

# Transportation Impact Assessment

Proposed Multifamily Residential Development  
School Street  
Manchester-By-The-Sea, Massachusetts

*Prepared for:*

SLV School Street, LLC  
Needham, Massachusetts

September 2020  
Updated December 2021

*Prepared by:*

 **Vanasse &  
Associates inc**  
Transportation Engineers & Planners

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Dear Reviewer:

This letter shall certify that this *Transportation Impact Assessment* has been prepared under my direct supervision and responsible charge. I am a Registered Professional Engineer (P.E.) in the Commonwealth of Massachusetts (Massachusetts P.E. No. 38871, Civil) and hold Certification as a Professional Traffic Operations Engineer (PTOE) from the Transportation Professional Certification Board, Inc. (TPCB), an independent affiliate of the Institute of Transportation Engineers (ITE) (PTOE Certificate No. 993). I am also a Fellow of the Institute of Transportation Engineers (FITE).

Sincerely,

VANASSE & ASSOCIATES, INC.



Jeffrey S. Dirk, P.E., PTOE, FITE  
Managing Partner

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## PREFACE

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Vanasse & Associates, Inc. (VAI) has prepared an update to the September 2020 *Transportation Impact Assessment* (TIA) that was prepared in support of The Sanctuary multifamily residential development, which is proposed to be located off School Street in Manchester-by-the-Sea, Massachusetts. This update has been prepared to address the following changes that have occurred since the publication of the September 2020 TIA:

- The development program has been reduced from 157 residential units to 136 units;
- The study area has been expanded along School Street to include intersections to the south of the Route 128 interchange as requested by the Zoning Board of Appeals and Town Staff; and
- New traffic count data has been obtained for School Street and the study area intersections that was collected in November 2021 and coordinated with Town Departments.

In addition, since the publication of the September 2020 TIA, the Institute of Transportation Engineers (ITE) has published an update to *Trip Generation*<sup>1</sup> in September 2021, which includes updated trip-generation data for various land uses, including for multifamily residential communities. Accordingly, the trip-generation calculations for the project have also been revised to use the current trip-generation data.

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<sup>1</sup>*Trip Generation*, 11<sup>th</sup> Edition; Institute of Transportation Engineers; Washington, DC; 2021.

## EXECUTIVE SUMMARY

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Vanasse & Associates, Inc. (VAI) has conducted a Transportation Impact Assessment (TIA) in order to determine the potential impacts on the transportation infrastructure associated with the proposed construction of a multifamily residential community to be known as The Sanctuary that will be located off School Street in Manchester-by-the-Sea, Massachusetts (hereafter referred to as the Project). This assessment was prepared in consultation with the Town of Manchester-by-the-Sea and the Massachusetts Department of Transportation (MassDOT), and was performed in accordance with MassDOT's *Transportation Impact Assessment (TIA) Guidelines* and the standards of the Traffic Engineering and Transportation Planning professions for the preparation of such reports.

Based on this assessment, we have concluded the following with respect to the Project:

1. Using trip-generation statistics published by the Institute of Transportation Engineers (ITE),<sup>2</sup> the Project is expected to generate approximately 948 vehicle trips on an average weekday (two-way, 24-hour volume), with 65 vehicle trips expected during the weekday morning peak-hour and 79 vehicle trips expected during the weekday evening peak-hour;
2. The Project will not have a significant impact (increase) on motorist delays or vehicle queuing over Existing or anticipated future conditions without the Project (No-Build conditions), acknowledging that one or more movements at the study area intersections are currently or are predicted to operate at or over capacity (i.e., level-of-service (LOS) "E" of "F", respectively) independent of the Project, with Project-related impacts on these movements generally characterized by a predicted increase in average motorist delay that resulted in an increase in vehicle queuing by up to five (5) vehicles;
3. All movements at the Project site driveway intersection with School Street are predicted to operate at LOS B or better during the peak hours, with vehicle queues of up to one (1) vehicle;
4. No apparent safety deficiencies were noted with respect to the motor vehicle crash history at the study area intersections, with all of the intersections found to have motor vehicle crash rates that are *below* the MassDOT average crash rates for similar intersections; and

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<sup>2</sup>*Trip Generation*, 11<sup>th</sup> Edition; Institute of Transportation Engineers; Washington, DC; 2021.

5. The available lines of sight at the Project site driveway intersection with School Street were found to exceed the recommended minimum sight distances to function in a safe and efficient manner.

In consideration of the above, we have concluded that the Project can be accommodated within the confines of the existing transportation infrastructure in a safe and efficient manner with implementation of the recommendations that follow.

## **RECOMMENDATIONS**

A detailed transportation improvement program has been developed that is designed to provide safe and efficient access to the Project site and address any deficiencies identified at off-site locations evaluated in conjunction with this study. The following improvements have been recommended as a part of this evaluation and, where applicable, will be completed in conjunction with the Project subject to receipt of all necessary rights, permits, and approvals.

### **Project Access**

Access to the Project site will be provided by way of a new driveway that will intersect the west side of School Street approximately 135 feet north of Atwater Avenue. A raised island is proposed along a portion of the driveway approaching School Street that separates entering and exiting traffic, transitioning thereafter to a non-divided access. The following recommendations are offered with respect to the design and operation of the Project site access and internal circulation, many of which are reflected on the Site Plans:

- The section of the Project site driveway that includes the raised island will provide two (2) 14-foot wide travel lanes separated by a 4-foot wide raised median. The non-boulevard section of the driveway will be 24-feet wide and designed to accommodate the turning and maneuvering requirements of the largest anticipated responding emergency vehicle.
- Where perpendicular parking is proposed, the drive aisle behind the parking will be a minimum of 23-feet in order to facilitate parking maneuvers.
- Vehicles exiting the Project site will be placed under STOP-sign control with a marked STOP-line provided.
- All signs and pavement markings to be installed within the Project site will conform to the applicable standards of the *Manual on Uniform Traffic Control Devices* (MUTCD).<sup>3</sup>
- Americans with Disabilities Act (ADA)-compliant wheelchair ramps will be provided at all pedestrian crossings that are to be constructed or modified as a part of the Project.
- Signs and landscaping to be installed as a part of the Project within the sight triangle areas of the Project site roadway will be designed and maintained so as not to restrict lines of sight.
- Snow accumulations (windrows) within sight triangle areas of the Project site driveway will be promptly removed where such accumulations would impede sight lines.

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<sup>3</sup>*Manual on Uniform Traffic Control Devices (MUTCD)*; Federal Highway Administration; Washington, D.C.; 2009.

- Consideration will be given to providing accommodations for electric vehicle charging for residents of the Project.

## **Off-Site**

### **School Street at the Route 128 Ramps**

The addition of Project-related traffic to the Route 128 southbound off-ramp was shown to result in an increase in average motorist delay over No-Build conditions of 12.0 seconds during the weekday morning peak-hour that caused a degradation in LOS from LOS D to LOS E during the weekday morning peak-hour and of 14.9 seconds during the weekday evening peak-hour that caused a degradation in LOS from LOS E to LOS F, with vehicle queues shown to increase by up to one (1) vehicle. All movements from the Route 128 northbound ramps to School Street are currently operating over capacity independent of the Project, with Project-related impacts generally defined by a predicted increase in motorist delays that resulted in an increase in vehicle queuing of up to five (5) vehicles.

In an effort to identify potential improvement measures for the ramp intersections, the Project proponent will conduct an improvement study for the Route 128 north and southbound ramp intersections with School Street that will include performing a detailed Traffic Signal Warrants Analysis (TSWA) in accordance with the methodology defined in the MUTCD<sup>4</sup> and evaluating the reconfiguration of the intersections as modern roundabouts. The study will include the preparation of conceptual improvement plans depicting each of the improvement alternatives that are evaluated and the necessary information to allow the Town to apply for state funding for the recommended improvement strategy. The improvement study will be conducted in consultation with the Town and MassDOT, and will be provided to the Town prior to the issuance of a Certificate of Occupancy for the Project.

## **Transportation Demand Management**

Regularly scheduled public transportation services are provided to the Town of Manchester-by-the-Sea, but are not available at the Project site. The Massachusetts Bay Transportation Authority (MBTA) provides Commuter Rail service to North Station in Boston on the Newburyport/Rockport Line from Manchester-by-the-Sea Station, which is located at 40 Beach Street (an approximate 7-minute driving distance to the south of the Project site). In addition, the Manchester-by-the-Sea Council On Aging (COA) provides transportation services to seniors for shopping and recreational activities. In an effort to reduce the overall number of automobile trips in the area and to integrate the Project into the available transportation resources, the following Transportation Demand Management (TDM) measures will be implemented as a part of the Project:

- Information regarding public transportation services, maps, schedules, and fare information will be posted in a central location and/or otherwise made available to residents;
- A “welcome packet” will be provided to new residents detailing available public transportation services, bicycle and walking alternatives, and commuter options;

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<sup>4</sup>Ibid.

- Pedestrian accommodations will be incorporated into the Project and consist of sidewalks and ADA-compliant wheelchair ramps at all pedestrian crossings that are to be constructed or modified as a part of the Project;
- Work-at-home workspaces will be provided to support telecommuting by residents of the Project;
- An internal mail room will be provided within the building; and
- Bicycle parking will be provided consisting of both an exterior bicycle rack located proximate to the building entrance and weather protected bicycle parking within the proposed parking garage.

With implementation of the aforementioned recommendations, safe and efficient access will be provided to the Project site and the Project can be accommodated within the confines of the existing and improved transportation system.

## INTRODUCTION

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Vanasse & Associates, Inc. (VAI) has conducted a Transportation Impact Assessment (TIA) in order to determine the potential impacts on the transportation infrastructure associated with the proposed construction of a multifamily residential community to be known as The Sanctuary that will be located off School Street in Manchester-by-the-Sea, Massachusetts (hereafter referred to as the Project). This study evaluates the following specific areas as they relate to the Project: i) access requirements; ii) potential off-site improvements; and iii) safety considerations; and identifies and analyzes existing traffic conditions and future traffic conditions, both with and without the Project, along School Street and at major intersections located along this roadway through which Project-related traffic will travel.

## PROJECT DESCRIPTION

The Project will entail the construction of a 136-unit multifamily residential development to be known as The Sanctuary that will be located off School Street in Manchester-by-the-Sea, Massachusetts. The Project site is located along the west side of School Street, north of Route 128 Exit 50 and generally opposite Atwater Avenue, and encompasses approximately 23.3± acres of land that is bounded by areas of open and wooded space to the north; Yankee Division Highway (Route 128) and areas of open and wooded space to the south; School Street and areas of open and wooded space to the east; and Old School Street and areas of open and wooded space to the west. Figure 1 depicts the Project site location in relation to the existing roadway network. The Project site currently consist of areas of open and wooded space.

Access to the Project site will be provided by way of a new driveway that will intersect west side of School Street approximately 135 feet north of Atwater Avenue. On-site parking will be provided for 242 vehicles, or an approximate parking ratio of 1.78 spaces per unit. The proposed parking supply exceeds the number of parking spaces that are required for the Project pursuant to Section 6.2, *Off-Street Parking and Driveway/Curb Cut Regulations*, of the Town Zoning By-Law.<sup>5</sup>

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<sup>5</sup>The Zoning By-Law requires that 2.0 parking spaces be provided for one dwelling unit, that 3.0 parking spaces be provided for two dwelling units, that 5.0 parking spaces be provided for three dwelling units, and that 6.0 parking spaces be provided for four dwelling units.



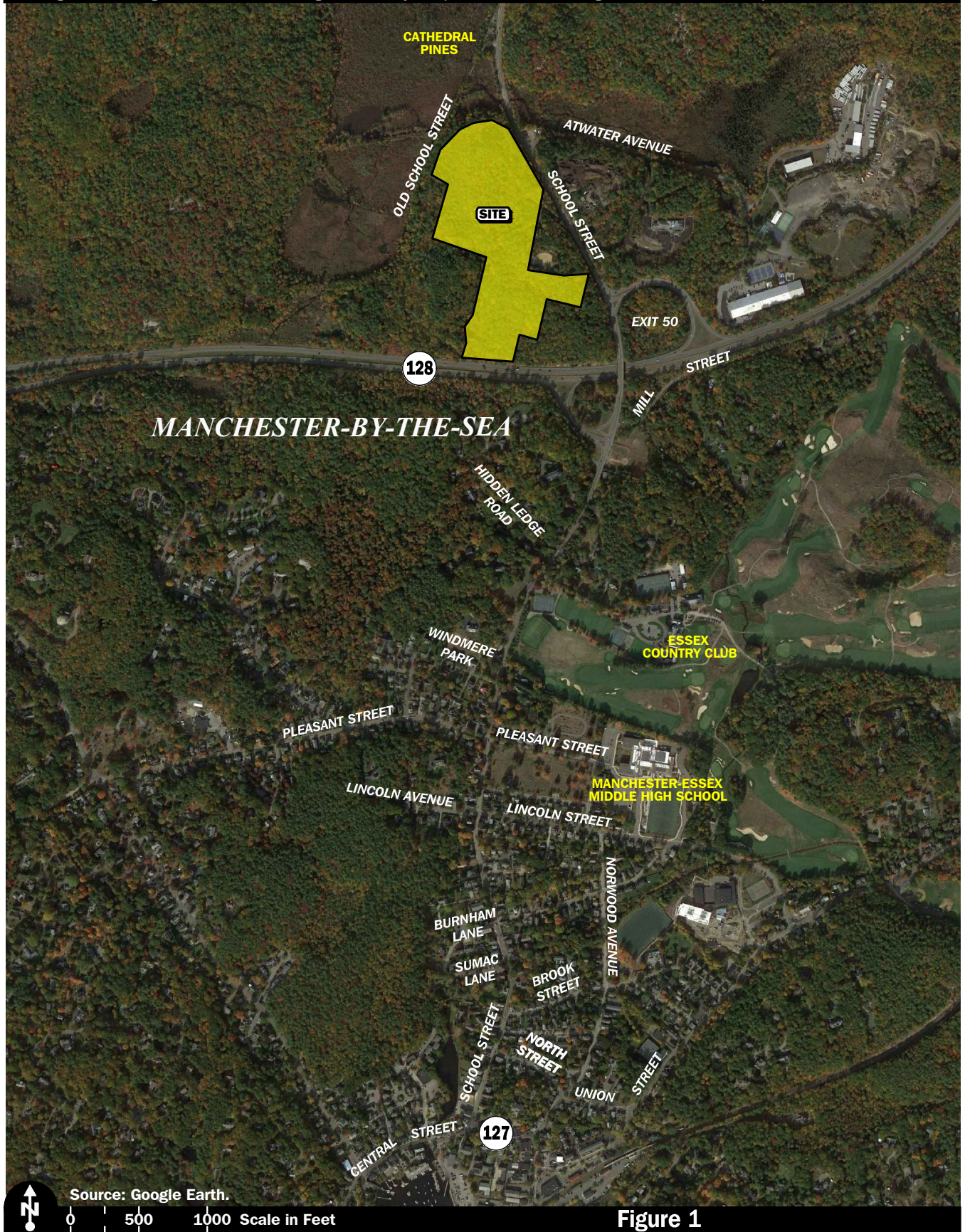


Figure 1

Site Location Map



## **STUDY METHODOLOGY**

This study was prepared in consultation with the Town of Manchester-by-the-Sea and the Massachusetts Department of Transportation (MassDOT); was performed in accordance with MassDOT's *Transportation Impact Assessment (TIA) Guidelines* and the standards of the Traffic Engineering and Transportation Planning professions for the preparation of such reports; and was conducted in three distinct stages.

The first stage involved an assessment of existing conditions in the study area and included an inventory of roadway geometrics; pedestrian and bicycle facilities; observations of traffic flow; and collection of daily and peak-period traffic counts.

In the second stage of the study, future traffic conditions were projected and analyzed. Specific travel demand forecasts for the Project were assessed along with future traffic demands due to expected traffic growth independent of the Project. The future conditions horizon year was established as 2029 in order to be consistent with the seven-year planning horizon specified in MassDOT's *Transportation Impact Assessment (TIA) Guidelines* given that this assessment is being published in late December 2021. The traffic analysis conducted in stage two identifies existing or projected future roadway capacity, traffic safety, and site access issues.

The third stage of the study presents and evaluates measures to address traffic and safety issues, if any, identified in stage two of the study.

## **EXISTING CONDITIONS**

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A comprehensive field inventory of existing conditions within the study area was conducted in July 2020 and updated in November and December 2021. The field investigation consisted of an inventory of existing roadway geometrics; pedestrian and bicycle facilities; public transportation services; traffic volumes; and operating characteristics; as well as posted speed limits and land use information within the study area. The study area that was assessed for the Project consisted of School Street and the following specific intersections through which Project-related traffic will travel: School Street at Atwater Avenue; School Street at the Route 128 southbound ramps; School Street at the Route 128 northbound ramps and Mill Street; School Street at Pleasant Street; School Street at Lincoln Street and Lincoln Avenue; and Central Street/Union Street (Route 127) at School Street.

The following describes the study area roadway and intersections.

### **ROADWAY**

#### **School Street**

- Two-lane urban minor arterial roadway under Town jurisdiction with the exception of the segment of School Street between and including the Route 128 ramps where the roadway is under MassDOT jurisdiction;
- Traverses the study area in a general north-south direction between Union Street/Central Street (Route 127) and Old School Street, where School Street becomes Southern Avenue;
- Provides two 12 to 20-foot wide travel lanes that are separated by a double-yellow centerline with 2 to 12-foot wide marked shoulders;
- The posted speed limit is 35 miles per hour (mph) in the vicinity of the Project site;
- A sidewalk is provided along one or both sides of School Street between Route 127 and the Route 128 southbound ramps;
- Illumination is not provided in the vicinity of the Project site;
- Land use within the study area consists of the Project site, the Essex Country Club, the Rosedale Cemetery, William K. Hinckley, Jr. Memorial Park, residential and commercial properties, a fire station, and areas of open and wooded space.

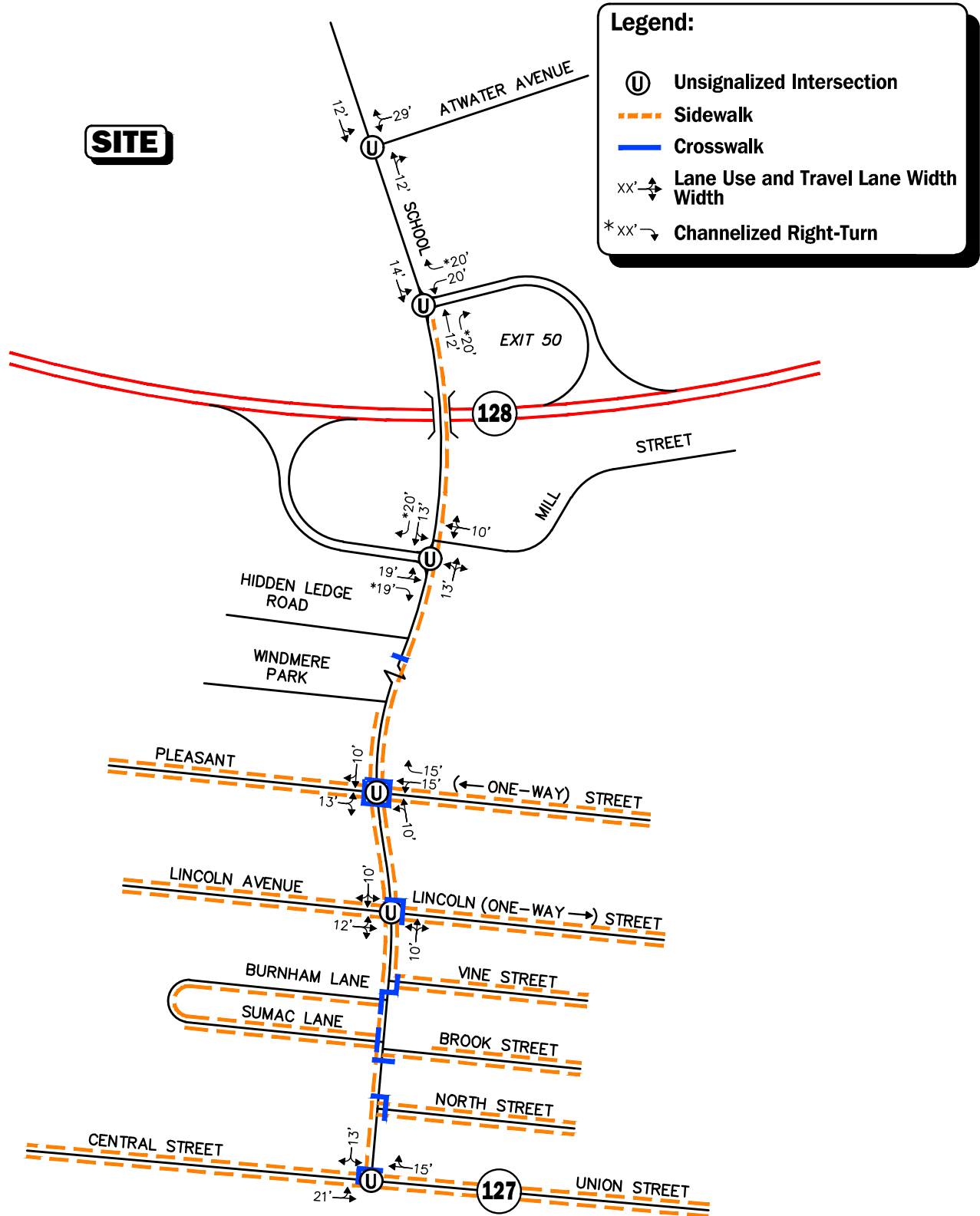
## INTERSECTIONS

Table 1 and Figure 2 summarize lane use, traffic control, and pedestrian and bicycle accommodations at the study area intersections as observed in July 2020 and backchecked in December 2021.

**Table 1**  
**STUDY AREA INTERSECTION DESCRIPTION**

<b>Intersection</b>	<b>Traffic Control Type<sup>a</sup></b>	<b>No. of Travel Lanes Provided</b>	<b>Shoulder Provided? (Yes/No/Width)</b>	<b>Pedestrian Accommodations? (Yes/No/Description)</b>	<b>Bicycle Accommodations? (Yes/No/Description)</b>
School St. at Atwater St.	S	1 general purpose lane on all approaches	Yes; 2 feet on School St.	No	Yes; Shared traveled-way along School St. <sup>b</sup>
Rte. 128 SB Ramps at School St.	S	1 general-purpose travel lane and 1 channelized right-turn lane on School St. NB approach, 1 general-purpose travel lane on School St. SB approach, Rte. 128 off-ramp diverges to provide separate channelized left and right-turn lanes	Yes; 2 to 11-feet on School St. and 2-feet on Rte. 128 SB on and off-ramps	Yes; sidewalk along the east side of School St. south of the intersection	Yes; Shared traveled-way along School St.
Rte. 128 NB Ramps at School St. and Mill St.	S	1 general-purpose travel lane on School St. NB approach, 1 general-purpose travel lane and 1 channelized right-turn lane on School St. SB approach, 1 general purpose-travel lane on Mill St. approach, Rte. 128 off-ramp diverges to provide separate channelized left and right-turn lanes	Yes; 2 to 12-feet on School St., 2-feet on Rte. 128 NB on and off-ramps and 1 foot on Mill St.	Yes; sidewalk along the east side of School St.	Yes; Shared traveled-way along School St.
School St. at Pleasant St.	S (all-way)	1 left-turn/through travel lane and 1 right-turn travel lane on Pleasant St. westbound approach, 1 general purpose travel lane on all other approaches; Pleasant St. is one-way westbound (towards School St.)	Yes; 1 to 4-feet on School St.	Yes; sidewalks along both sides of the intersecting roadways; crosswalks provided across all legs	Yes; Shared traveled-way along Pleasant St.

See notes at end of table.



**Figure 2**

**Existing Intersection Lane Use, Travel Lane Width, and Pedestrian Facilities**

**Table 1 (Continued)**  
**STUDY AREA INTERSECTION DESCRIPTION**

Intersection	Traffic Control Type <sup>a</sup>	No. of Travel Lanes Provided	Shoulder Provided? (Yes/No/Width)	Pedestrian Accommodations? (Yes/No/Description)	Bicycle Accommodations? (Yes/No/Description)
School St. at Lincoln St. and Lincoln Ave.	S	1 general-purpose travel lane on all approaches, Lincoln St. is one-way eastbound (away from School St.)	Yes; 1 to 5-feet on School St.	Yes; sidewalks along both sides of the intersecting roadways; crosswalks provided across the School St. north leg and across Lincoln St.	No
Rte. 127 at School St.	S	1 general-purpose travel lane on all approaches; on-street parking is provided along both sides of Rte. 127 west of the intersection	No	Yes; sidewalks along both sides of the intersecting roadways; crosswalks provided across School St. and the Rte. 127 west leg	Yes; Shared traveled-way along Rte. 127

<sup>a</sup>S = STOP-sign control.

<sup>b</sup>Combined shoulder and travel lane width equal to or exceed 14 feet.

NB= northbound; SB= southbound; EB= eastbound; WB = westbound

## **EXISTING TRAFFIC VOLUMES**

In order to determine existing traffic-volume demands and flow patterns within the study area, automatic traffic recorder (ATR) counts and manual turning movement and vehicle classification counts (TMCs) were completed in November 2021 while public schools were in regular session. The ATR counts were conducted on November 9<sup>th</sup> through 10<sup>th</sup>, 2021 (Tuesday through Wednesday, inclusive) on School Street in the vicinity of the Project site in order to record traffic volumes over an extended period, with weekday morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak-period manual TMCs performed at the study intersections on Tuesday, November 9<sup>th</sup>, 2021. These time periods were selected for analysis purposes as they are representative of the peak traffic volume hours for both the Project and the adjacent roadway network.

## **Traffic-Volume Adjustments**

In order to evaluate the potential for seasonal fluctuation of traffic volumes within the study area, traffic volume data from MassDOT Continuous Count Station No. 35 located on Route 128 in Beverly were reviewed.<sup>6</sup> Based on a review of this data, it was determined that traffic volumes for the month of November are approximately 4.6 percent below average-month conditions. As such, the November traffic volumes were adjusted upward by 4.6 percent in order to be representative of average-month conditions.

In order to account for the impact on traffic volumes and trip patterns resulting from the “safer-at-home” order and the phased “Reopening Massachusetts” plan that was issued by the Governor on May 18, 2020, in response to the COVID-19 pandemic, traffic-volume data collected at MassDOT Continuous Count Station No. 35 in November 2021 was compared to data collected at the same count station in November 2019. The 2019 traffic volumes were expanded to 2021 by applying the traffic growth procedure detailed in the April 2020 “Guidance on Traffic Counting

<sup>6</sup>MassDOT Traffic Volumes for the Commonwealth of Massachusetts; 2021.

Data” published by MassDOT<sup>7</sup> in order to allow for a comparison of the data. Based on this pre and post-COVID-19 traffic count data comparison, the 2021 traffic-volume data that was collected as a part of this assessment was adjusted upward by an additional 7.2 percent in order to account for the reduced traffic volumes resulting from the phased “Reopening Massachusetts” plan.

The 2021 Existing traffic volumes are summarized in Table 2, with the weekday morning and evening peak-hour traffic volumes graphically depicted on Figures 3 and 4, respectively. Note that the peak-hour traffic volumes presented in Table 2 were obtained from the TMCs and are reflected on the aforementioned figures.

**Table 2**  
**2021 EXISTING TRAFFIC VOLUMES**

Location/Peak Hour	AWT <sup>a</sup>	VPH <sup>b</sup>	K Factor <sup>c</sup>	Directional Distribution <sup>d</sup>
<i>School Street in the vicinity of the Project site:</i>	7,090	--	--	--
Weekday Morning (7:15 – 8:15 AM)	--	610	8.6	62.0% SB
Weekday Evening (4:00 – 5:00 PM)	--	623	8.8	54.6% NB

<sup>a</sup>Average weekday traffic in vehicles per day.

<sup>b</sup>Vehicles per hour.

<sup>c</sup>Percent of daily traffic occurring during the peak hour.

<sup>d</sup>Percent traveling in peak direction.

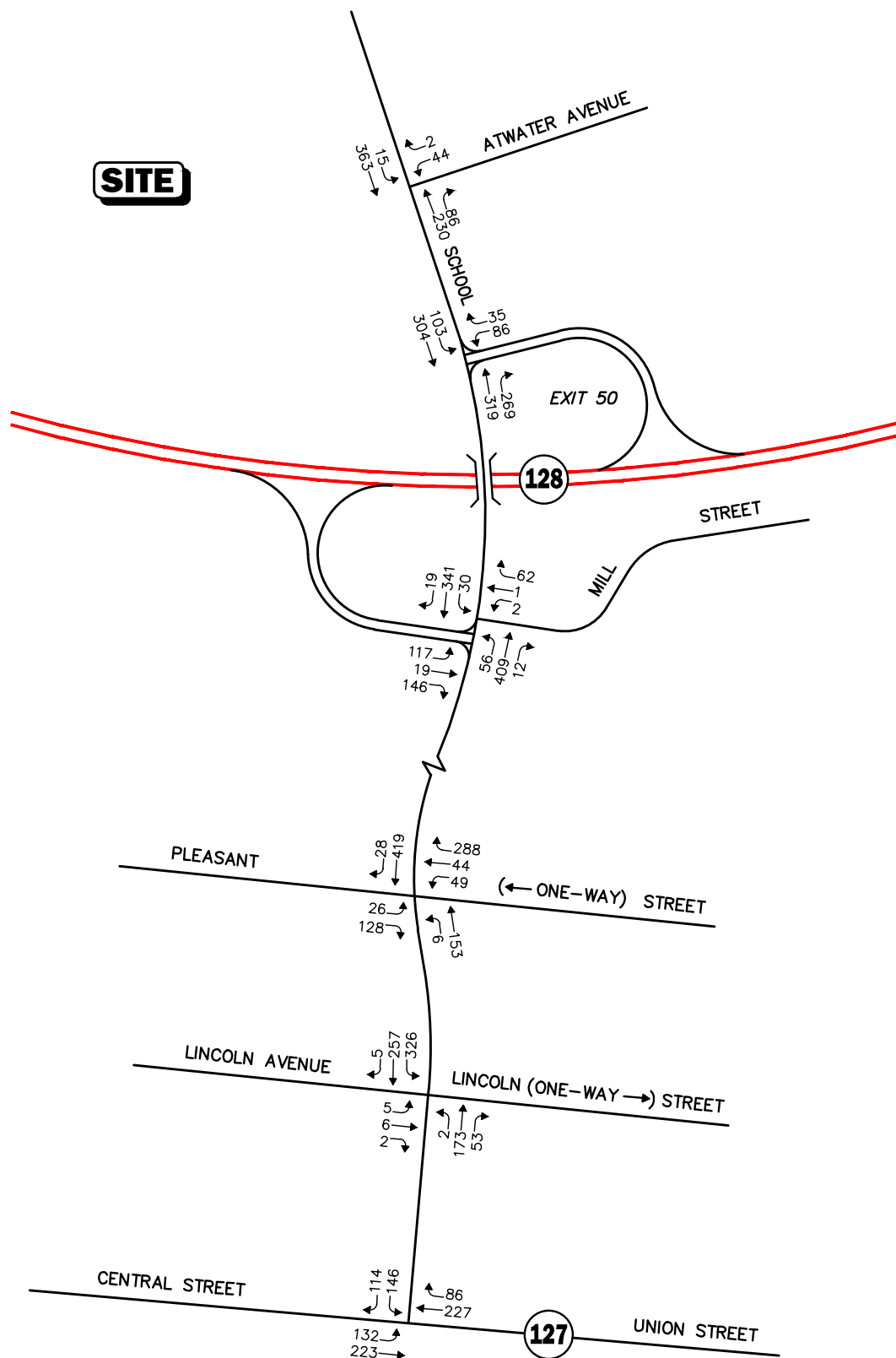
NB = northbound, SB= southbound

As can be seen in Table 2, School Street in the vicinity of the Project site accommodates approximately 7,090 vehicles on an average weekday (two-way, 24-hour volume), with 610 vehicles per hour (vph) accommodated during the weekday morning peak-hour and 623 vph accommodated during the weekday evening peak hour.

## **PEDESTRIAN AND BICYCLE FACILITIES**

A comprehensive field inventory of pedestrian and bicycle facilities within the study area was undertaken in December 2021. The field inventory consisted of a review of the location of sidewalks and pedestrian crossing locations along the study roadway and at the study intersections. As detailed on Figure 2, sidewalks are provided along the east side of School Street between Route 127 and the Route 128 southbound ramps; along the west side of School Street between Route 127 and Windemere Park; along both sides of Pleasant Street, Lincoln Street, Lincoln Avenue, Vine Street, Sumac Lane, North Street, and Route 127; along the south side of Burnham Lane; and along one or both sides of Brook Street. Marked crosswalks are provided for crossing School Street south of Hidden Hedge Road; all legs of the School Street/Pleasant Street intersection; the north leg of School Street and across Lincoln Street at the School Street/Lincoln Street/Lincoln Avenue intersection; the south leg of School Street and across Vine Street at the School Street/Vine Street intersection; across Burnham Lane and Sumac Lane at their intersections with School Street; School Street south of Brook Street; the north leg of School Street and across North Street at the School Street/North Street intersection; and the north leg of School Street and the west leg of Route 127 at the Route 127/School Street intersection.

<sup>7</sup>*Guidance on Traffic Count Data*; MassDOT; revised April 2020.



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

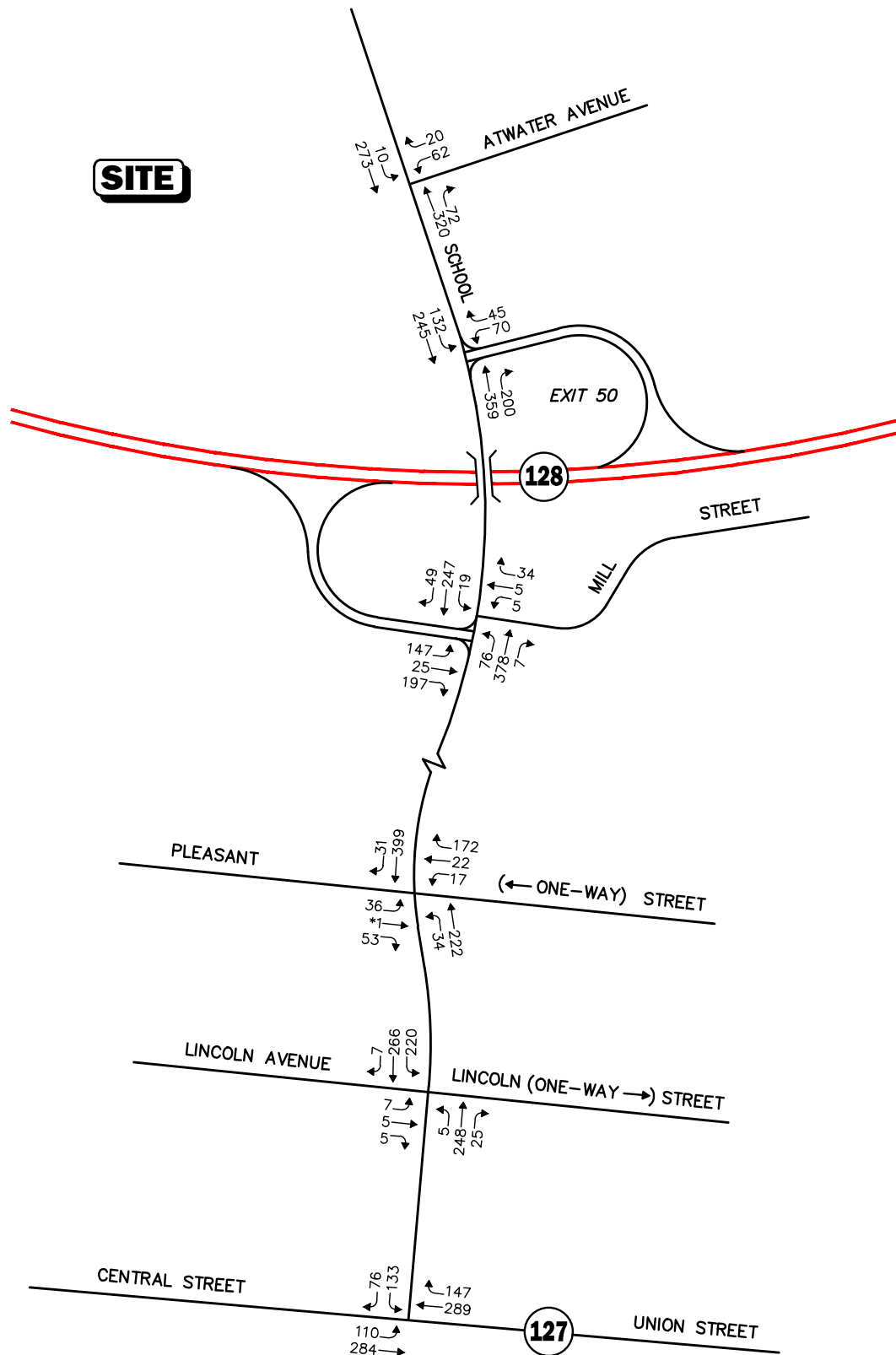
Not To Scale

**Figure 3**



**2021 Existing  
Weekday Morning  
Peak-Hour Traffic Volumes**





\*Illegal maneuver.

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

Not To Scale

Figure 4



2021 Existing  
Weekday Evening  
Peak-Hour Traffic Volumes

Formal bicycle facilities are not provided within the study area; however, School Street generally provides sufficient width (combined travel lane and shoulder) to support bicycle travel in a shared traveled-way configuration (i.e., motor vehicles and bicyclists sharing the roadway).<sup>8</sup>

## **PUBLIC TRANSPORTATION**

Regularly scheduled public transportation services are provided to the Town of Manchester-by-the-Sea, but are not available at the Project site. The Massachusetts Bay Transportation Authority (MBTA) provides Commuter Rail service to North Station in Boston on the Newburyport/Rockport Line from Manchester-by-the-Sea Station, which is located at 40 Beach Street (an approximate 7-minute driving distance to the south of the Project site). In addition, the Manchester-by-the-Sea Council On Aging (COA) provides transportation services to seniors for shopping and recreational activities.

The public transportation schedules and fare information are provided in the Appendix.

## **SPOT SPEED MEASUREMENTS**

Vehicle travel speed measurements were performed on School Street in the vicinity of the Project site in conjunction with the ATR counts. Table 3 summarizes the vehicle travel speed measurements.

**Table 3**  
**VEHICLE TRAVEL SPEED MEASUREMENTS**

	School Street	
	Northbound	Southbound
Mean Travel Speed (mph)	36	37
85 <sup>th</sup> Percentile Speed (mph)	43	43
Posted Speed Limit (mph)	35	35

mph = miles per hour.

As can be seen in Table 3, the mean vehicle travel speed along School Street in the vicinity of the Project site was found to be 36 mph in the northbound direction and 37 mph southbound. The measured 85<sup>th</sup> percentile vehicle travel speed, or the speed at which 85 percent of the observed vehicles traveled at or below, was found to be 43 mph in both the north and southbound directions, which is 8 mph above the posted speed limit on School Street in the vicinity of the Project site (35 mph). The 85<sup>th</sup> percentile speed is used as the basis of engineering design and in the evaluation of sight distances, and is often used in establishing posted speed limits.

<sup>8</sup>A minimum combined travel lane and paved shoulder width of 14-feet is required to support bicycle travel in a shared traveled-way condition.

## **MOTOR VEHICLE CRASH DATA**

Motor vehicle crash information for the study area intersections was provided by the MassDOT Highway Division Safety Management/Traffic Operations Unit for the most recent five-year period available (2015 through 2019, inclusive) in order to examine motor vehicle crash trends occurring within the study area. The data is summarized by intersection, type, severity, roadway and weather conditions, and day of occurrence, and presented in Table 4.

As it can be seen in Table 4, the study area intersections were found to have experienced an average of 1.6 or fewer reported motor vehicle crashes over the five-year review period, the majority of which occurred on a weekday, under clear weather conditions, during daylight, and involved angle type collisions that resulted in property damage only. All of the study intersections were found to have a motor vehicle crash rate *below* the MassDOT statewide and District average crash rates for an unsignalized intersection for the MassDOT Highway Division District in which the intersections are located (District 4).

A review of the MassDOT statewide High Crash Location List indicated that there are no locations within Manchester-by-the-Sea that are included on MassDOT's Highway Safety Improvement Program (HSIP) listing as high crash locations. In addition, no fatal motor vehicle crashes were reported to have occurred at the study area intersections over the five-year review period.

The detailed MassDOT Crash Rate Worksheets are provided in the Appendix.

**Table 4**  
**MOTOR VEHICLE CRASH DATA SUMMARY<sup>a</sup>**

	School Street/ Atwater Avenue	School Street/ Route 128 Southbound Ramps	School Street/ Route 128 Northbound Ramp	School Street/ Pleasant Street	School Street/ Lincoln Street/ Lincoln Avenue	Route 127/ School Street
Traffic Control Type: <sup>b</sup>	U	U	U	U	U	U
<i>Year:</i>						
2015	1	2	0	0	0	1
2016	0	2	0	1	0	0
2017	1	1	1	4	0	1
2018	0	0	0	2	0	1
<u>2019</u>	<u>0</u>	<u>2</u>	<u>3</u>	<u>1</u>	<u>0</u>	<u>0</u>
Total	2	7	4	8	0	3
Average	0.40	1.40	0.80	1.60	0.00	0.60
Rate <sup>c</sup>	0.13	0.33	0.17	0.40	0.00	0.14
MassDOT Crash Rate: <sup>d</sup>	0.57/0.57	0.57/0.57	0.57/0.57	0.57/0.57	0.57/0.57	0.57/0.57
Significant? <sup>e</sup>	No	No	No	No	No	No
<i>Type:</i>						
Angle	0	5	1	3	0	1
Rear-End	0	0	2	0	0	0
Head-On	0	1	0	1	0	0
Sideswipe	0	1	0	4	0	1
Single Vehicle Crash	2	0	1	0	0	1
<u>Unknown/Other</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	2	7	4	8	0	3
<i>Conditions:</i>						
Clear	1	7	3	7	0	3
Cloudy	1	0	1	1	0	0
Rain	0	0	0	0	0	0
Snow/Ice	0	0	0	0	0	0
<u>Not Reported</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	2	7	4	8	0	3
<i>Lighting:</i>						
Daylight	2	5	2	6	0	3
Dawn/Dusk	0	0	1	0	0	0
Dark (Road Lit)	0	1	0	2	0	0
<u>Dark (Road Unlit)</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	2	7	4	8	0	3
<i>Day of Week:</i>						
Monday through Friday	0	6	4	7	0	3
Saturday	1	1	0	1	0	0
<u>Sunday</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	2	7	4	8	0	3
<i>Severity:</i>						
Property Damage Only	0	3	2	8	0	1
Personal Injury	0	4	1	0	0	1
Not Reported	2	0	1	0	0	1
<u>Fatality</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	2	7	4	8	0	3

<sup>a</sup>Source: MassDOT Safety Management/Traffic Operations Unit records, 2015 through 2019.

<sup>b</sup>Traffic Control Type: U = unsignalized.

<sup>c</sup>Crash rate per million vehicles entering the intersection.

<sup>d</sup>Statewide/District crash rate.

<sup>e</sup>The intersection crash rate is significant if it is found to exceed the MassDOT statewide and/or District crash rate for the MassDOT Highway Division District in which the Project is located (District 4).

## **FUTURE CONDITIONS**

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Traffic volumes in the study area were projected to the year 2029 in order to be consistent with the seven-year planning horizon specified in MassDOT's *Transportation Impact Assessment (TIA) Guidelines* given that this assessment is being published in late December 2021. Independent of the Project, traffic volumes on the roadway network in the year 2029 under No-Build conditions include all existing traffic and new traffic resulting from background traffic growth. Anticipated Project-generated traffic volumes superimposed upon the 2029 No-Build traffic volumes reflect 2029 Build traffic volume conditions with the Project.

### **FUTURE TRAFFIC GROWTH**

Future traffic growth is a function of the expected land development in the immediate area and the surrounding region. Several methods can be used to estimate this growth. A procedure frequently employed estimates an annual percentage increase in traffic growth and applies that percentage to all traffic volumes under study. The drawback to such a procedure is that some turning volumes may actually grow at either a higher or a lower rate at particular intersections.

An alternative procedure identifies the location and type of planned development, estimates the traffic to be generated, and assigns it to the area roadway network. This procedure produces a more realistic estimate of growth for local traffic; however, potential population growth and development external to the study area would not be accounted for in the resulting traffic projections.

To provide a conservative analysis framework, both procedures were used, the salient components of which are described below.

#### **Specific Development by Others**

The Planning Department of the Town of Manchester-by-the-Sea was contacted in order to determine if there are any projects planned within the study area that would have an impact on future traffic volumes at the study intersections. Based on this consultation, the following project was identified for review in conjunction with this assessment.

- ***Proposed Parish Building, 189-193 School Street, Manchester-by-the-Sea, Massachusetts.*** This project entails the construction of an approximately 9,745 square foot (sf) parish building to be located at 189-193 School Street and the south of the Project site.

Traffic volumes associated with this project on a weekday and during the weekday commuter peak hours are expected to be relatively minor and would be reflected in the general background growth rate (discussion follows).

No other developments were identified at this time that are expected to result in an increase in traffic within the study area beyond the general background traffic growth rate.

### **General Background Traffic Growth**

Traffic-volume data compiled by MassDOT from permanent count stations located in Manchester-by-the-Sea, Beverly, Wenham, and Gloucester were reviewed in order to determine general traffic growth trends in the area. This data indicates that traffic volumes have fluctuated over the past several years, with the average growth rate found to be approximately 0.83 percent per year. In order to provide a prudent planning condition for the Project, a slightly higher 1.0 percent per year compounded annual traffic background growth rate was used in order to account for future traffic growth and presently unforeseen development within the study area.

### **Roadway Improvement Projects**

The Town of Manchester-by-the-Sea and MassDOT were contacted in order to determine if there were any planned future roadway improvement projects expected to be complete by 2029 within the study area. Based on these discussions, no roadway improvement projects aside from routine maintenance activities were identified to be planned within the study area at this time.

### **No-Build Traffic Volumes**

The 2029 No-Build condition peak-hour traffic-volumes were developed by applying the 1.0 percent per year compounded annual background traffic growth rate to the 2021 Existing peak-hour traffic volumes. The resulting 2029 No-Build weekday morning and evening peak-hour traffic volumes are shown on Figures 5 and 6, respectively.

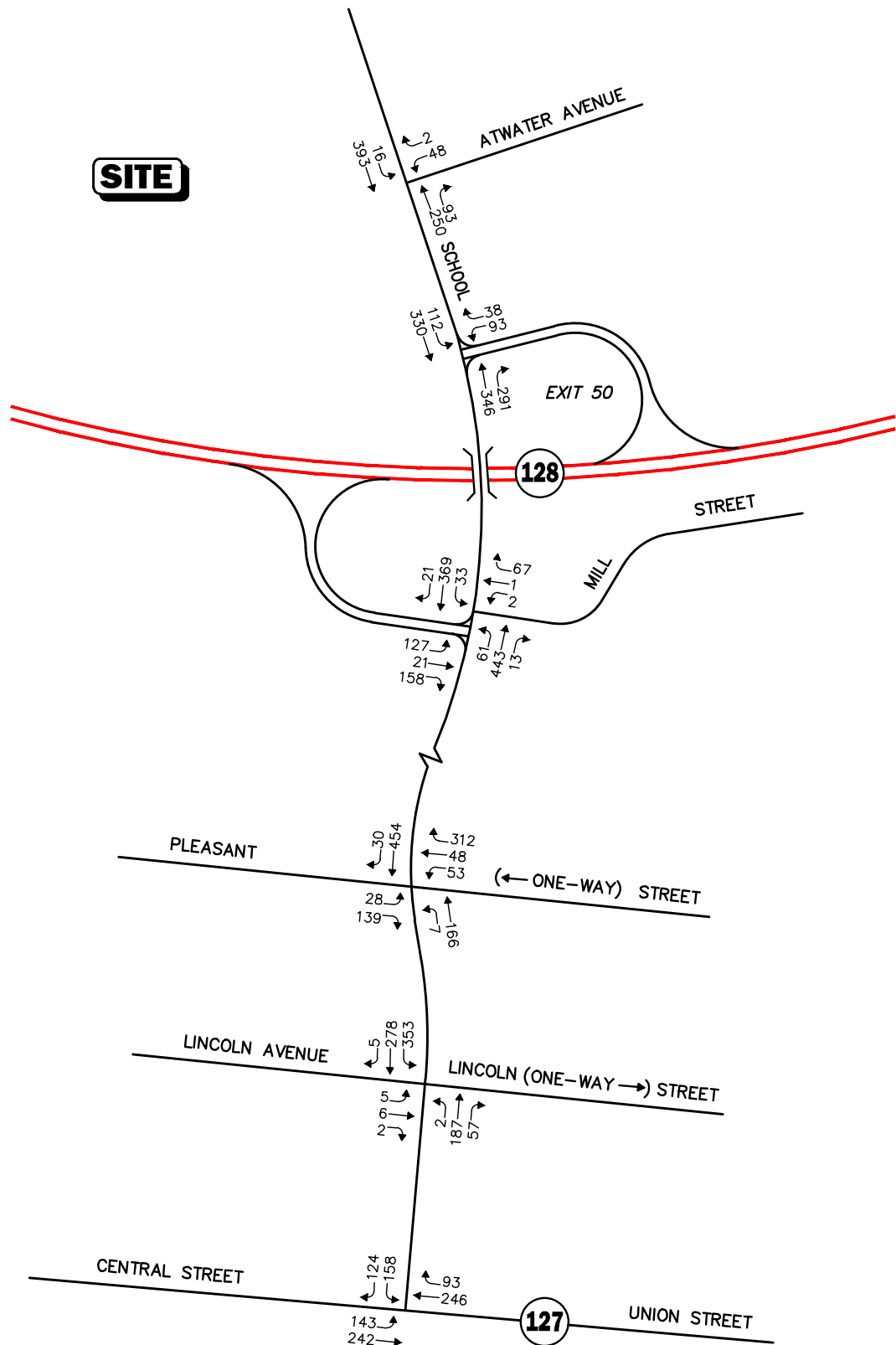
## **PROJECT-GENERATED TRAFFIC**

Design year (2029 Build) traffic volumes for the study area roadways were determined by estimating Project-generated traffic volumes and assigning those volumes on the study roadways. The following sections describe the methodology used to develop the anticipated traffic characteristics of the Project.

As proposed, the Project will entail the construction of a 136-unit multifamily residential development. In order to develop the traffic characteristics of the Project, trip-generation statistics published by the ITE<sup>9</sup> for a similar land use as that proposed were used. ITE Land Use Code (LUC) 220, *Multifamily Housing (Low-Rise)*, was used to develop the traffic characteristics of the Project, the results of which are summarized in Table 5.

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<sup>9</sup>Ibid 1.

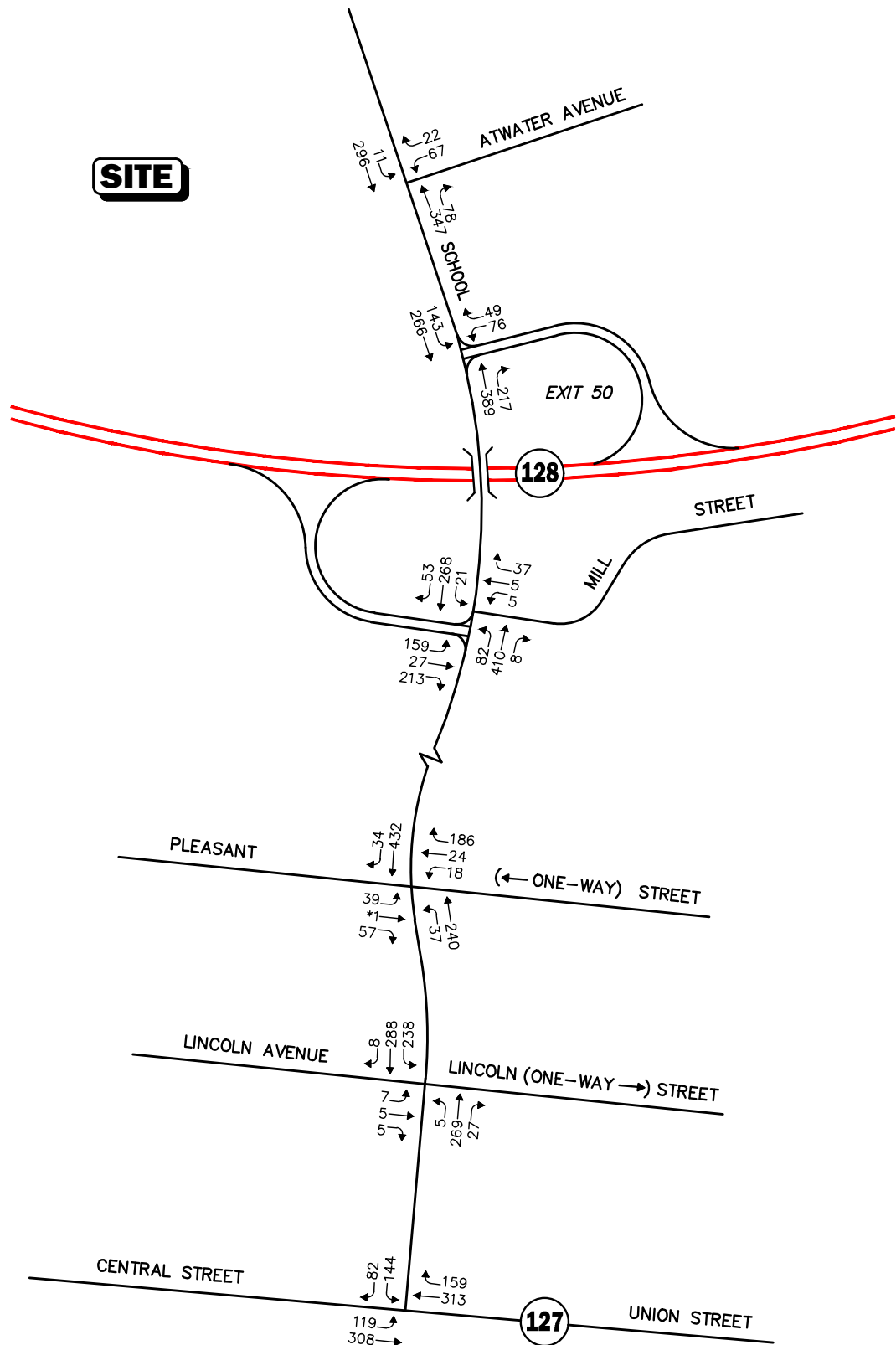


Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.  
Not To Scale

Figure 5

2029 No-Build  
Weekday Morning  
Peak-Hour Traffic Volumes





\*Illegal maneuver.

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

Not To Scale

Figure 6

2029 No-Build  
Weekday Evening  
Peak-Hour Traffic Volumes





**Table 5**  
**TRIP GENERATION SUMMARY<sup>a</sup>**

Time Period	Vehicle Trips		
	Entering	Exiting	Total
<i>Average Weekday:</i>	474	474	948
<i>Weekday Morning Peak Hour:</i>	16	49	65
<i>Weekday Evening Peak Hour:</i>	50	29	79

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

### **Project-Generated Traffic Volume Summary**

As can be seen in Table 5, the Project is expected to generate approximately 948 vehicle trips on an average weekday (two-way, 24-hour volume, or 474 vehicles entering and 474 exiting), with 65 vehicle trips (16 vehicles entering and 49 exiting) expected during the weekday morning peak-hour and 79 vehicle trips (50 vehicles entering and 29 exiting) expected during the weekday evening peak-hour.

### **TRIP DISTRIBUTION AND ASSIGNMENT**

The directional distribution of generated trips to and from the Project site was determined based on a review of Journey-to-Work data obtained from the U.S. Census for persons residing in the Town of Manchester-by-the-Sea and then refined based on existing traffic patterns within the study area. This methodology is consistent with the residential nature of the Project and the predominant land use within the study area (residential). The general trip distribution for the Project is graphically depicted on Figure 7. The additional traffic expected to be generated by the Project was assigned on the study area roadway network as shown on Figures 8 and 9, for the weekday morning and evening peak hours, respectively.

### **FUTURE TRAFFIC VOLUMES - BUILD CONDITION**

The 2029 Build condition traffic volumes consist of the 2029 No-Build traffic volumes with the additional traffic expected to be generated by the Project added to them. The 2029 Build weekday morning and evening peak-hour traffic-volumes are graphically depicted on Figures 10 and 11, respectively.

A summary of peak-hour projected traffic-volume changes outside of the study area that is the subject of this assessment is shown in Table 6. These changes are a result of the construction of the Project.

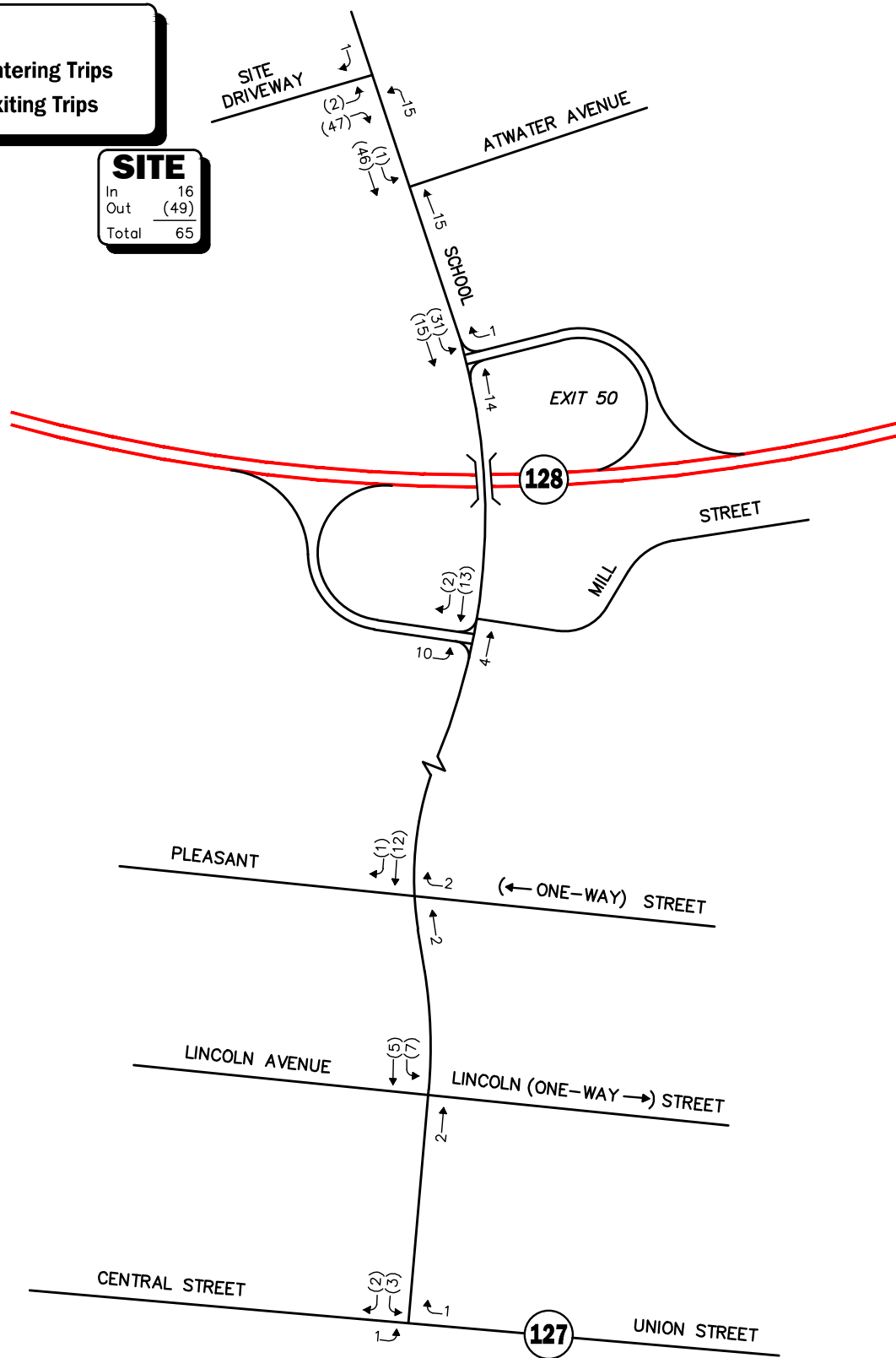


**Legend:**

XX Entering Trips  
(XX) Exiting Trips

**SITE**

In	16
Out	(49)
Total	65



Not To Scale



Vanasse &  
Associates inc

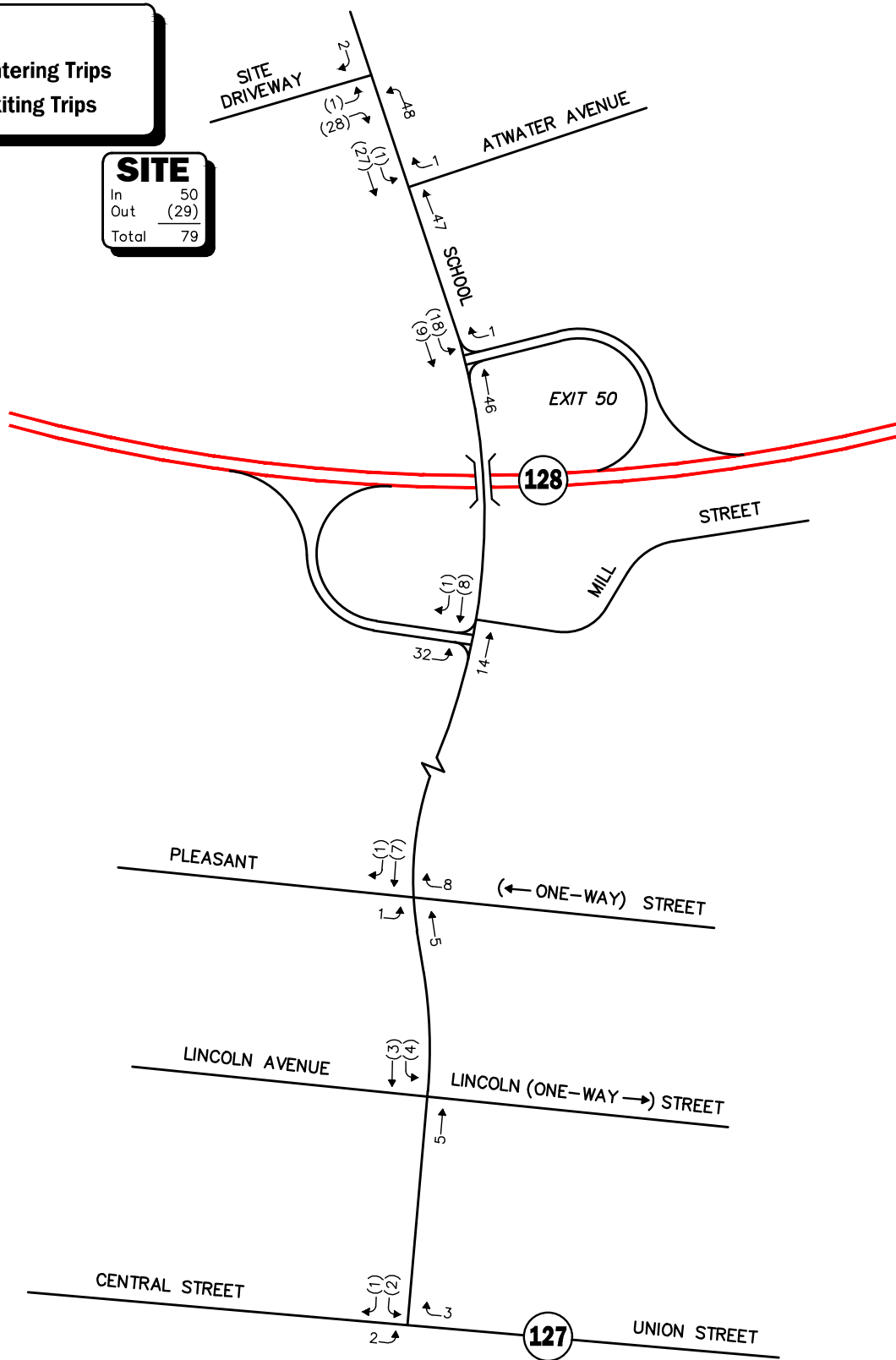
**Figure 8**

**Project-Generated  
Weekday Morning  
Peak-Hour Traffic Volumes**

**Legend:**

XX Entering Trips  
(XX) Exiting Trips

SITE	
In	50
Out	(29)
Total	79

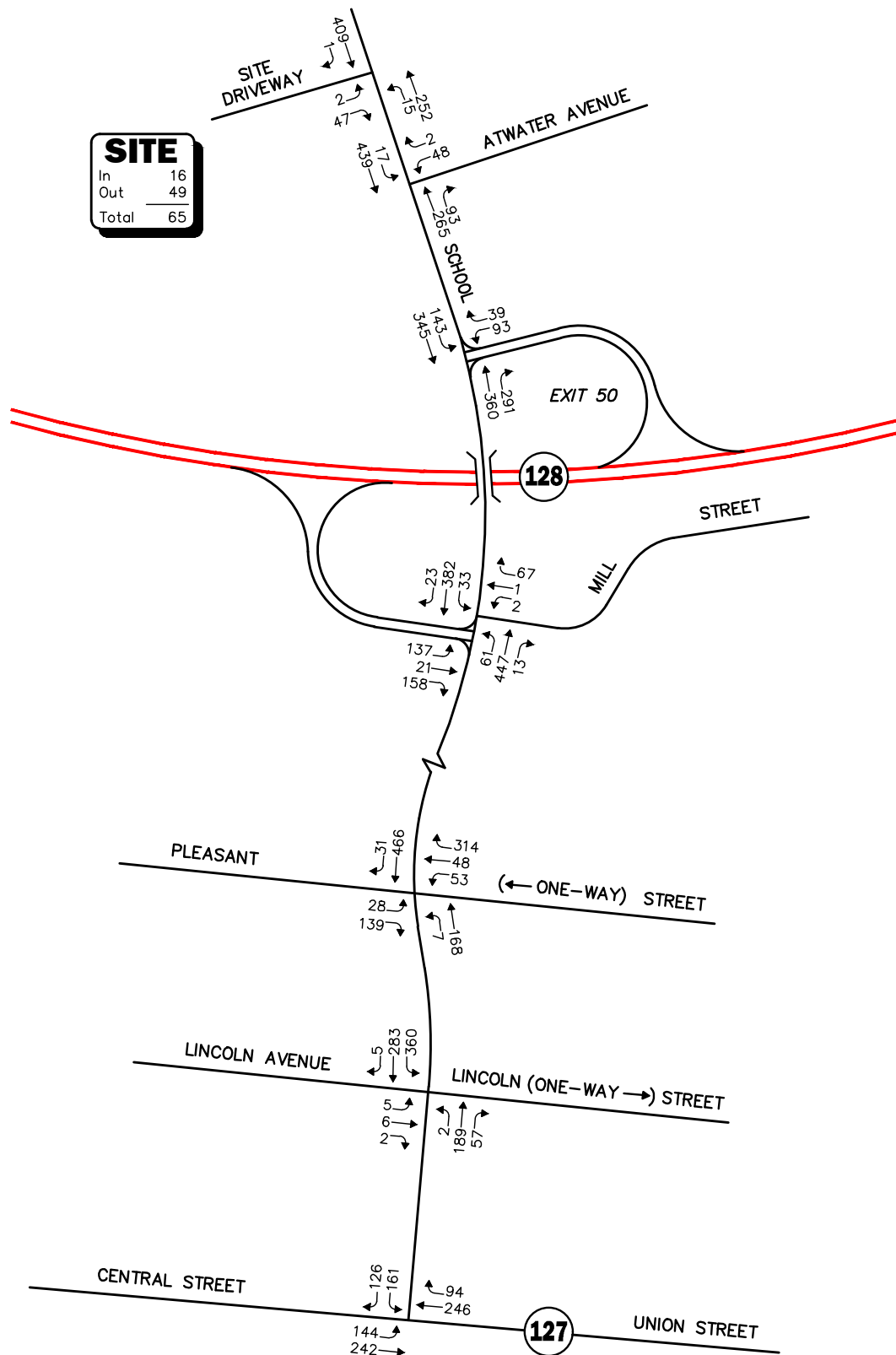


Not To Scale



**Figure 9**

**Project-Generated  
Weekday Evening  
Peak-Hour Traffic Volumes**



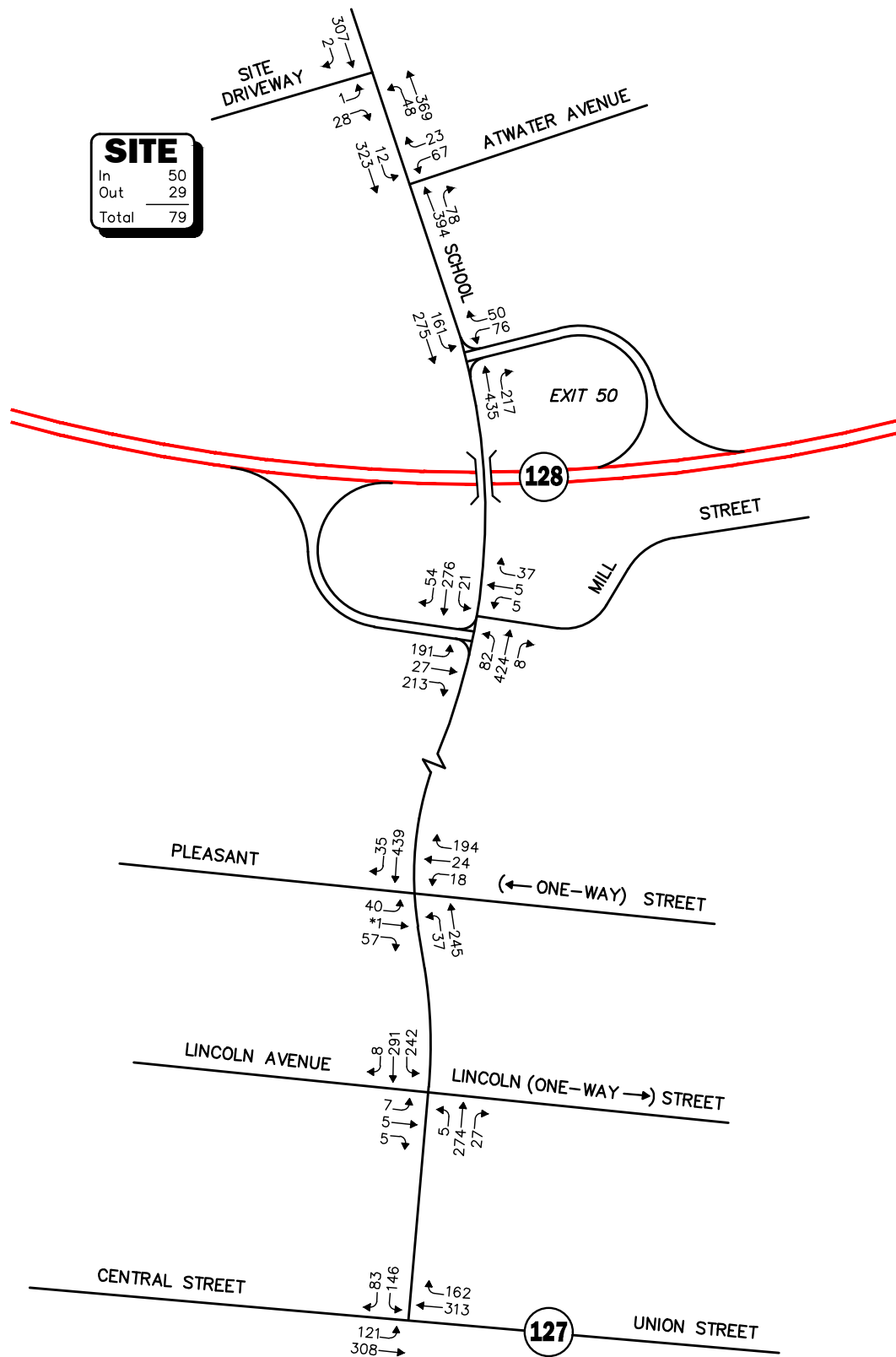
Note: Imbalances exist due to numerous curb cuts and side streets that are not shown.

Not To Scale

**Figure 10**



**2029 Build  
Weekday Morning  
Peak-Hour Traffic Volumes**



\*Illegal maneuver.

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

Not To Scale

Figure 11

2029 Build  
Weekday Evening  
Peak-Hour Traffic Volumes



**Table 6**  
**PEAK-HOUR TRAFFIC-VOLUME INCREASES**

Location/Peak Hour	2021 Existing	2029 No-Build	2029 Build	Traffic Volume Increase Over No-Build	Percent Increase Over No-Build
<i>School Street, north of Project Site Roadway:</i>					
Weekday Morning	610	661	664	3	0.5
Weekday Evening	623	676	679	3	0.4
<i>Route 128, east of School Street:</i>					
Weekday Morning	197	214	217	3	1.4
Weekday Evening	245	265	267	2	0.8
<i>Route 128, west of School Street:</i>					
Weekday Morning	654	709	750	41	5.8
Weekday Evening	701	759	809	50	6.6
<i>Mill Street, east of School Street:</i>					
Weekday Morning	126	137	137	0	0.0
Weekday Evening	95	103	103	0	0.0
<i>Pleasant Street, east of School Street:</i>					
Weekday Morning	381	413	415	2	0.5
Weekday Evening	212	229	237	8	3.5
<i>Pleasant Street, west of School Street:</i>					
Weekday Morning	232	252	253	1	0.4
Weekday Evening	177	192	194	2	1.0
<i>Lincoln Street, east of School Street:</i>					
Weekday Morning	385	416	423	7	1.7
Weekday Evening	250	270	274	4	1.5
<i>Route 127, east of School Street:</i>					
Weekday Morning	682	739	743	4	0.5
Weekday Evening	853	924	929	5	0.5
<i>Route 127, west of School Street:</i>					
Weekday Morning	696	755	758	3	0.4
Weekday Evening	759	822	825	3	0.4

As shown in Table 6, Project-related traffic-volume increases outside of the study area relative to 2029 No-Build conditions are anticipated to range from 0.0 to 6.6 percent during the peak periods, with vehicle increases shown to range from 0 to 50 vehicles.

***Focusing on local roadways, Project-related traffic volume increases outside of the study area range from 0 to 8 vehicles, or fewer than one (1) additional vehicle every 7 to 8 minutes during the peak hours, a level of impact that would not be readily apparent over existing conditions and that would not result in a material increase in motorist delays or vehicle queuing.***

# **TRAFFIC OPERATIONS ANALYSIS**

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Measuring existing and future traffic volumes quantifies traffic flow within the study area. To assess quality of flow, roadway capacity and vehicle queue analyses were conducted under Existing, No-Build and Build traffic volume conditions. Capacity analyses provide an indication of how well the roadway facilities serve the traffic demands placed upon them, with vehicle queue analyses providing a secondary measure of the operational characteristics of an intersection or section of roadway under study.

## **METHODOLOGY**

### **Levels of Service**

A primary result of capacity analyses is the assignment of level of service to traffic facilities under various traffic-flow conditions.<sup>10</sup> The concept of level of service is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with level-of-service (LOS) A representing the best operating conditions and LOS F representing congested or constrained operating conditions.

Since the level of service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year.

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<sup>10</sup>The capacity analysis methodology is based on the concepts and procedures presented in the *Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2010.



## Unsignalized Intersections

The six levels of service for unsignalized intersections may be described as follows:

- *LOS A* represents a condition with little or no control delay to minor street traffic.
- *LOS B* represents a condition with short control delays to minor street traffic.
- *LOS C* represents a condition with average control delays to minor street traffic.
- *LOS D* represents a condition with long control delays to minor street traffic.
- *LOS E* represents operating conditions at or near capacity level, with very long control delays to minor street traffic.
- *LOS F* represents a condition where minor street demand volume exceeds capacity of an approach lane, with extreme control delays resulting.

The levels of service of unsignalized intersections are determined by application of a procedure described in the 2010 *Highway Capacity Manual*.<sup>11</sup> Level of service is measured in terms of average control delay. Mathematically, control delay is a function of the capacity and degree of saturation of the lane group and/or approach under study and is a quantification of motorist delay associated with traffic control devices such as traffic signals and STOP signs. Control delay includes the effects of initial deceleration delay approaching a STOP sign, stopped delay, queue move-up time, and final acceleration delay from a stopped condition. Definitions for level of service at unsignalized intersections are also given in the 2010 *Highway Capacity Manual*. Table 7 summarizes the relationship between level of service and average control delay for two-way stop controlled and all-way stop controlled intersections.

**Table 7**  
**LEVEL-OF-SERVICE CRITERIA FOR**  
**UNSIGNALIZED INTERSECTIONS<sup>a</sup>**

Level-Of-Service by Volume-to-Capacity Ratio		Average Control Delay (Seconds Per Vehicle)
$v/c \leq 1.0$	$v/c > 1.0$	
A	F	$\leq 10.0$
B	F	10.1 to 15.0
C	F	15.1 to 25.0
D	F	25.1 to 35.0
E	F	35.1 to 50.0
F	F	$> 50.0$

<sup>a</sup>Source: *Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2010; page 19-2.

<sup>11</sup>*Highway Capacity Manual*; Transportation Research Board; Washington, DC; 2010.

### **Vehicle Queue Analysis**

Vehicle queue analyses are a direct measurement of an intersection's ability to process vehicles under various traffic control and volume scenarios and lane use arrangements. The vehicle queue analysis was performed using the Synchro® intersection capacity analysis software which is based upon the methodology and procedures presented in the 2010 *Highway Capacity Manual*. The Synchro® vehicle queue analysis methodology is a simulation based model which reports the number of vehicles that experience a delay of 6 seconds or more at an intersection. For signalized intersections, Synchro® reports both the average (50<sup>th</sup> percentile) the 95<sup>th</sup> percentile vehicle queue. For unsignalized intersections, Synchro® reports the 95<sup>th</sup> percentile vehicle queue. Vehicle queue lengths are a function of the capacity of the movement under study and the volume of traffic being processed by the intersection during the analysis period. The 95<sup>th</sup> percentile vehicle queue is the vehicle queue length that will be exceeded only 5 percent of the time, or approximately 3 minutes out of 60 minutes during the peak one hour of the day (during the remaining 57 minutes, the vehicle queue length will be less than the 95<sup>th</sup> percentile queue length).

### **ANALYSIS RESULTS**

Level-of-service and vehicle queue analyses were conducted for 2021 Existing, 2029 No-Build and 2029 Build conditions for the intersections within the study area. The results of the intersection capacity and vehicle queue analyses are summarized on Table 8, with the detailed analysis results presented in the Appendix.

The following is a summary of the level-of-service and vehicle queue analyses for the intersections within the study area. For context, we note that an LOS of "D" or better is generally defined as "acceptable" operating conditions.

#### **School Street at Atwater Avenue**

No change in level-of-service was shown to occur for any movement over No-Build conditions, with Project-related impacts defined as an increase in average motorist delay of up to 3.6 seconds and in vehicle queuing of up to one (1) vehicle.

#### **School Street at the Route 128 Southbound Ramps**

The addition of Project-related traffic was shown to result in an increase in average motorist delay for the left-turn movement from the Route 128 southbound off-ramp of 12.0 seconds during the weekday morning peak-hour and 14.9 seconds during the weekday evening peak-hour over No-Build conditions that caused a degradation in level-of-service from LOS D to LOS E during the weekday morning peak hour and from LOS E to LOS F during the weekday evening peak hour. All movements along School Street were shown to operate at LOS A/B during the peak hours. Vehicle queues at the intersection were shown to increase by up to one (1) vehicle as a result of the addition of Project-related traffic.

#### **School Street at the Route 128 Northbound Ramps and Mill Street**

The addition of Project-related traffic was shown to result in a general increase in average motorist delay that resulted in a corresponding increase in vehicle queuing of up to five (5) vehicles. Independent of the Project, it was noted that the left-turn movements from the Route 128

northbound off-ramp approach are operating over capacity (i.e., LOS “F”) during both the weekday morning and evening peak hours under 2021 Existing conditions.

#### **School Street at Pleasant Street**

The addition of Project-related traffic was shown to result in a general increase in average motorist delay that resulted in a corresponding increase in vehicle queuing of up to one (1) vehicle. Independent of the Project, it was noted that the through/right-turn movements from the School Street southbound and right-turn movements from Pleasant Street westbound are operating over capacity (i.e., LOS “F”) during the weekday morning peak hour under 2021 Existing conditions. These conditions are related to school traffic associated with the Manchester Essex Regional Middle High School and are confined to a distinct period of time during the weekday morning peak-hour.

#### **School Street at Lincoln Street and Lincoln Avenue**

No change in level-of-service or vehicle queuing is predicted to occur for any movement over No-Build conditions, with Project-related impacts defined as an increase in average motorist delay of up to 1.9 seconds with no (0) increase in vehicle queuing predicted. Independent of the Project, it was noted that the Lincoln Avenue approach is predicted to operate at its design capacity (i.e., LOS “E”) during the weekday morning peak hour under No-Build conditions with residual vehicle queues of up to one (1) vehicle. Again, these conditions are confined to the weekday morning peak-hour and are attributable to school traffic associated with the Manchester Essex Regional Middle High School.

#### **Route 127 at School Street**

The addition of Project-related traffic was shown to result in a general increase in average motorist delay that resulted in a corresponding increase in vehicle queuing of up to one (1) vehicle. Independent of the Project, it was noted that the School Street southbound approach is operating over capacity during the weekday morning and peak hours under 2021 Existing conditions.

#### **School Street at Project Site Driveway**

All movements at the Project-site driveway intersection with School Street were shown to operate at LOS B or better during the peak hours with vehicle queues of up to one (1) vehicle.

**Table 8**  
**UNSIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY**

Unsignalized Intersection/Peak Hour/Movement	2021 Existing				2029 No-Build				2029 Build			
	Demand <sup>a</sup>	Delay <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup> 95 <sup>th</sup>	Demand	Delay	LOS	Queue 95 <sup>th</sup>	Demand	Delay	LOS	Queue 95 <sup>th</sup>
<b><i>School Street at Atwater Avenue</i></b>												
<i>Weekday Morning:</i>												
Atwater Avenue WB LT/RT	46	16.8	C	1	50	18.6	C	1	50	20.4	C	1
School Street NB TH/RT	316	0.0	A	0	343	0.0	A	0	358	0.0	A	0
School Street SB LT/TH	378	0.3	A	0	409	0.3	A	0	456	0.3	A	0
<i>Weekday Evening:</i>												
Atwater Avenue WB LT/RT	82	18.4	C	2	89	20.9	C	2	90	24.5	C	3
School Street NB TH/RT	392	0.0	A	0	425	0.0	A	0	472	0.0	A	0
School Street SB LT/TH	283	0.3	A	0	307	0.3	A	0	335	0.3	A	0
<b><i>School Street at the Route 128 SB Ramps</i></b>												
<i>Weekday Morning:</i>												
Route 128 SB Off-Ramp WB LT	86	27.2	D	2	93	34.1	D	2	93	46.1	E	3
Route 128 SB Off-Ramp WB RT	35	10.3	B	0	38	10.9	B	0	39	11.0	B	0
School Street NB TH/RT	588	0.0	A	0	637	0.0	A	0	651	0.0	A	0
School Street SB LT/TH	407	2.1	A	1	442	2.2	A	1	488	2.5	A	1
<i>Weekday Evening:</i>												
Route 128 SB Off-Ramp WB LT	70	30.8	D	2	76	39.7	E	3	76	>50.0	F	3
Route 128 SB Off-Ramp WB RT	45	11.0	B	1	49	11.4	B	1	50	11.9	B	1
School Street NB TH/RT	559	0.0	A	0	606	0.0	A	0	652	0.0	A	0
School Street SB LT/TH	377	3.0	A	1	409	3.1	A	1	436	3.3	A	1
<b><i>School Street at the Route 128 NB Ramps and Mill Street</i></b>												
<i>Weekday Morning:</i>												
Route 128 NB Off-Ramp EB LT/TH	136	>50.0	F	10	148	>50.0	F	13	158	>50.0	F	15
Route 128 NB Off-Ramp EB RT	146	12.2	B	1	158	12.8	B	1	158	13.0	B	1
Mill Street WB LT/TH/RT	65	14.3	B	1	70	15.5	C	1	70	15.6	C	1
School Street NB LT/TH/RT	477	1.0	A	0	517	1.0	A	0	521	1.0	A	0
School Street SB LT/TH/RT	390	0.7	A	0	423	0.7	A	0	438	0.7	A	0
<i>Weekday Evening:</i>												
Route 128 NB Off-Ramp EB LT/TH	172	>50.0	F	8	186	>50.0	F	11	218	>50.0	F	16
Route 128 NB Off-Ramp EB RT	197	11.6	B	1	213	12.2	B	2	213	12.3	B	2
Mill Street WB LT/TH/RT	44	15.4	C	1	47	16.7	C	1	47	17.2	C	1
School Street NB LT/TH/RT	461	1.3	A	0	500	1.3	A	0	514	1.3	A	0
School Street SB LT/TH/RT	315	0.5	A	0	342	0.5	A	0	351	0.5	A	0

See notes at end of table.

**Table 8 (Continued)**  
**UNSIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY**

Unsignalized Intersection/Peak Hour/Movement	2021 Existing				2029 No-Build				2029 Build			
	Demand <sup>a</sup>	Delay <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup> 95 <sup>th</sup>	Demand	Delay	LOS	Queue 95 <sup>th</sup>	Demand	Delay	LOS	Queue 95 <sup>th</sup>
<b><i>School Street at Pleasant Street</i></b>												
<i>Weekday Morning:</i>												
Pleasant Street EB LT/TH/RT	154	18.0	C	3	167	20.4	C	3	167	20.6	C	3
Pleasant Street WB LT/TH	93	16.0	C	2	101	17.5	C	2	101	17.6	C	2
Pleasant Street WB RT	288	>50.0	F	15	312	>50.0	F	19	314	>50.0	F	19
School Street NB LT/TH	159	17.9	C	2	173	20.0	C	3	175	20.3	C	3
School Street SB TH/RT	447	>50.0	F	17	484	>50.0	F	22	497	>50.0	F	23
<i>Weekday Evening:</i>												
Pleasant Street EB LT/TH/RT	90	11.1	B	1	97	12.0	B	1	98	12.2	B	1
Pleasant Street WB LT/TH	39	10.4	B	1	42	10.9	B	1	42	11.0	B	1
Pleasant Street WB RT	172	11.7	B	2	186	12.9	B	2	194	13.3	B	2
School Street NB LT/TH	256	13.7	B	3	277	15.7	C	3	282	16.4	C	3
School Street SB TH/RT	430	20.8	C	6	466	29.0	D	9	474	31.2	D	9
<b><i>School Street at Lincoln Street and Lincoln Avenue</i></b>												
<i>Weekday Morning:</i>												
Lincoln Avenue EB LT/TH/RT	13	30.6	D	1	13	37.5	E	1	13	39.4	E	1
School Street NB LT/TH/RT	228	0.1	A	0	246	0.1	A	0	248	0.1	A	0
School Street SB LT/TH/RT	588	4.9	A	1	636	5.0	A	2	648	5.1	A	2
<i>Weekday Evening:</i>												
Lincoln Avenue EB LT/TH/RT	17	20.3	C	0	17	22.8	C	1	17	23.4	C	1
School Street NB LT/TH/RT	278	0.1	A	0	301	0.1	A	0	306	0.1	A	0
School Street SB LT/TH/RT	493	3.8	A	1	528	3.8	A	1	541	3.9	A	1
<b><i>Route 127 at School Street</i></b>												
<i>Weekday Morning:</i>												
Route 127 EB LT/TH	355	3.1	A	1	385	3.2	A	1	386	3.2	A	1
Route 127 WB TH/RT	313	0.0	A	0	339	0.0	A	0	340	0.0	A	0
School Street SB LT/RT	260	>50.0	F	8	282	>50.0	F	12	287	>50.0	F	12
<i>Weekday Evening:</i>												
Route 127 EB LT/TH	394	2.5	A	1	427	2.5	A	1	429	2.6	A	1
Route 127 WB TH/RT	436	0.0	A	0	472	0.0	A	0	475	0.0	A	0
School Street SB LT/RT	209	>50.0	F	7	226	>50.0	F	10	229	>50.0	F	11

See notes at end of table.

**Table 8 (Continued)**  
**UNSIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY**

Unsignalized Intersection/Peak Hour/Movement	2021 Existing				2029 No-Build				2029 Build			
	Demand <sup>a</sup>	Delay <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup> 95 <sup>th</sup>	Demand	Delay	LOS	Queue 95 <sup>th</sup>	Demand	Delay	LOS	Queue 95 <sup>th</sup>
<b><i>School Street at Project Site Driveway</i></b>												
<i>Weekday Morning:</i>												
Project Site Driveway EB LT/RT	--	--	--	--	--	--	--	--	65	11.7	B	1
School Street NB LT/TH	--	--	--	--	--	--	--	--	723	0.5	A	0
School Street SB TH/RT	--	--	--	--	--	--	--	--	664	0.0	A	0
<i>Weekday Evening:</i>												
Project Site Driveway EB LT/RT	--	--	--	--	--	--	--	--	79	10.6	B	0
School Street NB LT/TH	--	--	--	--	--	--	--	--	752	0.8	A	0
School Street SB TH/RT	--	--	--	--	--	--	--	--	679	0.0	A	0

<sup>a</sup>Demand in vehicles per hour.

<sup>b</sup>Average control delay per vehicle (in seconds).

<sup>c</sup>Level-of-Service.

<sup>d</sup>Queue length in vehicles.

NB = northbound; SB = southbound; EB = eastbound; WB = westbound; LT = left-turning movements; TH = through movements; RT = right-turning movements.

## SIGHT DISTANCE EVALUATION

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Sight distance measurements were performed at the Project site driveway intersection with School Street in accordance with MassDOT and American Association of State Highway and Transportation Officials (AASHTO)<sup>12</sup> requirements. Both stopping sight distance (SSD) and intersection sight distance (ISD) measurements were performed. In brief, SSD is the distance required by a vehicle traveling at the design speed of a roadway, on wet pavement, to stop prior to striking an object in its travel path. ISD or corner sight distance (CSD) is the sight distance required by a driver entering or crossing an intersecting roadway to perceive an on-coming vehicle and safely complete a turning or crossing maneuver with on-coming traffic. In accordance with AASHTO standards, if the measured ISD is at least equal to the required SSD value for the appropriate design speed, the intersection can operate in a safe manner. Table 9 presents the measured SSD and ISD at the subject intersection.

---

<sup>12</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 9**  
**SIGHT DISTANCE MEASUREMENTS<sup>a</sup>**

Intersection/Sight Distance Measurement	Feet		
	Required Minimum (SSD)	Desirable (ISD) <sup>b</sup>	Measured <sup>c</sup>
<b><i>School Street at the Project Driveway</i></b>			
<i>Stopping Sight Distance:</i>			
School Street approaching from the north	360	--	551
School Street approaching from the south	360	--	650+
<i>Intersection Sight Distance:</i>			
Looking to the north from the Project Driveway	360	430	596
Looking to the south from the Project Driveway	360	500	650+

<sup>a</sup>Recommended minimum 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; and based on a 45 mph approach speed on School Street.

<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.

As can be seen in Table 9, the available lines of sight to and from the Project site driveway intersection with School Street were shown to exceed the recommended minimum sight distances to function in a safe (SSD) and efficient (ISD) manner based on a 45 mph approach speed, which is slightly above the measured 85<sup>th</sup> percentile vehicle travel speed (43 mph) and 10 mph above the posted speed limit (35 mph).



## **CONCLUSIONS AND RECOMMENDATIONS**

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### **CONCLUSIONS**

VAI has conducted a TIA in order to determine the potential impacts on the transportation infrastructure associated with the proposed construction of a multifamily residential community to be known as The Sanctuary that will be located off School Street in Manchester-by-the-Sea, Massachusetts. The following specific areas have been evaluated as they relate to the Project: i) access requirements; ii) potential off-site improvements; and iii) safety considerations; under existing and future conditions, both with and without the Project. Based on this assessment, we have concluded the following with respect to the Project:

1. Using trip-generation statistics published by the ITE,<sup>13</sup> the Project is expected to generate approximately 948 vehicle trips on an average weekday (two-way, 24-hour volume), with 65 vehicle trips expected during the weekday morning peak-hour and 79 vehicle trips expected during the weekday evening peak-hour;
2. The Project will not have a significant impact (increase) on motorist delays or vehicle queuing over Existing or anticipated future conditions without the Project (No-Build conditions), acknowledging that one or more movements at the study area intersections are currently or are predicted to operate at or over capacity (i.e., LOS “E” or “F”, respectively) independent of the Project, with Project-related impacts on these movements generally characterized by a predicted increase in average motorist delay that resulted in an increase in vehicle queuing by up to five (5) vehicles;
3. All movements at the Project site driveway intersection with School Street are predicted to operate at LOS B or better during the peak hours, with vehicle queues of up to one (1) vehicle;
4. No apparent safety deficiencies were noted with respect to the motor vehicle crash history at the study area intersections, with all of the intersections found to have motor vehicle crash rates that are *below* the MassDOT average crash rates for similar intersections; and
5. The available lines of sight at the Project site driveway intersection with School Street were found to exceed the recommended minimum sight distances to function in a safe and efficient manner.

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<sup>13</sup>Ibid 1.

In consideration of the above, we have concluded that the Project can be accommodated within the confines of the existing transportation infrastructure in a safe and efficient manner with implementation of the recommendations that follow.

## **RECOMMENDATIONS**

A detailed transportation improvement program has been developed that is designed to provide safe and efficient access to the Project site and address any deficiencies identified at off-site locations evaluated in conjunction with this study. The following improvements have been recommended as a part of this evaluation and, where applicable, will be completed in conjunction with the Project subject to receipt of all necessary rights, permits, and approvals.

### **Project Access**

Access to the Project site will be provided by way of a new driveway that will intersect the west side of School Street approximately 135 feet north of Atwater Avenue. A raised island is proposed along a portion of the driveway approaching School Street that separates entering and exiting traffic, transitioning thereafter to a non-divided access. The following recommendations are offered with respect to the design and operation of the Project site access and internal circulation, many of which are reflected on the Site Plans:

- The section of the Project site driveway that includes the raised island will provide two (2) 14-foot wide travel lanes separated by a 4-foot wide raised median. The non-boulevard section of the driveway will be 24-feet wide and designed to accommodate the turning and maneuvering requirements of the largest anticipated responding emergency vehicle.
- Where perpendicular parking is proposed, the drive aisle behind the parking will be a minimum of 23-feet in order to facilitate parking maneuvers.
- Vehicles exiting the Project site will be placed under STOP-sign control with a marked STOP-line provided.
- All signs and pavement markings to be installed within the Project site will conform to the applicable standards of the *Manual on Uniform Traffic Control Devices* (MUTCD).<sup>14</sup>
- Americans with Disabilities Act (ADA)-compliant wheelchair ramps will be provided at all pedestrian crossings that are to be constructed or modified as a part of the Project.
- Signs and landscaping to be installed as a part of the Project within the sight triangle areas of the Project site roadway will be designed and maintained so as not to restrict lines of sight.
- Snow accumulations (windrows) within sight triangle areas of the Project site driveway will be promptly removed where such accumulations would impede sight lines.
- Consideration will be given to providing accommodations for electric vehicle charging for residents of the Project.

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<sup>14</sup>Ibid 2.

## **Off-Site**

### **School Street at the Route 128 Ramps**

The addition of Project-related traffic to the Route 128 southbound off-ramp was shown to result in an increase in average motorist delay over No-Build conditions of 12.0 seconds during the weekday morning peak-hour that caused a degradation in LOS from LOS D to LOS E during the weekday morning peak-hour and of 14.9 seconds during the weekday evening peak-hour that caused a degradation in LOS from LOS E to LOS F, with vehicle queues shown to increase by up to one (1) vehicle. All movements from the Route 128 northbound ramps to School Street are currently operating over capacity independent of the Project, with Project-related impacts generally defined by a predicted increase in motorist delays that resulted in an increase in vehicle queuing of up to five (5) vehicles.

In an effort to identify potential improvement measures for the ramp intersections, the Project proponent will conduct an improvement study for the Route 128 north and southbound ramp intersections with School Street that will include performing a detailed Traffic Signal Warrants Analysis (TSWA) in accordance with the methodology defined in the MUTCD<sup>15</sup> and evaluating the reconfiguration of the intersections as modern roundabouts. The study will include the preparation of conceptual improvement plans depicting each of the improvement alternatives that are evaluated and the necessary information to allow the Town to apply for state funding for the recommended improvement strategy. The improvement study will be conducted in consultation with the Town and MassDOT, and will be provided to the Town prior to the issuance of a Certificate of Occupancy for the Project.

### **Transportation Demand Management**

Regularly scheduled public transportation services are provided to the Town of Manchester-by-the-Sea, but are not available at the Project site. The MBTA provides Commuter Rail service to North Station in Boston on the Newburyport/Rockport Line from Manchester-by-the-Sea Station, which is located at 40 Beach Street (an approximate 7-minute driving distance to the south of the Project site). In addition, the Manchester-by-the-Sea Council On Aging (COA) provides transportation services to seniors for shopping and recreational activities. In an effort to reduce the overall number of automobile trips in the area and to integrate the Project into the available transportation resources, the following Transportation Demand Management (TDM) measures will be implemented as a part of the Project:

- Information regarding public transportation services, maps, schedules, and fare information will be posted in a central location and/or otherwise made available to residents;
- A “welcome packet” will be provided to new residents detailing available public transportation services, bicycle and walking alternatives, and commuter options;
- Pedestrian accommodations will be incorporated into the Project and consist of sidewalks and ADA-compliant wheelchair ramps at all pedestrian crossings that are to be constructed or modified as a part of the Project;

---

<sup>15</sup>Ibid 2.

- Work-at-home workspaces will be provided to support telecommuting by residents of the Project;
- An internal mail room will be provided within the building; and
- Bicycle parking will be provided consisting of both an exterior bicycle rack located proximate to the building entrance and weather protected bicycle parking within the proposed parking garage.

With implementation of the aforementioned recommendations, safe and efficient access will be provided to the Project site and the Project can be accommodated within the confines of the existing and improved transportation system.

## APPENDIX

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PROJECT SITE PLAN

AUTOMATIC TRAFFIC RECORDER COUNT DATA

MANUAL TURNING MOVEMENT COUNT DATA

TRAIL MAPS

SEASONAL ADJUSTMENT DATA

VEHICLE TRAVEL SPEED DATA

PUBLIC TRANSPORTATION SCHEDULES

MASSDOT CRASH RATE WORKSHEETS AND HIGH CRASH LOCATION MAPPING

GENERAL BACKGROUND TRAFFIC GROWTH

TRIP-GENERATION CALCULATIONS

JOURNEY TO WORK TRIP DISTRIBUTION

CAPACITY ANALYSIS WORKSHEETS

## PROJECT SITE PLAN

---



OLD SCHOOL STREET  
(PUBLIC - VARIABLE WIDTH)

SCHOOL STREET  
(PUBLIC - VARIABLE WIDTH)

**LEGEND**

SILT FENCE	SF
TUBULAR BARRIER	— x — x —
EROSION CONTROL FABRIC	[Pattern]
CATCH BASIN FILTER	[Pattern]
STABILIZED ENTRANCE	[Pattern]
STOCKPILE/STAGING AREA	[Pattern]

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  2. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR IT'S REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
  3. FINAL LOCATIONS OF ALL EROSION CONTROL MEASURED THROUGHOUT CONSTRUCTION SHALL BE COORDINATED WITH THE TOWN OF MANCHESTER-BY-THE-SEA CONSERVATION DEPARTMENT AND DEPARTMENT OF PUBLIC WORKS (DPW).
  4. EROSION CONTROL MEASURES SHALL BE MONITORED AND REVISED ACCORDINGLY AS CONSTRUCTION PROGRESSES.

PROFESSIONAL ENGINEER FOR  
ALLEN & MAJOR ASSOCIATES, INC.

REV	DATE	DESCRIPTION

APPLICANT/OWNER:  
SLV SCHOOL STREET, LLC  
257 HILLSIDE AVENUE  
NEEDHAM, MA 02494

PROJECT:  
**THE SANCTUARY  
SCHOOL STREET  
MANCHESTER-BY-THE-SEA, MA**

PROJECT NO.	2725-01	DATE:	07-16-2021
SCALE:	1"=40'	DWG. NAME:	C-2725-01
DESIGNED BY:	CMQ/SIL	CHECKED BY:	CMQ

PREPARED BY:

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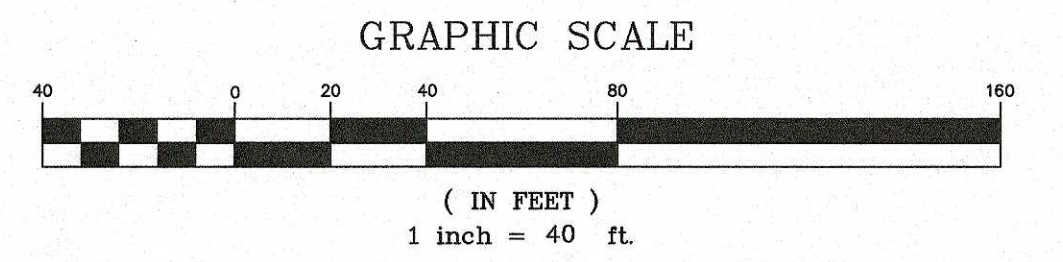
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DRAWING TITLE:	SHEET No.
<b>EROSION CONTROL PLAN</b>	<b>C-101</b>

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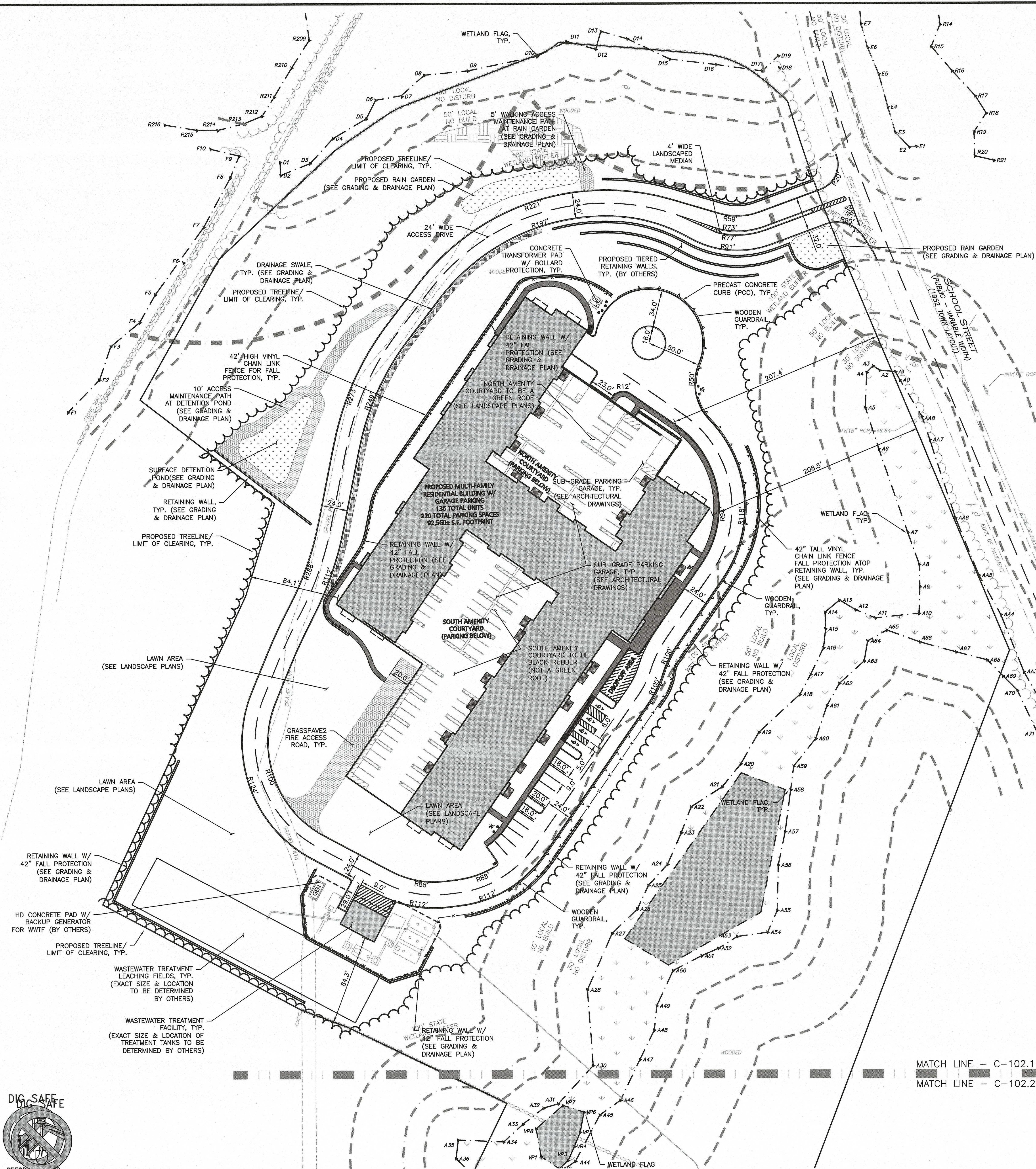
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CALL 811 OR  
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  2. THE CONTRACTOR SHALL CONTACT "DIGSAFE" AND THE TOWN OF MANCHESTER BY THE SEA DEPARTMENT OF PUBLIC WORKS AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION WORK TO REQUEST THE LOCATION OF THE EXISTING UTILITIES.
  3. SEE THE ABBREVIATIONS AND NOTES PLAN AND DETAILS FOR FURTHER INFORMATION.
  4. ALL CURBING RADII SHALL BE 3' UNLESS OTHERWISE NOTED. ALL RADII AND DIMENSIONS MEASURED AT FACE OF CURB.
  5. ALL ADA RAMP ARE TO BE CONCRETE UNLESS SPECIFIED OTHERWISE.
  6. EXISTING CONDITIONS BASE PLAN TAKEN FROM AN EXISTING CONDITIONS BASE PLAN ENTITLED "EXISTING CONDITIONS", PREPARED BY ALLEN & MAJOR ASSOCIATES, INC., ORIGINAL SCALE 1"=50', DATED SEPTEMBER 21, 2020.
  7. THIS SITE HAS AN ORDER OF RESOURCE AREA DELINEATION (ORAD DEP FILE #039-0834) CONFIRMING RESOURCE DELINEATION UNDER THE STATE WETLANDS PROTECTION ACT. THE ORIGINAL ORAD HAS AN EXPIRATION DATE OF 5/25/2024.
  8. ALL PAVEMENT MARKINGS AND SIGNAGE SHALL BE COORDINATED WITH THE MANCHESTER BY THE SEA DPW AND SHALL CONFORM TO THE LATEST MUTCD STANDARDS.

**LEGEND:**

PROPERTY LINE	---
SIGN	+
BOLLARD	•
BUILDING	[Hatched Box]
BUILDING ARCHITECTURE	[Line Style]
CURB	---
RETAINING WALL	[Hatched Box]
PARKING STRIPING	[Line Style]
ROADWAY STRIPING	[Line Style]
TRAFFIC ARROWS	[Arrow]
HEAVY DUTY CONCRETE	[Hatched Box]
SIDEWALK	[Line Style]
ADA ACCESSIBLE RAMP	[Line Style]
ADA DET. WARNING SURFACE	[Line Style]
SETBACK LINE	---
PARKING COUNT	[Line Style]
WOOD GUARDRAIL	[Line Style]
CHAIN LINK FENCE	[Line Style]
WOOD FENCE	[Line Style]
TREE LINE	[Line Style]
TRANSFORMER	[Symbol]

**PARKING SUMMARY CHART**

USE: RESIDENTIAL HOMES:

55 ONE-BEDROOMS PROVIDED	(1 BEDROOM = 2 SPACES) = 110 SPACES
66 TWO-BEDROOMS PROVIDED	(2 BEDROOMS = 3 SPACES) = 198 SPACES
15 THREE-BEDROOMS PROVIDED	(3 BEDROOMS = 5 SPACES) = 75 SPACES
00 FOUR-BEDROOMS PROVIDED	(4 BEDROOMS = 6 SPACES) = 00 SPACES
<b>TOTAL SPACES REQUIRED = 383 SPACES</b>	

242 TOTAL PARKING SPACES ARE CURRENTLY PROPOSED, 226 OF WHICH ARE LOCATED WITHIN THE PODIUM/GARAGE PARKING AREAS AND 16 TOTAL SURFACE PARKING STALLS, FOR A PROPOSED PARKING RATIO OF 1.78 SPACES PER 1 DWELLING UNIT.

ADA REQUIRED:  
THERE ARE BETWEEN 201 AND 300 TOTAL PARKING SPACES REQUIRING 7 ACCESSIBLE STALLS PER ADA REGULATIONS AND 2 OF THEM TO BE VAN ACCESSIBLE.

ADA PROVIDED:  
7 ADA ACCESSIBLE SPACES, 3 OF WHICH SHALL BE VAN ACCESSIBLE

SURFACE PARKING		STRUCTURED PARKING		TOTAL PARKING	
STANDARD SPACES	ACCESSIBLE SPACES	STANDARD SPACES	ACCESSIBLE SPACES	TOTAL PROVIDED	TOTAL REQUIRED
12	4	214	6	236	383

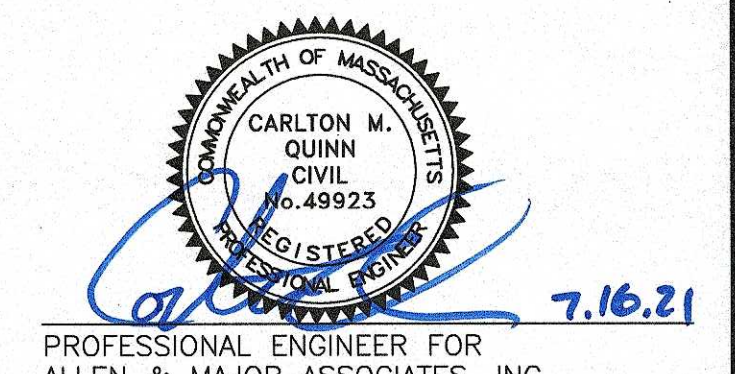
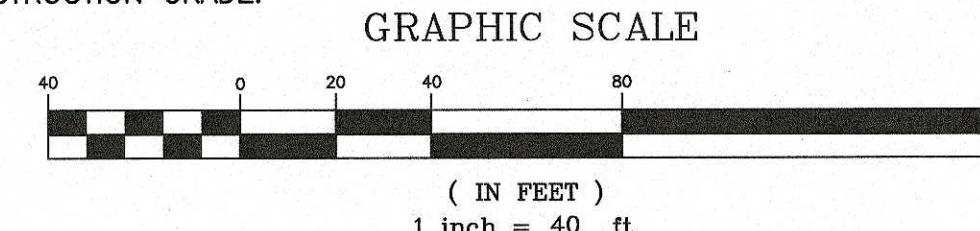
**PARKING NOTES:**

(1) OFF-STREET PARKING SPACES SHALL BE DESIGNED WITH MINIMUM DIMENSIONS OF 9 FEET BY 18 FEET.

**LAND USAGE TABLE - LIMITED COMMERCIAL DISTRICT (LCD) & WATER RESOURCE OVERLAY PROTECTION DISTRICTS - ZONE 3**

ITEM	EXISTING	PROPOSED	REQUIRED/ALLOWED
MINIMUM LOT AREA (2)	23.32± ACRES	23.32 ACRES	5.00 ACRES
MINIMUM FRONTAGE (1)	495.2 FEET	495.2 FEET	N/A
MINIMUM LOT WIDTH (6)	291.2 FEET	291.2 FEET	500 FEET
MAXIMUM BUILDING COVERAGE (3)	0%	9.7%	20%
MAXIMUM PARKING COVERAGE (3)	0%	0.56%	25%
MINIMUM LANDSCAPED COVERAGE (3)	100%	83.5%	25%
MAXIMUM IMPERVIOUS COVERAGE (5)	0%	16.5%	15%
MINIMUM FRONT YARD (4)	N/A	207.4 FEET	150 FEET
MINIMUM SIDE YARD (4)	N/A	84.1 FEET	100 FEET
MINIMUM REAR YARD (4)	N/A	84.3 FEET	100 FEET
MAXIMUM BUILDING HEIGHT (7)	N/A	25' (3 STORIES) (8)	35' (2.5 STORIES)
MINIMUM PARKING AREA INTERIOR LANDSCAPING	N/A	6.4%	5%

- LAND USAGE TABLE NOTES:**
- (1) SECTION 5.3 - SETBACK: IN THE CASE OF A LOT ABUTTING MORE THAN ONE STREET, THE MINIMUM FRONT SETBACK SHALL BE APPLICABLE TO EACH STREET. THE MINIMUM SETBACK REQUIREMENTS SHALL NOT APPLY TO THE PROJECTIONS OF STEPS, EAVES, CHIMNEYS, AND CORNICES, WINDOW SILLS OR BELT COURSES.
- SECTION 5.7 - LIMITED COMMERCIAL DISTRICT: NOT WITHSTANDING THE FOREGOING PROVISIONS OF THIS SECTION 5.0, THE FOLLOWING REQUIREMENTS SHALL BE MET IN THE LIMITED COMMERCIAL DISTRICT:
- (2) SECTION 5.7.1 - EACH BUSINESS, DEFINED AS A SINGLE-USE UNDER ONE OWNERSHIP, SHALL BE LOCATED ON A LOT OF NOT LESS THAN FIVE (5) ACRES AND A MINIMUM WIDTH AT ALL POINTS OF NOT LESS THAN FIVE HUNDRED (500) FEET.
- (3) SECTION 5.7.2 - THE STRUCTURES ON THE LOT SHALL COVER NOT MORE THAN TWENTY PERCENT (20%) OF THE LOT AREA AND AT LEAST TWENTY FIVE PERCENT (25%) OF THE LOT SHALL BE OF NATURAL OR LANDSCAPED AREA. NOT MORE THAN TWENTY FIVE PERCENT (25%) OF THE LOT SHALL BE USED FOR PARKING.
- (4) SECTION 5.7.3 - ALL STRUCTURES SHALL BE SET BACK FROM ANY STREET AT LEAST ONE HUNDRED AND FIFTY (150) FEET, AND ONE HUNDRED (100) FEET FROM ANY OTHER LOT LINE.
- (5) SECTION 4.9.5.1(d) - LAND USE (WITHIN THE WATER RESOURCE OVERLAY PROTECTION DISTRICT - ZONE 3) THAT RESULTS IN THE RENDERING OF MORE THAN 15% IMPERVIOUS AREA OR 2,500 SQUARE FEET OF ANY LOT, WHICHEVER IS GREATER, SHALL BE PROHIBITED UNLESS A SYSTEM FOR ARTIFICIAL RECHARGE OF PRECIPITATION IS PROVIDED WHICH IS SATISFACTORY TO THE PLANNING BOARD, THAT WILL NOT RESULT IN THE DEGRADATION OF GROUNDWATER QUALITY.
- (6) EXISTING NON-CONFORMING ZONING REQUIREMENT.
- (7) SECTION 5.5 - HEIGHT RESTRICTIONS - NO STRUCTURE SHALL BE ERRECTED OR ALTERED SO THAT IT EXCEEDS 2-1/2 STORIES OR SO THAT THE VERTICAL DISTANCE MEASURED FROM THE HIGHEST POINT OF THE ROOF TO THE MEAN PRE-CONSTRUCTION GRADE EXCEEDS 35 FEET, WHICHEVER IS LESSER. CHIMNEYS, SPIRES, OR TOWERS NOT USED FOR HUMAN OCCUPANCY MAY EXTEND TEN (10) FEET ABOVE HEIGHT LIMITS.
- (8) MEAN PRE-CONSTRUCTION GRADE IS DEFINED AS A REFERENCE PLANE REPRESENTING THE AVERAGE ELEVATION OF PRE-CONSTRUCTION GROUND ADJOINING THE BUILDING AT ALL EXTERIOR WALLS. A HALF STORY IS DEFINED AS A STORY WITH A SLOPING ROOF, THE AREA OF WHICH STORY AT A HEIGHT OF FOUR (4) FEET ABOVE THE FLOOR DOES NOT EXCEED TWO-THIRDS OF THE FLOOR AREA OF THE STORY IMMEDIATELY BELOW IT. SEE SHEET C-109 ENTITLED "MEAN PRE-CONSTRUCTION GRADE PLAN" FOR CALCULATION OF THE MEAN PRE-CONSTRUCTION GRADE.



PROFESSIONAL ENGINEER FOR ALLEN & MAJOR ASSOCIATES, INC.

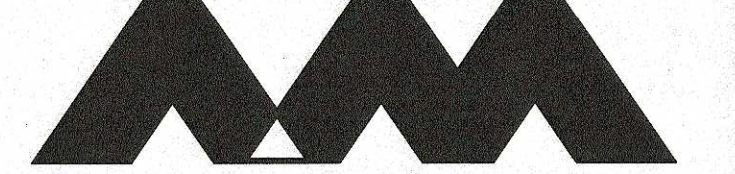
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APPLICANT/OWNER:  
SLV SCHOOL STREET, LLC  
257 HILLSIDE AVENUE  
NEEDHAM, MA 02494

PROJECT:  
**THE SANCTUARY  
SCHOOL STREET  
MANCHESTER-BY-THE-SEA, MA**

PROJECT NO.	2725-01	DATE:	07-16-2021
SCALE:	1"=40'	DWG. NAME:	C-2725-01
DESIGNED BY:	CMQ/SIL	CHECKED BY:	CMQ

PREPARED BY:



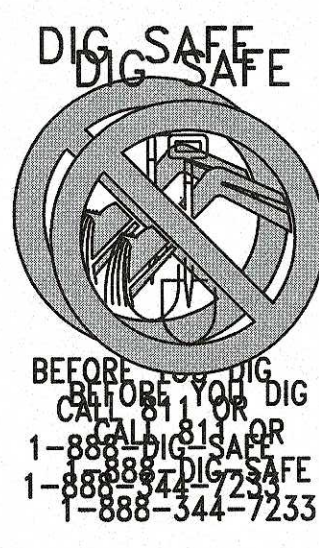
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DRAWING TITLE:	SHEET NO.
<b>LAYOUT &amp; MATERIALS PLAN</b>	<b>C-102.1</b>

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AUTOMATIC TRAFFIC RECORDER COUNT DATA

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Location : School Street

84410001

Location : South of Atwater Avenue

City/State: Manchester By The Sea, MA

11/9/2021	SB,		Hour Totals		NB,		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	0	54			1	75				
12:15	1	56			1	48				
12:30	1	53			0	50				
12:45	1	46	3	209	0	66	2	239	5	448
1:00	1	43			1	75				
1:15	0	54			0	77				
1:30	0	36			0	52				
1:45	0	55	1	188	0	49	1	253	2	441
2:00	0	77			0	48				
2:15	1	55			0	90				
2:30	0	41			0	79				
2:45	0	56	1	229	1	71	1	288	2	517
3:00	2	60			3	76				
3:15	2	65			1	78				
3:30	3	62			0	96				
3:45	0	52	7	239	0	89	4	339	11	578
4:00	3	61			1	96				
4:15	0	51			1	110				
4:30	1	71			2	96				
4:45	1	62	5	245	0	61	4	363	9	608
5:00	5	61			1	73				
5:15	5	58			2	56				
5:30	5	51			10	44				
5:45	7	29	22	199	14	53	27	226	49	425
6:00	9	49			14	42				
6:15	18	44			11	40				
6:30	38	28			34	38				
6:45	52	26	117	147	33	44	92	164	209	311
7:00	59	43			27	29				
7:15	81	26			76	14				
7:30	84	24			80	17				
7:45	97	7	321	100	85	21	268	81	589	181
8:00	71	19			62	20				
8:15	55	16			64	7				
8:30	54	15			71	6				
8:45	56	14	236	64	94	8	291	41	527	105
9:00	61	15			60	18				
9:15	37	8			53	13				
9:30	52	11			56	15				
9:45	49	6	199	40	42	6	211	52	410	92
10:00	47	6			50	2				
10:15	55	3			55	4				
10:30	51	0			49	3				
10:45	50	4	203	13	49	0	203	9	406	22
11:00	48	0			46	6				
11:15	47	2			57	1				
11:30	45	0			64	0				
11:45	34	0	174	2	71	1	238	8	412	10
Total	1289	1675			1342	2063			2631	3738
Percent	43.5%	56.5%			39.4%	60.6%			41.3%	58.7%

Location : School Street  
 Location : South of Atwater Avenue  
 City/State: Manchester By The Sea, MA

84410001

11/10/2021	SB,		Hour Totals		NB,		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	0	32			0	62				
12:15	1	50			1	53				
12:30	2	31			1	57				
12:45	0	48	3	161	2	64	4	236	7	397
1:00	0	37			0	69				
1:15	1	54			5	52				
1:30	1	53			2	52				
1:45	0	39	2	183	0	45	7	218	9	401
2:00	0	43			0	50				
2:15	2	50			0	72				
2:30	1	52			2	71				
2:45	0	58	3	203	1	75	3	268	6	471
3:00	4	56			0	78				
3:15	0	54			0	104				
3:30	0	55			1	79				
3:45	0	66	4	231	0	81	1	342	5	573
4:00	1	62			0	90				
4:15	0	60			1	80				
4:30	2	85			2	87				
4:45	6	71	9	278	1	70	4	327	13	605
5:00	1	45			1	75				
5:15	3	45			2	67				
5:30	8	50			7	64				
5:45	5	33	17	173	17	49	27	255	44	428
6:00	10	42			15	43				
6:15	13	28			11	46				
6:30	38	33			26	35				
6:45	36	24	97	127	38	33	90	157	187	284
7:00	50	33			37	40				
7:15	71	24			85	23				
7:30	103	20			79	19				
7:45	83	24	307	101	66	26	267	108	574	209
8:00	74	23			68	20				
8:15	54	15			72	16				
8:30	62	24			59	20				
8:45	48	24	238	86	75	15	274	71	512	157
9:00	50	25			46	21				
9:15	39	15			38	28				
9:30	29	12			42	27				
9:45	41	7	159	59	49	15	175	91	334	150
10:00	48	9			49	15				
10:15	43	10			60	17				
10:30	49	10			50	7				
10:45	46	10	186	39	43	11	202	50	388	89
11:00	40	8			42	7				
11:15	38	3			46	7				
11:30	34	8			58	8				
11:45	64	7	176	26	57	3	203	25	379	51
Total	1201	1667			1257	2148			2458	3815
Percent	41.9%	58.1%			36.9%	63.1%			39.2%	60.8%
Grand Total	2490	3342			2599	4211			5089	7553
Percent	42.7%	57.3%			38.2%	61.8%			40.3%	59.7%
ADT	ADT: 6,321		AADT: 6,321							

## MANUAL TURNING MOVEMENT COUNT DATA

---

# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Atwater Avenue  
City/State : Manchester By The Sea  
Weather : Clear

File Name : 84410001  
Site Code : 84410001  
Start Date : 11/9/2021  
Page No : 1

## Groups Printed- Cars - Trucks

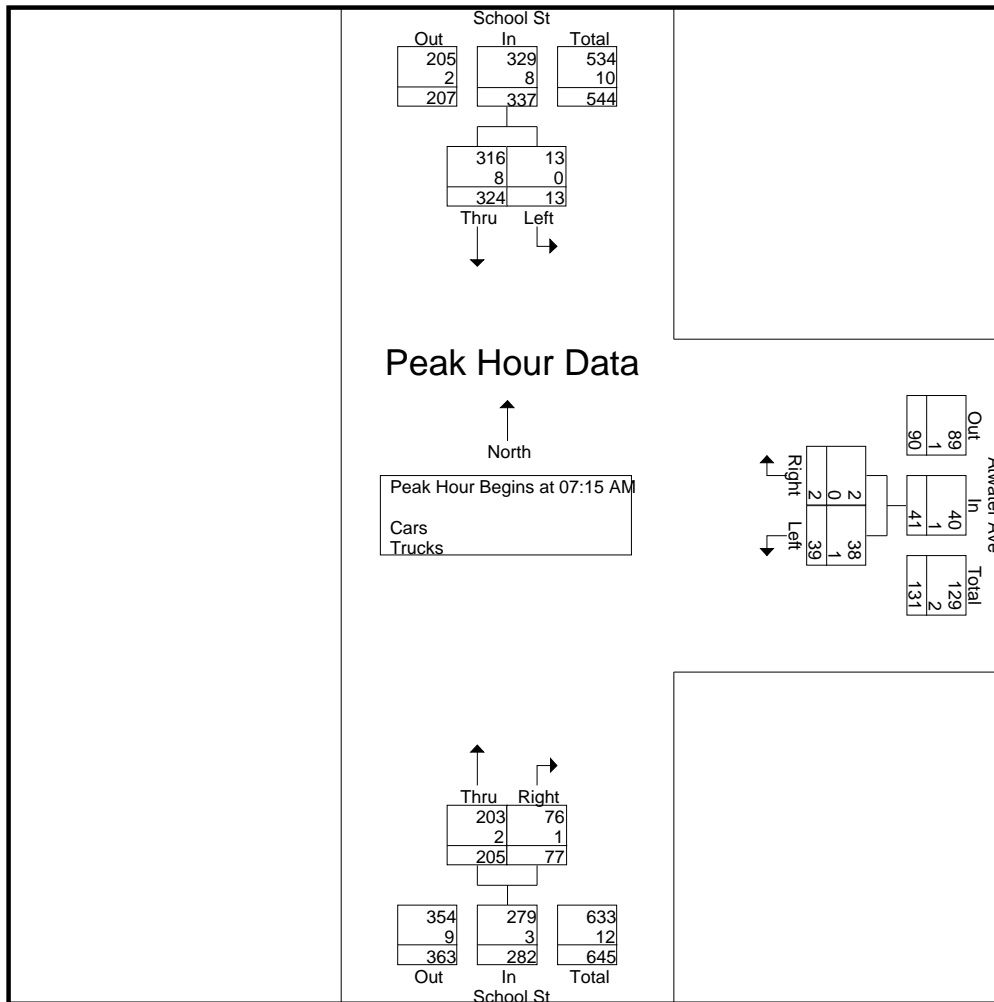
	School St From North		Atwater Ave From East		School St From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	1	54	16	1	23	5	100
07:15 AM	4	86	6	1	62	14	173
07:30 AM	3	90	7	1	61	16	178
07:45 AM	6	82	19	0	45	29	181
Total	14	312	48	3	191	64	632
08:00 AM	0	66	7	0	37	18	128
08:15 AM	2	54	10	1	39	18	124
08:30 AM	4	49	11	3	52	17	136
08:45 AM	11	63	7	1	32	45	159
Total	17	232	35	5	160	98	547
Grand Total	31	544	83	8	351	162	1179
Apprch %	5.4	94.6	91.2	8.8	68.4	31.6	
Total %	2.6	46.1	7	0.7	29.8	13.7	
Cars	31	534	80	8	345	161	1159
% Cars	100	98.2	96.4	100	98.3	99.4	98.3
Trucks	0	10	3	0	6	1	20
% Trucks	0	1.8	3.6	0	1.7	0.6	1.7

	School St From North			Atwater Ave From East			School St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	4	86	90	6	1	7	62	14	76	173
07:30 AM	3	90	93	7	1	8	61	16	77	178
07:45 AM	6	82	88	19	0	19	45	29	74	181
08:00 AM	0	66	66	7	0	7	37	18	55	128
Total Volume	13	324	337	39	2	41	205	77	282	660
% App. Total	3.9	96.1		95.1	4.9		72.7	27.3		
PHF	.542	.900	.906	.513	.500	.539	.827	.664	.916	.912
Cars	13	316	329	38	2	40	203	76	279	648
% Cars	100	97.5	97.6	97.4	100	97.6	99.0	98.7	98.9	98.2
Trucks	0	8	8	1	0	1	2	1	3	12
% Trucks	0	2.5	2.4	2.6	0	2.4	1.0	1.3	1.1	1.8

**Accurate Counts**  
978-664-2565

N/S Street : School Street  
E/W Street : Atwater Avenue  
City/State : Manchester By The Sea  
Weather : Clear

File Name : 84410001  
Site Code : 84410001  
Start Date : 11/9/2021  
Page No : 2

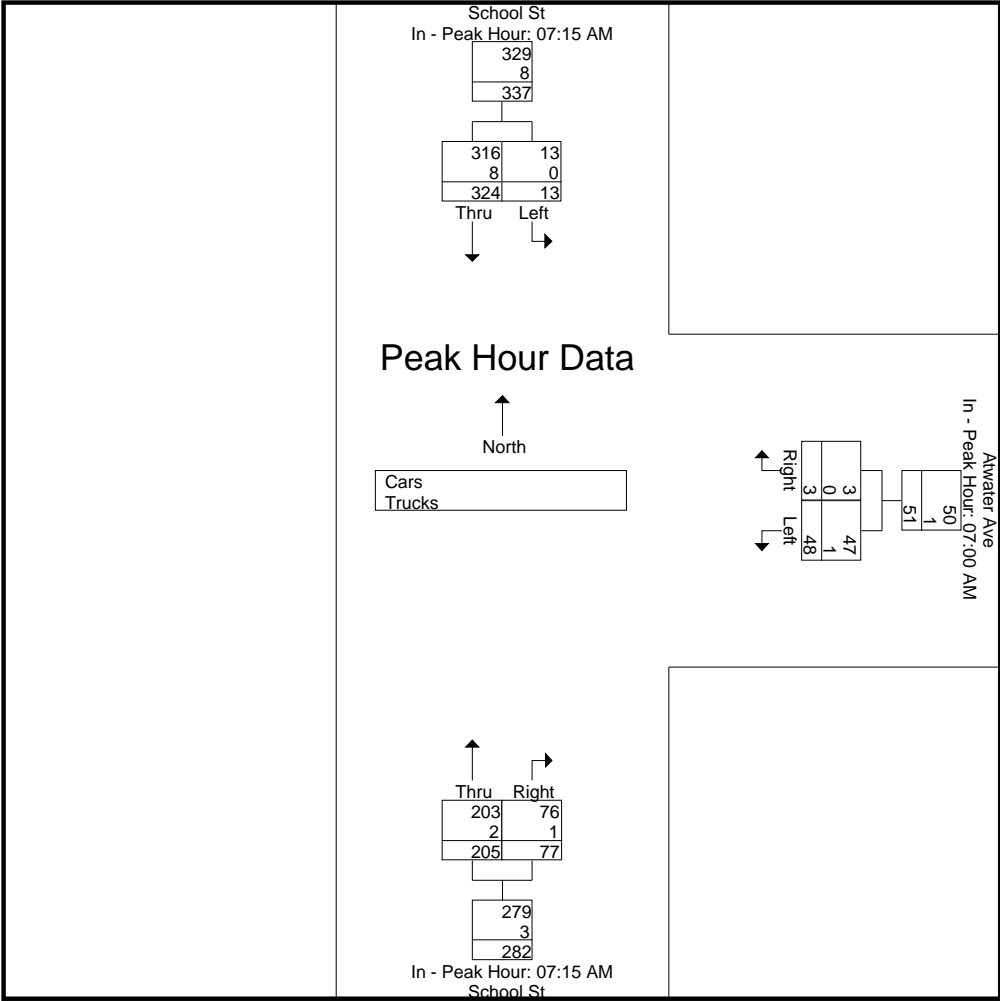


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	07:15 AM			07:00 AM			07:15 AM		
+0 mins.	4	86	90	16	<b>1</b>	17	<b>62</b>	14	76
+15 mins.	3	<b>90</b>	<b>93</b>	6	1	7	61	16	<b>77</b>
+30 mins.	<b>6</b>	82	88	7	1	8	45	<b>29</b>	74
+45 mins.	0	66	66	<b>19</b>	0	<b>19</b>	37	18	55
Total Volume	13	324	337	48	3	51	205	77	282
% App. Total	3.9	96.1		94.1	5.9		72.7	27.3	
PHF	.542	.900	.906	.632	.750	.671	.827	.664	.916
Cars	13	316	329	47	3	50	203	76	279
% Cars	100	97.5	97.6	97.9	100	98	99	98.7	98.9
Trucks	0	8	8	1	0	1	2	1	3
% Trucks	0	2.5	2.4	2.1	0	2	1	1.3	1.1

N/S Street : School Street  
E/W Street : Atwater Avenue  
City/State : Manchester By The Sea  
Weather : Clear

File Name : 84410001  
Site Code : 84410001  
Start Date : 11/9/2021  
Page No : 3





# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Atwater Avenue  
City/State : Manchester By The Sea  
Weather : Clear

File Name : 84410001  
Site Code : 84410001  
Start Date : 11/9/2021  
Page No : 4

## Groups Printed- Cars

	School St From North		Atwater Ave From East		School St From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	1	54	16	1	23	5	100
07:15 AM	4	82	6	1	61	14	168
07:30 AM	3	90	7	1	60	16	177
07:45 AM	6	81	18	0	45	29	179
Total	14	307	47	3	189	64	624
08:00 AM	0	63	7	0	37	17	124
08:15 AM	2	53	9	1	38	18	121
08:30 AM	4	48	11	3	52	17	135
08:45 AM	11	63	6	1	29	45	155
Total	17	227	33	5	156	97	535
Grand Total	31	534	80	8	345	161	1159
Apprch %	5.5	94.5	90.9	9.1	68.2	31.8	
Total %	2.7	46.1	6.9	0.7	29.8	13.9	

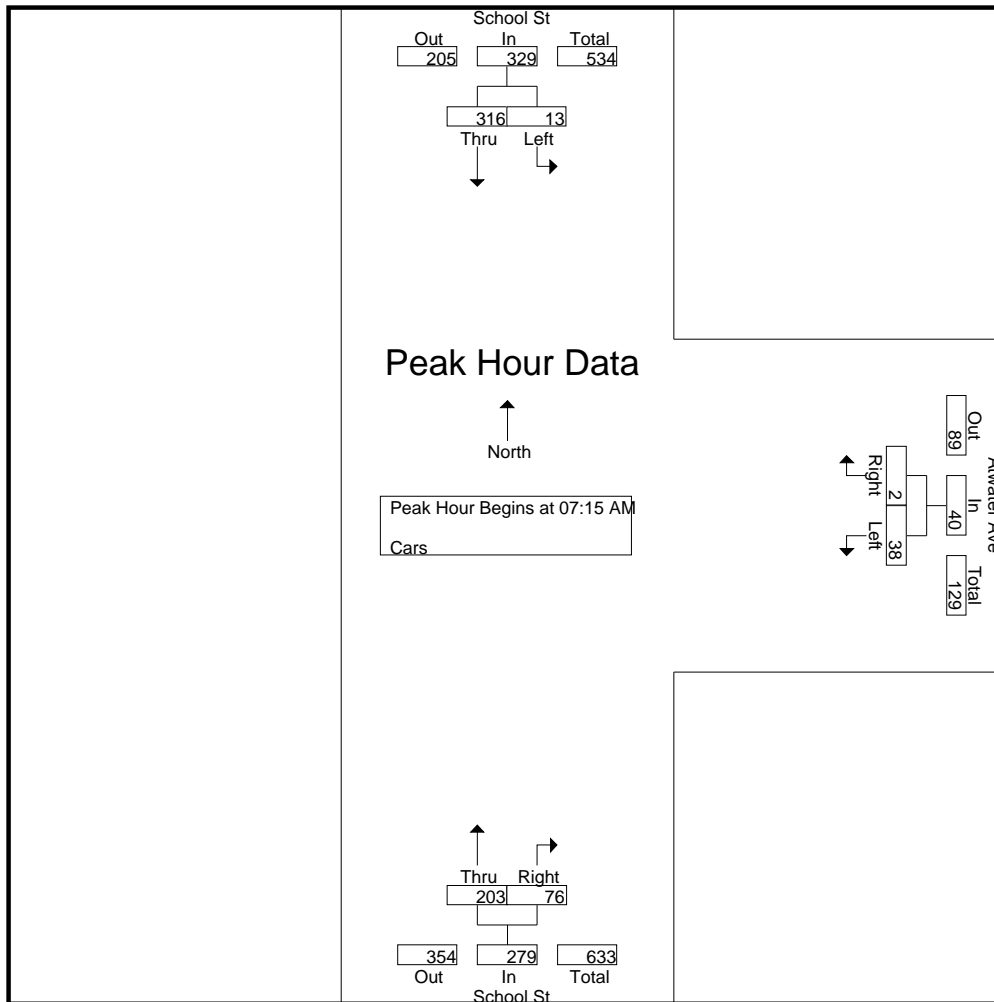
	School St From North			Atwater Ave From East			School St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	4	82	86	6	1	7	61	14	75	168
07:30 AM	3	90	93	7	1	8	60	16	76	177
07:45 AM	6	81	87	18	0	18	45	29	74	179
08:00 AM	0	63	63	7	0	7	37	17	54	124
Total Volume	13	316	329	38	2	40	203	76	279	648
% App. Total	4	96		95	5		72.8	27.2		
PHF	.542	.878	.884	.528	.500	.556	.832	.655	.918	.905

# Accurate Counts

978-664-2565

N/S Street : School Street  
 E/W Street : Atwater Avenue  
 City/State : Manchester By The Sea  
 Weather : Clear

File Name : 84410001  
 Site Code : 84410001  
 Start Date : 11/9/2021  
 Page No : 5

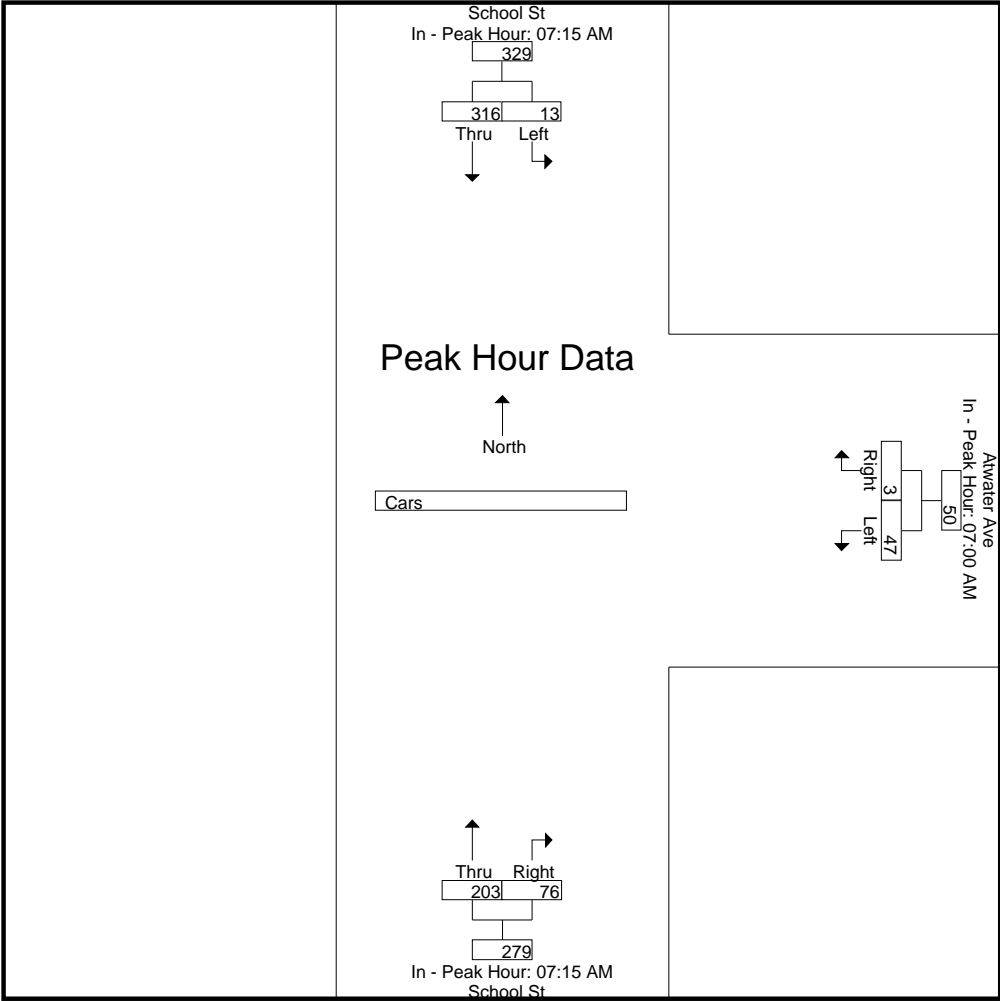


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	07:15 AM			07:00 AM			07:15 AM		
+0 mins.	4	82	86	16	<b>1</b>	17	<b>61</b>	14	75
+15 mins.	3	<b>90</b>	<b>93</b>	6	1	7	60	16	<b>76</b>
+30 mins.	<b>6</b>	81	87	7	1	8	45	<b>29</b>	74
+45 mins.	0	63	63	<b>18</b>	0	<b>18</b>	37	17	54
Total Volume	13	316	329	47	3	50	203	76	279
% App. Total	4	96		94	6		72.8	27.2	
PHF	.542	.878	.884	.653	.750	.694	.832	.655	.918

N/S Street : School Street  
E/W Street : Atwater Avenue  
City/State : Manchester By The Sea  
Weather : Clear

File Name : 84410001  
Site Code : 84410001  
Start Date : 11/9/2021  
Page No : 6



# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Atwater Avenue  
City/State : Manchester By The Sea  
Weather : Clear

File Name : 84410001  
Site Code : 84410001  
Start Date : 11/9/2021  
Page No : 7

## Groups Printed- Trucks

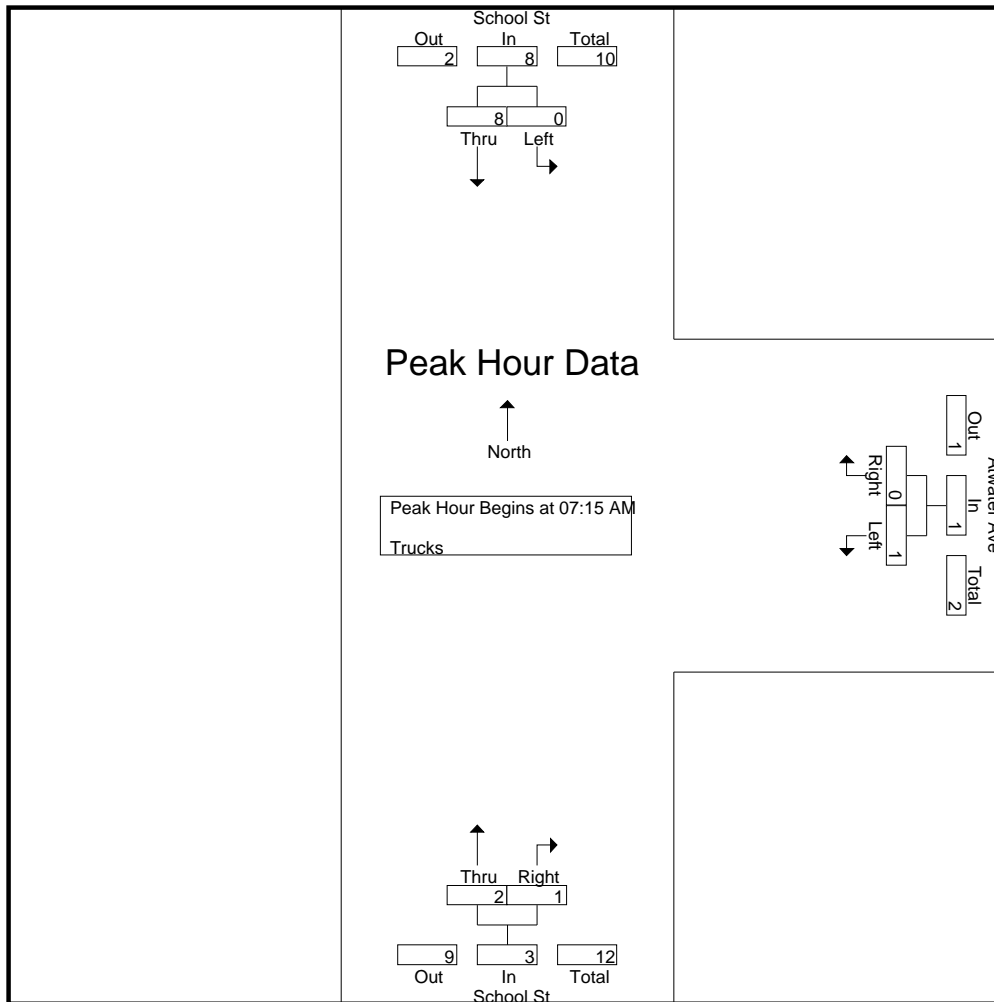
	School St From North		Atwater Ave From East		School St From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	0	0	0	0	0	0	0
07:15 AM	0	4	0	0	1	0	5
07:30 AM	0	0	0	0	1	0	1
07:45 AM	0	1	1	0	0	0	2
Total	0	5	1	0	2	0	8
08:00 AM	0	3	0	0	0	1	4
08:15 AM	0	1	1	0	1	0	3
08:30 AM	0	1	0	0	0	0	1
08:45 AM	0	0	1	0	3	0	4
Total	0	5	2	0	4	1	12
Grand Total	0	10	3	0	6	1	20
Apprch %	0	100	100	0	85.7	14.3	
Total %	0	50	15	0	30	5	

	School St From North			Atwater Ave From East			School St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	4	4	0	0	0	1	0	1	5
07:30 AM	0	0	0	0	0	0	1	0	1	1
07:45 AM	0	1	1	1	0	1	0	0	0	2
08:00 AM	0	3	3	0	0	0	0	1	1	4
Total Volume	0	8	8	1	0	1	2	1	3	12
% App. Total	0	100		100	0		66.7	33.3		
PHF	.000	.500	.500	.250	.000	.250	.500	.250	.750	.600

**Accurate Counts**  
978-664-2565

N/S Street : School Street  
E/W Street : Atwater Avenue  
City/State : Manchester By The Sea  
Weather : Clear

File Name : 84410001  
Site Code : 84410001  
Start Date : 11/9/2021  
Page No : 8

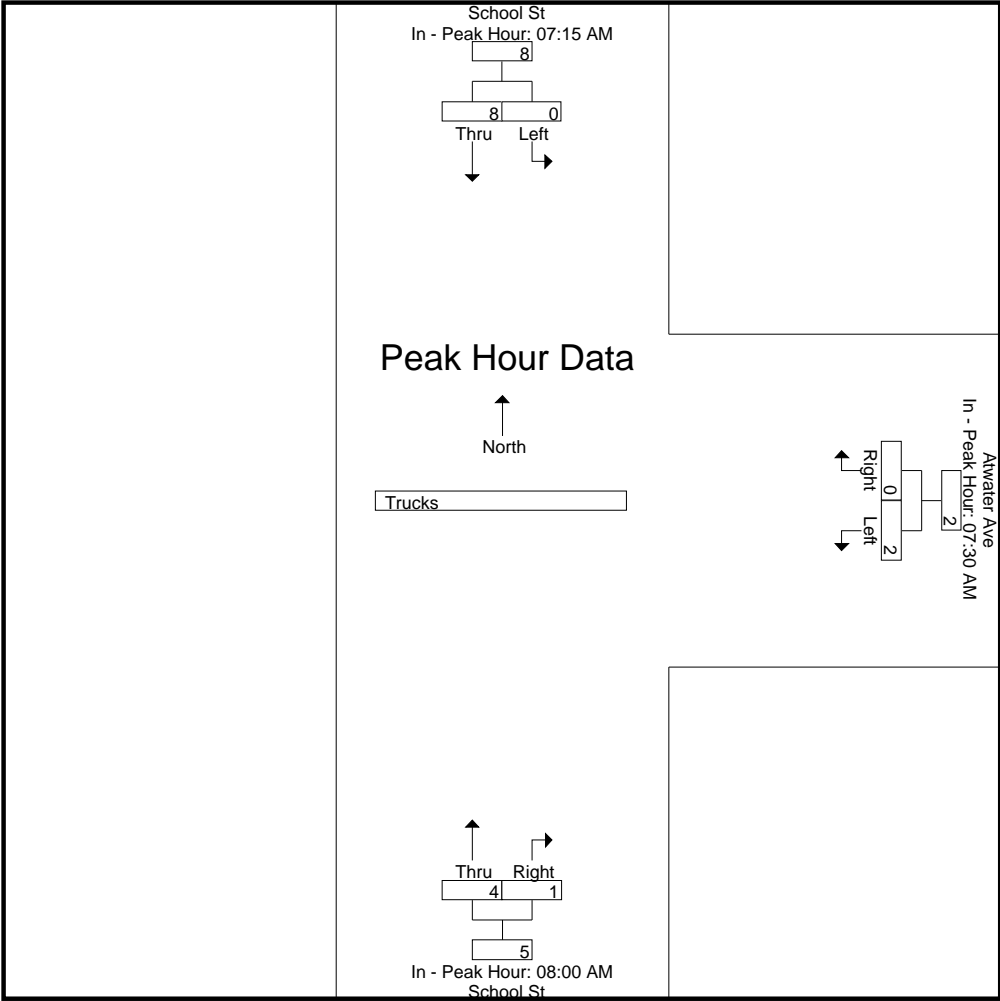


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	07:15 AM			07:30 AM			08:00 AM		
+0 mins.	0	4	4	0	0	0	0	1	1
+15 mins.	0	0	0	1	0	1	1	0	1
+30 mins.	0	1	1	0	0	0	0	0	0
+45 mins.	0	3	3	1	0	1	3	0	3
Total Volume	0	8	8	2	0	2	4	1	5
% App. Total	0	100		100	0		80	20	
PHF	.000	.500	.500	.500	.000	.500	.333	.250	.417

N/S Street : School Street  
E/W Street : Atwater Avenue  
City/State : Manchester By The Sea  
Weather : Clear

File Name : 84410001  
Site Code : 84410001  
Start Date : 11/9/2021  
Page No : 9



# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Atwater Avenue  
City/State : Manchester By The Sea  
Weather : Clear

File Name : 84410001  
Site Code : 84410001  
Start Date : 11/9/2021  
Page No : 10

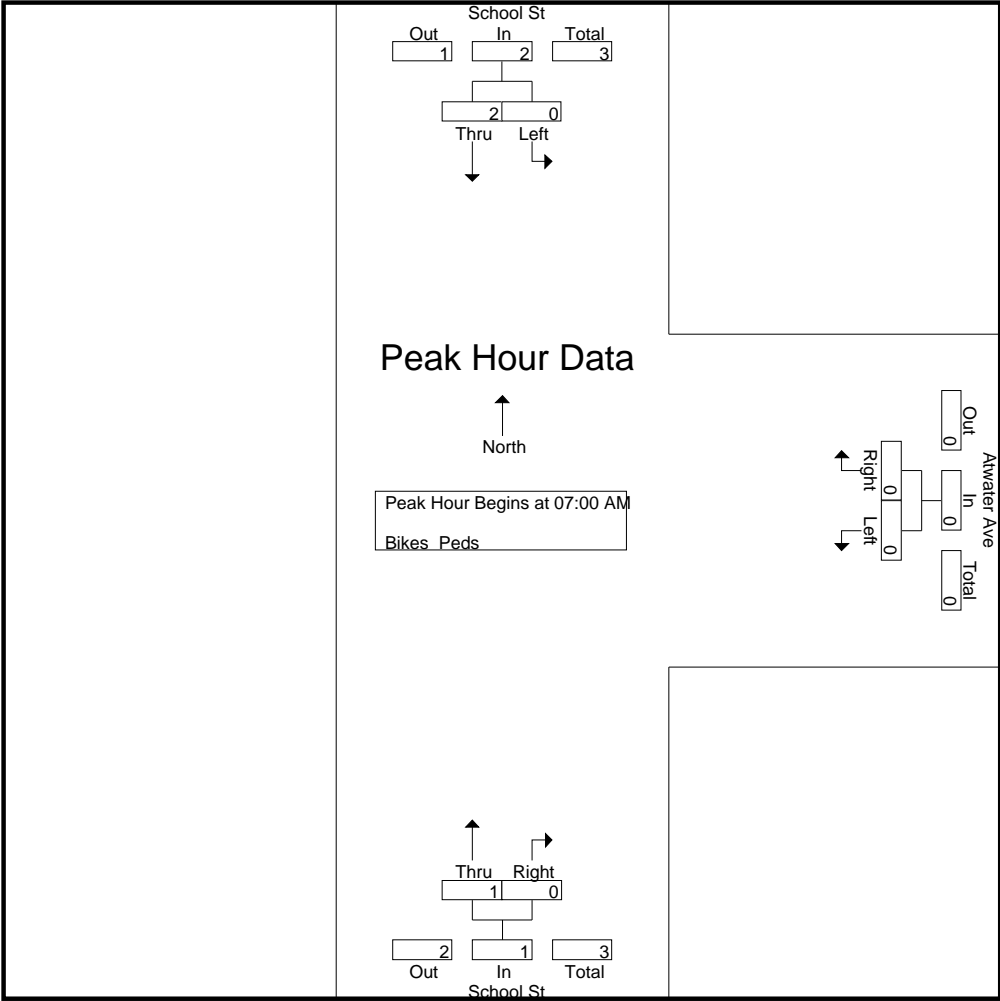
## Groups Printed- Bikes Peds

	School St From North			Atwater Ave From East			School St From South			Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds			
07:00 AM	0	1	0	0	0	0	1	0	0	0	2	2
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	1	0	0	0	0	0	0	0	0	1	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	0	0	0	0	1	0	0	0	3	3
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	1	0	0	0	1	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	0	1	1
Grand Total	0	2	0	0	0	0	2	0	0	0	4	4
Apprch %	0	100		0	0		100	0				
Total %	0	50		0	0		50	0		0	100	

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

N/S Street : School Street  
E/W Street : Atwater Avenue  
City/State : Manchester By The Sea  
Weather : Clear

File Name : 84410001  
Site Code : 84410001  
Start Date : 11/9/2021  
Page No : 11



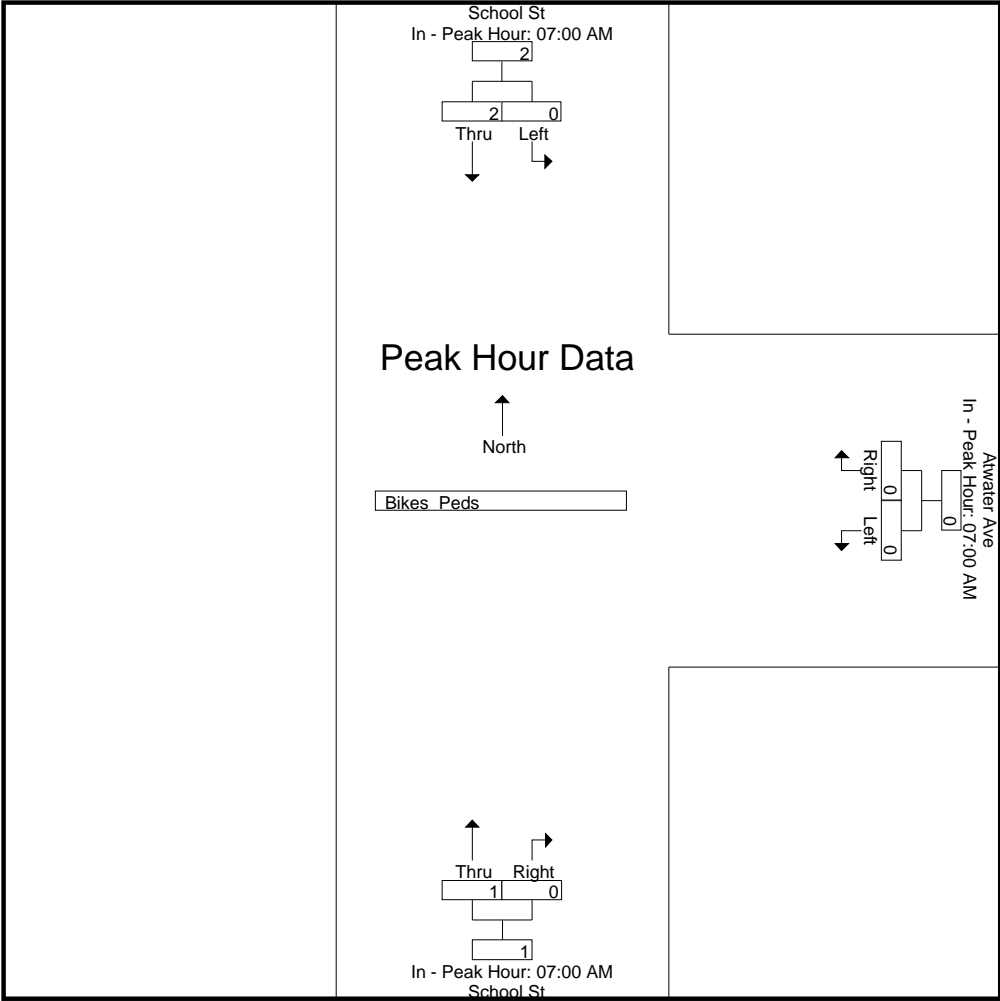
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

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



N/S Street : School Street  
E/W Street : Atwater Avenue  
City/State : Manchester By The Sea  
Weather : Clear

File Name : 84410001  
Site Code : 84410001  
Start Date : 11/9/2021  
Page No : 12



# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Atwater Avenue  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410001  
Site Code : 84410001  
Start Date : 11/9/2021  
Page No : 1

## Groups Printed- Cars - Trucks

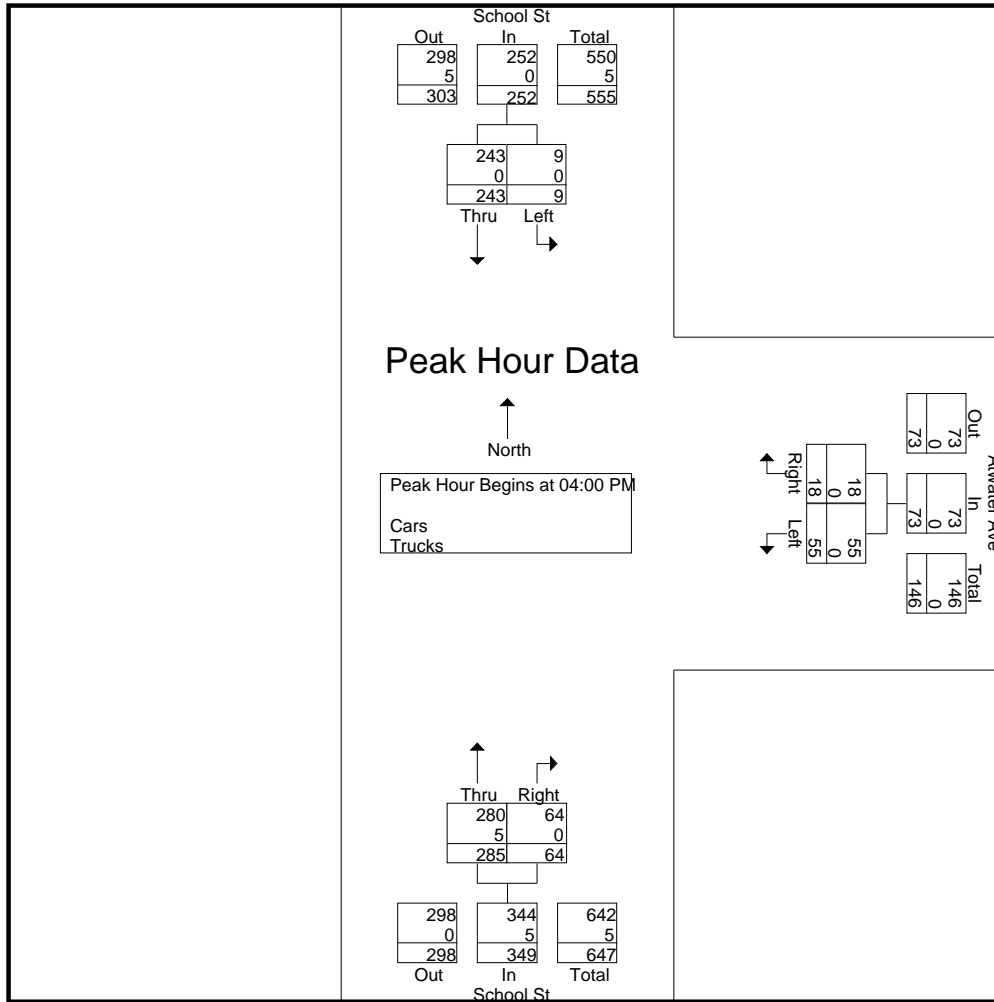
	School St From North		Atwater Ave From East		School St From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	0	65	10	1	82	11	169
04:15 PM	3	58	10	3	78	27	179
04:30 PM	5	64	24	9	79	16	197
04:45 PM	1	56	11	5	46	10	129
Total	9	243	55	18	285	64	674
05:00 PM	2	58	9	1	59	9	138
05:15 PM	1	53	8	3	50	3	118
05:30 PM	0	49	9	0	36	8	102
05:45 PM	4	34	6	3	28	21	96
Total	7	194	32	7	173	41	454
Grand Total	16	437	87	25	458	105	1128
Apprch %	3.5	96.5	77.7	22.3	81.3	18.7	
Total %	1.4	38.7	7.7	2.2	40.6	9.3	
Cars	16	436	87	25	453	105	1122
% Cars	100	99.8	100	100	98.9	100	99.5
Trucks	0	1	0	0	5	0	6
% Trucks	0	0.2	0	0	1.1	0	0.5

	School St From North			Atwater Ave From East			School St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	<b>65</b>	65	10	1	11	<b>82</b>	11	93	169
04:15 PM	3	58	61	10	3	13	78	<b>27</b>	<b>105</b>	179
04:30 PM	<b>5</b>	64	<b>69</b>	<b>24</b>	<b>9</b>	<b>33</b>	79	16	95	<b>197</b>
04:45 PM	1	56	57	11	5	16	46	10	56	129
Total Volume	9	243	252	55	18	73	285	64	349	674
% App. Total	3.6	96.4		75.3	24.7		81.7	18.3		
PHF	.450	.935	.913	.573	.500	.553	.869	.593	.831	.855
Cars	9	243	252	55	18	73	280	64	344	669
% Cars	100	100	100	100	100	100	98.2	100	98.6	99.3
Trucks	0	0	0	0	0	0	5	0	5	5
% Trucks	0	0	0	0	0	0	1.8	0	1.4	0.7

**Accurate Counts**  
978-664-2565

N/S Street : School Street  
E/W Street : Atwater Avenue  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410001  
Site Code : 84410001  
Start Date : 11/9/2021  
Page No : 2

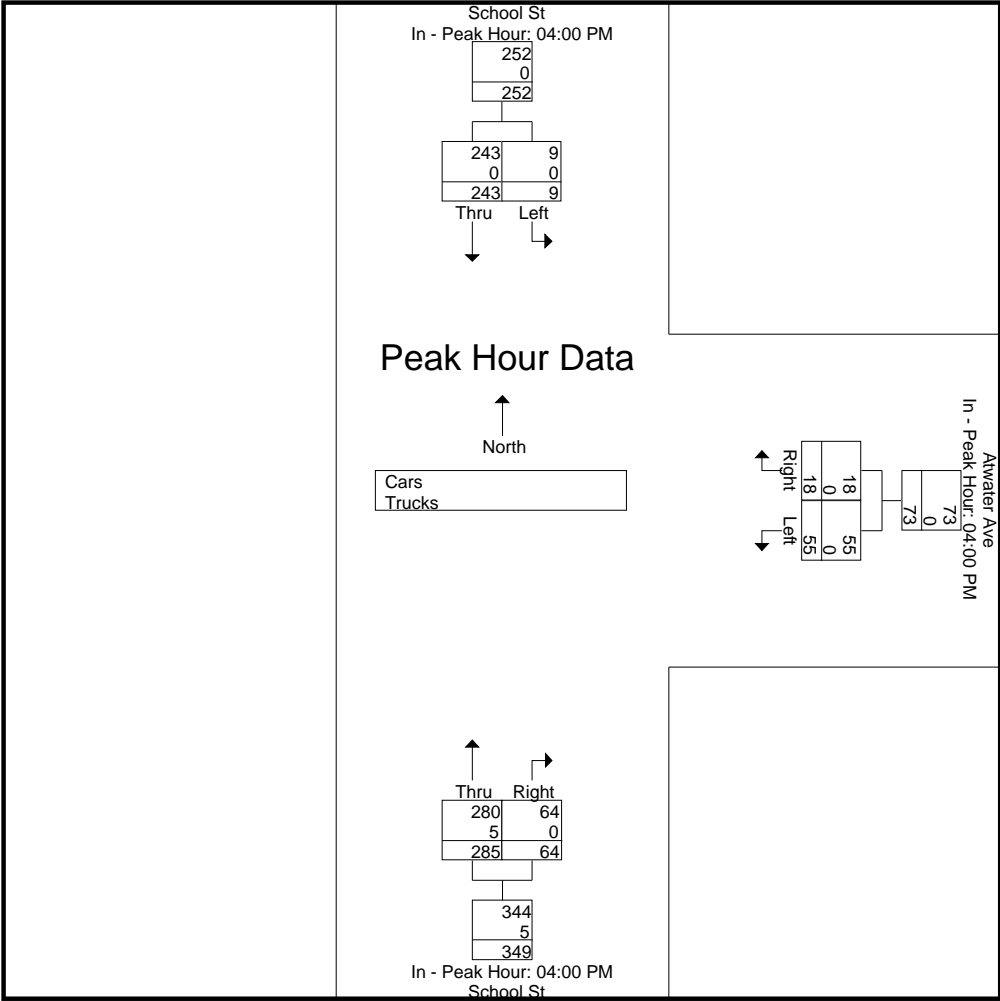


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	0	<b>65</b>	65	10	1	11	<b>82</b>	11	93
+15 mins.	3	58	61	10	3	13	78	<b>27</b>	<b>105</b>
+30 mins.	<b>5</b>	64	<b>69</b>	<b>24</b>	<b>9</b>	<b>33</b>	79	16	95
+45 mins.	1	56	57	11	5	16	46	10	56
Total Volume	9	243	252	55	18	73	285	64	349
% App. Total	3.6	96.4		75.3	24.7		81.7	18.3	
PHF	.450	.935	.913	.573	.500	.553	.869	.593	.831
Cars	9	243	252	55	18	73	280	64	344
% Cars	100	100	100	100	100	100	98.2	100	98.6
Trucks	0	0	0	0	0	0	5	0	5
% Trucks	0	0	0	0	0	0	1.8	0	1.4

N/S Street : School Street  
E/W Street : Atwater Avenue  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410001  
Site Code : 84410001  
Start Date : 11/9/2021  
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# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Atwater Avenue  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410001  
Site Code : 84410001  
Start Date : 11/9/2021  
Page No : 4

## Groups Printed- Cars

	School St From North		Atwater Ave From East		School St From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	0	65	10	1	81	11	168
04:15 PM	3	58	10	3	76	27	177
04:30 PM	5	64	24	9	78	16	196
04:45 PM	1	56	11	5	45	10	128
Total	9	243	55	18	280	64	669
05:00 PM	2	57	9	1	59	9	137
05:15 PM	1	53	8	3	50	3	118
05:30 PM	0	49	9	0	36	8	102
05:45 PM	4	34	6	3	28	21	96
Total	7	193	32	7	173	41	453
Grand Total	16	436	87	25	453	105	1122
Apprch %	3.5	96.5	77.7	22.3	81.2	18.8	
Total %	1.4	38.9	7.8	2.2	40.4	9.4	

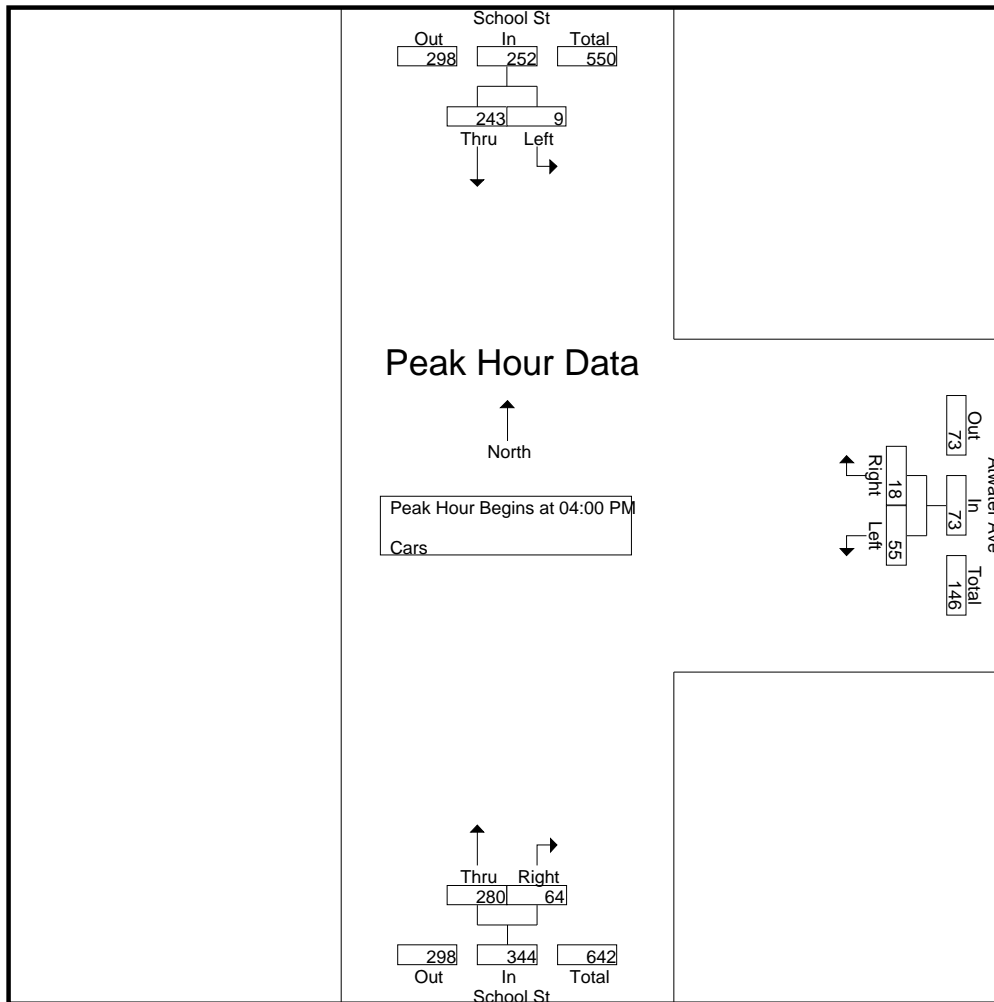
	School St From North			Atwater Ave From East			School St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	65	65	10	1	11	81	11	92	168
04:15 PM	3	58	61	10	3	13	76	27	103	177
04:30 PM	5	64	69	24	9	33	78	16	94	196
04:45 PM	1	56	57	11	5	16	45	10	55	128
Total Volume	9	243	252	55	18	73	280	64	344	669
% App. Total	3.6	96.4		75.3	24.7		81.4	18.6		
PHF	.450	.935	.913	.573	.500	.553	.864	.593	.835	.853

# Accurate Counts

978-664-2565

N/S Street : School Street  
 E/W Street : Atwater Avenue  
 City/State : Manchester By The Sea, MA  
 Weather : Clear

File Name : 84410001  
 Site Code : 84410001  
 Start Date : 11/9/2021  
 Page No : 5

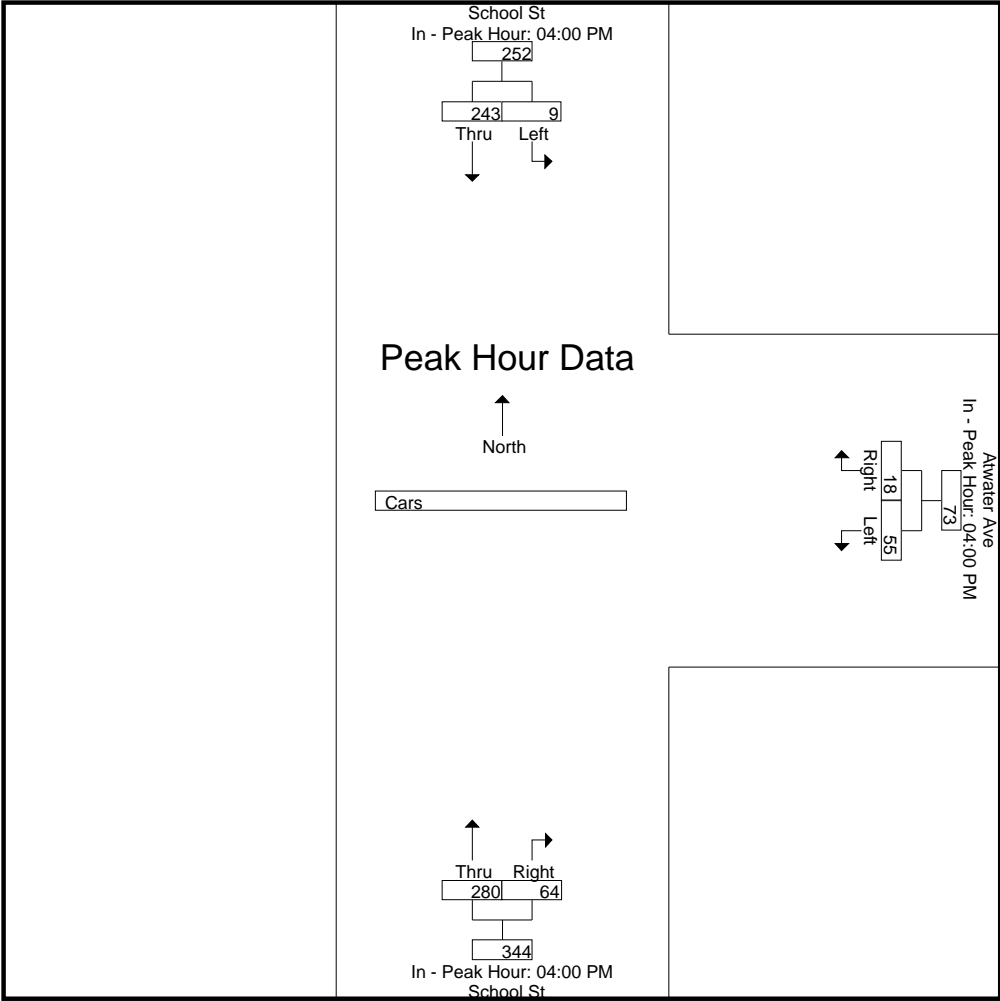


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	0	<b>65</b>	65	10	1	11	<b>81</b>	11	92
+15 mins.	3	58	61	10	3	13	76	<b>27</b>	<b>103</b>
+30 mins.	<b>5</b>	64	<b>69</b>	<b>24</b>	<b>9</b>	<b>33</b>	78	16	94
+45 mins.	1	56	57	11	5	16	45	10	55
Total Volume	9	243	252	55	18	73	280	64	344
% App. Total	3.6	96.4		75.3	24.7		81.4	18.6	
PHF	.450	.935	.913	.573	.500	.553	.864	.593	.835

N/S Street : School Street  
E/W Street : Atwater Avenue  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410001  
Site Code : 84410001  
Start Date : 11/9/2021  
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# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Atwater Avenue  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410001  
Site Code : 84410001  
Start Date : 11/9/2021  
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## Groups Printed- Trucks

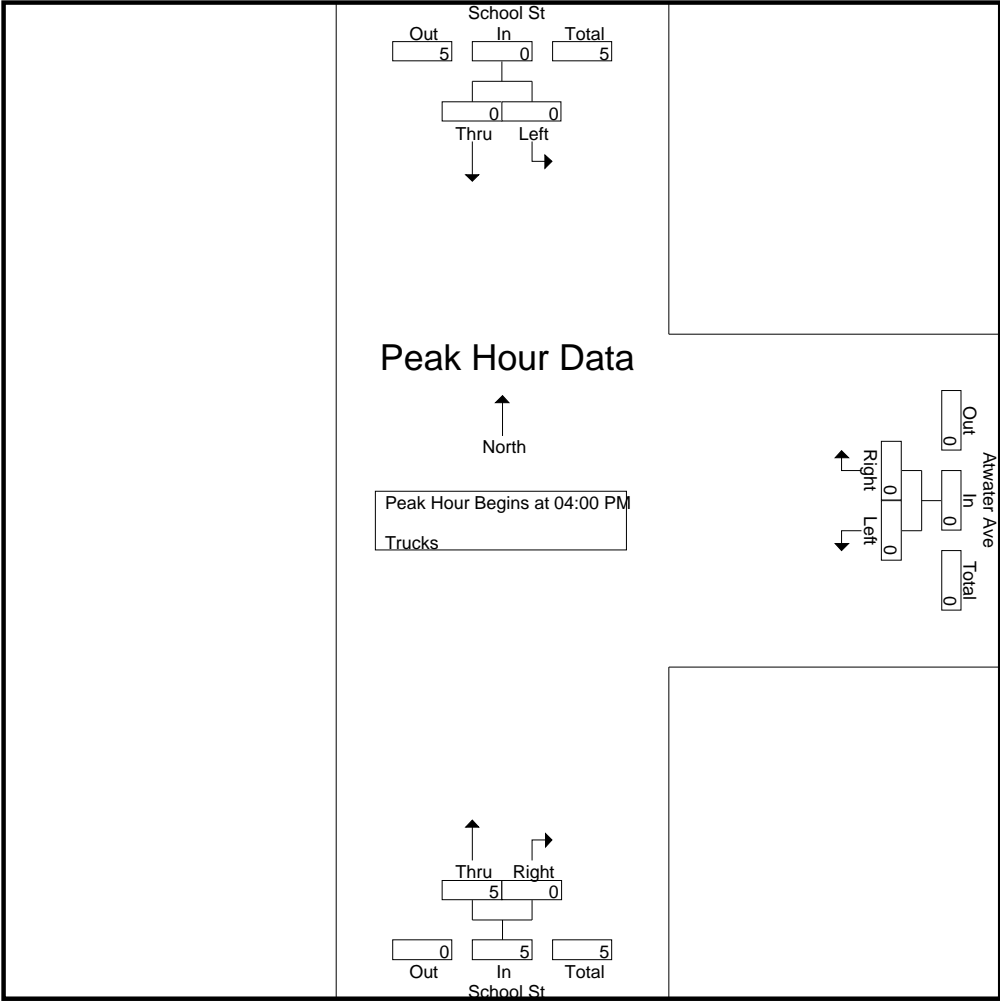
	School St From North		Atwater Ave From East		School St From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	0	0	0	0	1	0	1
04:15 PM	0	0	0	0	2	0	2
04:30 PM	0	0	0	0	1	0	1
04:45 PM	0	0	0	0	1	0	1
Total	0	0	0	0	5	0	5
05:00 PM	0	1	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	1
Grand Total	0	1	0	0	5	0	6
Apprch %	0	100	0	0	100	0	
Total %	0	16.7	0	0	83.3	0	

	School St From North			Atwater Ave From East			School St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	0	0	0	1	0	1	1
04:15 PM	0	0	0	0	0	0	2	0	2	2
04:30 PM	0	0	0	0	0	0	1	0	1	1
04:45 PM	0	0	0	0	0	0	1	0	1	1
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	.625	.000	.625	.625



N/S Street : School Street  
E/W Street : Atwater Avenue  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410001  
Site Code : 84410001  
Start Date : 11/9/2021  
Page No : 8

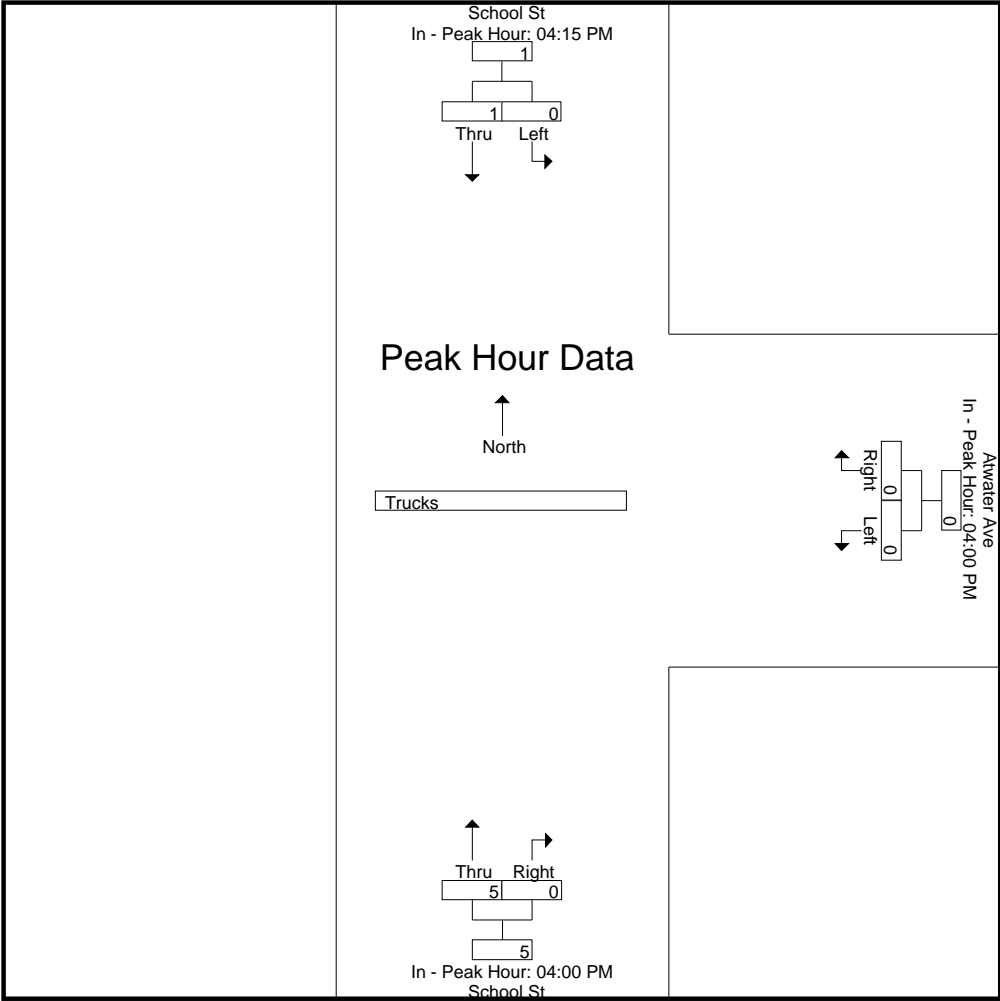


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	04:15 PM			04:00 PM			04:00 PM		
+0 mins.	0	0	0	0	0	0	1	0	1
+15 mins.	0	0	0	0	0	0	2	0	2
+30 mins.	0	0	0	0	0	0	1	0	1
+45 mins.	0	1	1	0	0	0	1	0	1
Total Volume	0	1	1	0	0	0	5	0	5
% App. Total	0	100		0	0		100	0	
PHF	.000	.250	.250	.000	.000	.000	.625	.000	.625

N/S Street : School Street  
E/W Street : Atwater Avenue  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410001  
Site Code : 84410001  
Start Date : 11/9/2021  
Page No : 9



# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Atwater Avenue  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410001  
Site Code : 84410001  
Start Date : 11/9/2021  
Page No : 10

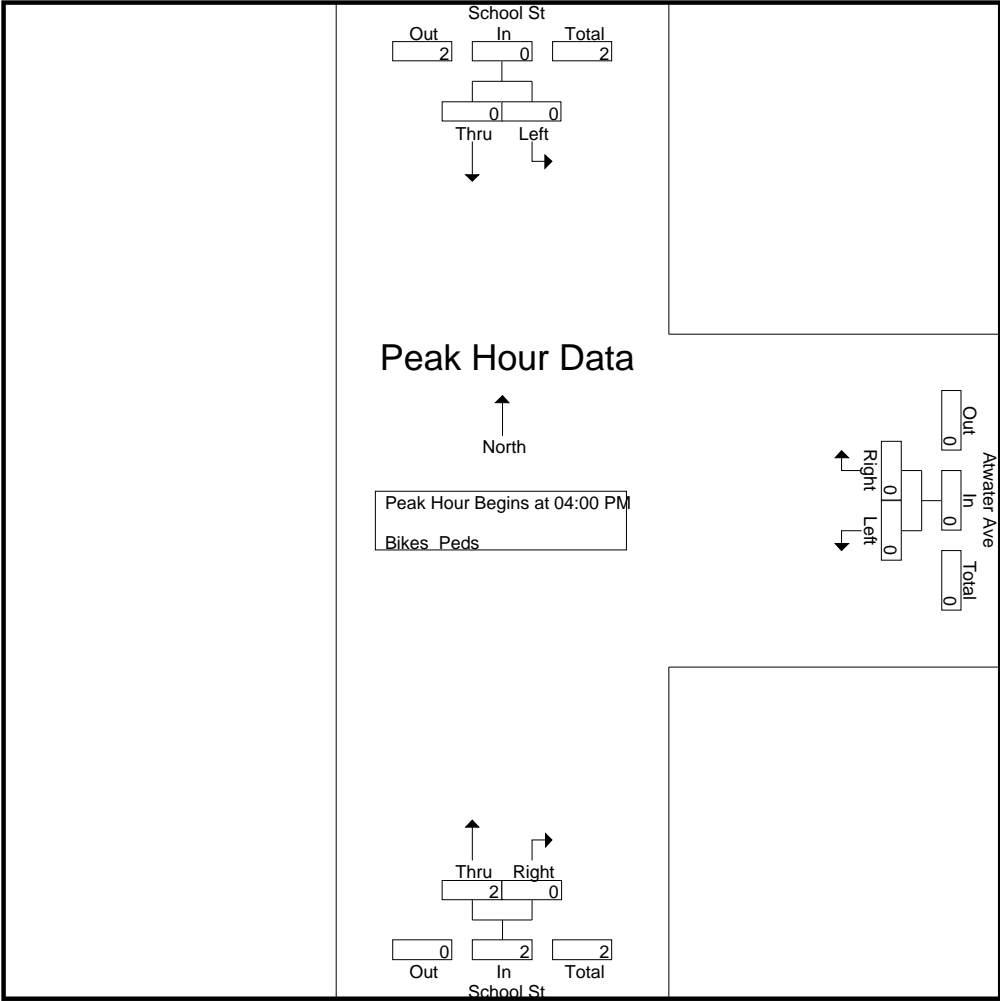
## Groups Printed- Bikes Peds

	School St From North			Atwater Ave From East			School St From South			Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds			
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	2	0	0	0	2	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	2	0	0	0	2	2
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	1	0	0	0	0	0	0	0	0	1	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	0	0	0	0	1	1
Grand Total	0	1	0	0	0	0	2	0	0	0	3	3
Apprch %	0	100		0	0		100	0				
Total %	0	33.3		0	0		66.7	0		0	100	

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

N/S Street : School Street  
E/W Street : Atwater Avenue  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410001  
Site Code : 84410001  
Start Date : 11/9/2021  
Page No : 11

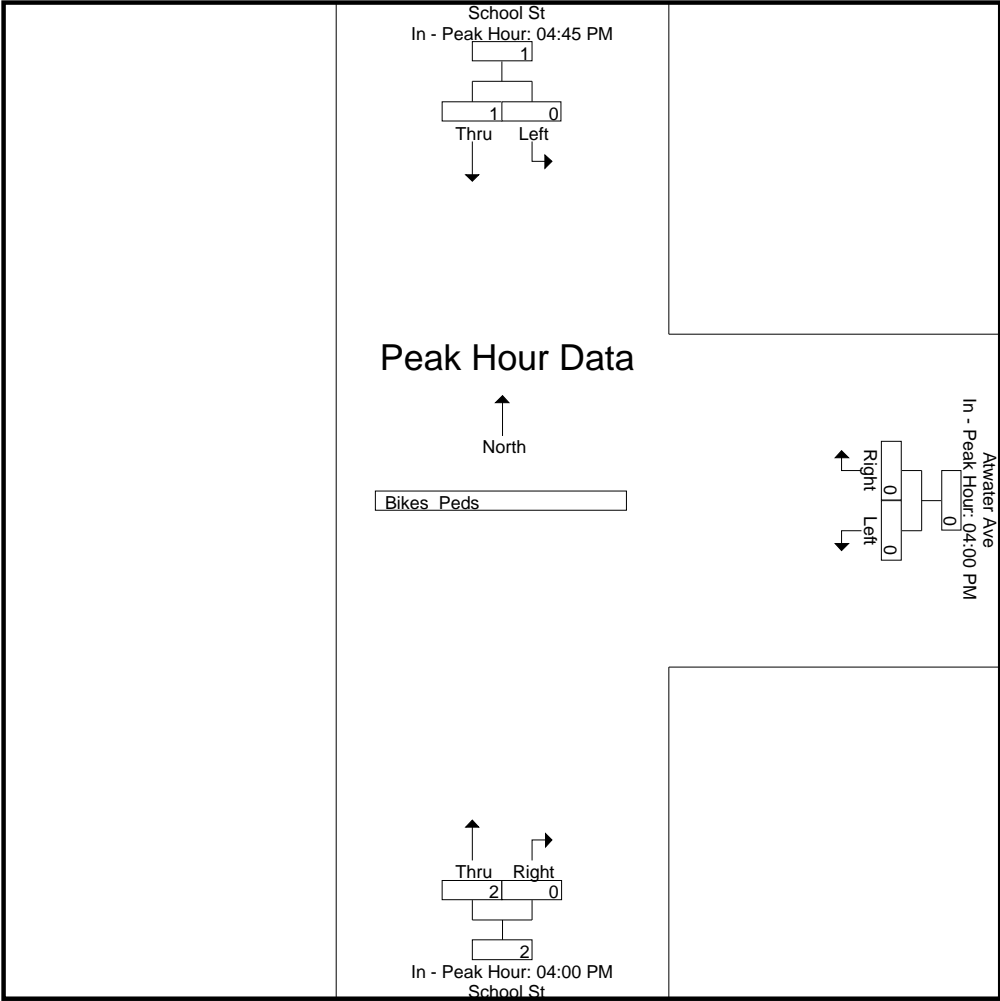


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	04:45 PM			04:00 PM			04:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	2	0	2
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	1	1	0	0	0	0	0	0
Total Volume	0	1	1	0	0	0	2	0	2
% App. Total	0	100		0	0		100	0	
PHF	.000	.250	.250	.000	.000	.000	.250	.000	.250

N/S Street : School Street  
E/W Street : Atwater Avenue  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410001  
Site Code : 84410001  
Start Date : 11/9/2021  
Page No : 12



# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Route 128 SB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410002  
Site Code : 84410002  
Start Date : 11/9/2021  
Page No : 1

## Groups Printed- Cars - Trucks

	School St From North		Route 128 SB Ramp From East		School St From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	23	49	17	7	26	45	167
07:15 AM	24	66	19	9	75	64	257
07:30 AM	26	65	18	5	77	74	265
07:45 AM	23	81	17	12	73	53	259
Total	96	261	71	33	251	236	948
08:00 AM	19	59	23	5	59	49	214
08:15 AM	19	45	28	6	59	54	211
08:30 AM	23	42	20	14	72	49	220
08:45 AM	27	44	18	16	73	64	242
Total	88	190	89	41	263	216	887
Grand Total	184	451	160	74	514	452	1835
Apprch %	29	71	68.4	31.6	53.2	46.8	
Total %	10	24.6	8.7	4	28	24.6	
Cars	180	445	159	74	505	447	1810
% Cars	97.8	98.7	99.4	100	98.2	98.9	98.6
Trucks	4	6	1	0	9	5	25
% Trucks	2.2	1.3	0.6	0	1.8	1.1	1.4

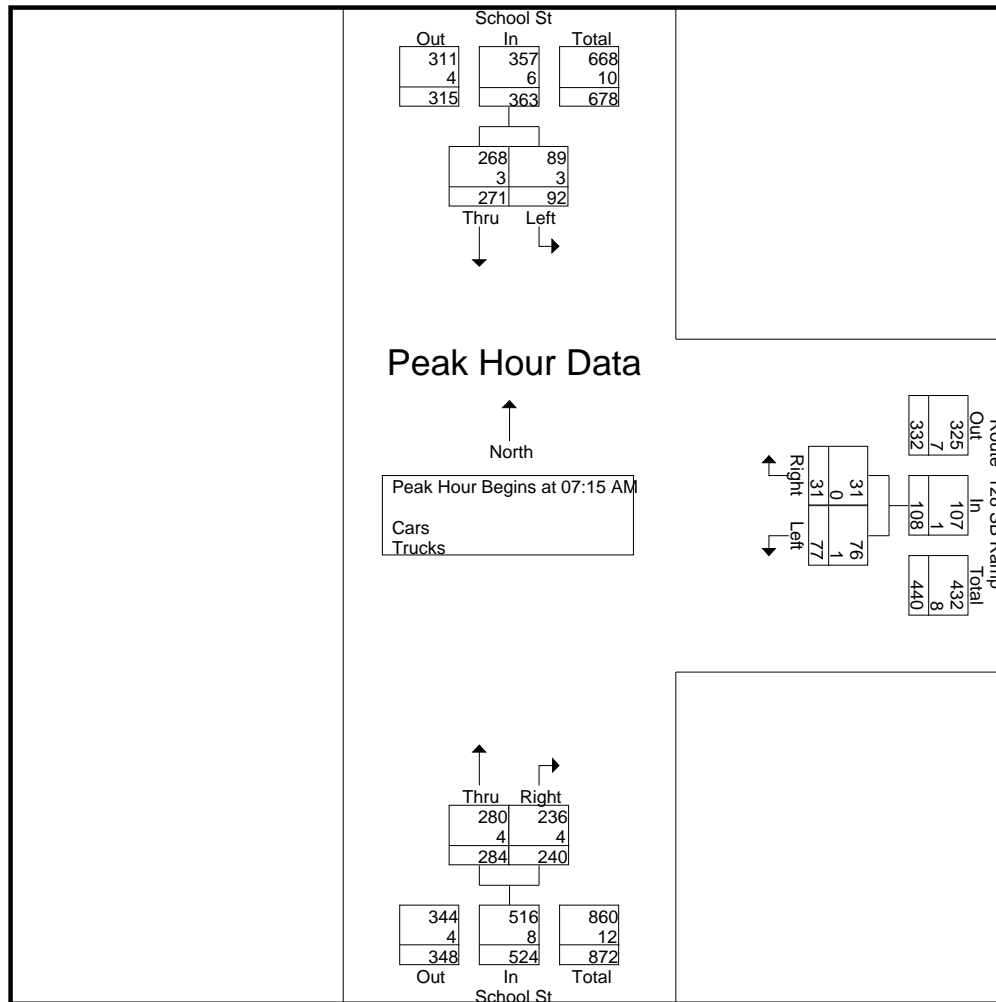
	School St From North			Route 128 SB Ramp From East			School St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	24	66	90	19	9	28	75	64	139	257
07:30 AM	<b>26</b>	65	91	18	5	23	<b>77</b>	<b>74</b>	<b>151</b>	<b>265</b>
07:45 AM	23	<b>81</b>	<b>104</b>	17	<b>12</b>	<b>29</b>	73	53	126	259
08:00 AM	19	59	78	<b>23</b>	5	28	59	49	108	214
Total Volume	92	271	363	77	31	108	284	240	524	995
% App. Total	25.3	74.7		71.3	28.7		54.2	45.8		
PHF	.885	.836	.873	.837	.646	.931	.922	.811	.868	.939
Cars	89	268	357	76	31	107	280	236	516	980
% Cars	96.7	98.9	98.3	98.7	100	99.1	98.6	98.3	98.5	98.5
Trucks	3	3	6	1	0	1	4	4	8	15
% Trucks	3.3	1.1	1.7	1.3	0	0.9	1.4	1.7	1.5	1.5

# Accurate Counts

978-664-2565

N/S Street : School Street  
 E/W Street : Route 128 SB Ramp  
 City/State : Manchester By The Sea, MA  
 Weather : Clear

File Name : 84410002  
 Site Code : 84410002  
 Start Date : 11/9/2021  
 Page No : 2

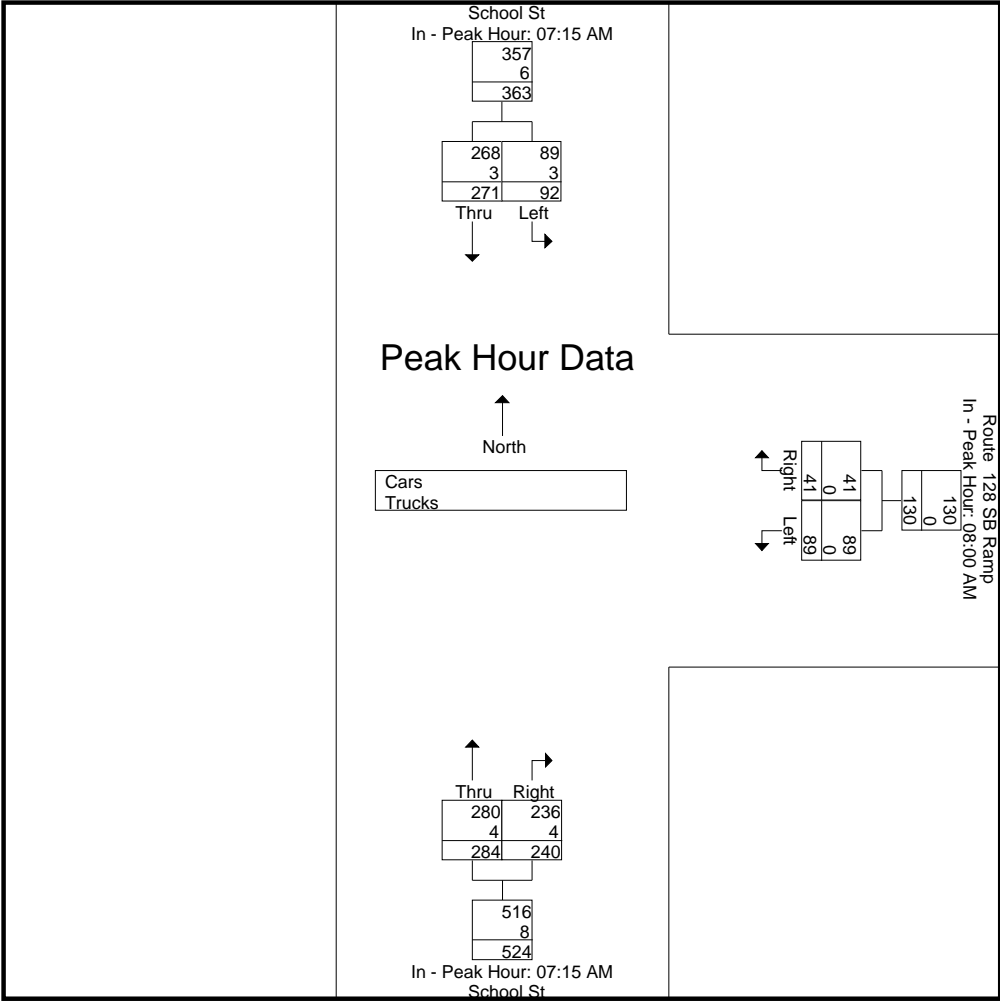


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	07:15 AM			08:00 AM			07:15 AM		
+0 mins.	24	66	90	23	5	28	75	64	139
+15 mins.	<b>26</b>	65	91	<b>28</b>	6	<b>34</b>	<b>77</b>	<b>74</b>	<b>151</b>
+30 mins.	23	<b>81</b>	<b>104</b>	20	14	34	73	53	126
+45 mins.	19	59	78	18	<b>16</b>	34	59	49	108
Total Volume	92	271	363	89	41	130	284	240	524
% App. Total	25.3	74.7		68.5	31.5		54.2	45.8	
PHF	.885	.836	.873	.795	.641	.956	.922	.811	.868
Cars	89	268	357	89	41	130	280	236	516
% Cars	96.7	98.9	98.3	100	100	100	98.6	98.3	98.5
Trucks	3	3	6	0	0	0	4	4	8
% Trucks	3.3	1.1	1.7	0	0	0	1.4	1.7	1.5

N/S Street : School Street  
E/W Street : Route 128 SB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410002  
Site Code : 84410002  
Start Date : 11/9/2021  
Page No : 3





# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Route 128 SB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410002  
Site Code : 84410002  
Start Date : 11/9/2021  
Page No : 4

## Groups Printed- Cars

	School St From North		Route 128 SB Ramp From East		School St From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	23	49	17	7	25	44	165
07:15 AM	23	63	18	9	74	63	250
07:30 AM	26	65	18	5	76	74	264
07:45 AM	23	81	17	12	73	51	257
Total	95	258	70	33	248	232	936
08:00 AM	17	59	23	5	57	48	209
08:15 AM	18	43	28	6	57	54	206
08:30 AM	23	41	20	14	72	49	219
08:45 AM	27	44	18	16	71	64	240
Total	85	187	89	41	257	215	874
Grand Total	180	445	159	74	505	447	1810
Apprch %	28.8	71.2	68.2	31.8	53	47	
Total %	9.9	24.6	8.8	4.1	27.9	24.7	

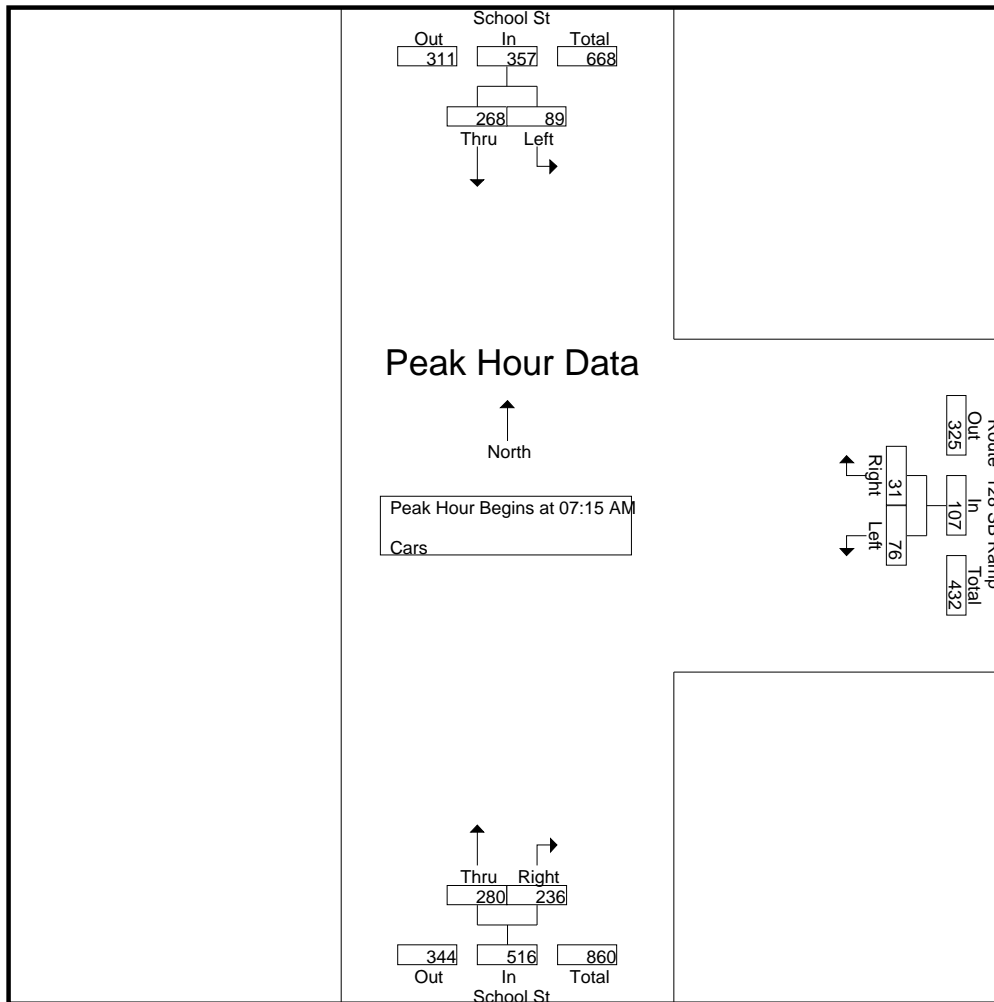
	School St From North			Route 128 SB Ramp From East			School St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	23	63	86	18	9	27	74	63	137	250
07:30 AM	<b>26</b>	65	91	18	5	23	<b>76</b>	<b>74</b>	<b>150</b>	<b>264</b>
07:45 AM	23	<b>81</b>	<b>104</b>	17	<b>12</b>	<b>29</b>	73	51	124	257
08:00 AM	17	59	76	<b>23</b>	5	28	57	48	105	209
Total Volume	89	268	357	76	31	107	280	236	516	980
% App. Total	24.9	75.1		71	29		54.3	45.7		
PHF	.856	.827	.858	.826	.646	.922	.921	.797	.860	.928

# Accurate Counts

978-664-2565

N/S Street : School Street  
 E/W Street : Route 128 SB Ramp  
 City/State : Manchester By The Sea, MA  
 Weather : Clear

File Name : 84410002  
 Site Code : 84410002  
 Start Date : 11/9/2021  
 Page No : 5

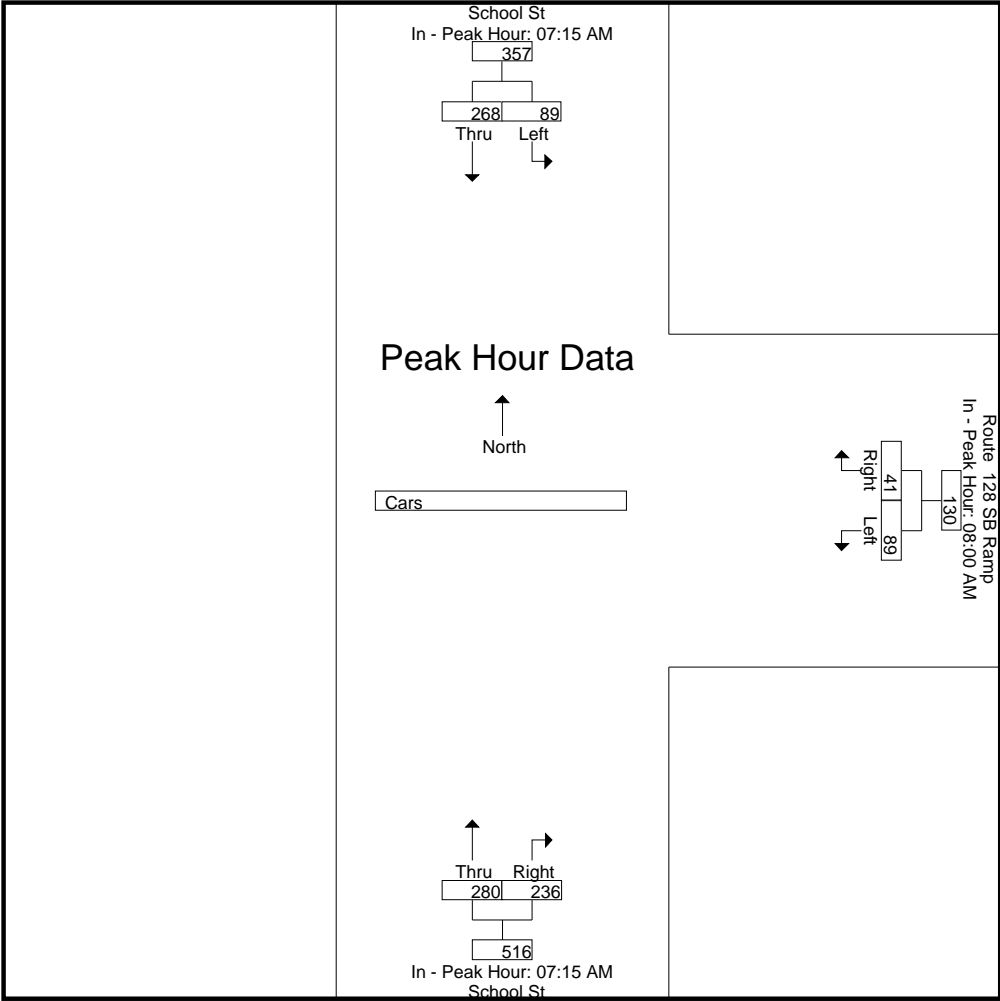


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	07:15 AM			08:00 AM			07:15 AM		
+0 mins.	23	63	86	23	5	28	74	63	137
+15 mins.	<b>26</b>	65	91	<b>28</b>	6	<b>34</b>	<b>76</b>	<b>74</b>	<b>150</b>
+30 mins.	23	<b>81</b>	<b>104</b>	20	14	34	73	51	124
+45 mins.	17	59	76	18	<b>16</b>	34	57	48	105
Total Volume	89	268	357	89	41	130	280	236	516
% App. Total	24.9	75.1		68.5	31.5		54.3	45.7	
PHF	.856	.827	.858	.795	.641	.956	.921	.797	.860

N/S Street : School Street  
E/W Street : Route 128 SB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410002  
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Start Date : 11/9/2021  
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# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Route 128 SB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410002  
Site Code : 84410002  
Start Date : 11/9/2021  
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## Groups Printed- Trucks

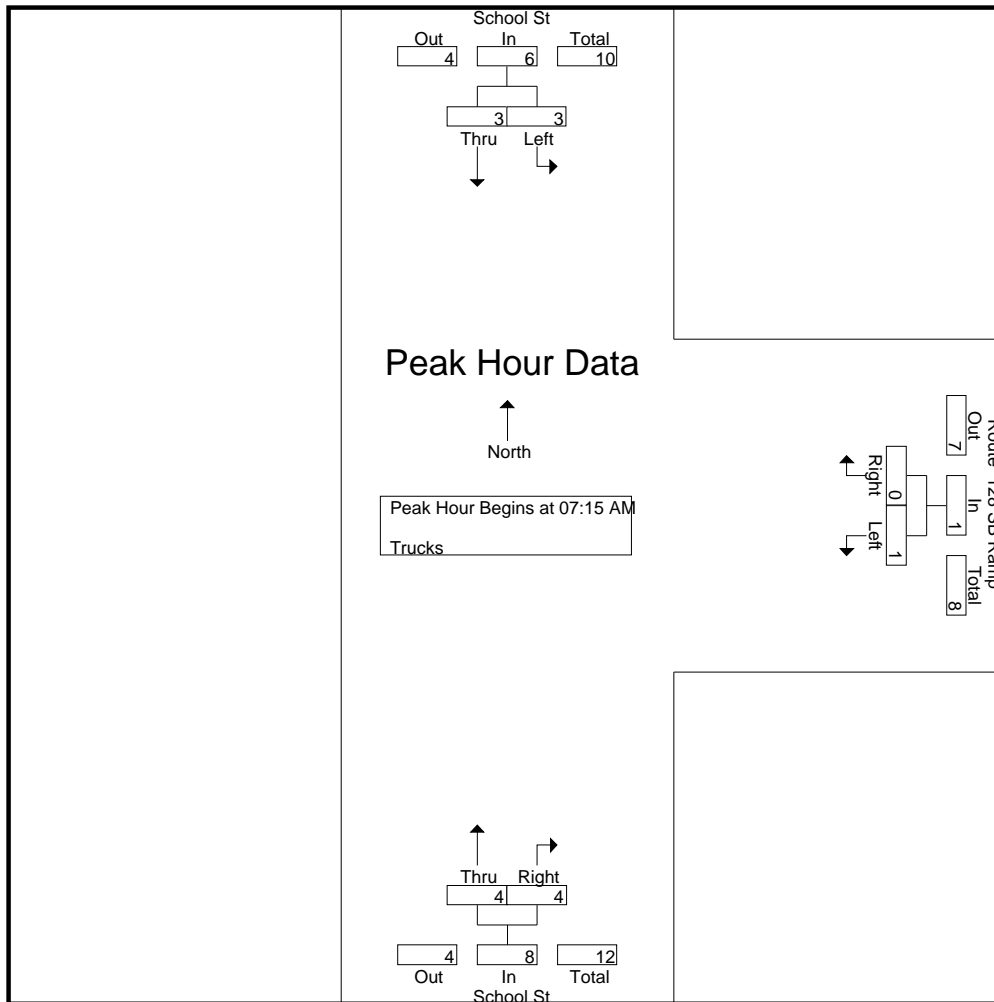
	School St From North		Route 128 SB Ramp From East		School St From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	0	0	0	0	1	1	2
07:15 AM	1	3	1	0	1	1	7
07:30 AM	0	0	0	0	1	0	1
07:45 AM	0	0	0	0	0	2	2
Total	1	3	1	0	3	4	12
08:00 AM	2	0	0	0	2	1	5
08:15 AM	1	2	0	0	2	0	5
08:30 AM	0	1	0	0	0	0	1
08:45 AM	0	0	0	0	2	0	2
Total	3	3	0	0	6	1	13
Grand Total	4	6	1	0	9	5	25
Apprch %	40	60	100	0	64.3	35.7	
Total %	16	24	4	0	36	20	

	School St From North			Route 128 SB Ramp From East			School St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	1	3	4	1	0	1	1	1	2	7
07:30 AM	0	0	0	0	0	0	1	0	1	1
07:45 AM	0	0	0	0	0	0	0	2	2	2
08:00 AM	2	0	2	0	0	0	2	1	3	5
Total Volume	3	3	6	1	0	1	4	4	8	15
% App. Total	50	50		100	0		50	50		
PHF	.375	.250	.375	.250	.000	.250	.500	.500	.667	.536

**Accurate Counts**  
978-664-2565

N/S Street : School Street  
E/W Street : Route 128 SB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410002  
Site Code : 84410002  
Start Date : 11/9/2021  
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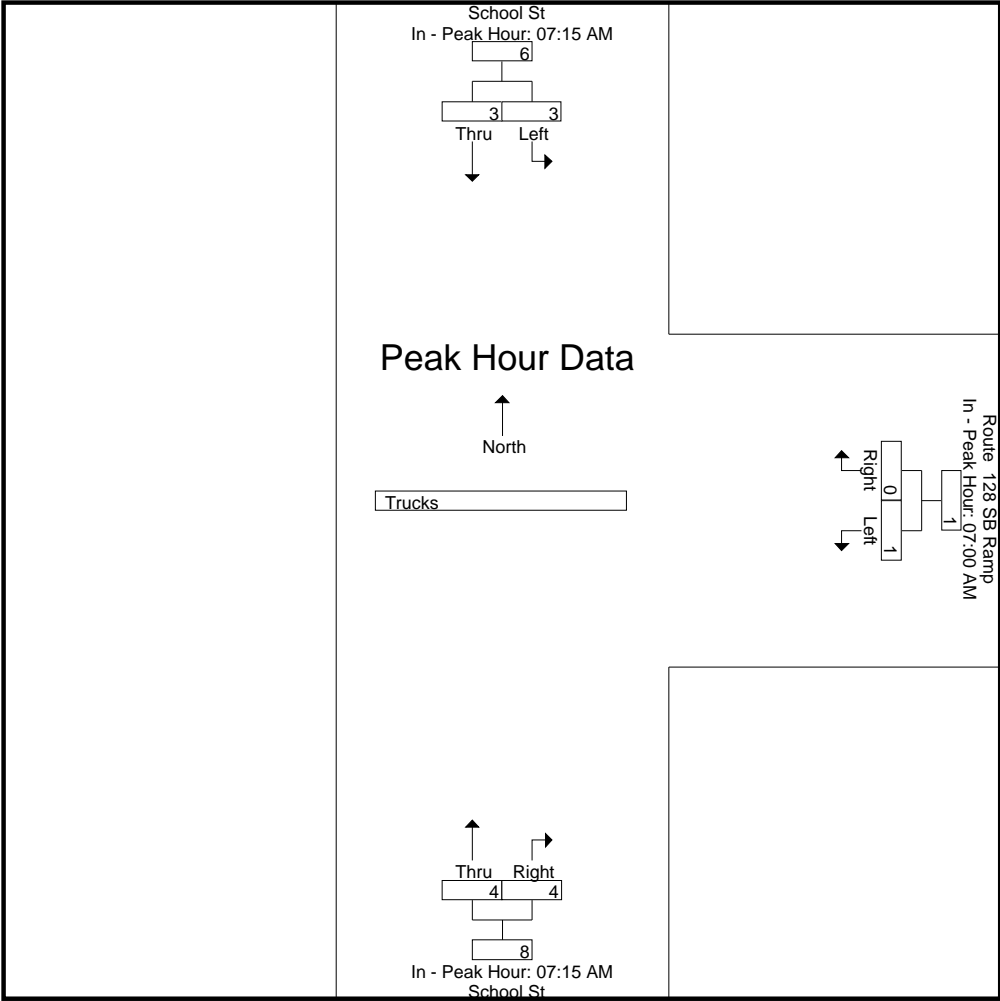


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	07:15 AM			07:00 AM			07:15 AM		
+0 mins.	1	3	4	0	0	0	1	1	2
+15 mins.	0	0	0	1	0	1	1	0	1
+30 mins.	0	0	0	0	0	0	0	2	2
+45 mins.	2	0	2	0	0	0	2	1	3
Total Volume	3	3	6	1	0	1	4	4	8
% App. Total	50	50		100	0		50	50	
PHF	.375	.250	.375	.250	.000	.250	.500	.500	.667

N/S Street : School Street  
E/W Street : Route 128 SB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410002  
Site Code : 84410002  
Start Date : 11/9/2021  
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# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Route 128 SB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410002  
Site Code : 84410002  
Start Date : 11/9/2021  
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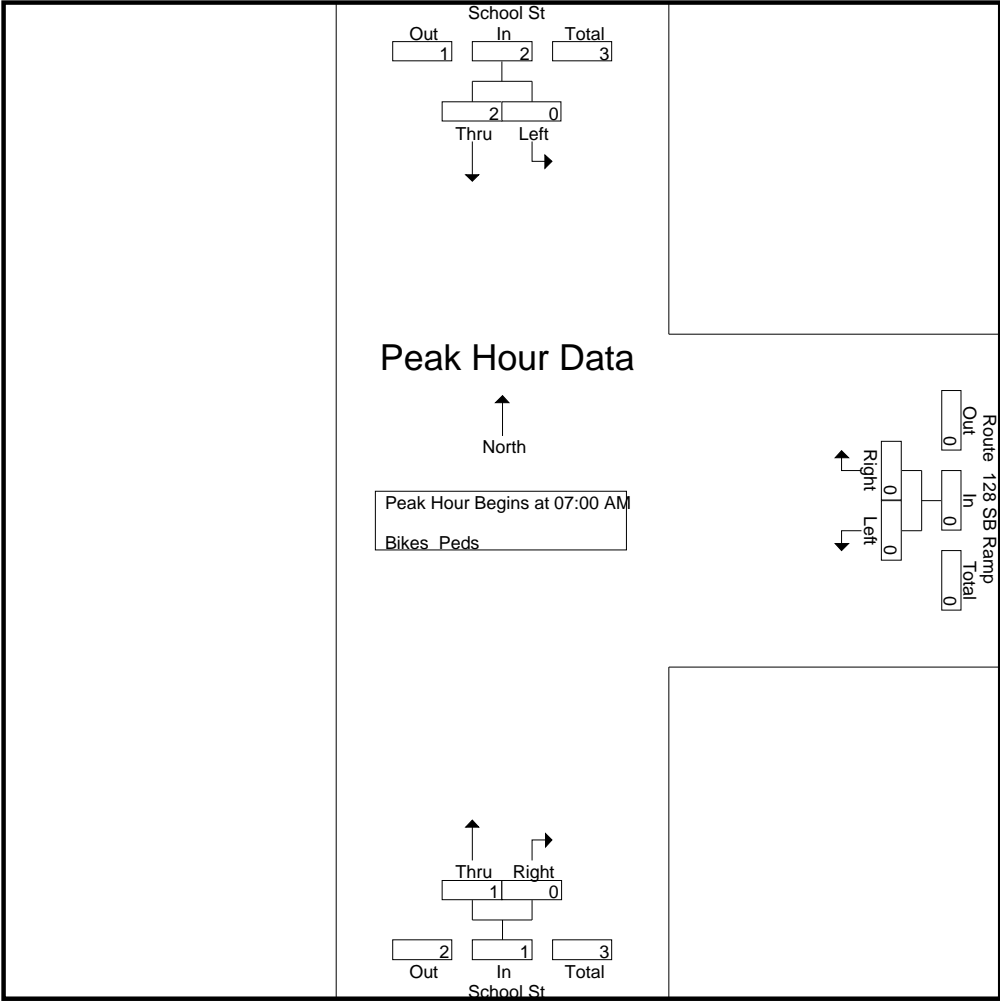
## Groups Printed- Bikes Peds

	School St From North			Route 128 SB Ramp From East			School St From South					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	1	0	0	0	0	1	0	0	0	2	2
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	1	0	0	0	0	0	0	0	0	1	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	0	0	0	0	1	0	0	0	3	3
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	1	0	0	0	1	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	0	1	1
Grand Total	0	2	0	0	0	0	2	0	0	0	4	4
Apprch %	0	100		0	0		100	0				
Total %	0	50		0	0		50	0		0	100	

	School St From North			Route 128 SB Ramp From East			School St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	1	1	0	0	0	1	0	1	2
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	1	1	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	2	2	0	0	0	1	0	1	3
% App. Total	0	100		0	0		100	0		
PHF	.000	.500	.500	.000	.000	.000	.250	.000	.250	.375

N/S Street : School Street  
E/W Street : Route 128 SB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410002  
Site Code : 84410002  
Start Date : 11/9/2021  
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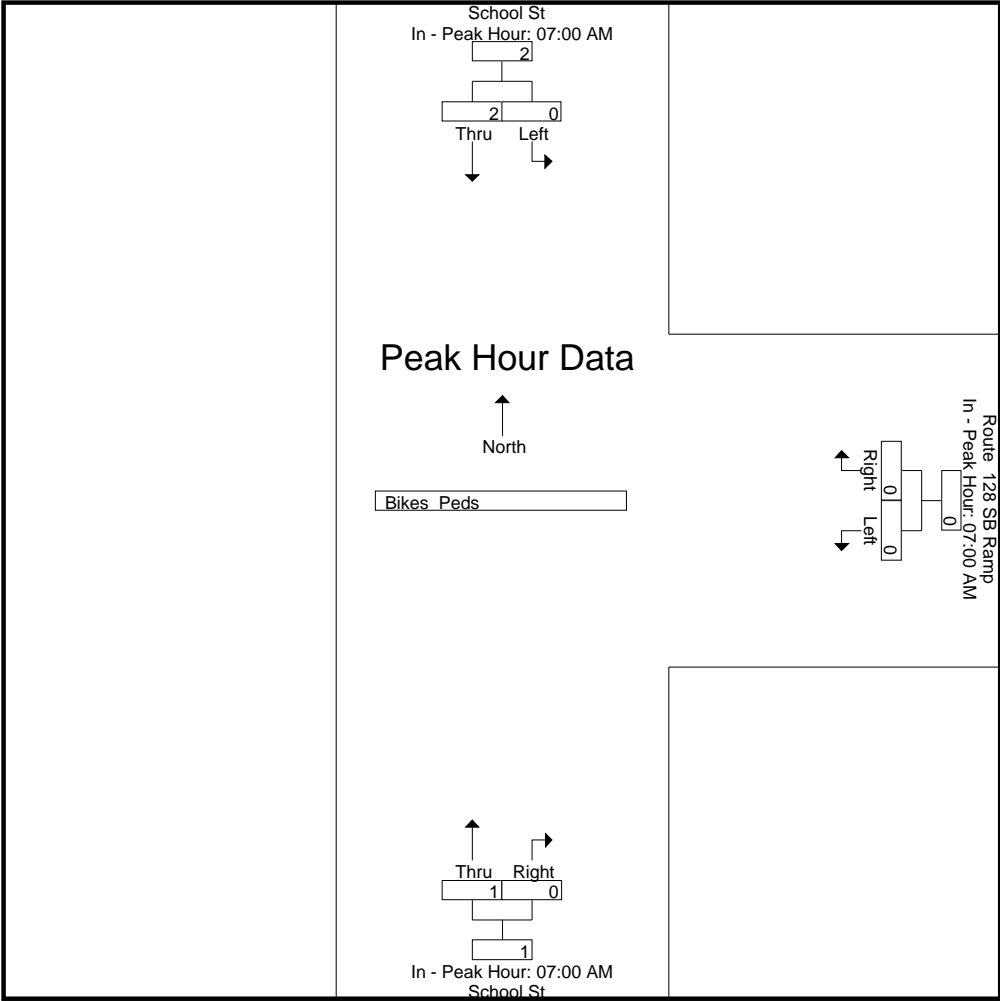
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

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



N/S Street : School Street  
E/W Street : Route 128 SB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410002  
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Start Date : 11/9/2021  
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# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Route 128 SB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410002  
Site Code : 84410002  
Start Date : 11/9/2021  
Page No : 1

## Groups Printed- Cars - Trucks

	School St From North		Route 128 SB Ramp From East			School St From South		
Start Time	Left	Thru	Left	Right		Thru	Right	Int. Total
04:00 PM	24	60	16	6		93	47	246
04:15 PM	25	48	13	17		93	43	239
04:30 PM	40	61	15	11		85	38	250
04:45 PM	29	49	18	6		49	50	201
Total	118	218	62	40		320	178	936
05:00 PM	30	50	13	3		65	36	197
05:15 PM	20	44	25	4		53	32	178
05:30 PM	17	41	14	5		36	26	139
05:45 PM	15	28	14	5		46	33	141
Total	82	163	66	17		200	127	655
Grand Total	200	381	128	57		520	305	1591
Apprch %	34.4	65.6	69.2	30.8		63	37	
Total %	12.6	23.9	8	3.6		32.7	19.2	
Cars	198	381	126	57		516	304	1582
% Cars	99	100	98.4	100		99.2	99.7	99.4
Trucks	2	0	2	0		4	1	9
% Trucks	1	0	1.6	0		0.8	0.3	0.6

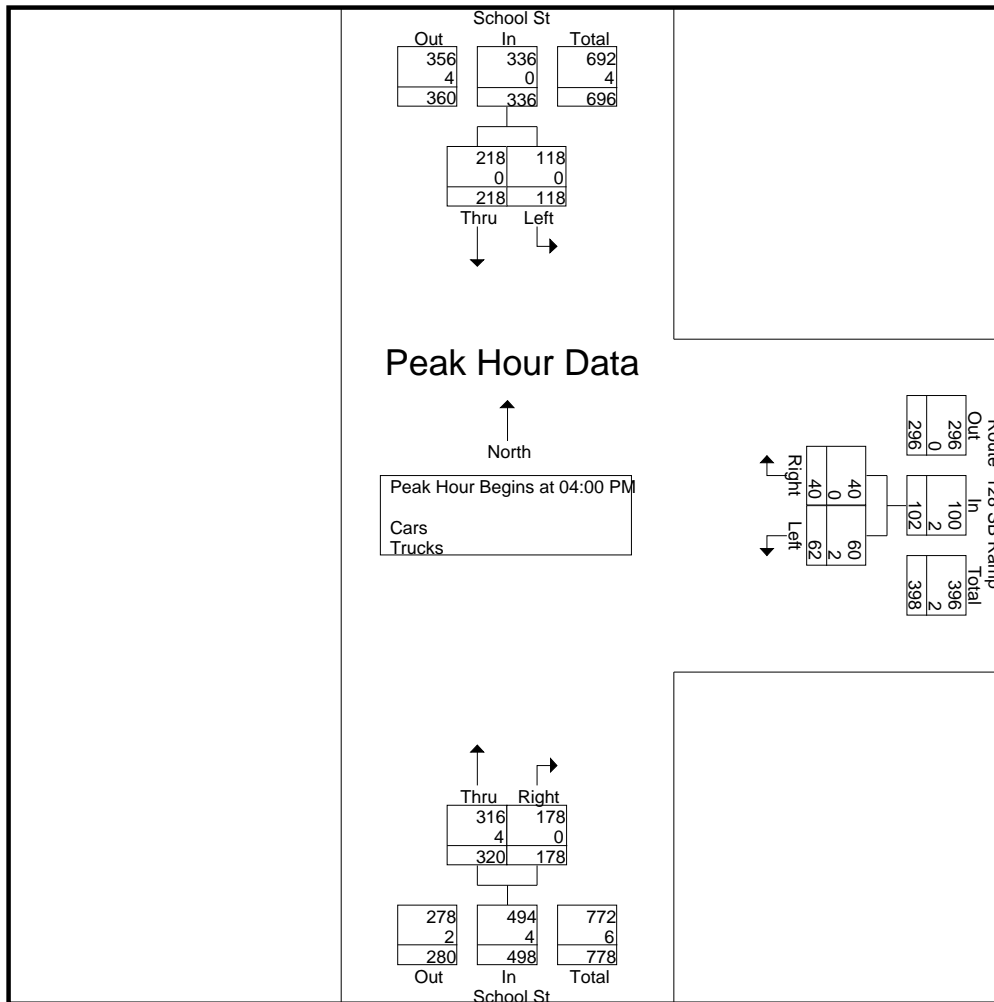
	School St From North			Route 128 SB Ramp From East			School St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	24	60	84	16	6	22	<b>93</b>	47	<b>140</b>	246
04:15 PM	25	48	73	13	<b>17</b>	<b>30</b>	93	43	136	239
04:30 PM	<b>40</b>	<b>61</b>	<b>101</b>	15	11	26	85	38	123	<b>250</b>
04:45 PM	29	49	78	<b>18</b>	6	24	49	<b>50</b>	99	201
Total Volume	118	218	336	62	40	102	320	178	498	936
% App. Total	35.1	64.9		60.8	39.2		64.3	35.7		
PHF	.738	.893	.832	.861	.588	.850	.860	.890	.889	.936
Cars	118	218	336	60	40	100	316	178	494	930
% Cars	100	100	100	96.8	100	98.0	98.8	100	99.2	99.4
Trucks	0	0	0	2	0	2	4	0	4	6
% Trucks	0	0	0	3.2	0	2.0	1.3	0	0.8	0.6

# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Route 128 SB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410002  
Site Code : 84410002  
Start Date : 11/9/2021  
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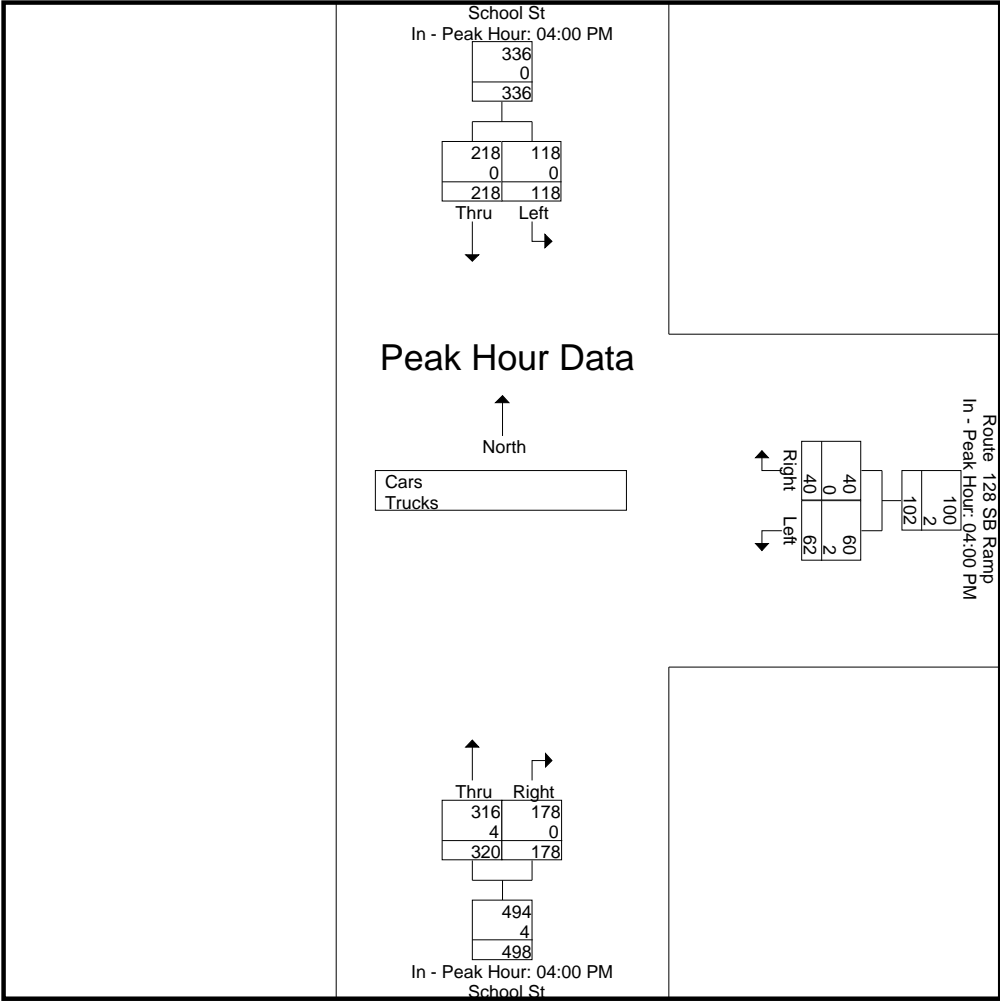
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	24	60	84	16	6	22	<b>93</b>	47	<b>140</b>
+15 mins.	25	48	73	13	<b>17</b>	<b>30</b>	93	43	136
+30 mins.	<b>40</b>	<b>61</b>	<b>101</b>	15	11	26	85	38	123
+45 mins.	29	49	78	<b>18</b>	6	24	49	<b>50</b>	99
Total Volume	118	218	336	62	40	102	320	178	498
% App. Total	35.1	64.9		60.8	39.2		64.3	35.7	
PHF	.738	.893	.832	.861	.588	.850	.860	.890	.889
Cars	118	218	336	60	40	100	316	178	494
% Cars	100	100	100	96.8	100	98	98.8	100	99.2
Trucks	0	0	0	2	0	2	4	0	4
% Trucks	0	0	0	3.2	0	2	1.2	0	0.8

N/S Street : School Street  
E/W Street : Route 128 SB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410002  
Site Code : 84410002  
Start Date : 11/9/2021  
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# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Route 128 SB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410002  
Site Code : 84410002  
Start Date : 11/9/2021  
Page No : 4

## Groups Printed- Cars

	School St From North		Route 128 SB Ramp From East		School St From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	24	60	16	6	92	47	245
04:15 PM	25	48	13	17	91	43	237
04:30 PM	40	61	14	11	85	38	249
04:45 PM	29	49	17	6	48	50	199
Total	118	218	60	40	316	178	930
05:00 PM	29	50	13	3	65	36	196
05:15 PM	20	44	25	4	53	32	178
05:30 PM	16	41	14	5	36	26	138
05:45 PM	15	28	14	5	46	32	140
Total	80	163	66	17	200	126	652
Grand Total	198	381	126	57	516	304	1582
Apprch %	34.2	65.8	68.9	31.1	62.9	37.1	
Total %	12.5	24.1	8	3.6	32.6	19.2	

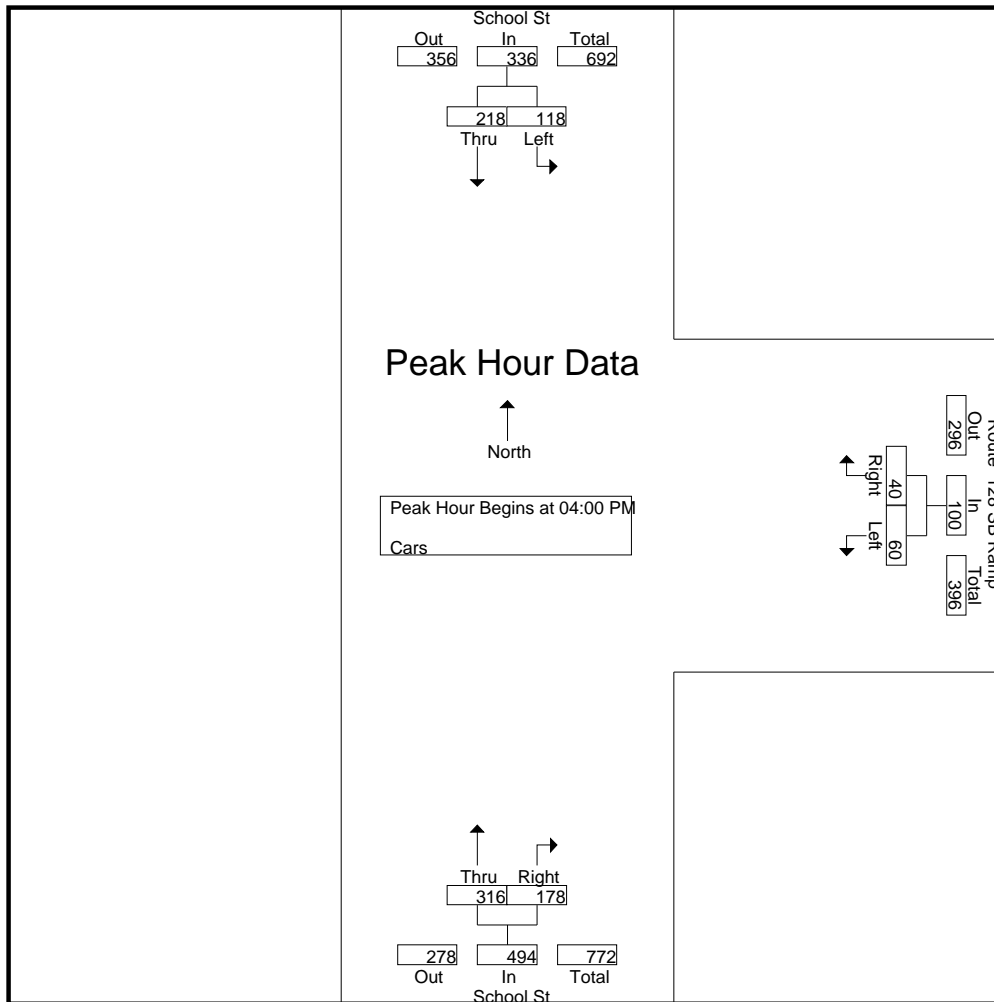
	School St From North			Route 128 SB Ramp From East			School St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	24	60	84	16	6	22	<b>92</b>	47	<b>139</b>	245
04:15 PM	25	48	73	13	<b>17</b>	<b>30</b>	91	43	134	237
04:30 PM	<b>40</b>	<b>61</b>	<b>101</b>	14	11	25	85	38	123	<b>249</b>
04:45 PM	29	49	78	<b>17</b>	6	23	<b>48</b>	<b>50</b>	98	199
Total Volume	118	218	336	60	40	100	316	178	494	930
% App. Total	35.1	64.9		60	40		64	36		
PHF	.738	.893	.832	.882	.588	.833	.859	.890	.888	.934

# Accurate Counts

978-664-2565

N/S Street : School Street  
 E/W Street : Route 128 SB Ramp  
 City/State : Manchester By The Sea, MA  
 Weather : Clear

File Name : 84410002  
 Site Code : 84410002  
 Start Date : 11/9/2021  
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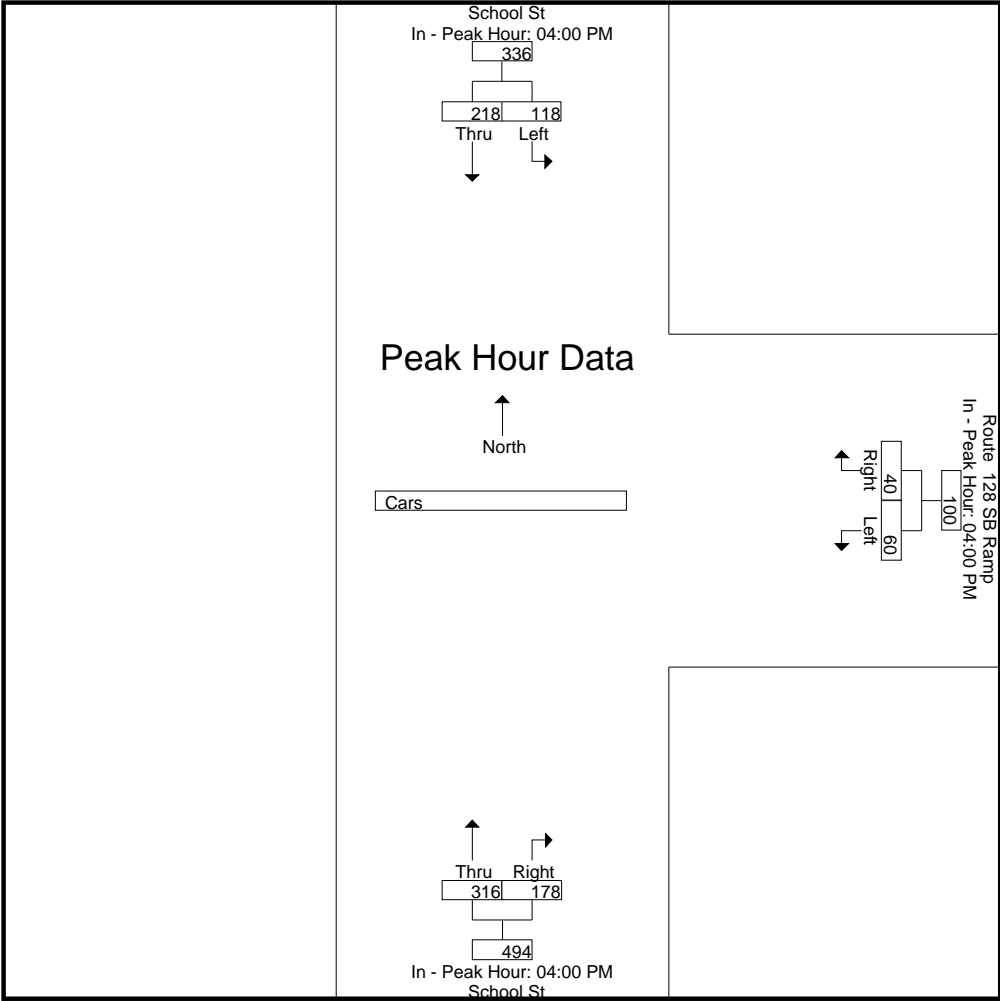


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	24	60	84	16	6	22	<b>92</b>	47	<b>139</b>
+15 mins.	25	48	73	13	<b>17</b>	<b>30</b>	91	43	134
+30 mins.	<b>40</b>	<b>61</b>	<b>101</b>	14	11	25	85	38	123
+45 mins.	29	49	78	<b>17</b>	6	23	48	<b>50</b>	98
Total Volume	118	218	336	60	40	100	316	178	494
% App. Total	35.1	64.9		60	40		64	36	
PHF	.738	.893	.832	.882	.588	.833	.859	.890	.888

N/S Street : School Street  
E/W Street : Route 128 SB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410002  
Site Code : 84410002  
Start Date : 11/9/2021  
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# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Route 128 SB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410002  
Site Code : 84410002  
Start Date : 11/9/2021  
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## Groups Printed- Trucks

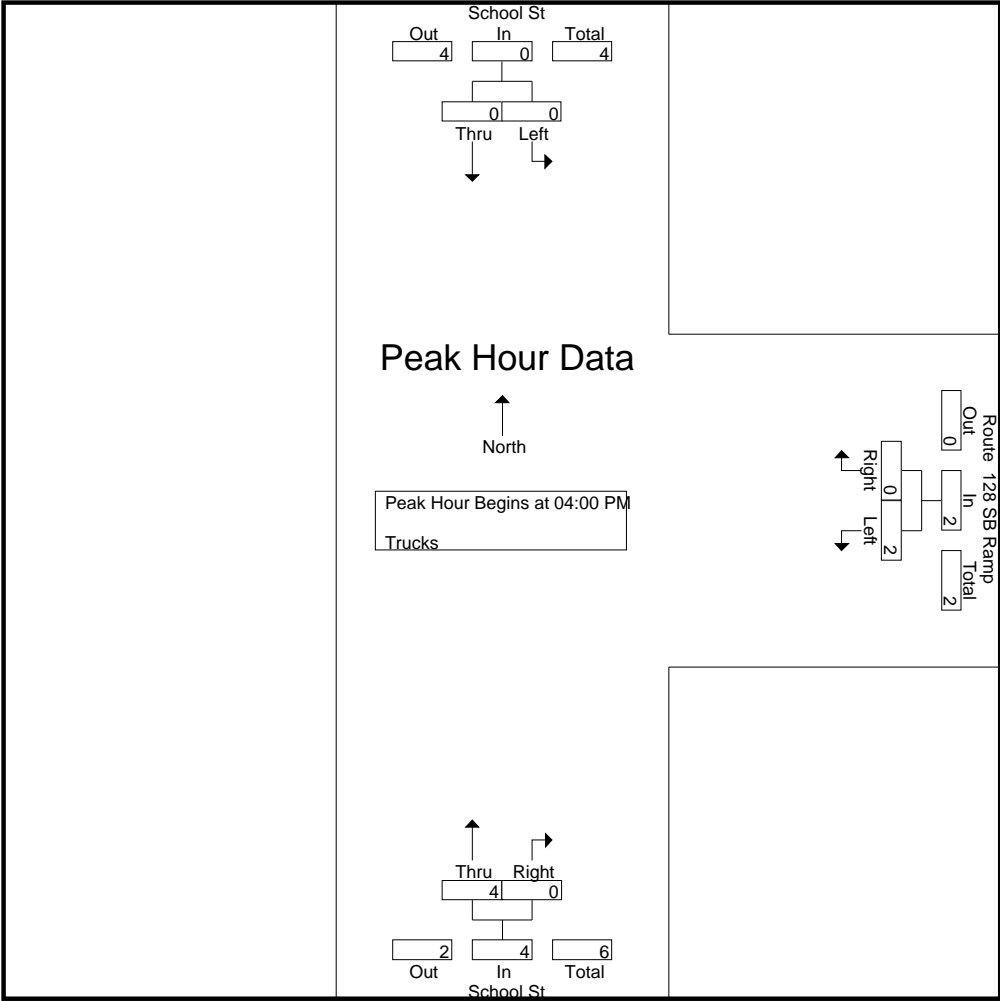
	School St From North		Route 128 SB Ramp From East		School St From South		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	0	0	0	0	1	0	1
04:15 PM	0	0	0	0	2	0	2
04:30 PM	0	0	1	0	0	0	1
04:45 PM	0	0	1	0	1	0	2
Total	0	0	2	0	4	0	6
05:00 PM	1	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0
05:30 PM	1	0	0	0	0	0	1
05:45 PM	0	0	0	0	0	1	1
Total	2	0	0	0	0	1	3
Grand Total	2	0	2	0	4	1	9
Apprch %	100	0	100	0	80	20	
Total %	22.2	0	22.2	0	44.4	11.1	

	School St From North			Route 128 SB Ramp From East			School St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	0	0	0	1	0	1	1
04:15 PM	0	0	0	0	0	0	2	0	2	2
04:30 PM	0	0	0	1	0	1	0	0	0	1
04:45 PM	0	0	0	1	0	1	1	0	1	2
Total Volume	0	0	0	2	0	2	4	0	4	6
% App. Total	0	0		100	0		100	0		
PHF	.000	.000	.000	.500	.000	.500	.500	.000	.500	.750



N/S Street : School Street  
E/W Street : Route 128 SB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410002  
Site Code : 84410002  
Start Date : 11/9/2021  
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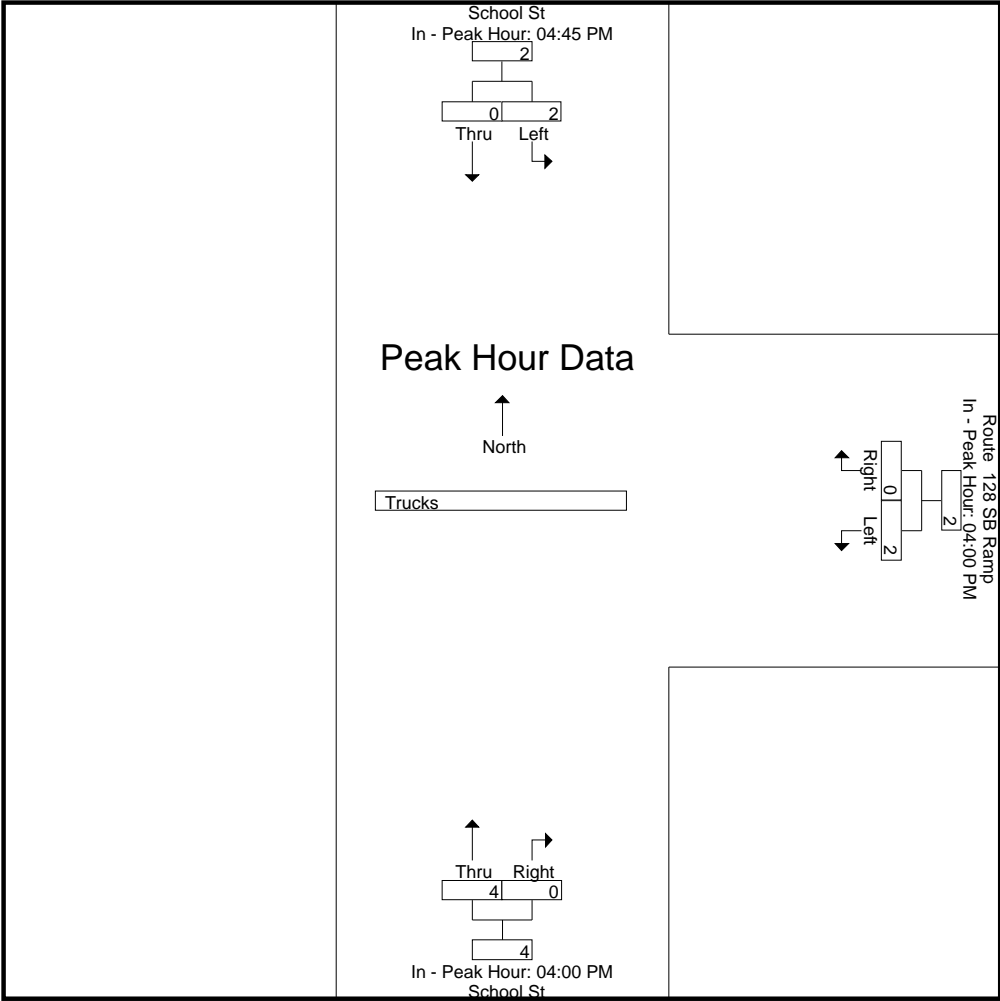


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	04:45 PM			04:00 PM			04:00 PM		
+0 mins.	0	0	0	0	0	0	1	0	1
+15 mins.	1	0	1	0	0	0	2	0	2
+30 mins.	0	0	0	1	0	1	0	0	0
+45 mins.	1	0	1	1	0	1	1	0	1
Total Volume	2	0	2	2	0	2	4	0	4
% App. Total	100	0		100	0		100	0	
PHF	.500	.000	.500	.500	.000	.500	.500	.000	.500

N/S Street : School Street  
E/W Street : Route 128 SB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410002  
Site Code : 84410002  
Start Date : 11/9/2021  
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# Accurate Counts

978-664-2565

N/S Street : School Street  
 E/W Street : Route 128 SB Ramp  
 City/State : Manchester By The Sea, MA  
 Weather : Clear

File Name : 84410002  
 Site Code : 84410002  
 Start Date : 11/9/2021  
 Page No : 10

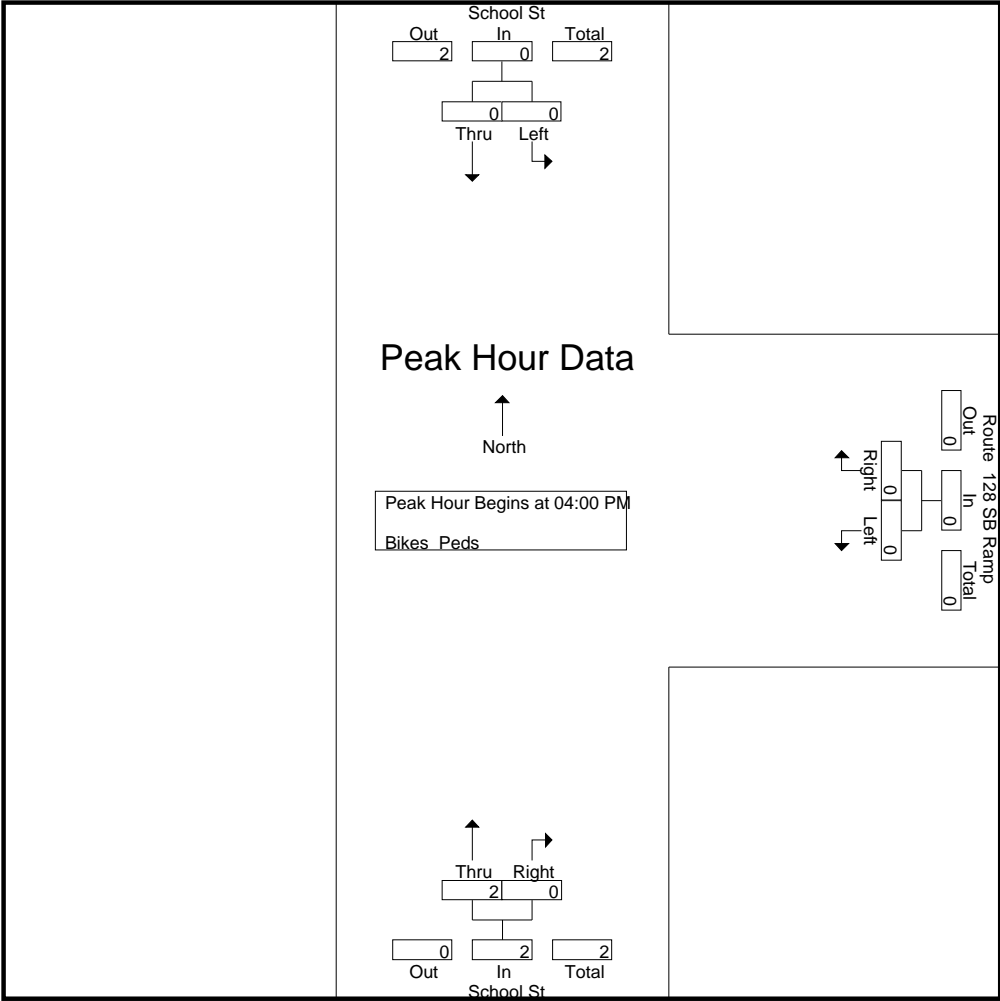
## Groups Printed- Bikes Peds

	School St From North			Route 128 SB Ramp From East			School St From South					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	2	0	0	0	2	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	2	0	0	0	2	2
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	2	0	0	0	2	2
Apprch %	0	0		0	0		100	0				
Total %	0	0		0	0		100	0		0	100	

	School St From North			Route 128 SB Ramp From East			School St From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	2	0	2	2
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	2	0	2	2
% App. Total	0	0		0	0		100	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250

N/S Street : School Street  
E/W Street : Route 128 SB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410002  
Site Code : 84410002  
Start Date : 11/9/2021  
Page No : 11

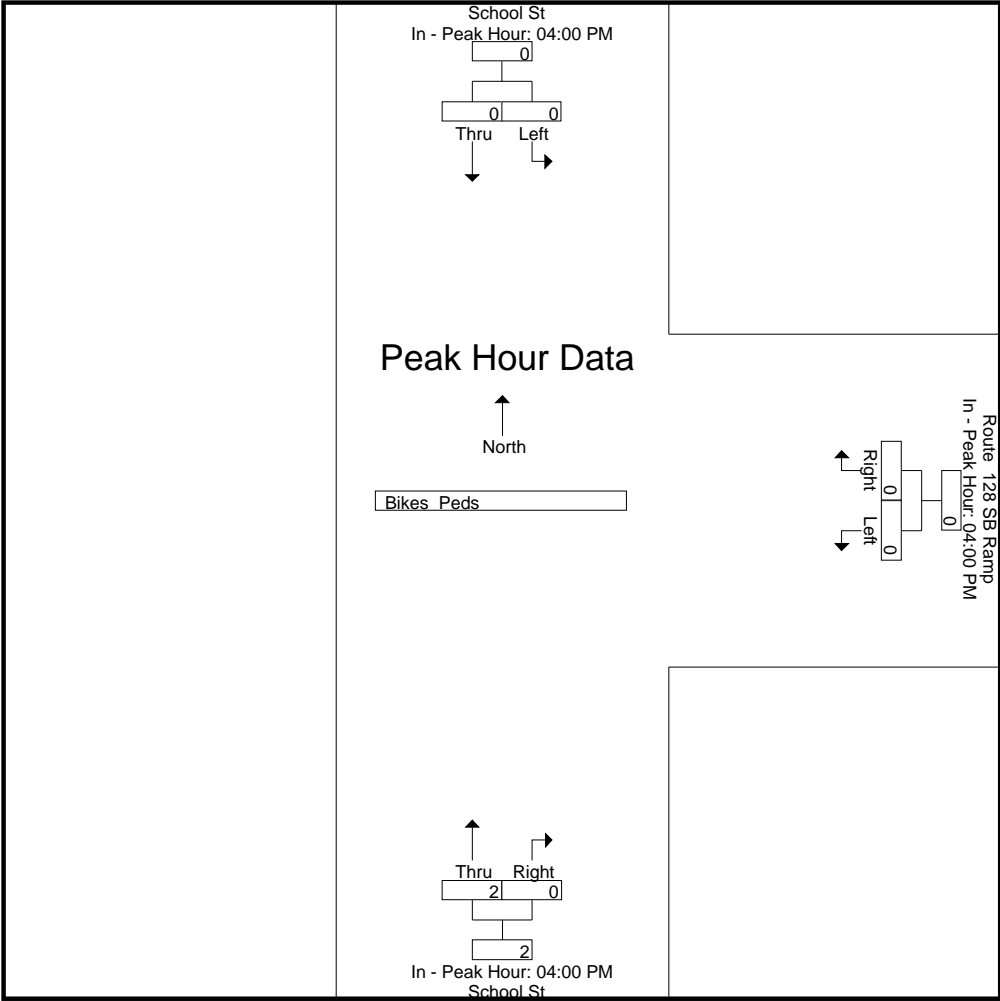


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	2	0	2
+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	2	0	2
% App. Total	0	0		0	0		100	0	
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.250

N/S Street : School Street  
E/W Street : Route 128 SB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410002  
Site Code : 84410002  
Start Date : 11/9/2021  
Page No : 12



# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Route 128 NB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410003  
Site Code : 84410003  
Start Date : 11/9/2021  
Page No : 1

## Groups Printed- Cars - Trucks

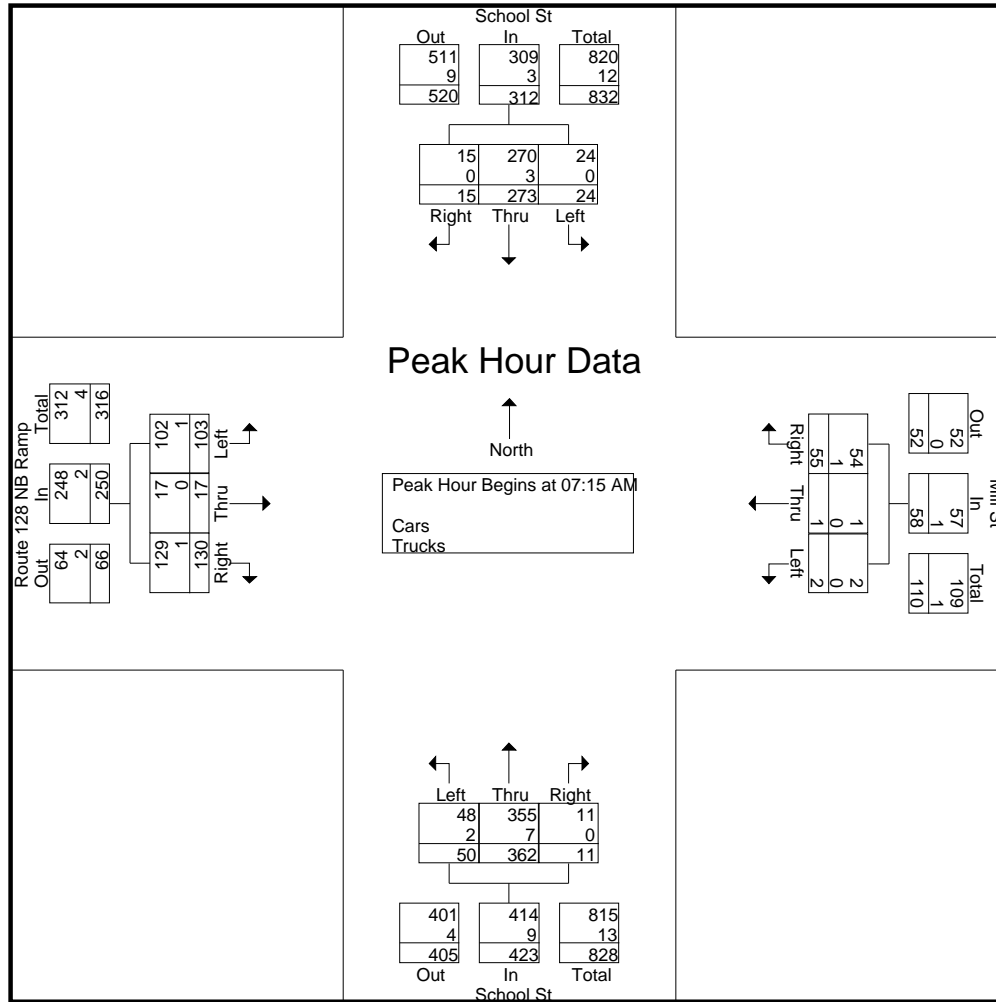
	School St From North			Mill St From East			School St From South			Route 128 NB Ramp From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	0	58	3	1	0	12	7	44	1	21	2	30	179
07:15 AM	1	74	1	1	1	14	7	89	4	33	9	45	279
07:30 AM	10	58	3	0	0	17	16	115	4	18	1	19	261
07:45 AM	11	69	6	0	0	9	9	80	0	30	4	33	251
Total	22	259	13	2	1	52	39	328	9	102	16	127	970
08:00 AM	2	72	5	1	0	15	18	78	3	22	3	33	252
08:15 AM	3	52	8	2	1	10	20	79	3	25	4	27	234
08:30 AM	0	49	9	0	1	13	7	78	2	27	4	38	228
08:45 AM	5	49	3	2	1	14	11	104	1	24	4	34	252
Total	10	222	25	5	3	52	56	339	9	98	15	132	966
Grand Total	32	481	38	7	4	104	95	667	18	200	31	259	1936
Apprch %	5.8	87.3	6.9	6.1	3.5	90.4	12.2	85.5	2.3	40.8	6.3	52.9	
Total %	1.7	24.8	2	0.4	0.2	5.4	4.9	34.5	0.9	10.3	1.6	13.4	
Cars	32	478	36	7	4	103	92	658	18	197	31	253	1909
% Cars	100	99.4	94.7	100	100	99	96.8	98.7	100	98.5	100	97.7	98.6
Trucks	0	3	2	0	0	1	3	9	0	3	0	6	27
% Trucks	0	0.6	5.3	0	0	1	3.2	1.3	0	1.5	0	2.3	1.4

	School St From North				Mill St From East				School St From South				Route 128 NB Ramp From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	1	74	1	76	1	1	14	16	7	89	4	100	33	9	45	87	279
07:30 AM	10	58	3	71	0	0	17	17	16	115	4	135	18	1	19	38	261
07:45 AM	11	69	6	86	0	0	9	9	9	80	0	89	30	4	33	67	251
08:00 AM	2	72	5	79	1	0	15	16	18	78	3	99	22	3	33	58	252
Total Volume	24	273	15	312	2	1	55	58	50	362	11	423	103	17	130	250	1043
% App. Total	7.7	87.5	4.8		3.4	1.7	94.8		11.8	85.6	2.6		41.2	6.8	52		
PHF	.545	.922	.625	.907	.500	.250	.809	.853	.694	.787	.688	.783	.780	.472	.722	.718	.935
Cars	24	270	15	309	2	1	54	57	48	355	11	414	102	17	129	248	1028
% Cars	100	98.9	100	99.0	100	100	98.2	98.3	96.0	98.1	100	97.9	99.0	100	99.2	99.2	98.6
Trucks	0	3	0	3	0	0	1	1	2	7	0	9	1	0	1	2	15
% Trucks	0	1.1	0	1.0	0	0	1.8	1.7	4.0	1.9	0	2.1	1.0	0	0.8	0.8	1.4

**Accurate Counts**  
978-664-2565

N/S Street : School Street  
E/W Street : Route 128 NB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410003  
Site Code : 84410003  
Start Date : 11/9/2021  
Page No : 2

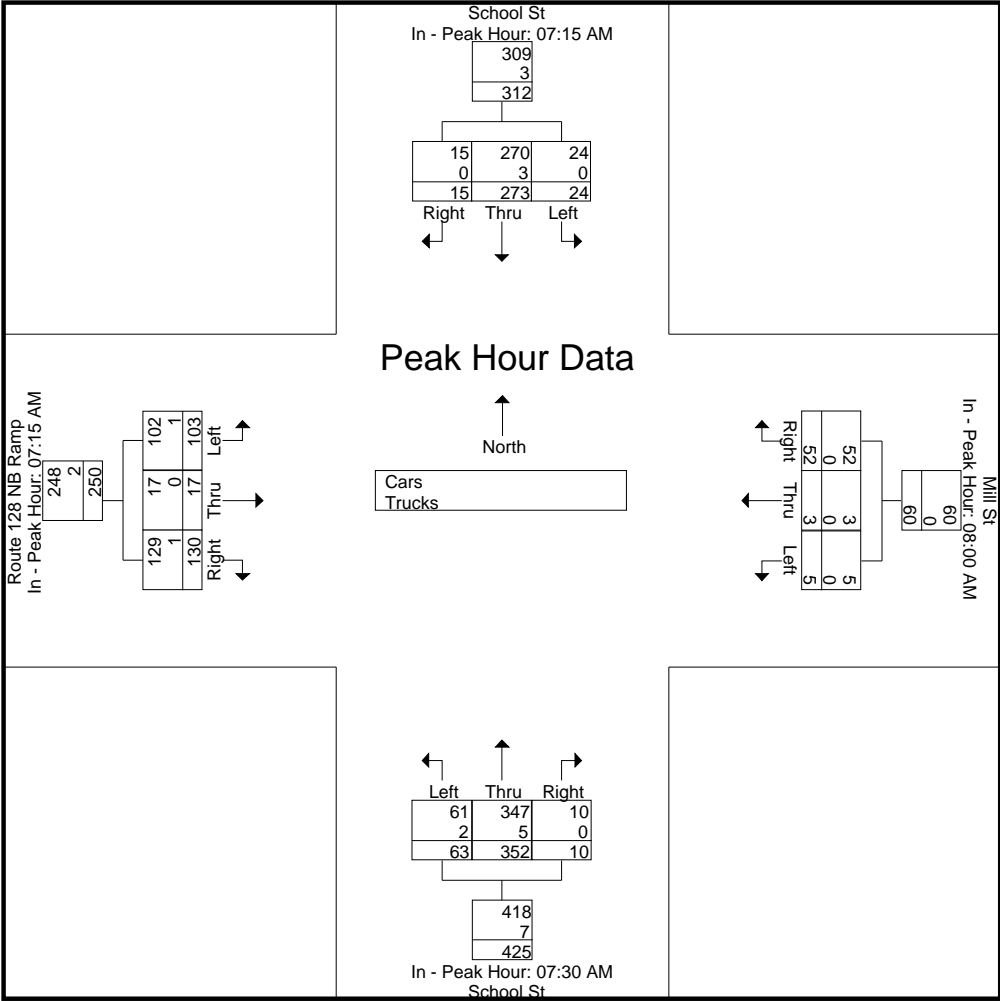


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	07:15 AM				08:00 AM				07:30 AM				07:15 AM			
+0 mins.	1	<b>74</b>	1	76	1	0	<b>15</b>	16	16	<b>115</b>	<b>4</b>	<b>135</b>	<b>33</b>	<b>9</b>	<b>45</b>	<b>87</b>
+15 mins.	10	58	3	71	<b>2</b>	<b>1</b>	10	13	9	80	0	89	18	1	19	38
+30 mins.	<b>11</b>	69	<b>6</b>	<b>86</b>	0	1	13	14	18	78	3	99	30	4	33	67
+45 mins.	2	72	5	79	2	1	14	<b>17</b>	<b>20</b>	79	3	102	22	3	33	58
Total Volume	24	273	15	312	5	3	52	60	63	352	10	425	103	17	130	250
% App. Total	7.7	87.5	4.8		8.3	5	86.7		14.8	82.8	2.4		41.2	6.8	52	
PHF	.545	.922	.625	.907	.625	.750	.867	.882	.788	.765	.625	.787	.780	.472	.722	.718
Cars	24	270	15	309	5	3	52	60	61	347	10	418	102	17	129	248
% Cars	100	98.9	100	99	100	100	100	100	96.8	98.6	100	98.4	99	100	99.2	99.2
Trucks	0	3	0	3	0	0	0	0	2	5	0	7	1	0	1	2
% Trucks	0	1.1	0	1	0	0	0	0	3.2	1.4	0	1.6	1	0	0.8	0.8

N/S Street : School Street  
E/W Street : Route 128 NB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410003  
Site Code : 84410003  
Start Date : 11/9/2021  
Page No : 3





# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Route 128 NB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410003  
Site Code : 84410003  
Start Date : 11/9/2021  
Page No : 4

## Groups Printed- Cars

	School St From North			Mill St From East			School St From South			Route 128 NB Ramp From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	0	58	3	1	0	12	7	44	1	20	2	30	178
07:15 AM	1	71	1	1	1	14	7	87	4	33	9	45	274
07:30 AM	10	58	3	0	0	17	15	113	4	18	1	19	258
07:45 AM	11	69	6	0	0	8	9	79	0	30	4	33	249
Total	22	256	13	2	1	51	38	323	9	101	16	127	959
08:00 AM	2	72	5	1	0	15	17	76	3	21	3	32	247
08:15 AM	3	52	7	2	1	10	20	79	3	25	4	26	232
08:30 AM	0	49	8	0	1	13	7	78	2	27	4	36	225
08:45 AM	5	49	3	2	1	14	10	102	1	23	4	32	246
Total	10	222	23	5	3	52	54	335	9	96	15	126	950
Grand Total	32	478	36	7	4	103	92	658	18	197	31	253	1909
Apprch %	5.9	87.5	6.6	6.1	3.5	90.4	12	85.7	2.3	41	6.4	52.6	
Total %	1.7	25	1.9	0.4	0.2	5.4	4.8	34.5	0.9	10.3	1.6	13.3	

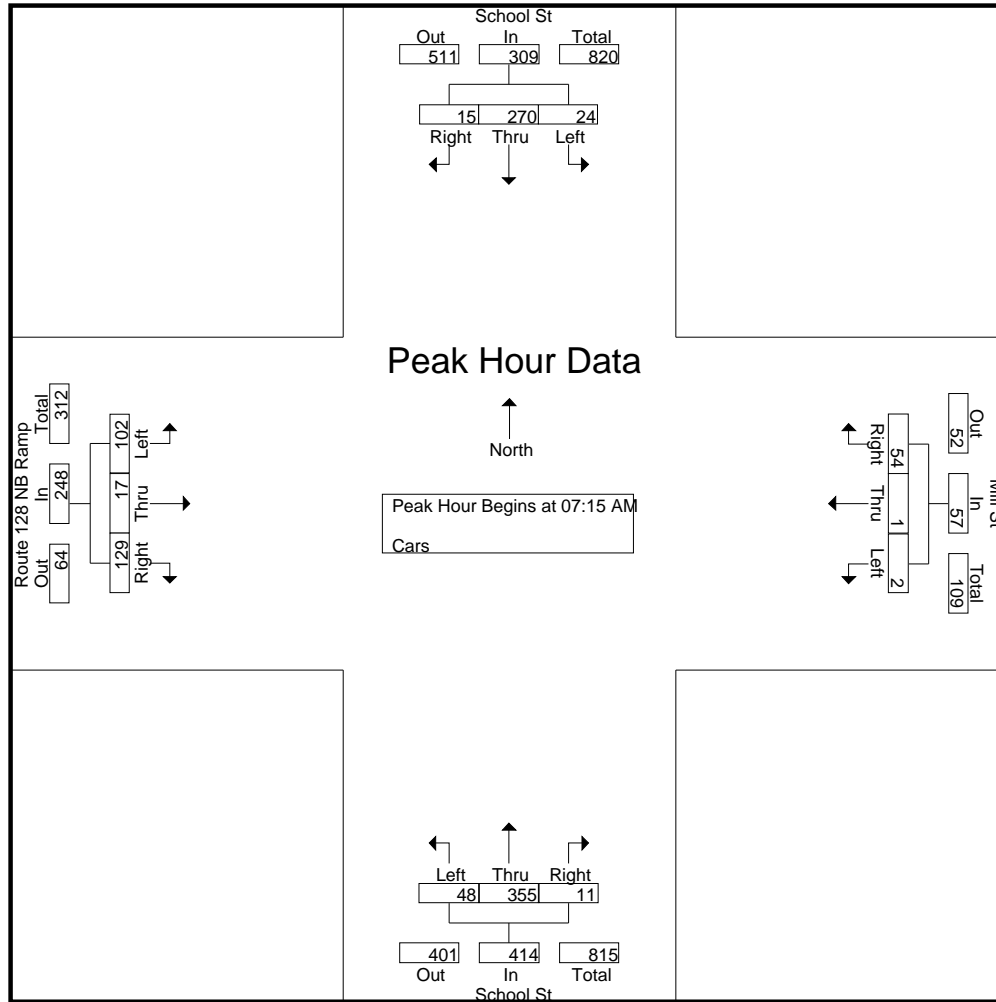
	School St From North				Mill St From East				School St From South				Route 128 NB Ramp From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	1	71	1	73	1	1	14	16	7	87	4	98	33	9	45	87	274
07:30 AM	10	58	3	71	0	0	17	17	15	113	4	132	18	1	19	38	258
07:45 AM	11	69	6	86	0	0	8	8	9	79	0	88	30	4	33	67	249
08:00 AM	2	72	5	79	1	0	15	16	17	76	3	96	21	3	32	56	247
Total Volume	24	270	15	309	2	1	54	57	48	355	11	414	102	17	129	248	1028
% App. Total	7.8	87.4	4.9		3.5	1.8	94.7		11.6	85.7	2.7		41.1	6.9	52		
PHF	.545	.938	.625	.898	.500	.250	.794	.838	.706	.785	.688	.784	.773	.472	.717	.713	.938

# Accurate Counts

978-664-2565

N/S Street : School Street  
 E/W Street : Route 128 NB Ramp  
 City/State : Manchester By The Sea, MA  
 Weather : Clear

File Name : 84410003  
 Site Code : 84410003  
 Start Date : 11/9/2021  
 Page No : 5

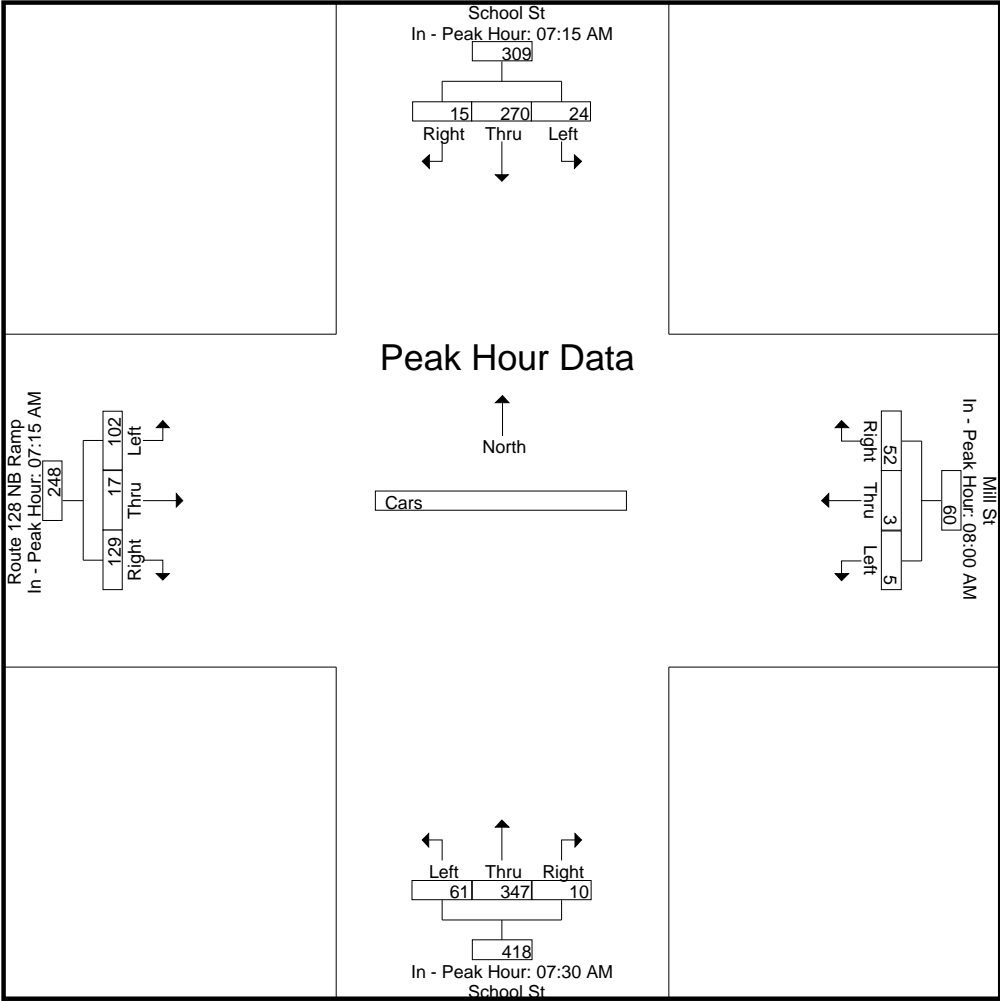


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	07:15 AM				08:00 AM				07:30 AM				07:15 AM			
+0 mins.	1	71	1	73	1	0	<b>15</b>	16	15	<b>113</b>	<b>4</b>	<b>132</b>	<b>33</b>	<b>9</b>	<b>45</b>	<b>87</b>
+15 mins.	10	58	3	71	<b>2</b>	<b>1</b>	10	13	9	79	0	88	18	1	19	38
+30 mins.	<b>11</b>	69	<b>6</b>	<b>86</b>	0	1	13	14	17	76	3	96	30	4	33	67
+45 mins.	2	<b>72</b>	5	79	2	1	14	<b>17</b>	<b>20</b>	79	3	102	21	3	32	56
Total Volume	24	270	15	309	5	3	52	60	61	347	10	418	102	17	129	248
% App. Total	7.8	87.4	4.9		8.3	5	86.7		14.6	83	2.4		41.1	6.9	52	
PHF	.545	.938	.625	.898	.625	.750	.867	.882	.763	.768	.625	.792	.773	.472	.717	.713

N/S Street : School Street  
E/W Street : Route 128 NB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410003  
Site Code : 84410003  
Start Date : 11/9/2021  
Page No : 6



# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Route 128 NB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

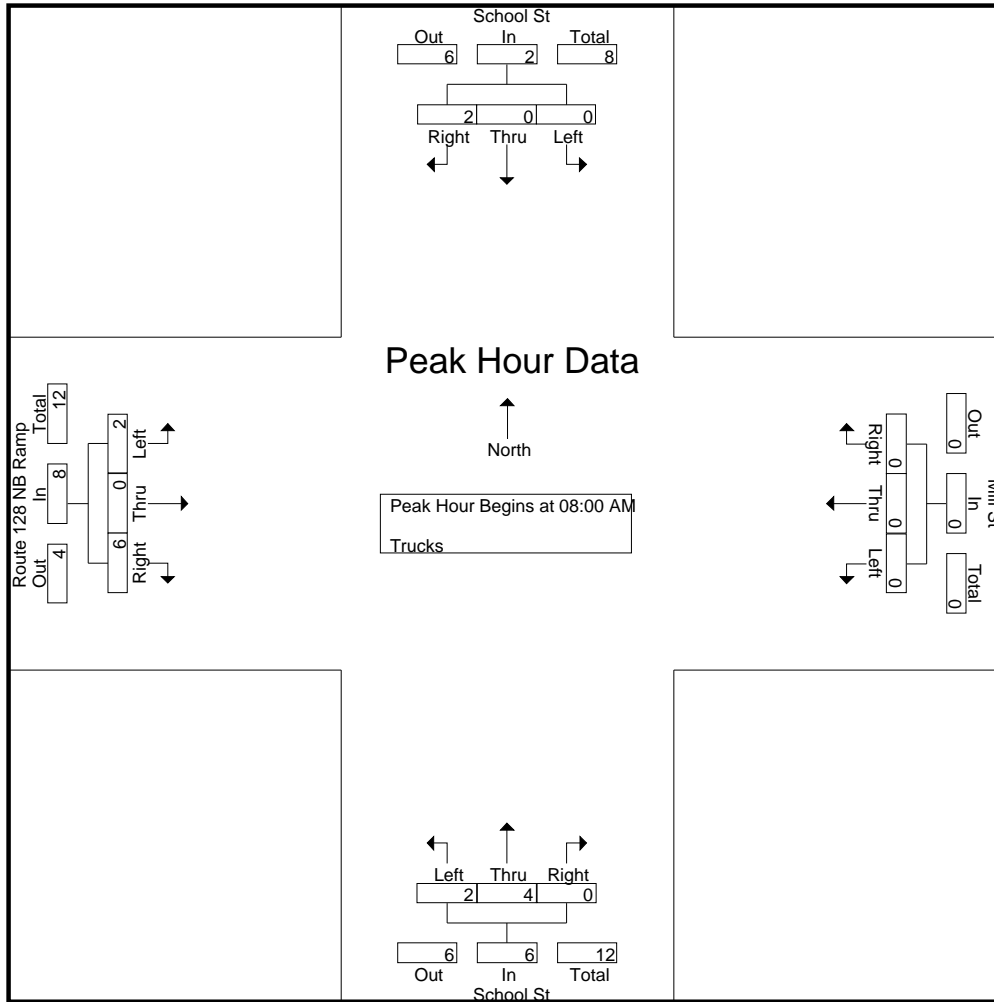
File Name : 84410003  
Site Code : 84410003  
Start Date : 11/9/2021  
Page No : 7

## Groups Printed- Trucks

	School St From North			Mill St From East			School St From South			Route 128 NB Ramp From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	1
07:15 AM	0	3	0	0	0	0	0	2	0	0	0	0	5
07:30 AM	0	0	0	0	0	0	1	2	0	0	0	0	3
07:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	2
Total	0	3	0	0	0	1	1	5	0	1	0	0	11
08:00 AM	0	0	0	0	0	0	1	2	0	1	0	1	5
08:15 AM	0	0	1	0	0	0	0	0	0	0	0	1	2
08:30 AM	0	0	1	0	0	0	0	0	0	0	0	2	3
08:45 AM	0	0	0	0	0	0	1	2	0	1	0	2	6
Total	0	0	2	0	0	0	2	4	0	2	0	6	16
Grand Total	0	3	2	0	0	1	3	9	0	3	0	6	27
Apprch %	0	60	40	0	0	100	25	75	0	33.3	0	66.7	
Total %	0	11.1	7.4	0	0	3.7	11.1	33.3	0	11.1	0	22.2	

	School St From North				Mill St From East				School St From South				Route 128 NB Ramp From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	0	0	0	0	1	2	0	3	1	0	1	2	5
08:15 AM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	2
08:30 AM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	2	3
08:45 AM	0	0	0	0	0	0	0	0	1	2	0	3	1	0	2	3	6
Total Volume	0	0	2	2	0	0	0	0	2	4	0	6	2	0	6	8	16
% App. Total	0	0	100		0	0	0		33.3	66.7	0		25	0	75		
PHF	.000	.000	.500	.500	.000	.000	.000	.000	.500	.500	.000	.500	.500	.000	.750	.667	.667

N/S Street : School Street  
E/W Street : Route 128 NB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

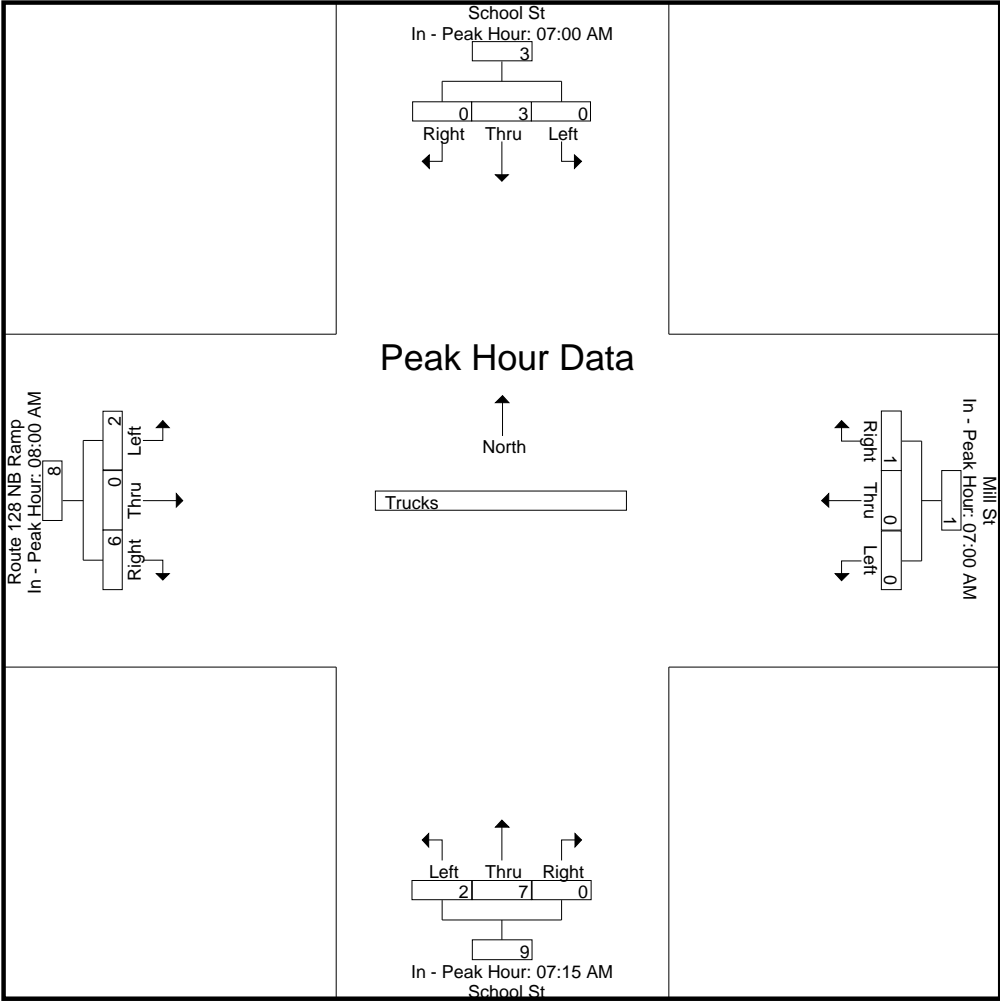


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:15 AM				08:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	2	0	2	1	0	1	2
+15 mins.	0	3	0	3	0	0	0	0	1	2	0	3	0	0	1	1
+30 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	0	2	2
+45 mins.	0	0	0	0	0	0	1	1	1	2	0	3	1	0	2	3
Total Volume	0	3	0	3	0	0	1	1	2	7	0	9	2	0	6	8
% App. Total	0	100	0		0	0	100		22.2	77.8	0		25	0	75	
PHF	.000	.250	.000	.250	.000	.000	.250	.250	.500	.875	.000	.750	.500	.000	.750	.667

N/S Street : School Street  
E/W Street : Route 128 NB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410003  
Site Code : 84410003  
Start Date : 11/9/2021  
Page No : 9



# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Route 128 NB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410003  
Site Code : 84410003  
Start Date : 11/9/2021  
Page No : 10

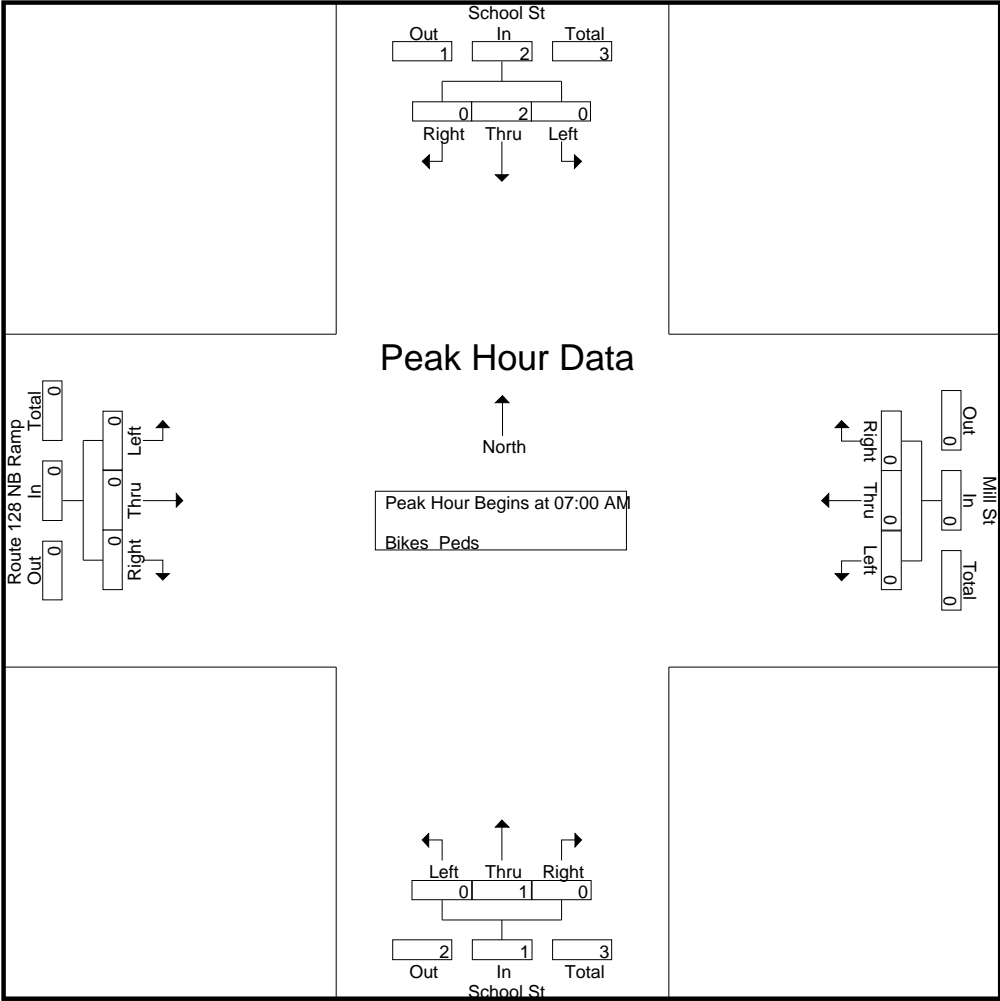
## Groups Printed- Bikes Peds

	School St From North				Mill St From East				School St From South				Route 128 NB Ramp From West				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:00 AM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	2
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	3	3
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1
Grand Total	0	2	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	4	4
Apprch %	0	100	0		0	0	100		0	100	0		0	0	0				
Total %	0	50	0		0	0	25		0	25	0		0	0	0		0	100	

	School St From North				Mill St From East				School St From South				Route 128 NB Ramp From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	2	0	2	0	0	0	0	0	1	0	1	0	0	0	0	3
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.500	.000	.500	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.375

N/S Street : School Street  
E/W Street : Route 128 NB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410003  
Site Code : 84410003  
Start Date : 11/9/2021  
Page No : 11



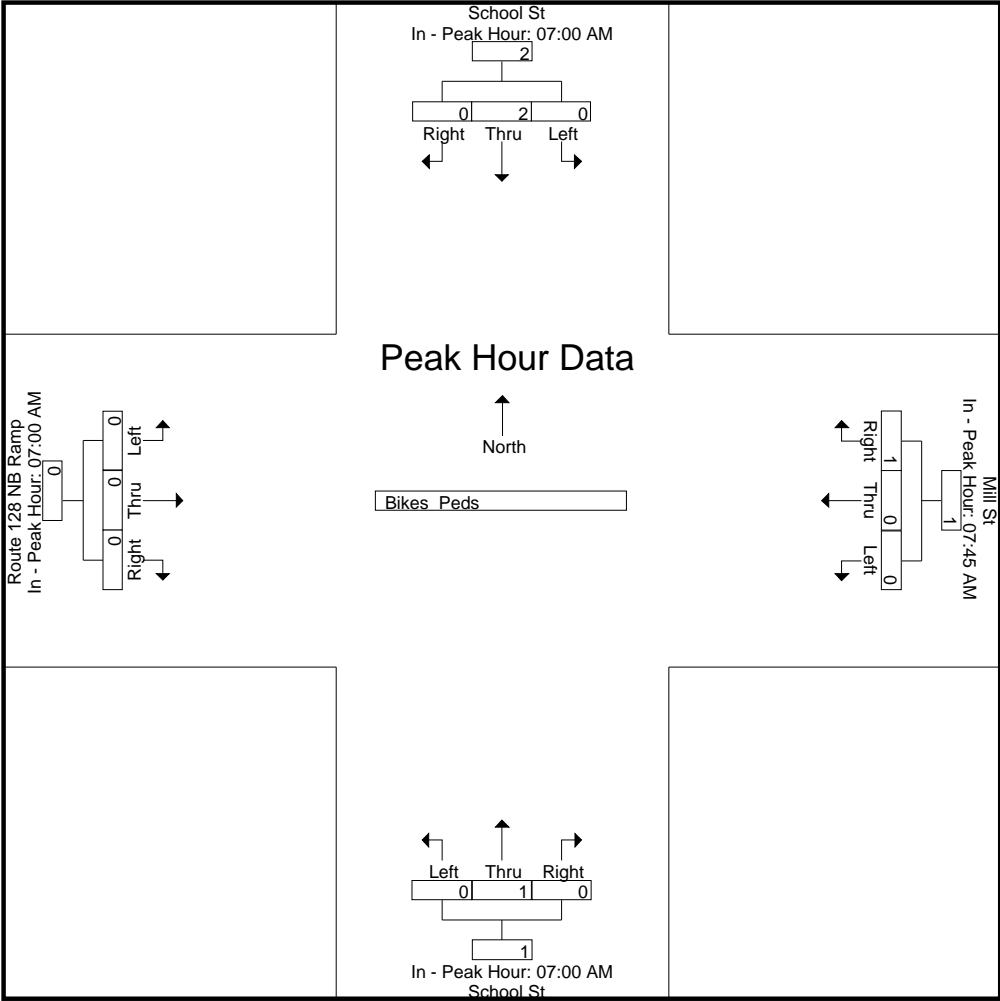
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

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



N/S Street : School Street  
E/W Street : Route 128 NB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410003  
Site Code : 84410003  
Start Date : 11/9/2021  
Page No : 12



# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Route 128 NB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410003  
Site Code : 84410003  
Start Date : 11/9/2021  
Page No : 1

## Groups Printed- Cars - Trucks

	School St From North			Mill St From East			School St From South			Route 128 NB Ramp From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
04:00 PM	4	56	11	0	0	8	24	85	2	46	5	41	282
04:15 PM	2	47	8	3	2	10	15	92	0	31	9	53	272
04:30 PM	8	44	12	1	1	6	12	88	3	29	5	36	245
04:45 PM	1	52	8	0	1	6	17	69	1	24	3	46	228
Total	15	199	39	4	4	30	68	334	6	130	22	176	1027
05:00 PM	6	41	12	0	1	7	18	61	1	23	6	42	218
05:15 PM	7	54	4	0	4	7	16	64	1	17	5	35	214
05:30 PM	1	48	3	0	1	3	20	47	0	11	2	22	158
05:45 PM	3	37	0	2	0	6	25	53	1	19	4	34	184
Total	17	180	19	2	6	23	79	225	3	70	17	133	774
Grand Total	32	379	58	6	10	53	147	559	9	200	39	309	1801
Apprch %	6.8	80.8	12.4	8.7	14.5	76.8	20.6	78.2	1.3	36.5	7.1	56.4	
Total %	1.8	21	3.2	0.3	0.6	2.9	8.2	31	0.5	11.1	2.2	17.2	
Cars	32	378	58	6	10	53	144	554	9	199	39	309	1791
% Cars	100	99.7	100	100	100	100	98	99.1	100	99.5	100	100	99.4
Trucks	0	1	0	0	0	0	3	5	0	1	0	0	10
% Trucks	0	0.3	0	0	0	0	2	0.9	0	0.5	0	0	0.6

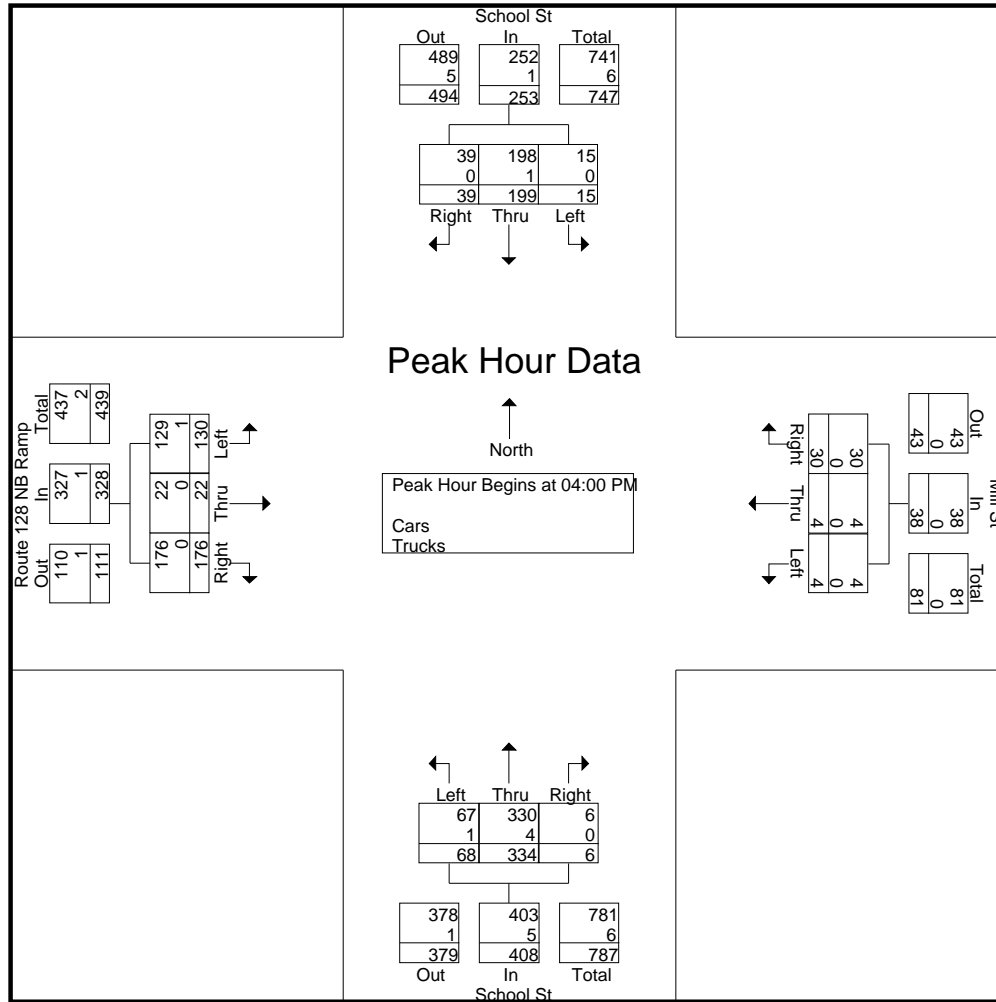
	School St From North				Mill St From East				School St From South				Route 128 NB Ramp From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	4	56	11	71	0	0	8	8	24	85	2	111	46	5	41	92	282
04:15 PM	2	47	8	57	3	2	10	15	15	92	0	107	31	9	53	93	272
04:30 PM	8	44	12	64	1	1	6	8	12	88	3	103	29	5	36	70	245
04:45 PM	1	52	8	61	0	1	6	7	17	69	1	87	24	3	46	73	228
Total Volume	15	199	39	253	4	4	30	38	68	334	6	408	130	22	176	328	1027
% App. Total	5.9	78.7	15.4		10.5	10.5	78.9		16.7	81.9	1.5		39.6	6.7	53.7		
PHF	.469	.888	.813	.891	.333	.500	.750	.633	.708	.908	.500	.919	.707	.611	.830	.882	.910
Cars	15	198	39	252	4	4	30	38	67	330	6	403	129	22	176	327	1020
% Cars	100	99.5	100	99.6	100	100	100	100	98.5	98.8	100	98.8	99.2	100	100	99.7	99.3
Trucks	0	1	0	1	0	0	0	0	1	4	0	5	1	0	0	1	7
% Trucks	0	0.5	0	0.4	0	0	0	0	1.5	1.2	0	1.2	0.8	0	0	0.3	0.7

# Accurate Counts

978-664-2565

N/S Street : School Street  
 E/W Street : Route 128 NB Ramp  
 City/State : Manchester By The Sea, MA  
 Weather : Clear

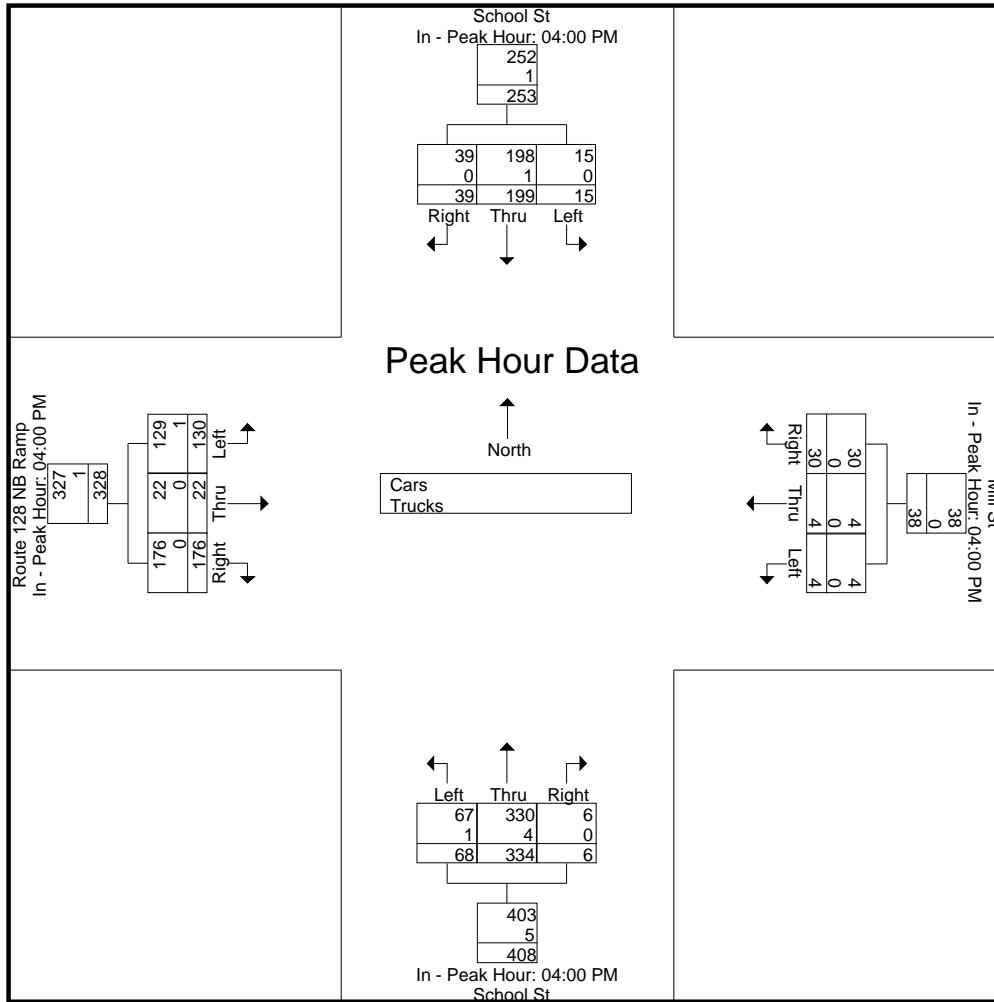
File Name : 84410003  
 Site Code : 84410003  
 Start Date : 11/9/2021  
 Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	4	56	11	71	0	0	8	8	24	85	2	111	46	5	41	92
+15 mins.	2	47	8	57	3	2	10	15	15	92	0	107	31	9	53	93
+30 mins.	8	44	12	64	1	1	6	8	12	88	3	103	29	5	36	70
+45 mins.	1	52	8	61	0	1	6	7	17	69	1	87	24	3	46	73
Total Volume	15	199	39	253	4	4	30	38	68	334	6	408	130	22	176	328
% App. Total	5.9	78.7	15.4		10.5	10.5	78.9		16.7	81.9	1.5		39.6	6.7	53.7	
PHF	.469	.888	.813	.891	.333	.500	.750	.633	.708	.908	.500	.919	.707	.611	.830	.882
Cars	15	198	39	252	4	4	30	38	67	330	6	403	129	22	176	327
% Cars	100	99.5	100	99.6	100	100	100	100	98.5	98.8	100	98.8	99.2	100	100	99.7
Trucks	0	1	0	1	0	0	0	0	1	4	0	5	1	0	0	1
% Trucks	0	0.5	0	0.4	0	0	0	0	1.5	1.2	0	1.2	0.8	0	0	0.3

N/S Street : School Street  
E/W Street : Route 128 NB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear



# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Route 128 NB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410003  
Site Code : 84410003  
Start Date : 11/9/2021  
Page No : 4

## Groups Printed- Cars

	School St From North			Mill St From East			School St From South			Route 128 NB Ramp From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
04:00 PM	4	56	11	0	0	8	23	85	2	45	5	41	280
04:15 PM	2	47	8	3	2	10	15	89	0	31	9	53	269
04:30 PM	8	44	12	1	1	6	12	88	3	29	5	36	245
04:45 PM	1	51	8	0	1	6	17	68	1	24	3	46	226
Total	15	198	39	4	4	30	67	330	6	129	22	176	1020
05:00 PM	6	41	12	0	1	7	16	61	1	23	6	42	216
05:15 PM	7	54	4	0	4	7	16	64	1	17	5	35	214
05:30 PM	1	48	3	0	1	3	20	47	0	11	2	22	158
05:45 PM	3	37	0	2	0	6	25	52	1	19	4	34	183
Total	17	180	19	2	6	23	77	224	3	70	17	133	771
Grand Total	32	378	58	6	10	53	144	554	9	199	39	309	1791
Apprch %	6.8	80.8	12.4	8.7	14.5	76.8	20.4	78.4	1.3	36.4	7.1	56.5	
Total %	1.8	21.1	3.2	0.3	0.6	3	8	30.9	0.5	11.1	2.2	17.3	

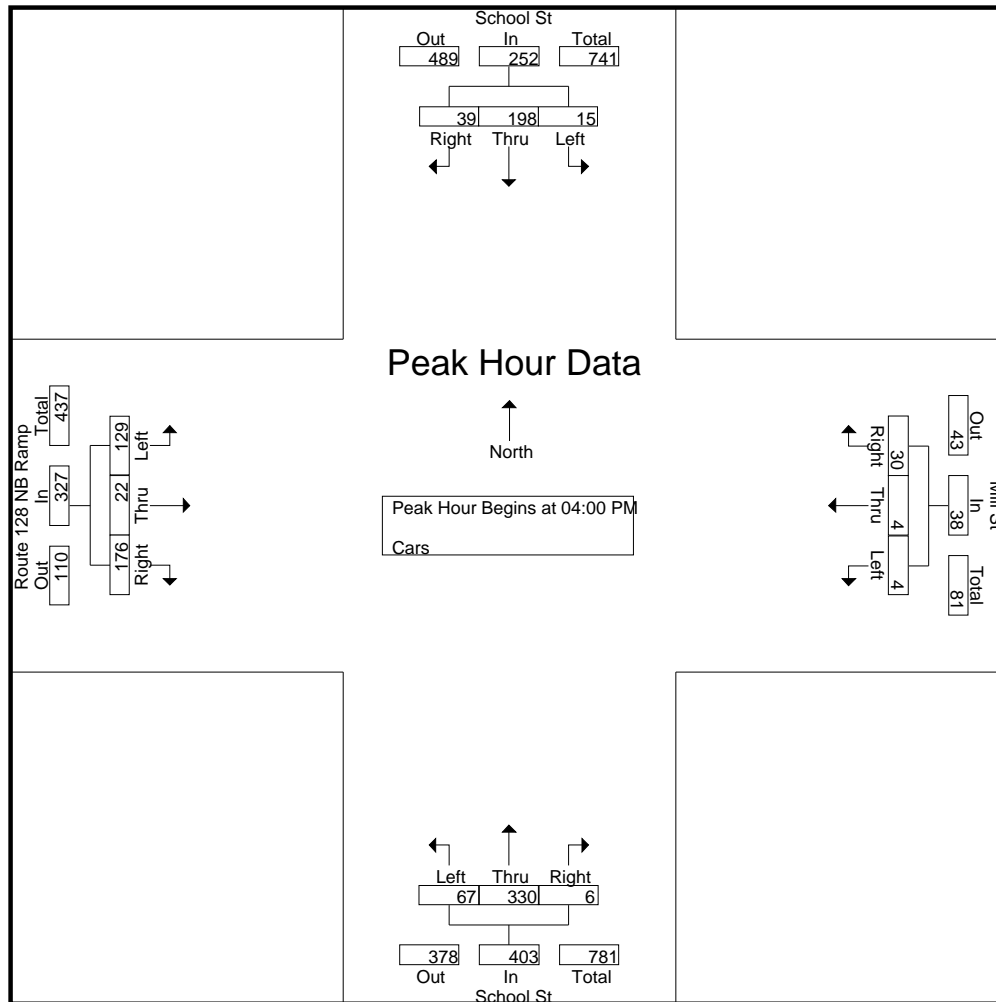
	School St From North				Mill St From East				School St From South				Route 128 NB Ramp From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	4	<b>56</b>	11	<b>71</b>	0	0	8	8	<b>23</b>	85	2	<b>110</b>	<b>45</b>	5	41	91	<b>280</b>
04:15 PM	2	47	8	57	<b>3</b>	<b>2</b>	<b>10</b>	<b>15</b>	15	<b>89</b>	0	104	31	<b>9</b>	<b>53</b>	<b>93</b>	269
04:30 PM	<b>8</b>	44	<b>12</b>	64	1	1	6	8	12	88	<b>3</b>	103	29	5	36	70	245
04:45 PM	1	51	8	60	0	1	6	7	17	68	1	86	24	3	46	73	226
Total Volume	15	198	39	252	4	4	30	38	67	330	6	403	129	22	176	327	1020
% App. Total	6	78.6	15.5		10.5	10.5	78.9		16.6	81.9	1.5		39.4	6.7	53.8		
PHF	.469	.884	.813	.887	.333	.500	.750	.633	.728	.927	.500	.916	.717	.611	.830	.879	.911

# Accurate Counts

978-664-2565

N/S Street : School Street  
 E/W Street : Route 128 NB Ramp  
 City/State : Manchester By The Sea, MA  
 Weather : Clear

File Name : 84410003  
 Site Code : 84410003  
 Start Date : 11/9/2021  
 Page No : 5

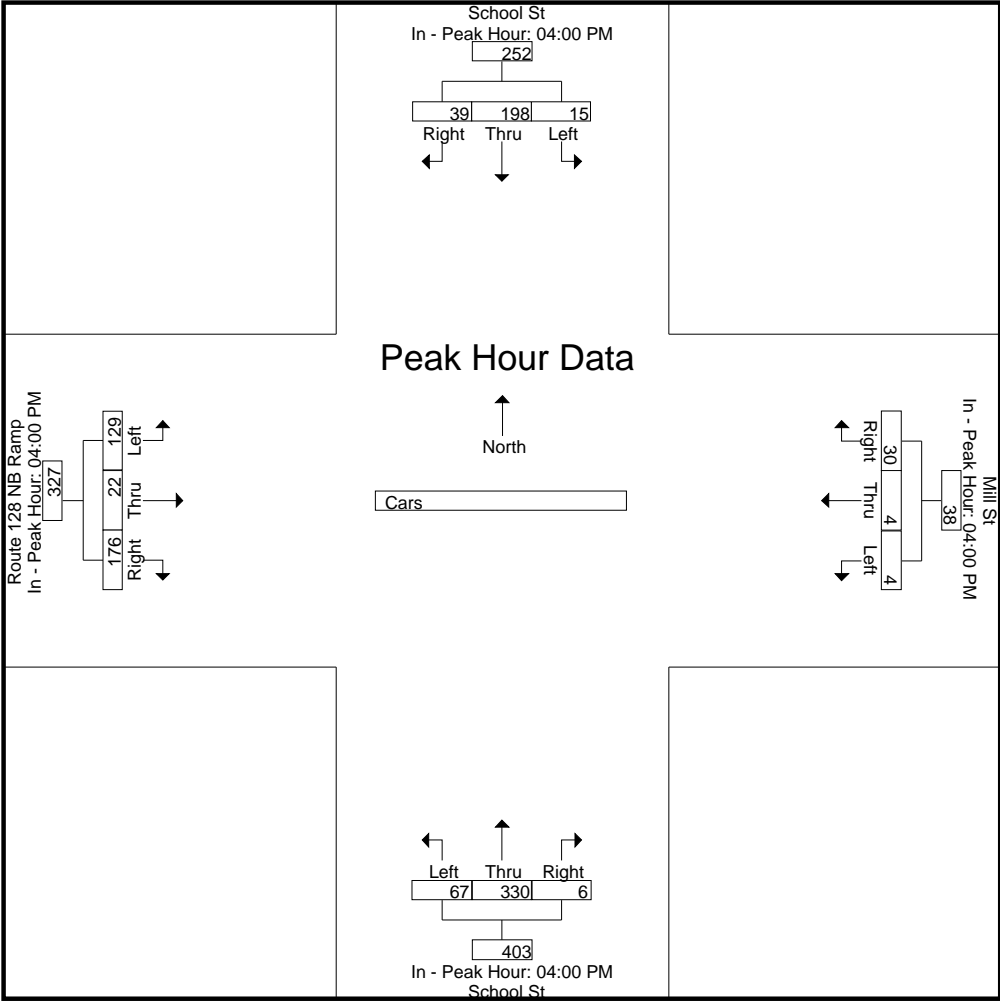


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	4	<b>56</b>	11	<b>71</b>	0	0	8	8	<b>23</b>	85	2	<b>110</b>	<b>45</b>	5	41	91
+15 mins.	2	47	8	57	<b>3</b>	<b>2</b>	<b>10</b>	<b>15</b>	15	<b>89</b>	0	104	31	<b>9</b>	<b>53</b>	<b>93</b>
+30 mins.	<b>8</b>	44	<b>12</b>	64	1	1	6	8	12	88	<b>3</b>	103	29	5	36	70
+45 mins.	1	51	8	60	0	1	6	7	17	68	1	86	24	3	46	73
Total Volume	15	198	39	252	4	4	30	38	67	330	6	403	129	22	176	327
% App. Total	6	78.6	15.5		10.5	10.5	78.9		16.6	81.9	1.5		39.4	6.7	53.8	
PHF	.469	.884	.813	.887	.333	.500	.750	.633	.728	.927	.500	.916	.717	.611	.830	.879

N/S Street : School Street  
E/W Street : Route 128 NB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410003  
Site Code : 84410003  
Start Date : 11/9/2021  
Page No : 6



# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Route 128 NB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410003  
Site Code : 84410003  
Start Date : 11/9/2021  
Page No : 7

## Groups Printed- Trucks

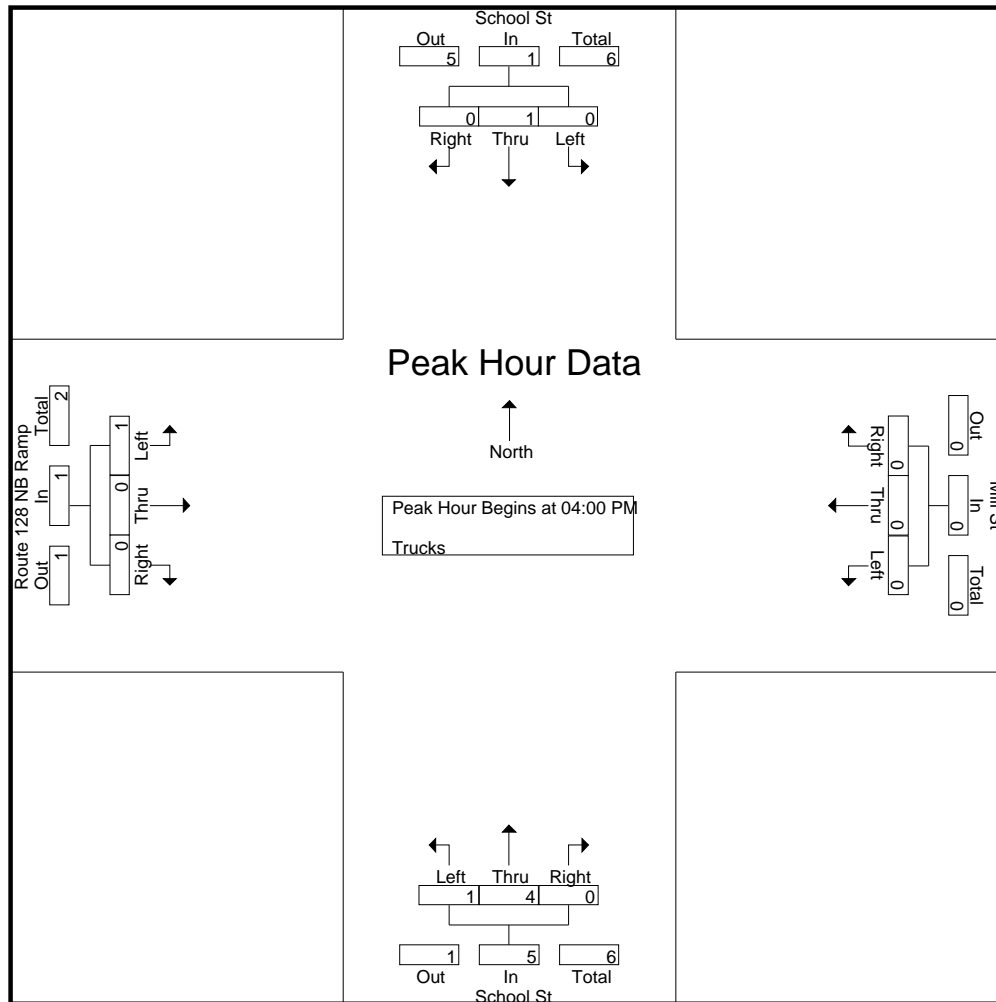
	School St From North			Mill St From East			School St From South			Route 128 NB Ramp From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
04:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	2
04:15 PM	0	0	0	0	0	0	0	3	0	0	0	0	3
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	1	0	0	0	0	0	1	0	0	0	0	2
Total	0	1	0	0	0	0	1	4	0	1	0	0	7
05:00 PM	0	0	0	0	0	0	2	0	0	0	0	0	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
Total	0	0	0	0	0	0	2	1	0	0	0	0	3
Grand Total	0	1	0	0	0	0	3	5	0	1	0	0	10
Apprch %	0	100	0	0	0	0	37.5	62.5	0	100	0	0	
Total %	0	10	0	0	0	0	30	50	0	10	0	0	

	School St From North				Mill St From East				School St From South				Route 128 NB Ramp From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	1	2
04:15 PM	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	3
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
Total Volume	0	1	0	1	0	0	0	0	1	4	0	5	1	0	0	1	7
% App. Total	0	100	0		0	0	0		20	80	0		100	0	0		
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.250	.333	.000	.417	.250	.000	.000	.250	.583



N/S Street : School Street  
E/W Street : Route 128 NB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410003  
Site Code : 84410003  
Start Date : 11/9/2021  
Page No : 8

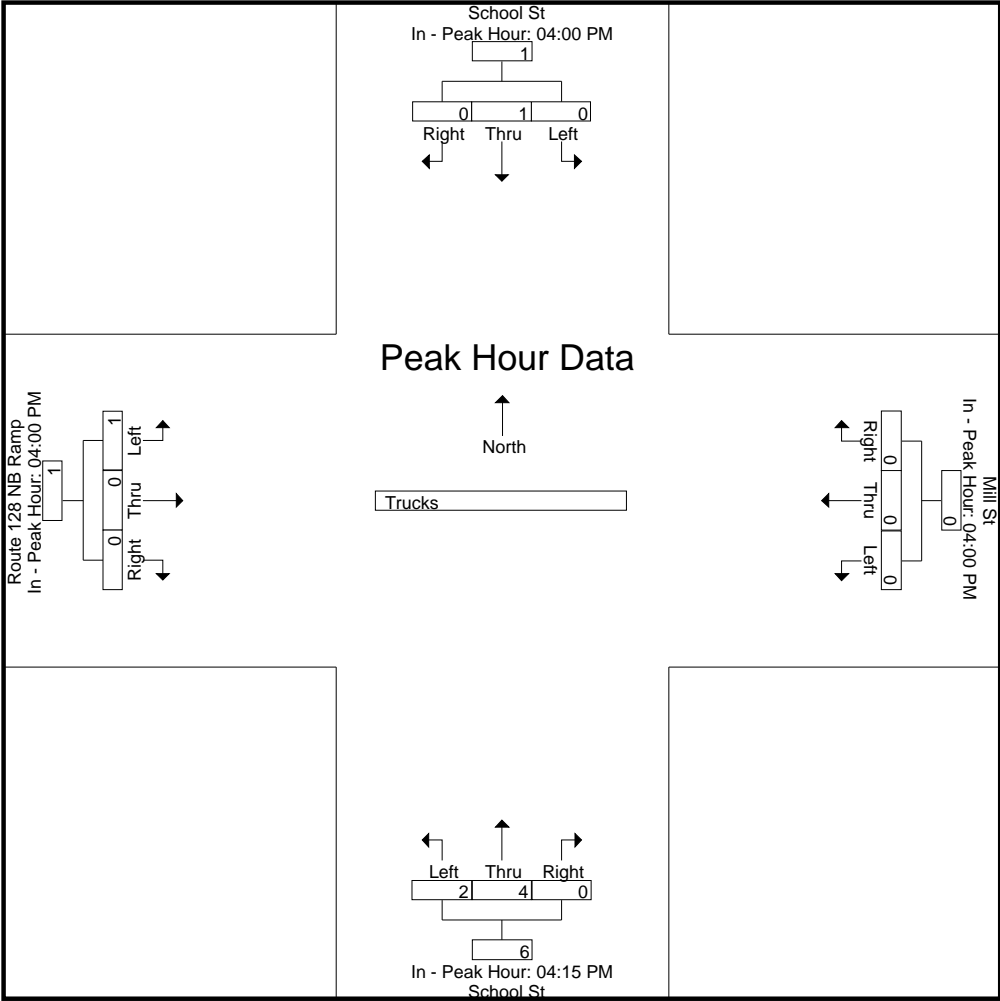


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:15 PM				04:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	<b>3</b>	0	<b>3</b>	<b>1</b>	0	0	<b>1</b>
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
+45 mins.	0	<b>1</b>	0	<b>1</b>	0	0	0	0	<b>2</b>	0	0	2	0	0	0	0
Total Volume	0	1	0	1	0	0	0	0	2	4	0	6	1	0	0	1
% App. Total	0	100	0		0	0	0		33.3	66.7	0		100	0	0	
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.250	.333	.000	.500	.250	.000	.000	.250

N/S Street : School Street  
E/W Street : Route 128 NB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410003  
Site Code : 84410003  
Start Date : 11/9/2021  
Page No : 9



# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Route 128 NB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410003  
Site Code : 84410003  
Start Date : 11/9/2021  
Page No : 10

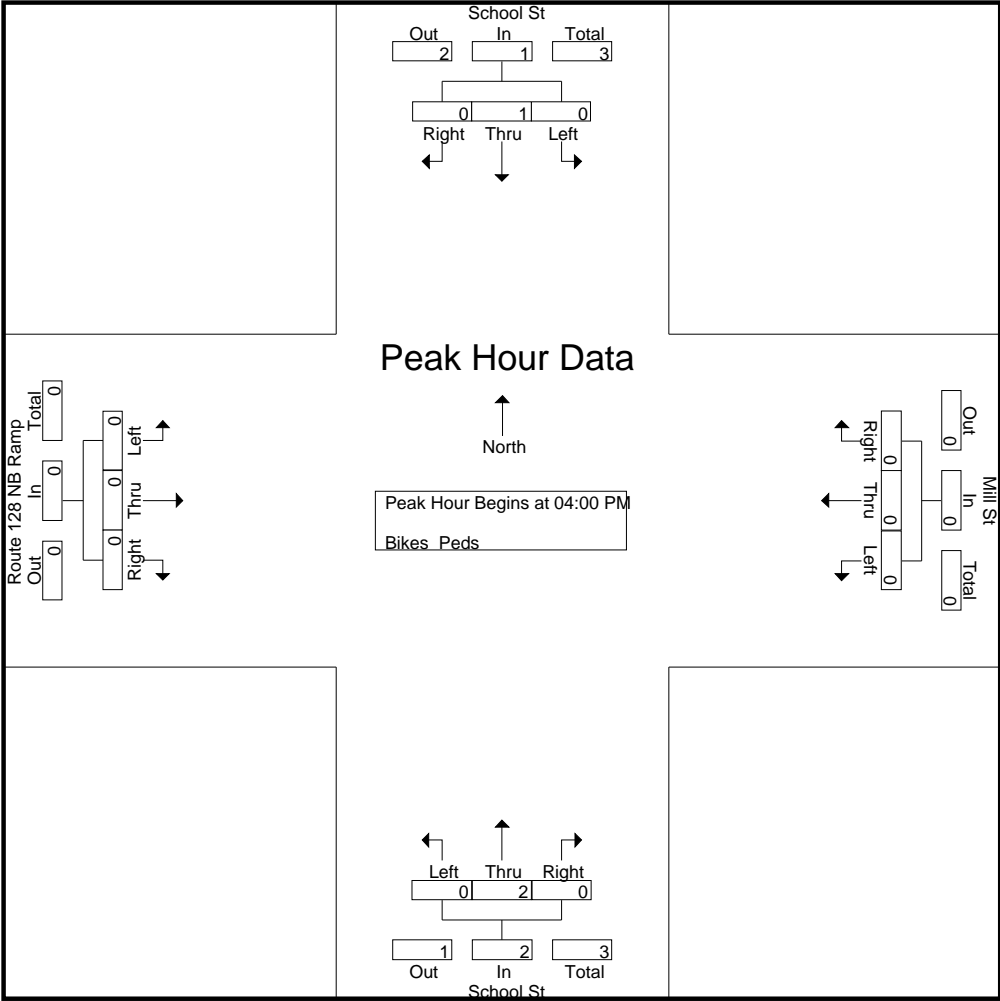
## Groups Printed- Bikes Peds

	School St From North				Mill St From East				School St From South				Route 128 NB Ramp From West				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
04:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1
04:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	3	3
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
Grand Total	0	3	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	5	5
Apprch %	0	100	0		0	0	0		0	100	0		0	0	0				
Total %	0	60	0		0	0	0		0	40	0		0	0	0		0	100	

	School St From North				Mill St From East				School St From South				Route 128 NB Ramp From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	1	0	1	0	0	0	0	0	2	0	2	0	0	0	0	3
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000	.750

N/S Street : School Street  
E/W Street : Route 128 NB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410003  
Site Code : 84410003  
Start Date : 11/9/2021  
Page No : 11

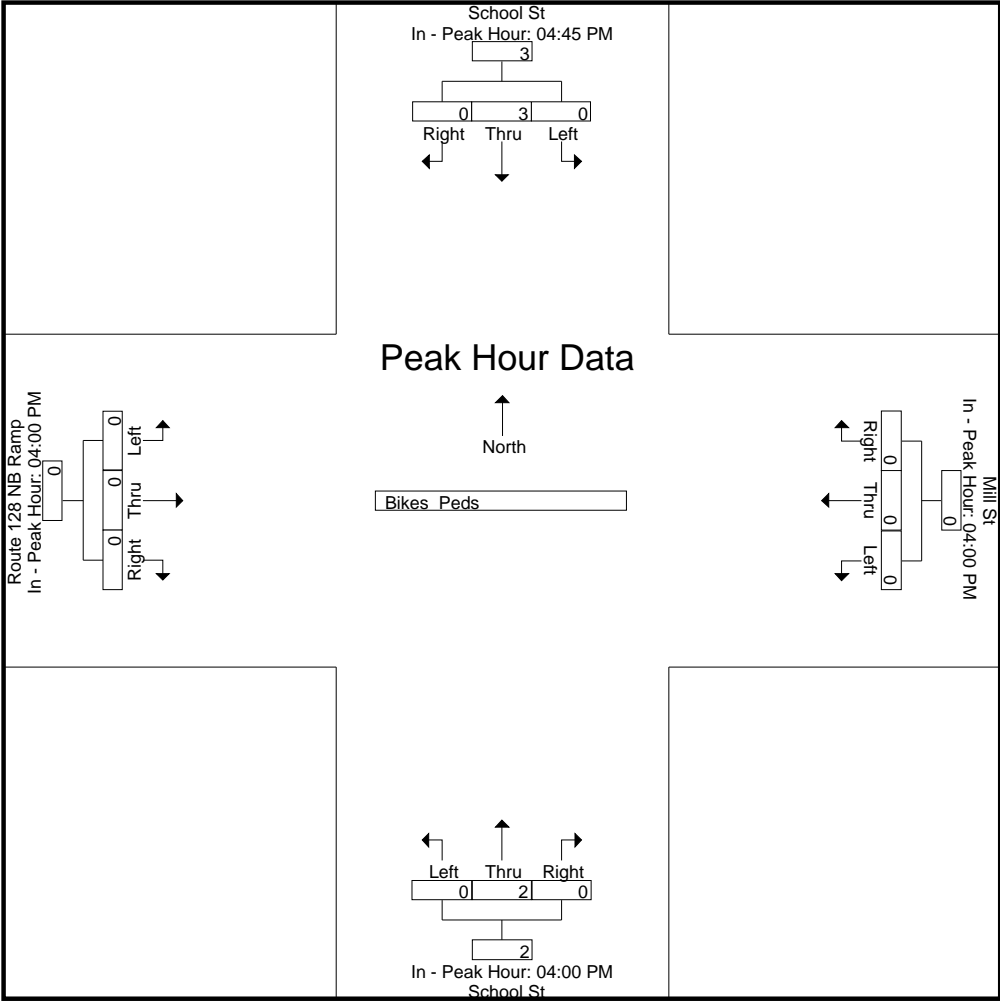


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	04:45 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	3	0	3	0	0	0	0	0	2	0	2	0	0	0	0
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0	
PHF	.000	.375	.000	.375	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000

N/S Street : School Street  
E/W Street : Route 128 NB Ramp  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410003  
Site Code : 84410003  
Start Date : 11/9/2021  
Page No : 12



# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Pleasant Street  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410004  
Site Code : 84410004  
Start Date : 11/9/2021  
Page No : 1

## Groups Printed- Cars - Trucks

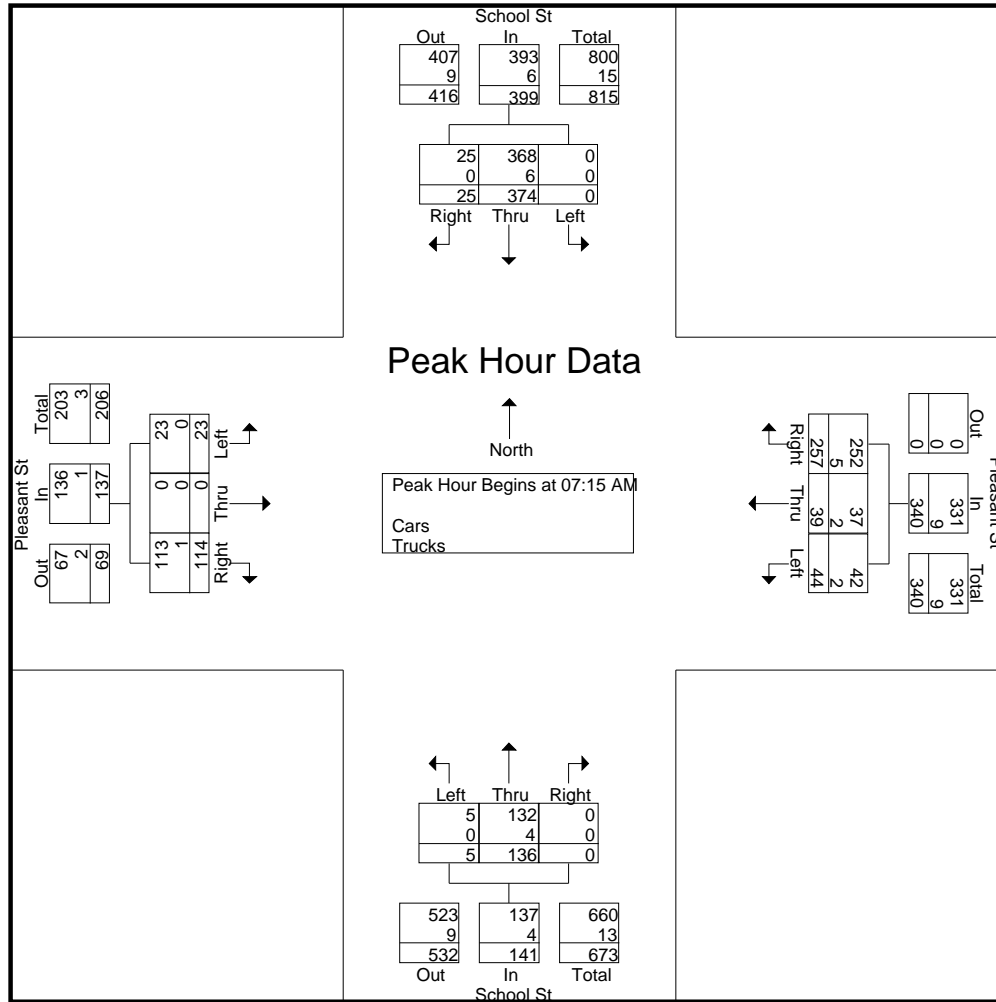
	School St From North			Pleasant St From East			School St From South			Pleasant St From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	0	70	8	0	4	36	1	22	0	0	0	16	157
07:15 AM	0	119	2	5	7	64	2	30	0	5	0	36	270
07:30 AM	0	75	7	28	28	101	0	30	0	2	0	46	317
07:45 AM	0	87	8	5	3	46	0	37	0	9	0	12	207
Total	0	351	25	38	42	247	3	119	0	16	0	110	951
08:00 AM	0	93	8	6	1	46	3	39	0	7	0	20	223
08:15 AM	0	88	2	4	11	51	4	51	0	5	0	18	234
08:30 AM	0	76	6	2	4	42	3	41	0	6	1	12	193
08:45 AM	0	65	9	2	9	54	3	50	0	12	0	14	218
Total	0	322	25	14	25	193	13	181	0	30	1	64	868
Grand Total	0	673	50	52	67	440	16	300	0	46	1	174	1819
Apprch %	0	93.1	6.9	9.3	12	78.7	5.1	94.9	0	20.8	0.5	78.7	
Total %	0	37	2.7	2.9	3.7	24.2	0.9	16.5	0	2.5	0.1	9.6	
Cars	0	663	50	50	64	433	16	293	0	46	1	173	1789
% Cars	0	98.5	100	96.2	95.5	98.4	100	97.7	0	100	100	99.4	98.4
Trucks	0	10	0	2	3	7	0	7	0	0	0	1	30
% Trucks	0	1.5	0	3.8	4.5	1.6	0	2.3	0	0	0	0.6	1.6

	School St From North				Pleasant St From East				School St From South				Pleasant St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	119	2	121	5	7	64	76	2	30	0	32	5	0	36	41	270
07:30 AM	0	75	7	82	28	28	101	157	0	30	0	30	2	0	46	48	317
07:45 AM	0	87	8	95	5	3	46	54	0	37	0	37	9	0	12	21	207
08:00 AM	0	93	8	101	6	1	46	53	3	39	0	42	7	0	20	27	223
Total Volume	0	374	25	399	44	39	257	340	5	136	0	141	23	0	114	137	1017
% App. Total	0	93.7	6.3		12.9	11.5	75.6		3.5	96.5	0		16.8	0	83.2		
PHF	.000	.786	.781	.824	.393	.348	.636	.541	.417	.872	.000	.839	.639	.000	.620	.714	.802
Cars	0	368	25	393	42	37	252	331	5	132	0	137	23	0	113	136	997
% Cars	0	98.4	100	98.5	95.5	94.9	98.1	97.4	100	97.1	0	97.2	100	0	99.1	99.3	98.0
Trucks	0	6	0	6	2	2	5	9	0	4	0	4	0	0	1	1	20
% Trucks	0	1.6	0	1.5	4.5	5.1	1.9	2.6	0	2.9	0	2.8	0	0	0.9	0.7	2.0

**Accurate Counts**  
978-664-2565

N/S Street : School Street  
E/W Street : Pleasant Street  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410004  
Site Code : 84410004  
Start Date : 11/9/2021  
Page No : 2

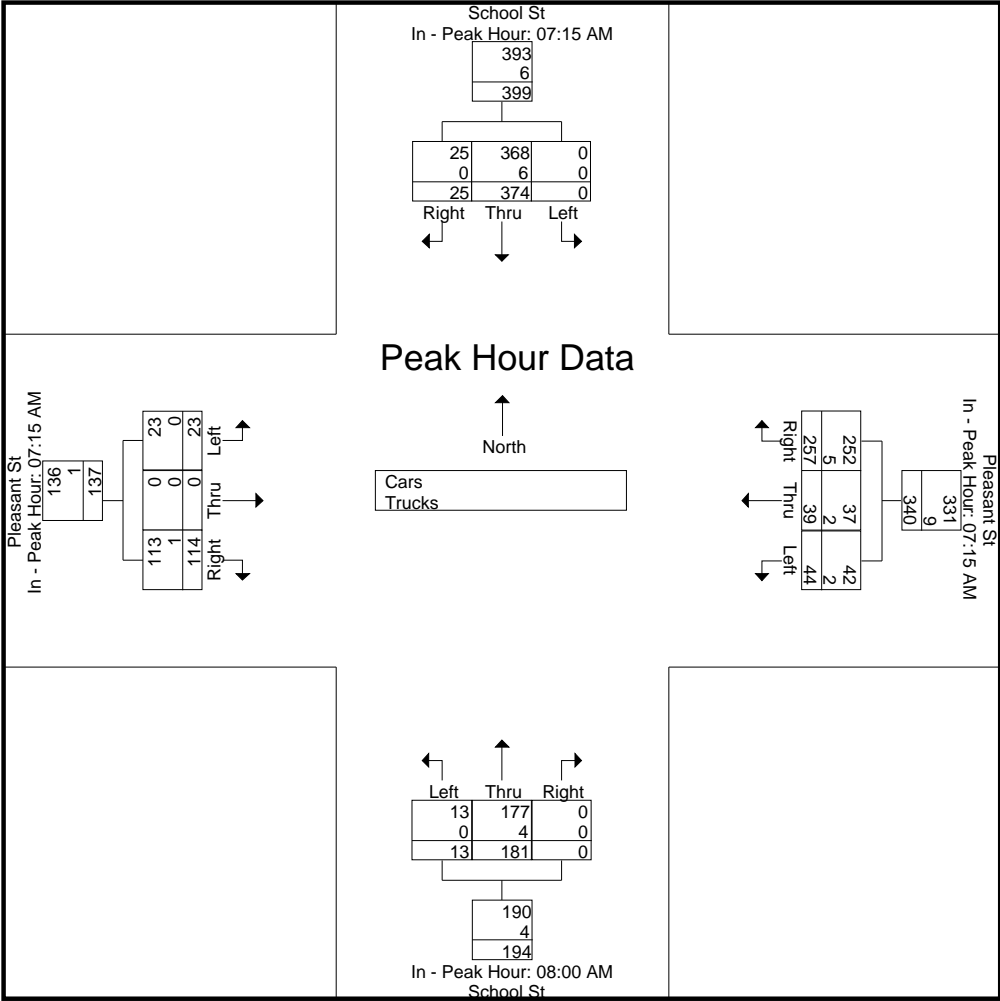


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	07:15 AM				07:15 AM				08:00 AM				07:15 AM			
+0 mins.	0	<b>119</b>	2	<b>121</b>	5	7	64	76	3	39	0	42	5	0	36	41
+15 mins.	0	75	7	82	<b>28</b>	<b>28</b>	<b>101</b>	<b>157</b>	<b>4</b>	<b>51</b>	0	<b>55</b>	2	0	<b>46</b>	<b>48</b>
+30 mins.	0	87	<b>8</b>	95	5	3	46	54	3	41	0	44	<b>9</b>	0	12	21
+45 mins.	0	93	8	101	6	1	46	53	3	50	0	53	7	0	20	27
Total Volume	0	374	25	399	44	39	257	340	13	181	0	194	23	0	114	137
% App. Total	0	93.7	6.3		12.9	11.5	75.6		6.7	93.3	0		16.8	0	83.2	
PHF	.000	.786	.781	.824	.393	.348	.636	.541	.813	.887	.000	.882	.639	.000	.620	.714
Cars	0	368	25	393	42	37	252	331	13	177	0	190	23	0	113	136
% Cars	0	98.4	100	98.5	95.5	94.9	98.1	97.4	100	97.8	0	97.9	100	0	99.1	99.3
Trucks	0	6	0	6	2	2	5	9	0	4	0	4	0	0	1	1
% Trucks	0	1.6	0	1.5	4.5	5.1	1.9	2.6	0	2.2	0	2.1	0	0	0.9	0.7

N/S Street : School Street  
E/W Street : Pleasant Street  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410004  
Site Code : 84410004  
Start Date : 11/9/2021  
Page No : 3





# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Pleasant Street  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410004  
Site Code : 84410004  
Start Date : 11/9/2021  
Page No : 4

## Groups Printed- Cars

	School St From North			Pleasant St From East			School St From South			Pleasant St From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	70	8	0	4	35	1	22	0	0	0	16	156
07:15 AM	0	116	2	5	7	62	2	30	0	5	0	36	265
07:30 AM	0	75	7	26	26	100	0	28	0	2	0	46	310
07:45 AM	0	86	8	5	3	46	0	36	0	9	0	12	205
Total	0	347	25	36	40	243	3	116	0	16	0	110	936
08:00 AM	0	91	8	6	1	44	3	38	0	7	0	19	217
08:15 AM	0	86	2	4	11	50	4	50	0	5	0	18	230
08:30 AM	0	76	6	2	4	42	3	41	0	6	1	12	193
08:45 AM	0	63	9	2	8	54	3	48	0	12	0	14	213
Total	0	316	25	14	24	190	13	177	0	30	1	63	853
Grand Total	0	663	50	50	64	433	16	293	0	46	1	173	1789
Apprch %	0	93	7	9.1	11.7	79.2	5.2	94.8	0	20.9	0.5	78.6	
Total %	0	37.1	2.8	2.8	3.6	24.2	0.9	16.4	0	2.6	0.1	9.7	

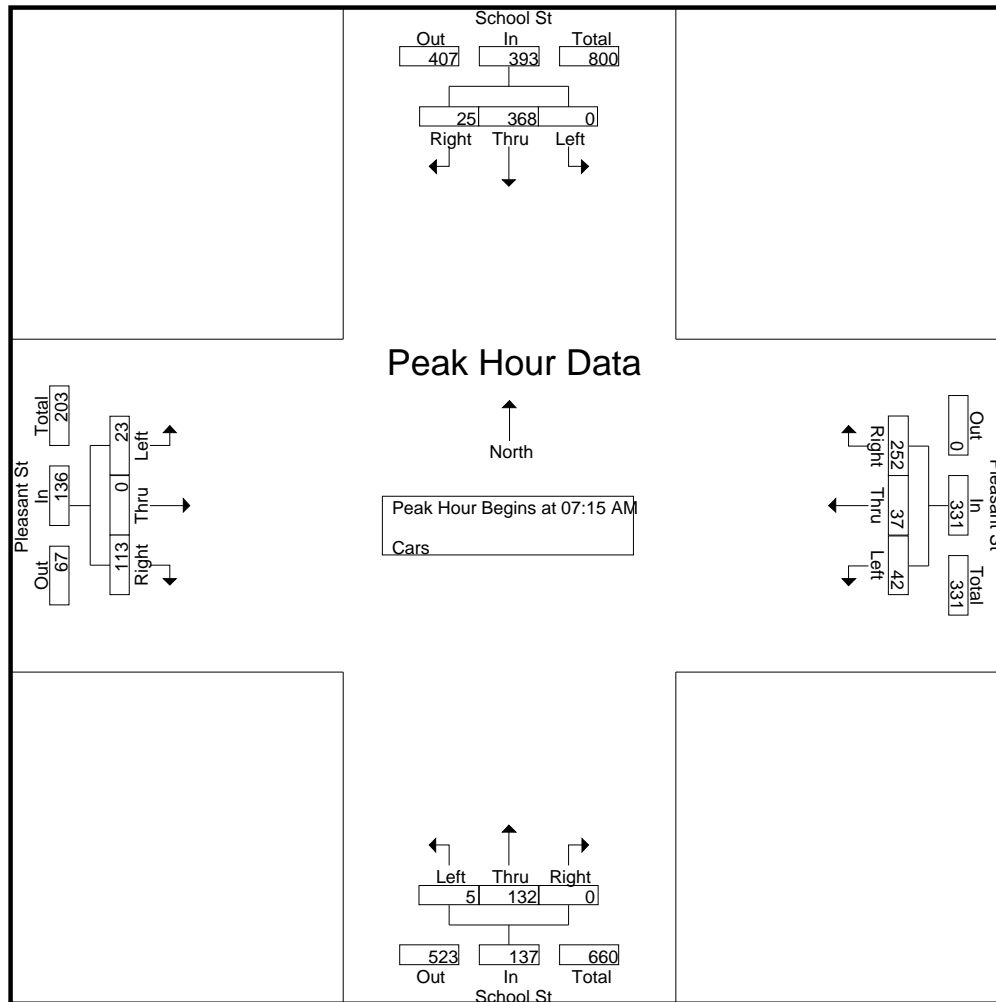
	School St From North				Pleasant St From East				School St From South				Pleasant St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	<b>116</b>	2	<b>118</b>	5	7	62	74	2	30	0	32	5	0	36	41	265
07:30 AM	0	75	7	82	<b>26</b>	<b>26</b>	<b>100</b>	<b>152</b>	0	28	0	28	2	0	<b>46</b>	<b>48</b>	<b>310</b>
07:45 AM	0	86	<b>8</b>	94	5	3	46	54	0	36	0	36	<b>9</b>	0	12	21	205
08:00 AM	0	91	8	99	6	1	44	51	<b>3</b>	<b>38</b>	0	<b>41</b>	7	0	19	26	217
Total Volume	0	368	25	393	42	37	252	331	5	132	0	137	23	0	113	136	997
% App. Total	0	93.6	6.4		12.7	11.2	76.1		3.6	96.4	0		16.9	0	83.1		
PHF	.000	.793	.781	.833	.404	.356	.630	.544	.417	.868	.000	.835	.639	.000	.614	.708	.804

# Accurate Counts

978-664-2565

N/S Street : School Street  
 E/W Street : Pleasant Street  
 City/State : Manchester By The Sea, MA  
 Weather : Clear

File Name : 84410004  
 Site Code : 84410004  
 Start Date : 11/9/2021  
 Page No : 5

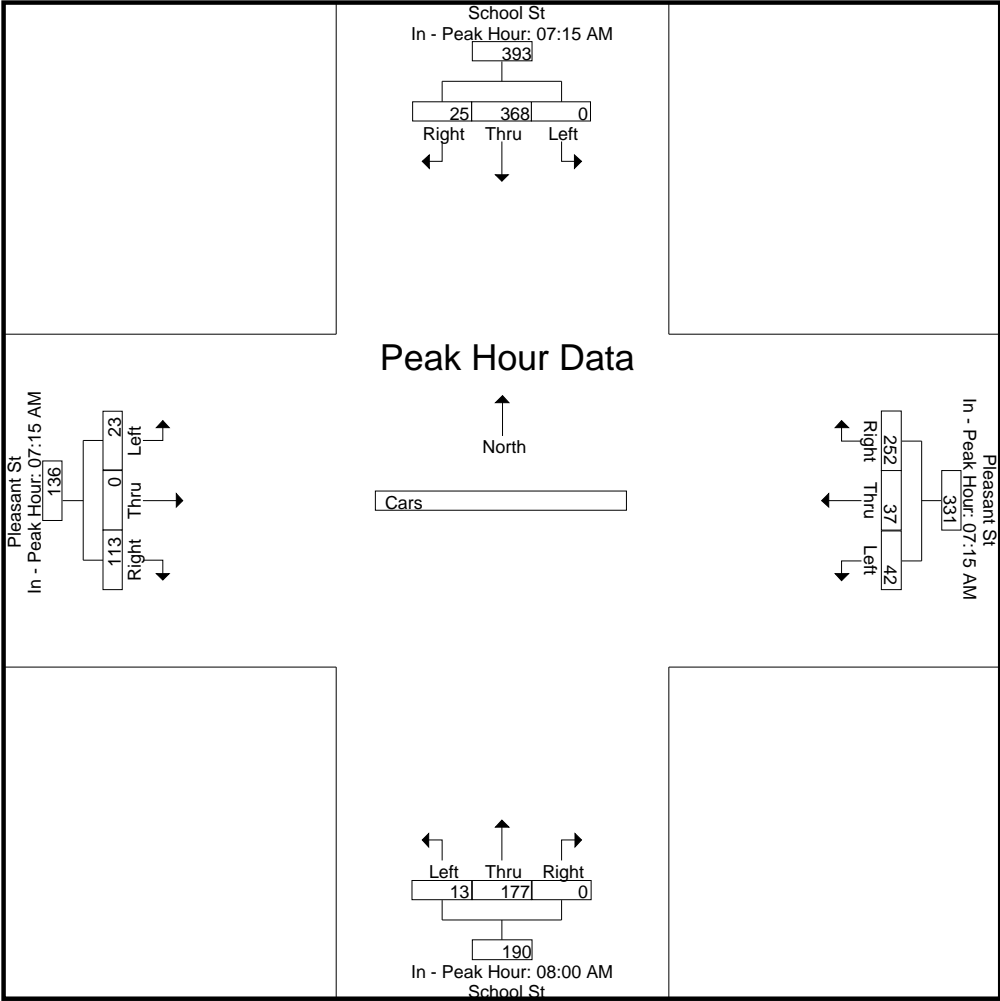


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	07:15 AM				07:15 AM				08:00 AM				07:15 AM			
+0 mins.	0	<b>116</b>	2	<b>118</b>	5	7	62	74	3	38	0	41	5	0	36	41
+15 mins.	0	75	7	82	<b>26</b>	<b>26</b>	<b>100</b>	<b>152</b>	<b>4</b>	<b>50</b>	0	<b>54</b>	2	0	<b>46</b>	<b>48</b>
+30 mins.	0	86	<b>8</b>	94	5	3	46	54	3	41	0	44	<b>9</b>	0	12	21
+45 mins.	0	91	8	99	6	1	44	51	3	48	0	51	7	0	19	26
Total Volume	0	368	25	393	42	37	252	331	13	177	0	190	23	0	113	136
% App. Total	0	93.6	6.4		12.7	11.2	76.1		6.8	93.2	0		16.9	0	83.1	
PHF	.000	.793	.781	.833	.404	.356	.630	.544	.813	.885	.000	.880	.639	.000	.614	.708

N/S Street : School Street  
E/W Street : Pleasant Street  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410004  
Site Code : 84410004  
Start Date : 11/9/2021  
Page No : 6



# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Pleasant Street  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410004  
Site Code : 84410004  
Start Date : 11/9/2021  
Page No : 7

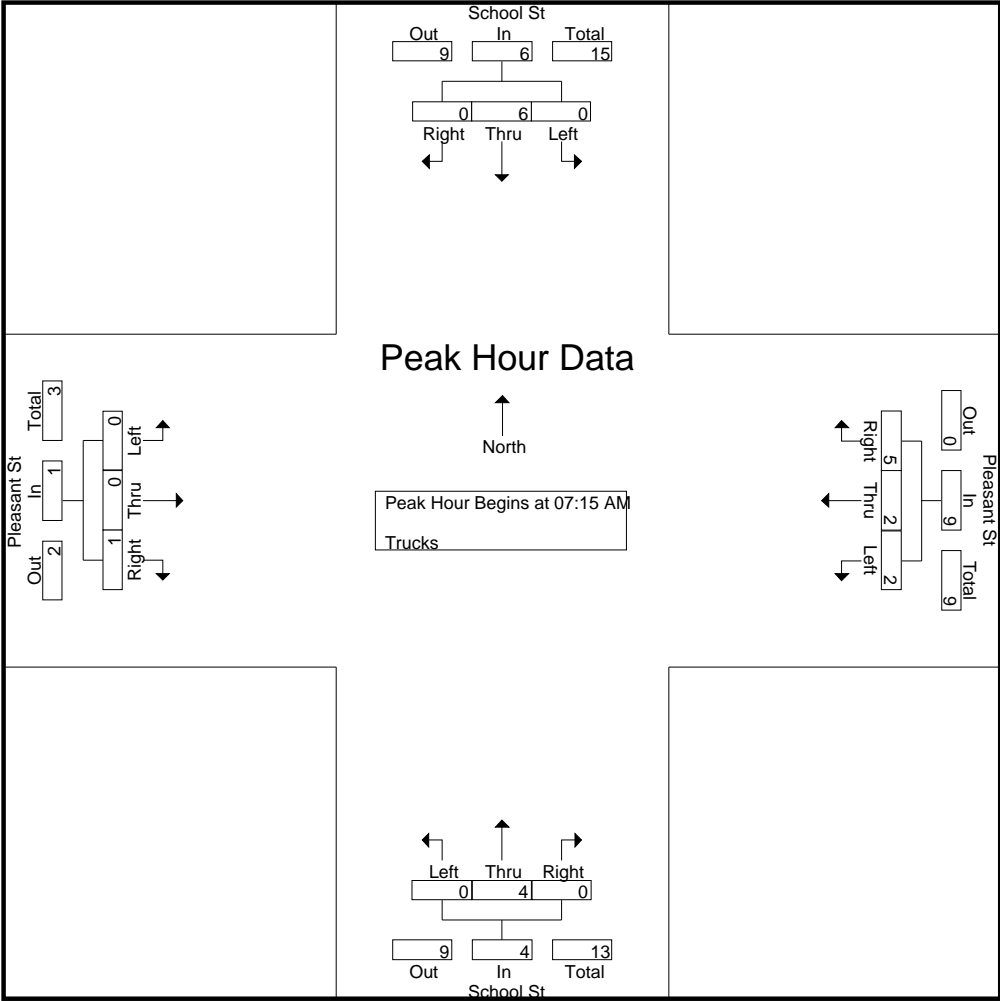
## Groups Printed- Trucks

	School St From North			Pleasant St From East			School St From South			Pleasant St From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	1
07:15 AM	0	3	0	0	0	2	0	0	0	0	0	0	5
07:30 AM	0	0	0	2	2	1	0	2	0	0	0	0	7
07:45 AM	0	1	0	0	0	0	0	1	0	0	0	0	2
Total	0	4	0	2	2	4	0	3	0	0	0	0	15
08:00 AM	0	2	0	0	0	2	0	1	0	0	0	1	6
08:15 AM	0	2	0	0	0	1	0	1	0	0	0	0	4
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	2	0	0	1	0	0	2	0	0	0	0	5
Total	0	6	0	0	1	3	0	4	0	0	0	1	15
Grand Total	0	10	0	2	3	7	0	7	0	0	0	1	30
Apprch %	0	100	0	16.7	25	58.3	0	100	0	0	0	100	
Total %	0	33.3	0	6.7	10	23.3	0	23.3	0	0	0	3.3	

	School St From North				Pleasant St From East				School St From South				Pleasant St From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	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 07:15 AM																	
07:15 AM	0	3	0	3	0	0	2	2	0	0	0	0	0	0	0	0	5
07:30 AM	0	0	0	0	2	2	1	5	0	2	0	2	0	0	0	0	7
07:45 AM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
08:00 AM	0	2	0	2	0	0	2	2	0	1	0	1	0	0	1	1	6
Total Volume	0	6	0	6	2	2	5	9	0	4	0	4	0	0	1	1	20
% App. Total	0	100	0		22.2	22.2	55.6		0	100	0		0	0	100		
PHF	.000	.500	.000	.500	.250	.250	.625	.450	.000	.500	.000	.500	.000	.000	.250	.250	.714

N/S Street : School Street  
E/W Street : Pleasant Street  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410004  
Site Code : 84410004  
Start Date : 11/9/2021  
Page No : 8

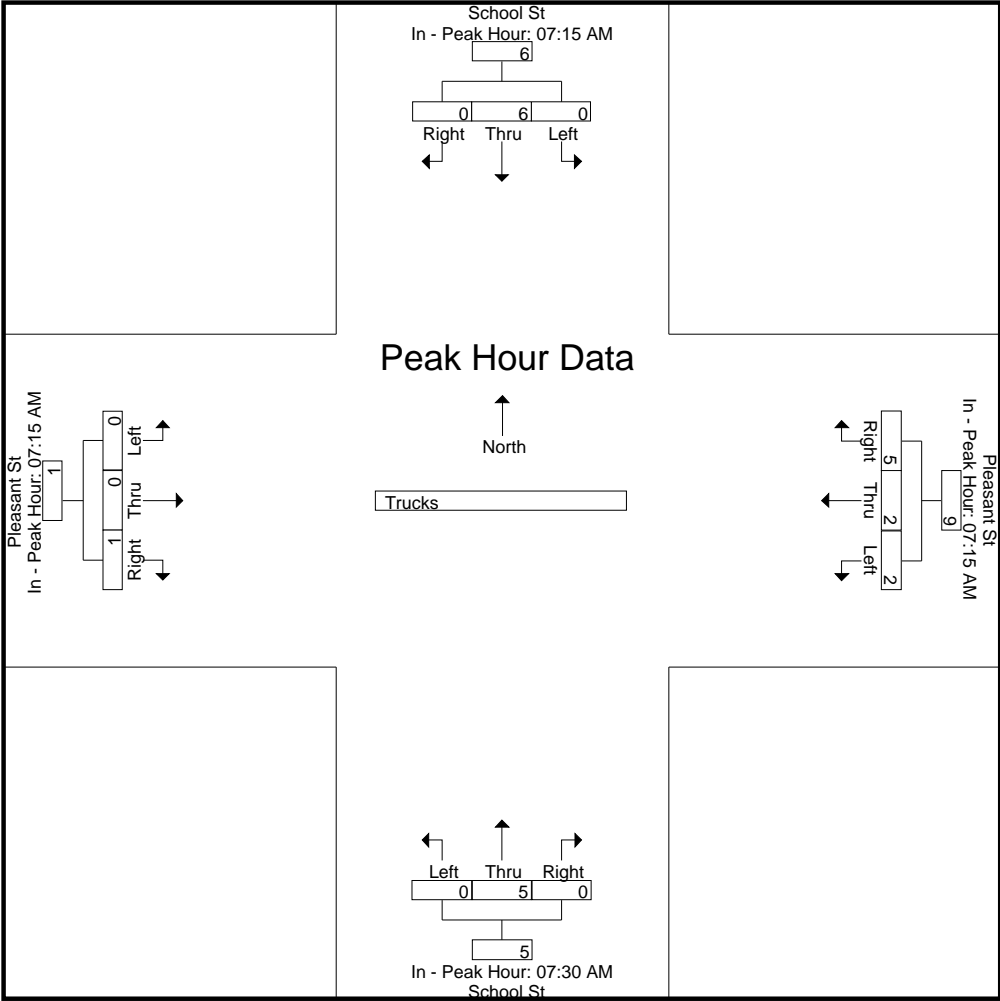


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	07:15 AM				07:15 AM				07:30 AM				07:15 AM			
+0 mins.	0	3	0	3	0	0	2	2	0	2	0	2	0	0	0	0
+15 mins.	0	0	0	0	2	2	1	5	0	1	0	1	0	0	0	0
+30 mins.	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0
+45 mins.	0	2	0	2	0	0	2	2	0	1	0	1	0	0	1	1
Total Volume	0	6	0	6	2	2	5	9	0	5	0	5	0	0	1	1
% App. Total	0	100	0		22.2	22.2	55.6		0	100	0		0	0	100	
PHF	.000	.500	.000	.500	.250	.250	.625	.450	.000	.625	.000	.625	.000	.000	.250	.250

N/S Street : School Street  
E/W Street : Pleasant Street  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410004  
Site Code : 84410004  
Start Date : 11/9/2021  
Page No : 9



# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Pleasant Street  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410004  
Site Code : 84410004  
Start Date : 11/9/2021  
Page No : 10

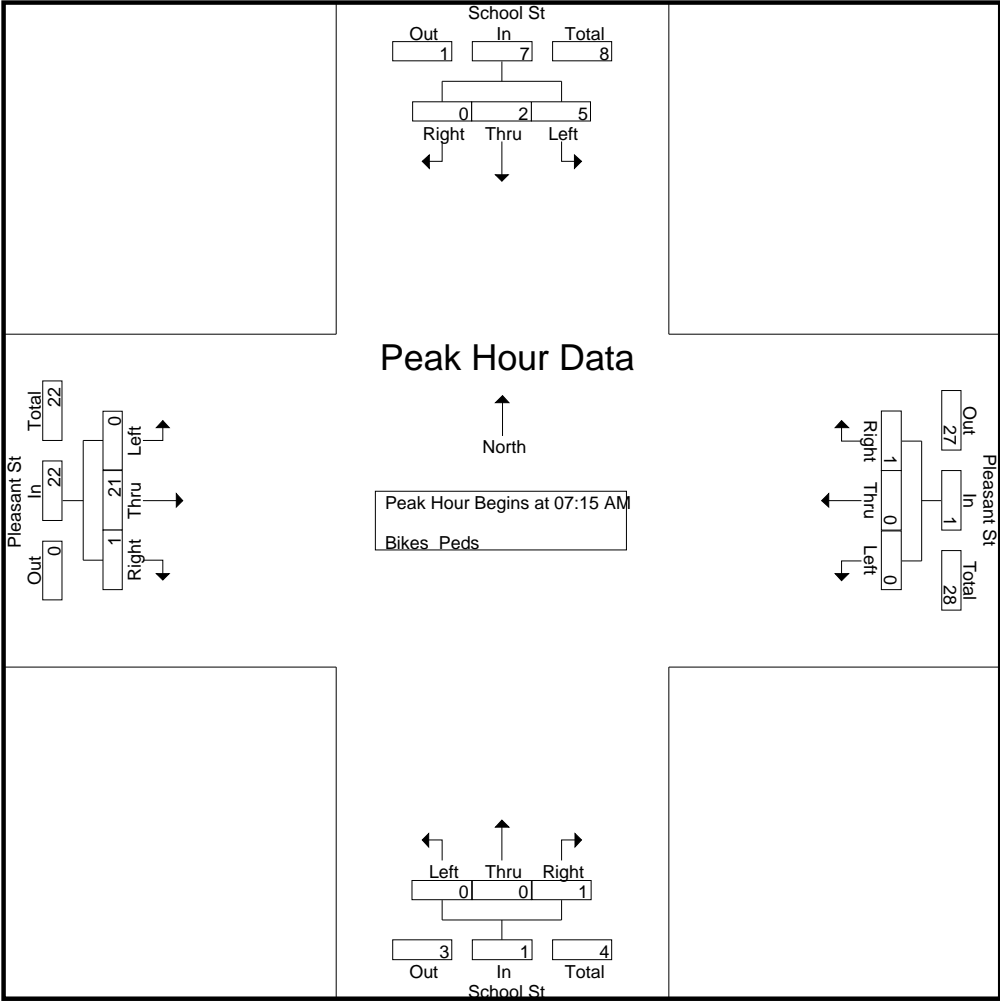
## Groups Printed- Bikes Peds

	School St From North				Pleasant St From East				School St From South				Pleasant St From West				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:00 AM	0	1	0	1	0	0	0	0	0	1	0	1	0	2	0	0	2	4	6
07:15 AM	0	0	0	4	0	0	0	0	0	0	0	1	0	3	0	1	6	3	9
07:30 AM	0	1	0	6	0	0	0	0	0	0	0	4	0	6	0	1	11	7	18
07:45 AM	3	1	0	3	0	0	0	0	0	0	0	0	0	1	0	1	4	5	9
Total	3	3	0	14	0	0	0	0	0	1	0	6	0	12	0	3	23	19	42
08:00 AM	2	0	0	0	0	0	1	0	0	0	1	1	0	11	1	0	1	16	17
08:15 AM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2
08:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	2	0	2
Total	2	0	0	3	0	0	1	1	0	0	1	1	0	11	2	2	7	17	24
Grand Total	5	3	0	17	0	0	1	1	0	1	1	7	0	23	2	5	30	36	66
Apprch %	62.5	37.5	0		0	0	100		0	50	50		0	92	8				
Total %	13.9	8.3	0		0	0	2.8		0	2.8	2.8		0	63.9	5.6		45.5	54.5	

	School St From North				Pleasant St From East				School St From South				Pleasant St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	3
07:30 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	6	0	6	7
07:45 AM	3	1	0	4	0	0	0	0	0	0	0	0	0	1	0	1	5
08:00 AM	2	0	0	2	0	0	1	1	0	0	1	1	0	11	1	12	16
Total Volume	5	2	0	7	0	0	1	1	0	0	1	1	0	21	1	22	31
% App. Total	71.4	28.6	0		0	0	100		0	0	100		0	95.5	4.5		
PHF	.417	.500	.000	.438	.000	.000	.250	.250	.000	.000	.250	.250	.000	.477	.250	.458	.484

N/S Street : School Street  
E/W Street : Pleasant Street  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410004  
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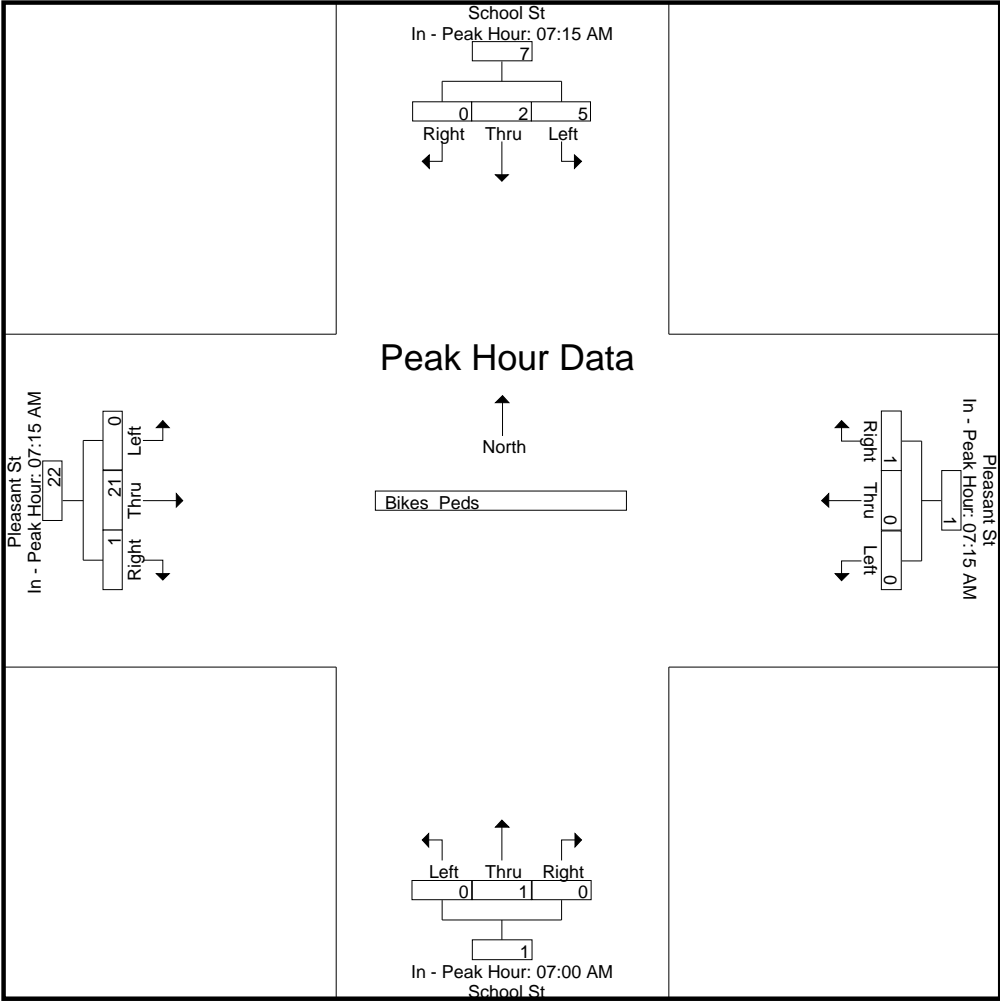
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	07:15 AM				07:15 AM				07:00 AM				07:15 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	3	0	3
+15 mins.	0	1	0	1	0	0	0	0	0	0	0	0	0	6	0	6
+30 mins.	3	1	0	4	0	0	0	0	0	0	0	0	0	1	0	1
+45 mins.	2	0	0	2	0	0	1	1	0	0	0	0	0	11	1	12
Total Volume	5	2	0	7	0	0	1	1	0	1	0	1	0	21	1	22
% App. Total	71.4	28.6	0		0	0	100		0	100	0		0	95.5	4.5	
PHF	.417	.500	.000	.438	.000	.000	.250	.250	.000	.250	.000	.250	.000	.477	.250	.458



N/S Street : School Street  
E/W Street : Pleasant Street  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410004  
Site Code : 84410004  
Start Date : 11/9/2021  
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# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Pleasant Street  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410004  
Site Code : 84410004  
Start Date : 11/9/2021  
Page No : 1

## Groups Printed- Cars - Trucks

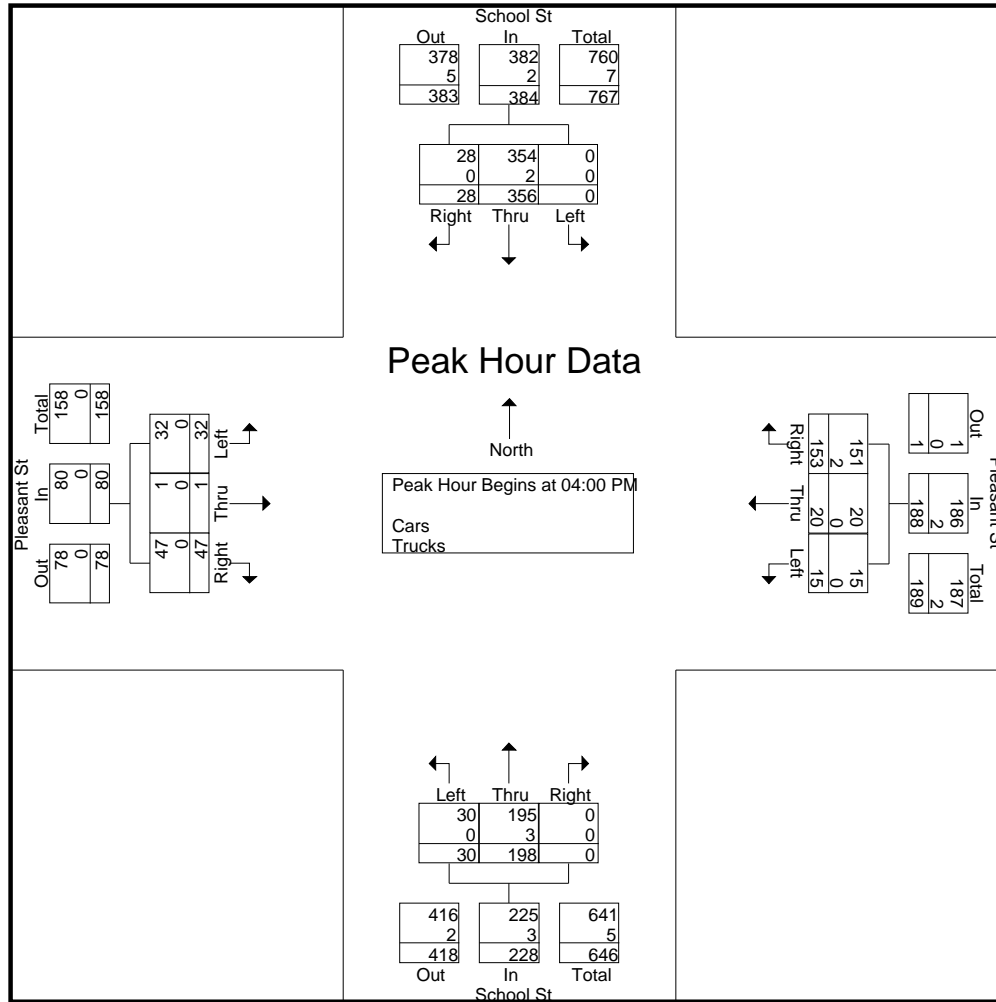
	School St From North			Pleasant St From East			School St From South			Pleasant St From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
04:00 PM	0	99	7	2	4	45	10	49	0	12	1	13	242
04:15 PM	0	82	8	3	2	34	7	57	0	5	0	14	212
04:30 PM	0	85	5	3	9	37	9	51	0	10	0	9	218
04:45 PM	0	90	8	7	5	37	4	41	0	5	0	11	208
Total	0	356	28	15	20	153	30	198	0	32	1	47	880
05:00 PM	0	84	7	1	6	33	9	48	0	4	0	14	206
05:15 PM	0	82	7	0	10	27	4	44	0	8	0	15	197
05:30 PM	0	63	2	2	5	32	4	37	0	1	0	13	159
05:45 PM	0	72	4	3	4	28	6	42	0	6	0	10	175
Total	0	301	20	6	25	120	23	171	0	19	0	52	737
Grand Total	0	657	48	21	45	273	53	369	0	51	1	99	1617
Apprch %	0	93.2	6.8	6.2	13.3	80.5	12.6	87.4	0	33.8	0.7	65.6	
Total %	0	40.6	3	1.3	2.8	16.9	3.3	22.8	0	3.2	0.1	6.1	
Cars	0	654	48	21	45	271	53	364	0	51	1	99	1607
% Cars	0	99.5	100	100	100	99.3	100	98.6	0	100	100	100	99.4
Trucks	0	3	0	0	0	2	0	5	0	0	0	0	10
% Trucks	0	0.5	0	0	0	0.7	0	1.4	0	0	0	0	0.6

	School St From North				Pleasant St From East				School St From South				Pleasant St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	99	7	106	2	4	45	51	10	49	0	59	12	1	13	26	242
04:15 PM	0	82	8	90	3	2	34	39	7	57	0	64	5	0	14	19	212
04:30 PM	0	85	5	90	3	9	37	49	9	51	0	60	10	0	9	19	218
04:45 PM	0	90	8	98	7	5	37	49	4	41	0	45	5	0	11	16	208
Total Volume	0	356	28	384	15	20	153	188	30	198	0	228	32	1	47	80	880
% App. Total	0	92.7	7.3		8	10.6	81.4		13.2	86.8	0		40	1.2	58.8		
PHF	.000	.899	.875	.906	.536	.556	.850	.922	.750	.868	.000	.891	.667	.250	.839	.769	.909
Cars	0	354	28	382	15	20	151	186	30	195	0	225	32	1	47	80	873
% Cars	0	99.4	100	99.5	100	100	98.7	98.9	100	98.5	0	98.7	100	100	100	100	99.2
Trucks	0	2	0	2	0	0	2	2	0	3	0	3	0	0	0	0	7
% Trucks	0	0.6	0	0.5	0	0	1.3	1.1	0	1.5	0	1.3	0	0	0	0	0.8

**Accurate Counts**  
978-664-2565

N/S Street : School Street  
E/W Street : Pleasant Street  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410004  
Site Code : 84410004  
Start Date : 11/9/2021  
Page No : 2

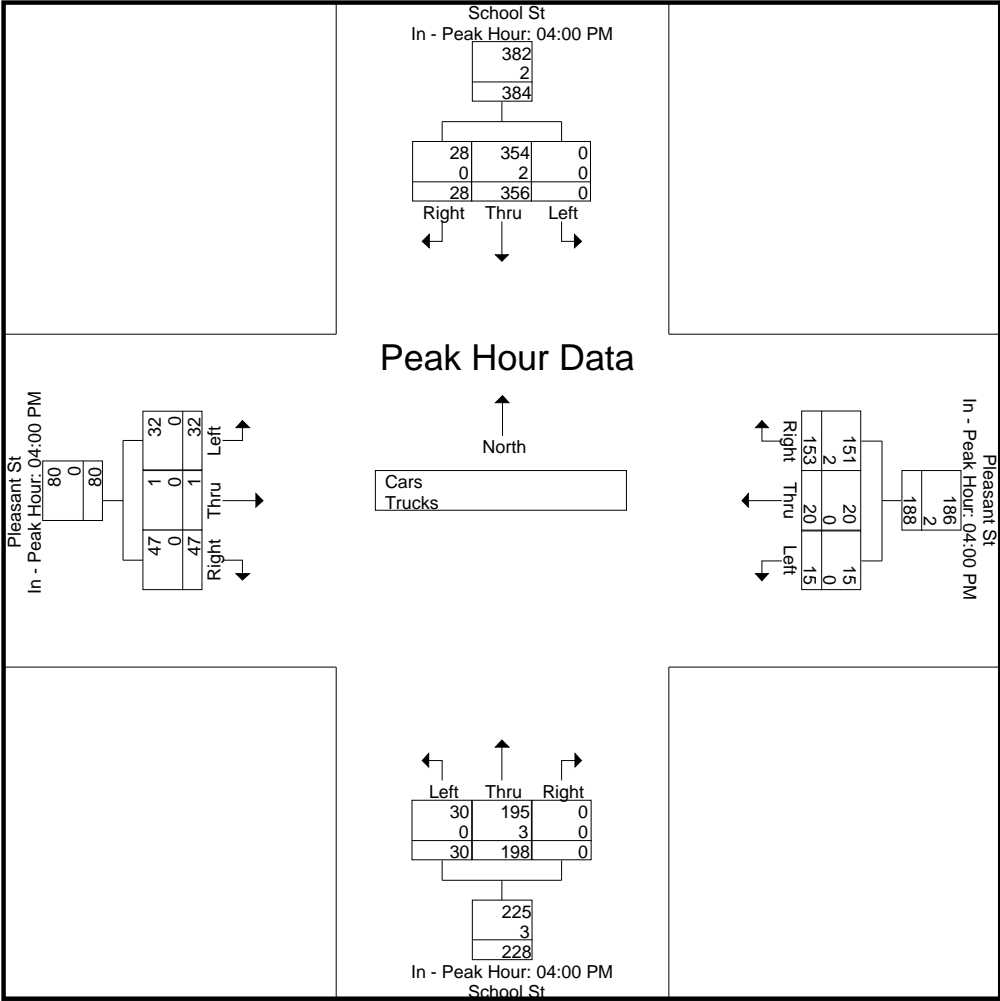


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	<b>99</b>	7	<b>106</b>	2	4	<b>45</b>	<b>51</b>	<b>10</b>	49	0	59	<b>12</b>	<b>1</b>	13	<b>26</b>
+15 mins.	0	82	<b>8</b>	90	3	2	34	39	7	<b>57</b>	0	<b>64</b>	5	0	<b>14</b>	19
+30 mins.	0	85	5	90	3	<b>9</b>	37	49	9	51	0	60	10	0	9	19
+45 mins.	0	90	8	98	<b>7</b>	5	37	49	4	41	0	45	5	0	11	16
Total Volume	0	356	28	384	15	20	153	188	30	198	0	228	32	1	47	80
% App. Total	0	92.7	7.3		8	10.6	81.4		13.2	86.8	0		40	1.2	58.8	
PHF	.000	.899	.875	.906	.536	.556	.850	.922	.750	.868	.000	.891	.667	.250	.839	.769
Cars	0	354	28	382	15	20	151	186	30	195	0	225	32	1	47	80
% Cars	0	99.4	100	99.5	100	100	98.7	98.9	100	98.5	0	98.7	100	100	100	100
Trucks	0	2	0	2	0	0	2	2	0	3	0	3	0	0	0	0
% Trucks	0	0.6	0	0.5	0	0	1.3	1.1	0	1.5	0	1.3	0	0	0	0

N/S Street : School Street  
E/W Street : Pleasant Street  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410004  
Site Code : 84410004  
Start Date : 11/9/2021  
Page No : 3



# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Pleasant Street  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410004  
Site Code : 84410004  
Start Date : 11/9/2021  
Page No : 4

## Groups Printed- Cars

	School St From North			Pleasant St From East			School St From South			Pleasant St From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
04:00 PM	0	99	7	2	4	45	10	48	0	12	1	13	241
04:15 PM	0	82	8	3	2	32	7	57	0	5	0	14	210
04:30 PM	0	85	5	3	9	37	9	50	0	10	0	9	217
04:45 PM	0	88	8	7	5	37	4	40	0	5	0	11	205
Total	0	354	28	15	20	151	30	195	0	32	1	47	873
05:00 PM	0	83	7	1	6	33	9	47	0	4	0	14	204
05:15 PM	0	82	7	0	10	27	4	44	0	8	0	15	197
05:30 PM	0	63	2	2	5	32	4	37	0	1	0	13	159
05:45 PM	0	72	4	3	4	28	6	41	0	6	0	10	174
Total	0	300	20	6	25	120	23	169	0	19	0	52	734
Grand Total	0	654	48	21	45	271	53	364	0	51	1	99	1607
Apprch %	0	93.2	6.8	6.2	13.4	80.4	12.7	87.3	0	33.8	0.7	65.6	
Total %	0	40.7	3	1.3	2.8	16.9	3.3	22.7	0	3.2	0.1	6.2	

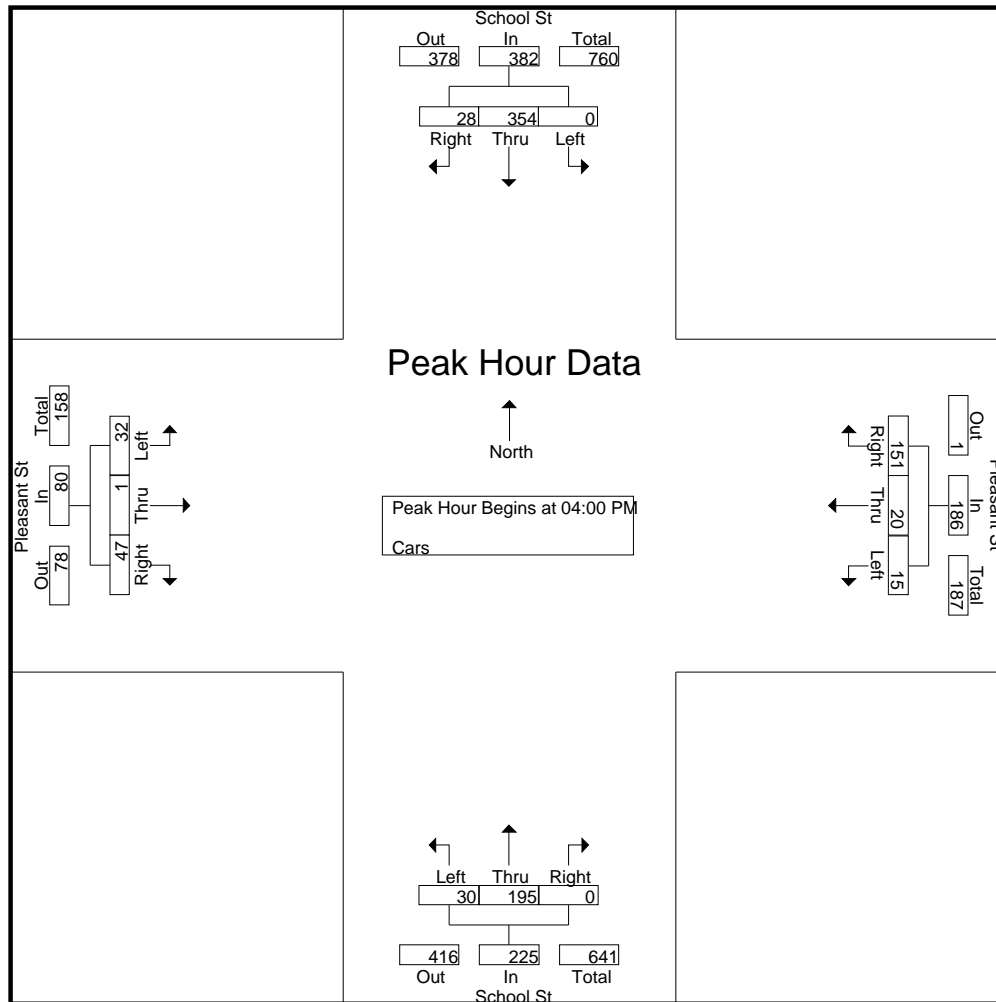
	School St From North				Pleasant St From East				School St From South				Pleasant St From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	<b>99</b>	7	<b>106</b>	2	4	<b>45</b>	<b>51</b>	<b>10</b>	48	0	58	<b>12</b>	<b>1</b>	13	<b>26</b>	<b>241</b>
04:15 PM	0	82	<b>8</b>	90	3	2	32	37	7	<b>57</b>	0	<b>64</b>	5	0	<b>14</b>	19	210
04:30 PM	0	85	5	90	3	<b>9</b>	37	49	9	50	0	59	10	0	9	19	217
04:45 PM	0	88	8	96	<b>7</b>	5	37	49	4	40	0	44	5	0	11	16	205
Total Volume	0	354	28	382	15	20	151	186	30	195	0	225	32	1	47	80	873
% App. Total	0	92.7	7.3		8.1	10.8	81.2		13.3	86.7	0		40	1.2	58.8		
PHF	.000	.894	.875	.901	.536	.556	.839	.912	.750	.855	.000	.879	.667	.250	.839	.769	.906

# Accurate Counts

978-664-2565

N/S Street : School Street  
 E/W Street : Pleasant Street  
 City/State : Manchester By The Sea, MA  
 Weather : Clear

File Name : 84410004  
 Site Code : 84410004  
 Start Date : 11/9/2021  
 Page No : 5

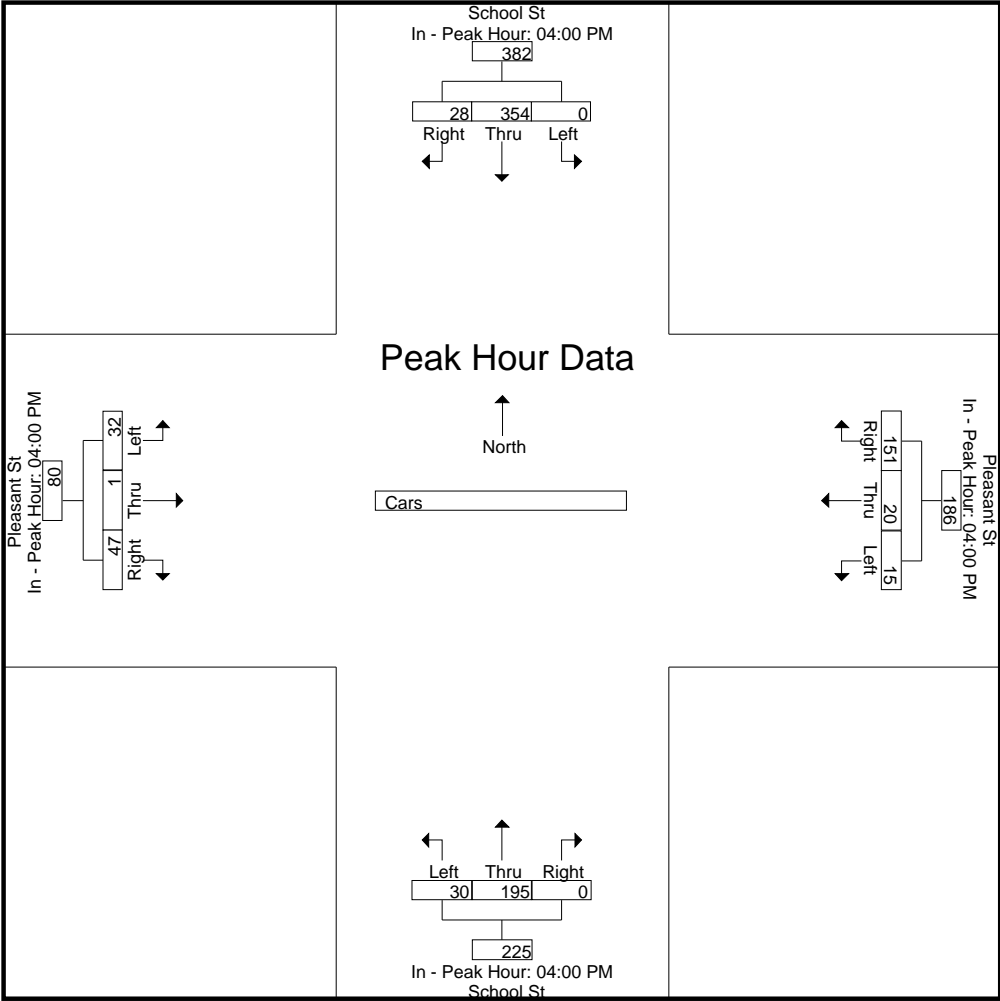


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	<b>99</b>	7	<b>106</b>	2	4	<b>45</b>	<b>51</b>	<b>10</b>	48	0	58	<b>12</b>	<b>1</b>	13	<b>26</b>
+15 mins.	0	82	<b>8</b>	90	3	2	32	37	7	<b>57</b>	0	<b>64</b>	5	0	<b>14</b>	19
+30 mins.	0	85	5	90	3	<b>9</b>	37	49	9	50	0	59	10	0	9	19
+45 mins.	0	88	8	96	<b>7</b>	5	37	49	4	40	0	44	5	0	11	16
Total Volume	0	354	28	382	15	20	151	186	30	195	0	225	32	1	47	80
% App. Total	0	92.7	7.3		8.1	10.8	81.2		13.3	86.7	0		40	1.2	58.8	
PHF	.000	.894	.875	.901	.536	.556	.839	.912	.750	.855	.000	.879	.667	.250	.839	.769

N/S Street : School Street  
E/W Street : Pleasant Street  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410004  
Site Code : 84410004  
Start Date : 11/9/2021  
Page No : 6



# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Pleasant Street  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410004  
Site Code : 84410004  
Start Date : 11/9/2021  
Page No : 7

## Groups Printed- Trucks

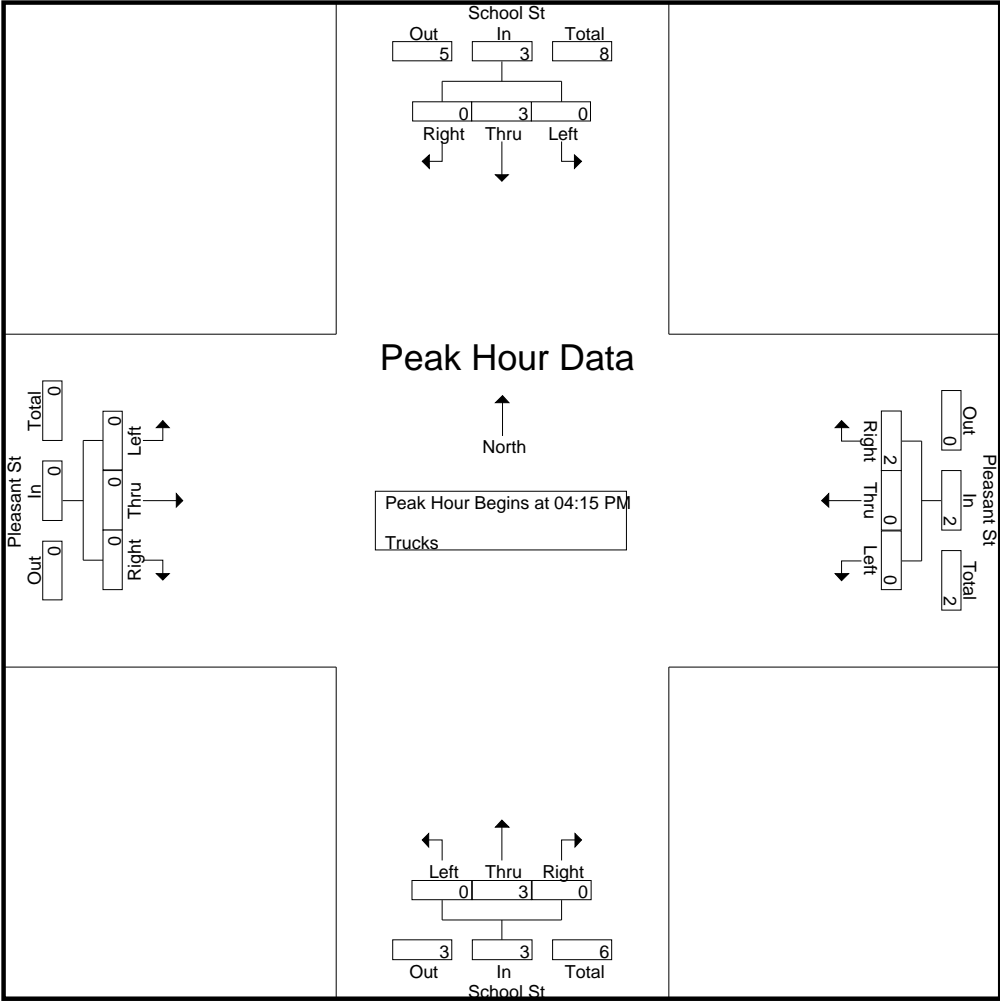
	School St From North			Pleasant St From East			School St From South			Pleasant St From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
04:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
04:15 PM	0	0	0	0	0	2	0	0	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
04:45 PM	0	2	0	0	0	0	0	1	0	0	0	0	3
Total	0	2	0	0	0	2	0	3	0	0	0	0	7
05:00 PM	0	1	0	0	0	0	0	1	0	0	0	0	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
Total	0	1	0	0	0	0	0	2	0	0	0	0	3
Grand Total	0	3	0	0	0	2	0	5	0	0	0	0	10
Apprch %	0	100	0	0	0	100	0	100	0	0	0	0	
Total %	0	30	0	0	0	20	0	50	0	0	0	0	

	School St From North				Pleasant St From East				School St From South				Pleasant St From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
04:45 PM	0	2	0	2	0	0	0	0	0	1	0	1	0	0	0	0	3
05:00 PM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
Total Volume	0	3	0	3	0	0	2	2	0	3	0	3	0	0	0	0	8
% App. Total	0	100	0		0	0	100		0	100	0		0	0	0		
PHF	.000	.375	.000	.375	.000	.000	.250	.250	.000	.750	.000	.750	.000	.000	.000	.000	.667



N/S Street : School Street  
E/W Street : Pleasant Street  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410004  
Site Code : 84410004  
Start Date : 11/9/2021  
Page No : 8

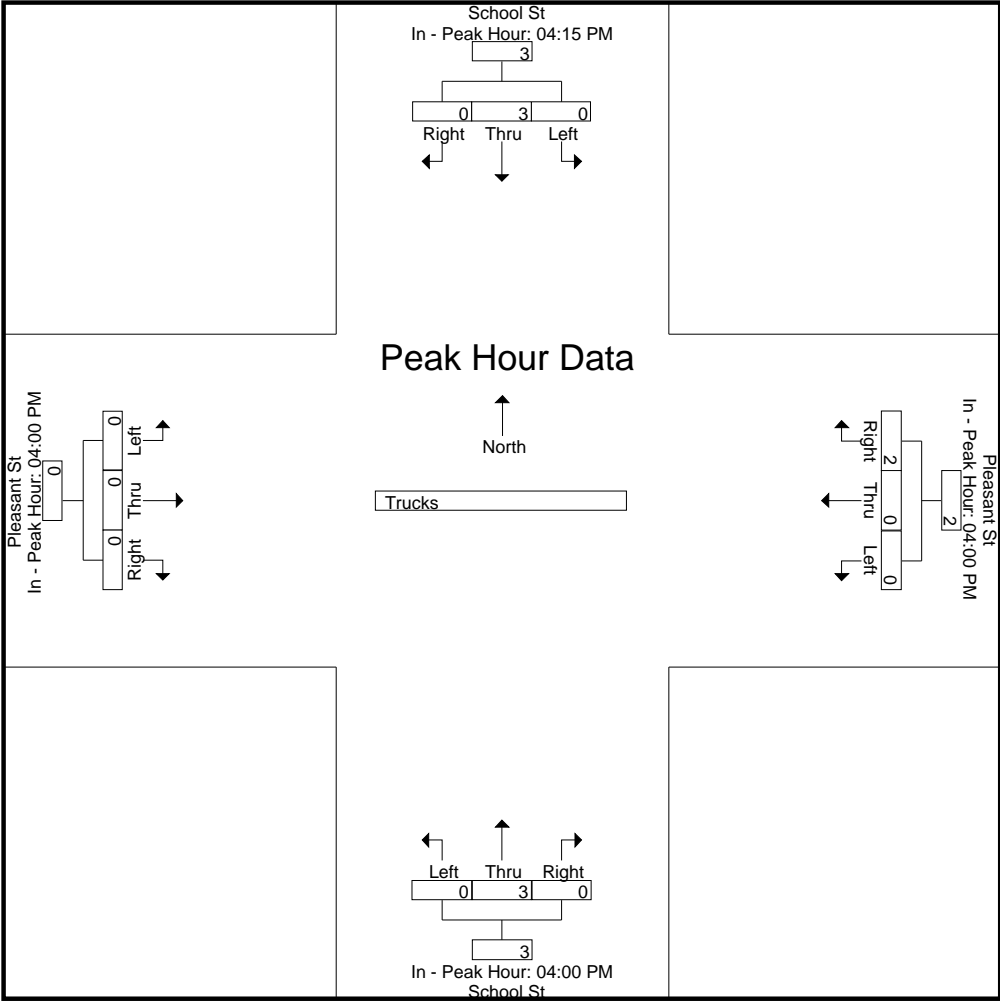


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	04:15 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
+15 mins.	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0
+30 mins.	0	2	0	2	0	0	0	0	0	1	0	1	0	0	0	0
+45 mins.	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0
Total Volume	0	3	0	3	0	0	2	2	0	3	0	3	0	0	0	0
% App. Total	0	100	0		0	0	100		0	100	0		0	0	0	
PHF	.000	.375	.000	.375	.000	.000	.250	.250	.000	.750	.000	.750	.000	.000	.000	.000

N/S Street : School Street  
E/W Street : Pleasant Street  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410004  
Site Code : 84410004  
Start Date : 11/9/2021  
Page No : 9



# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Pleasant Street  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410004  
Site Code : 84410004  
Start Date : 11/9/2021  
Page No : 10

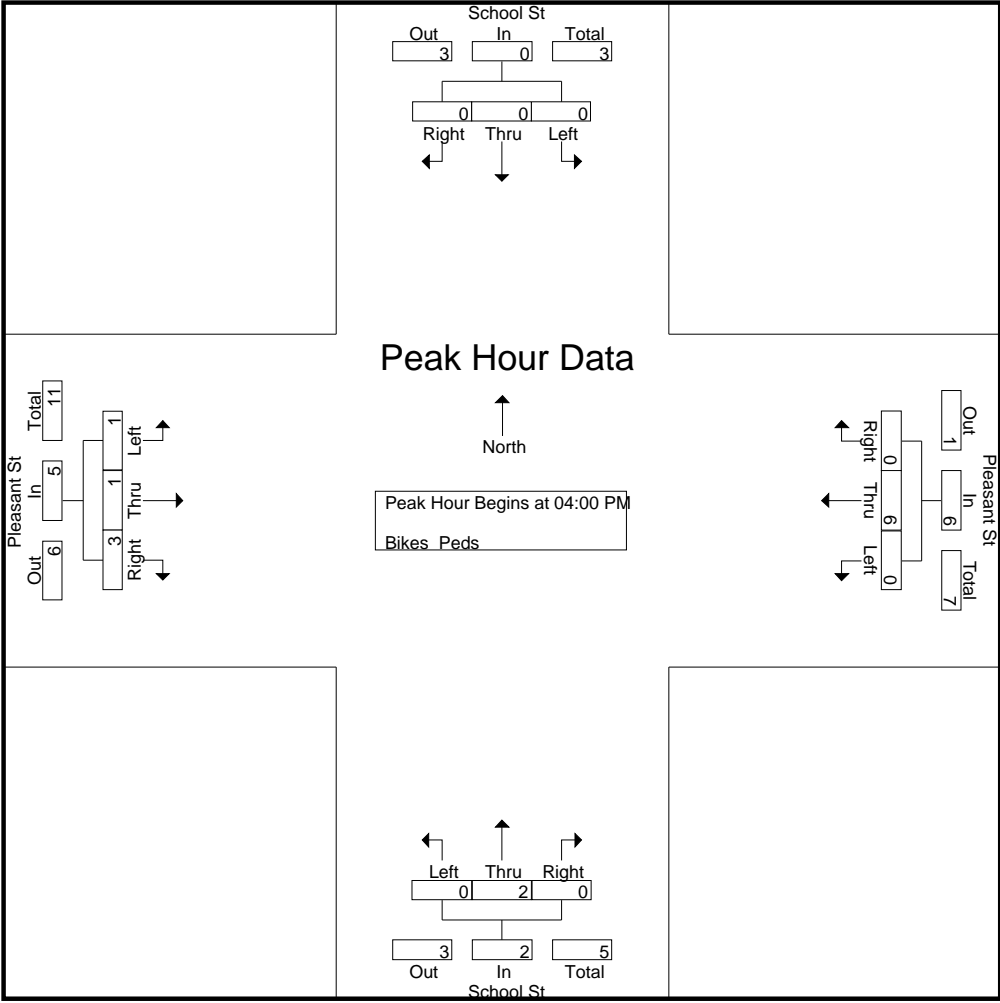
## Groups Printed- Bikes Peds

	School St From North				Pleasant St From East				School St From South				Pleasant St From West				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
04:00 PM	0	0	0	3	0	3	0	0	0	2	0	1	1	1	0	0	4	7	11
04:15 PM	0	0	0	1	0	1	0	0	0	0	0	2	0	0	3	0	3	4	7
04:30 PM	0	0	0	1	0	2	0	0	0	0	0	1	0	0	0	0	2	2	4
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	5	0	6	0	0	0	2	0	4	1	1	3	0	9	13	22
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	3
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	1	2	2	4
Grand Total	0	1	1	5	0	6	0	0	0	2	0	5	1	1	3	1	11	15	26
Apprch %	0	50	50		0	100	0		0	100	0		20	20	60				
Total %	0	6.7	6.7		0	40	0		0	13.3	0		6.7	6.7	20		42.3	57.7	

	School St From North				Pleasant St From East				School St From South				Pleasant St From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	3	0	3	0	2	0	2	1	1	0	2	7
04:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	3	3	4
04:30 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	6	0	6	0	2	0	2	1	1	3	5	13
% App. Total	0	0	0	0	0	100	0		0	100	0		20	20	60		
PHF	.000	.000	.000	.000	.000	.500	.000	.500	.000	.250	.000	.250	.250	.250	.250	.417	.464

N/S Street : School Street  
E/W Street : Pleasant Street  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410004  
Site Code : 84410004  
Start Date : 11/9/2021  
Page No : 11

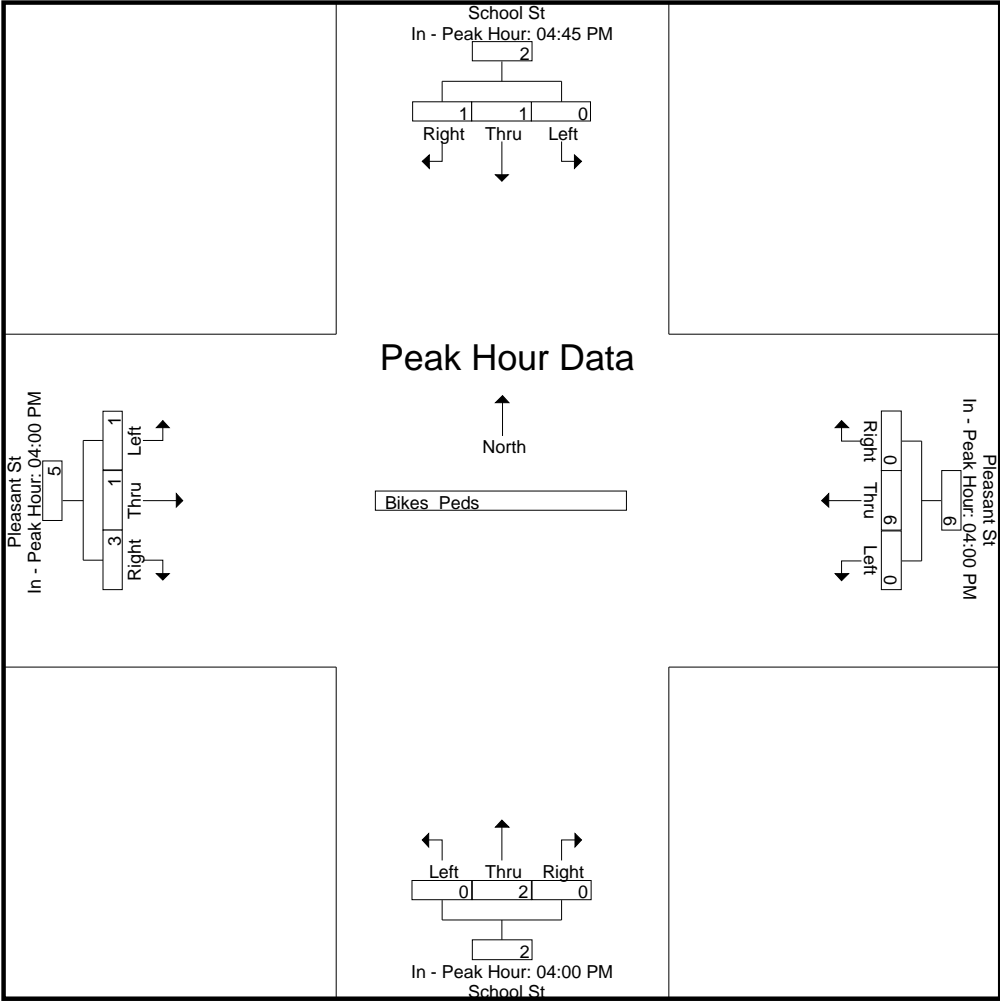


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	04:45 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	3	0	3	0	2	0	2	1	1	0	2
+15 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	0	3	3
+30 mins.	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0
+45 mins.	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	1	2	0	6	0	6	0	2	0	2	1	1	3	5
% App. Total	0	50	50		0	100	0		0	100	0		20	20	60	
PHF	.000	.250	.250	.250	.000	.500	.000	.500	.000	.250	.000	.250	.250	.250	.250	.417

N/S Street : School Street  
E/W Street : Pleasant Street  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410004  
Site Code : 84410004  
Start Date : 11/9/2021  
Page No : 12



# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Lincoln St / Lincoln Ave  
City/State : Manchester By The Sea, MA  
Weather : Clear

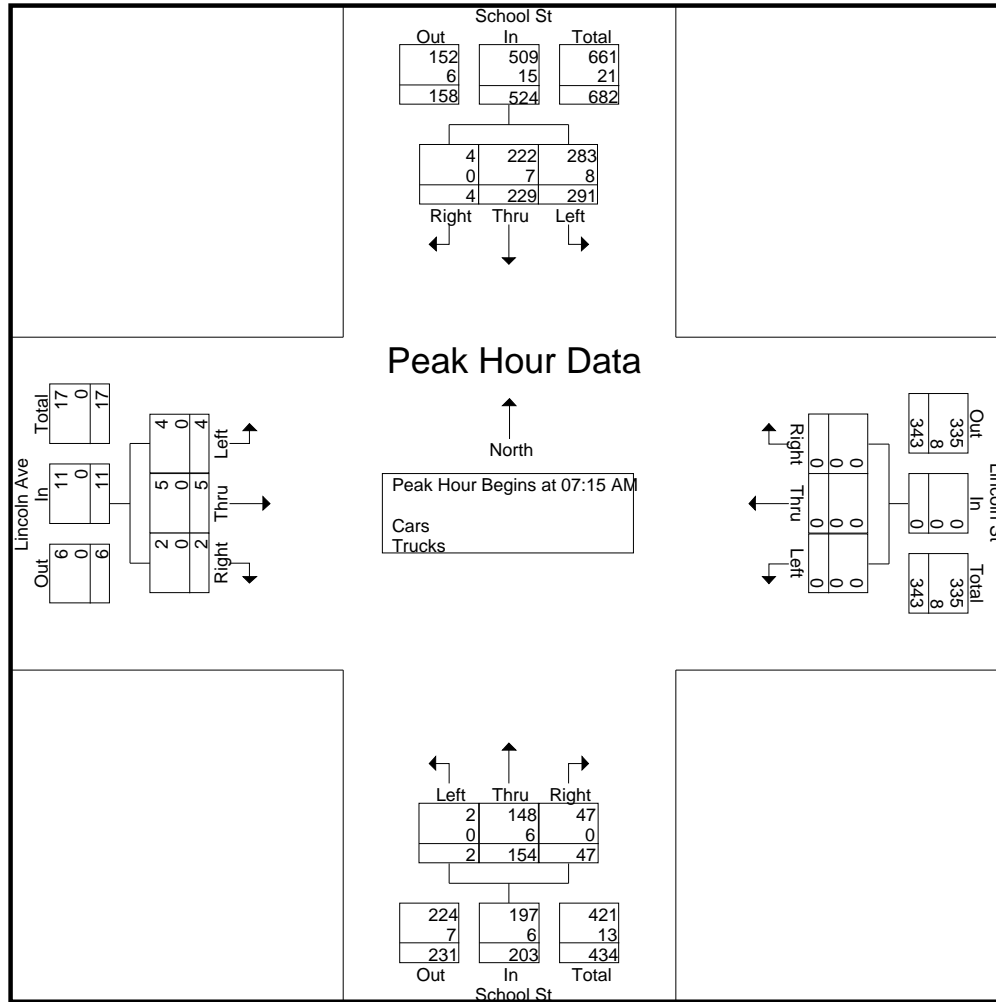
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Site Code : 84410005  
Start Date : 11/9/2021  
Page No : 1

## Groups Printed- Cars - Trucks

	School St From North			Lincoln St From East			School St From South			Lincoln Ave From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	55	28	0	0	0	0	0	22	9	0	1	0	115
07:15 AM	107	41	1	0	0	0	1	34	12	2	0	0	198
07:30 AM	64	69	3	0	0	0	0	37	20	1	3	0	197
07:45 AM	52	60	0	0	0	0	1	40	2	1	2	2	160
Total	278	198	4	0	0	0	2	133	43	4	6	2	670
08:00 AM	68	59	0	0	0	0	0	43	13	0	0	0	183
08:15 AM	49	61	3	0	0	0	2	54	6	2	0	0	177
08:30 AM	34	58	0	0	0	0	0	42	2	1	1	0	138
08:45 AM	50	37	0	0	0	0	0	53	2	1	1	0	144
Total	201	215	3	0	0	0	2	192	23	4	2	0	642
Grand Total	479	413	7	0	0	0	4	325	66	8	8	2	1312
Apprch %	53.3	45.9	0.8	0	0	0	1	82.3	16.7	44.4	44.4	11.1	
Total %	36.5	31.5	0.5	0	0	0	0.3	24.8	5	0.6	0.6	0.2	
Cars	468	404	7	0	0	0	4	316	66	8	8	2	1283
% Cars	97.7	97.8	100	0	0	0	100	97.2	100	100	100	100	97.8
Trucks	11	9	0	0	0	0	0	9	0	0	0	0	29
% Trucks	2.3	2.2	0	0	0	0	0	2.8	0	0	0	0	2.2

	School St From North				Lincoln St From East				School St From South				Lincoln Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	107	41	1	149	0	0	0	0	1	34	12	47	2	0	0	2	198
07:30 AM	64	69	3	136	0	0	0	0	0	37	20	57	1	3	0	4	197
07:45 AM	52	60	0	112	0	0	0	0	1	40	2	43	1	2	2	5	160
08:00 AM	68	59	0	127	0	0	0	0	0	43	13	56	0	0	0	0	183
Total Volume	291	229	4	524	0	0	0	0	2	154	47	203	4	5	2	11	738
% App. Total	55.5	43.7	0.8		0	0	0		1	75.9	23.2		36.4	45.5	18.2		
PHF	.680	.830	.333	.879	.000	.000	.000	.000	.500	.895	.588	.890	.500	.417	.250	.550	.932
Cars	283	222	4	509	0	0	0	0	2	148	47	197	4	5	2	11	717
% Cars	97.3	96.9	100	97.1	0	0	0	0	100	96.1	100	97.0	100	100	100	100	97.2
Trucks	8	7	0	15	0	0	0	0	0	6	0	6	0	0	0	0	21
% Trucks	2.7	3.1	0	2.9	0	0	0	0	0	3.9	0	3.0	0	0	0	0	2.8

N/S Street : School Street  
E/W Street : Lincoln St / Lincoln Ave  
City/State : Manchester By The Sea, MA  
Weather : Clear

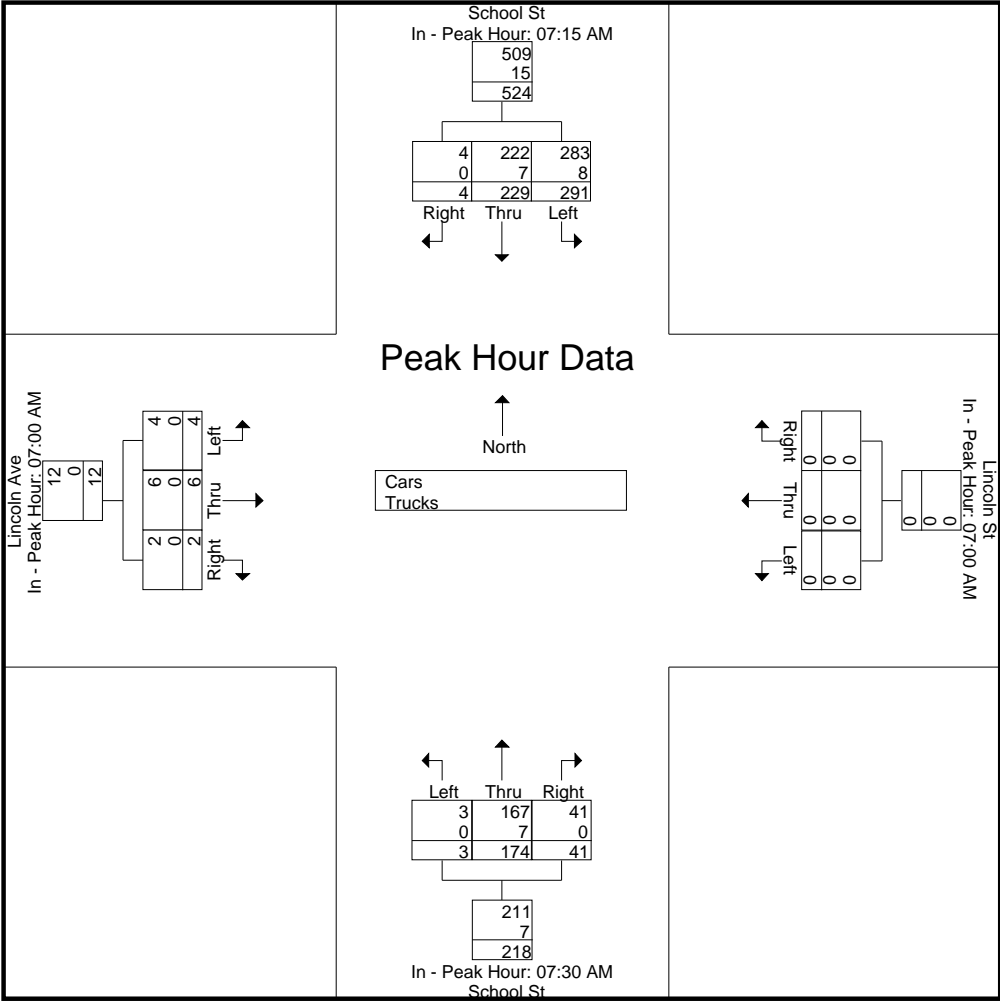


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	07:15 AM				07:00 AM				07:30 AM				07:00 AM			
+0 mins.	<b>107</b>	41	1	<b>149</b>	0	0	0	0	0	37	<b>20</b>	57	0	1	0	1
+15 mins.	64	<b>69</b>	<b>3</b>	136	0	0	0	0	1	40	2	43	<b>2</b>	0	0	2
+30 mins.	52	60	0	112	0	0	0	0	0	43	13	56	1	<b>3</b>	0	4
+45 mins.	68	59	0	127	0	0	0	0	<b>2</b>	<b>54</b>	6	<b>62</b>	1	2	<b>2</b>	<b>5</b>
Total Volume	291	229	4	524	0	0	0	0	3	174	41	218	4	6	2	12
% App. Total	55.5	43.7	0.8		0	0	0		1.4	79.8	18.8		33.3	50	16.7	
PHF	.680	.830	.333	.879	.000	.000	.000	.000	.375	.806	.513	.879	.500	.500	.250	.600
Cars	283	222	4	509	0	0	0	0	3	167	41	211	4	6	2	12
% Cars	97.3	96.9	100	97.1	0	0	0	0	100	96	100	96.8	100	100	100	100
Trucks	8	7	0	15	0	0	0	0	0	7	0	7	0	0	0	0
% Trucks	2.7	3.1	0	2.9	0	0	0	0	0	4	0	3.2	0	0	0	0

N/S Street : School Street  
E/W Street : Lincoln St / Lincoln Ave  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410005  
Site Code : 84410005  
Start Date : 11/9/2021  
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# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Lincoln St / Lincoln Ave  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410005  
Site Code : 84410005  
Start Date : 11/9/2021  
Page No : 4

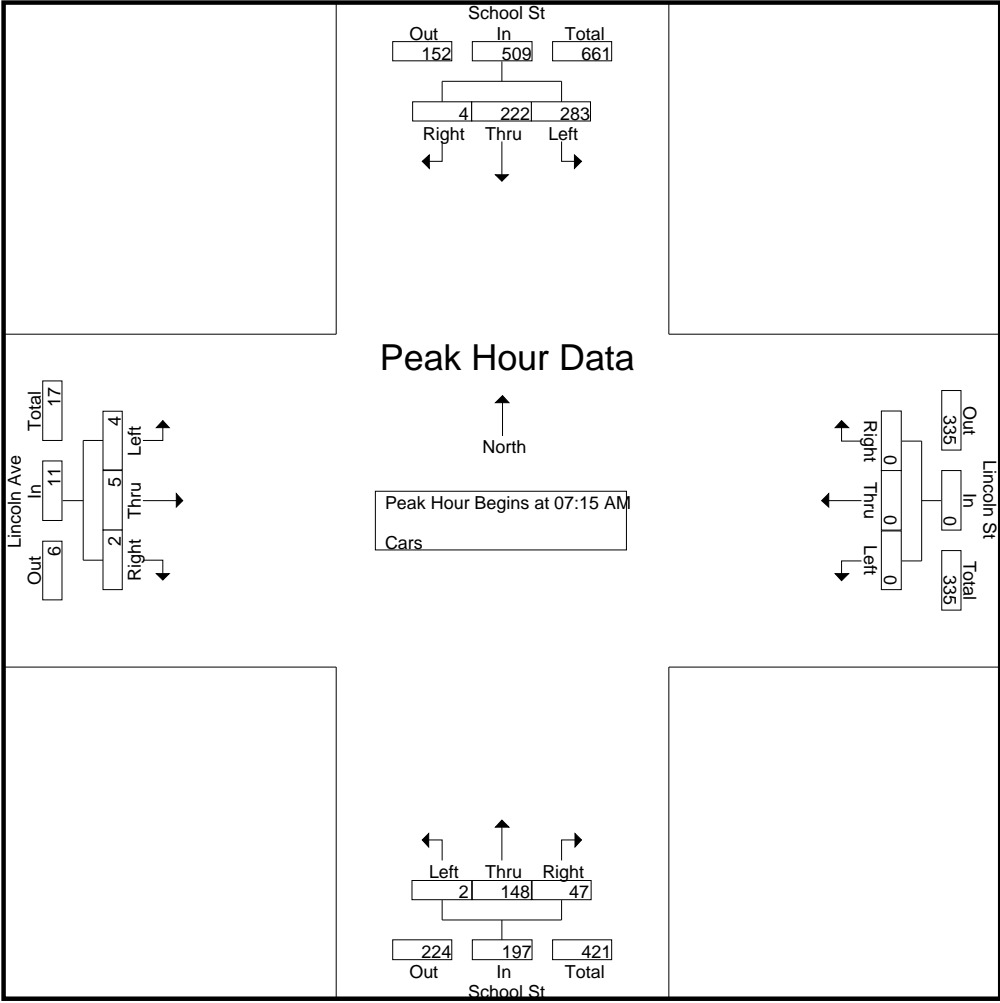
## Groups Printed- Cars

	School St From North			Lincoln St From East			School St From South			Lincoln Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	55	28	0	0	0	0	0	22	9	0	1	0	115
07:15 AM	103	39	1	0	0	0	1	34	12	2	0	0	192
07:30 AM	63	68	3	0	0	0	0	35	20	1	3	0	193
07:45 AM	52	59	0	0	0	0	1	38	2	1	2	2	157
Total	273	194	4	0	0	0	2	129	43	4	6	2	657
08:00 AM	65	56	0	0	0	0	0	41	13	0	0	0	175
08:15 AM	48	60	3	0	0	0	2	53	6	2	0	0	174
08:30 AM	33	58	0	0	0	0	0	42	2	1	1	0	137
08:45 AM	49	36	0	0	0	0	0	51	2	1	1	0	140
Total	195	210	3	0	0	0	2	187	23	4	2	0	626
Grand Total	468	404	7	0	0	0	4	316	66	8	8	2	1283
Apprch %	53.2	46	0.8	0	0	0	1	81.9	17.1	44.4	44.4	11.1	
Total %	36.5	31.5	0.5	0	0	0	0.3	24.6	5.1	0.6	0.6	0.2	

	School St From North				Lincoln St From East				School St From South				Lincoln Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	<b>103</b>	39	1	<b>143</b>	0	0	0	0	<b>1</b>	34	12	47	<b>2</b>	0	0	2	192
07:30 AM	63	<b>68</b>	<b>3</b>	134	0	0	0	0	0	35	<b>20</b>	<b>55</b>	1	<b>3</b>	0	4	<b>193</b>
07:45 AM	52	59	0	111	0	0	0	0	1	38	2	41	1	2	<b>2</b>	<b>5</b>	157
08:00 AM	65	56	0	121	0	0	0	0	0	<b>41</b>	13	54	0	0	0	0	175
Total Volume	283	222	4	509	0	0	0	0	2	148	47	197	4	5	2	11	717
% App. Total	55.6	43.6	0.8		0	0	0		1	75.1	23.9		36.4	45.5	18.2		
PHF	.687	.816	.333	.890	.000	.000	.000	.000	.500	.902	.588	.895	.500	.417	.250	.550	.929

N/S Street : School Street  
E/W Street : Lincoln St / Lincoln Ave  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410005  
Site Code : 84410005  
Start Date : 11/9/2021  
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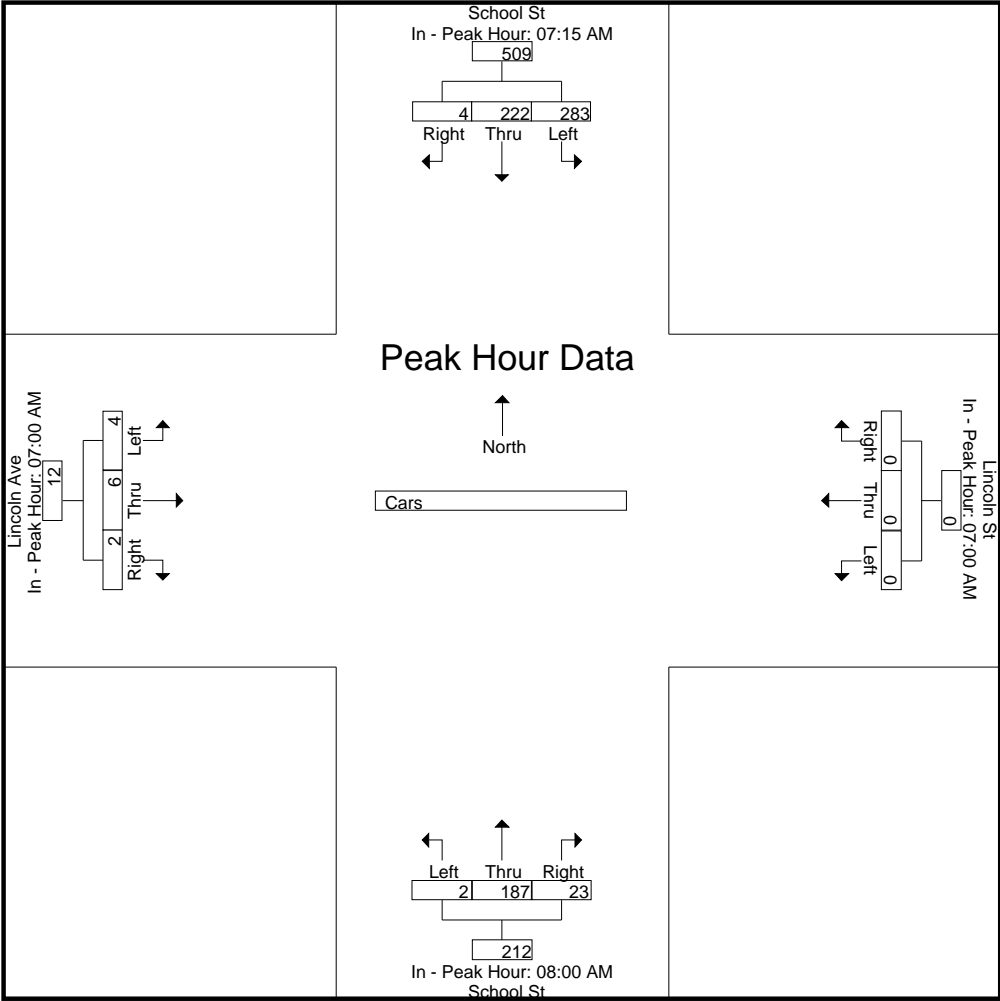


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	07:15 AM				07:00 AM				08:00 AM				07:00 AM			
+0 mins.	103	39	1	143	0	0	0	0	0	41	13	54	0	1	0	1
+15 mins.	63	68	3	134	0	0	0	0	2	53	6	61	2	0	0	2
+30 mins.	52	59	0	111	0	0	0	0	0	42	2	44	1	3	0	4
+45 mins.	65	56	0	121	0	0	0	0	0	51	2	53	1	2	2	5
Total Volume	283	222	4	509	0	0	0	0	2	187	23	212	4	6	2	12
% App. Total	55.6	43.6	0.8		0	0	0		0.9	88.2	10.8		33.3	50	16.7	
PHF	.687	.816	.333	.890	.000	.000	.000	.000	.250	.882	.442	.869	.500	.500	.250	.600

N/S Street : School Street  
E/W Street : Lincoln St / Lincoln Ave  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410005  
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# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Lincoln St / Lincoln Ave  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410005  
Site Code : 84410005  
Start Date : 11/9/2021  
Page No : 7

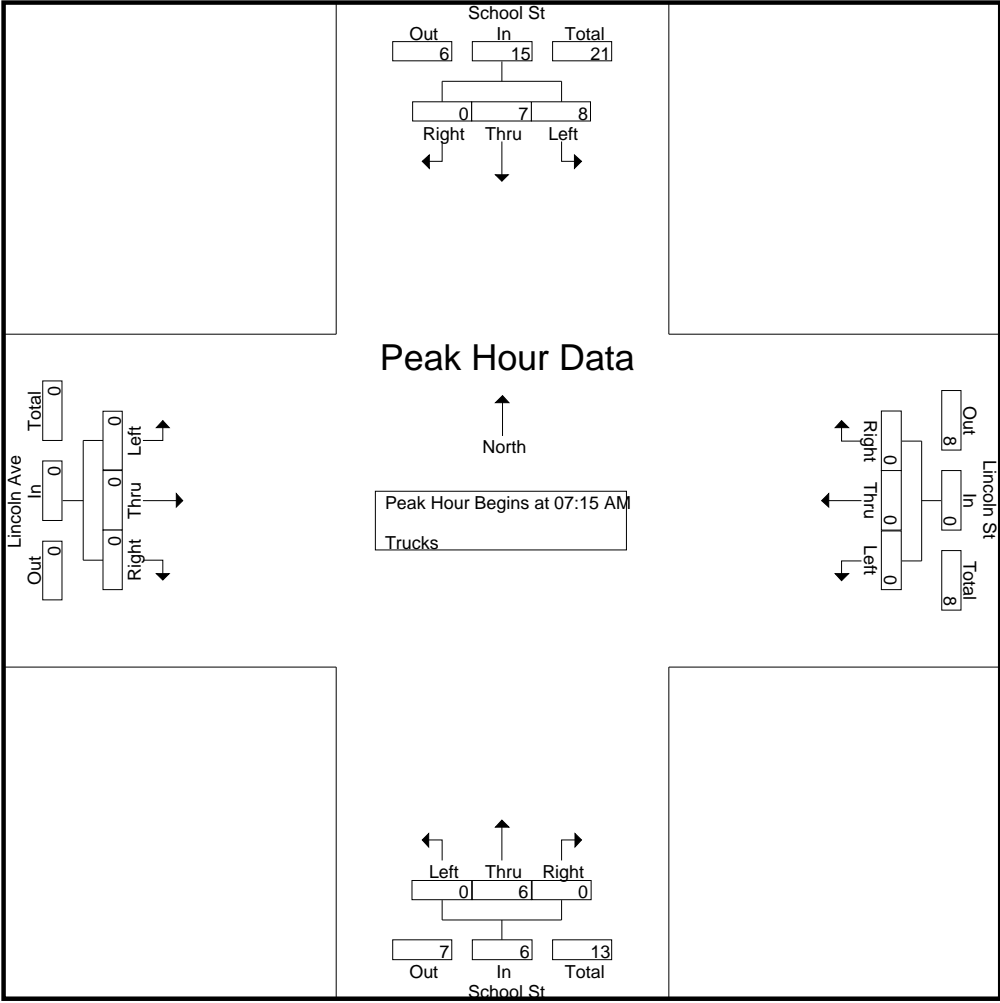
## Groups Printed- Trucks

	School St From North			Lincoln St From East			School St From South			Lincoln Ave From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	4	2	0	0	0	0	0	0	0	0	0	0	6
07:30 AM	1	1	0	0	0	0	0	2	0	0	0	0	4
07:45 AM	0	1	0	0	0	0	0	2	0	0	0	0	3
Total	5	4	0	0	0	0	0	4	0	0	0	0	13
08:00 AM	3	3	0	0	0	0	0	2	0	0	0	0	8
08:15 AM	1	1	0	0	0	0	0	1	0	0	0	0	3
08:30 AM	1	0	0	0	0	0	0	0	0	0	0	0	1
08:45 AM	1	1	0	0	0	0	0	2	0	0	0	0	4
Total	6	5	0	0	0	0	0	5	0	0	0	0	16
Grand Total	11	9	0	0	0	0	0	9	0	0	0	0	29
Apprch %	55	45	0	0	0	0	0	100	0	0	0	0	
Total %	37.9	31	0	0	0	0	0	31	0	0	0	0	

	School St From North				Lincoln St From East				School St From South				Lincoln Ave From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	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 07:15 AM																	
07:15 AM	4	2	0	6	0	0	0	0	0	0	0	0	0	0	0	0	6
07:30 AM	1	1	0	2	0	0	0	0	0	2	0	2	0	0	0	0	4
07:45 AM	0	1	0	1	0	0	0	0	0	2	0	2	0	0	0	0	3
08:00 AM	3	3	0	6	0	0	0	0	0	2	0	2	0	0	0	0	8
Total Volume	8	7	0	15	0	0	0	0	0	6	0	6	0	0	0	0	21
% App. Total	53.3	46.7	0		0	0	0		0	100	0		0	0	0		
PHF	.500	.583	.000	.625	.000	.000	.000	.000	.000	.750	.000	.750	.000	.000	.000	.000	.656

N/S Street : School Street  
E/W Street : Lincoln St / Lincoln Ave  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410005  
Site Code : 84410005  
Start Date : 11/9/2021  
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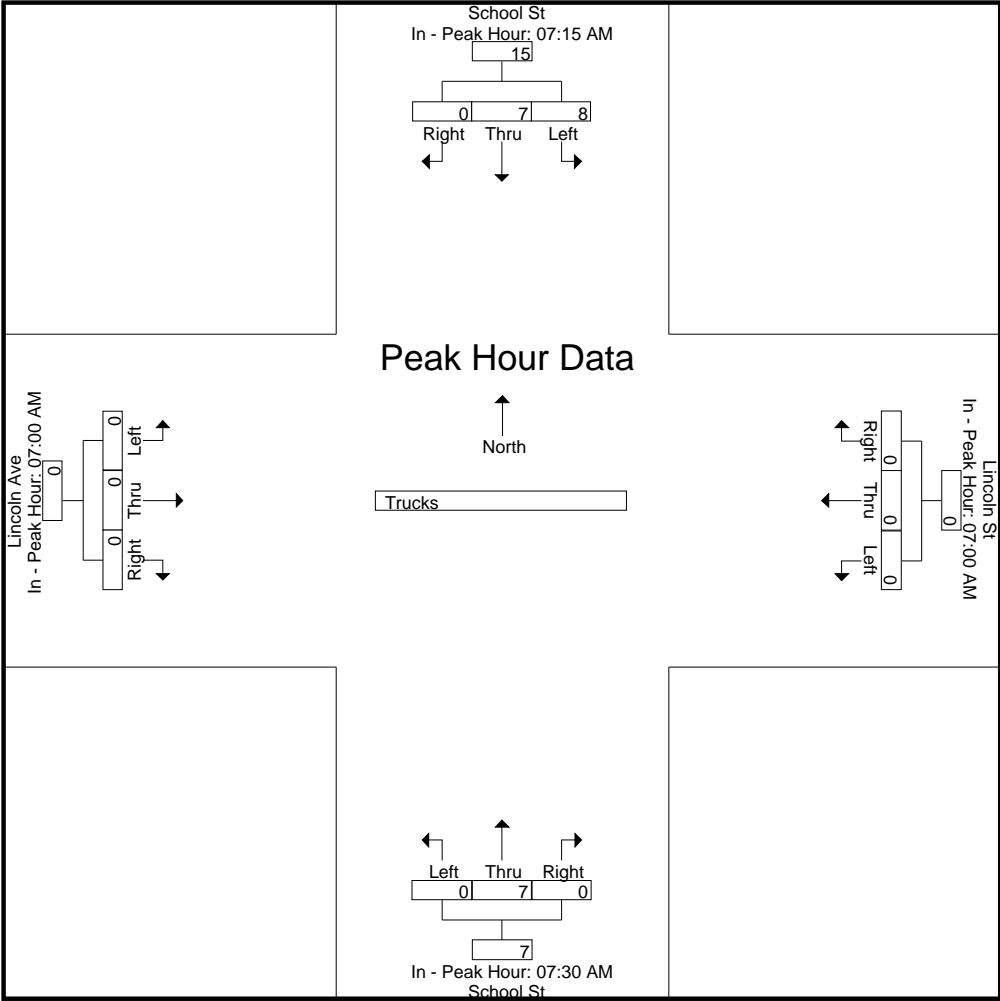


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	07:15 AM				07:00 AM				07:30 AM				07:00 AM			
+0 mins.	4	2	0	6	0	0	0	0	0	2	0	2	0	0	0	0
+15 mins.	1	1	0	2	0	0	0	0	0	2	0	2	0	0	0	0
+30 mins.	0	1	0	1	0	0	0	0	0	2	0	2	0	0	0	0
+45 mins.	3	3	0	6	0	0	0	0	0	1	0	1	0	0	0	0
Total Volume	8	7	0	15	0	0	0	0	0	7	0	7	0	0	0	0
% App. Total	53.3	46.7	0		0	0	0		0	100	0		0	0	0	
PHF	.500	.583	.000	.625	.000	.000	.000	.000	.000	.875	.000	.875	.000	.000	.000	.000

N/S Street : School Street  
E/W Street : Lincoln St / Lincoln Ave  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410005  
Site Code : 84410005  
Start Date : 11/9/2021  
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# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Lincoln St / Lincoln Ave  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410005  
Site Code : 84410005  
Start Date : 11/9/2021  
Page No : 10

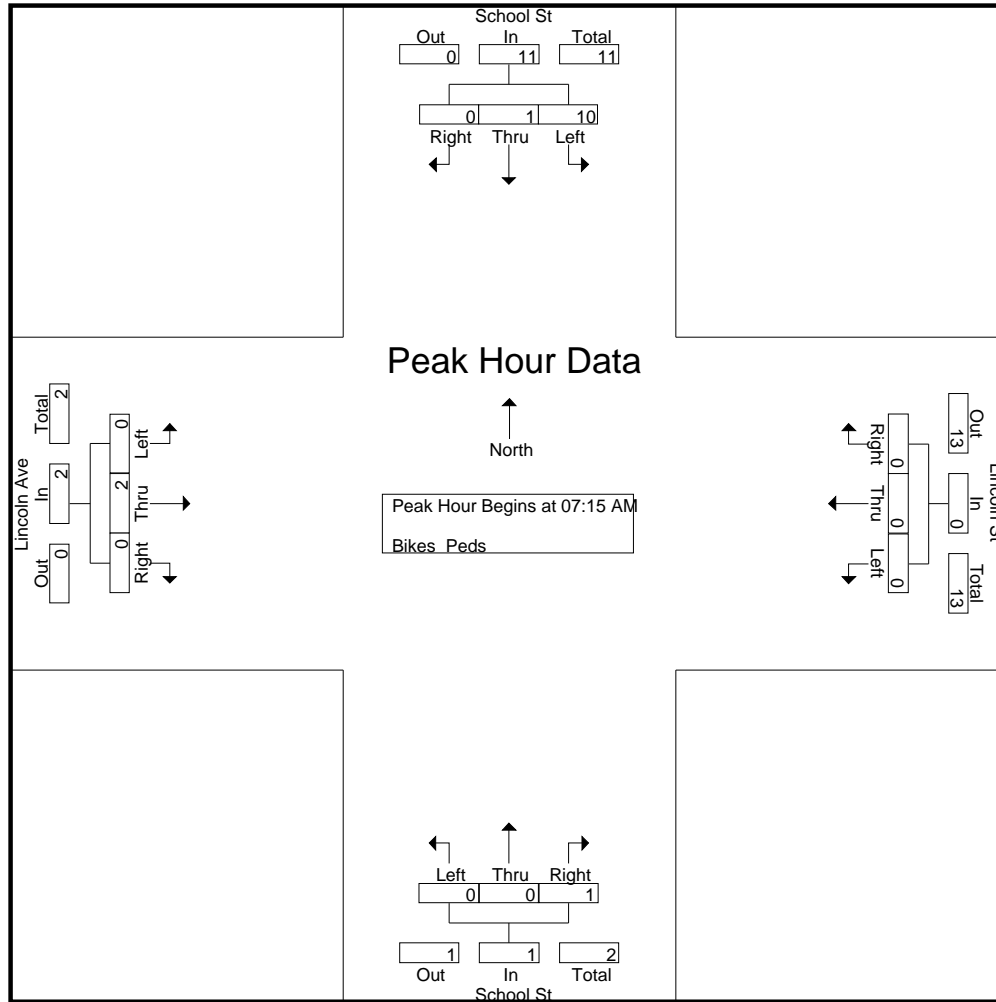
## Groups Printed- Bikes Peds

	School St From North				Lincoln St From East				School St From South				Lincoln Ave From West				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:00 AM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	2	2	2	4
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0	4
07:30 AM	0	1	0	3	0	0	0	2	0	0	1	0	0	1	0	1	6	3	9
07:45 AM	7	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	2	8	10
Total	7	2	0	3	0	0	0	2	0	1	1	0	0	2	0	9	14	13	27
08:00 AM	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	3	8
08:15 AM	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4	0	4
08:30 AM	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	3	1	4
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
Total	4	0	0	0	0	0	0	5	0	0	0	0	0	0	0	8	13	4	17
Grand Total	11	2	0	3	0	0	0	7	0	1	1	0	0	2	0	17	27	17	44
Apprch %	84.6	15.4	0		0	0	0		0	50	50		0	100	0				
Total %	64.7	11.8	0		0	0	0		0	5.9	5.9		0	11.8	0		61.4	38.6	

	School St From North				Lincoln St From East				School St From South				Lincoln Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	1	0	1	0	0	0	0	0	0	1	1	0	1	0	1	3
07:45 AM	7	0	0	7	0	0	0	0	0	0	0	0	0	1	0	1	8
08:00 AM	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
Total Volume	10	1	0	11	0	0	0	0	0	0	1	1	0	2	0	2	14
% App. Total	90.9	9.1	0		0	0	0		0	0	100		0	100	0		
PHF	.357	.250	.000	.393	.000	.000	.000	.000	.000	.000	.250	.250	.000	.500	.000	.500	.438

N/S Street : School Street  
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City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410005  
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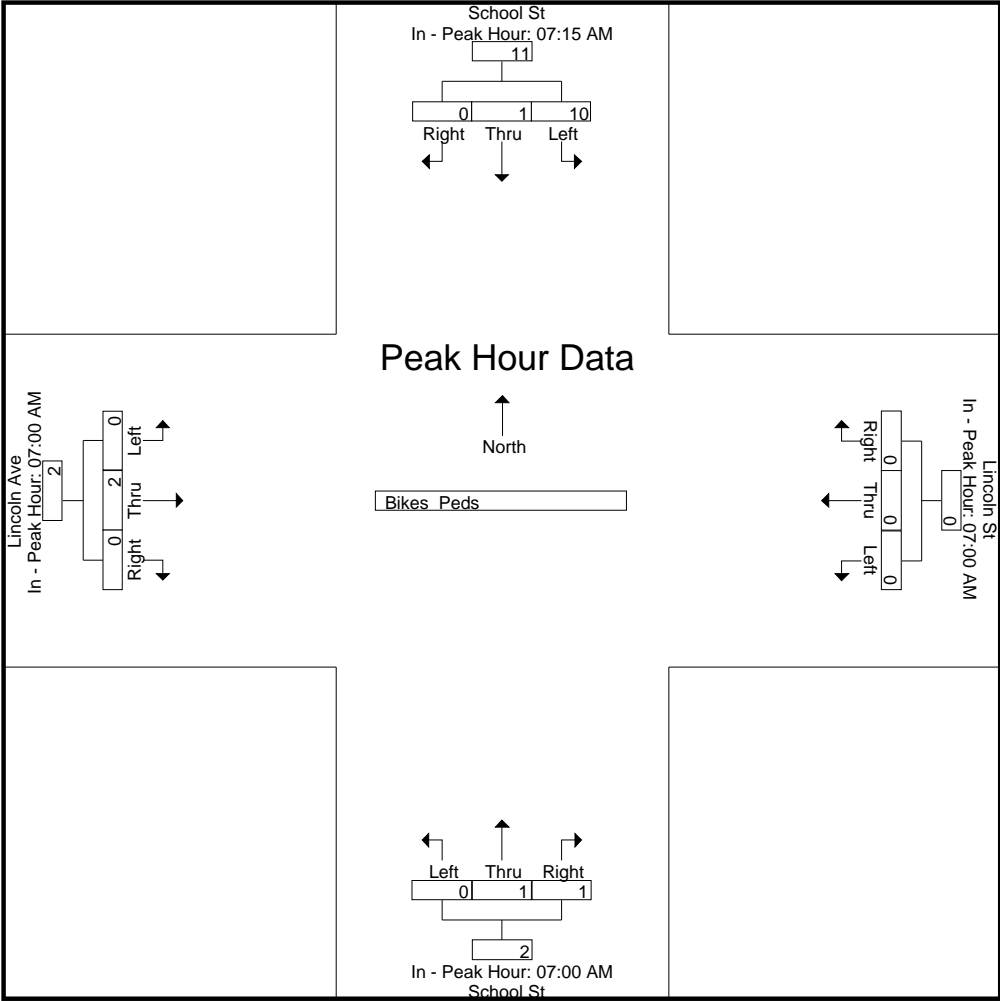
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	07:15 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
+15 mins.	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	7	0	0	7	0	0	0	0	0	0	1	1	0	1	0	1
+45 mins.	3	0	0	3	0	0	0	0	0	0	0	0	0	1	0	1
Total Volume	10	1	0	11	0	0	0	0	0	1	1	2	0	2	0	2
% App. Total	90.9	9.1	0		0	0	0		0	50	50		0	100	0	
PHF	.357	.250	.000	.393	.000	.000	.000	.000	.000	.250	.250	.500	.000	.500	.000	.500



N/S Street : School Street  
E/W Street : Lincoln St / Lincoln Ave  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410005  
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# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Lincoln St / Lincoln Ave  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410005  
Site Code : 84410005  
Start Date : 11/9/2021  
Page No : 1

## Groups Printed- Cars - Trucks

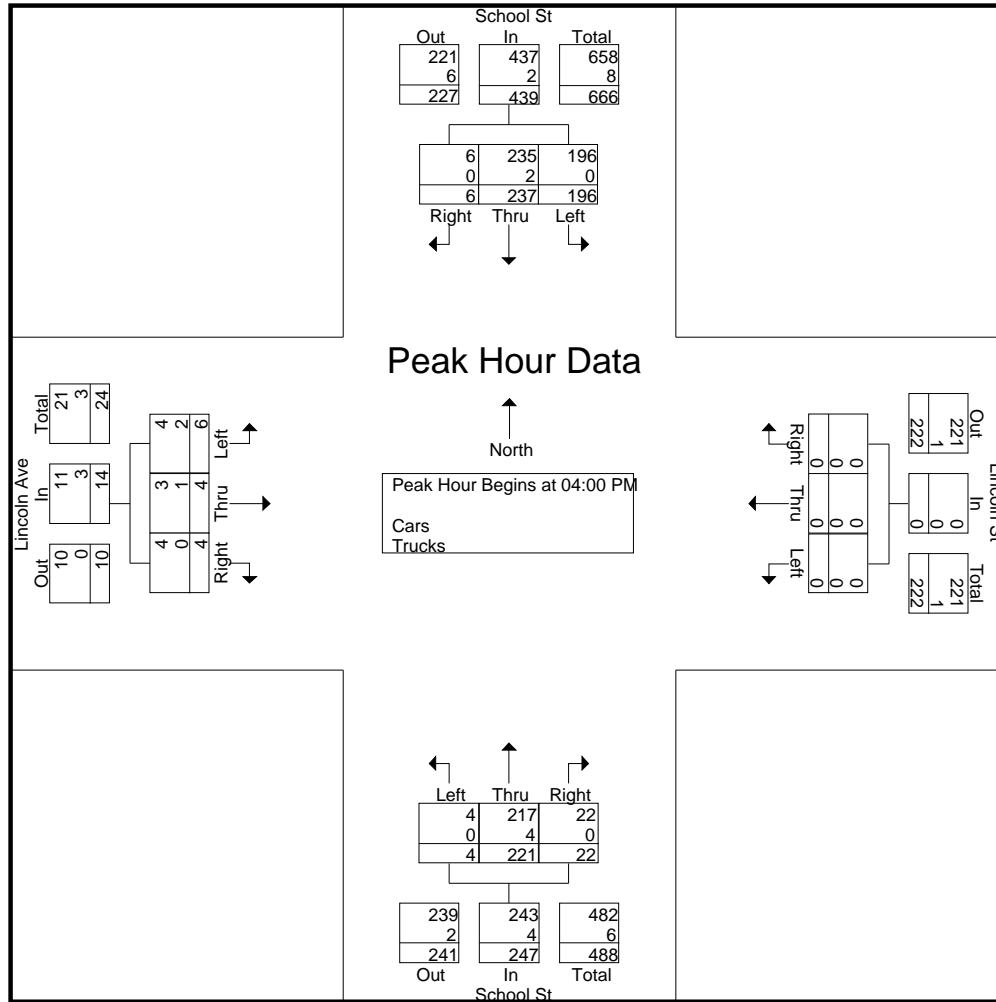
	School St From North			Lincoln St From East			School St From South			Lincoln Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	40	72	2	0	0	0	1	63	4	0	2	1	185
04:15 PM	57	57	1	0	0	0	1	56	7	3	0	1	183
04:30 PM	42	54	0	0	0	0	2	61	5	2	1	1	168
04:45 PM	57	54	3	0	0	0	0	41	6	1	1	1	164
Total	196	237	6	0	0	0	4	221	22	6	4	4	700
05:00 PM	50	50	0	0	0	0	0	61	6	0	0	0	167
05:15 PM	40	54	2	0	0	0	0	45	8	2	0	0	151
05:30 PM	25	53	0	0	0	0	2	45	4	0	0	2	131
05:45 PM	37	47	2	0	0	0	0	52	5	1	0	0	144
Total	152	204	4	0	0	0	2	203	23	3	0	2	593
Grand Total	348	441	10	0	0	0	6	424	45	9	4	6	1293
Apprch %	43.6	55.2	1.3	0	0	0	1.3	89.3	9.5	47.4	21.1	31.6	
Total %	26.9	34.1	0.8	0	0	0	0.5	32.8	3.5	0.7	0.3	0.5	
Cars	347	438	10	0	0	0	6	417	45	7	3	6	1279
% Cars	99.7	99.3	100	0	0	0	100	98.3	100	77.8	75	100	98.9
Trucks	1	3	0	0	0	0	0	7	0	2	1	0	14
% Trucks	0.3	0.7	0	0	0	0	0	1.7	0	22.2	25	0	1.1

	School St From North				Lincoln St From East				School St From South				Lincoln Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	40	72	2	114	0	0	0	0	1	63	4	68	0	2	1	3	185
04:15 PM	57	57	1	115	0	0	0	0	1	56	7	64	3	0	1	4	183
04:30 PM	42	54	0	96	0	0	0	0	2	61	5	68	2	1	1	4	168
04:45 PM	57	54	3	114	0	0	0	0	0	41	6	47	1	1	1	3	164
Total Volume	196	237	6	439	0	0	0	0	4	221	22	247	6	4	4	14	700
% App. Total	44.6	54	1.4		0	0	0		1.6	89.5	8.9		42.9	28.6	28.6		
PHF	.860	.823	.500	.954	.000	.000	.000	.000	.500	.877	.786	.908	.500	.500	1.00	.875	.946
Cars	196	235	6	437	0	0	0	0	4	217	22	243	4	3	4	11	691
% Cars	100	99.2	100	99.5	0	0	0	0	100	98.2	100	98.4	66.7	75.0	100	78.6	98.7
Trucks	0	2	0	2	0	0	0	0	0	4	0	4	2	1	0	3	9
% Trucks	0	0.8	0	0.5	0	0	0	0	0	1.8	0	1.6	33.3	25.0	0	21.4	1.3

**Accurate Counts**  
978-664-2565

N/S Street : School Street  
E/W Street : Lincoln St / Lincoln Ave  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410005  
Site Code : 84410005  
Start Date : 11/9/2021  
Page No : 2

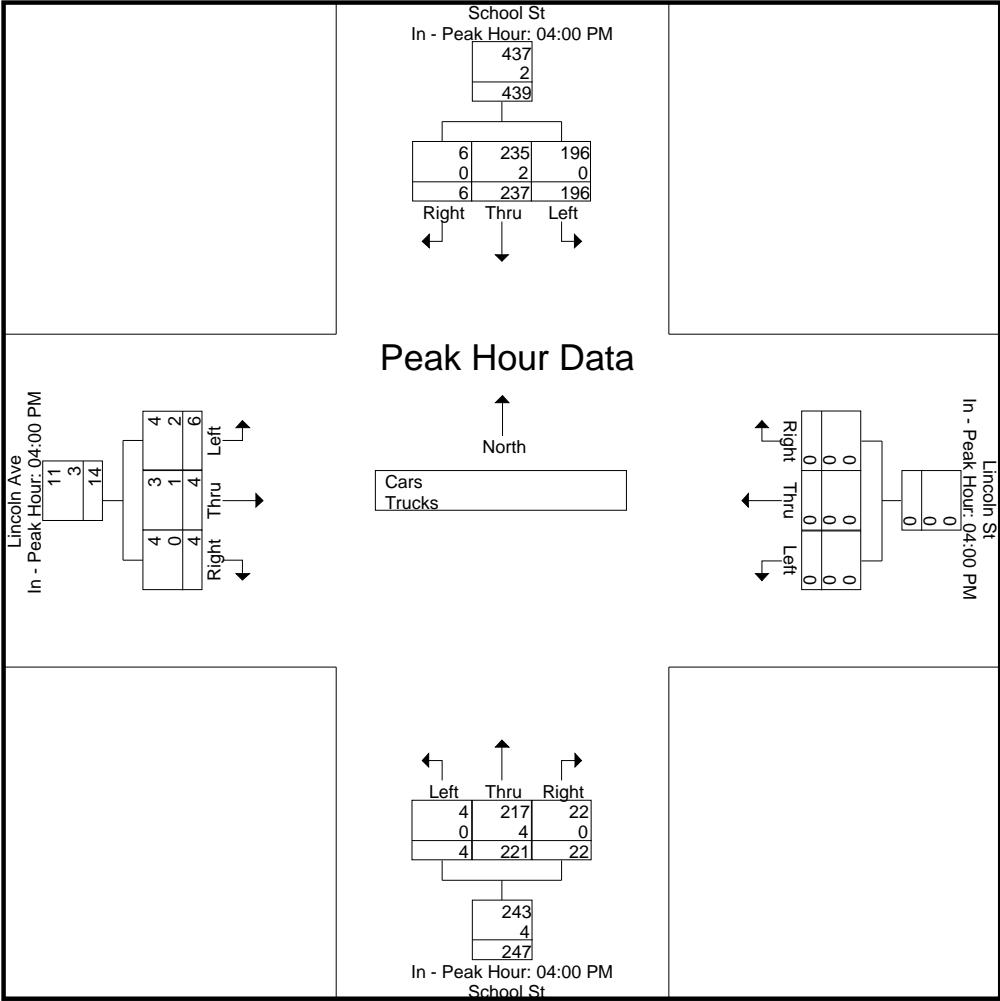


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	40	<b>72</b>	2	114	0	0	0	0	1	<b>63</b>	4	<b>68</b>	0	<b>2</b>	<b>1</b>	3
+15 mins.	<b>57</b>	57	1	<b>115</b>	0	0	0	0	1	56	<b>7</b>	64	<b>3</b>	0	1	<b>4</b>
+30 mins.	42	54	0	96	0	0	0	0	<b>2</b>	61	5	68	2	1	1	4
+45 mins.	57	54	<b>3</b>	114	0	0	0	0	0	41	6	47	1	1	1	3
Total Volume	196	237	6	439	0	0	0	0	4	221	22	247	6	4	4	14
% App. Total	44.6	54	1.4		0	0	0		1.6	89.5	8.9		42.9	28.6	28.6	
PHF	.860	.823	.500	.954	.000	.000	.000	.000	.500	.877	.786	.908	.500	.500	1.000	.875
Cars	196	235	6	437	0	0	0	0	4	217	22	243	4	3	4	11
% Cars	100	99.2	100	99.5	0	0	0	0	100	98.2	100	98.4	66.7	75	100	78.6
Trucks	0	2	0	2	0	0	0	0	0	4	0	4	2	1	0	3
% Trucks	0	0.8	0	0.5	0	0	0	0	0	1.8	0	1.6	33.3	25	0	21.4

N/S Street : School Street  
E/W Street : Lincoln St / Lincoln Ave  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410005  
Site Code : 84410005  
Start Date : 11/9/2021  
Page No : 3



# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Lincoln St / Lincoln Ave  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410005  
Site Code : 84410005  
Start Date : 11/9/2021  
Page No : 4

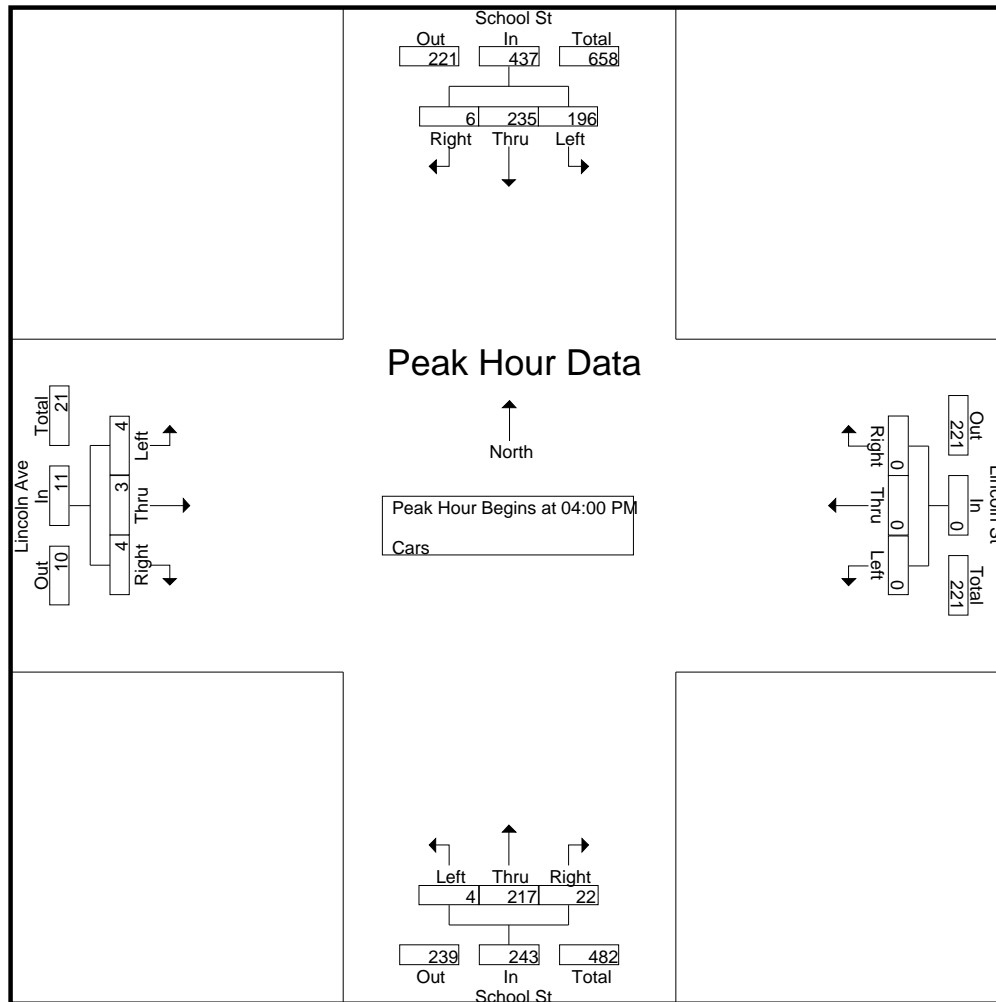
## Groups Printed- Cars

	School St From North			Lincoln St From East			School St From South			Lincoln Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	40	72	2	0	0	0	1	61	4	0	1	1	182
04:15 PM	57	57	1	0	0	0	1	55	7	2	0	1	181
04:30 PM	42	54	0	0	0	0	2	61	5	1	1	1	167
04:45 PM	57	52	3	0	0	0	0	40	6	1	1	1	161
Total	196	235	6	0	0	0	4	217	22	4	3	4	691
05:00 PM	49	49	0	0	0	0	0	59	6	0	0	0	163
05:15 PM	40	54	2	0	0	0	0	45	8	2	0	0	151
05:30 PM	25	53	0	0	0	0	2	45	4	0	0	2	131
05:45 PM	37	47	2	0	0	0	0	51	5	1	0	0	143
Total	151	203	4	0	0	0	2	200	23	3	0	2	588
Grand Total	347	438	10	0	0	0	6	417	45	7	3	6	1279
Apprch %	43.6	55.1	1.3	0	0	0	1.3	89.1	9.6	43.8	18.8	37.5	
Total %	27.1	34.2	0.8	0	0	0	0.5	32.6	3.5	0.5	0.2	0.5	

	School St From North				Lincoln St From East				School St From South				Lincoln Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	40	<b>72</b>	2	114	0	0	0	0	1	<b>61</b>	4	66	0	<b>1</b>	<b>1</b>	2	<b>182</b>
04:15 PM	<b>57</b>	57	1	<b>115</b>	0	0	0	0	1	55	<b>7</b>	63	<b>2</b>	0	1	<b>3</b>	181
04:30 PM	42	54	0	96	0	0	0	0	<b>2</b>	61	5	<b>68</b>	1	1	1	3	167
04:45 PM	57	52	<b>3</b>	112	0	0	0	0	0	40	6	46	1	1	1	3	161
Total Volume	196	235	6	437	0	0	0	0	4	217	22	243	4	3	4	11	691
% App. Total	44.9	53.8	1.4		0	0	0		1.6	89.3	9.1		36.4	27.3	36.4		
PHF	.860	.816	.500	.950	.000	.000	.000	.000	.500	.889	.786	.893	.500	.750	1.00	.917	.949

N/S Street : School Street  
E/W Street : Lincoln St / Lincoln Ave  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410005  
Site Code : 84410005  
Start Date : 11/9/2021  
Page No : 5

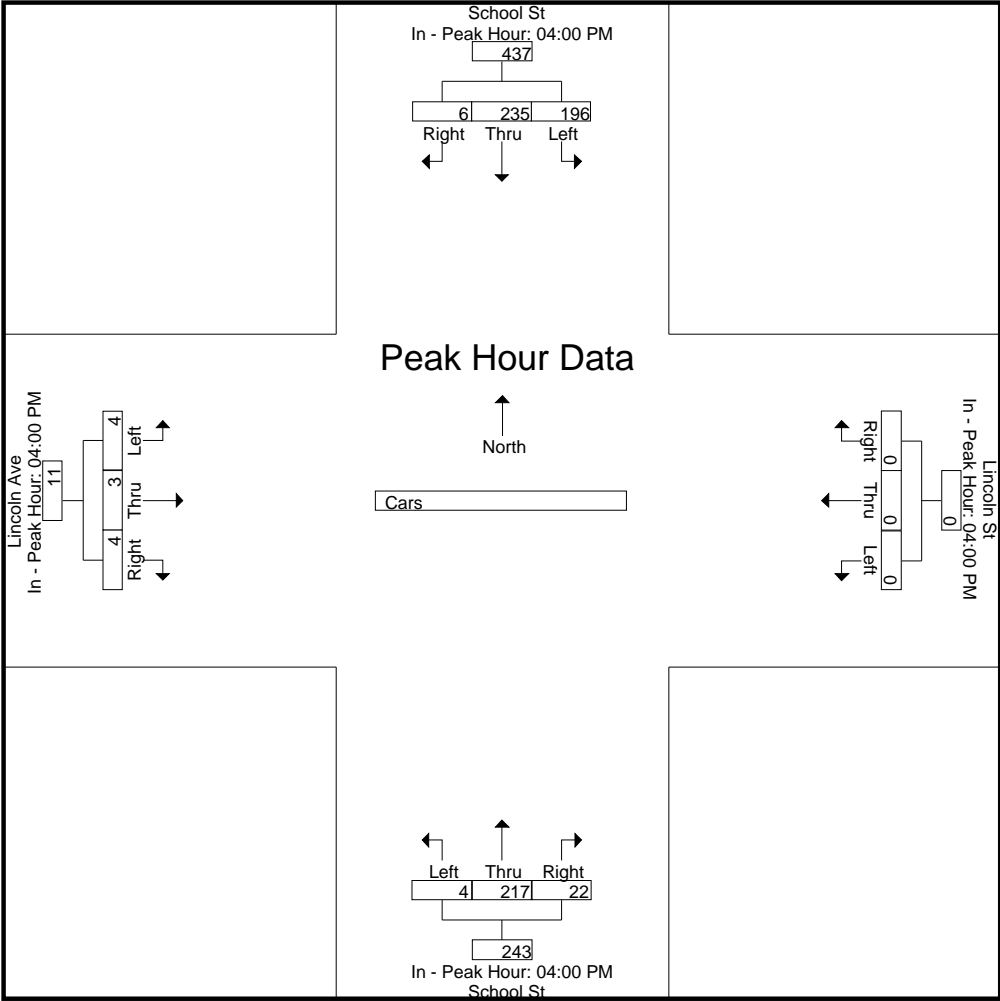


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	40	<b>72</b>	2	114	0	0	0	0	1	<b>61</b>	4	66	0	<b>1</b>	<b>1</b>	2
+15 mins.	<b>57</b>	57	1	<b>115</b>	0	0	0	0	1	55	<b>7</b>	63	<b>2</b>	0	1	<b>3</b>
+30 mins.	42	54	0	96	0	0	0	0	<b>2</b>	61	5	<b>68</b>	1	1	1	3
+45 mins.	57	52	<b>3</b>	112	0	0	0	0	0	40	6	46	1	1	1	3
Total Volume	196	235	6	437	0	0	0	0	4	217	22	243	4	3	4	11
% App. Total	44.9	53.8	1.4		0	0	0		1.6	89.3	9.1		36.4	27.3	36.4	
PHF	.860	.816	.500	.950	.000	.000	.000	.000	.500	.889	.786	.893	.500	.750	1.000	.917

N/S Street : School Street  
E/W Street : Lincoln St / Lincoln Ave  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410005  
Site Code : 84410005  
Start Date : 11/9/2021  
Page No : 6



# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Lincoln St / Lincoln Ave  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410005  
Site Code : 84410005  
Start Date : 11/9/2021  
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## Groups Printed- Trucks

	School St From North			Lincoln St From East			School St From South			Lincoln Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	0	0	0	0	0	2	0	0	1	0	3
04:15 PM	0	0	0	0	0	0	0	1	0	1	0	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	1
04:45 PM	0	2	0	0	0	0	0	1	0	0	0	0	3
Total	0	2	0	0	0	0	0	4	0	2	1	0	9
05:00 PM	1	1	0	0	0	0	0	2	0	0	0	0	4
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	1
Total	1	1	0	0	0	0	0	3	0	0	0	0	5
Grand Total	1	3	0	0	0	0	0	7	0	2	1	0	14
Apprch %	25	75	0	0	0	0	0	100	0	66.7	33.3	0	
Total %	7.1	21.4	0	0	0	0	0	50	0	14.3	7.1	0	

	School St From North				Lincoln St From East				School St From South				Lincoln Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	1	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
04:45 PM	0	2	0	2	0	0	0	0	0	1	0	1	0	0	0	0	3
05:00 PM	1	1	0	2	0	0	0	0	0	2	0	2	0	0	0	0	4
Total Volume	1	3	0	4	0	0	0	0	0	4	0	4	2	0	0	2	10
% App. Total	25	75	0		0	0	0		0	100	0		100	0	0		
PHF	.250	.375	.000	.500	.000	.000	.000	.000	.000	.500	.000	.500	.500	.000	.000	.500	.625

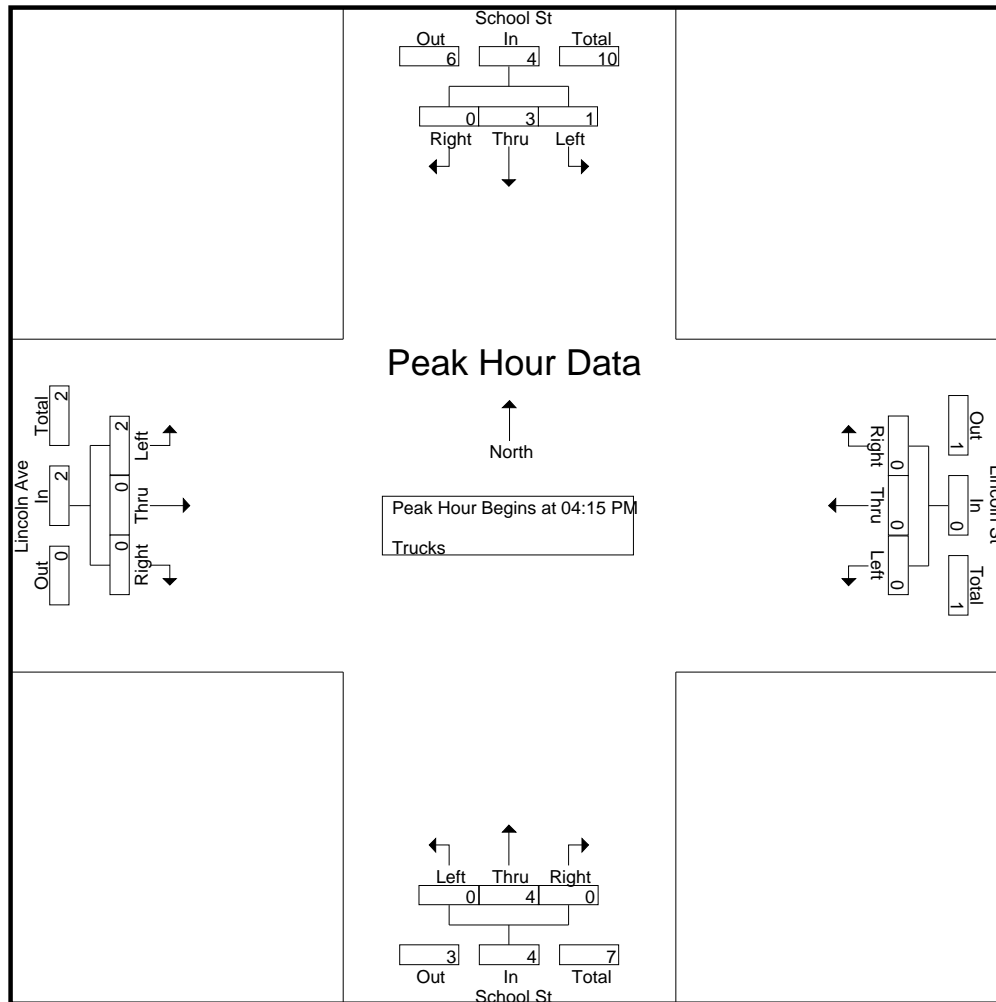


# Accurate Counts

978-664-2565

N/S Street : School Street  
 E/W Street : Lincoln St / Lincoln Ave  
 City/State : Manchester By The Sea, MA  
 Weather : Clear

File Name : 84410005  
 Site Code : 84410005  
 Start Date : 11/9/2021  
 Page No : 8

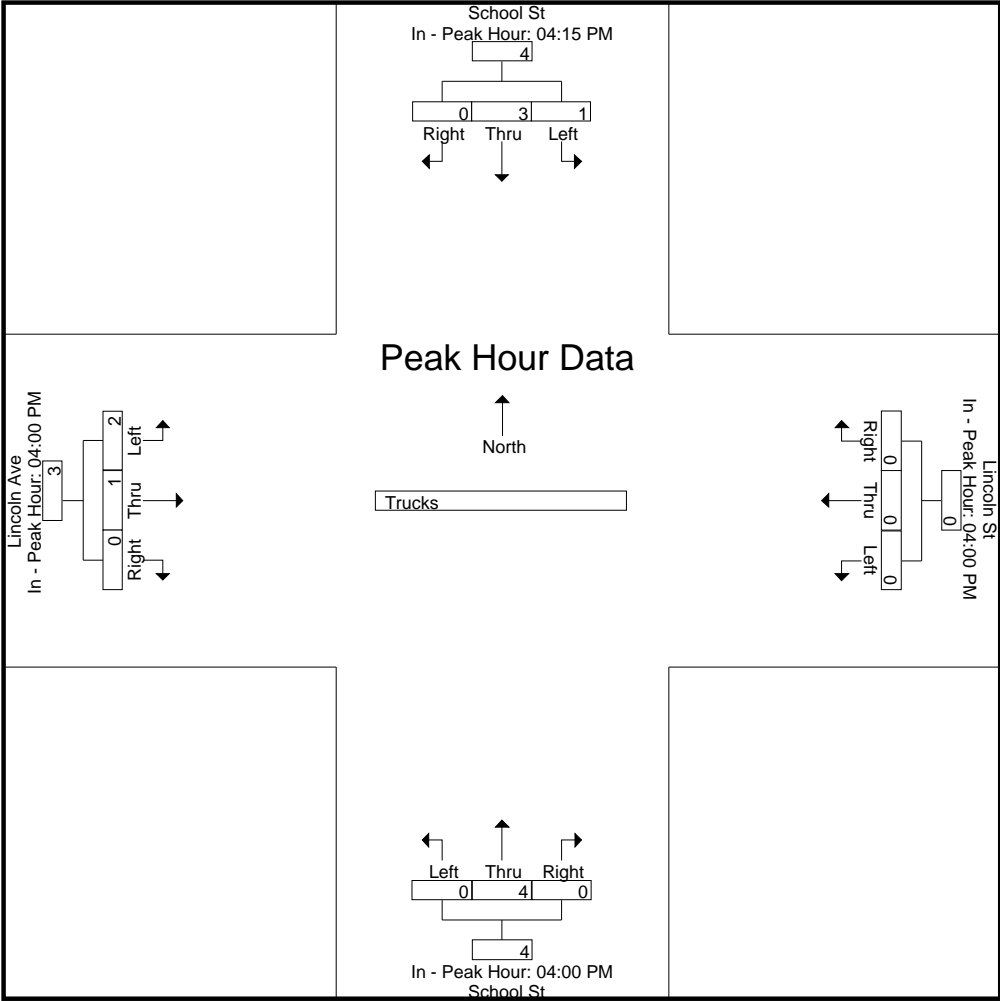


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	04:15 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	2	0	2	0	1	0	1
+15 mins.	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	1
+30 mins.	0	2	0	2	0	0	0	0	0	0	0	0	1	0	0	1
+45 mins.	1	1	0	2	0	0	0	0	0	1	0	1	0	0	0	0
Total Volume	1	3	0	4	0	0	0	0	0	4	0	4	2	1	0	3
% App. Total	25	75	0		0	0	0		0	100	0		66.7	33.3	0	
PHF	.250	.375	.000	.500	.000	.000	.000	.000	.000	.500	.000	.500	.500	.250	.000	.750

N/S Street : School Street  
E/W Street : Lincoln St / Lincoln Ave  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410005  
Site Code : 84410005  
Start Date : 11/9/2021  
Page No : 9



# Accurate Counts

978-664-2565

N/S Street : School Street  
E/W Street : Lincoln St / Lincoln Ave  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410005  
Site Code : 84410005  
Start Date : 11/9/2021  
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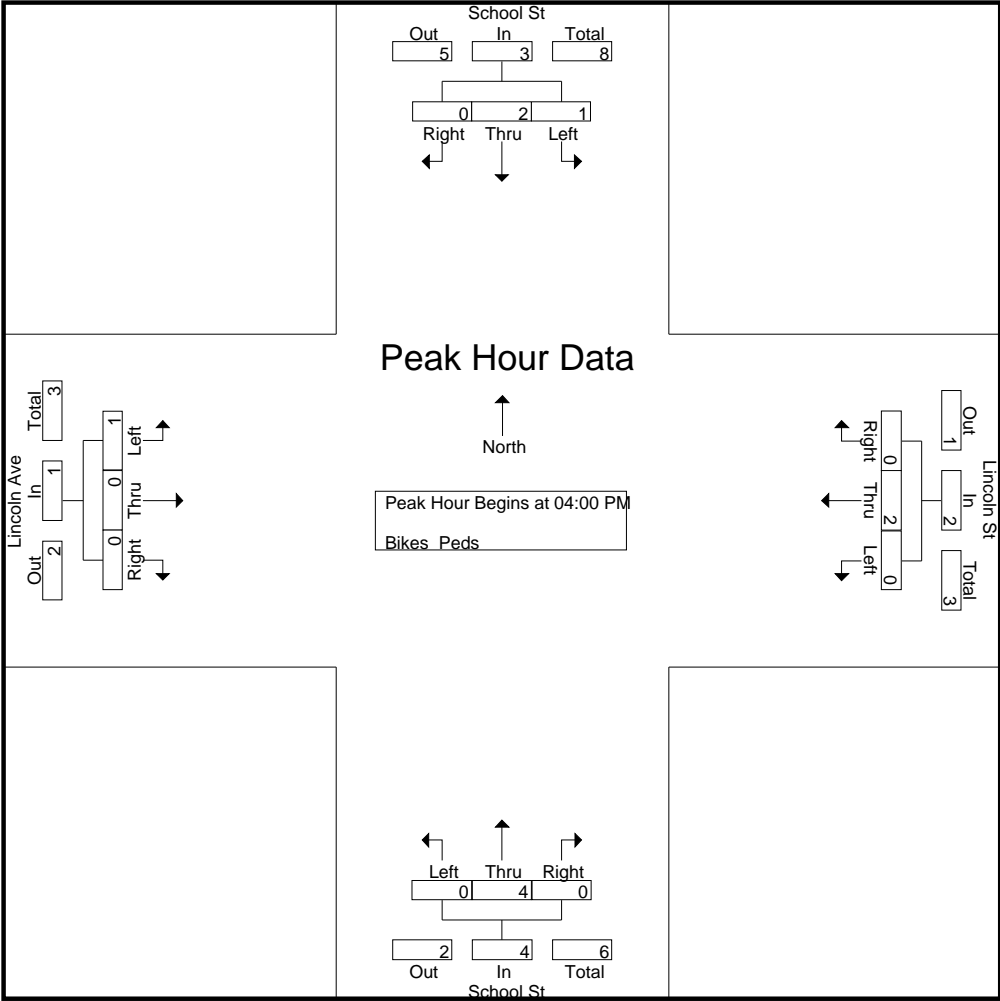
## Groups Printed- Bikes Peds

	School St From North				Lincoln St From East				School St From South				Lincoln Ave From West				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
04:00 PM	0	0	0	3	0	0	0	1	0	2	0	0	0	0	0	2	6	2	8
04:15 PM	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3	4
04:30 PM	0	0	0	0	0	2	0	0	0	2	0	0	1	0	0	6	6	5	11
04:45 PM	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	2	6	0	6
Total	1	2	0	5	0	2	0	3	0	4	0	0	1	0	0	11	19	10	29
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2	0	2
05:30 PM	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	2	3	1	4
05:45 PM	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	3	7	0	7
Total	0	1	0	3	0	0	0	3	0	0	0	0	0	0	0	6	12	1	13
Grand Total	1	3	0	8	0	2	0	6	0	4	0	0	1	0	0	17	31	11	42
Apprch %	25	75	0		0	100	0		0	100	0		100	0	0				
Total %	9.1	27.3	0		0	18.2	0		0	36.4	0		9.1	0	0		73.8	26.2	

	School St From North				Lincoln St From East				School St From South				Lincoln Ave From West						
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total		
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 04:00 PM																			
04:00 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	2
04:15 PM	1	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
04:30 PM	0	0	0	0	0	2	0	2	0	2	0	2	1	0	0	1	1	5	
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total Volume	1	2	0	3	0	2	0	2	0	4	0	4	1	0	0	1	10		
% App. Total	33.3	66.7	0		0	100	0		0	100	0		100	0	0				
PHF	.250	.250	.000	.250	.000	.250	.000	.250	.000	.500	.000	.500	.250	.000	.000	.250	.500		

N/S Street : School Street  
E/W Street : Lincoln St / Lincoln Ave  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410005  
Site Code : 84410005  
Start Date : 11/9/2021  
Page No : 11

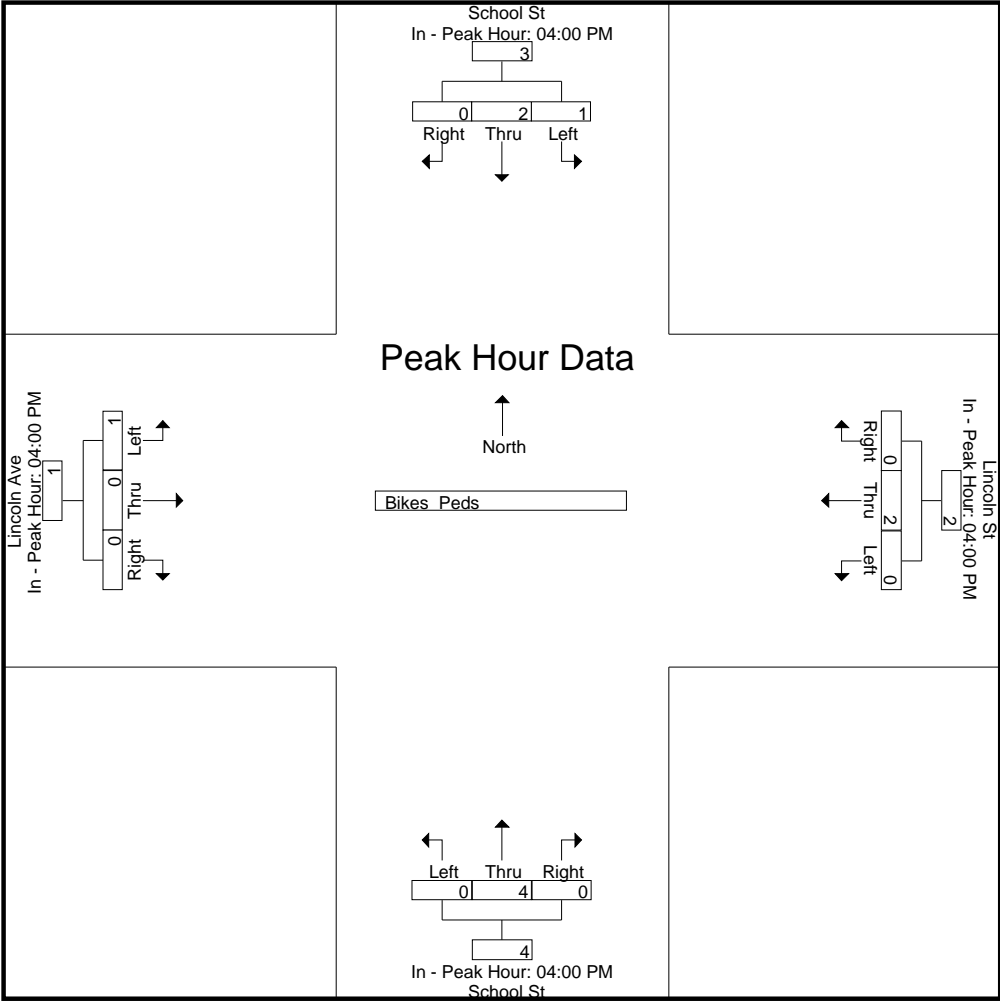


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0
+15 mins.	1	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	2	0	2	0	2	0	2	1	0	0	1
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	1	2	0	3	0	2	0	2	0	4	0	4	1	0	0	1
% App. Total	33.3	66.7	0		0	100	0		0	100	0		100	0	0	
PHF	.250	.250	.000	.250	.000	.250	.000	.250	.000	.500	.000	.500	.250	.000	.000	.250

N/S Street : School Street  
E/W Street : Lincoln St / Lincoln Ave  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410005  
Site Code : 84410005  
Start Date : 11/9/2021  
Page No : 12



# Accurate Counts

978-664-2565

N/S Street : School St / Church St  
E/W Street : Route 127  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410006  
Site Code : 84410006  
Start Date : 11/9/2021  
Page No : 1

## Groups Printed- Cars - Trucks

	School St From North			Route 127 From East			Church St From South			Route 127 From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	15	0	7	0	38	13	0	0	0	12	30	0	115
07:15 AM	33	0	10	0	33	21	0	0	0	17	44	0	158
07:30 AM	34	0	21	0	56	15	0	0	0	29	30	0	185
07:45 AM	27	0	28	0	39	22	0	0	0	20	49	0	185
Total	109	0	66	0	166	71	0	0	0	78	153	0	643
08:00 AM	33	0	23	1	62	17	0	0	0	37	51	0	224
08:15 AM	36	0	30	0	45	23	0	0	0	32	69	1	236
08:30 AM	21	0	23	3	56	13	0	0	0	19	46	0	181
08:45 AM	19	1	20	1	46	19	0	0	0	16	51	0	173
Total	109	1	96	5	209	72	0	0	0	104	217	1	814
Grand Total	218	1	162	5	375	143	0	0	0	182	370	1	1457
Apprch %	57.2	0.3	42.5	1	71.7	27.3	0	0	0	32.9	66.9	0.2	
Total %	15	0.1	11.1	0.3	25.7	9.8	0	0	0	12.5	25.4	0.1	
Cars	212	1	160	5	370	137	0	0	0	180	361	1	1427
% Cars	97.2	100	98.8	100	98.7	95.8	0	0	0	98.9	97.6	100	97.9
Trucks	6	0	2	0	5	6	0	0	0	2	9	0	30
% Trucks	2.8	0	1.2	0	1.3	4.2	0	0	0	1.1	2.4	0	2.1

	School St From North				Route 127 From East				Church St From South				Route 127 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	34	0	21	55	0	56	15	71	0	0	0	0	29	30	0	59	185
07:45 AM	27	0	28	55	0	39	22	61	0	0	0	0	20	49	0	69	185
08:00 AM	33	0	23	56	1	62	17	80	0	0	0	0	37	51	0	88	224
08:15 AM	36	0	30	66	0	45	23	68	0	0	0	0	32	69	1	102	236
Total Volume	130	0	102	232	1	202	77	280	0	0	0	0	118	199	1	318	830
% App. Total	56	0	44		0.4	72.1	27.5		0	0	0		37.1	62.6	0.3		
PHF	.903	.000	.850	.879	.250	.815	.837	.875	.000	.000	.000	.000	.797	.721	.250	.779	.879
Cars	127	0	101	228	1	199	73	273	0	0	0	0	117	193	1	311	812
% Cars	97.7	0	99.0	98.3	100	98.5	94.8	97.5	0	0	0	0	99.2	97.0	100	97.8	97.8
Trucks	3	0	1	4	0	3	4	7	0	0	0	0	1	6	0	7	18
% Trucks	2.3	0	1.0	1.7	0	1.5	5.2	2.5	0	0	0	0	0.8	3.0	0	2.2	2.2

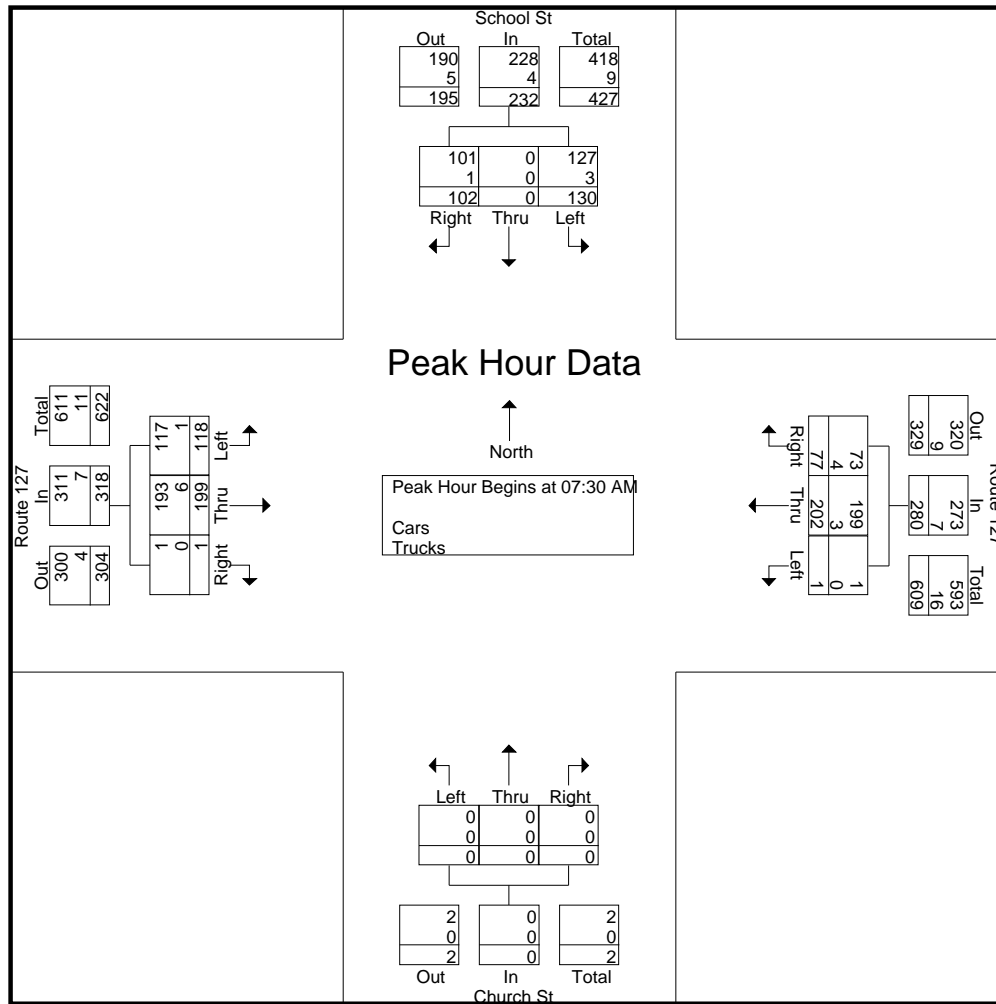


# Accurate Counts

978-664-2565

N/S Street : School St / Church St  
 E/W Street : Route 127  
 City/State : Manchester By The Sea, MA  
 Weather : Clear

File Name : 84410006  
 Site Code : 84410006  
 Start Date : 11/9/2021  
 Page No : 2

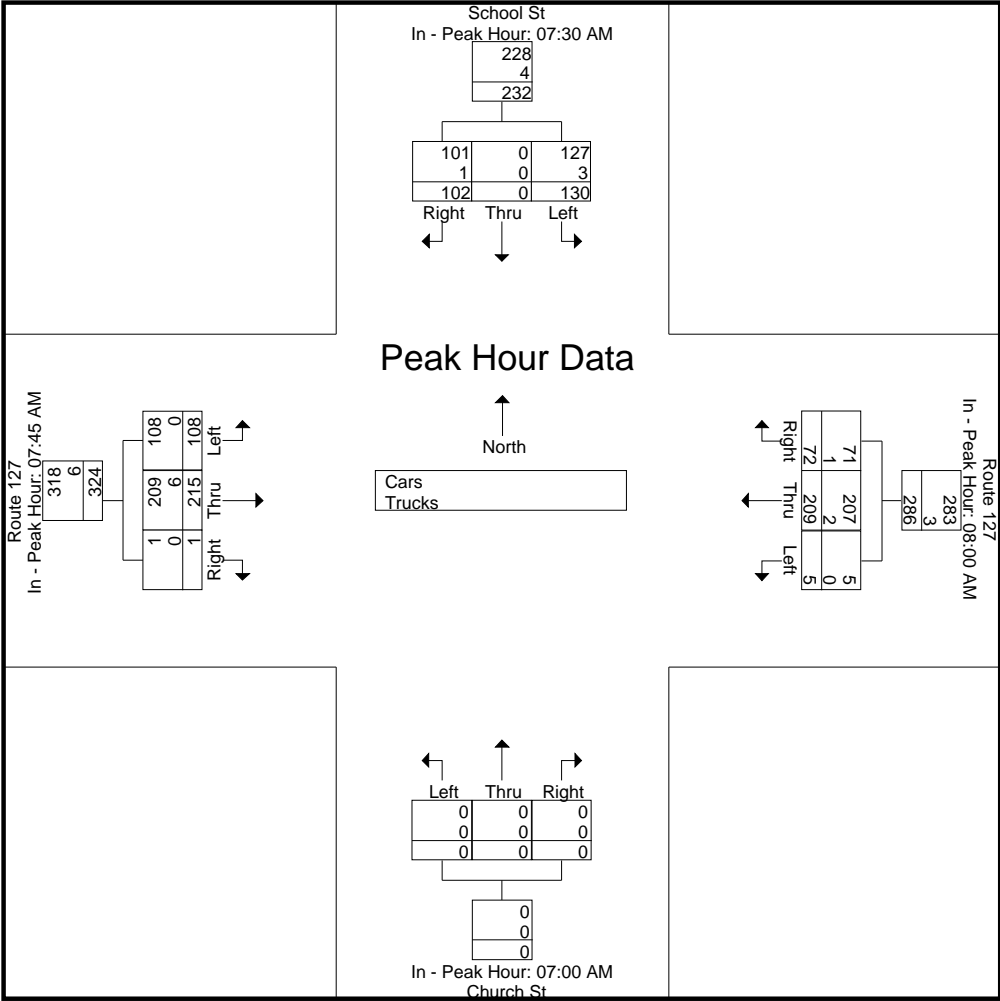


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	07:30 AM				08:00 AM				07:00 AM				07:45 AM			
+0 mins.	34	0	21	55	1	<b>62</b>	17	<b>80</b>	0	0	0	0	20	49	0	69
+15 mins.	27	0	28	55	0	45	<b>23</b>	68	0	0	0	0	<b>37</b>	51	0	88
+30 mins.	33	0	23	56	<b>3</b>	56	13	72	0	0	0	0	32	<b>69</b>	<b>1</b>	<b>102</b>
+45 mins.	<b>36</b>	0	<b>30</b>	<b>66</b>	1	46	19	66	0	0	0	0	19	46	0	65
Total Volume	130	0	102	232	5	209	72	286	0	0	0	0	108	215	1	324
% App. Total	56	0	44		1.7	73.1	25.2		0	0	0		33.3	66.4	0.3	
PHF	.903	.000	.850	.879	.417	.843	.783	.894	.000	.000	.000	.000	.730	.779	.250	.794
Cars	127	0	101	228	5	207	71	283	0	0	0	0	108	209	1	318
% Cars	97.7	0	99	98.3	100	99	98.6	99	0	0	0	0	100	97.2	100	98.1
Trucks	3	0	1	4	0	2	1	3	0	0	0	0	0	6	0	6
% Trucks	2.3	0	1	1.7	0	1	1.4	1	0	0	0	0	0	2.8	0	1.9

N/S Street : School St / Church St  
E/W Street : Route 127  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410006  
Site Code : 84410006  
Start Date : 11/9/2021  
Page No : 3



# Accurate Counts

978-664-2565

N/S Street : School St / Church St  
E/W Street : Route 127  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410006  
Site Code : 84410006  
Start Date : 11/9/2021  
Page No : 4

## Groups Printed- Cars

	School St From North			Route 127 From East			Church St From South			Route 127 From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	15	0	7	0	38	12	0	0	0	12	30	0	114
07:15 AM	32	0	10	0	32	21	0	0	0	17	41	0	153
07:30 AM	33	0	21	0	54	13	0	0	0	28	30	0	179
07:45 AM	27	0	28	0	39	20	0	0	0	20	49	0	183
Total	107	0	66	0	163	66	0	0	0	77	150	0	629
08:00 AM	32	0	22	1	62	17	0	0	0	37	48	0	219
08:15 AM	35	0	30	0	44	23	0	0	0	32	66	1	231
08:30 AM	20	0	23	3	55	13	0	0	0	19	46	0	179
08:45 AM	18	1	19	1	46	18	0	0	0	15	51	0	169
Total	105	1	94	5	207	71	0	0	0	103	211	1	798
Grand Total	212	1	160	5	370	137	0	0	0	180	361	1	1427
Apprch %	56.8	0.3	42.9	1	72.3	26.8	0	0	0	33.2	66.6	0.2	
Total %	14.9	0.1	11.2	0.4	25.9	9.6	0	0	0	12.6	25.3	0.1	

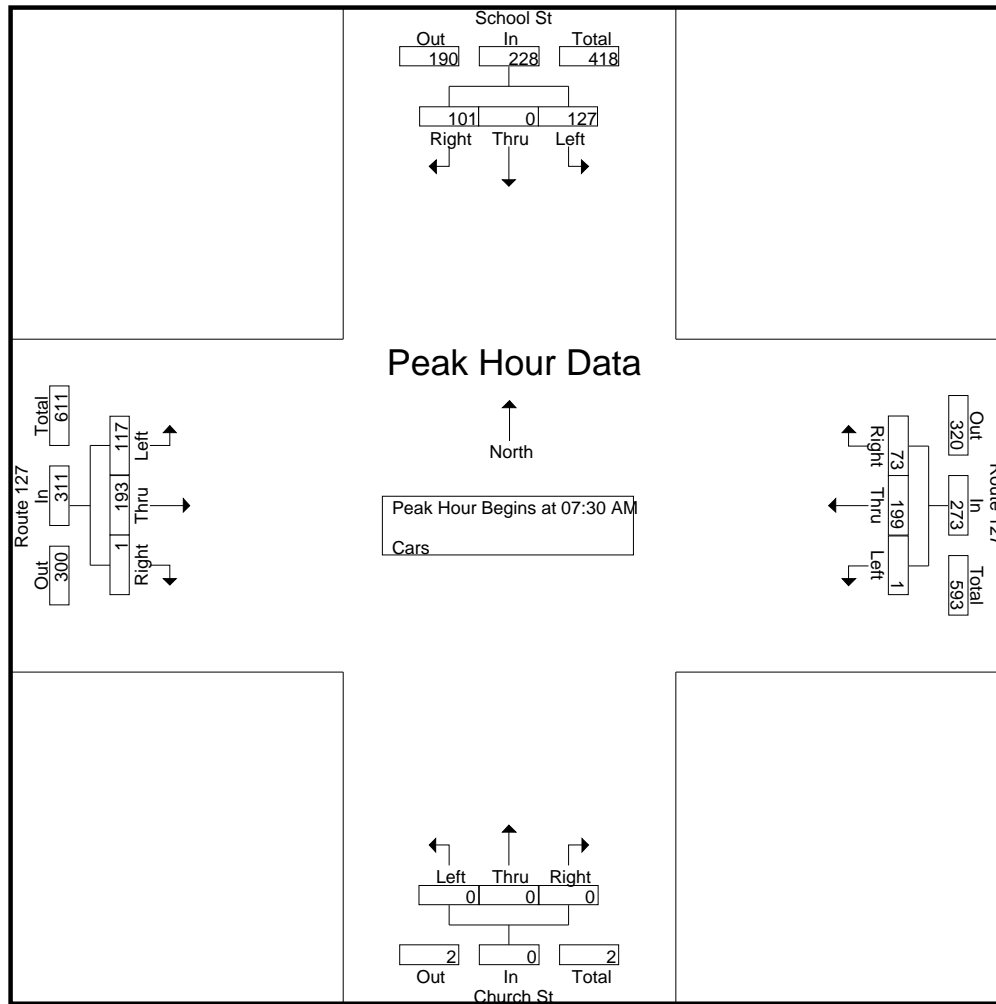
	School St From North				Route 127 From East				Church St From South				Route 127 From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	33	0	21	54	0	54	13	67	0	0	0	0	28	30	0	58	179
07:45 AM	27	0	28	55	0	39	20	59	0	0	0	0	20	49	0	69	183
08:00 AM	32	0	22	54	1	62	17	80	0	0	0	0	37	48	0	85	219
08:15 AM	35	0	30	65	0	44	23	67	0	0	0	0	32	66	1	99	231
Total Volume	127	0	101	228	1	199	73	273	0	0	0	0	117	193	1	311	812
% App. Total	55.7	0	44.3		0.4	72.9	26.7		0	0	0		37.6	62.1	0.3		
PHF	.907	.000	.842	.877	.250	.802	.793	.853	.000	.000	.000	.000	.791	.731	.250	.785	.879

# Accurate Counts

978-664-2565

N/S Street : School St / Church St  
 E/W Street : Route 127  
 City/State : Manchester By The Sea, MA  
 Weather : Clear

File Name : 84410006  
 Site Code : 84410006  
 Start Date : 11/9/2021  
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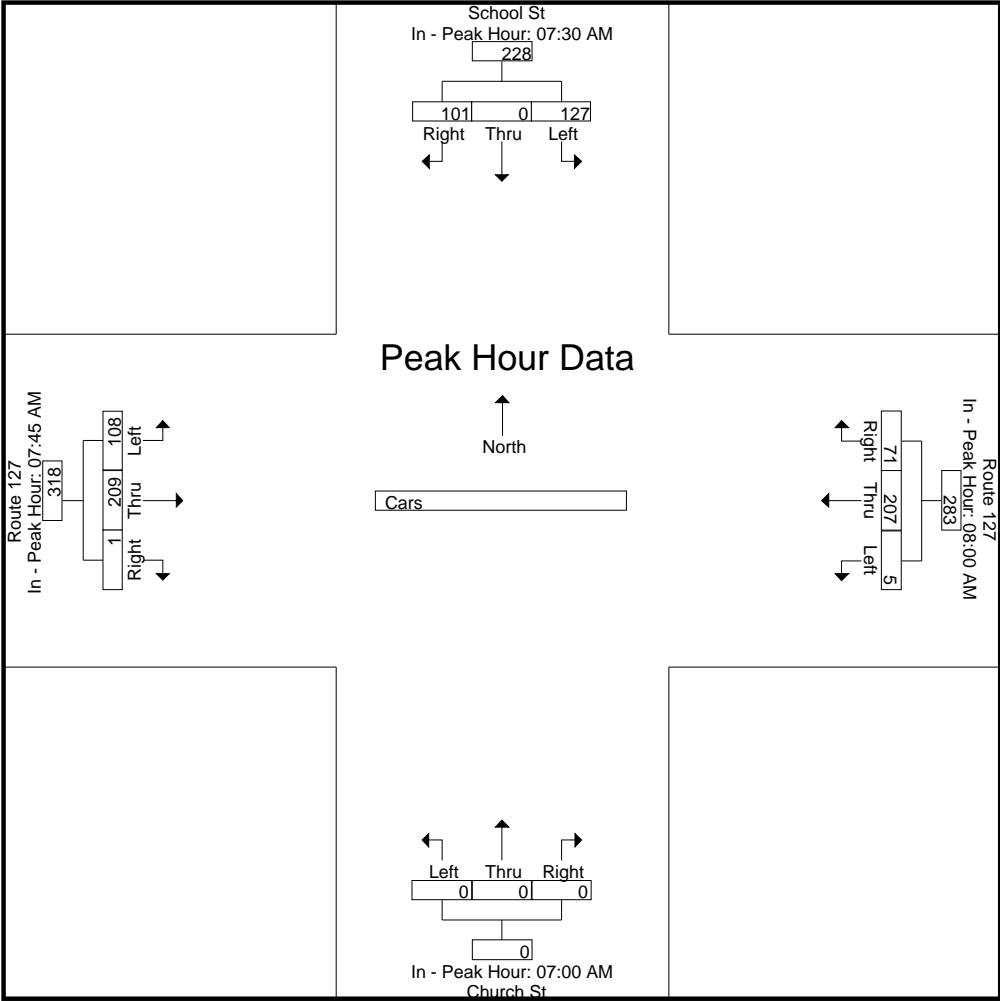


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	07:30 AM				08:00 AM				07:00 AM				07:45 AM			
+0 mins.	33	0	21	54	1	<b>62</b>	17	<b>80</b>	0	0	0	0	20	49	0	69
+15 mins.	27	0	28	55	0	44	<b>23</b>	67	0	0	0	0	<b>37</b>	48	0	85
+30 mins.	32	0	22	54	<b>3</b>	55	13	71	0	0	0	0	32	<b>66</b>	<b>1</b>	<b>99</b>
+45 mins.	<b>35</b>	0	<b>30</b>	<b>65</b>	1	46	18	65	0	0	0	0	19	46	0	65
Total Volume	127	0	101	228	5	207	71	283	0	0	0	0	108	209	1	318
% App. Total	55.7	0	44.3		1.8	73.1	25.1		0	0	0		34	65.7	0.3	
PHF	.907	.000	.842	.877	.417	.835	.772	.884	.000	.000	.000	.000	.730	.792	.250	.803

N/S Street : School St / Church St  
E/W Street : Route 127  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410006  
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Start Date : 11/9/2021  
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# Accurate Counts

978-664-2565

N/S Street : School St / Church St  
E/W Street : Route 127  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410006  
Site Code : 84410006  
Start Date : 11/9/2021  
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## Groups Printed- Trucks

	School St From North			Route 127 From East			Church St From South			Route 127 From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	1
07:15 AM	1	0	0	0	1	0	0	0	0	0	3	0	5
07:30 AM	1	0	0	0	2	2	0	0	0	1	0	0	6
07:45 AM	0	0	0	0	0	2	0	0	0	0	0	0	2
Total	2	0	0	0	3	5	0	0	0	1	3	0	14
08:00 AM	1	0	1	0	0	0	0	0	0	0	3	0	5
08:15 AM	1	0	0	0	1	0	0	0	0	0	3	0	5
08:30 AM	1	0	0	0	1	0	0	0	0	0	0	0	2
08:45 AM	1	0	1	0	0	1	0	0	0	1	0	0	4
Total	4	0	2	0	2	1	0	0	0	1	6	0	16
Grand Total	6	0	2	0	5	6	0	0	0	2	9	0	30
Apprch %	75	0	25	0	45.5	54.5	0	0	0	18.2	81.8	0	
Total %	20	0	6.7	0	16.7	20	0	0	0	6.7	30	0	

	School St From North				Route 127 From East				Church St From South				Route 127 From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	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 07:15 AM																	
07:15 AM	1	0	0	1	0	1	0	1	0	0	0	0	0	3	0	3	5
07:30 AM	1	0	0	1	0	2	2	4	0	0	0	0	1	0	0	1	6
07:45 AM	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	2
08:00 AM	1	0	1	2	0	0	0	0	0	0	0	0	0	3	0	3	5
Total Volume	3	0	1	4	0	3	4	7	0	0	0	0	1	6	0	7	18
% App. Total	75	0	25		0	42.9	57.1		0	0	0		14.3	85.7	0		
PHF	.750	.000	.250	.500	.000	.375	.500	.438	.000	.000	.000	.000	.250	.500	.000	.583	.750

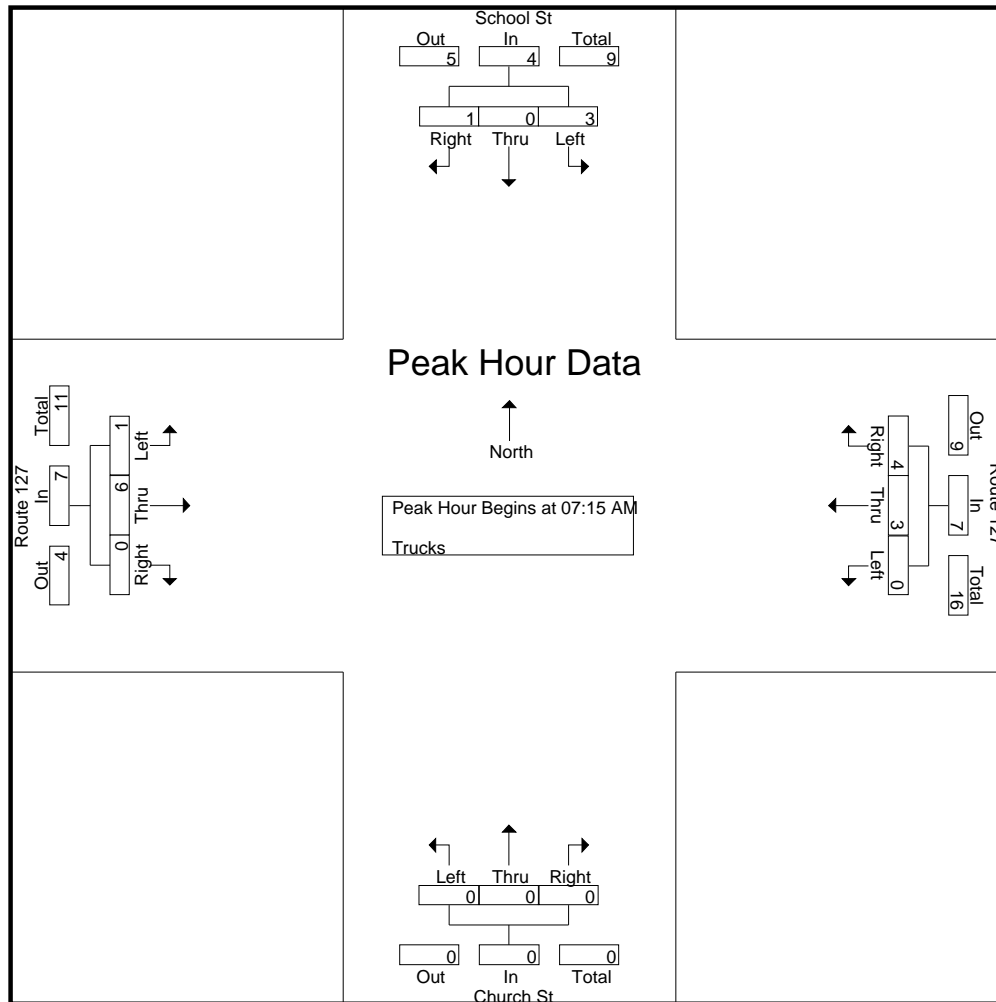


# Accurate Counts

978-664-2565

N/S Street : School St / Church St  
 E/W Street : Route 127  
 City/State : Manchester By The Sea, MA  
 Weather : Clear

File Name : 84410006  
 Site Code : 84410006  
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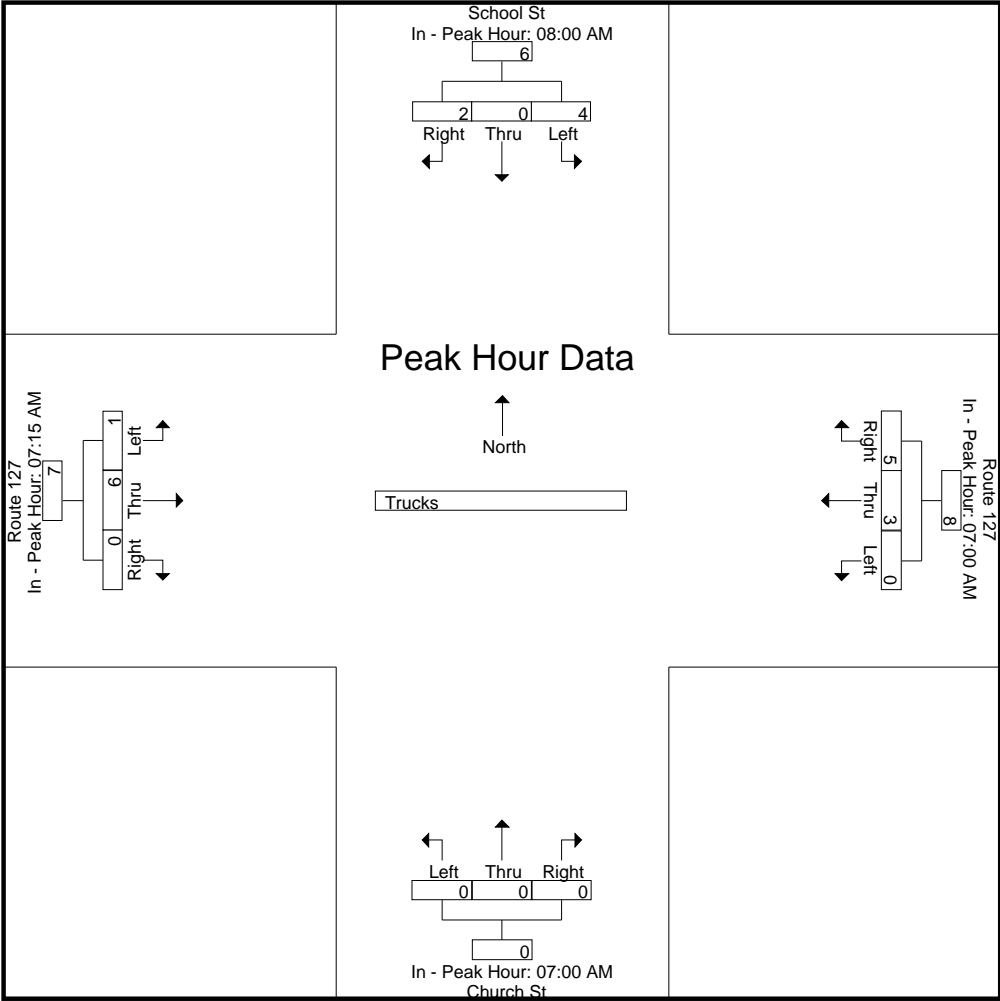


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	08:00 AM				07:00 AM				07:00 AM				07:15 AM			
+0 mins.	1	0	1	2	0	0	1	1	0	0	0	0	0	3	0	3
+15 mins.	1	0	0	1	0	1	0	1	0	0	0	0	1	0	0	1
+30 mins.	1	0	0	1	0	2	2	4	0	0	0	0	0	0	0	0
+45 mins.	1	0	1	2	0	0	2	2	0	0	0	0	0	3	0	3
Total Volume	4	0	2	6	0	3	5	8	0	0	0	0	1	6	0	7
% App. Total	66.7	0	33.3		0	37.5	62.5		0	0	0		14.3	85.7	0	
PHF	1.000	.000	.500	.750	.000	.375	.625	.500	.000	.000	.000	.000	.250	.500	.000	.583

N/S Street : School St / Church St  
E/W Street : Route 127  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410006  
Site Code : 84410006  
Start Date : 11/9/2021  
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# Accurate Counts

978-664-2565

N/S Street : School St / Church St  
E/W Street : Route 127  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410006  
Site Code : 84410006  
Start Date : 11/9/2021  
Page No : 10

## Groups Printed- Bikes Peds

	School St From North				Route 127 From East				Church St From South				Route 127 From West				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
07:00 AM	0	0	1	2	0	0	0	0	0	0	0	0	1	1	0	1	8	3	11
07:15 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	6	0	6
07:30 AM	0	0	1	2	0	0	1	0	0	0	0	1	0	1	0	0	3	3	6
07:45 AM	0	0	0	0	0	0	0	1	0	0	0	2	1	0	0	2	5	1	6
Total	0	0	2	6	0	0	1	1	0	0	0	11	2	2	0	4	22	7	29
08:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	1	2	3
08:15 AM	0	0	0	2	0	2	0	0	0	0	0	3	0	1	0	3	8	3	11
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	3	0	3
08:45 AM	0	0	0	3	0	0	0	0	0	0	0	3	0	0	0	2	8	0	8
Total	0	0	0	6	0	2	0	0	0	0	0	8	0	3	0	6	20	5	25
Grand Total	0	0	2	12	0	2	1	1	0	0	0	19	2	5	0	10	42	12	54
Apprch %	0	0	100		0	66.7	33.3		0	0	0		28.6	71.4	0				
Total %	0	0	16.7		0	16.7	8.3		0	0	0		16.7	41.7	0		77.8	22.2	

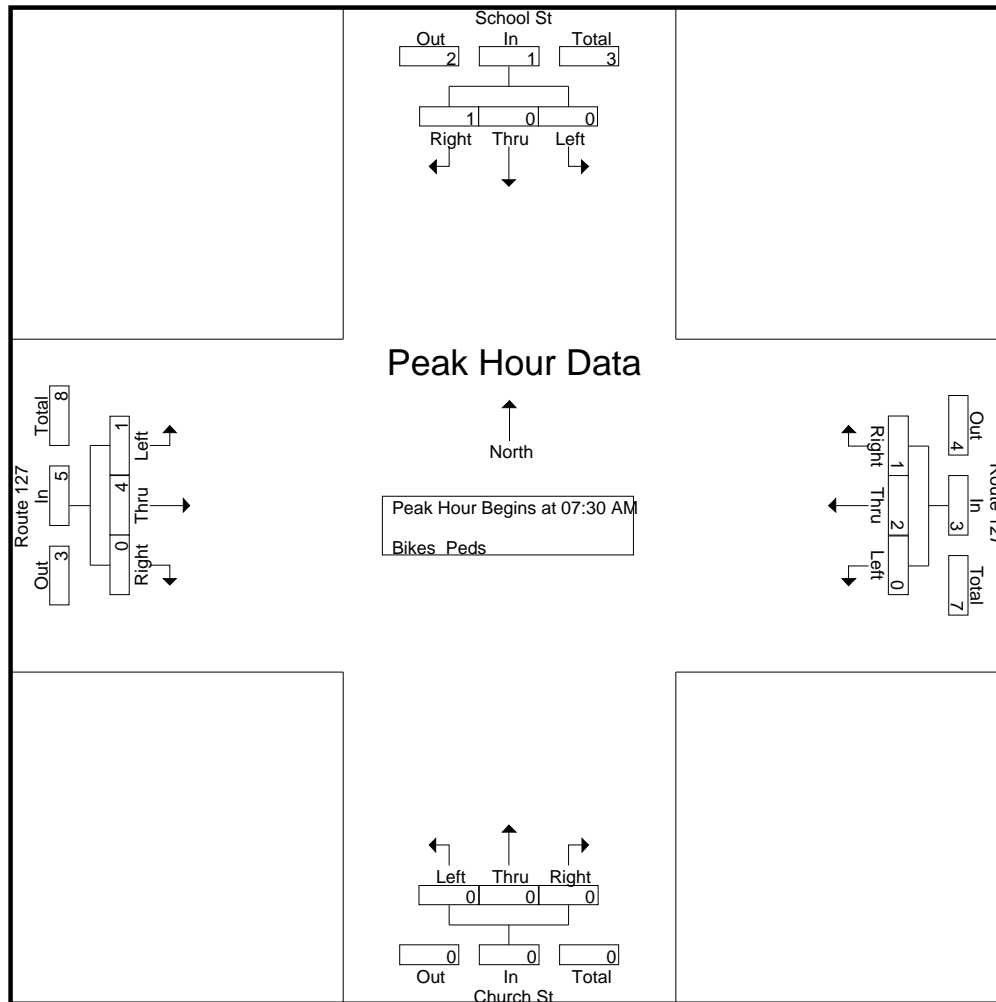
	School St From North				Route 127 From East				Church St From South				Route 127 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	1	1	0	0	1	1	0	0	0	0	0	1	0	1	3
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
08:15 AM	0	0	0	0	0	2	0	2	0	0	0	0	0	1	0	1	3
Total Volume	0	0	1	1	0	2	1	3	0	0	0	0	1	4	0	5	9
% App. Total	0	0	100		0	66.7	33.3		0	0	0		20	80	0		
PHF	.000	.000	.250	.250	.000	.250	.250	.375	.000	.000	.000	.000	.250	.500	.000	.625	.750

# Accurate Counts

978-664-2565

N/S Street : School St / Church St  
 E/W Street : Route 127  
 City/State : Manchester By The Sea, MA  
 Weather : Clear

File Name : 84410006  
 Site Code : 84410006  
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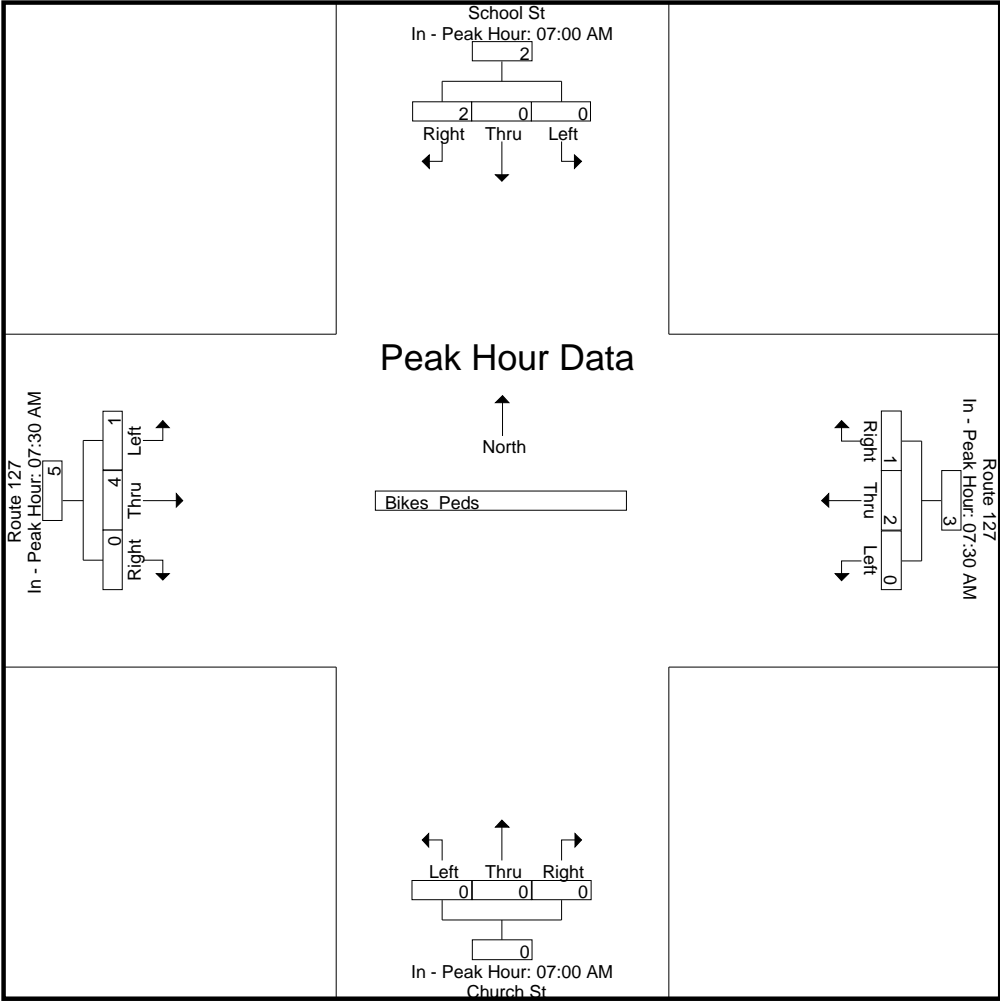


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	07:00 AM				07:30 AM				07:00 AM				07:30 AM			
+0 mins.	0	0	1	1	0	0	1	1	0	0	0	0	0	1	0	1
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
+30 mins.	0	0	1	1	0	0	0	0	0	0	0	0	0	2	0	2
+45 mins.	0	0	0	0	0	2	0	2	0	0	0	0	0	1	0	1
Total Volume	0	0	2	2	0	2	1	3	0	0	0	0	1	4	0	5
% App. Total	0	0	100		0	66.7	33.3		0	0	0		20	80	0	
PHF	.000	.000	.500	.500	.000	.250	.250	.375	.000	.000	.000	.000	.250	.500	.000	.625

N/S Street : School St / Church St  
E/W Street : Route 127  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410006  
Site Code : 84410006  
Start Date : 11/9/2021  
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# Accurate Counts

978-664-2565

N/S Street : School St / Church St  
E/W Street : Route 127  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410006  
Site Code : 84410006  
Start Date : 11/9/2021  
Page No : 1

## Groups Printed- Cars - Trucks

	School St From North			Route 127 From East			Church St From South			Route 127 From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
04:00 PM	30	0	19	5	74	38	0	0	0	37	79	0	282
04:15 PM	31	0	16	1	69	26	0	0	0	29	66	0	238
04:30 PM	30	0	17	1	56	34	0	0	0	23	61	1	223
04:45 PM	28	0	16	3	59	33	0	0	0	9	47	0	195
Total	119	0	68	10	258	131	0	0	0	98	253	1	938
05:00 PM	25	0	23	4	66	33	0	0	0	26	52	0	229
05:15 PM	24	2	19	5	51	27	0	0	0	25	32	0	185
05:30 PM	21	0	17	3	43	16	0	0	0	28	64	0	192
05:45 PM	24	0	22	1	42	28	0	0	0	41	79	3	240
Total	94	2	81	13	202	104	0	0	0	120	227	3	846
Grand Total	213	2	149	23	460	235	0	0	0	218	480	4	1784
Apprch %	58.5	0.5	40.9	3.2	64.1	32.7	0	0	0	31.1	68.4	0.6	
Total %	11.9	0.1	8.4	1.3	25.8	13.2	0	0	0	12.2	26.9	0.2	
Cars	210	2	149	23	457	230	0	0	0	218	479	4	1772
% Cars	98.6	100	100	100	99.3	97.9	0	0	0	100	99.8	100	99.3
Trucks	3	0	0	0	3	5	0	0	0	0	1	0	12
% Trucks	1.4	0	0	0	0.7	2.1	0	0	0	0	0.2	0	0.7

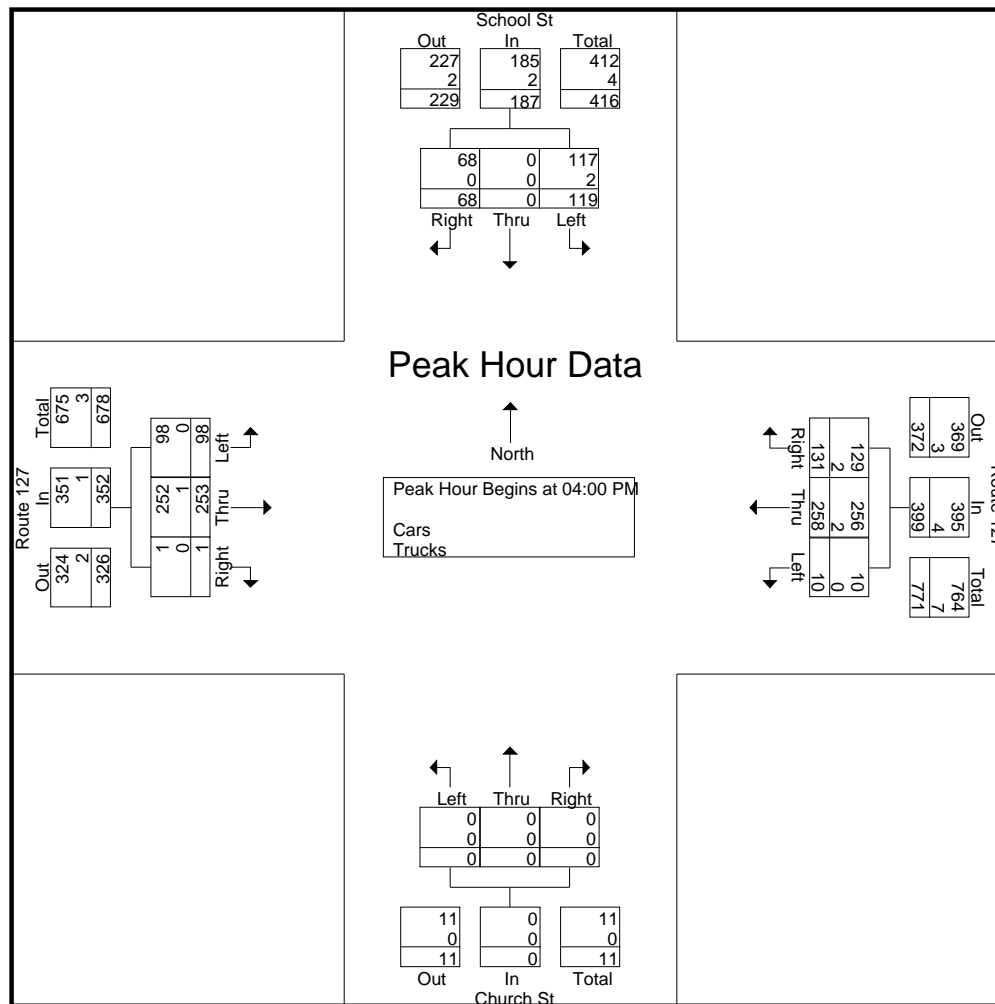
	School St From North				Route 127 From East				Church St From South				Route 127 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	30	0	19	49	5	74	38	117	0	0	0	0	37	79	0	116	282
04:15 PM	31	0	16	47	1	69	26	96	0	0	0	0	29	66	0	95	238
04:30 PM	30	0	17	47	1	56	34	91	0	0	0	0	23	61	1	85	223
04:45 PM	28	0	16	44	3	59	33	95	0	0	0	0	9	47	0	56	195
Total Volume	119	0	68	187	10	258	131	399	0	0	0	0	98	253	1	352	938
% App. Total	63.6	0	36.4		2.5	64.7	32.8		0	0	0		27.8	71.9	0.3		
PHF	.960	.000	.895	.954	.500	.872	.862	.853	.000	.000	.000	.000	.662	.801	.250	.759	.832
Cars	117	0	68	185	10	256	129	395	0	0	0	0	98	252	1	351	931
% Cars	98.3	0	100	98.9	100	99.2	98.5	99.0	0	0	0	0	100	99.6	100	99.7	99.3
Trucks	2	0	0	2	0	2	2	4	0	0	0	0	0	1	0	1	7
% Trucks	1.7	0	0	1.1	0	0.8	1.5	1.0	0	0	0	0	0	0.4	0	0.3	0.7



**Accurate Counts**  
978-664-2565

N/S Street : School St / Church St  
E/W Street : Route 127  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410006  
Site Code : 84410006  
Start Date : 11/9/2021  
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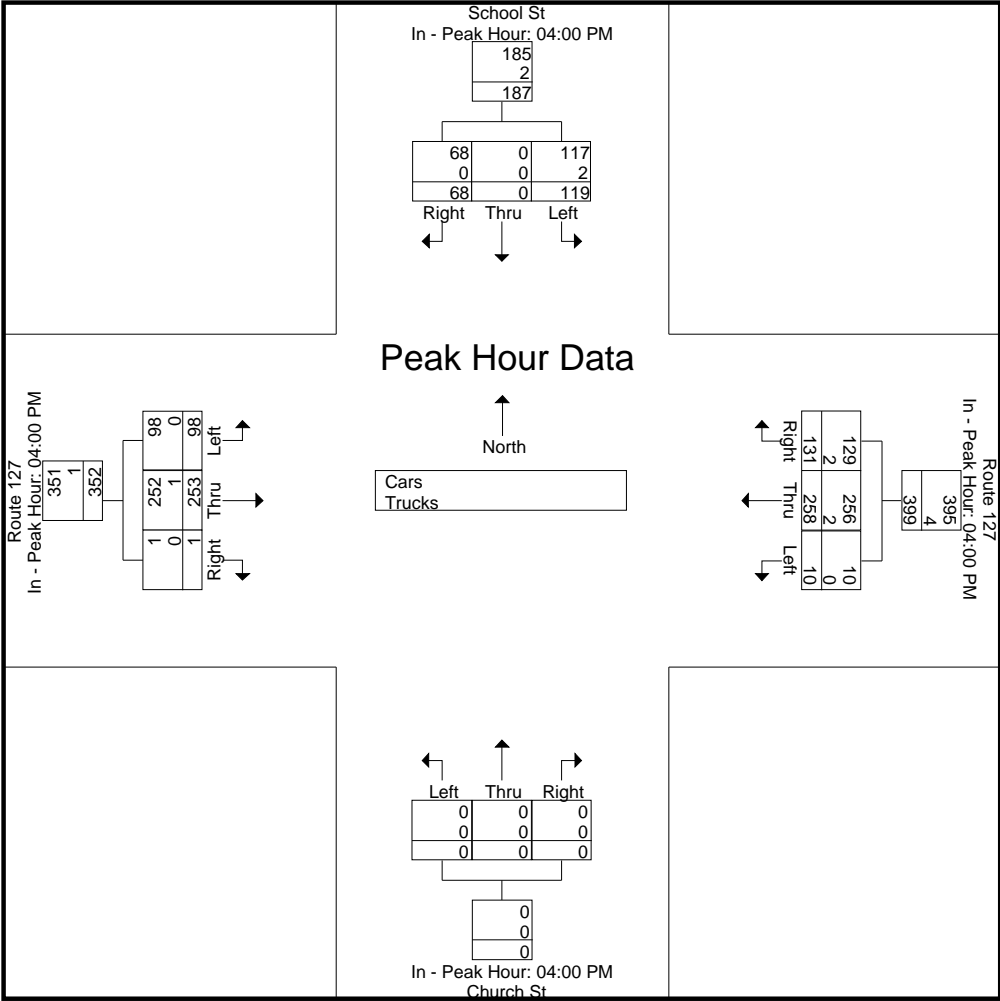


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

Peak Hour for Each Approach Begins at:																
	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	30	0	19	49	5	74	38	117	0	0	0	0	37	79	0	116
+15 mins.	31	0	16	47	1	69	26	96	0	0	0	0	29	66	0	95
+30 mins.	30	0	17	47	1	56	34	91	0	0	0	0	23	61	1	85
+45 mins.	28	0	16	44	3	59	33	95	0	0	0	0	9	47	0	56
Total Volume	119	0	68	187	10	258	131	399	0	0	0	0	98	253	1	352
% App. Total	63.6	0	36.4		2.5	64.7	32.8		0	0	0		27.8	71.9	0.3	
PHF	.960	.000	.895	.954	.500	.872	.862	.853	.000	.000	.000	.000	.662	.801	.250	.759
Cars	117	0	68	185	10	256	129	395	0	0	0	0	98	252	1	351
% Cars	98.3	0	100	98.9	100	99.2	98.5	99	0	0	0	0	100	99.6	100	99.7
Trucks	2	0	0	2	0	2	2	4	0	0	0	0	0	1	0	1
% Trucks	1.7	0	0	1.1	0	0.8	1.5	1	0	0	0	0	0	0.4	0	0.3

N/S Street : School St / Church St  
E/W Street : Route 127  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410006  
Site Code : 84410006  
Start Date : 11/9/2021  
Page No : 3



# Accurate Counts

978-664-2565

N/S Street : School St / Church St  
E/W Street : Route 127  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410006  
Site Code : 84410006  
Start Date : 11/9/2021  
Page No : 4

## Groups Printed- Cars

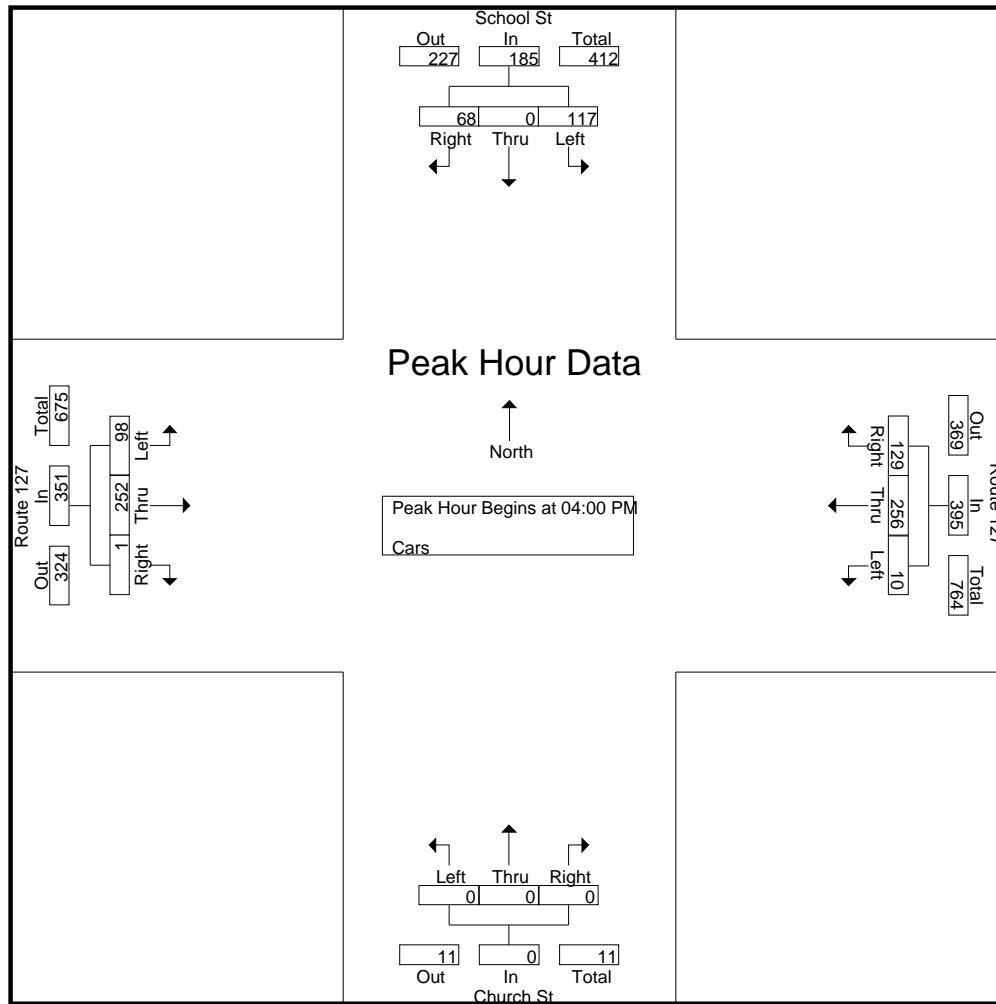
	School St From North			Route 127 From East			Church St From South			Route 127 From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
04:00 PM	30	0	19	5	73	37	0	0	0	37	79	0	280
04:15 PM	31	0	16	1	68	26	0	0	0	29	66	0	237
04:30 PM	30	0	17	1	56	34	0	0	0	23	61	1	223
04:45 PM	26	0	16	3	59	32	0	0	0	9	46	0	191
Total	117	0	68	10	256	129	0	0	0	98	252	1	931
05:00 PM	25	0	23	4	66	31	0	0	0	26	52	0	227
05:15 PM	23	2	19	5	50	27	0	0	0	25	32	0	183
05:30 PM	21	0	17	3	43	16	0	0	0	28	64	0	192
05:45 PM	24	0	22	1	42	27	0	0	0	41	79	3	239
Total	93	2	81	13	201	101	0	0	0	120	227	3	841
Grand Total	210	2	149	23	457	230	0	0	0	218	479	4	1772
Apprch %	58.2	0.6	41.3	3.2	64.4	32.4	0	0	0	31.1	68.3	0.6	
Total %	11.9	0.1	8.4	1.3	25.8	13	0	0	0	12.3	27	0.2	

	School St From North				Route 127 From East				Church St From South				Route 127 From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	30	0	19	49	5	73	37	115	0	0	0	0	37	79	0	116	280
04:15 PM	31	0	16	47	1	68	26	95	0	0	0	0	29	66	0	95	237
04:30 PM	30	0	17	47	1	56	34	91	0	0	0	0	23	61	1	85	223
04:45 PM	26	0	16	42	3	59	32	94	0	0	0	0	9	46	0	55	191
Total Volume	117	0	68	185	10	256	129	395	0	0	0	0	98	252	1	351	931
% App. Total	63.2	0	36.8		2.5	64.8	32.7		0	0	0		27.9	71.8	0.3		
PHF	.944	.000	.895	.944	.500	.877	.872	.859	.000	.000	.000	.000	.662	.797	.250	.756	.831

**Accurate Counts**  
978-664-2565

N/S Street : School St / Church St  
E/W Street : Route 127  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410006  
Site Code : 84410006  
Start Date : 11/9/2021  
Page No : 5

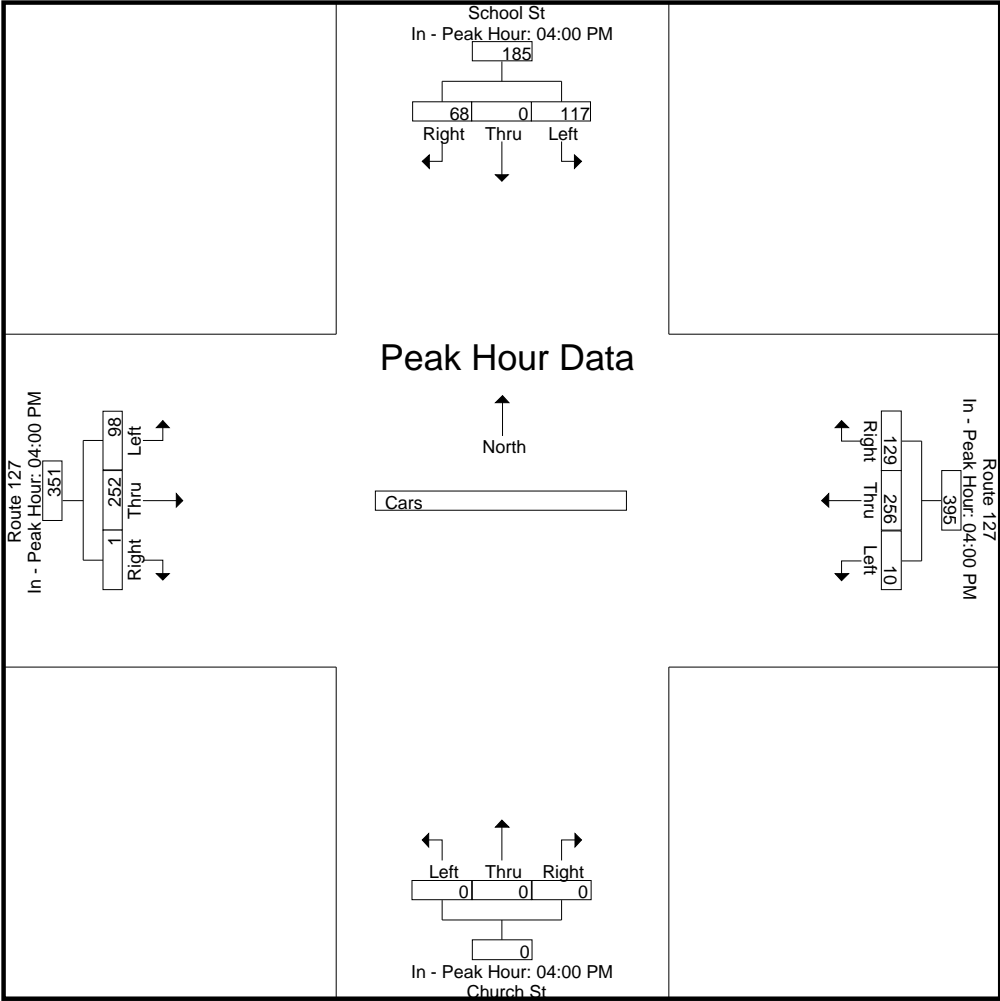


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	30	0	19	49	5	73	37	115	0	0	0	0	37	79	0	116
+15 mins.	31	0	16	47	1	68	26	95	0	0	0	0	29	66	0	95
+30 mins.	30	0	17	47	1	56	34	91	0	0	0	0	23	61	1	85
+45 mins.	26	0	16	42	3	59	32	94	0	0	0	0	9	46	0	55
Total Volume	117	0	68	185	10	256	129	395	0	0	0	0	98	252	1	351
% App. Total	63.2	0	36.8		2.5	64.8	32.7		0	0	0		27.9	71.8	0.3	
PHF	.944	.000	.895	.944	.500	.877	.872	.859	.000	.000	.000	.000	.662	.797	.250	.756

N/S Street : School St / Church St  
E/W Street : Route 127  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410006  
Site Code : 84410006  
Start Date : 11/9/2021  
Page No : 6



# Accurate Counts

978-664-2565

N/S Street : School St / Church St  
E/W Street : Route 127  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410006  
Site Code : 84410006  
Start Date : 11/9/2021  
Page No : 7

## Groups Printed- Trucks

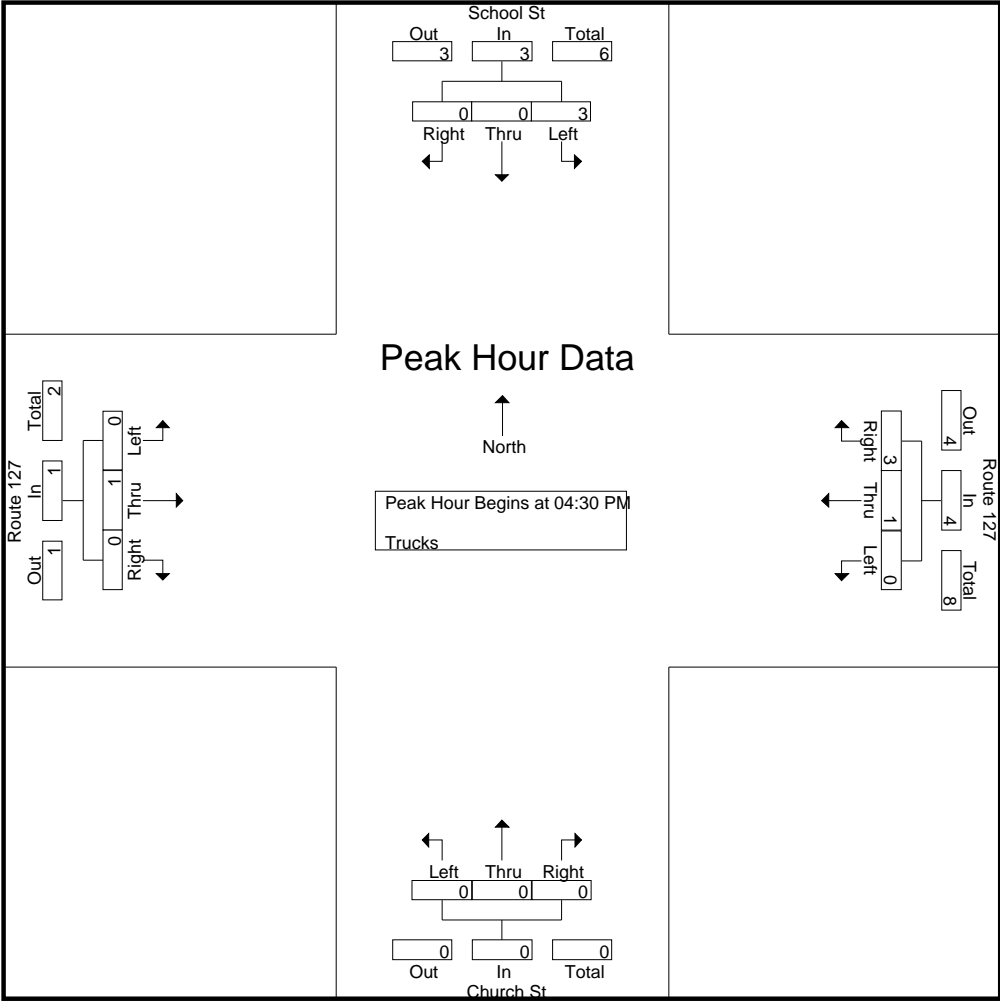
	School St From North			Route 127 From East			Church St From South			Route 127 From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
04:00 PM	0	0	0	0	1	1	0	0	0	0	0	0	2
04:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	2	0	0	0	0	1	0	0	0	0	1	0	4
Total	2	0	0	0	2	2	0	0	0	0	1	0	7
05:00 PM	0	0	0	0	0	2	0	0	0	0	0	0	2
05:15 PM	1	0	0	0	1	0	0	0	0	0	0	0	2
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	1
Total	1	0	0	0	1	3	0	0	0	0	0	0	5
Grand Total	3	0	0	0	3	5	0	0	0	0	1	0	12
Apprch %	100	0	0	0	37.5	62.5	0	0	0	0	100	0	
Total %	25	0	0	0	25	41.7	0	0	0	0	8.3	0	

	School St From North				Route 127 From East				Church St From South				Route 127 From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	2	0	0	2	0	0	1	1	0	0	0	0	0	1	0	1	4
05:00 PM	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	2
05:15 PM	1	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
Total Volume	3	0	0	3	0	1	3	4	0	0	0	0	0	1	0	1	8
% App. Total	100	0	0		0	25	75		0	0	0		0	100	0		
PHF	.375	.000	.000	.375	.000	.250	.375	.500	.000	.000	.000	.000	.000	.250	.000	.250	.500



N/S Street : School St / Church St  
E/W Street : Route 127  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410006  
Site Code : 84410006  
Start Date : 11/9/2021  
Page No : 8

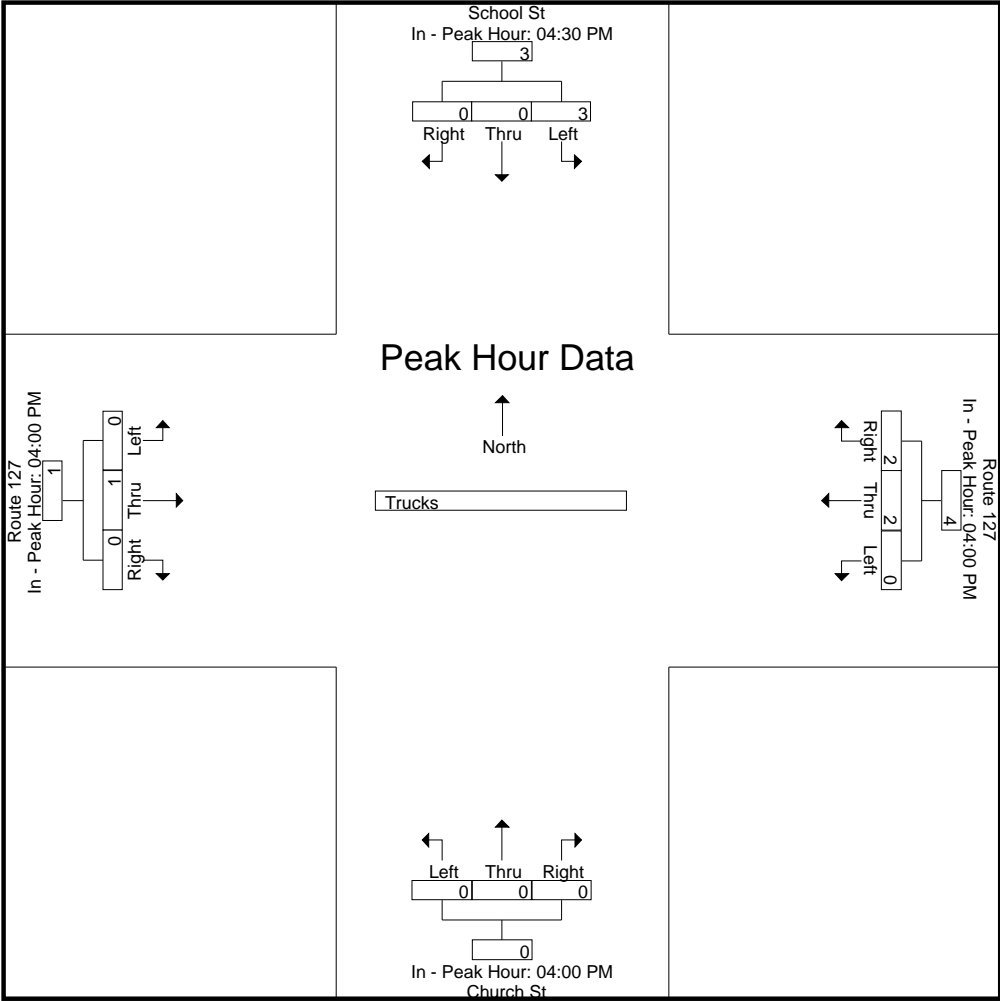


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	04:30 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0
+15 mins.	2	0	0	2	0	1	0	1	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	1	0	0	1	0	0	1	1	0	0	0	0	0	1	0	1
Total Volume	3	0	0	3	0	2	2	4	0	0	0	0	0	1	0	1
% App. Total	100	0	0		0	50	50		0	0	0		0	100	0	
PHF	.375	.000	.000	.375	.000	.500	.500	.500	.000	.000	.000	.000	.000	.250	.000	.250

N/S Street : School St / Church St  
E/W Street : Route 127  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410006  
Site Code : 84410006  
Start Date : 11/9/2021  
Page No : 9



# Accurate Counts

978-664-2565

N/S Street : School St / Church St  
E/W Street : Route 127  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410006  
Site Code : 84410006  
Start Date : 11/9/2021  
Page No : 10

## Groups Printed- Bikes Peds

	School St From North				Route 127 From East				Church St From South				Route 127 From West				Exclu. Total	Inclu. Total	Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds			
04:00 PM	0	0	0	2	0	0	2	2	0	0	0	9	0	1	0	0	13	3	16
04:15 PM	1	0	0	1	0	0	0	0	0	0	0	3	1	1	0	5	9	3	12
04:30 PM	0	0	0	5	0	0	2	0	0	0	0	3	0	1	0	6	14	3	17
04:45 PM	0	0	0	3	0	0	0	0	0	0	0	3	0	0	0	4	10	0	10
Total	1	0	0	11	0	0	4	2	0	0	0	18	1	3	0	15	46	9	55
05:00 PM	0	0	0	1	0	0	0	0	0	0	0	8	1	0	0	2	11	1	12
05:15 PM	0	0	0	0	0	0	0	1	0	0	0	4	0	0	0	1	6	0	6
05:30 PM	1	0	0	2	0	0	0	0	0	0	0	3	0	1	0	0	5	2	7
05:45 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	8	10	0	10
Total	1	0	0	4	0	0	0	1	0	0	0	16	1	1	0	11	32	3	35
Grand Total	2	0	0	15	0	0	4	3	0	0	0	34	2	4	0	26	78	12	90
Apprch %	100	0	0		0	0	100		0	0	0		33.3	66.7	0				
Total %	16.7	0	0		0	0	33.3		0	0	0		16.7	33.3	0		86.7	13.3	

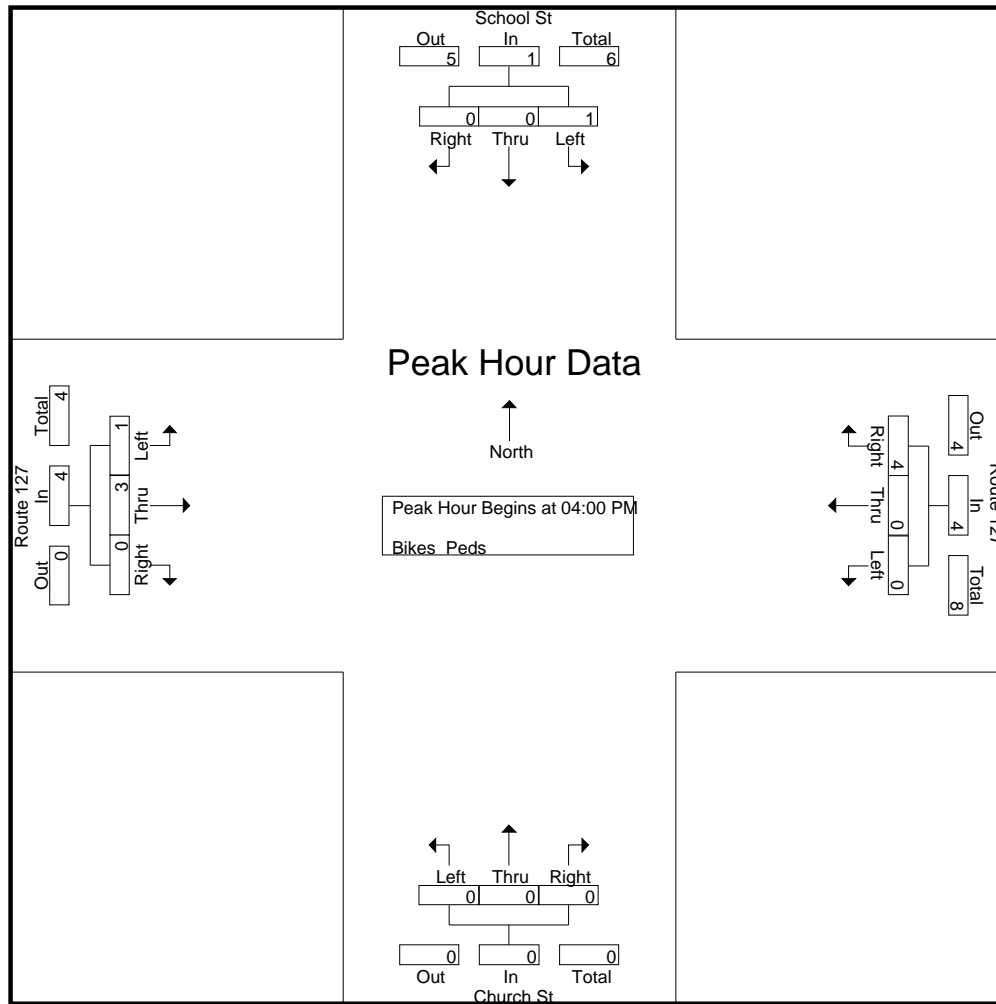
	School St From North				Route 127 From East				Church St From South				Route 127 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	2	2	0	0	0	0	0	1	0	1	3
04:15 PM	1	0	0	1	0	0	0	0	0	0	0	0	1	1	0	2	3
04:30 PM	0	0	0	0	0	0	2	2	0	0	0	0	0	1	0	1	3
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	1	0	0	1	0	0	4	4	0	0	0	0	1	3	0	4	9
% App. Total	100	0	0		0	0	100		0	0	0		25	75	0		
PHF	.250	.000	.000	.250	.000	.000	.500	.500	.000	.000	.000	.000	.250	.750	.000	.500	.750

# Accurate Counts

978-664-2565

N/S Street : School St / Church St  
 E/W Street : Route 127  
 City/State : Manchester By The Sea, MA  
 Weather : Clear

File Name : 84410006  
 Site Code : 84410006  
 Start Date : 11/9/2021  
 Page No : 11

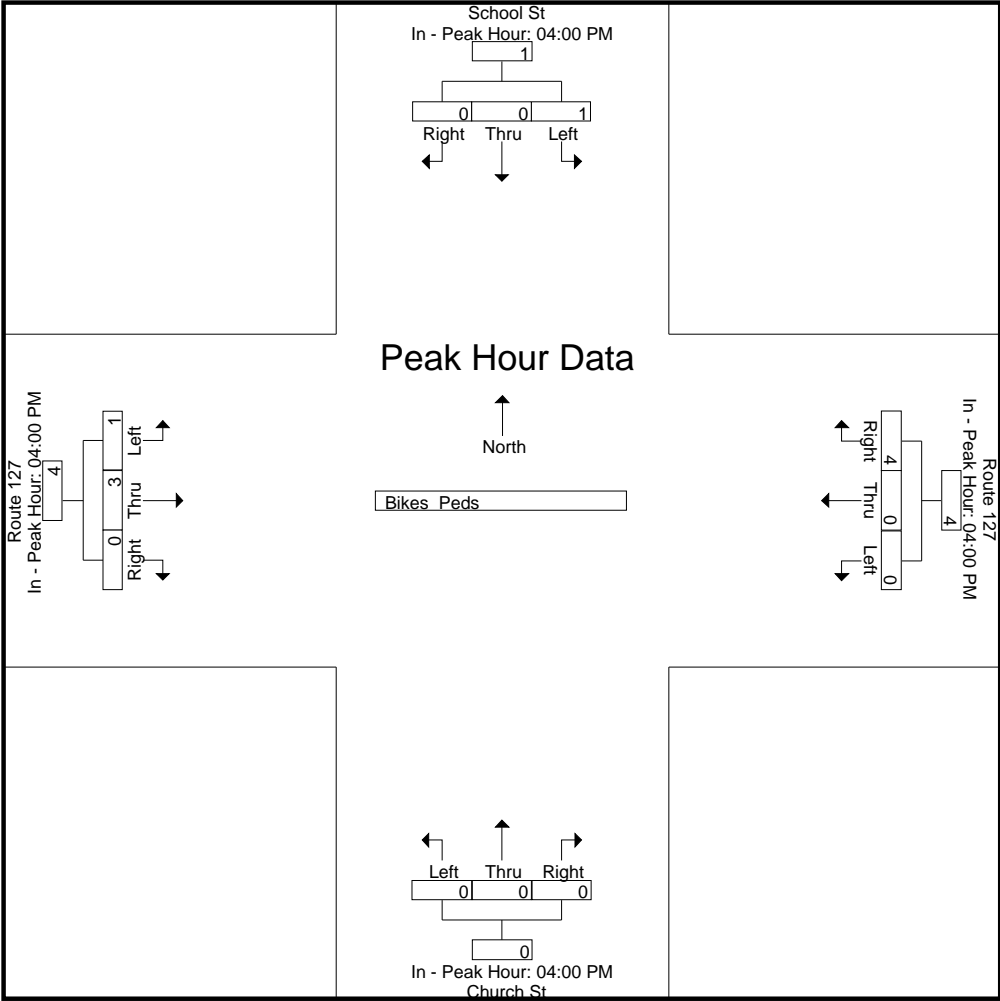


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	0	<b>2</b>	<b>2</b>	0	0	0	0	0	<b>1</b>	0	<b>1</b>
+15 mins.	<b>1</b>	0	0	<b>1</b>	0	0	0	0	0	0	0	0	<b>1</b>	<b>1</b>	0	<b>2</b>
+30 mins.	0	0	0	0	0	0	2	2	0	0	0	0	0	1	0	1
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	1	0	0	1	0	0	4	4	0	0	0	0	1	3	0	4
% App. Total	100	0	0		0	0	100		0	0	0		25	75	0	
PHF	.250	.000	.000	.250	.000	.000	.500	.500	.000	.000	.000	.000	.250	.750	.000	.500

N/S Street : School St / Church St  
E/W Street : Route 127  
City/State : Manchester By The Sea, MA  
Weather : Clear

File Name : 84410006  
Site Code : 84410006  
Start Date : 11/9/2021  
Page No : 12



## TRAIL MAPS

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# Cedar Swamp Conservation Area - Manchester-by-the-Sea - MA

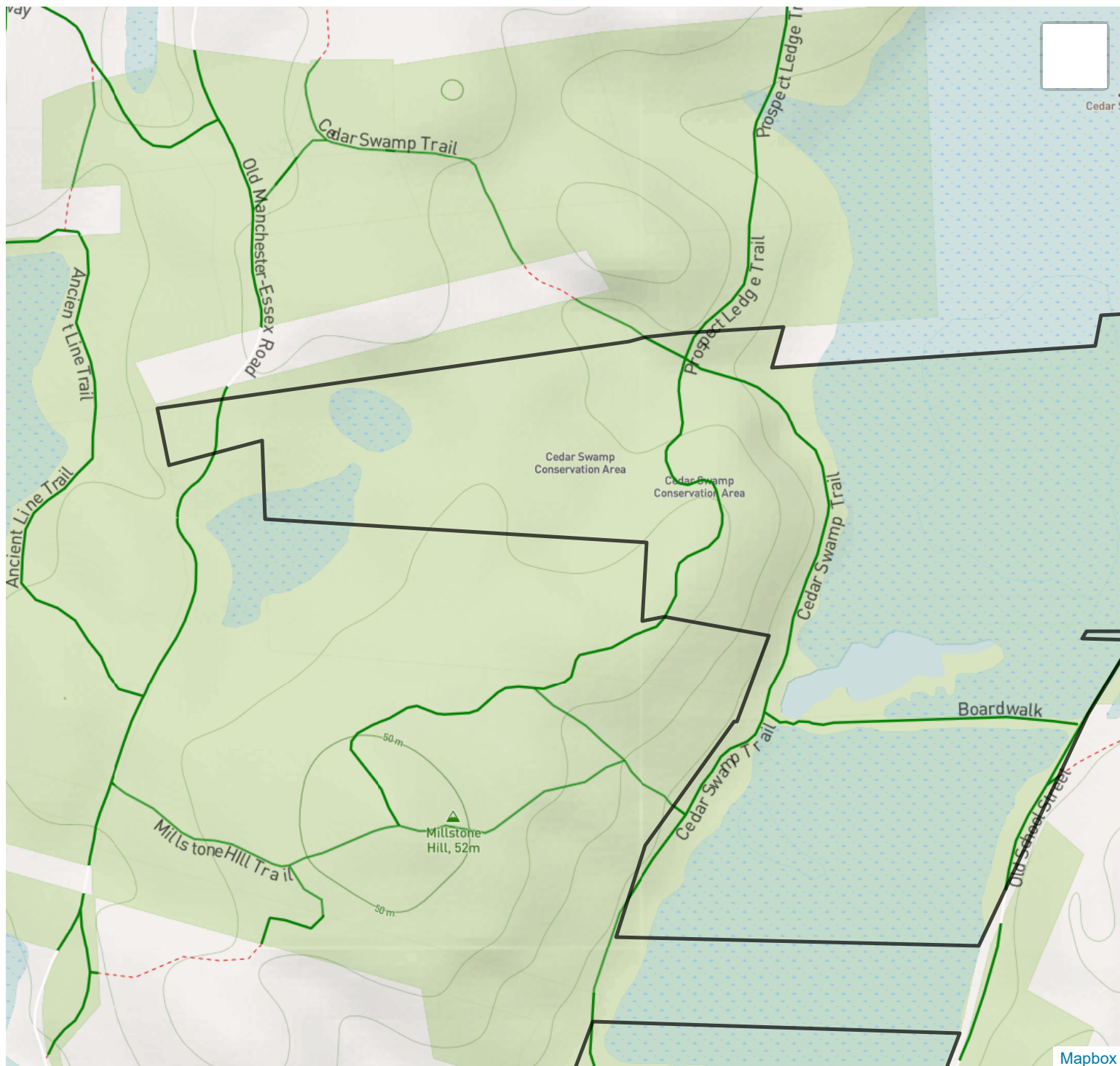
[Welcome](#) [Manchester-by-the-Sea](#) [Statewide Trail Map](#) [Search](#)  
[Contribute](#)

[Home](#) / [Towns](#) / [Manchester-by-the-Sea](#) / [Cedar Swamp Conservation Area](#)

The Cedar Swamp Conservation Area recreation ground is owned by the [Milton Land Conservation Trust](#). It is 66 acres. This property is open to the public.

The property has 1.0 miles of public trails.

## Trail Map



## SEASONAL ADJUSTMENT DATA

---

# Massachusetts Highway Department

## 35: Monthly Hourly Volume for November 2019

Location ID: 35  
County: Essex  
Functional Class: 2  
Location: YANKEE DIVISION HIGHWAY

Seasonal Factor Group: U2  
Daily Factor Group:  
Axle Factor Group: U2  
Growth Factor Group:

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	TOTAL	QC Status
1	273	175	122	131	311	1061	2099	3818	3757	3015	2985	3153	3507	3523	4109	4279	4252	4022	3245	2185	1604	1302	1004	695	54627	Accepted
2	400	192	119	103	176	361	782	1686	2294	2776	3288	3777	3881	3839	3865	3826	3913	3296	2848	2096	1519	1309	1197	821	48364	Accepted
3	428	346	75	64	133	266	551	1121	1810	2456	2946	3231	3635	3653	3559	3558	3190	2632	2069	1528	944	710	418	349	39672	Accepted
4	139	97	76	93	356	1246	2525	4357	3787	2967	2659	2862	2912	3023	3288	3992	4287	3595	2958	1762	1300	941	604	359	50185	Accepted
5	191	98	68	109	355	1223	2469	4270	3839	3041	2923	3024	3206	3238	3716	3829	3887	3820	2740	2065	1385	1048	661	367	51572	Accepted
6	175	90	73	116	365	1246	2500	4344	4003	3112	2942	2946	3152	3194	3822	4198	4334	3964	2982	2104	1505	1197	731	392	53487	Accepted
7	190	96	74	121	375	1205	2539	4350	3973	3015	2839	2876	3125	3205	3678	4318	4135	3772	2822	2108	1634	1146	744	481	52821	Accepted
8	218	117	76	117	328	1083	2251	3944	3776	3161	3039	3276	3598	3534	4099	4344	4092	3865	2945	1913	1487	1157	993	645	54058	Accepted
9	350	205	127	94	163	413	818	1544	2196	2719	3283	3855	3895	3776	3678	3725	3512	2947	2431	1757	1339	1131	1091	676	45725	Accepted
10	337	169	112	93	123	191	438	900	1545	2244	2682	3226	3605	3424	3260	3338	3298	2583	1963	1553	1209	861	578	333	38065	Accepted
11	183	115	74	92	278	863	1788	3082	3185	2880	3052	3130	3366	3338	3574	4022	3949	3537	2433	1612	1173	862	530	349	47467	Accepted
12	191	106	80	102	349	1270	2444	4317	3953	3086	2885	2778	2907	2982	3356	3762	3822	3804	2680	1689	1345	956	673	374	49911	Accepted
13	193	101	76	100	301	1188	2380	4065	3827	2981	2731	2716	2942	2970	3525	4172	4093	3791	2906	1909	1423	1060	613	431	50494	Accepted
14	189	109	81	118	346	1161	2293	4176	4014	3119	2901	2941	3069	3126	3827	4185	4152	3977	2994	2135	1534	1216	712	535	52910	Accepted
15	264	133	85	120	302	1054	2219	4047	3705	3179	3032	3018	3265	3484	4012	4348	4111	3910	2968	2074	1485	1323	888	696	53722	Accepted
16	350	178	121	84	162	400	857	1517	2292	2644	3070	3529	3808	3572	3637	3514	3397	2943	2249	1595	1348	1113	1087	703	44170	Accepted
17	347	176	114	60	84	194	437	827	1402	1979	2713	3193	3413	3411	3219	3398	2720	2007	1680	1327	1389	800	394	255	35539	Accepted
18	150	90	62	108	326	1173	2305	4067	3875	2871	2700	2701	2859	2884	3385	3831	3739	3718	2682	1762	1235	875	557	359	48314	Accepted
19	194	101	79	107	345	1205	2355	4045	3930	3006	2756	2872	2891	3100	3637	4171	4127	3878	2851	2035	1496	1093	659	429	51362	Accepted
20	210	105	80	108	315	1189	2381	4230	4103	3091	2784	2922	3066	3089	3572	3859	3918	3717	2736	2021	1457	1107	685	413	51158	Accepted
21	211	122	84	125	284	1147	2308	4081	4028	3194	2915	3054	3156	3229	3795	4334	3600	2889	3050	2242	1766	1232	765	481	52092	Accepted
22	233	127	99	108	315	1100	2282	4040	3821	3055	3133	3380	3636	3677	4123	4040	3899	3851	2858	1981	1459	1272	985	685	54159	Accepted
23	365	213	118	105	170	380	846	1602	2195	2771	3360	3660	3797	3633	3694	3793	3411	2979	2343	1673	1277	1280	985	702	45352	Accepted
24	373	199	116	86	101	206	370	799	1302	1850	2276	2718	2999	2698	2574	2383	2162	1605	1303	1088	1033	687	466	307	29701	Accepted
25	225	114	82	112	327	1240	2324	4136	3940	3084	2940	3074	3204	3343	3723	4130	3926	3817	2911	1976	1384	976	612	420	52020	Accepted
26	211	93	96	124	351	1229	2370	4185	3966	3399	3149	3337	3299	3541	4012	4287	4073	3803	3065	2269	1706	1207	804	481	55057	Accepted
27	248	138	119	110	315	1048	2093	3659	3430	3112	3168	3598	3855	3689	3682	3888	3380	2762	1928	1465	1153	932	784	543	49099	Accepted
28	294	189	113	81	107	166	354	619	829	1395	1843	2578	3380	2784	2006	1581	1849	2084	2216	2101	1780	1158	728	501	30736	Accepted
29	338	193	160	207	264	593	974	1615	1986	2523	2853	3126	3295	3420	3461	3365	3087	2690	1996	1507	1215	966	840	543	41217	Accepted
30	276	159	98	84	175	300	637	1226	1759	2480	3057	3312	3408	3283	3409	3293	3002	2565	2165	1636	1324	1169	876	653	40346	Accepted

47446.73 Nov ADT

49749 2019 ADT

0.953722

4.63%

## VEHICLE TRAVEL SPEED DATA

---

Location : School Street

84410001

Location : South of Atwater Avenue

City/State: Manchester By The Sea, MA

Direction: SB,

11/9/2021	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	
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	Total
12:00 AM	0	0	1	0	2	0	0	0	0	0	0	0	0	3
1:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1
2:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1
3:00	0	2	0	0	0	2	1	1	0	1	0	0	0	7
4:00	0	0	0	1	0	2	0	1	1	0	0	0	0	5
5:00	0	0	0	0	2	6	7	5	2	0	0	0	0	22
6:00	2	0	5	10	8	37	40	14	1	0	0	0	0	117
7:00	0	3	12	28	52	128	85	12	1	0	0	0	0	321
8:00	1	1	14	17	28	82	71	22	0	0	0	0	0	236
9:00	0	2	12	20	30	58	52	21	3	1	0	0	0	199
10:00	1	2	17	49	20	60	46	7	1	0	0	0	0	203
11:00	1	1	11	17	13	65	45	18	3	0	0	0	0	174
12:00 PM	1	1	9	25	27	83	47	13	3	0	0	0	0	209
1:00	0	1	5	22	36	55	54	14	1	0	0	0	0	188
2:00	0	4	9	32	35	71	65	11	2	0	0	0	0	229
3:00	2	2	11	31	30	86	65	10	2	0	0	0	0	239
4:00	0	0	9	32	47	93	53	10	1	0	0	0	0	245
5:00	0	0	2	24	72	73	23	5	0	0	0	0	0	199
6:00	0	0	7	21	47	44	20	8	0	0	0	0	0	147
7:00	0	0	21	27	18	22	9	3	0	0	0	0	0	100
8:00	0	1	9	11	13	19	8	3	0	0	0	0	0	64
9:00	0	0	2	9	0	12	10	5	2	0	0	0	0	40
10:00	0	0	0	3	4	0	4	1	0	1	0	0	0	13
11:00	0	0	0	0	0	2	0	0	0	0	0	0	0	2
Total	8	20	156	379	486	1000	705	184	23	3	0	0	0	2964

Percentile 15th 50th 85th 95th

Speed 28.5 37.2 42.8 45.9

Mean Speed (Average) 36.4

10 MPH Pace Speed 35-44

Number in Pace 1701

Percent in Pace 57.4%

Number &gt; 35 MPH 1915

Percent &gt; 35 MPH 64.6%

84410001

11/10/2021	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	
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	Total
12:00 AM	0	0	0	0	0	0	1	1	1	0	0	0	0	3
1:00	0	1	0	0	1	0	0	0	0	0	0	0	0	2
2:00	0	0	0	1	0	2	0	0	0	0	0	0	0	3
3:00	0	0	0	1	1	1	0	0	0	1	0	0	0	4
4:00	0	0	0	1	1	3	2	1	1	0	0	0	0	9
5:00	0	0	0	0	3	6	5	3	0	0	0	0	0	17
6:00	1	1	5	1	15	33	30	7	3	1	0	0	0	97
7:00	0	0	20	25	55	108	85	12	2	0	0	0	0	307
8:00	1	3	9	15	37	83	74	15	1	0	0	0	0	238
9:00	1	0	20	20	35	44	34	5	0	0	0	0	0	159
10:00	1	1	16	26	22	54	56	10	0	0	0	0	0	186
11:00	0	0	10	20	13	61	57	15	0	0	0	0	0	176
12:00 PM	1	0	10	22	15	37	58	17	1	0	0	0	0	161
1:00	0	1	6	18	32	72	41	11	2	0	0	0	0	183
2:00	1	1	8	20	37	62	52	18	3	1	0	0	0	203
3:00	0	1	7	20	38	63	83	18	1	0	0	0	0	231
4:00	0	0	15	36	69	96	53	9	0	0	0	0	0	278
5:00	0	0	8	30	48	52	26	8	0	1	0	0	0	173
6:00	0	1	5	21	17	50	24	9	0	0	0	0	0	127
7:00	0	1	14	23	8	31	21	3	0	0	0	0	0	101
8:00	0	3	10	13	13	25	18	4	0	0	0	0	0	86
9:00	0	0	3	13	14	17	9	2	1	0	0	0	0	59
10:00	0	0	1	2	5	11	11	4	4	1	0	0	0	39
11:00	0	0	0	0	6	8	7	3	2	0	0	0	0	26
Total	6	14	167	328	485	919	747	175	22	5	0	0	0	2868
			Percentile	15th	50th	85th	95th							
			Speed	28.5	37.8	42.8	45.9							
			Mean Speed (Average)	36.6										
			10 MPH Pace Speed	35-44										
			Number in Pace	1661										
			Percent in Pace	57.9%										
			Number > 35 MPH	1868										
			Percent > 35 MPH	65.1%										
Grand Total	14	34	323	707	971	1919	1452	359	45	8	0	0	0	5832
Stats			Percentile	15th	50th	85th	95th							
			Speed	28.5	37.2	42.8	45.9							
			Mean Speed (Average)	36.5										
			10 MPH Pace Speed	35-44										
			Number in Pace	3361										
			Percent in Pace	57.6%										
			Number > 35 MPH	3783										
			Percent > 35 MPH	64.9%										

Location : School Street

84410001

Location : South of Atwater Avenue

City/State: Manchester By The Sea, MA

Direction: NB,

11/9/2021	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	
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	Total
12:00 AM	0	0	0	0	1	0	1	0	0	0	0	0	0	2
1:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1
2:00	0	0	0	0	0	0	0	0	1	0	0	0	0	1
3:00	0	2	2	0	0	0	0	0	0	0	0	0	0	4
4:00	0	0	0	0	1	1	1	1	0	0	0	0	0	4
5:00	0	0	8	5	1	5	5	3	0	0	0	0	0	27
6:00	1	0	25	13	6	20	16	7	4	0	0	0	0	92
7:00	0	8	46	37	21	68	67	19	2	0	0	0	0	268
8:00	0	9	65	58	27	55	56	19	1	1	0	0	0	291
9:00	0	11	27	26	15	49	52	26	4	1	0	0	0	211
10:00	0	6	30	21	17	51	58	20	0	0	0	0	0	203
11:00	0	13	22	25	27	55	71	23	2	0	0	0	0	238
12:00 PM	1	6	19	15	23	77	67	26	5	0	0	0	0	239
1:00	0	4	19	22	19	79	89	15	6	0	0	0	0	253
2:00	1	10	17	26	21	101	88	22	1	1	0	0	0	288
3:00	1	14	37	40	22	115	92	17	1	0	0	0	0	339
4:00	0	4	43	47	49	120	81	17	2	0	0	0	0	363
5:00	0	0	34	29	44	85	30	4	0	0	0	0	0	226
6:00	0	3	24	25	23	60	23	4	2	0	0	0	0	164
7:00	0	0	14	2	12	33	20	0	0	0	0	0	0	81
8:00	0	1	5	2	6	17	7	3	0	0	0	0	0	41
9:00	0	0	0	2	4	24	20	2	0	0	0	0	0	52
10:00	0	0	2	0	0	2	2	2	1	0	0	0	0	9
11:00	0	0	0	0	0	6	2	0	0	0	0	0	0	8
Total	4	91	439	395	339	1024	848	230	32	3	0	0	0	3405

Percentile	15th	50th	85th	95th
Speed	24.8	37.2	42.8	45.9
Mean Speed (Average)	35.5			
10 MPH Pace Speed	35-44			
Number in Pace	1862			
Percent in Pace	54.7%			
Number > 35 MPH	2137			
Percent > 35 MPH	62.8%			



84410001

[illegible]

Location : School Street

84410001

Location : South of Atwater Avenue

City/State: Manchester By The Sea, MA

Direction: Combined

11/9/2021	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	
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	Total
12:00 AM	0	0	1	0	3	0	1	0	0	0	0	0	0	5
1:00	0	0	0	0	1	1	0	0	0	0	0	0	0	2
2:00	0	0	0	0	1	0	0	0	1	0	0	0	0	2
3:00	0	4	2	0	0	2	1	1	0	1	0	0	0	11
4:00	0	0	0	1	1	3	1	2	1	0	0	0	0	9
5:00	0	0	8	5	3	11	12	8	2	0	0	0	0	49
6:00	3	0	30	23	14	57	56	21	5	0	0	0	0	209
7:00	0	11	58	65	73	196	152	31	3	0	0	0	0	589
8:00	1	10	79	75	55	137	127	41	1	1	0	0	0	527
9:00	0	13	39	46	45	107	104	47	7	2	0	0	0	410
10:00	1	8	47	70	37	111	104	27	1	0	0	0	0	406
11:00	1	14	33	42	40	120	116	41	5	0	0	0	0	412
12:00 PM	2	7	28	40	50	160	114	39	8	0	0	0	0	448
1:00	0	5	24	44	55	134	143	29	7	0	0	0	0	441
2:00	1	14	26	58	56	172	153	33	3	1	0	0	0	517
3:00	3	16	48	71	52	201	157	27	3	0	0	0	0	578
4:00	0	4	52	79	96	213	134	27	3	0	0	0	0	608
5:00	0	0	36	53	116	158	53	9	0	0	0	0	0	425
6:00	0	3	31	46	70	104	43	12	2	0	0	0	0	311
7:00	0	0	35	29	30	55	29	3	0	0	0	0	0	181
8:00	0	2	14	13	19	36	15	6	0	0	0	0	0	105
9:00	0	0	2	11	4	36	30	7	2	0	0	0	0	92
10:00	0	0	2	3	4	2	6	3	1	1	0	0	0	22
11:00	0	0	0	0	0	8	2	0	0	0	0	0	0	10
Total	12	111	595	774	825	2024	1553	414	55	6	0	0	0	6369

Percentile	15th	50th	85th	95th
Speed	26.6	37.2	42.8	45.9
Mean Speed (Average)	35.9			
10 MPH Pace Speed	35-44			
Number in Pace	3562			
Percent in Pace	55.9%			
Number > 35 MPH	4052			
Percent > 35 MPH	63.6%			

84410001

11/10/2021	0 - 15	> 15 -	> 20 -	> 25 -	> 30 -	> 35 -	> 40 -	> 45 -	> 50 -	> 55 -	> 60 -	> 65 -	> 70	
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	Total
12:00 AM	0	0	0	0	0	1	3	2	1	0	0	0	0	7
1:00	1	4	1	0	2	0	1	0	0	0	0	0	0	9
2:00	0	0	0	3	0	3	0	0	0	0	0	0	0	6
3:00	0	0	0	1	2	1	0	0	0	1	0	0	0	5
4:00	0	0	1	1	1	6	2	1	1	0	0	0	0	13
5:00	0	2	9	3	4	10	8	6	2	0	0	0	0	44
6:00	1	5	20	24	20	61	40	11	4	1	0	0	0	187
7:00	0	1	46	72	79	182	156	33	5	0	0	0	0	574
8:00	2	5	65	74	57	142	129	36	2	0	0	0	0	512
9:00	1	0	38	38	58	103	82	14	0	0	0	0	0	334
10:00	1	5	58	51	38	101	114	19	1	0	0	0	0	388
11:00	0	4	31	38	23	102	143	33	4	0	1	0	0	379
12:00 PM	1	8	29	43	29	112	143	31	1	0	0	0	0	397
1:00	3	4	20	37	58	136	104	32	5	2	0	0	0	401
2:00	1	4	19	47	68	153	130	40	7	2	0	0	0	471
3:00	0	16	51	66	76	157	168	36	3	0	0	0	0	573
4:00	0	13	60	64	126	213	109	18	2	0	0	0	0	605
5:00	4	7	35	55	76	161	77	12	0	1	0	0	0	428
6:00	0	3	36	35	42	98	57	13	0	0	0	0	0	284
7:00	0	8	32	39	17	62	43	8	0	0	0	0	0	209
8:00	0	3	17	15	30	49	34	8	0	0	1	0	0	157
9:00	0	0	5	15	29	61	33	6	1	0	0	0	0	150
10:00	0	0	1	3	16	29	27	6	5	1	1	0	0	89
11:00	0	0	1	0	10	17	17	4	2	0	0	0	0	51
Total	15	92	575	724	861	1960	1620	369	46	8	3	0	0	6273
			Percentile	15th	50th	85th	95th							
			Speed	26.6	37.2	42.8	45.9							
	Mean Speed (Average)			36.0										
	10 MPH Pace Speed			35-44										
	Number in Pace			3565										
	Percent in Pace			56.8%										
	Number > 35 MPH			4006										
	Percent > 35 MPH			63.9%										
Grand Total	27	203	1170	1498	1686	3984	3173	783	101	14	3	0	0	12642
Stats			Percentile	15th	50th	85th	95th							
			Speed	26.6	37.2	42.8	45.9							
	Mean Speed (Average)			35.9										
	10 MPH Pace Speed			35-44										
	Number in Pace			7127										
	Percent in Pace			56.4%										
	Number > 35 MPH			8058										
	Percent > 35 MPH			63.7%										

## PUBLIC TRANSPORTATION SCHEDULES

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# NEWBURYPORT/ROCKPORT LINE

## 2021 Fall/Winter Schedule

Effective October 11, 2021

**B:** Due to construction activities for the Gloucester Drawbridge Replacement project, bus shuttles will replace train service between Rockport, Gloucester, West Gloucester (and Manchester on designated outbound trips) on the Rockport Line. Bikes are not allowed on board buses.

### Monday to Friday (except when Storm Service is operating)

Inbound to Boston		AM															PM														
ZONE	STATION	TRAIN #	140 	100 	142	102	144	104	146	106	148	108 	150 	192 	110 	152 	112 	154 	114 	156 	198 	116 	158 	118 	160 	120 	162 	122 	124 	164 	
	Bikes Allowed																														
8	Rockport	♂	-	B 4:58	-	B 6:03	-	B 7:03	-	B 8:03	-	B 9:03	-	-	B 10:33	-	B 12:03	-	B 1:33	-	-	B 3:03	-	-	-	B 5:36	-	B 7:36	B 8:40	-	
7	Gloucester	♂	-	B 5:05	-	B 6:10	-	B 7:10	-	B 8:10	-	B 9:10	-	-	B 10:40	-	B 12:10	-	B 1:40	-	-	B 3:10	-	-	-	B 5:43	-	B 7:43	B 8:47	-	
7	West Gloucester	♂	-	5:21	-	6:26	-	7:26	-	8:26	-	9:26	-	-	10:56	-	12:26	-	1:56	-	-	3:26	-	-	-	5:59	-	7:59	9:03	-	
6	Manchester	♂	-	5:28	-	6:33	-	7:33	-	8:33	-	9:33	-	-	11:03	-	12:33	-	2:03	-	-	3:33	-	-	-	6:06	-	8:06	9:10	-	
5	Beverly Farms	♂	-	5:34	-	6:39	-	7:39	-	8:39	-	f 9:39	-	-	f 11:09	-	f 12:39	-	f 2:09	-	-	f 3:39	-	-	-	f 6:12	-	f 8:12	f 9:16	-	
4	Montserrat	♂	-	5:40	-	6:45	-	7:45	-	8:45	-	f 9:45	-	-	f 11:15	-	f 12:45	-	f 2:15	-	-	f 3:45	-	-	-	f 6:18	-	f 8:18	f 9:22	-	
8	Newburyport	♂	4:49	-	5:54	-	6:54	-	7:54	-	8:54	-	9:54	-	-	11:24	-	12:54	-	2:24	-	-	3:54	-	5:07	-	6:57	-	-	9:39	
7	Rowley	♂	4:54	-	5:59	-	6:59	-	7:59	-	8:59	-	f 9:59	-	-	f 11:29	-	f 12:59	-	f 2:29	-	-	f 3:59	-	f 5:12	-	f 7:02	-	-	f 9:44	
6	Ipswich	♂	5:00	-	6:05	-	7:05	-	8:05	-	9:05	-	10:05	-	-	11:35	-	1:05	-	2:35	-	-	4:05	-	5:18	-	7:08	-	-	9:50	
5	Hamilton/Wenham	♂	5:06	-	6:11	-	7:11	-	8:11	-	9:11	-	f 10:11	-	-	f 11:41	-	f 1:11	-	f 2:41	-	-	f 4:11	-	f 5:31	-	f 7:14	-	-	f 9:56	
5	North Beverly	♂	5:10	-	6:15	-	7:15	-	8:15	-	9:15	-	f 10:15	-	-	f 11:45	-	f 1:15	-	f 2:45	-	-	f 4:15	-	f 5:35	-	f 7:18	-	-	f 10:00	
4	Beverly	♂	5:15	5:45	6:20	6:50	7:20	7:50	8:20	8:50	9:20	9:50	10:20	10:50	11:20	11:50	12:50	1:20	2:20	2:50	3:20	3:50	4:20	5:14	5:40	6:23	7:23	8:23	9:27	10:05	
3	Salem	♂	5:19	5:49	6:24	6:54	7:24	7:54	8:24	8:54	9:24	9:54	10:24	10:54	11:24	11:54	12:54	1:24	2:24	2:54	3:24	3:54	4:24	5:18	5:44	6:27	7:27	8:27	9:31	10:09	
3	Swampscott	♂	5:26	5:56	6:31	7:01	7:31	8:01	8:31	9:01	9:31	10:01	10:31	11:01	11:31	12:01	1:01	1:31	2:31	3:01	3:31	4:01	4:31	5:25	5:51	6:34	7:34	8:34	9:38	10:16	
2	Lynn	♂	5:29	5:59	6:34	7:04	7:34	8:04	8:34	9:04	9:34	10:04	10:34	11:04	11:34	12:04	1:04	1:34	2:34	3:04	3:34	4:04	4:34	5:28	5:54	6:37	7:37	8:37	9:41	10:19	
2	River Works	♂	f 5:32	f 6:02	f 6:37	f 7:07	-	f 8:07	f 8:37	-	-	-	-	-	-	-	f 1:13	f 1:43	f 2:37	f 3:07	f 3:37	f 4:07	f 4:37	f 5:31	f 5:57	f 6:40	f 7:40	-	-	f 10:22	
1A	Chelsea	♂	5:39	6:09	6:45	7:15	7:44	8:15	8:45	9:14	f 9:43	f 10:13	f 10:43	f 11:13	f 11:43	f 12:13	f 1:13	f 1:43	f 2:44	f 3:14	f 3:44	f 4:14	f 4:44	f 5:38	f 6:04	f 6:47	f 7:47	f 8:46	f 9:50	f 10:29	
1A	North Station	♂	5:53	6:24	7:00	7:31	7:59	8:31	9:00	9:29	9:58	10:28	10:57	11:26	11:58	12:27	1:28	1:57	2:59	3:28	3:57	4:29	4:58	5:53	6:19	7:02	8:01	9:01	10:05	10:43	

### Keep in Mind:

This schedule will be effective from October 11, 2021 and will replace the schedule of June 28, 2021.

#### Holiday Service

On Thursday, November 25th 2021 (Thanksgiving Day), Saturday, December 25th 2021 (Christmas Day), and Saturday, January 1st 2022 (New Year's day), all lines will operate on a weekend schedule. On Friday, November 26th 2021, Friday, December 24th 2021 (Christmas Eve) and Friday, December 31st 2021 (New Year's Eve), all lines will operate on a regular weekday schedule. For all holiday schedules, please check MBTA.com/holidays or call 617-222-3200.

Masks are federally required on board and in station. Visit [MBTA.com/covid19](https://www.mbta.com/covid19) for the latest updates.

### Monday to Friday (except when Storm Service is operating)

Outbound from Boston			AM													PM																
ZONE	STATION	TRAIN #	141	101	143	103	145	105	191	147	107	149	109	151	111	197	153	113	155	115	157	117	159	119	161	121	163	123	165	125	167	
	Bikes Allowed																															
1A	North Station	♂	5:35	6:35	7:35	7:50	8:35	9:05	9:35	10:05	10:35	11:35	12:05	1:05	1:35	2:05	2:35	3:05	3:35	4:05	4:35	5:05	5:35	6:05	6:40	7:20	8:05	8:50	9:35	11:00	Board Rockport Train 125 and change trains at Salem for a Newburyport connection	
1A	Chelsea	♂	f 5:46	f 6:46	f 7:46	-	f 8:46	f 9:16	f 9:46	f 10:16	f 10:46	f 11:46	f 12:16	f 1:16	f 1:46	f 2:16	f 2:46	f 3:16	3:46	4:16	4:46	5:16	5:46	6:16	6:51	f 7:31	f 8:16	f 9:01	f 9:46	f 11:11		
2	River Works	♂	f 5:53	f 6:53	f 7:53	-	-	-	-	-	-	-	-	-	f 1:54	-	f 2:54	f 3:24	f 3:54	f 4:24	-	f 5:24	f 5:54	-	f 6:59	f 7:39	-	-	-	f 11:19		
2	Lynn	♂	5:56	6:56	7:56	-	8:55	9:25	9:55	10:25	10:55	11:55	12:25	1:25	1:56	2:25	2:56	3:26	3:56	4:26	4:55	5:26	5:56	6:25	7:01	7:41	8:25	9:10	9:55	11:21		
3	Swampscott	♂	5:59	6:59	7:59	-	8:58	9:28	9:58	10:28	10:58	11:58	12:28	1:28	1:59	2:28	2:59	3:29	3:59	4:29	4:58	5:29	5:59	6:28	7:04	7:44	8:28	9:13	9:58	11:24		
3	Salem	♂	6:06	7:06	8:06	8:16	9:05	9:35	10:05	10:35	11:05	12:05	12:35	1:35	2:06	2:35	3:06	3:36	4:06	4:36	5:05	5:36	6:06	6:35	7:11	7:51	8:35	9:20	10:05	11:31		
4	Beverly	♂	6:10	7:10	8:10	8:20	9:09	9:39	10:10	10:39	11:09	12:09	12:39	1:39	2:10	2:40	3:10	3:40	4:10	4:40	5:09	5:40	6:10	6:39	7:15	7:55	8:39	9:24	10:09	11:35		
5	North Beverly	♂	f 6:14	-	f 8:14	-	f 9:13	-	-	f 10:43	-	f 12:13	-	f 1:43	-	-	f 3:14	-	4:14	-	5:13	-	6:14	-	7:19	-	8:43	-	10:13	-		11:48
5	Hamilton/Wenham	♂	f 6:18	-	f 8:18	-	f 9:17	-	-	f 10:47	-	f 12:17	-	f 1:47	-	-	f 3:18	-	4:19	-	5:18	-	6:19	-	7:24	-	8:47	-	10:17	-		11:52
6	Ipswich	♂	6:24	-	8:24	-	9:23	-	-	10:53	-	12:23	-	1:53	-	-	3:24	-	4:25	-	5:25	-	6:26	-	7:30	-	8:53	-	10:23	-		11:58
7	Rowley	♂	f 6:30	-	f 8:30	-	f 9:29	-	-	f 10:59	-	f 12:29	-	f 1:59	-	-	f 3:30	-	4:31	-	5:31	-	6:32	-	7:36	-	f 8:59	-	f 10:29	-	f 12:04	
8	Newburyport	♂	6:39	-	8:39	-	9:39	-	-	11:09	-	12:39	-	2:09	-	-	3:40	-	4:41	-	5:41	-	6:42	-	7:46	-	9:09	-	10:39	-	12:14	
4	Montserrat	♂	-	f 7:14	-	-	-	f 9:43	-	-	f 11:13	-	f 12:43	-	f 2:14	-	-	f 3:44	-	4:44	-	5:44	-	6:43	-	f 7:59	-	f 9:28	-	f 11:39	-	-
5	Beverly Farms	♂	-	f 7:20	-	-	-	f 9:49	-	-	f 11:19	-	f 12:49	-	f 2:20	-	-	f 3:50	-	4:51	-	5:51	-	6:50	-	f 8:05	-	f 9:34	-	f 11:45	-	-
6	Manchester	♂	-	B 7:26	-	-	-	B 9:55	-	-	B 11:25	-	B 12:55	-	B 2:26	-	-	B 3:56	-	B 4:57	-	5:57	-	B 6:56	-	B 8:12	-	B 9:40	-	B 11:51	-	-
7	West Gloucester	♂	-	B 7:46	-	-	-	B 10:15	-	-	B 11:45	-	B 1:15	-	B 2:46	-	-	B 4:16	-	B 5:17	-	B 6:03	-	B 7:16	-	B 8:32	-	B 10:00	-	B 12:11	-	-
7	Gloucester	♂	-	B 7:54	-	-	-	B 10:23	-	-	B 11:53	-	B 1:23	-	B 2:54	-	-	B 4:24	-	B 5:25	-	B 6:16	-	B 7:24	-	B 8:40	-	B 10:08	-	B 12:11	-	-
8	Rockport	♂	-	B 7:54	-	-	-	B 10:23	-	-	B 11:53	-	B 1:23	-	B 2:54	-	-	B 4:24	-	B 5:25	-	B 6:23	-	B 7:24	-	B 8:40	-	B 10:08	-	B 12:19	-	-

### Weekend & Storm Service

Inbound to Boston		AM									PM									
SATURDAY TRAIN #		1150	1100	1152	1102	1154	1104	1156	1106	SATURDAY TRAIN #		1150	1100	1152	1102	1154	1104	1156	1106	
ZONE	STATION	SUNDAY TRAIN #	2150	2100	2152	2102	2154	2104	2156	2106	1158	1108	1160	1110	1162	1112	1164	1114	1166	1116
Bikes Allowed																				
8	Rockport	♂	-	B 5:50	-	B 7:50	-	B 9:50	-	B 11:50	-	B 1:50	-	B 3:50	-	B 5:50	-	B 7:50	-	B 9:50
7	Gloucester	♂	-	B 5:57	-	B 7:57	-	B 9:57	-	B 11:57	-	B 1:57	-	B 3:57	-	B 5:57	-	B 7:57	-	B 9:57
7	West Gloucester	♂	-	6:13	-	8:13	-	10:13	-	12:13	-	2:13	-	4:13	-	6:13	-	8:13	-	10:13
6	Manchester	♂	-	6:20	-	8:20	-	10:20	-	12:20	-	2:20	-	4:20	-	6:20	-	8:20	-	10:20
5	Beverly Farms	♂	-	f 6:26	-	f 8:26	-	f 10:26	-	f 12:26	-	f 2:26	-	f 4:26	-	f 6:26	-	f 8:26	-	f 10:26
4	Montserrat	♂	-	f 6:32	-	f 8:32	-	f 10:32	-	f 12:32	-	f 2:32	-	f 4:32	-	f 6:32	-	f 8:32	-	f 10:32
8	Newburyport	♂	5:10	-	7:10	-	9:10	-	11:10	-	1:10	-	3:10	-	5:10	-	7:10	-	9:10	-
7	Rowley	♂	5:15	-	7:15	-	9:15	-	11:15	-	1:15	-	3:15	-	5:15	-	7:15	-	9:15	-
6	Ipswich	♂	5:21	-	7:21	-	9:21	-	11:21	-	1:21	-	3:21	-	5:21	-	7:21	-	9:21	-
5	Hamilton/Wenham	♂	5:27	-	7:27	-	9:27	-	11:27	-	1:27	-	3:27	-	5:27	-	7:27	-	9:27	-
5	North Beverly	♂	f 5:31	-	f 7:31	-	f 9:31	-	f 11:31	-	f 1:31	-	f 3:31	-	f 5:31	-	f 7:31	-	f 9:31	-
4	Beverly	♂	5:37	6:37	7:37	8:37	9:37	10:37	11:37	12:37	1:37	2:37	3:37	4:37	5:37	6:37	7:37	8:37	9:37	10:37
3	Salem	♂	5:41	6:41	7:41	8:41	9:41	10:41	11:41	12:41	1:41	2:41	3:41	4:41	5:41	6:41	7:41	8:41	9:41	10:41
3	Swampscott	♂	5:48	6:48	7:48	8:48	9:48	10:48	11:48	12:48	1:48	2:48	3:48	4:48	5:48	6:48	7:48	8:48	9:48	10:48
2	Lynn	♂	5:51	6:51	7:51	8:51	9:51	10:51	11:51	12:51	1:51	2:51	3:51	4:51	5:51	6:51	7:51	8:51	9:51	10:51
1A	Chelsea		f 6:00	f 7:00	f 8:00	f 9:00	f 10:00	f 11:00	f 12:00	f 1:00	f 2:00	f 3:00	f 4:00	f 5:00	f 6:00	f 7:00	f 8:00	f 9:00	f 10:00	f 11:00
1A	North Station	♂	6:14	7:15	8:14	9:15	10:14	11:15	12:14	1:15	2:14	3:15	4:14	5:15	6:14	7:15	8:14	9:15	10:14	11:15

## MASSDOT CRASH RATE WORKSHEETS AND HIGH CRASH LOCATION MAPPING

## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Manchester-by-the-Sea COUNT DATE : Nov-21

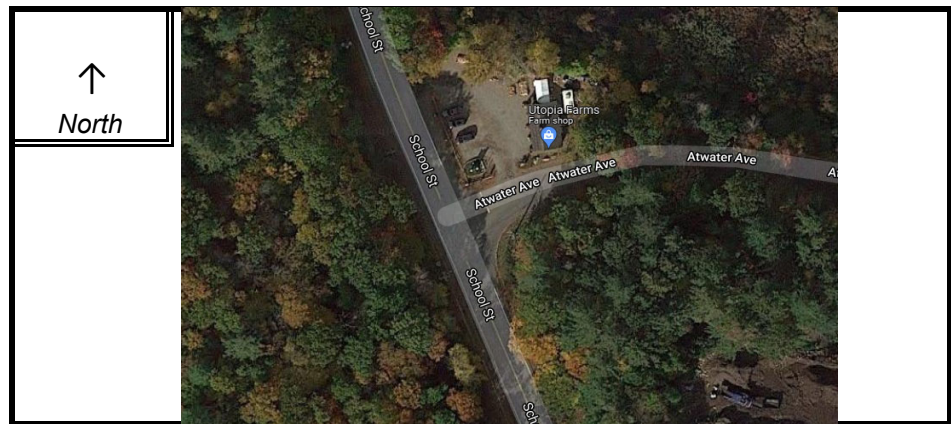
DISTRICT : 4 UNSIGNALIZED : ☒ SIGNALIZED : ☐

### ~ INTERSECTION DATA ~

MAJOR STREET : School Street

MINOR STREET(S) : Atwater Avenue

**INTERSECTION  
DIAGRAM**  
(Label Approaches)



### PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (AM/PM) :	392	283	0	82		757

" K " FACTOR : **0.090** INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME : **8,411**

TOTAL # OF CRASHES : **2** # OF YEARS : **5** AVERAGE # OF CRASHES PER YEAR ( A ) : **0.40**

CRASH RATE CALCULATION :

**0.13**

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

Comments : \_\_\_\_\_

Project Title & Date: 8441 - Manchester-by-the-Sea



## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Manchester-by-the-Sea COUNT DATE : Nov-21

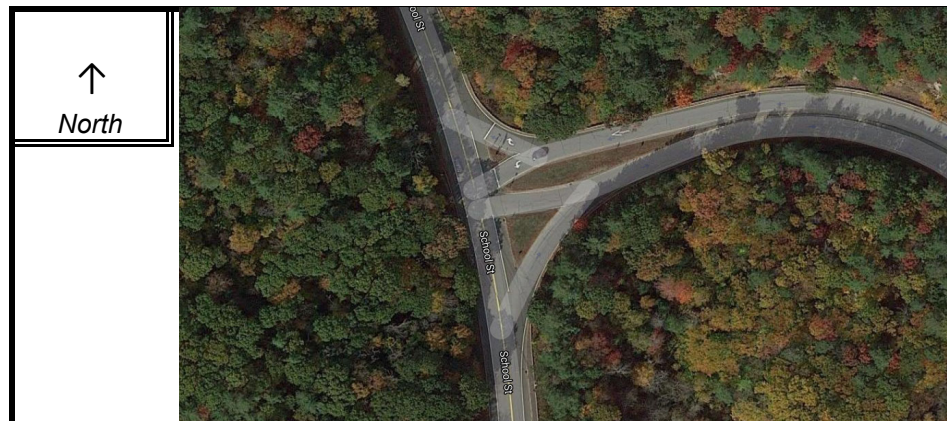
DISTRICT : 4 UNSIGNALIZED : ☒ SIGNALIZED : ☐

### ~ INTERSECTION DATA ~

MAJOR STREET : School Street

MINOR STREET(S) : Route 128 Southbound Ramps

**INTERSECTION  
DIAGRAM**  
(Label Approaches)



### PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (AM/PM) :	559	377	0	115		1,051

" K " FACTOR :

**0.090**

INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME :

**11,678**

TOTAL # OF CRASHES :

**7**

# OF YEARS :

**5**

AVERAGE # OF CRASHES PER YEAR ( A ) :

**1.40**

**CRASH RATE CALCULATION :**

**0.33**

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

Comments : \_\_\_\_\_

Project Title & Date: 8441 - Manchester-by-the-Sea

## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Manchester-by-the-Sea COUNT DATE : Nov-21

DISTRICT : 4 UNSIGNALIZED : ☒ SIGNALIZED : ☐

### ~ INTERSECTION DATA ~

MAJOR STREET : School Street

MINOR STREET(S) : Route 128 Northbound Ramps

Mill Street

**INTERSECTION  
DIAGRAM**  
(Label Approaches)



### PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (AM/PM) :	461	315	369	44		1,189

" K " FACTOR : **0.090** INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME : **13,211**

TOTAL # OF CRASHES : **4** # OF YEARS : **5** AVERAGE # OF CRASHES PER YEAR ( A ) : **0.80**

CRASH RATE CALCULATION :

**0.17**

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

Comments : \_\_\_\_\_

Project Title & Date : 8441 - Manchester-by-the-Sea

## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Manchester-by-the-Sea COUNT DATE : Nov-21

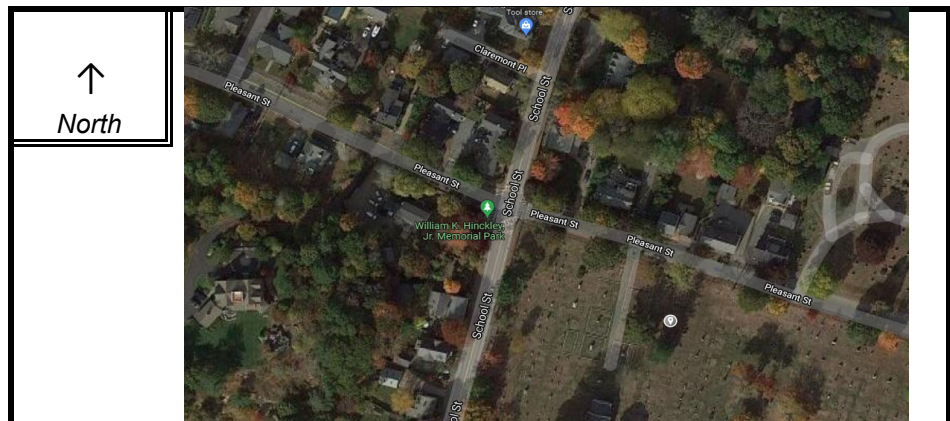
DISTRICT : 4 UNSIGNALIZED : ☒ SIGNALIZED : ☐

### ~ INTERSECTION DATA ~

MAJOR STREET : School Street

MINOR STREET(S) : Pleasant Street

**INTERSECTION  
DIAGRAM**  
(Label Approaches)



### PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (AM/PM) :	256	430	90	211		987

" K " FACTOR :

**0.090**

INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME :

**10,967**

TOTAL # OF CRASHES :

**8**

# OF YEARS :

**5**

AVERAGE # OF CRASHES PER YEAR ( A ) :

**1.60**

CRASH RATE CALCULATION :

**0.40**

RATE =

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

Comments : \_\_\_\_\_

Project Title & Date: 8441 - Manchester-by-the-Sea

## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Manchester-by-the-Sea COUNT DATE : Nov-21

DISTRICT : 4 UNSIGNALIZED : ☒ SIGNALIZED : ☐

### ~ INTERSECTION DATA ~

MAJOR STREET : Route 127

MINOR STREET(S) : School Street

**INTERSECTION  
DIAGRAM**  
(Label Approaches)



### PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (AM/PM) :	0	209	394	436		1,039

" K " FACTOR : **0.090** INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME : **11,544**

TOTAL # OF CRASHES : **3** # OF YEARS : **5** AVERAGE # OF CRASHES PER YEAR ( A ) : **0.60**

CRASH RATE CALCULATION :

**0.14**

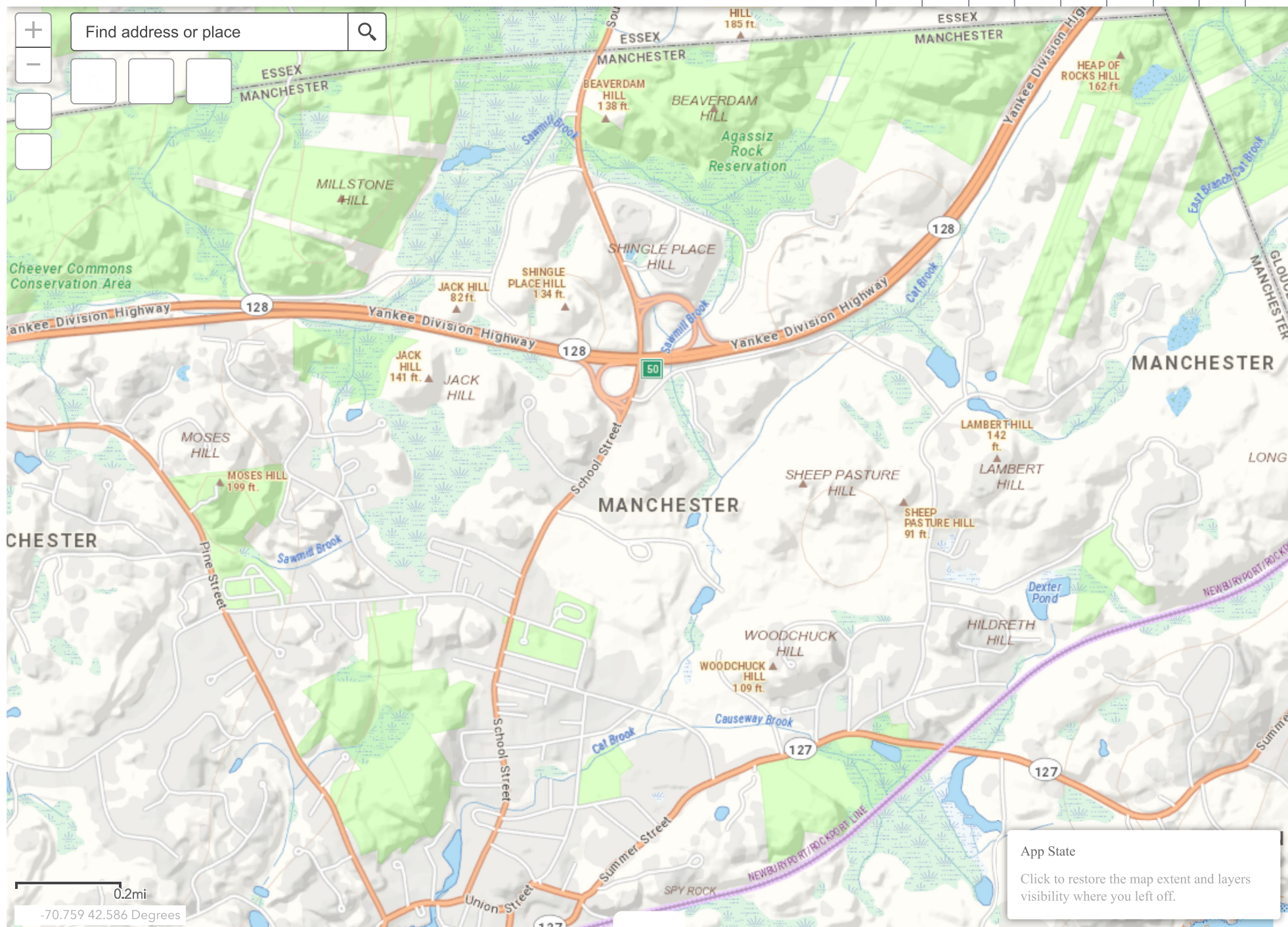
$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : \_\_\_\_\_

Project Title & Date: 8441 - Manchester-by-the-Sea



Accessible Version



## GENERAL BACKGROUND TRAFFIC GROWTH

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**General Background Traffic Growth - Daily Traffic Volumes**

<b>CITY/TOWN</b>	<b>ROUTE/STREET</b>	<b>LOCATION</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>Annual Growth Rate</b>
Beverly	Essex Street	at Wenham town line	4,667	4,400	4,399	4,199	4,083	4,210	4,307	4,792	4,873	4,888	4,868	<b>0.52%</b>
Beverly	Hale Street	east of Haskell Street	4,783	4,742	4,218	3,991	4,004	4,375	4,476		4,796	4,810	4,791	<b>-0.69%</b>
Beverly	Route 128	at Wenham town line	44,664	44,798	46,385	36,107	36,127	36,705	38,173	40,005	40,325	40,728	41,543	<b>-0.41%</b>
Wenham	Grapevine Road	west of Route 128	5,481	5,433	5,539	5,062	5,065	5,961	6,098	6,476	6,828	6,848	6,821	<b>2.40%</b>
Manchester by the Sea	Route 128	at Manchester town line	38,500	28,700	28,944	32,524	33,075	33,604	37,827	39,643	39,960	40,360	41,167	<b>1.22%</b>
Gloucester	Route 128	east of Route 133 ramp to Route 128 southbound		33,547	34,458	35,530	39,390	33,864	35,604	36,194	36,377	35,677	38,039	<b>1.63%</b>
Manchester by the Sea	Route 128	at Wenham town line	41,300	41,392	41,578	29,663	29,777	30,253	38,859	40,724	41,050	41,461	42,290	<b>1.10%</b>
														<b>0.83%</b>



## TRIP-GENERATION CALCULATIONS

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

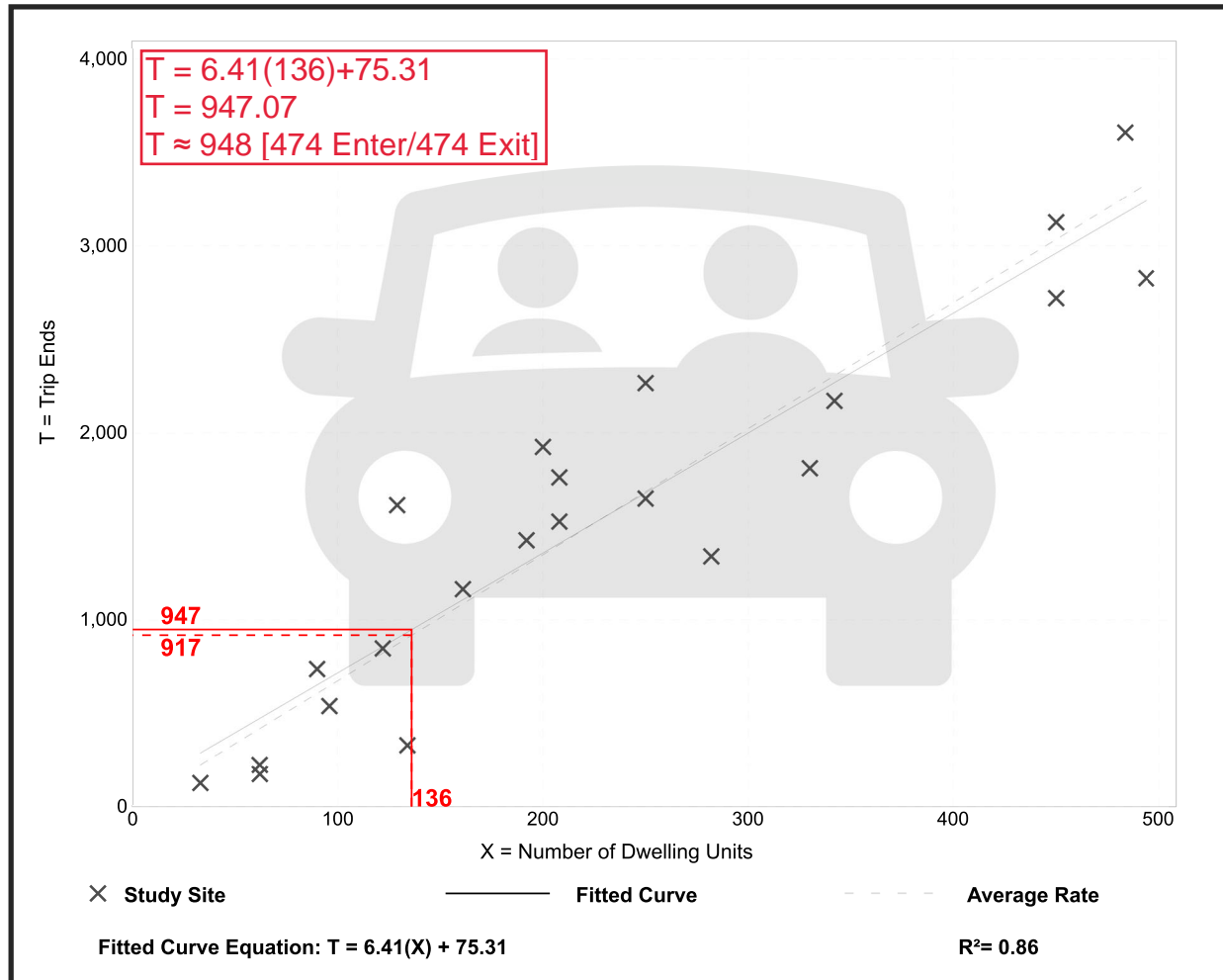
Vehicle Trip Ends vs: Dwelling Units  
On a: Weekday

Setting/Location: General Urban/Suburban  
Number of Studies: 22  
Avg. Num. of Dwelling Units: 229  
Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
6.74	2.46 - 12.50	1.79

## 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

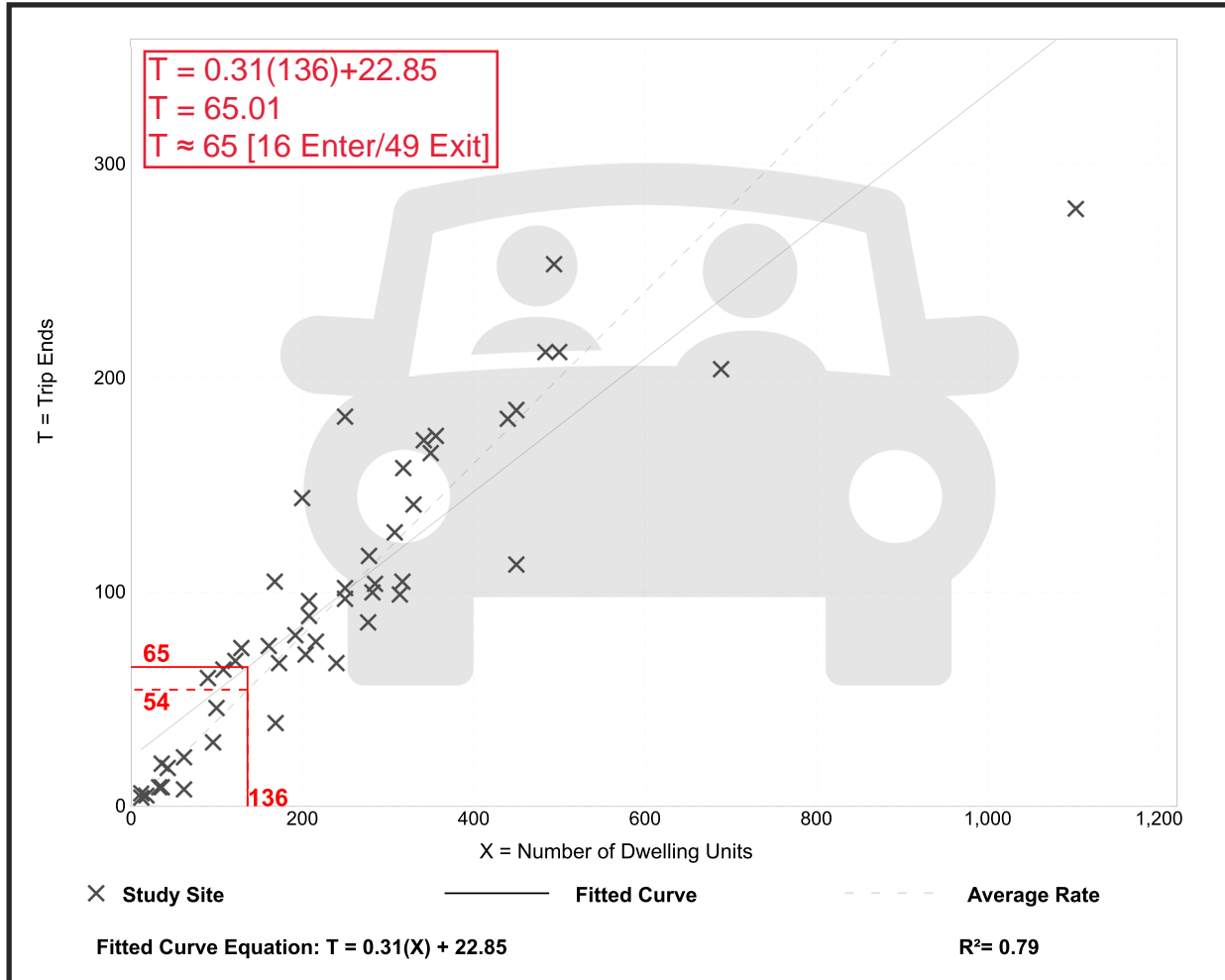
Avg. Num. of Dwelling Units: 249

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

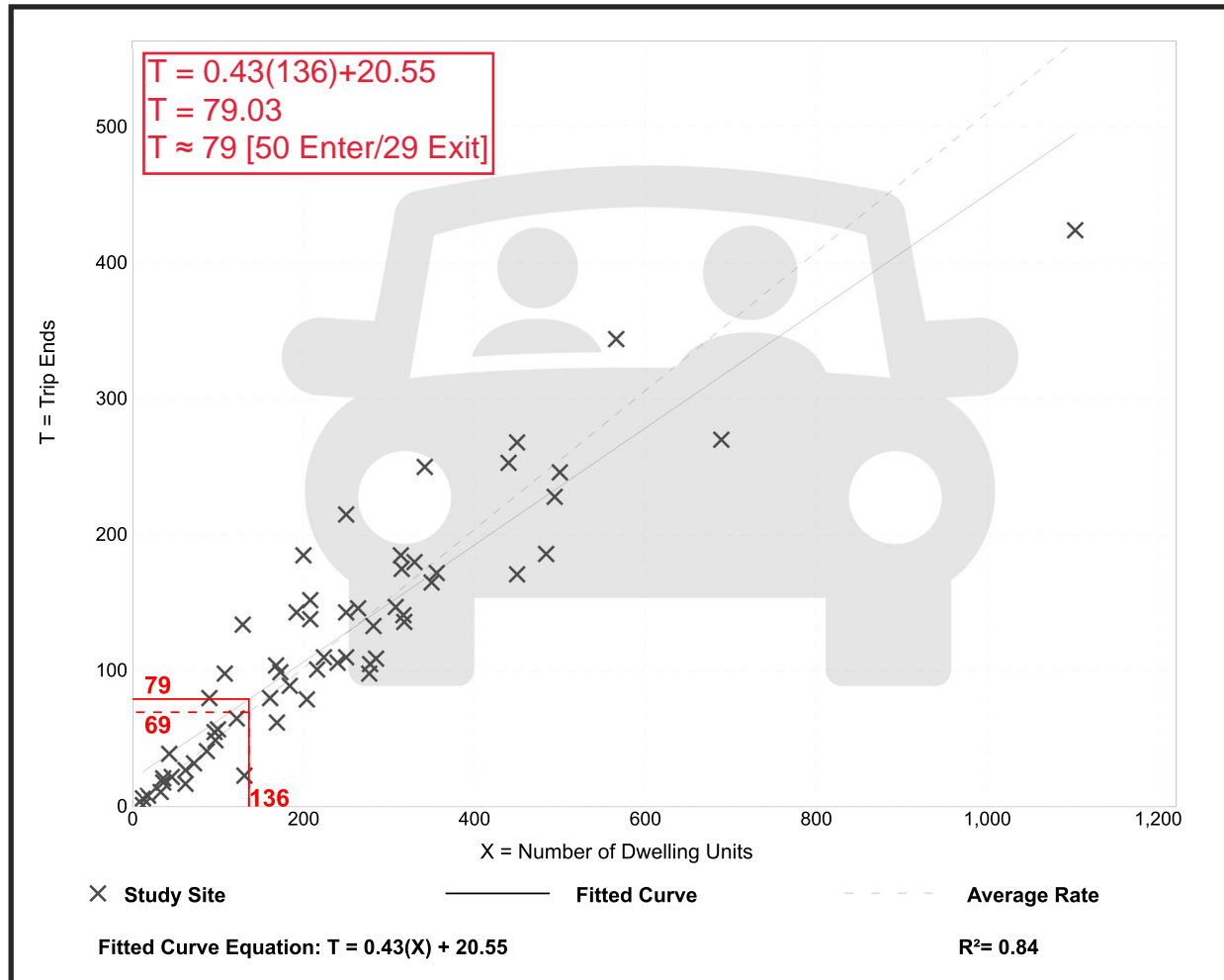
Avg. Num. of Dwelling Units: 241

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



## JOURNEY TO WORK TRIP DISTRIBUTION

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Proposed Residential Development  
Manchester-by-the-Sea, Massachusetts

Residence	Workplace	Number	School Street (North)		Atwater Street (East)		Route 128 Eastbound (East)		Route 128 Westbound (West)		Pleasant Street (East) Entrance Only		Pleasant Street (West)		Lincoln Street (East) Exit Only		Route 127 (East)		Route 127 (West)	
Massachusetts	Manchester-by-the-Sea	727		0	10%	73		0		0	50%	364	10%	73	50%	364	10%	73	20%	145
Massachusetts	Boston city	382		0		0		0	100%	382		0		0		0		0		0
Massachusetts	Beverly city	288		0		0		0	100%	288		0		0		0		0		0
Massachusetts	Cambridge city	157		0		0		0	100%	157		0		0		0		0		0
Massachusetts	Danvers town	89		0		0		0	100%	89		0		0		0		0		0
Massachusetts	Andover town	68		0		0		0	100%	68		0		0		0		0		0
Massachusetts	Gloucester city	61		0		0	100%	61		0		0		0		0		0		0
Massachusetts	North Andover town	50		0		0		0	100%	50		0		0		0		0		0
Massachusetts	Lynn city	40		0		0		0	100%	40		0		0		0		0		0
Massachusetts	Bedford town	40		0		0		0	100%	40		0		0		0		0		0
Massachusetts	Topsfield town	38		0		0		0	100%	38		0		0		0		0		0
Massachusetts	Ipswich town	32	50%	16		0		0	50%	16		0		0		0		0		0
Massachusetts	Wenham town	32		0		0		0	100%	32		0		0		0		0		0
Massachusetts	Hamilton town	30	50%	15		0		0	50%	15		0		0		0		0		0
Massachusetts	Burlington town	30		0		0		0	100%	30		0		0		0		0		0
Massachusetts	Peabody city	25		0		0		0	100%	25		0		0		0		0		0
Massachusetts	Woburn city	24		0		0		0	100%	24		0		0		0		0		0
Massachusetts	Salem city	23		0		0		0	100%	23		0		0		0		0		0
Massachusetts	Rowley town	21	100%	21		0		0		0		0		0		0		0		0
Massachusetts	Haverhill city	20		0		0		0	100%	20		0		0		0		0		0
Massachusetts	Canton town	20		0		0		0	100%	20		0		0		0		0		0
Massachusetts	Waltham city	18		0		0		0	100%	18		0		0		0		0		0
Massachusetts	Revere city	17		0		0		0	100%	17		0		0		0		0		0
Massachusetts	Newburyport city	16	50%	8		0		0	50%	8		0		0		0		0		0
Massachusetts	Amesbury Town city	15	25%	4		0		0	75%	11		0		0		0		0		0
Maine	Portland city	14		0		0		0	100%	14		0		0		0		0		0
Massachusetts	Lawrence city	14		0		0		0	100%	14		0		0		0		0		0
Massachusetts	Newbury town	14	100%	14		0		0		0		0		0		0		0		0
New Hampshire	Keene city	14		0		0		0	100%	14		0		0		0		0		0
Massachusetts	Winchester town	8		0		0		0	100%	8		0		0		0		0		0
Massachusetts	Salisbury town	6	50%	3		0		0	50%	3		0		0		0		0		0
Massachusetts	Chelmsford town	2		0		0		0	100%	2		0		0		0		0		0
2,335			81		73		61		1,466		364		73		364		73		145	
84.4%			3.5%		3.1%		2.6%		62.8%		15.6%		3.1%		15.6%		3.1%		6.2%	
<u>SAY</u>			<b>4%</b>		<b>3%</b>		<b>3%</b>		<b>63%</b>		<b>15%</b>		<b>3%</b>		<b>15%</b>		<b>3%</b>		<b>6%</b>	

## CAPACITY ANALYSIS WORKSHEETS

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School Street at Atwater Avenue  
School Street at the Route 128 Southbound Ramps  
School Street at the Route 128 Northbound Ramps  
School Street at Pleasant Street  
School Street at Lincoln Street and Lincoln Avenue  
Route 127 at School Street  
School Street at Project Site Roadway






School Street at Atwater Avenue

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2021 Existing Weekday Morning  
1: School Street & Atwater Avenue

Intersection

Int Delay, s/veh 1.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	44	2	230	86	15	363
Future Vol, veh/h	44	2	230	86	15	363
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	54	54	92	92	91	91
Heavy Vehicles, %	3	0	1	1	0	3
Mvmt Flow	81	4	250	93	16	399

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	728	297	0
Stage 1	297	-	-
Stage 2	431	-	-
Critical Hdwy	6.43	6.2	-
Critical Hdwy Stg 1	5.43	-	-
Critical Hdwy Stg 2	5.43	-	-
Follow-up Hdwy	3.527	3.3	-
Pot Cap-1 Maneuver	389	747	-
Stage 1	752	-	-
Stage 2	653	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	382	747	-
Mov Cap-2 Maneuver	382	-	-
Stage 1	752	-	-
Stage 2	642	-	-




Approach	WB	NB	SB
HCM Control Delay, s	16.8	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	390	1227
HCM Lane V/C Ratio	-	-	0.218	0.013
HCM Control Delay (s)	-	-	16.8	8
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.8	0

2021 Existing Weekday Evening  
1: School Street & Atwater Avenue

Intersection

Int Delay, s/veh 3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	62	20	320	72	10	273
Future Vol, veh/h	62	20	320	72	10	273
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	55	55	83	83	91	91
Heavy Vehicles, %	0	0	2	0	0	0
Mvmt Flow	113	36	386	87	11	300

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	752	430	0
Stage 1	430	-	-
Stage 2	322	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	381	629	-
Stage 1	660	-	-
Stage 2	739	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	376	629	-
Mov Cap-2 Maneuver	376	-	-
Stage 1	660	-	-
Stage 2	730	-	-




Approach	WB	NB	SB
HCM Control Delay, s	18.4	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	417	1099
HCM Lane V/C Ratio	-	-	0.358	0.01
HCM Control Delay (s)	-	-	18.4	8.3
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	1.6	0

2029 No Build Weekday Morning  
1: School Street & Atwater Avenue

Intersection

Int Delay, s/veh 2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	48	2	250	93	16	393
Future Vol, veh/h	48	2	250	93	16	393
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	54	54	92	92	91	91
Heavy Vehicles, %	3	0	1	1	0	3
Mvmt Flow	89	4	272	101	18	432

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	791	323	0
Stage 1	323	-	-
Stage 2	468	-	-
Critical Hdwy	6.43	6.2	-
Critical Hdwy Stg 1	5.43	-	-
Critical Hdwy Stg 2	5.43	-	-
Follow-up Hdwy	3.527	3.3	-
Pot Cap-1 Maneuver	357	723	-
Stage 1	732	-	-
Stage 2	628	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	350	723	-
Mov Cap-2 Maneuver	350	-	-
Stage 1	732	-	-
Stage 2	615	-	-




Approach	WB	NB	SB
HCM Control Delay, s	18.6	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	357	1197
HCM Lane V/C Ratio	-	-	0.259	0.015
HCM Control Delay (s)	-	-	18.6	8.1
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	1	0

2029 No-Build Weekday Evening  
1: School Street & Atwater Avenue

Intersection

Int Delay, s/veh 3.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	67	22	347	78	11	296
Future Vol, veh/h	67	22	347	78	11	296
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	55	55	83	83	91	91
Heavy Vehicles, %	0	0	2	0	0	0
Mvmt Flow	122	40	418	94	12	325

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	814	465	0
Stage 1	465	-	-
Stage 2	349	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	350	602	-
Stage 1	636	-	-
Stage 2	719	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	345	602	-
Mov Cap-2 Maneuver	345	-	-
Stage 1	636	-	-
Stage 2	709	-	-




Approach	WB	NB	SB
HCM Control Delay, s	20.9	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	386	1064
HCM Lane V/C Ratio	-	-	0.419	0.011
HCM Control Delay (s)	-	-	20.9	8.4
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	2	0

2029 Build Weekday Morning  
1: School Street & Atwater Avenue

Intersection

Int Delay, s/veh 2.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	48	2	265	93	17	439
Future Vol, veh/h	48	2	265	93	17	439
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	54	54	92	92	91	91
Heavy Vehicles, %	3	0	1	1	0	3
Mvmt Flow	89	4	288	101	19	482

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	859	339	0
Stage 1	339	-	-
Stage 2	520	-	-
Critical Hdwy	6.43	6.2	-
Critical Hdwy Stg 1	5.43	-	-
Critical Hdwy Stg 2	5.43	-	-
Follow-up Hdwy	3.527	3.3	-
Pot Cap-1 Maneuver	326	708	-
Stage 1	719	-	-
Stage 2	595	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	319	708	-
Mov Cap-2 Maneuver	319	-	-
Stage 1	719	-	-
Stage 2	582	-	-




Approach	WB	NB	SB
HCM Control Delay, s	20.4	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	326	1181
HCM Lane V/C Ratio	-	-	0.284	0.016
HCM Control Delay (s)	-	-	20.4	8.1
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	1.1	0

2029 Build Weekday Evening  
1: School Street & Atwater Avenue

Intersection

Int Delay, s/veh 3.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	67	23	394	78	12	323
Future Vol, veh/h	67	23	394	78	12	323
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	55	55	83	83	91	91
Heavy Vehicles, %	0	0	2	0	0	0
Mvmt Flow	122	42	475	94	13	355

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	903	522	0
Stage 1	522	-	-
Stage 2	381	-	-
Critical Hdwy	6.4	6.2	-
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	-
Pot Cap-1 Maneuver	310	559	-
Stage 1	599	-	-
Stage 2	695	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	305	559	-
Mov Cap-2 Maneuver	305	-	-
Stage 1	599	-	-
Stage 2	684	-	-

Approach	WB	NB	SB
HCM Control Delay, s	24.5	0	0.3
HCM LOS	C		






Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	345	1013
HCM Lane V/C Ratio	-	-	0.474	0.013
HCM Control Delay (s)	-	-	24.5	8.6
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	2.4	0



School Street at the Route 128 Southbound Ramps

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2021 Existing Weekday Morning  
2: School Street & Route 128 SB Ramps






Intersection						
Int Delay, s/veh	3.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	86	35	319	269	103	304
Future Vol, veh/h	86	35	319	269	103	304
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	Yield	-	None
Storage Length	0	50	-	50	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	87	87	87	87
Heavy Vehicles, %	1	0	1	2	3	1
Mvmt Flow	92	38	367	309	118	349
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	952	367	0	0	367	0
Stage 1	367	-	-	-	-	-
Stage 2	585	-	-	-	-	-
Critical Hdwy	6.41	6.2	-	-	4.13	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.3	-	-	2.227	-
Pot Cap-1 Maneuver	289	683	-	-	1186	-
Stage 1	703	-	-	-	-	-
Stage 2	559	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	253	683	-	-	1186	-
Mov Cap-2 Maneuver	253	-	-	-	-	-
Stage 1	703	-	-	-	-	-
Stage 2	490	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	22.4	0		2.1		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	253	683	1186	-
HCM Lane V/C Ratio	-	-	0.366	0.055	0.1	-
HCM Control Delay (s)	-	-	27.2	10.6	8.4	0
HCM Lane LOS	-	-	D	B	A	A
HCM 95th %tile Q(veh)	-	-	1.6	0.2	0.3	-

## 2021 Existing Weekday Evening

### 2: School Street & Route 128 SB Ramps

#### Intersection

Int Delay, s/veh 3.7







Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	70	45	359	200	132	245
Future Vol, veh/h	70	45	359	200	132	245
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	Yield	-	None
Storage Length	0	50	-	50	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	89	89	83	83
Heavy Vehicles, %	3	0	1	0	0	0
Mvmt Flow	82	53	403	225	159	295

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1016	403	0	0	403
Stage 1	403	-	-	-	-
Stage 2	613	-	-	-	-
Critical Hdwy	6.43	6.2	-	-	4.1
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-
Follow-up Hdwy	3.527	3.3	-	-	2.2
Pot Cap-1 Maneuver	263	652	-	-	1167
Stage 1	673	-	-	-	-
Stage 2	539	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	220	652	-	-	1167
Mov Cap-2 Maneuver	220	-	-	-	-
Stage 1	673	-	-	-	-
Stage 2	451	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	23.1	0	3
HCM LOS	C		







Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT
Capacity (veh/h)	-	- 220 652 1167	-	-
HCM Lane V/C Ratio	-	- 0.374 0.081 0.136	-	-
HCM Control Delay (s)	-	- 30.8 11 8.6	0	
HCM Lane LOS	-	- D B A A		
HCM 95th %tile Q(veh)	-	- 1.6 0.3 0.5	-	-

2029 No Build Weekday Morning  
2: School Street & Route 128 SB Ramps

Intersection						
Int Delay, s/veh	3.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	93	38	346	291	112	330
Future Vol, veh/h	93	38	346	291	112	330
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	Yield	-	None
Storage Length	0	50	-	50	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	87	87	87	87
Heavy Vehicles, %	1	0	1	2	3	1
Mvmt Flow	100	41	398	334	129	379
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1035	398	0	0	398	0
Stage 1	398	-	-	-	-	-
Stage 2	637	-	-	-	-	-
Critical Hdwy	6.41	6.2	-	-	4.13	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.3	-	-	2.227	-
Pot Cap-1 Maneuver	258	656	-	-	1155	-
Stage 1	681	-	-	-	-	-
Stage 2	529	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	221	656	-	-	1155	-
Mov Cap-2 Maneuver	221	-	-	-	-	-
Stage 1	681	-	-	-	-	-
Stage 2	454	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	27.4	0	2.2			
HCM LOS	D					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 221 656 1155	-	-		
HCM Lane V/C Ratio	-	- 0.452 0.062 0.111	-	-		
HCM Control Delay (s)	-	- 34.1 10.9 8.5	0			
HCM Lane LOS	-	- D B A A				
HCM 95th %tile Q(veh)	-	- 2.2 0.2 0.4	-			







## 2029 No-Build Weekday Evening

### 2: School Street & Route 128 SB Ramps

Intersection						
Int Delay, s/veh	4.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	76	49	389	217	143	266
Future Vol, veh/h	76	49	389	217	143	266
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	Yield	-	None
Storage Length	0	50	-	50	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	89	89	83	83
Heavy Vehicles, %	3	0	1	0	0	0
Mvmt Flow	89	58	437	244	172	320
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1101	437	0	0	437	0
Stage 1	437	-	-	-	-	-
Stage 2	664	-	-	-	-	-
Critical Hdwy	6.43	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	233	624	-	-	1134	-
Stage 1	649	-	-	-	-	-
Stage 2	510	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	190	624	-	-	1134	-
Mov Cap-2 Maneuver	190	-	-	-	-	-
Stage 1	649	-	-	-	-	-
Stage 2	416	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	28.6	0	3.1			
HCM LOS	D					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 190 624 1134	-	-		
HCM Lane V/C Ratio	-	- 0.471 0.092 0.152	-	-		
HCM Control Delay (s)	-	- 39.7 11.4 8.7	0			
HCM Lane LOS	-	- E B A	A			
HCM 95th %tile Q(veh)	-	- 2.3 0.3 0.5	-			







## 2029 Build Weekday Morning

### 2: School Street & Route 128 SB Ramps

Intersection						
Int Delay, s/veh	4.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	93	39	360	291	143	345
Future Vol, veh/h	93	39	360	291	143	345
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	Yield	-	None
Storage Length	0	50	-	50	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	87	87	87	87
Heavy Vehicles, %	1	0	1	2	3	1
Mvmt Flow	100	42	414	334	164	397
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1139	414	0	0	414	0
Stage 1	414	-	-	-	-	-
Stage 2	725	-	-	-	-	-
Critical Hdwy	6.41	6.2	-	-	4.13	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.3	-	-	2.227	-
Pot Cap-1 Maneuver	224	643	-	-	1140	-
Stage 1	669	-	-	-	-	-
Stage 2	481	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	183	643	-	-	1140	-
Mov Cap-2 Maneuver	183	-	-	-	-	-
Stage 1	669	-	-	-	-	-
Stage 2	392	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	35.7	0	2.5			
HCM LOS	E					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 183 643 1140	-	-		
HCM Lane V/C Ratio	-	- 0.546 0.065 0.144	-	-		
HCM Control Delay (s)	-	- 46.1 11 8.7	0			
HCM Lane LOS	-	- E B A	A			
HCM 95th %tile Q(veh)	-	- 2.8 0.2 0.5	-			

## 2029 Build Weekday Evening

### 2: School Street & Route 128 SB Ramps







Intersection						
Int Delay, s/veh	5.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	76	50	435	217	161	275
Future Vol, veh/h	76	50	435	217	161	275
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	Yield	-	None
Storage Length	0	50	-	50	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	89	89	83	83
Heavy Vehicles, %	3	0	1	0	0	0
Mvmt Flow	89	59	489	244	194	331
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1208	489	0	0	489	0
Stage 1	489	-	-	-	-	-
Stage 2	719	-	-	-	-	-
Critical Hdwy	6.43	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	201	583	-	-	1085	-
Stage 1	614	-	-	-	-	-
Stage 2	481	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	157	583	-	-	1085	-
Mov Cap-2 Maneuver	157	-	-	-	-	-
Stage 1	614	-	-	-	-	-
Stage 2	376	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	37.7	0	3.3			
HCM LOS	E					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 157 583 1085	-	-		
HCM Lane V/C Ratio	-	- 0.57 0.101 0.179	-	-		
HCM Control Delay (s)	-	- 54.6 11.9 9	-	0		
HCM Lane LOS	-	- F B A A	-	-		
HCM 95th %tile Q(veh)	-	- 2.9 0.3 0.6	-	-		



School Street at the Route 128 Northbound Ramps

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2021 Existing Weekday Morning  
3: School Street & Route 128 NB Ramps/Mill Street

Intersection												
Int Delay, s/veh	24.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	117	19	146	2	1	62	56	409	12	30	341	19
Future Vol, veh/h	117	19	146	2	1	62	56	409	12	30	341	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	50	-	-	-	-	-	-	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	72	72	72	78	78	78	91	91	91
Heavy Vehicles, %	1	0	1	0	0	2	4	2	0	0	1	0
Mvmt Flow	138	22	172	3	1	86	72	524	15	33	375	21
Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1160	1124	375	1128	1117	532	375	0	0	539	0	0
Stage 1	441	441	-	676	676	-	-	-	-	-	-	-
Stage 2	719	683	-	452	441	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.5	6.21	7.1	6.5	6.22	4.14	-	-	4.1	-	-
Critical Hdwy Stg 1	6.11	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4	3.309	3.5	4	3.318	2.236	-	-	2.2	-	-
Pot Cap-1 Maneuver	173	207	674	183	209	547	1173	-	-	1040	-	-
Stage 1	597	580	-	446	456	-	-	-	-	-	-	-
Stage 2	421	452	-	591	580	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 131	181	674	112	183	547	1173	-	-	1040	-	-
Mov Cap-2 Maneuver	~ 131	181	-	112	183	-	-	-	-	-	-	-
Stage 1	544	556	-	407	416	-	-	-	-	-	-	-
Stage 2	322	412	-	405	556	-	-	-	-	-	-	-
Approach	EB		WB		NB			SB				
HCM Control Delay, s	100.8		14.3		1			0.7				
HCM LOS	F		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR			
Capacity (veh/h)	1173	-	-	136	674	476	1040	-	-			
HCM Lane V/C Ratio	0.061	-	-	1.176	0.255	0.19	0.032	-	-			
HCM Control Delay (s)	8.3	0	-	196	12.2	14.3	8.6	0	-			
HCM Lane LOS	A	A	-	F	B	B	A	A	-			
HCM 95th %tile Q(veh)	0.2	-	-	9.4	1	0.7	0.1	-	-			
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined				*: All major volume in platoon				

2021 Existing Weekday Evening  
3: School Street & Route 128 NB Ramps/Mill Street

Intersection												
Int Delay, s/veh	16.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰			↰			↰	↱
Traffic Vol, veh/h	147	25	197	5	5	34	76	378	7	19	247	49
Future Vol, veh/h	147	25	197	5	5	34	76	378	7	19	247	49
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	50	-	-	-	-	-	-	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	63	63	63	92	92	92	89	89	89
Heavy Vehicles, %	1	0	0	0	0	0	2	1	0	0	1	0
Mvmt Flow	167	28	224	8	8	54	83	411	8	21	278	55
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	932	905	278	915	901	415	278	0	0	419	0	0
Stage 1	320	320	-	581	581	-	-	-	-	-	-	-
Stage 2	612	585	-	334	320	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.5	6.2	7.1	6.5	6.2	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.11	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4	3.3	3.5	4	3.3	2.218	-	-	2.2	-	-
Pot Cap-1 Maneuver	248	278	766	256	280	642	1285	-	-	1151	-	-
Stage 1	694	656	-	503	503	-	-	-	-	-	-	-
Stage 2	482	501	-	684	656	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	204	249	766	152	251	642	1285	-	-	1151	-	-
Mov Cap-2 Maneuver	204	249	-	152	251	-	-	-	-	-	-	-
Stage 1	636	641	-	461	461	-	-	-	-	-	-	-
Stage 2	397	459	-	452	641	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	49.4		15.4		1.3		0.5					
HCM LOS	E		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR			
Capacity (veh/h)	1285	-	-	210	766	416	1151	-	-			
HCM Lane V/C Ratio	0.064	-	-	0.931	0.292	0.168	0.019	-	-			
HCM Control Delay (s)	8	0	-	92.7	11.6	15.4	8.2	0	-			
HCM Lane LOS	A	A	-	F	B	C	A	A	-			
HCM 95th %tile Q(veh)	0.2	-	-	7.7	1.2	0.6	0.1	-	-			

2029 No Build Weekday Morning  
3: School Street & Route 128 NB Ramps/Mill Street

Intersection												
Int Delay, s/veh	41.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕			↕			↕	↗
Traffic Vol, veh/h	127	21	158	2	1	67	61	443	13	33	369	21
Future Vol, veh/h	127	21	158	2	1	67	61	443	13	33	369	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	50	-	-	-	-	-	-	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	72	72	72	78	78	78	91	91	91
Heavy Vehicles, %	1	0	1	0	0	2	4	2	0	0	1	0
Mvmt Flow	149	25	186	3	1	93	78	568	17	36	405	23
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	1257	1218	405	1223	1210	577	405	0	0	585	0	0
Stage 1	477	477	-	733	733	-	-	-	-	-	-	-
Stage 2	780	741	-	490	477	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.5	6.21	7.1	6.5	6.22	4.14	-	-	4.1	-	-
Critical Hdwy Stg 1	6.11	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4	3.309	3.5	4	3.318	2.236	-	-	2.2	-	-
Pot Cap-1 Maneuver	~ 149	182	648	158	184	516	1143	-	-	1000	-	-
Stage 1	571	559	-	415	429	-	-	-	-	-	-	-
Stage 2	390	426	-	564	559	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 108	156	648	88	158	516	1143	-	-	1000	-	-
Mov Cap-2 Maneuver	~ 108	156	-	88	158	-	-	-	-	-	-	-
Stage 1	513	533	-	373	386	-	-	-	-	-	-	-
Stage 2	286	383	-	366	533	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	176.2		15.5			1			0.7			
HCM LOS	F		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR			
Capacity (veh/h)	1143	-	-	113	648	441	1000	-	-			
HCM Lane V/C Ratio	0.068	-	-	1.541	0.287	0.22	0.036	-	-			
HCM Control Delay (s)	8.4	0	-	\$ 350.6	12.8	15.5	8.7	0	-			
HCM Lane LOS	A	A	-	F	B	C	A	A	-			
HCM 95th %tile Q(veh)	0.2	-	-	12.8	1.2	0.8	0.1	-	-			
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s			+: Computation Not Defined				*: All major volume in platoon			

2029 No-Build Weekday Evening  
3: School Street & Route 128 NB Ramps/Mill Street

Intersection												
Int Delay, s/veh	28.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱	↱		↱			↱			↱	↱
Traffic Vol, veh/h	159	27	213	5	5	37	82	410	8	21	268	53
Future Vol, veh/h	159	27	213	5	5	37	82	410	8	21	268	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	50	-	-	-	-	-	-	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	63	63	63	92	92	92	89	89	89
Heavy Vehicles, %	1	0	0	0	0	0	2	1	0	0	1	0
Mvmt Flow	181	31	242	8	8	59	89	446	9	24	301	60
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1011	982	301	994	978	451	301	0	0	455	0	0
Stage 1	349	349	-	629	629	-	-	-	-	-	-	-
Stage 2	662	633	-	365	349	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.5	6.2	7.1	6.5	6.2	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.11	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4	3.3	3.5	4	3.3	2.218	-	-	2.2	-	-
Pot Cap-1 Maneuver	219	251	743	226	252	613	1260	-	-	1116	-	-
Stage 1	669	637	-	474	478	-	-	-	-	-	-	-
Stage 2	453	476	-	658	637	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 175	221	743	124	222	613	1260	-	-	1116	-	-
Mov Cap-2 Maneuver	~ 175	221	-	124	222	-	-	-	-	-	-	-
Stage 1	605	620	-	429	433	-	-	-	-	-	-	-
Stage 2	364	431	-	410	620	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	87.7		16.7		1.3		0.5					
HCM LOS	F		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR			
Capacity (veh/h)	1260	-	-	180	743	381	1116	-	-			
HCM Lane V/C Ratio	0.071	-	-	1.174	0.326	0.196	0.021	-	-			
HCM Control Delay (s)	8.1	0	-	174.2	12.2	16.7	8.3	0	-			
HCM Lane LOS	A	A	-	F	B	C	A	A	-			
HCM 95th %tile Q(veh)	0.2	-	-	11.1	1.4	0.7	0.1	-	-			
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s			+: Computation Not Defined				*: All major volume in platoon			

2029 Build Weekday Morning  
3: School Street & Route 128 NB Ramps/Mill Street

Intersection												
Int Delay, s/veh	52.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕			↕			↕	↗
Traffic Vol, veh/h	137	21	158	2	1	67	61	447	13	33	382	23
Future Vol, veh/h	137	21	158	2	1	67	61	447	13	33	382	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	50	-	-	-	-	-	-	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	72	72	72	78	78	78	91	91	91
Heavy Vehicles, %	1	0	1	0	0	2	4	2	0	0	1	0
Mvmt Flow	161	25	186	3	1	93	78	573	17	36	420	25
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	1277	1238	420	1243	1230	582	420	0	0	590	0	0
Stage 1	492	492	-	738	738	-	-	-	-	-	-	-
Stage 2	785	746	-	505	492	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.5	6.21	7.1	6.5	6.22	4.14	-	-	4.1	-	-
Critical Hdwy Stg 1	6.11	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4	3.309	3.5	4	3.318	2.236	-	-	2.2	-	-
Pot Cap-1 Maneuver	~ 144	177	635	153	179	513	1128	-	-	995	-	-
Stage 1	560	551	-	413	427	-	-	-	-	-	-	-
Stage 2	387	424	-	553	551	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 104	151	635	84	153	513	1128	-	-	995	-	-
Mov Cap-2 Maneuver	~ 104	151	-	84	153	-	-	-	-	-	-	-
Stage 1	502	525	-	370	383	-	-	-	-	-	-	-
Stage 2	283	380	-	355	525	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	221		15.6			1			0.7			
HCM LOS	F		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR			
Capacity (veh/h)	1128	-	-	108	635	435	995	-	-			
HCM Lane V/C Ratio	0.069	-	-	1.721	0.293	0.223	0.036	-	-			
HCM Control Delay (s)	8.4	0	-	428.9	13	15.6	8.8	0	-			
HCM Lane LOS	A	A	-	F	B	C	A	A	-			
HCM 95th %tile Q(veh)	0.2	-	-	14.5	1.2	0.8	0.1	-	-			
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s			+: Computation Not Defined				*: All major volume in platoon			

2029 Build Weekday Evening  
3: School Street & Route 128 NB Ramps/Mill Street

Intersection												
Int Delay, s/veh	48.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕			↕			↕	↗
Traffic Vol, veh/h	191	27	213	5	5	37	82	424	8	21	276	54
Future Vol, veh/h	191	27	213	5	5	37	82	424	8	21	276	54
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	50	-	-	-	-	-	-	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	63	63	63	92	92	92	89	89	89
Heavy Vehicles, %	1	0	0	0	0	0	2	1	0	0	1	0
Mvmt Flow	217	31	242	8	8	59	89	461	9	24	310	61
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1035	1006	310	1018	1002	466	310	0	0	470	0	0
Stage 1	358	358	-	644	644	-	-	-	-	-	-	-
Stage 2	677	648	-	374	358	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.5	6.2	7.1	6.5	6.2	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.11	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4	3.3	3.5	4	3.3	2.218	-	-	2.2	-	-
Pot Cap-1 Maneuver	~ 211	243	735	218	244	601	1250	-	-	1102	-	-
Stage 1	662	631	-	465	471	-	-	-	-	-	-	-
Stage 2	444	469	-	651	631	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 168	214	735	118	214	601	1250	-	-	1102	-	-
Mov Cap-2 Maneuver	~ 168	214	-	118	214	-	-	-	-	-	-	-
Stage 1	598	613	-	420	426	-	-	-	-	-	-	-
Stage 2	355	424	-	403	613	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	144.8		17.2		1.3		0.5					
HCM LOS	F		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR			
Capacity (veh/h)	1250	-	-	173	735	369	1102	-	-			
HCM Lane V/C Ratio	0.071	-	-	1.432	0.329	0.202	0.021	-	-			
HCM Control Delay (s)	8.1	0	-	274.2	12.3	17.2	8.3	0	-			
HCM Lane LOS	A	A	-	F	B	C	A	A	-			
HCM 95th %tile Q(veh)	0.2	-	-	15.4	1.4	0.7	0.1	-	-			
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s			+: Computation Not Defined				*: All major volume in platoon			



School Street at Pleasant Street






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2021 Existing Weekday Morning  
4: School Street & Pleasant Street

Intersection

Intersection Delay, s/veh 60.5

Intersection LOS F






Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	0	128	49	44	288	6	153	0	0	419	28
Future Vol, veh/h	26	0	128	49	44	288	6	153	0	0	419	28
Peak Hour Factor	0.71	0.71	0.71	0.54	0.54	0.54	0.84	0.84	0.84	0.82	0.82	0.82
Heavy Vehicles, %	0	0	1	5	5	2	0	3	0	0	2	0
Mvmt Flow	37	0	180	91	81	533	7	182	0	0	511	34
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	18	61.7	17.9	90.8
HCM LOS	C	F	C	F

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	4%	17%	53%	0%	0%
Vol Thru, %	96%	0%	47%	0%	94%
Vol Right, %	0%	83%	0%	100%	6%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	159	154	93	288	447
LT Vol	6	26	49	0	0
Through Vol	153	0	44	0	419
RT Vol	0	128	0	288	28
Lane Flow Rate	189	217	172	533	545
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.428	0.464	0.381	1.034	1.081
Departure Headway (Hd)	8.588	8.158	8.313	7.319	7.301
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	422	445	436	501	502
Service Time	6.588	6.158	6.013	5.019	5.301
HCM Lane V/C Ratio	0.448	0.488	0.394	1.064	1.086
HCM Control Delay	17.9	18	16	76.5	90.8
HCM Lane LOS	C	C	C	F	F
HCM 95th-tile Q	2.1	2.4	1.8	14.9	16.9

2021 Existing Weekday Evening  
4: School Street & Pleasant Street






Intersection	
Intersection Delay, s/veh	16
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	36	1	53	17	22	172	34	222	0	0	399	31
Future Vol, veh/h	36	1	53	17	22	172	34	222	0	0	399	31
Peak Hour Factor	0.77	0.77	0.77	0.92	0.92	0.92	0.89	0.89	0.89	0.91	0.91	0.91
Heavy Vehicles, %	0	0	0	0	0	1	0	2	0	0	1	0
Mvmt Flow	47	1	69	18	24	187	38	249	0	0	438	34
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	11.1	11.5	13.7	20.8
HCM LOS	B	B	B	C






Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	13%	40%	44%	0%	0%
Vol Thru, %	87%	1%	56%	0%	93%
Vol Right, %	0%	59%	0%	100%	7%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	256	90	39	172	430
LT Vol	34	36	17	0	0
Through Vol	222	1	22	0	399
RT Vol	0	53	0	172	31
Lane Flow Rate	288	117	42	187	473
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.459	0.208	0.083	0.315	0.71
Departure Headway (Hd)	5.746	6.418	7.012	6.074	5.41
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	621	562	507	587	662
Service Time	3.83	4.418	4.803	3.864	3.483
HCM Lane V/C Ratio	0.464	0.208	0.083	0.319	0.715
HCM Control Delay	13.7	11.1	10.4	11.7	20.8
HCM Lane LOS	B	B	B	B	C
HCM 95th-tile Q	2.4	0.8	0.3	1.3	5.9

2029 No Build Weekday Morning  
4: School Street & Pleasant Street

Intersection													
Intersection Delay, s/veh	86.3												
Intersection LOS	F												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Vol, veh/h	28	0	139	53	48	312	7	166	0	0	454	30	
Future Vol, veh/h	28	0	139	53	48	312	7	166	0	0	454	30	
Peak Hour Factor	0.71	0.71	0.71	0.54	0.54	0.54	0.84	0.84	0.84	0.82	0.82	0.82	
Heavy Vehicles, %	0	0	1	5	5	2	0	3	0	0	2	0	
Mvmt Flow	39	0	196	98	89	578	8	198	0	0	554	37	
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0	
Approach	EB	WB				NB				SB			
Opposing Approach	WB	EB				SB				NB			
Opposing Lanes	2	1				1				1			
Conflicting Approach Left	SB	NB				EB				WB			
Conflicting Lanes Left	1	1				1				2			
Conflicting Approach Right	NB	SB				WB				EB			
Conflicting Lanes Right	1	1				2				1			
HCM Control Delay	20.4	88.3				20				133.1			
HCM LOS	C	F				C				F			
Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1								
Vol Left, %		4%	17%	52%	0%	0%							
Vol Thru, %		96%	0%	48%	0%	94%							
Vol Right, %		0%	83%	0%	100%	6%							
Sign Control		Stop	Stop	Stop	Stop	Stop							
Traffic Vol by Lane		173	167	101	312	484							
LT Vol		7	28	53	0	0							
Through Vol		166	0	48	0	454							
RT Vol		0	139	0	312	30							
Lane Flow Rate		206	235	187	578	590							
Geometry Grp		2	5	7	7	2							
Degree of Util (X)		0.472	0.509	0.418	1.137	1.198							
Departure Headway (Hd)		9.111	8.7	8.706	7.709	7.595							
Convergence, Y/N		Yes	Yes	Yes	Yes	Yes							
Cap		397	416	417	474	484							
Service Time		7.111	6.7	6.406	5.409	5.595							
HCM Lane V/C Ratio		0.519	0.565	0.448	1.219	1.219							
HCM Control Delay		20	20.4	17.5	111.2	133.1							
HCM Lane LOS		C	C	C	F	F							
HCM 95th-tile Q		2.5	2.8	2	18.7	21.6							

2029 No-Build Weekday Evening  
4: School Street & Pleasant Street

Intersection	
Intersection Delay, s/veh	20.3
Intersection LOS	C






Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	39	1	57	18	24	186	37	240	0	0	432	34
Future Vol, veh/h	39	1	57	18	24	186	37	240	0	0	432	34
Peak Hour Factor	0.77	0.77	0.77	0.92	0.92	0.92	0.89	0.89	0.89	0.91	0.91	0.91
Heavy Vehicles, %	0	0	0	0	0	1	0	2	0	0	1	0
Mvmt Flow	51	1	74	20	26	202	42	270	0	0	475	37
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	12	12.5	15.7	29
HCM LOS	B	B	C	D

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	13%	40%	43%	0%	0%
Vol Thru, %	87%	1%	57%	0%	93%
Vol Right, %	0%	59%	0%	100%	7%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	277	97	42	186	466
LT Vol	37	39	18	0	0
Through Vol	240	1	24	0	432
RT Vol	0	57	0	186	34
Lane Flow Rate	311	126	46	202	512
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.526	0.237	0.094	0.362	0.815
Departure Headway (Hd)	6.088	6.776	7.387	6.449	5.729
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	591	528	484	556	635
Service Time	4.139	4.843	5.144	4.206	3.729
HCM Lane V/C Ratio	0.526	0.239	0.095	0.363	0.806
HCM Control Delay	15.7	12	10.9	12.9	29
HCM Lane LOS	C	B	B	B	D
HCM 95th-tile Q	3.1	0.9	0.3	1.6	8.4

2029 Build Weekday Morning  
4: School Street & Pleasant Street

Intersection	
Intersection Delay, s/veh	90.5
Intersection LOS	F






Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	0	139	53	48	314	7	168	0	0	466	31
Future Vol, veh/h	28	0	139	53	48	314	7	168	0	0	466	31
Peak Hour Factor	0.71	0.71	0.71	0.54	0.54	0.54	0.84	0.84	0.84	0.82	0.82	0.82
Heavy Vehicles, %	0	0	1	5	5	2	0	3	0	0	2	0
Mvmt Flow	39	0	196	98	89	581	8	200	0	0	568	38
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	20.6	91.5	20.3	140.4
HCM LOS	C	F	C	F

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	4%	17%	52%	0%	0%
Vol Thru, %	96%	0%	48%	0%	94%
Vol Right, %	0%	83%	0%	100%	6%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	175	167	101	314	497
LT Vol	7	28	53	0	0
Through Vol	168	0	48	0	466
RT Vol	0	139	0	314	31
Lane Flow Rate	208	235	187	581	606
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.478	0.51	0.419	1.148	1.217
Departure Headway (Hd)	9.17	8.78	8.756	7.759	7.622
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	396	414	413	471	479
Service Time	7.17	6.78	6.456	5.459	5.622
HCM Lane V/C Ratio	0.525	0.568	0.453	1.234	1.265
HCM Control Delay	20.3	20.6	17.6	115.3	140.4
HCM Lane LOS	C	C	C	F	F
HCM 95th-tile Q	2.5	2.8	2	19.1	22.4

2029 Build Weekday Evening  
4: School Street & Pleasant Street

Intersection	
Intersection Delay, s/veh	21.5
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	1	57	18	24	194	37	245	0	0	439	35
Future Vol, veh/h	40	1	57	18	24	194	37	245	0	0	439	35
Peak Hour Factor	0.77	0.77	0.77	0.92	0.92	0.92	0.89	0.89	0.89	0.91	0.91	0.91
Heavy Vehicles, %	0	0	0	0	0	1	0	2	0	0	1	0
Mvmt Flow	52	1	74	20	26	211	42	275	0	0	482	38
Number of Lanes	0	1	0	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	1
HCM Control Delay	12.2	12.9	16.4	31.2
HCM LOS	B	B	C	D

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	13%	41%	43%	0%	0%
Vol Thru, %	87%	1%	57%	0%	93%
Vol Right, %	0%	58%	0%	100%	7%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	282	98	42	194	474
LT Vol	37	40	18	0	0
Through Vol	245	1	24	0	439
RT Vol	0	57	0	194	35
Lane Flow Rate	317	127	46	211	521
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.543	0.244	0.095	0.382	0.834
Departure Headway (Hd)	6.172	6.888	7.462	6.524	5.762
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	583	519	480	550	630
Service Time	4.222	4.954	5.216	4.278	3.805
HCM Lane V/C Ratio	0.544	0.245	0.096	0.384	0.827
HCM Control Delay	16.4	12.2	11	13.3	31.2
HCM Lane LOS	C	B	B	B	D
HCM 95th-tile Q	3.2	0.9	0.3	1.8	8.9



School Street at Lincoln Street and Lincoln Avenue

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2021 Existing Weekday Morning  
5: School Street & Lincoln Avenue/Lincoln Street

Intersection												
Int Delay, s/veh	4.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	5	6	2	0	0	0	2	173	53	326	257	5
Future Vol, veh/h	5	6	2	0	0	0	2	173	53	326	257	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	55	55	55	92	92	92	89	89	89	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0	0	4	0	3	3	0
Mvmt Flow	9	11	4	0	0	0	2	194	60	370	292	6
Major/Minor	Minor2						Major1		Major2			
Conflicting Flow All	1263	1293	295				298	0	0	254	0	0
Stage 1	1035	1035	-				-	-	-	-	-	-
Stage 2	228	258	-				-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.2				4.1	-	-	4.13	-	-
Critical Hdwy Stg 1	5.4	5.5	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-				-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3				2.2	-	-	2.227	-	-
Pot Cap-1 Maneuver	189	164	749				1275	-	-	1305	-	-
Stage 1	345	312	-				-	-	-	-	-	-
Stage 2	815	698	-				-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	125	0	749				1275	-	-	1305	-	-
Mov Cap-2 Maneuver	125	0	-				-	-	-	-	-	-
Stage 1	344	0	-				-	-	-	-	-	-
Stage 2	538	0	-				-	-	-	-	-	-
Approach	EB						NB		SB			
HCM Control Delay, s	30.6						0.1		4.9			
HCM LOS	D											
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1275	-	-	164	1305	-	-					
HCM Lane V/C Ratio	0.002	-	-	0.144	0.284	-	-					
HCM Control Delay (s)	7.8	0	-	30.6	8.8	0	-					
HCM Lane LOS	A	A	-	D	A	A	-					
HCM 95th %tile Q(veh)	0	-	-	0.5	1.2	-	-					

2021 Existing Weekday Evening  
5: School Street & Lincoln Avenue/Lincoln Street

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		<div>↕</div>						<div>↕</div>			<div>↕</div>	
Traffic Vol, veh/h	7	5	5	0	0	0	5	248	25	220	266	7
Future Vol, veh/h	7	5	5	0	0	0	5	248	25	220	266	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	92	92	92	91	91	91	95	95	95
Heavy Vehicles, %	33	25	0	0	0	0	0	2	0	0	1	0
Mvmt Flow	8	6	6	0	0	0	5	273	27	232	280	7
Major/Minor	Minor2						Major1		Major2			
Conflicting Flow All	1045	1058	284				287	0	0	300	0	0
Stage 1	748	748	-				-	-	-	-	-	-
Stage 2	297	310	-				-	-	-	-	-	-
Critical Hdwy	6.73	6.75	6.2				4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.73	5.75	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.73	5.75	-				-	-	-	-	-	-
Follow-up Hdwy	3.797	4.225	3.3				2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	222	205	760				1287	-	-	1273	-	-
Stage 1	417	388	-				-	-	-	-	-	-
Stage 2	688	620	-				-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	173	0	760				1287	-	-	1273	-	-
Mov Cap-2 Maneuver	173	0	-				-	-	-	-	-	-
Stage 1	415	0	-				-	-	-	-	-	-
Stage 2	539	0	-				-	-	-	-	-	-
Approach	EB						NB		SB			
HCM Control Delay, s	20.3						0.1		3.8			
HCM LOS	C											
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1287	-	-	255	1273	-	-					
HCM Lane V/C Ratio	0.004	-	-	0.076	0.182	-	-					
HCM Control Delay (s)	7.8	0	-	20.3	8.5	0	-					
HCM Lane LOS	A	A	-	C	A	A	-					
HCM 95th %tile Q(veh)	0	-	-	0.2	0.7	-	-					

2029 No Build Weekday Morning  
5: School Street & Lincoln Avenue/Lincoln Street

Intersection												
Int Delay, s/veh	4.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	5	6	2	0	0	0	2	187	57	353	278	5
Future Vol, veh/h	5	6	2	0	0	0	2	187	57	353	278	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	55	55	55	92	92	92	89	89	89	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0	0	4	0	3	3	0
Mvmt Flow	9	11	4	0	0	0	2	210	64	401	316	6
Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	1367	1399	319				322	0	0	274	0	0
Stage 1	1121	1121	-				-	-	-	-	-	-
Stage 2	246	278	-				-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.2				4.1	-	-	4.13	-	-
Critical Hdwy Stg 1	5.4	5.5	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-				-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3				2.2	-	-	2.227	-	-
Pot Cap-1 Maneuver	164	142	726				1249	-	-	1283	-	-
Stage 1	314	284	-				-	-	-	-	-	-
Stage 2	800	684	-				-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	101	0	726				1249	-	-	1283	-	-
Mov Cap-2 Maneuver	101	0	-				-	-	-	-	-	-
Stage 1	313	0	-				-	-	-	-	-	-
Stage 2	495	0	-				-	-	-	-	-	-
Approach	EB						NB			SB		
HCM Control Delay, s	37.5						0.1			5		
HCM LOS	E											
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1249	-	-	134	1283	-	-					
HCM Lane V/C Ratio	0.002	-	-	0.176	0.313	-	-					
HCM Control Delay (s)	7.9	0	-	37.5	9.1	0	-					
HCM Lane LOS	A	A	-	E	A	A	-					
HCM 95th %tile Q(veh)	0	-	-	0.6	1.3	-	-					

2029 No-Build Weekday Evening  
5: School Street & Lincoln Avenue/Lincoln Street

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	7	5	5	0	0	0	5	269	27	238	288	8
Future Vol, veh/h	7	5	5	0	0	0	5	269	27	238	288	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	92	92	92	91	91	91	95	95	95
Heavy Vehicles, %	33	25	0	0	0	0	0	2	0	0	1	0
Mvmt Flow	8	6	6	0	0	0	5	296	30	251	303	8
Major/Minor	Minor2						Major1		Major2			
Conflicting Flow All	1130	1145	307				311	0	0	326	0	0
Stage 1	809	809	-				-	-	-	-	-	-
Stage 2	321	336	-				-	-	-	-	-	-
Critical Hdwy	6.73	6.75	6.2				4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.73	5.75	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.73	5.75	-				-	-	-	-	-	-
Follow-up Hdwy	3.797	4.225	3.3				2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	196	181	738				1261	-	-	1245	-	-
Stage 1	389	362	-				-	-	-	-	-	-
Stage 2	671	603	-				-	-	-	-	-	-
Platoon blocked, %							-	-		-	-	
Mov Cap-1 Maneuver	147	0	738				1261	-	-	1245	-	-
Mov Cap-2 Maneuver	147	0	-				-	-	-	-	-	-
Stage 1	387	0	-				-	-	-	-	-	-
Stage 2	507	0	-				-	-	-	-	-	-
Approach	EB						NB		SB			
HCM Control Delay, s	22.8						0.1		3.8			
HCM LOS	C											
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1261	-	-	221	1245	-	-					
HCM Lane V/C Ratio	0.004	-	-	0.087	0.201	-	-					
HCM Control Delay (s)	7.9	0	-	22.8	8.6	0	-					
HCM Lane LOS	A	A	-	C	A	A	-					
HCM 95th %tile Q(veh)	0	-	-	0.3	0.8	-	-					

2029 Build Weekday Morning  
5: School Street & Lincoln Avenue/Lincoln Street

Intersection												
Int Delay, s/veh	4.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	5	6	2	0	0	0	2	189	57	360	283	5
Future Vol, veh/h	5	6	2	0	0	0	2	189	57	360	283	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	55	55	55	92	92	92	89	89	89	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0	0	4	0	3	3	0
Mvmt Flow	9	11	4	0	0	0	2	212	64	409	322	6
Major/Minor	Minor2						Major1		Major2			
Conflicting Flow All	1391	1423	325				328	0	0	276	0	0
Stage 1	1143	1143	-				-	-	-	-	-	-
Stage 2	248	280	-				-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.2				4.1	-	-	4.13	-	-
Critical Hdwy Stg 1	5.4	5.5	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-				-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3				2.2	-	-	2.227	-	-
Pot Cap-1 Maneuver	158	137	721				1243	-	-	1281	-	-
Stage 1	307	277	-				-	-	-	-	-	-
Stage 2	798	683	-				-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	96	0	721				1243	-	-	1281	-	-
Mov Cap-2 Maneuver	96	0	-				-	-	-	-	-	-
Stage 1	306	0	-				-	-	-	-	-	-
Stage 2	486	0	-				-	-	-	-	-	-
Approach	EB						NB		SB			
HCM Control Delay, s	39.4						0.1		5.1			
HCM LOS	E											
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1243	-	-	128	1281	-	-					
HCM Lane V/C Ratio	0.002	-	-	0.185	0.319	-	-					
HCM Control Delay (s)	7.9	0	-	39.4	9.1	0	-					
HCM Lane LOS	A	A	-	E	A	A	-					
HCM 95th %tile Q(veh)	0	-	-	0.6	1.4	-	-					

2029 Build Weekday Evening  
5: School Street & Lincoln Avenue/Lincoln Street




Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	7	5	5	0	0	0	5	274	27	242	291	8
Future Vol, veh/h	7	5	5	0	0	0	5	274	27	242	291	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	92	92	92	91	91	91	95	95	95
Heavy Vehicles, %	33	25	0	0	0	0	0	2	0	0	1	0
Mvmt Flow	8	6	6	0	0	0	5	301	30	255	306	8
Major/Minor	Minor2						Major1		Major2			
Conflicting Flow All	1146	1161	310				314	0	0	331	0	0
Stage 1	820	820	-				-	-	-	-	-	-
Stage 2	326	341	-				-	-	-	-	-	-
Critical Hdwy	6.73	6.75	6.2				4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.73	5.75	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.73	5.75	-				-	-	-	-	-	-
Follow-up Hdwy	3.797	4.225	3.3				2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	192	177	735				1258	-	-	1240	-	-
Stage 1	384	358	-				-	-	-	-	-	-
Stage 2	667	600	-				-	-	-	-	-	-
Platoon blocked, %							-	-	-			
Mov Cap-1 Maneuver	143	0	735				1258	-	-	1240	-	-
Mov Cap-2 Maneuver	143	0	-				-	-	-	-	-	-
Stage 1	382	0	-				-	-	-	-	-	-
Stage 2	500	0	-				-	-	-	-	-	-
Approach	EB						NB		SB			
HCM Control Delay, s	23.4						0.1		3.9			
HCM LOS	C											
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1258	-	-	215	1240	-	-					
HCM Lane V/C Ratio	0.004	-	-	0.09	0.205	-	-					
HCM Control Delay (s)	7.9	0	-	23.4	8.7	0	-					
HCM Lane LOS	A	A	-	C	A	A	-					
HCM 95th %tile Q(veh)	0	-	-	0.3	0.8	-	-					






Route 127 at School Street

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2021 Existing Weekday Morning  
6: Route 127 & School Street

Intersection						
Int Delay, s/veh	15.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	132	223	227	86	146	114
Future Vol, veh/h	132	223	227	86	146	114
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	78	78	88	88	88	88
Heavy Vehicles, %	1	3	2	5	3	1
Mvmt Flow	169	286	258	98	166	130
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	356	0	-	0	931	307
Stage 1	-	-	-	-	307	-
Stage 2	-	-	-	-	624	-
Critical Hdwy	4.11	-	-	-	6.43	6.21
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.209	-	-	-	3.527	3.309
Pot Cap-1 Maneuver	1208	-	-	-	295	735
Stage 1	-	-	-	-	744	-
Stage 2	-	-	-	-	532	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1208	-	-	-	246	735
Mov Cap-2 Maneuver	-	-	-	-	246	-
Stage 1	-	-	-	-	620	-
Stage 2	-	-	-	-	532	-
Approach	EB	WB		SB		
HCM Control Delay, s	3.1	0		53.3		
HCM LOS				F		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1208	-	-	-	347	
HCM Lane V/C Ratio	0.14	-	-	-	0.851	
HCM Control Delay (s)	8.5	0	-	-	53.3	
HCM Lane LOS	A	A	-	-	F	
HCM 95th %tile Q(veh)	0.5	-	-	-	7.8	

2021 Existing Weekday Evening  
6: Route 127 & School Street

Intersection						
Int Delay, s/veh	12					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	110	284	289	147	133	76
Future Vol, veh/h	110	284	289	147	133	76
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	76	76	85	85	95	95
Heavy Vehicles, %	0	0	1	2	2	0
Mvmt Flow	145	374	340	173	140	80
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	513	0	-	0	1091	427
Stage 1	-	-	-	-	427	-
Stage 2	-	-	-	-	664	-
Critical Hdwy	4.1	-	-	-	6.42	6.2
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.3
Pot Cap-1 Maneuver	1063	-	-	-	238	632
Stage 1	-	-	-	-	658	-
Stage 2	-	-	-	-	512	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1063	-	-	-	197	632
Mov Cap-2 Maneuver	-	-	-	-	197	-
Stage 1	-	-	-	-	545	-
Stage 2	-	-	-	-	512	-
Approach	EB	WB		SB		
HCM Control Delay, s	2.5	0		62.6		
HCM LOS				F		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1063	-	-	-	263	
HCM Lane V/C Ratio	0.136	-	-	-	0.837	
HCM Control Delay (s)	8.9	0	-	-	62.6	
HCM Lane LOS	A	A	-	-	F	
HCM 95th %tile Q(veh)	0.5	-	-	-	6.8	

2029 No Build Weekday Morning  
6: Route 127 & School Street

Intersection						
Int Delay, s/veh	27.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	143	242	246	93	158	124
Future Vol, veh/h	143	242	246	93	158	124
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	78	78	88	88	88	88
Heavy Vehicles, %	1	3	2	5	3	1
Mvmt Flow	183	310	280	106	180	141
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	386	0	-	0	1009	333
Stage 1	-	-	-	-	333	-
Stage 2	-	-	-	-	676	-
Critical Hdwy	4.11	-	-	-	6.43	6.21
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.209	-	-	-	3.527	3.309
Pot Cap-1 Maneuver	1178	-	-	-	265	711
Stage 1	-	-	-	-	724	-
Stage 2	-	-	-	-	503	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1178	-	-	-	215	711
Mov Cap-2 Maneuver	-	-	-	-	215	-
Stage 1	-	-	-	-	588	-
Stage 2	-	-	-	-	503	-
Approach	EB	WB		SB		
HCM Control Delay, s	3.2	0		98.1		
HCM LOS				F		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1178	-	-	-	310	
HCM Lane V/C Ratio	0.156	-	-	-	1.034	
HCM Control Delay (s)	8.6	0	-	-	98.1	
HCM Lane LOS	A	A	-	-	F	
HCM 95th %tile Q(veh)	0.6	-	-	-	11.6	

2029 No-Build Weekday Evening  
6: Route 127 & School Street

Intersection

Int Delay, s/veh 21.3

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations 

Traffic Vol, veh/h 119 308 313 159 144 82

Future Vol, veh/h 119 308 313 159 144 82

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 76 76 85 85 95 95

Heavy Vehicles, % 0 0 1 2 2 0

Mvmt Flow 157 405 368 187 152 86

Major/Minor Major1 Major2 Minor2

Conflicting Flow All 555 0 - 0 1181 462

Stage 1 - - - - 462 -

Stage 2 - - - - 719 -

Critical Hdwy 4.1 - - - 6.42 6.2

Critical Hdwy Stg 1 - - - - 5.42 -

Critical Hdwy Stg 2 - - - - 5.42 -

Follow-up Hdwy 2.2 - - - 3.518 3.3

Pot Cap-1 Maneuver 1026 - - - 210 604

Stage 1 - - - - 634 -

Stage 2 - - - - 483 -

Platoon blocked, % - - - -

Mov Cap-1 Maneuver 1026 - - - 169 604

Mov Cap-2 Maneuver - - - - 169 -

Stage 1 - - - - 509 -

Stage 2 - - - - 483 -

Approach EB WB SB

HCM Control Delay, s 2.5 0 115.6

HCM LOS F

Minor Lane/Major Mvmt EBL EBT WBT WBR SBLn1

Capacity (veh/h) 1026 - - - 229




HCM Lane V/C Ratio 0.153 - - - 1.039

HCM Control Delay (s) 9.1 0 - - 115.6

HCM Lane LOS A A - - F

HCM 95th %tile Q(veh) 0.5 - - - 10

2029 Build Weekday Morning  
6: Route 127 & School Street

Intersection						
Int Delay, s/veh	29.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	144	242	246	94	161	126
Future Vol, veh/h	144	242	246	94	161	126
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	78	78	88	88	88	88
Heavy Vehicles, %	1	3	2	5	3	1
Mvmt Flow	185	310	280	107	183	143
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	387	0	-	0	1014	334
Stage 1	-	-	-	-	334	-
Stage 2	-	-	-	-	680	-
Critical Hdwy	4.11	-	-	-	6.43	6.21
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.209	-	-	-	3.527	3.309
Pot Cap-1 Maneuver	1177	-	-	-	263	710
Stage 1	-	-	-	-	723	-
Stage 2	-	-	-	-	501	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1177	-	-	-	213	710
Mov Cap-2 Maneuver	-	-	-	-	213	-
Stage 1	-	-	-	-	586	-
Stage 2	-	-	-	-	501	-
Approach	EB	WB		SB		
HCM Control Delay, s	3.2	0		105.7		
HCM LOS	F					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1177	-	-	-	308	
HCM Lane V/C Ratio	0.157	-	-	-	1.059	
HCM Control Delay (s)	8.6	0	-	-	105.7	
HCM Lane LOS	A	A	-	-	F	
HCM 95th %tile Q(veh)	0.6	-	-	-	12.2	

2029 Build Weekday Evening  
6: Route 127 & School Street

Intersection

Int Delay, s/veh 23.4

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations   

Traffic Vol, veh/h 121 308 313 162 146 83

Future Vol, veh/h 121 308 313 162 146 83

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 76 76 85 85 95 95

Heavy Vehicles, % 0 0 1 2 2 0

Mvmt Flow 159 405 368 191 154 87

Major/Minor Major1 Major2 Minor2

Conflicting Flow All 559 0 - 0 1187 464

Stage 1 - - - - 464 -

Stage 2 - - - - 723 -

Critical Hdwy 4.1 - - - 6.42 6.2

Critical Hdwy Stg 1 - - - - 5.42 -

Critical Hdwy Stg 2 - - - - 5.42 -

Follow-up Hdwy 2.2 - - - 3.518 3.3

Pot Cap-1 Maneuver 1022 - - - 208 602

Stage 1 - - - - 633 -

Stage 2 - - - - 481 -

Platoon blocked, % - - - -

Mov Cap-1 Maneuver 1022 - - - 166 602

Mov Cap-2 Maneuver - - - - 166 -

Stage 1 - - - - 506 -

Stage 2 - - - - 481 -

Approach EB WB SB

HCM Control Delay, s 2.6 0 126.3

HCM LOS F

Minor Lane/Major Mvmt EBL EBT WBT WBR SBLn1

Capacity (veh/h) 1022 - - - 225

HCM Lane V/C Ratio 0.156 - - - 1.071

HCM Control Delay (s) 9.2 0 - - 126.3

HCM Lane LOS A A - - F




HCM 95th %tile Q(veh) 0.6 - - - 10.6






School Street at Project Site Roadway

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2029 Build Weekday Morning  
7: School Street & Project Site Driveway

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	47	15	252	409	1
Future Vol, veh/h	2	47	15	252	409	1
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	92	92	92	92	91	92
Heavy Vehicles, %	2	2	2	1	3	2
Mvmt Flow	2	51	16	274	449	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	756	450	450	0	-	0
Stage 1	450	-	-	-	-	-
Stage 2	306	-	-	-	-	-
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	376	609	1110	-	-	-
Stage 1	642	-	-	-	-	-
Stage 2	747	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	370	609	1110	-	-	-
Mov Cap-2 Maneuver	370	-	-	-	-	-
Stage 1	631	-	-	-	-	-
Stage 2	747	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.7	0.5		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1110	-	593	-	-	
HCM Lane V/C Ratio	0.015	-	0.09	-	-	
HCM Control Delay (s)	8.3	0	11.7	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.3	-	-	

2029 Build Weekday Evening  
7: School Street & Project Site Driveway

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	28	48	369	307	2
Future Vol, veh/h	1	28	48	369	307	2
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	92	92	92	83	91	92
Heavy Vehicles, %	2	2	2	2	0	2
Mvmt Flow	1	30	52	445	337	2
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	887	338	339	0	-	0
Stage 1	338	-	-	-	-	-
Stage 2	549	-	-	-	-	-
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	315	704	1220	-	-	-
Stage 1	722	-	-	-	-	-
Stage 2	579	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	297	704	1220	-	-	-
Mov Cap-2 Maneuver	297	-	-	-	-	-
Stage 1	681	-	-	-	-	-
Stage 2	579	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.6	0.8		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1220	-	672	-	-	
HCM Lane V/C Ratio	0.043	-	0.047	-	-	
HCM Control Delay (s)	8.1	0	10.6	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-	