h	0	0	580	20	68	1020
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	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	763	26	89	1342

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	-	776	0	0	789
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	2.218
Pot Cap-1 Maneuver	0	397	-	-	831
Stage 1	0	-	-	-	-
Stage 2	0	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	-	397	-	-	831
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	831
HCM Lane V/C Ratio	-	-	-	0.108
HCM Control Delay (s)	-	-	0	9.9
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0.4

Intersection						
Int Delay, s/veh	2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑			↑
Traffic Vol, veh/h	17	56	580	0	0	1071
Future Vol, veh/h	17	56	580	0	0	1071
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	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	73	73	73	73	73	73
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	77	795	0	0	1467

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	2262	795	0	-	-	-
Stage 1	795	-	-	-	-	-
Stage 2	1467	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	45	388	-	0	0	-
Stage 1	445	-	-	0	0	-
Stage 2	212	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	45	388	-	-	-	-
Mov Cap-2 Maneuver	45	-	-	-	-	-
Stage 1	445	-	-	-	-	-
Stage 2	212	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	47.9	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBTWBLn1	WBLn2	SBT
Capacity (veh/h)	-	45	388
HCM Lane V/C Ratio	-	0.518	0.198
HCM Control Delay (s)	-	150.8	16.6
HCM Lane LOS	-	F	C
HCM 95th %tile Q(veh)	-	1.9	0.7

Intersection						
Int Delay, s/veh	2.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↙	↑	↘		↘	
Traffic Vol, veh/h	262	531	101	0	0	0
Future Vol, veh/h	262	531	101	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	285	577	110	0	0	0

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	110	0	-	0	1257 110
Stage 1	-	-	-	-	110 -
Stage 2	-	-	-	-	1147 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1480	-	-	-	189 943
Stage 1	-	-	-	-	915 -
Stage 2	-	-	-	-	303 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1480	-	-	-	153 943
Mov Cap-2 Maneuver	-	-	-	-	153 -
Stage 1	-	-	-	-	738 -
Stage 2	-	-	-	-	303 -

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1480	-	-	-	-
HCM Lane V/C Ratio	0.192	-	-	-	-
HCM Control Delay (s)	8	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0.7	-	-	-	-

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Vol, veh/h	30	501	101	0	0	0
Future Vol, veh/h	30	501	101	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	545	110	0	0	0

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	110	0	-	0	721 110
Stage 1	-	-	-	-	110 -
Stage 2	-	-	-	-	611 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1480	-	-	-	394 943
Stage 1	-	-	-	-	915 -
Stage 2	-	-	-	-	542 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1480	-	-	-	381 943
Mov Cap-2 Maneuver	-	-	-	-	381 -
Stage 1	-	-	-	-	886 -
Stage 2	-	-	-	-	542 -

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1480	-	-	-	-
HCM Lane V/C Ratio	0.022	-	-	-	-
HCM Control Delay (s)	7.5	0	-	-	0
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	-





Lanes, Volumes, Timings  
1: Farm St & Water St

	→	↘	↙	←	↖	↗		
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø2	Ø9
Lane Configurations	↑	↗	↖	↑	↘	↗		
Traffic Volume (vph)	228	225	317	238	377	618		
Future Volume (vph)	228	225	317	238	377	618		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Storage Length (ft)		225	250		250	0		
Storage Lanes		1	1		1	1		
Taper Length (ft)			25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Frt		0.850				0.850		
Flt Protected			0.950		0.950			
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583		
Flt Permitted			0.558		0.950			
Satd. Flow (perm)	1863	1583	1039	1863	1770	1583		
Right Turn on Red		Yes				Yes		
Satd. Flow (RTOR)		232				637		
Link Speed (mph)	30			30	30			
Link Distance (ft)	636			1028	649			
Travel Time (s)	14.5			23.4	14.8			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97		
Adj. Flow (vph)	235	232	327	245	389	637		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	235	232	327	245	389	637		
Turn Type	NA	pm+ov	custom	NA	Prot	pt+ov		
Protected Phases	6	8	5	5 2	8	8 5	2	9
Permitted Phases		6	2					
Detector Phase	6	8	5	5 2	8	8 5		
Switch Phase								
Minimum Initial (s)	10.0	6.0	6.0		6.0		5.0	23.0
Minimum Split (s)	16.0	12.0	12.0		12.0		22.5	26.0
Total Split (s)	23.0	26.0	15.0		26.0		23.0	26.0
Total Split (%)	25.6%	28.9%	16.7%		28.9%		26%	29%
Maximum Green (s)	17.0	20.0	9.0		20.0		17.0	23.0
Yellow Time (s)	4.0	4.0	4.0		4.0		4.0	2.0
All-Red Time (s)	2.0	2.0	2.0		2.0		2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0			
Total Lost Time (s)	6.0	6.0	6.0		6.0			
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0
Recall Mode	C-Min	None	Min		None		C-Max	None
Walk Time (s)								7.0
Flash Dont Walk (s)								16.0
Pedestrian Calls (#/hr)								0
Act Effct Green (s)	31.4	57.4	52.0	58.0	20.0	46.6		
Actuated g/C Ratio	0.35	0.64	0.58	0.64	0.22	0.52		
v/c Ratio	0.36	0.21	0.43	0.20	0.99	0.57		
Control Delay	24.6	1.6	9.2	7.1	80.0	3.1		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	24.6	1.6	9.2	7.1	80.0	3.1		



Lanes, Volumes, Timings  
1: Farm St & Water St

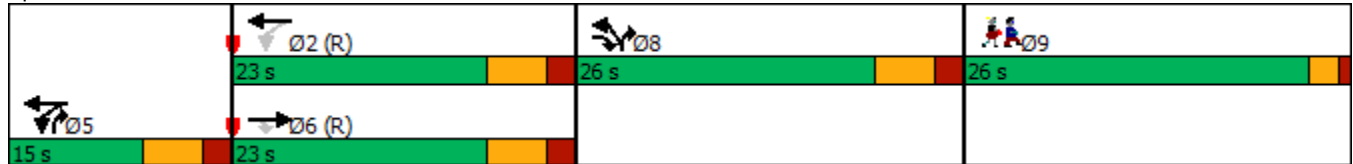


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø2	Ø9
LOS	C	A	A	A	E	A		
Approach Delay	13.1			8.3	32.2			
Approach LOS	B			A	C			
Queue Length 50th (ft)	97	0	73	51	222	0		
Queue Length 95th (ft)	171	27	114	83	#404	46		
Internal Link Dist (ft)	556			948	569			
Turn Bay Length (ft)		225	250		250			
Base Capacity (vph)	649	1093	767	1200	393	1126		
Starvation Cap Reductn	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0		
Reduced v/c Ratio	0.36	0.21	0.43	0.20	0.99	0.57		

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.99  
 Intersection Signal Delay: 21.3  
 Intersection LOS: C  
 Intersection Capacity Utilization 65.4%  
 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: 1: Farm St & Water St



Lanes, Volumes, Timings  
2: Farm St & Nahant St



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Traffic Volume (vph)	62	42	183	59	108	113	249	537	72	64	550	143
Future Volume (vph)	62	42	183	59	108	113	249	537	72	64	550	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	150		0	600		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			50			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.914			0.945			0.982			0.969	
Flt Protected		0.989			0.990		0.950			0.950		
Satd. Flow (prot)	0	1684	0	0	1743	0	1770	1829	0	1770	1805	0
Flt Permitted		0.989			0.990		0.950			0.950		
Satd. Flow (perm)	0	1684	0	0	1743	0	1770	1829	0	1770	1805	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		61			24			8			13	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		644			526			493			702	
Travel Time (s)		14.6			12.0			11.2			16.0	
Peak Hour Factor	0.95	0.92	0.95	0.92	0.92	0.92	0.95	0.95	0.92	0.92	0.95	0.95
Adj. Flow (vph)	65	46	193	64	117	123	262	565	78	70	579	151
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	304	0	0	304	0	262	643	0	70	730	0
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	22.5	22.5		22.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	22.6	22.6		23.9	23.9		23.0	61.5		12.0	50.5	
Total Split (%)	18.8%	18.8%		19.9%	19.9%		19.2%	51.3%		10.0%	42.1%	
Maximum Green (s)	18.1	18.1		19.4	19.4		18.5	57.0		7.5	46.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0			7.0			7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0			11.0	
Pedestrian Calls (#/hr)	0	0		0	0			0			0	
Act Effct Green (s)		18.1			19.4		18.5	59.4		7.3	46.0	
Actuated g/C Ratio		0.15			0.16		0.15	0.50		0.06	0.38	
v/c Ratio		1.00			1.01		0.96	0.71		0.65	1.04	
Control Delay		91.9			100.8		96.8	29.4		82.8	82.2	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		91.9			100.8		96.8	29.4		82.8	82.2	

Lanes, Volumes, Timings  
2: Farm St & Nahant St



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		F			F		F	C		F	F	
Approach Delay		91.9			100.8			48.9			82.3	
Approach LOS		F			F			D			F	
Queue Length 50th (ft)		194			~224		204	387		54	~607	
Queue Length 95th (ft)		#382			#412		#372	537		#122	#846	
Internal Link Dist (ft)		564			446			413			622	
Turn Bay Length (ft)							150			600		
Base Capacity (vph)		305			301		272	909		110	699	
Starvation Cap Reductn		0			0		0	0		0	0	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		1.00			1.01		0.96	0.71		0.64	1.04	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Natural Cycle: 120  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.04  
 Intersection Signal Delay: 72.9  
 Intersection LOS: E  
 Intersection Capacity Utilization 85.5%  
 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: 2: Farm St & Nahant St

Ø1	Ø2	Ø4	Ø8
12 s	61.5 s	22.6 s	23.9 s
Ø5	Ø6		
23 s	50.5 s		

Intersection						
Int Delay, s/veh	8.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	124	119	699	13	10	603
Future Vol, veh/h	124	119	699	13	10	603
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	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	128	123	721	13	10	622

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1370	728	0	0	734
Stage 1	728	-	-	-	-
Stage 2	642	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	161	423	-	-	871
Stage 1	478	-	-	-	-
Stage 2	524	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	158	423	-	-	871
Mov Cap-2 Maneuver	158	-	-	-	-
Stage 1	478	-	-	-	-
Stage 2	515	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	52	0	0.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	158	423	871	-
HCM Lane V/C Ratio	-	-	0.809	0.29	0.012	-
HCM Control Delay (s)	-	-	85.5	17	9.2	0
HCM Lane LOS	-	-	F	C	A	A
HCM 95th %tile Q(veh)	-	-	5.3	1.2	0	-

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↘			↖
Traffic Vol, veh/h	0	0	808	9	12	548
Future Vol, veh/h	0	0	808	9	12	548
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	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	860	10	13	583

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	-	865	0	0	870
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	2.218
Pot Cap-1 Maneuver	0	353	-	-	775
Stage 1	0	-	-	-	-
Stage 2	0	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	-	353	-	-	775
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	775
HCM Lane V/C Ratio	-	-	-	0.016
HCM Control Delay (s)	-	-	0	9.7
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0.1

Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑			↑
Traffic Vol, veh/h	18	34	808	0	0	542
Future Vol, veh/h	18	34	808	0	0	542
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	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	19	37	869	0	0	583

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1452	869	0	-	-	-
Stage 1	869	-	-	-	-	-
Stage 2	583	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	144	351	-	0	0	-
Stage 1	410	-	-	0	0	-
Stage 2	558	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	144	351	-	-	-	-
Mov Cap-2 Maneuver	144	-	-	-	-	-
Stage 1	410	-	-	-	-	-
Stage 2	558	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBTWBLn1	WBLn2	SBT
Capacity (veh/h)	-	144	351
HCM Lane V/C Ratio	-	0.134	0.104
HCM Control Delay (s)	-	33.8	16.4
HCM Lane LOS	-	D	C
HCM 95th %tile Q(veh)	-	0.5	0.3

Intersection						
Int Delay, s/veh	1.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	70	108	249	0	0	31
Future Vol, veh/h	70	108	249	0	0	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	76	117	271	0	0	34

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	271	0	-	0	540 271
Stage 1	-	-	-	-	271 -
Stage 2	-	-	-	-	269 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1292	-	-	-	503 768
Stage 1	-	-	-	-	775 -
Stage 2	-	-	-	-	776 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1292	-	-	-	471 768
Mov Cap-2 Maneuver	-	-	-	-	471 -
Stage 1	-	-	-	-	726 -
Stage 2	-	-	-	-	776 -

Approach	EB	WB	SB
HCM Control Delay, s	3.1	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1292	-	-	-	768
HCM Lane V/C Ratio	0.059	-	-	-	0.044
HCM Control Delay (s)	8	0	-	-	9.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.1

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	0	108	219	0	0	30
Future Vol, veh/h	0	108	219	0	0	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	117	238	0	0	33

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	238	0	-	0	355 238
Stage 1	-	-	-	-	238 -
Stage 2	-	-	-	-	117 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1329	-	-	-	643 801
Stage 1	-	-	-	-	802 -
Stage 2	-	-	-	-	908 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1329	-	-	-	643 801
Mov Cap-2 Maneuver	-	-	-	-	643 -
Stage 1	-	-	-	-	802 -
Stage 2	-	-	-	-	908 -













Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1329	-	-	-	801
HCM Lane V/C Ratio	-	-	-	-	0.041
HCM Control Delay (s)	0	-	-	-	9.7
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1





Lanes, Volumes, Timings  
1: Farm St & Water St

							Ø2	Ø9
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations								
Traffic Volume (vph)	170	454	617	357	319	305		
Future Volume (vph)	170	454	617	357	319	305		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Storage Length (ft)		225	250		250	0		
Storage Lanes		1	1		1	1		
Taper Length (ft)			25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Frt		0.850				0.850		
Flt Protected			0.950		0.950			
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583		
Flt Permitted			0.227		0.950			
Satd. Flow (perm)	1863	1583	423	1863	1770	1583		
Right Turn on Red		Yes				Yes		
Satd. Flow (RTOR)		376				391		
Link Speed (mph)	30			30	30			
Link Distance (ft)	636			1028	649			
Travel Time (s)	14.5			23.4	14.8			
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78		
Adj. Flow (vph)	218	582	791	458	409	391		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	218	582	791	458	409	391		
Turn Type	NA	pm+ov	custom	NA	Prot	pt+ov		
Protected Phases	6	8	5	5 2	8	8 5	2	9
Permitted Phases		6	2					
Detector Phase	6	8	5	5 2	8	8 5		
Switch Phase								
Minimum Initial (s)	10.0	6.0	6.0		6.0		5.0	23.0
Minimum Split (s)	16.0	12.0	12.0		12.0		22.5	26.0
Total Split (s)	25.0	38.0	61.0		38.0		25.0	26.0
Total Split (%)	16.7%	25.3%	40.7%		25.3%		17%	17%
Maximum Green (s)	19.0	32.0	55.0		32.0		19.0	23.0
Yellow Time (s)	4.0	4.0	4.0		4.0		4.0	2.0
All-Red Time (s)	2.0	2.0	2.0		2.0		2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0			
Total Lost Time (s)	6.0	6.0	6.0		6.0			
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0
Recall Mode	C-Min	None	Min		None		C-Max	None
Walk Time (s)								7.0
Flash Dont Walk (s)								16.0
Pedestrian Calls (#/hr)								0
Act Effct Green (s)	19.0	57.0	100.0	106.0	32.0	119.0		
Actuated g/C Ratio	0.13	0.38	0.67	0.71	0.21	0.79		
v/c Ratio	0.93	0.70	0.78	0.35	1.08	0.29		
Control Delay	106.6	17.9	28.5	9.4	124.9	0.9		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	106.6	17.9	28.5	9.4	124.9	0.9		

Lanes, Volumes, Timings  
1: Farm St & Water St

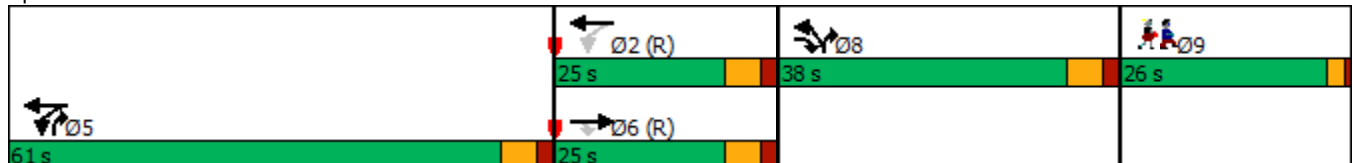


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø2	Ø9
LOS	F	B	C	A	F	A		
Approach Delay	42.1			21.5	64.3			
Approach LOS	D			C	E			
Queue Length 50th (ft)	214	172	525	160	~447	0		
Queue Length 95th (ft)	#294	199	528	176	#522	7		
Internal Link Dist (ft)	556			948	569			
Turn Bay Length (ft)		225	250		250			
Base Capacity (vph)	235	834	1009	1316	377	1336		
Starvation Cap Reductn	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0		
Reduced v/c Ratio	0.93	0.70	0.78	0.35	1.08	0.29		

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.08  
 Intersection Signal Delay: 39.3  
 Intersection LOS: D  
 Intersection Capacity Utilization 75.8%  
 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: 1: Farm St & Water St





Intersection						
Int Delay, s/veh	479.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	136	136	464	66	182	838
Future Vol, veh/h	136	136	464	66	182	838
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	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	181	181	619	88	243	1117

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	2266	663	0	0	707	0
Stage 1	663	-	-	-	-	-
Stage 2	1603	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	~ 45	461	-	-	891	-
Stage 1	512	-	-	-	-	-
Stage 2	~ 181	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	~ 13	461	-	-	891	-
Mov Cap-2 Maneuver	~ 13	-	-	-	-	-
Stage 1	512	-	-	-	-	-
Stage 2	~ 51	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, \$	3205.6	0	1.9
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	13	461	891	-
HCM Lane V/C Ratio	-	-	13.949	0.393	0.272	-
HCM Control Delay (s)	-	-	\$ 6393.3	17.8	10.5	0
HCM Lane LOS	-	-	F	C	B	A
HCM 95th %tile Q(veh)	-	-	23.9	1.8	1.1	-

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↘			↖
Traffic Vol, veh/h	0	0	580	20	68	1020
Future Vol, veh/h	0	0	580	20	68	1020
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	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	763	26	89	1342

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	-	776	0	0	789
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	2.218
Pot Cap-1 Maneuver	0	397	-	-	831
Stage 1	0	-	-	-	-
Stage 2	0	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	-	397	-	-	831
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	831
HCM Lane V/C Ratio	-	-	-	0.108
HCM Control Delay (s)	-	-	0	9.9
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0.4

Intersection						
Int Delay, s/veh	2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑			↑
Traffic Vol, veh/h	17	56	580	0	0	1071
Future Vol, veh/h	17	56	580	0	0	1071
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	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	73	73	73	73	73	73
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	77	795	0	0	1467

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	2262	795	0	-	-	-
Stage 1	795	-	-	-	-	-
Stage 2	1467	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	45	388	-	0	0	-
Stage 1	445	-	-	0	0	-
Stage 2	212	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	45	388	-	-	-	-
Mov Cap-2 Maneuver	45	-	-	-	-	-
Stage 1	445	-	-	-	-	-
Stage 2	212	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	47.9	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBTWBLn1	WBLn2	SBT
Capacity (veh/h)	-	45	388
HCM Lane V/C Ratio	-	0.518	0.198
HCM Control Delay (s)	-	150.8	16.6
HCM Lane LOS	-	F	C
HCM 95th %tile Q(veh)	-	1.9	0.7

Intersection						
Int Delay, s/veh	2.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	262	531	101	0	0	0
Future Vol, veh/h	262	531	101	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	285	577	110	0	0	0

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	110	0	-	0	1257 110
Stage 1	-	-	-	-	110 -
Stage 2	-	-	-	-	1147 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1480	-	-	-	189 943
Stage 1	-	-	-	-	915 -
Stage 2	-	-	-	-	303 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1480	-	-	-	153 943
Mov Cap-2 Maneuver	-	-	-	-	153 -
Stage 1	-	-	-	-	738 -
Stage 2	-	-	-	-	303 -

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1480	-	-	-	-
HCM Lane V/C Ratio	0.192	-	-	-	-
HCM Control Delay (s)	8	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0.7	-	-	-	-

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Vol, veh/h	30	501	101	0	0	0
Future Vol, veh/h	30	501	101	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	545	110	0	0	0

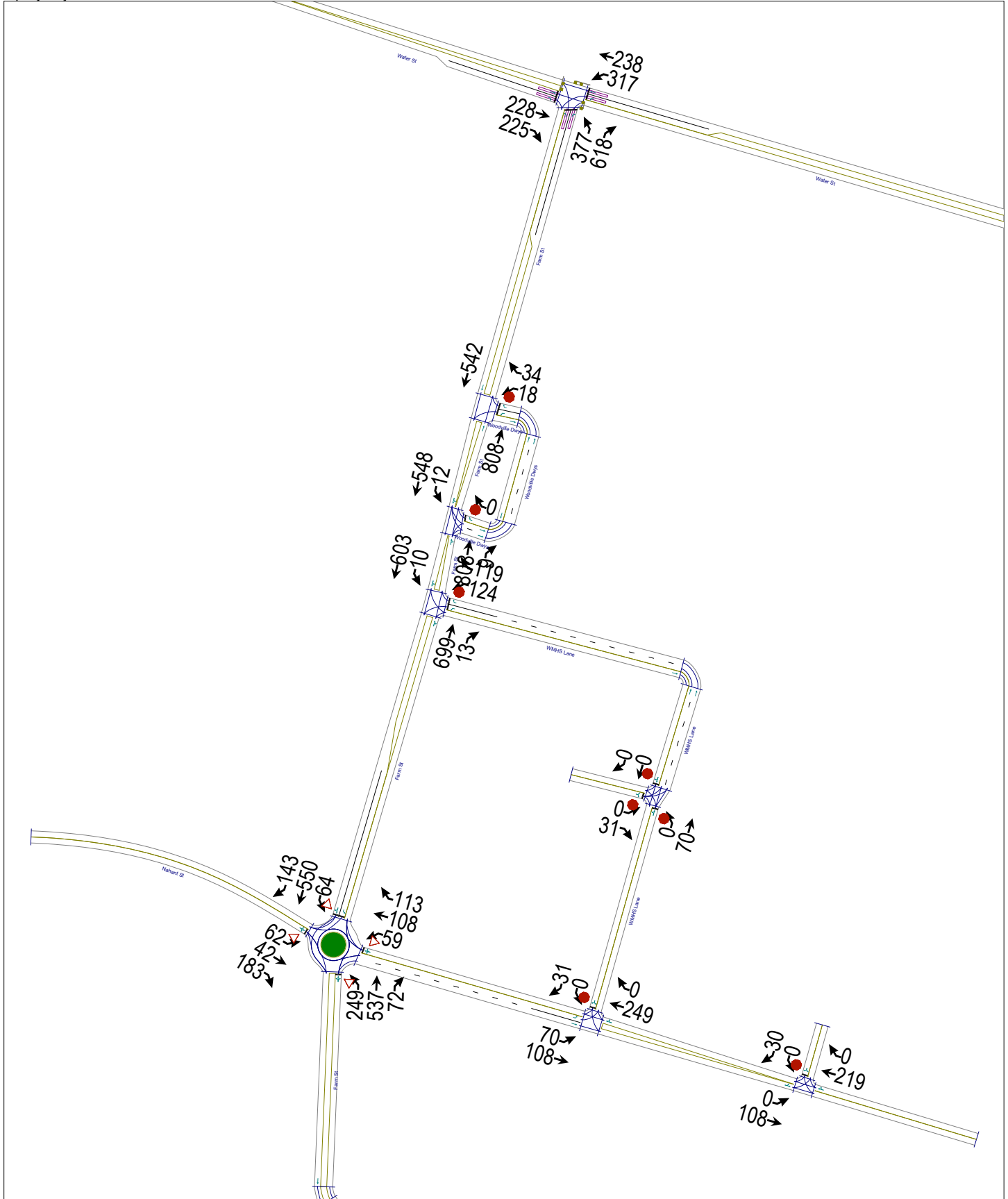
Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	110	0	-	0	721 110
Stage 1	-	-	-	-	110 -
Stage 2	-	-	-	-	611 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1480	-	-	-	394 943
Stage 1	-	-	-	-	915 -
Stage 2	-	-	-	-	542 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1480	-	-	-	381 943
Mov Cap-2 Maneuver	-	-	-	-	381 -
Stage 1	-	-	-	-	886 -
Stage 2	-	-	-	-	542 -

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1480	-	-	-	-
HCM Lane V/C Ratio	0.022	-	-	-	-
HCM Control Delay (s)	7.5	0	-	-	0
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	-



Intersection					
Intersection Delay, s/veh	47.1				
Intersection LOS	E				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	2	
Conflicting Circle Lanes	2	2	2	2	
Adj Approach Flow, veh/h	487	115	932	1053	
Demand Flow Rate, veh/h	497	117	951	1074	
Vehicles Circulating, veh/h	957	714	642	223	
Vehicles Exiting, veh/h	340	879	812	608	
Ped Vol Crossing Leg, #/h	0	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	28.1	6.3	104.1	10.0	
Approach LOS	D	A	F	A	
Lane	Left	Left	Left	Left	Right
Designated Moves	LTR	LTR	LTR	L	TR
Assumed Moves	LTR	LTR	LTR	L	TR
RT Channelized					
Lane Util	1.000	1.000	1.000	0.304	0.696
Follow-Up Headway, s	2.535	2.535	2.535	2.667	2.535
Critical Headway, s	4.328	4.328	4.328	4.645	4.328
Entry Flow, veh/h	497	117	951	327	747
Cap Entry Lane, veh/h	629	774	823	1099	1175
Entry HV Adj Factor	0.980	0.981	0.980	0.982	0.980
Flow Entry, veh/h	487	115	932	321	732
Cap Entry, veh/h	617	759	807	1079	1151
V/C Ratio	0.790	0.151	1.156	0.297	0.636
Control Delay, s/veh	28.1	6.3	104.1	6.2	11.6
LOS	D	A	F	A	B
95th %tile Queue, veh	8	1	28	1	5



Lanes, Volumes, Timings  
1: Farm St & Water St

	→	↘	↙	←	↖	↗		
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø2	Ø9
Lane Configurations	↑	↗	↖	↑	↘	↗		
Traffic Volume (vph)	228	225	317	238	377	618		
Future Volume (vph)	228	225	317	238	377	618		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Storage Length (ft)		225	250		250	0		
Storage Lanes		1	1		1	1		
Taper Length (ft)			25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Frt		0.850				0.850		
Flt Protected			0.950		0.950			
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583		
Flt Permitted			0.558		0.950			
Satd. Flow (perm)	1863	1583	1039	1863	1770	1583		
Right Turn on Red		Yes				Yes		
Satd. Flow (RTOR)		232				637		
Link Speed (mph)	30			30	30			
Link Distance (ft)	636			1028	649			
Travel Time (s)	14.5			23.4	14.8			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97		
Adj. Flow (vph)	235	232	327	245	389	637		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	235	232	327	245	389	637		
Turn Type	NA	pm+ov	custom	NA	Prot	pt+ov		
Protected Phases	6	8	5	5 2	8	8 5	2	9
Permitted Phases		6	2					
Detector Phase	6	8	5	5 2	8	8 5		
Switch Phase								
Minimum Initial (s)	10.0	6.0	6.0		6.0		5.0	23.0
Minimum Split (s)	16.0	12.0	12.0		12.0		22.5	26.0
Total Split (s)	23.0	26.0	15.0		26.0		23.0	26.0
Total Split (%)	25.6%	28.9%	16.7%		28.9%		26%	29%
Maximum Green (s)	17.0	20.0	9.0		20.0		17.0	23.0
Yellow Time (s)	4.0	4.0	4.0		4.0		4.0	2.0
All-Red Time (s)	2.0	2.0	2.0		2.0		2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0			
Total Lost Time (s)	6.0	6.0	6.0		6.0			
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0
Recall Mode	C-Min	None	Min		None		C-Max	None
Walk Time (s)								7.0
Flash Dont Walk (s)								16.0
Pedestrian Calls (#/hr)								0
Act Effct Green (s)	31.4	57.4	52.0	58.0	20.0	46.6		
Actuated g/C Ratio	0.35	0.64	0.58	0.64	0.22	0.52		
v/c Ratio	0.36	0.21	0.43	0.20	0.99	0.57		
Control Delay	24.6	1.6	9.2	7.1	80.0	3.1		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	24.6	1.6	9.2	7.1	80.0	3.1		

Lanes, Volumes, Timings  
1: Farm St & Water St

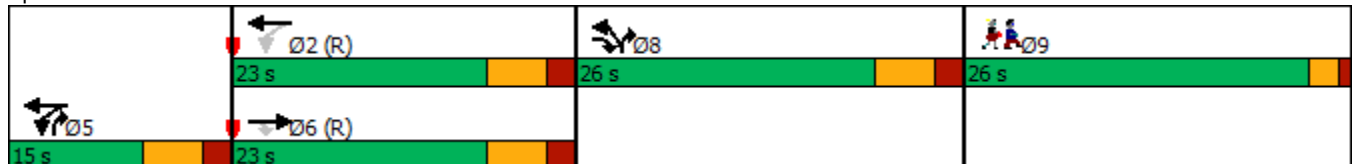


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø2	Ø9
LOS	C	A	A	A	E	A		
Approach Delay	13.1			8.3	32.2			
Approach LOS	B			A	C			
Queue Length 50th (ft)	97	0	73	51	222	0		
Queue Length 95th (ft)	171	27	114	83	#404	46		
Internal Link Dist (ft)	556			948	569			
Turn Bay Length (ft)		225	250		250			
Base Capacity (vph)	649	1093	767	1200	393	1126		
Starvation Cap Reductn	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0		
Reduced v/c Ratio	0.36	0.21	0.43	0.20	0.99	0.57		

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.99  
 Intersection Signal Delay: 21.3  
 Intersection LOS: C  
 Intersection Capacity Utilization 65.4%  
 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: 1: Farm St & Water St



Intersection						
Int Delay, s/veh	8.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	124	119	699	13	10	603
Future Vol, veh/h	124	119	699	13	10	603
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	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	128	123	721	13	10	622

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1370	728	0	0	734
Stage 1	728	-	-	-	-
Stage 2	642	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	161	423	-	-	871
Stage 1	478	-	-	-	-
Stage 2	524	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	158	423	-	-	871
Mov Cap-2 Maneuver	158	-	-	-	-
Stage 1	478	-	-	-	-
Stage 2	515	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	52	0	0.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	158	423	871	-
HCM Lane V/C Ratio	-	-	0.809	0.29	0.012	-
HCM Control Delay (s)	-	-	85.5	17	9.2	0
HCM Lane LOS	-	-	F	C	A	A
HCM 95th %tile Q(veh)	-	-	5.3	1.2	0	-

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↘			↖
Traffic Vol, veh/h	0	0	808	9	12	548
Future Vol, veh/h	0	0	808	9	12	548
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	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	860	10	13	583

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	-	865	0	0	870
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	2.218
Pot Cap-1 Maneuver	0	353	-	-	775
Stage 1	0	-	-	-	-
Stage 2	0	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	-	353	-	-	775
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	775
HCM Lane V/C Ratio	-	-	-	0.016
HCM Control Delay (s)	-	-	0	9.7
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0.1

Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑			↑
Traffic Vol, veh/h	18	34	808	0	0	542
Future Vol, veh/h	18	34	808	0	0	542
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	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	19	37	869	0	0	583

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1452	869	0	-	-	-
Stage 1	869	-	-	-	-	-
Stage 2	583	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-	-
Pot Cap-1 Maneuver	144	351	-	0	0	-
Stage 1	410	-	-	0	0	-
Stage 2	558	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	144	351	-	-	-	-
Mov Cap-2 Maneuver	144	-	-	-	-	-
Stage 1	410	-	-	-	-	-
Stage 2	558	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBTWBLn1	WBLn2	SBT
Capacity (veh/h)	-	144	351
HCM Lane V/C Ratio	-	0.134	0.104
HCM Control Delay (s)	-	33.8	16.4
HCM Lane LOS	-	D	C
HCM 95th %tile Q(veh)	-	0.5	0.3

Intersection						
Int Delay, s/veh	1.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	70	108	249	0	0	31
Future Vol, veh/h	70	108	249	0	0	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	76	117	271	0	0	34

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	271	0	-	0	540 271
Stage 1	-	-	-	-	271 -
Stage 2	-	-	-	-	269 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1292	-	-	-	503 768
Stage 1	-	-	-	-	775 -
Stage 2	-	-	-	-	776 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1292	-	-	-	473 768
Mov Cap-2 Maneuver	-	-	-	-	473 -
Stage 1	-	-	-	-	729 -
Stage 2	-	-	-	-	776 -

Approach	EB	WB	SB
HCM Control Delay, s	3.1	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1292	-	-	-	768
HCM Lane V/C Ratio	0.059	-	-	-	0.044
HCM Control Delay (s)	8	-	-	-	9.9
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.1



Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	0	108	219	0	0	30
Future Vol, veh/h	0	108	219	0	0	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	117	238	0	0	33

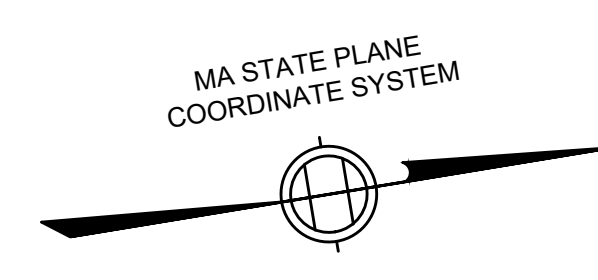
Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	238	0	-	0	355 238
Stage 1	-	-	-	-	238 -
Stage 2	-	-	-	-	117 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1329	-	-	-	643 801
Stage 1	-	-	-	-	802 -
Stage 2	-	-	-	-	908 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1329	-	-	-	643 801
Mov Cap-2 Maneuver	-	-	-	-	643 -
Stage 1	-	-	-	-	802 -
Stage 2	-	-	-	-	908 -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1329	-	-	-	801
HCM Lane V/C Ratio	-	-	-	-	0.041
HCM Control Delay (s)	0	-	-	-	9.7
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection					
Intersection Delay, s/veh	15.3				
Intersection LOS	C				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	2	
Conflicting Circle Lanes	2	2	2	2	
Adj Approach Flow, veh/h	304	304	905	800	
Demand Flow Rate, veh/h	310	309	923	816	
Vehicles Circulating, veh/h	727	909	184	451	
Vehicles Exiting, veh/h	540	198	853	767	
Ped Vol Crossing Leg, #/h	0	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	10.0	12.8	15.7	17.8	
Approach LOS	B	B	C	C	
Lane	Left	Left	Left	Left	Right
Designated Moves	LTR	LTR	LTR	L	TR
Assumed Moves	LTR	LTR	LTR	L	TR
RT Channelized					
Lane Util	1.000	1.000	1.000	0.087	0.913
Follow-Up Headway, s	2.535	2.535	2.535	2.667	2.535
Critical Headway, s	4.328	4.328	4.328	4.645	4.328
Entry Flow, veh/h	310	309	923	71	745
Cap Entry Lane, veh/h	765	656	1214	891	968
Entry HV Adj Factor	0.981	0.983	0.980	0.986	0.980
Flow Entry, veh/h	304	304	905	70	730
Cap Entry, veh/h	751	644	1190	879	949
V/C Ratio	0.405	0.471	0.760	0.080	0.770
Control Delay, s/veh	10.0	12.8	15.7	4.8	19.1
LOS	B	B	C	A	C
95th %tile Queue, veh	2	3	8	0	8





**PAVEMENT NOTES**

**PROPOSED FULL DEPTH PAVEMENT**

SURFACE: 1 1/2" SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5) OVER  
0.07 GALUSY TACK COAT OVER  
INTERMEDIATE: 2 1/2" SUPERPAVE INTERMEDIATE COURSE - 19.0 (SIC - 19.0) OVER  
0.07 GALUSY TACK COAT OVER  
BASE: 4" SUPERPAVE BASE COURSE 37.5 - (SBC - 37.5) OVER  
SUB-BASE: 4" DENSE GRADED CRUSHED STONE OVER  
8" GRAVEL BORROW (M1.03.0 TYPE b)

**PROPOSED PAVEMENT MILLING AND OVERLAY**

SURFACE: 1 1/2" SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5) OVER  
0.09 GALUSY TACK COAT OVER  
VARIABLE DEPTH PAVEMENT FINE MILLING

**PROPOSED CEMENT CONCRETE SIDEWALK / WHEELCHAIR RAMP**

SURFACE: 4" CEMENT CONCRETE (AIR ENTRAINED 4,000 PSI, 3/4", 610)  
FOUNDATION: 8" GRAVEL BORROW (M1.03.0 TYPE b)

**PROPOSED CEMENT CONCRETE SIDEWALK AT DRIVEWAYS**

SURFACE: 6" CEMENT CONCRETE (AIR ENTRAINED 4,000 PSI, 3/4", 610)  
FOUNDATION: 8" GRAVEL BORROW (M1.03.0 TYPE b)

**PROPOSED HOT MIX ASPHALT SIDEWALK**

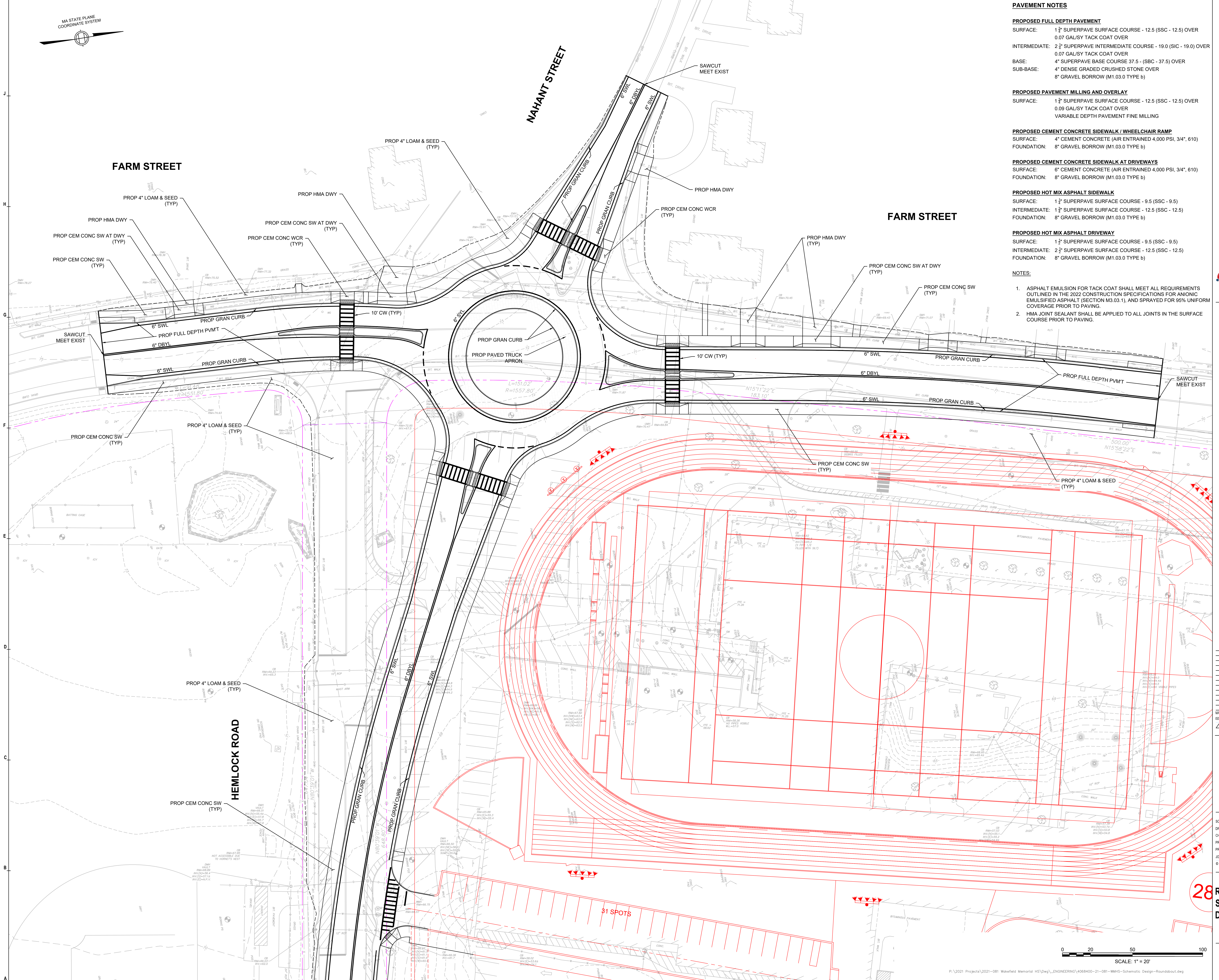
SURFACE: 1 1/2" SUPERPAVE SURFACE COURSE - 9.5 (SSC - 9.5)  
INTERMEDIATE: 1 3/4" SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5)  
FOUNDATION: 8" GRAVEL BORROW (M1.03.0 TYPE b)

**PROPOSED HOT MIX ASPHALT DRIVEWAY**

SURFACE: 1 1/2" SUPERPAVE SURFACE COURSE - 9.5 (SSC - 9.5)  
INTERMEDIATE: 2 1/2" SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5)  
FOUNDATION: 8" GRAVEL BORROW (M1.03.0 TYPE b)

**NOTES:**

- 1. ASPHALT EMULSION FOR TACK COAT SHALL MEET ALL REQUIREMENTS OUTLINED IN THE 2022 CONSTRUCTION SPECIFICATIONS FOR ANIONIC EMULSIFIED ASPHALT (SECTION M3.03.1), AND SPRAYED FOR 95% UNIFORM COVERAGE PRIOR TO PAVING.
- 2. HMA JOINT SEALANT SHALL BE APPLIED TO ALL JOINTS IN THE SURFACE COURSE PRIOR TO PAVING.

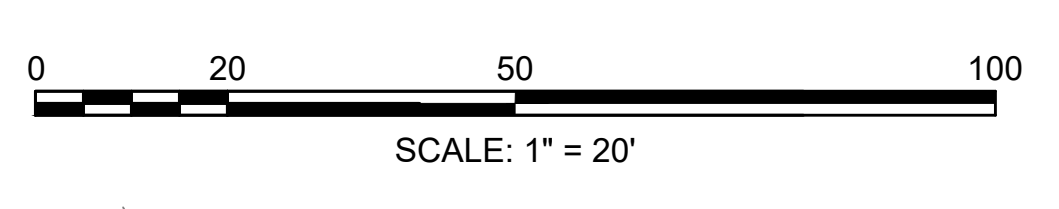


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		△ = CLOUDED CHANGE

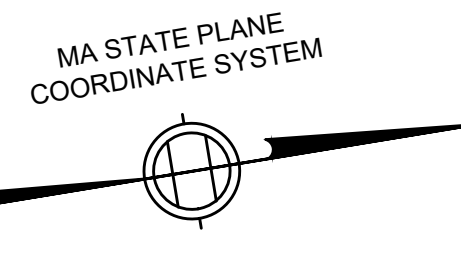
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SCALE	1"=20'
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PROJ. MGR.	LSF
JOB NO.	21081.00
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**28 ROUNDABOUT  
SCHEMATIC  
DESIGN PLAN**







**PAVEMENT NOTES**

**PROPOSED FULL DEPTH PAVEMENT**

- SURFACE: 1 1/2" SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5) OVER 0.07 GALUSY TACK COAT OVER
- INTERMEDIATE: 2 1/2" SUPERPAVE INTERMEDIATE COURSE - 19.0 (SIC - 19.0) OVER 0.07 GALUSY TACK COAT OVER
- BASE: 4" SUPERPAVE BASE COURSE 37.5 - (SBC - 37.5) OVER
- SUB-BASE: 4" DENSE GRADED CRUSHED STONE OVER 8" GRAVEL BORROW (M1.03.0 TYPE b)

**PROPOSED PAVEMENT MILLING AND OVERLAY**

- SURFACE: 1 1/2" SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5) OVER 0.09 GALUSY TACK COAT OVER VARIABLE DEPTH PAVEMENT FINE MILLING

**PROPOSED CEMENT CONCRETE SIDEWALK / WHEELCHAIR RAMP**

- SURFACE: 4" CEMENT CONCRETE (AIR ENTRAINED 4,000 PSI, 3/4", 610)
- FOUNDATION: 8" GRAVEL BORROW (M1.03.0 TYPE b)

**PROPOSED CEMENT CONCRETE SIDEWALK AT DRIVEWAYS**

- SURFACE: 6" CEMENT CONCRETE (AIR ENTRAINED 4,000 PSI, 3/4", 610)
- FOUNDATION: 8" GRAVEL BORROW (M1.03.0 TYPE b)

**PROPOSED HOT MIX ASPHALT SIDEWALK**

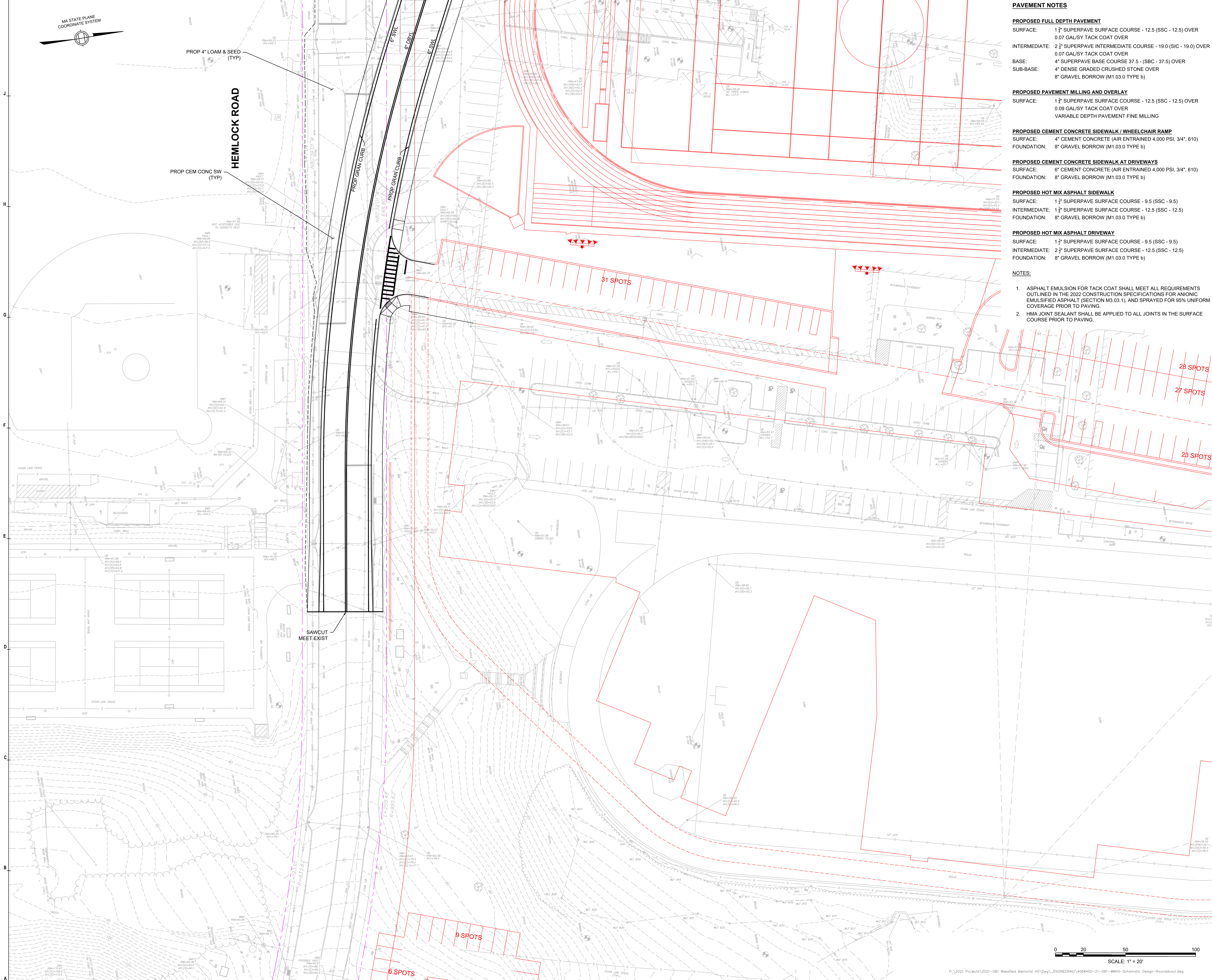
- SURFACE: 1 1/2" SUPERPAVE SURFACE COURSE - 9.5 (SSC - 9.5)
- INTERMEDIATE: 1 1/2" SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5)
- FOUNDATION: 8" GRAVEL BORROW (M1.03.0 TYPE b)

**PROPOSED HOT MIX ASPHALT DRIVEWAY**

- SURFACE: 1 1/2" SUPERPAVE SURFACE COURSE - 9.5 (SSC - 9.5)
- INTERMEDIATE: 2 1/2" SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5)
- FOUNDATION: 8" GRAVEL BORROW (M1.03.0 TYPE b)

**NOTES:**

- ASPHALT EMULSION FOR TACK COAT SHALL MEET ALL REQUIREMENTS OUTLINED IN THE 2022 CONSTRUCTION SPECIFICATIONS FOR ANIONIC EMULSIFIED ASPHALT (SECTION M3.03.1), AND SPRAYED FOR 95% UNIFORM COVERAGE PRIOR TO PAVING.
- HMA JOINT SEALANT SHALL BE APPLIED TO ALL JOINTS IN THE SURFACE COURSE PRIOR TO PAVING.

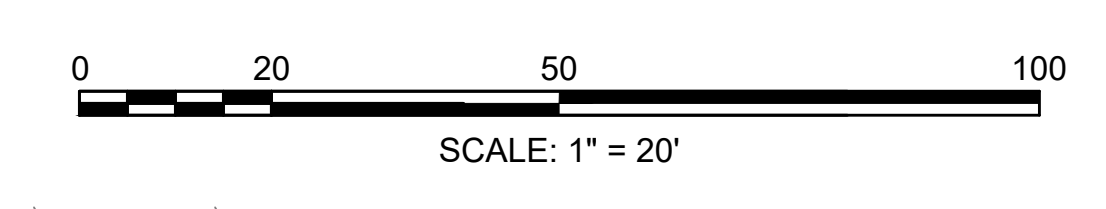


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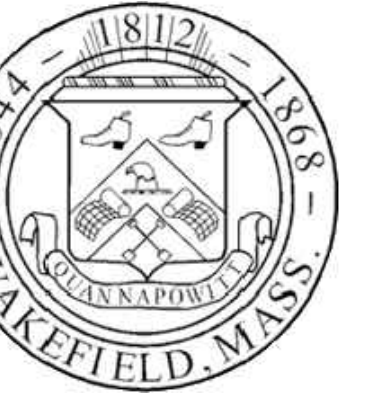
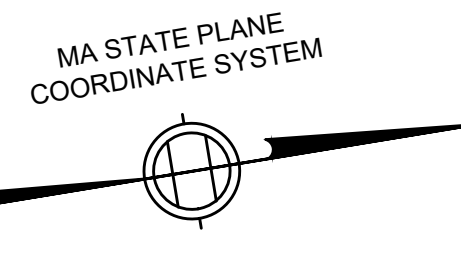
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PROJ. MGR.	LSF
JOB NO.	2181.00
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**ROUNDBOUT SCHEMATIC DESIGN PLAN**







**PAVEMENT NOTES**

**PROPOSED FULL DEPTH PAVEMENT**

SURFACE: 1 1/2" SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5) OVER 0.07 GALUSY TACK COAT OVER  
INTERMEDIATE: 2 1/2" SUPERPAVE INTERMEDIATE COURSE - 19.0 (SIC - 19.0) OVER 0.07 GALUSY TACK COAT OVER  
BASE: 4" SUPERPAVE BASE COURSE 37.5 - (SBC - 37.5) OVER  
SUB-BASE: 4" DENSE GRADED CRUSHED STONE OVER 8" GRAVEL BORROW (M1.03.0 TYPE b)

**PROPOSED PAVEMENT MILLING AND OVERLAY**

SURFACE: 1 1/2" SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5) OVER 0.09 GALUSY TACK COAT OVER  
VARIABLE DEPTH PAVEMENT FINE MILLING

**PROPOSED CEMENT CONCRETE SIDEWALK / WHEELCHAIR RAMP**

SURFACE: 4" CEMENT CONCRETE (AIR ENTRAINED 4,000 PSI, 3/4", 610)  
FOUNDATION: 8" GRAVEL BORROW (M1.03.0 TYPE b)

**PROPOSED CEMENT CONCRETE SIDEWALK AT DRIVEWAYS**

SURFACE: 6" CEMENT CONCRETE (AIR ENTRAINED 4,000 PSI, 3/4", 610)  
FOUNDATION: 8" GRAVEL BORROW (M1.03.0 TYPE b)

**PROPOSED HOT MIX ASPHALT SIDEWALK**

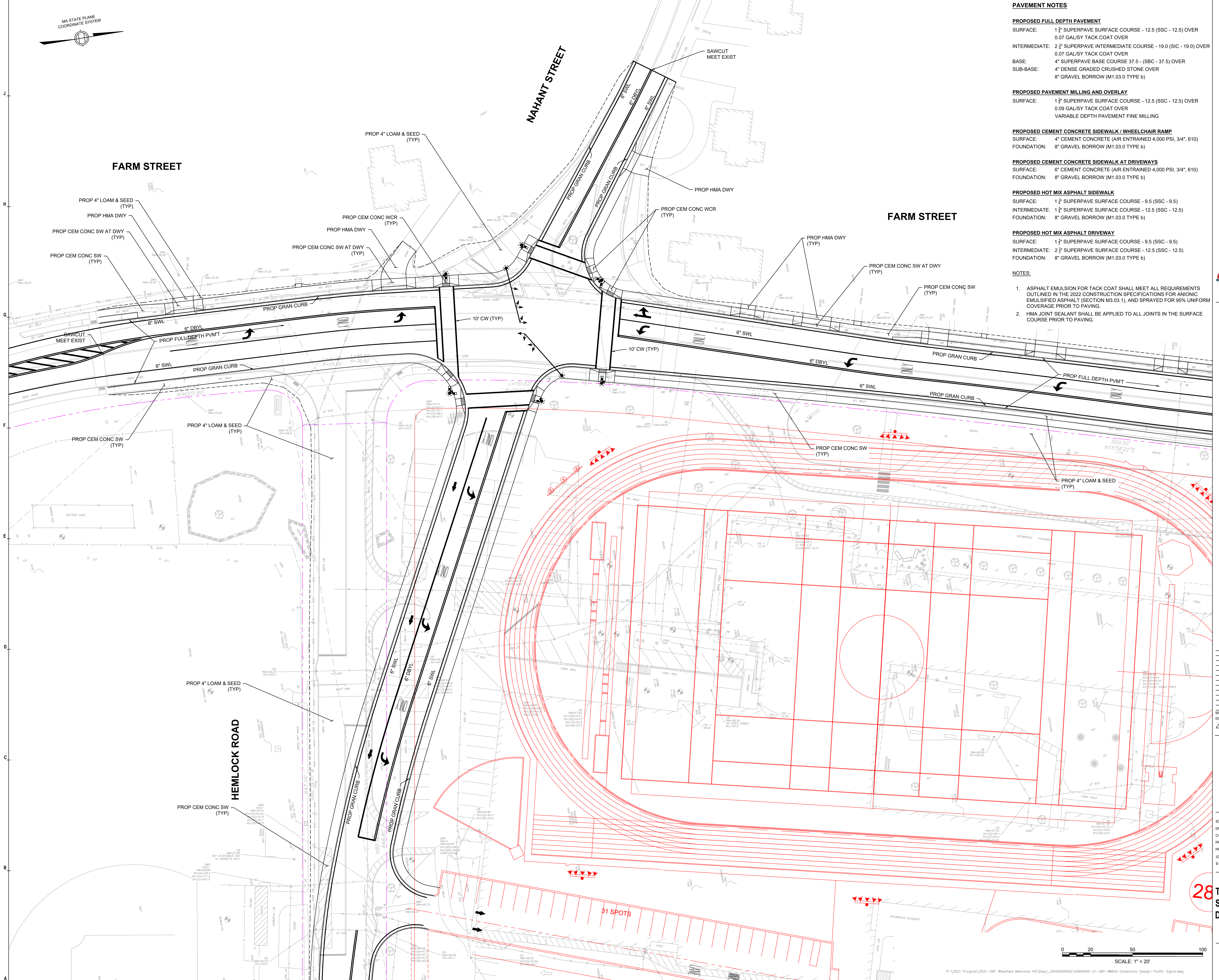
SURFACE: 1 1/2" SUPERPAVE SURFACE COURSE - 9.5 (SSC - 9.5)  
INTERMEDIATE: 1 1/2" SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5)  
FOUNDATION: 8" GRAVEL BORROW (M1.03.0 TYPE b)

**PROPOSED HOT MIX ASPHALT DRIVEWAY**

SURFACE: 1 1/2" SUPERPAVE SURFACE COURSE - 9.5 (SSC - 9.5)  
INTERMEDIATE: 2 1/2" SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5)  
FOUNDATION: 8" GRAVEL BORROW (M1.03.0 TYPE b)

**NOTES:**

- 1. ASPHALT EMULSION FOR TACK COAT SHALL MEET ALL REQUIREMENTS OUTLINED IN THE 2022 CONSTRUCTION SPECIFICATIONS FOR ANIONIC EMULSIFIED ASPHALT (SECTION M3.03.1), AND SPRAYED FOR 95% UNIFORM COVERAGE PRIOR TO PAVING.
- 2. HMA JOINT SEALANT SHALL BE APPLIED TO ALL JOINTS IN THE SURFACE COURSE PRIOR TO PAVING.

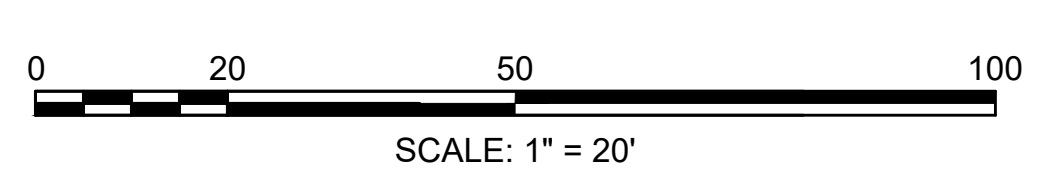


MARK	DATE	DESCRIPTION
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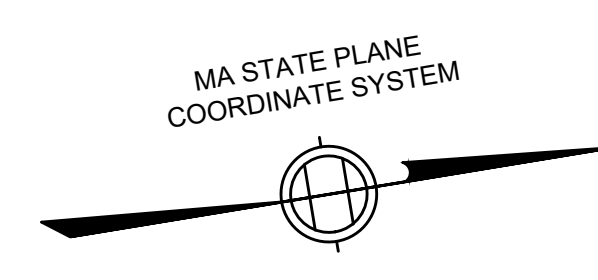
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**28** TRAFFIC SIGNAL SCHEMATIC DESIGN PLAN







1	02/08/2022	SD ESTIMATE SET
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ISSUE LOG		
△		± CLOUDED CHANGE

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**TRAFFIC SIGNAL SCHEMATIC DESIGN PLAN**

**PAVEMENT NOTES**

**PROPOSED FULL DEPTH PAVEMENT**

- SURFACE: 1 1/2" SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5) OVER 0.07 GALUSY TACK COAT OVER
- INTERMEDIATE: 2 1/2" SUPERPAVE INTERMEDIATE COURSE - 19.0 (SIC - 19.0) OVER 0.07 GALUSY TACK COAT OVER
- BASE: 4" SUPERPAVE BASE COURSE 37.5 - (SBC - 37.5) OVER
- SUB-BASE: 4" DENSE GRADED CRUSHED STONE OVER 8" GRAVEL BORROW (M1.03.0 TYPE b)

**PROPOSED PAVEMENT MILLING AND OVERLAY**

- SURFACE: 1 1/2" SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5) OVER 0.09 GALUSY TACK COAT OVER
- VARIABLE DEPTH PAVEMENT FINE MILLING

**PROPOSED CEMENT CONCRETE SIDEWALK / WHEELCHAIR RAMP**

- SURFACE: 4" CEMENT CONCRETE (AIR ENTRAINED 4,000 PSI, 3/4", 610)
- FOUNDATION: 8" GRAVEL BORROW (M1.03.0 TYPE b)

**PROPOSED CEMENT CONCRETE SIDEWALK AT DRIVEWAYS**

- SURFACE: 6" CEMENT CONCRETE (AIR ENTRAINED 4,000 PSI, 3/4", 610)
- FOUNDATION: 8" GRAVEL BORROW (M1.03.0 TYPE b)

**PROPOSED HOT MIX ASPHALT SIDEWALK**

- SURFACE: 1 1/2" SUPERPAVE SURFACE COURSE - 9.5 (SSC - 9.5)
- INTERMEDIATE: 1 1/2" SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5)
- FOUNDATION: 8" GRAVEL BORROW (M1.03.0 TYPE b)

**PROPOSED HOT MIX ASPHALT DRIVEWAY**

- SURFACE: 1 1/2" SUPERPAVE SURFACE COURSE - 9.5 (SSC - 9.5)
- INTERMEDIATE: 2 1/2" SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5)
- FOUNDATION: 8" GRAVEL BORROW (M1.03.0 TYPE b)

**NOTES:**

- ASPHALT EMULSION FOR TACK COAT SHALL MEET ALL REQUIREMENTS OUTLINED IN THE 2022 CONSTRUCTION SPECIFICATIONS FOR ANIONIC EMULSIFIED ASPHALT (SECTION M3.03.1), AND SPRAYED FOR 95% UNIFORM COVERAGE PRIOR TO PAVING.
- HMA JOINT SEALANT SHALL BE APPLIED TO ALL JOINTS IN THE SURFACE COURSE PRIOR TO PAVING.

