MEMORANDUM

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DATE: June 15, 2023

RE: 9568

SUBJECT: Transportation Impact Assessment
Proposed Multifamily Residential Development – Main Street (Route 140)
Upton, Massachusetts

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 multifamily residential development to be located off of Main Street (Route 140) in Upton, 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 Route 140 and at major intersections along this roadway through which Project-related traffic will travel. 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),[1] the Project is expected to generate approximately 310 vehicle trips on an average weekday (two-way, 24-hour volume), with 18 vehicle trips expected during the weekday morning peak-hour and 27 vehicle trips expected during the weekday evening peak-hour;

2. The Project will not result in 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 operating or are predicted to operate at or over capacity (i.e., level-of-service (LOS) "E" or "F", respectively) independent of the Project;

3. All movements exiting the Project site driveway to Route 140 are predicted to operate at LOS B during the peak hours with negligible vehicle queuing predicted. All movements along Route 140 approaching the driveway are predicted to operate at LOS A, also with negligible vehicle queuing;

[1] *Trip Generation,* 11th Edition; Institute of Transportation Engineers; Washington, DC; 2021.

4. Independent of the Project, the Route 140/School Street/Pleasant Street intersection was found to have a motor vehicle crash rate that is above the MassDOT average crash rate for similar intersections. MassDOT is currently advancing improvements along Route 140 that include improvements at this intersection that will enhance safety and mobility; and

5. Lines of sight at the Project site driveway intersection with Route 140 were found to exceed the recommended minimum distance for the intersection to operate in a safe and efficient manner based on the appropriate approach speed.

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 the implementation of the recommendations defined herein.

The following details our assessment of the Project.

PROJECT DESCRIPTION

The Project will entail the construction of a 68±-unit multifamily residential development to be located off of Main Street (Route 140) in Upton, Massachusetts. The Project site encompasses approximately 6.75± acres of land that is bound by residential properties to the north, east and west; and Route 140 and Pickering & Son Upton Funeral Home to the south. The Project site currently contains areas of open and wooded space. Figure 1 depicts the Project site location in relation to the existing roadway network.

Access to the Project site will be provided by way of a new drive that will intersect the north side of Route 140 approximately 700 feet west of School Street (between the Pickering & Son Upton Funeral Home and 51 Main Street). Off-street parking will be provided for 111 vehicles, or a parking ratio of 1.63 parking spaces per unit. The proposed parking ratio is consistent with the parking ratios observed for other multifamily residential communities in a similar setting documented by the ITE.[2] The ITE parking demand observations indicate that the peak parking demands ratio for a multifamily residential community range from 0.75 to 2.03 spaces per residential unit.

STUDY METHODOLOGY

This study was prepared in consultation with the Massachusetts Department of Transportation (MassDOT) and the Town of Upton; 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; on-street parking; public transportation services; observations of traffic flow; and collection of pedestrian, bicycle, and vehicle 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. A seven-year time horizon was selected for analyses consistent with MassDOT guidelines. The analysis conducted in stage two identifies existing or projected future capacity, safety, and access issues, as these areas relate to the transportation infrastructure.

[2] *Parking Generation,* 5th Edition; Institute of Transportation Engineers; Washington D.C.; January 2019.

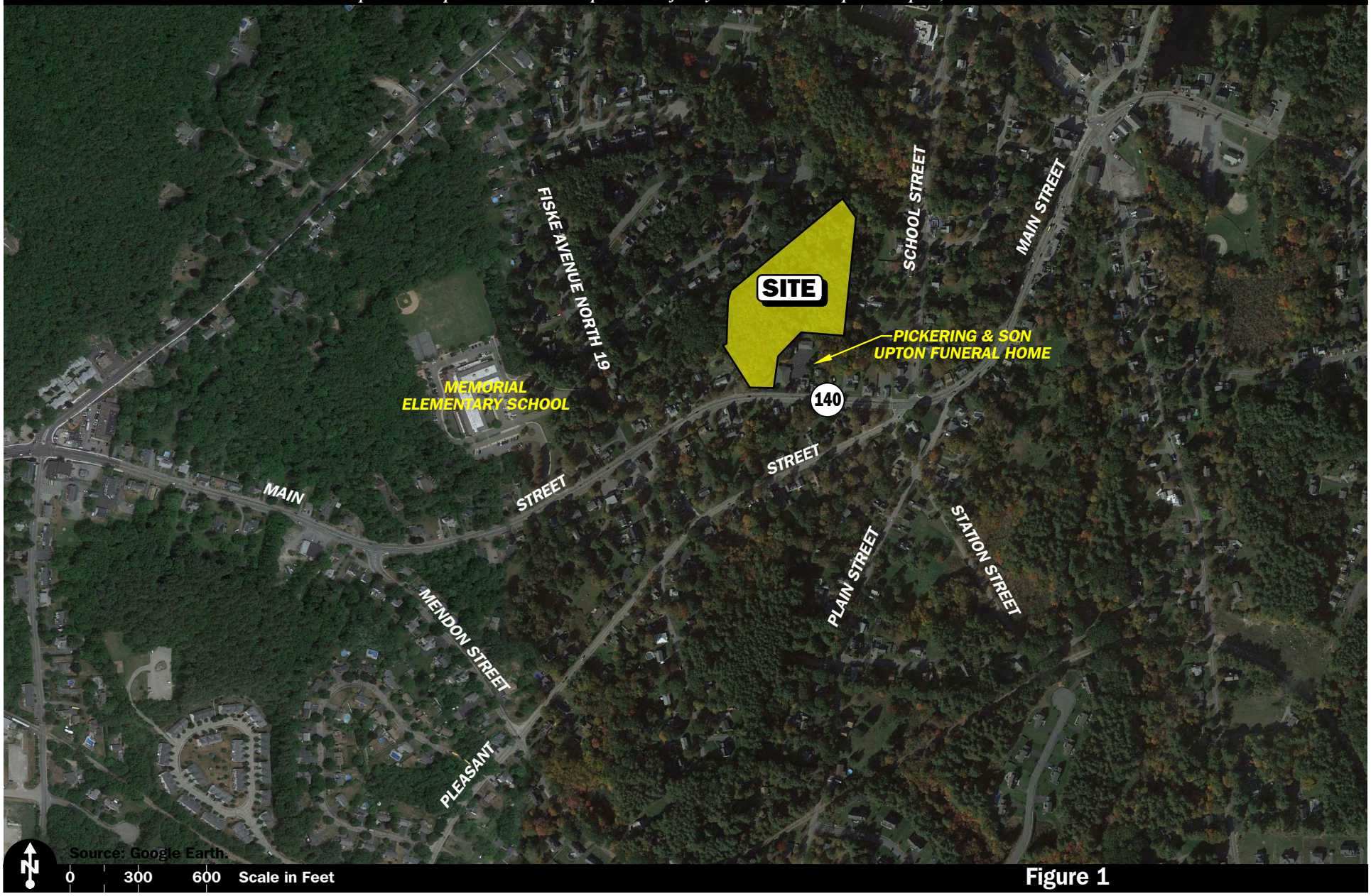

Figure 1

Site Location Map

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The third stage of the study presents and evaluates measures to address deficiencies in the transportation infrastructure, if any, identified in stage two of the study.

EXISTING CONDITIONS

A comprehensive field inventory of existing conditions within the study area was conducted in December 2022 and January 2023. This inventory included the collection of traffic-volume data and vehicle travel speed measurements, as well as a review of existing pedestrian and bicycle accommodations, public transportation services, and motor vehicle crash data. The following summarizes existing conditions within the study area.

Roadway

Main Street (Route 140)

Main Street is a two-lane, urban principal arterial roadway that traverses the study area in a general east-west direction and is under MassDOT jurisdiction. In the vicinity of the Project site, Route 140 provides two 13-foot-wide travel lanes that are separated by a double yellow centerline, with 6 to 8-foot-wide marked shoulders. The posted speed limit in the vicinity of the Project site is 35 miles per hour (mph). A sidewalk is provided along both sides of the roadway within the study area. Illumination is provided intermittently by way of street lights mounted on wooden poles. Land use along Route 140 within the study area consists of the Project site, residential properties, the Pickering & Son Upton Funeral Home, the Memorial Elementary School and areas of open and wooded space.

Intersections

Table 1 and Figure 2 summarize existing lane use, traffic control, and pedestrian and bicycle accommodations at the study area intersections as observed in December 2022.

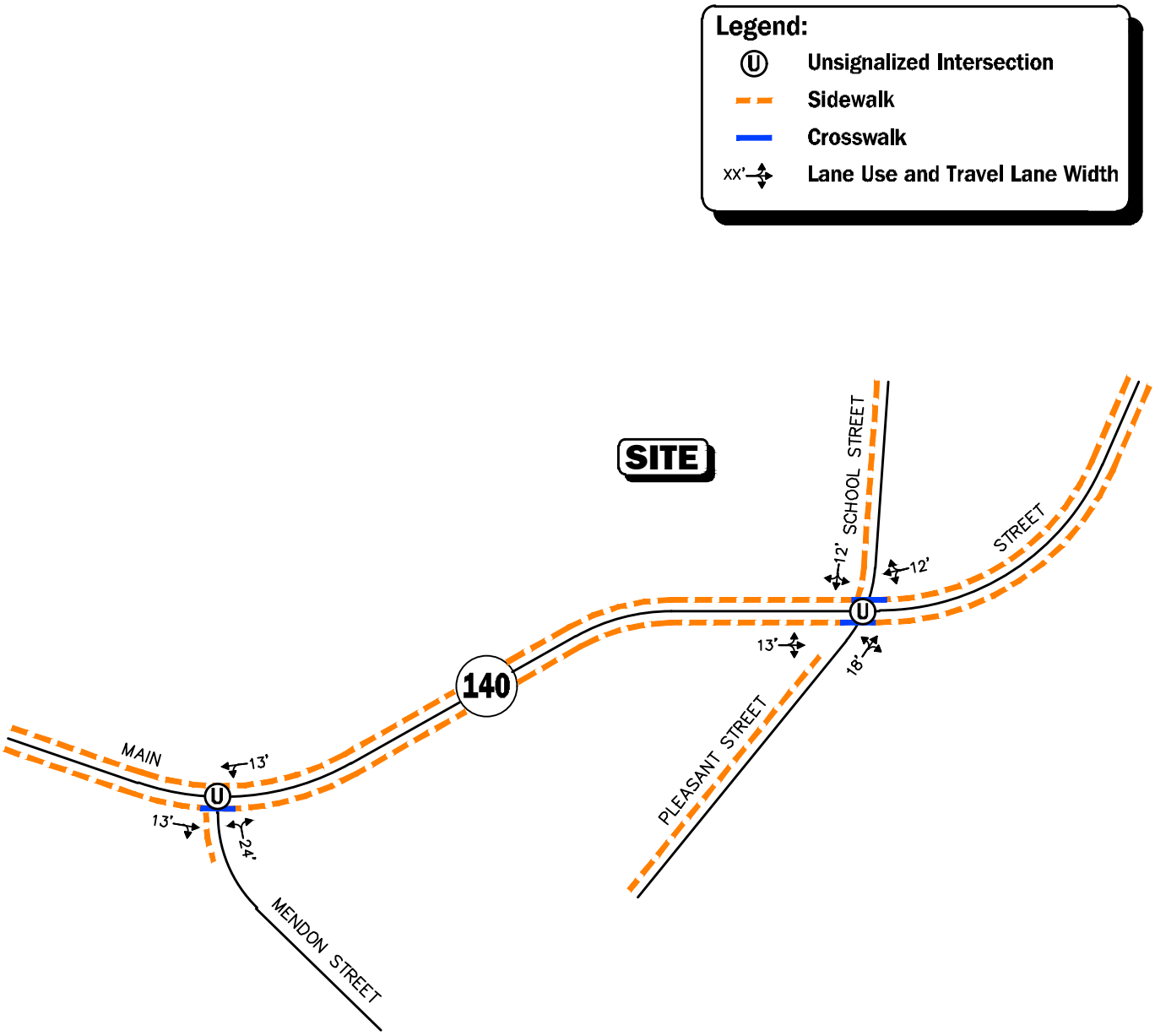

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Figure 2

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

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Table 1
STUDY AREA INTERSECTION DESCRIPTION

Intersection	Traffic Control Type[a]	No. of Travel Lanes Provided	Shoulder Provided? (Yes/No/Width)	Pedestrian Accommodations? (Yes/No/Description)	Bicycle Accommodations? (Yes/No/Description)
Rte. 140/ School St./ Pleasant St.	S	1 general-purpose travel lane provided on all approaches	Yes; 7-feet on Rte. 140 and 1-foot on School St. (west side) and Pleasant St.	Yes; sidewalks are provided along both sides of Rte. 140 and along the west side of School St. and Pleasant St. (south of Station St.); marked crosswalks are provided for crossing the Rte. 140 west leg, School St. and Pleasant St.	Yes; shared-traveled-way[b] on Rte. 140
Rte. 140/ Mendon St.	S	1 general-purpose travel lane provided on all approaches	Yes; 7-feet on Rte. 140 and 1 to 3-feet on Mendon St.	Yes; sidewalks are provided along both sides of Rte. 140; marked crosswalk is provided for crossing Mendon St.	Yes; shared-traveled-way on Rte. 140

[a]S = STOP-sign control.
[b]Combined shoulder and travel lane width equal to or exceed 14 feet.

Existing Traffic Volumes

In order to determine existing traffic-volume demands and flow patterns within the study area, automatic traffic recorder (ATR) counts, turning movement counts (TMCs), and vehicle classification counts were completed in January 2023. The ATR counts were conducted on Route 140, west of School Street, on January 11th through 12th, 2023 (Wednesday through Thursday, inclusive) in order to record weekday traffic conditions over an extended period, with weekday morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak-period TMCs performed at the study intersections on January 11th, 2023 (Wednesday). 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.

In order to evaluate the potential for seasonal fluctuation of traffic volumes within the study area, MassDOT weekday seasonal factors for Urban Group 3 roadways (principal arterial roadways, the functional classification of Route 140) were reviewed.[3] Based on a review of this data, it was determined that traffic volumes for the month of January are approximately 6.0 percent *below* average-month conditions. As such, the January traffic volumes were adjusted upward by 6.0 percent in order to be representative of average-month conditions in accordance with MassDOT standards.

MassDOT does not require pandemic-related adjustment of traffic counts performed after March 2022, except in locations where the predominant land use consists of offices or similar uses.[4] Given that the predominant land use within the study area is residential, a pandemic-related adjustment was not required.

[3]MassDOT statewide Traffic Data Collection; 2019 Weekday Seasonal Factors, Group U3.
[4]*25% Design Submission Guidelines;* MassDOT Highway Division, Traffic and Safety Engineering; Revised May 31, 2022.

The 2023 Existing traffic volumes are summarized in Table 2, with the weekday morning and evening peak-hour traffic volumes graphically depicted on Figure 3. Note that the peak-hour traffic volumes presented in Table 2 were obtained from the TMCs and are reflected on the aforementioned figure.

Table 2
2023 EXISTING TRAFFIC VOLUMES

Location/Peak-Hour	AWT[a]	VPH[b]	K Factor[c]	Directional Distribution[d]
Route 140, west of School Street:	6,150	--	--	--
Weekday Morning (7:00 – 8:00 AM)	--	577	9.4	55.8% EB
Weekday Evening (4:00 – 5:00 PM)	--	599	9.7	51.3% WB

[a]Average weekday traffic in vehicles per day.
[b]Vehicles per hour.
[c]Percent of daily traffic occurring during the peak-hour.
[d]Percent traveling in peak direction.
EB = eastbound; WB = westbound.

As can be seen in Table 2, Route 140 in the vicinity of the Project site, was found to accommodate approximately 6,150 vehicles on an average weekday (two-way, 24-hour volume), with approximately 577 vehicles per hour (vph) during the weekday morning peak-hour and 599 vph 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 2022. The field inventory consisted of a review of the location of sidewalks and pedestrian crossing locations along the study roadways and at the study intersections, as well as the location of existing and planned future bicycle facilities. As detailed on Figure 2, sidewalks are generally provided along one or both sides of the study area roadways with marked crosswalks provided for crossing one or more legs of the study area intersections.

Formal bicycle facilities are not provided within the study area; however, Route 140 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).[5]

Public Transportation

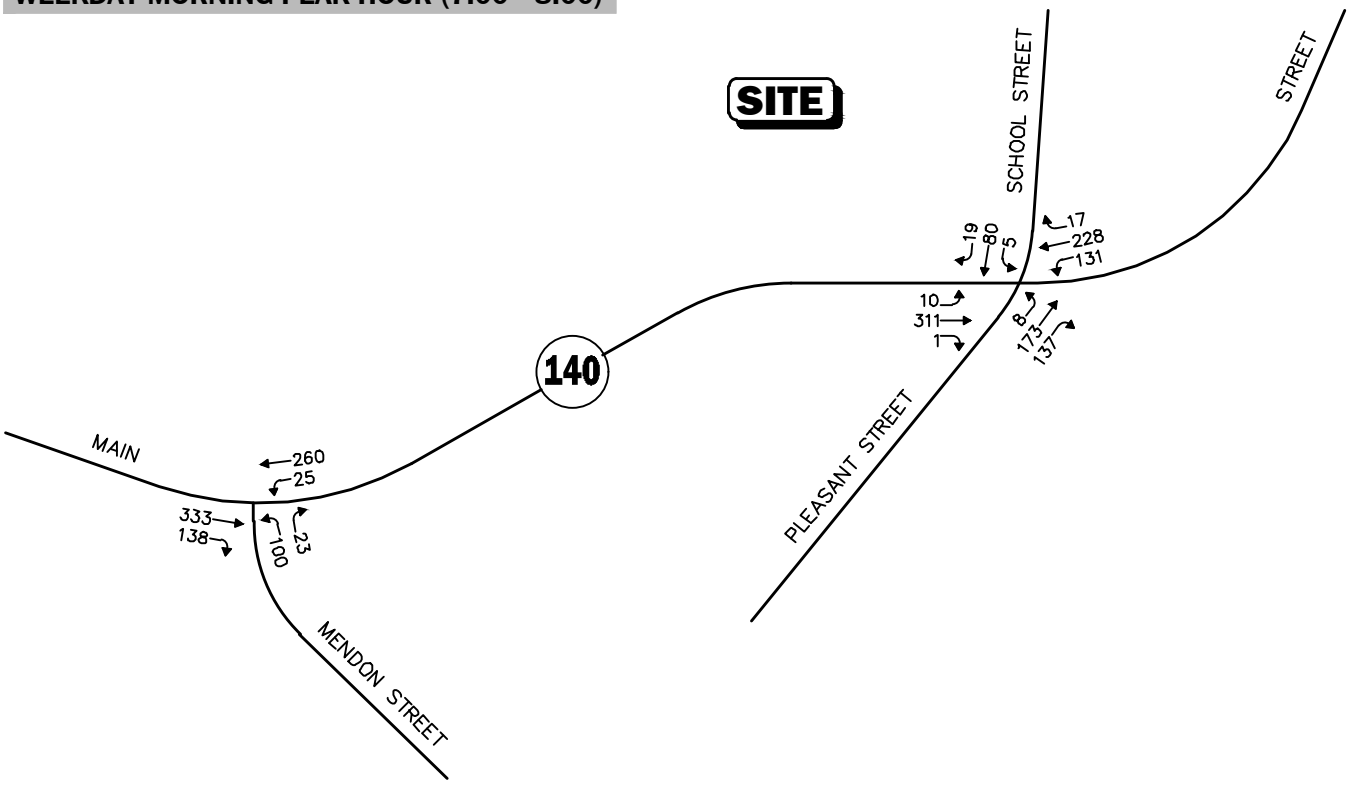
Regularly scheduled public transportation services are not currently provided within the study area or to the Town of Upton. The Upton Council on Aging (COA) provides transportation services for seniors (age 60+) and eligible disabled Upton residents. Trips must be scheduled 48-hours in advance by contacting the COA and the cost varies by the trip destination.

Spot Speed Measurements

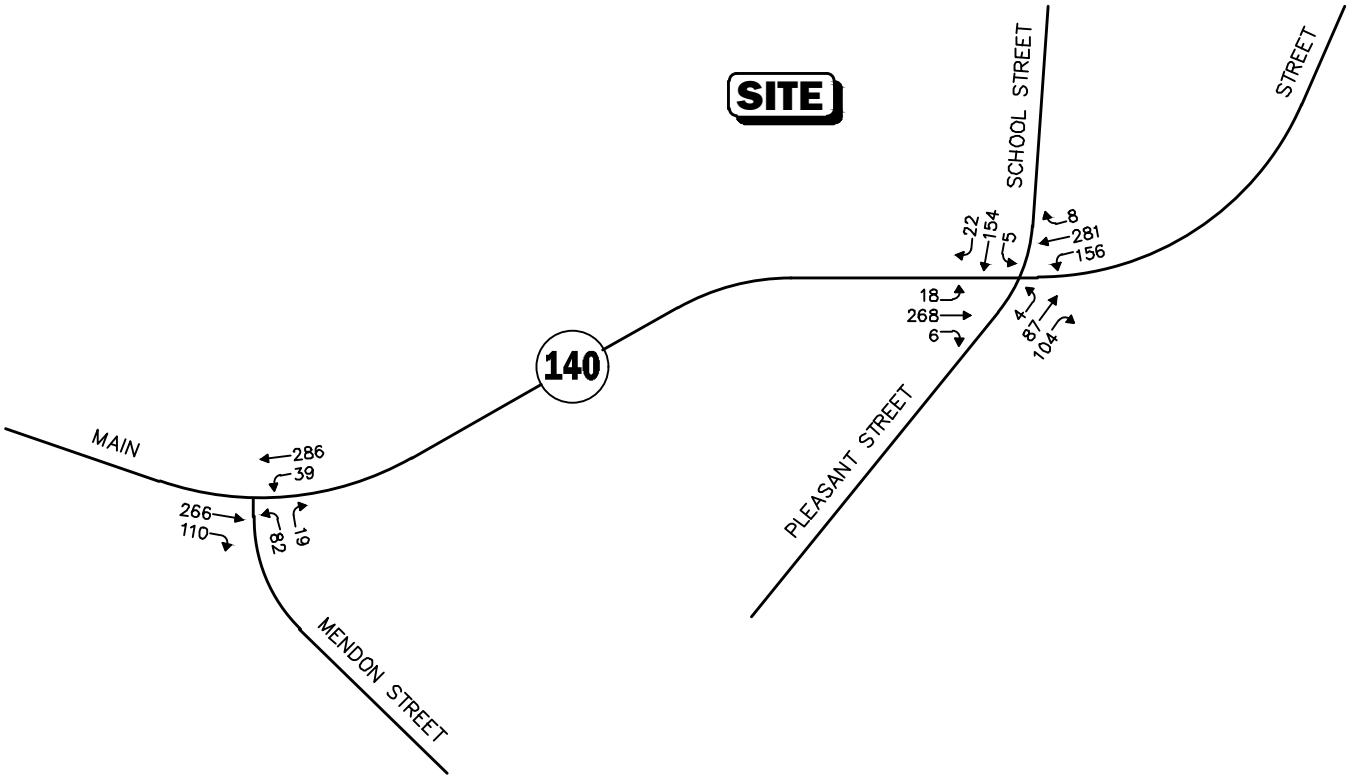
Vehicle travel speed measurements were performed on Route 140 in the vicinity of the Project site in conjunction with the ATR counts. Table 3 summarizes the vehicle travel speed measurements.

[5]A minimum combined travel lane and paved shoulder width of 14-feet is required to support bicycle travel in a shared traveled-way condition.

WEEKDAY MORNING PEAK HOUR (7:00 - 8:00)



WEEKDAY EVENING PEAK HOUR (4:00 - 5:00 PM)



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

Not To Scale

Figure 3

2023 Existing Peak-Hour Traffic Volumes

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Table 3
VEHICLE TRAVEL SPEED MEASUREMENTS

	Route 140	
	Eastbound	Westbound
Mean Travel Speed (mph)	29	31
85th Percentile Speed (mph)	34	36
Posted Speed Limit (mph)	35	35

mph = miles per hour.

As can be seen in Table 3, the mean vehicle travel speed along Route 140 in the vicinity of the Project site was found to be 29 mph in the eastbound direction and 31 mph westbound. The measured 85th percentile vehicle travel speed, or the speed at which 85 percent of the observed vehicles traveled at or below, was found to be 34 mph in the eastbound direction and 36 mph westbound, which is consistent with the posted speed limit (35 mph) in the vicinity of the Project site. The 85th 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.

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 (2016 through 2020, inclusive) 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 is presented in Table 4.

As can be seen in Table 4, no (0) reported motor vehicle crashes were reported to have occurred along Route 140 in the vicinity of the Project site driveway over the five-year review period. The Route 140/Mendon Street intersection was found to have experienced four (4) reported motor vehicle crashes over the five-year review period, or an average of 0.8 crashes per year, and was identified to have a motor vehicle crash rate *below* both the MassDOT Statewide and District average crash rates for similar intersections for the MassDOT Highway Division District in which the intersection is located (District 3). The majority of the crashes occurred on a weekday; during rainy weather conditions; and involved collisions with a fixed-object that resulted in property damage only.

The Route 140/School Street/Pleasant Street intersection was found to have experienced 22 reported motor vehicle crashes per year over the five-year review period, or an average of 4.4 crashes per year, the majority of which occurred on a weekday; during daylight; under clear weather conditions; and involved angle-type or rear-end collisions that resulted in property damage only. The intersection was identified to have a motor vehicle crash rate that is *above* the MassDOT statewide and District average crash rates for similar intersections. MassDOT is currently advancing improvements along Route 140 that include improvements at this intersection that will enhance safety and mobility (discussion follows).

A review of the MassDOT statewide High Crash Location List indicated that there are no Highway Safety Improvement Program (HSIP) eligible high crash locations within the study area or the Town of Upton. 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 and HSIP Mapping are attached.

Table 4
MOTOR VEHICLE CRASH DATA SUMMARY[a]

	Rte. 140/ School St./ Pleasant St.	Rte. 140/ Mendon St.	Rte. 140/Project Site Driveway
Traffic Control Type[b]	U	U	U
Year:			
2016	2	1	0
2017	8	1	0
2018	3	1	0
2019	4	1	0
2020	5	0	0
Total	22	4	0
Average	4.40	0.80	0.00
Crash Rate[c]	0.97	0.22	0.00
MassDOT Crash Rate:[d]	0.57/0.61	0.57/0.61	0.57/0.61
Significant?[e]	Yes	No	No
Type:			
Angle	9	1	0
Head-On	0	0	0
Rear-End	9	1	0
Rear-to-Rear	0	0	0
Sideswipe	0	0	0
Fixed Object	4	2	0
Pedestrian/Bicycle	0	0	0
Unknown/Other	0	0	0
Total	22	4	0
Conditions:			
Clear	13	1	0
Cloudy	7	1	0
Rain	1	2	0
Snow/Ice	1	0	0
Not Reported/Other	0	0	0
Total	22	4	0
Lighting:			
Daylight	17	2	0
Dawn/Dusk	0	0	0
Dark (Road Lit)	4	2	0
Dark (Road Unlit)	1	0	0
Total	22	4	0
Day of Week:			
Monday-Friday	17	4	0
Saturday	1	0	0
Sunday	4	0	0
Total	22	4	0
Severity:			
Property Damage Only	14	4	0
Non-fatal Injury	7	0	0
Fatalities	0	0	0
Not Reported	1	0	0
Total	22	4	0

[a]Source: MassDOT Safety Management/Traffic Operations Unit records, 2016 through 2020.
[b]Traffic Control Type: U = unsignalized.
[c]Crash rate per million vehicles entering the intersection.
[d]Statewide/District crash rate.
[e]The intersection crash rate is significant if it is found to exceed the MassDOT crash rate for the MassDOT Highway Division District in which the Project is located (District 3).

FUTURE CONDITIONS

Traffic volumes in the study area were projected to the year 2030, which reflects a seven-year planning horizon consistent with MassDOT guidelines. Independent of the Project, traffic volumes on the roadway network in the year 2030 under No-Build conditions include all existing traffic and new traffic resulting from background traffic growth. Anticipated Project-generated traffic volumes superimposed upon the 2030 No-Build traffic volumes reflect 2030 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 Town of Upton Planning Department was consulted in order to determine if there were any projects that would have an impact on future traffic volumes at the study intersections. Based on this consultation, the following project was identified for inclusion in this assessment:

- ***Governor's Landing Residential Development, Milford Street (Route 140), Upton, Massachusetts.*** This project entails the construction of a 162±-unit residential development that will include 48± multifamily units, 10± detached senior homes and 100± attached senior housing units to be located off of Milford Street to the east of the Project site. Traffic volumes associated with this project obtained from the traffic study prepared for the development[6] and were incorporated into the future conditions traffic volumes.

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 (discussion follows).

General Background Traffic Growth

Traffic-volume data compiled by MassDOT from count stations located in Upton were reviewed in order to determine general traffic growth trends in the area. This data indicates that annual traffic volumes have fluctuated over the past several years, with the average growth rate found to be approximately 0.92 percent per year. As such, a slightly higher 1.0 percent per year compounded annual background traffic growth rate was used in order to account for future traffic growth and presently unforeseen development within the study area.

[6] *Traffic Assessment*, Governor's Landing Residential Development, Upton, Massachusetts; TEPP LLC; September 10, 2019.

Roadway Improvement Projects

The Town of Upton and MassDOT were contacted in order to determine if there were any planned future roadway improvement projects expected to be complete by 2030 within the study area. Based on these discussions, the following roadway improvement project was identified:

- ***Resurfacing and Related Work on Route 140 and Roundabout Construction at Route 140, Church Street and Grove Street (MassDOT Project No. 608490).*** This project is being undertaken by MassDOT and entails the following improvements: rehabilitation and resurfacing of sections of Route 140; the construction of bicycle lanes; improved sidewalks and upgraded pedestrian curb ramps; the reconstruction of the Route 140/Church Street/Grove Street intersection to function under modern roundabout control; and the realignment of specific side streets along the Route 140 corridor. Within the study area, the Pleasant Street approach to Route 140 will be realigned to intersect Route 140 opposite School Street and new sidewalks, crosswalks bicycle lanes and signs and pavement markings will be installed. These improvements will enhance both safety and mobility at the intersection. The Route 140 improvement project is being funded through the 2024 Transportation Improvement Program (TIP) for the Central Massachusetts Metropolitan Planning Organization, with construction planned to begin in Spring 2025.

No other 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 2030 No-Build condition peak-hour traffic volumes were developed by: i) applying the 1.0 percent per year compounded annual background traffic growth rate to the 2023 Existing peak-hour traffic volumes; and ii) adding the traffic volumes associated with the specific development project by others (Governor's Landing residential development). The resulting 2030 No-Build weekday morning and evening peak-hour traffic volumes are shown on Figure 4.

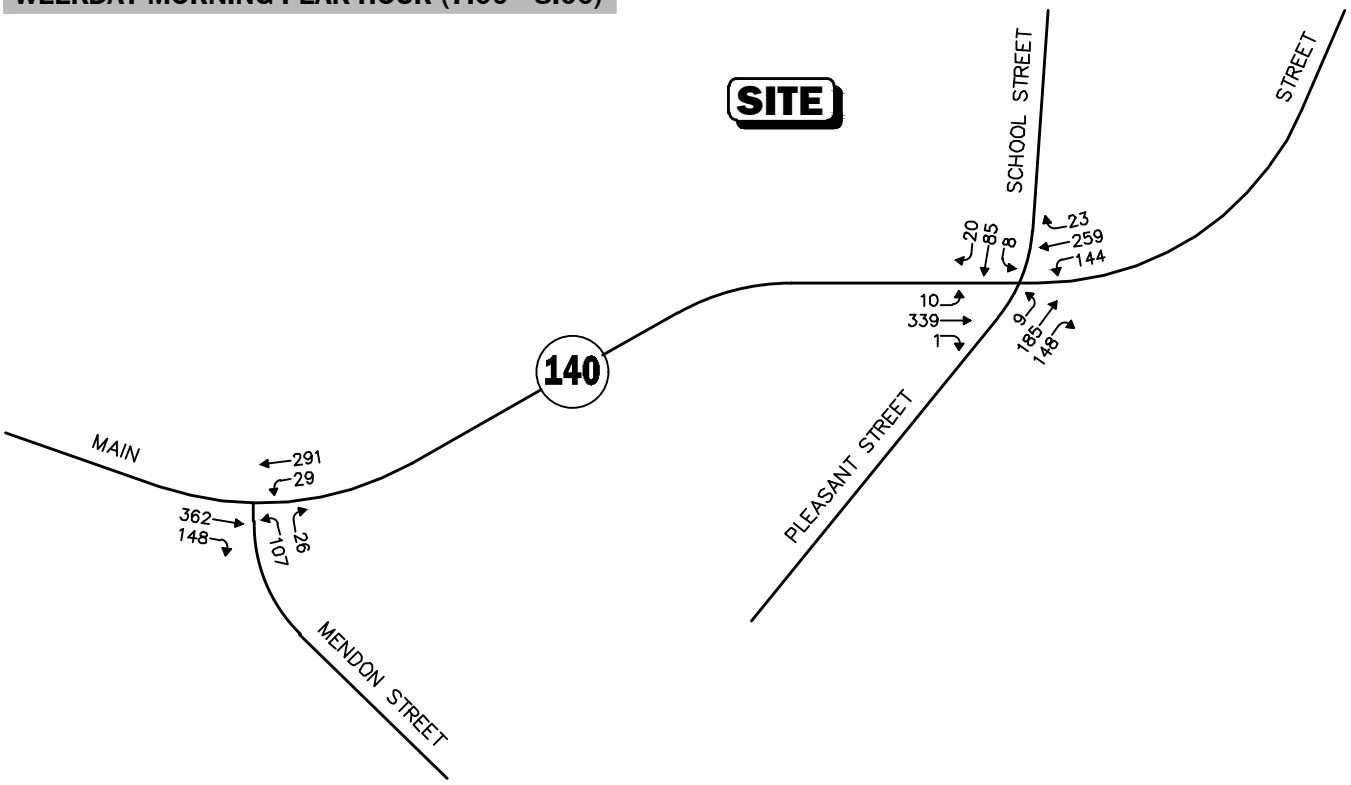
Project-Generated Traffic

Design year (2030 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.

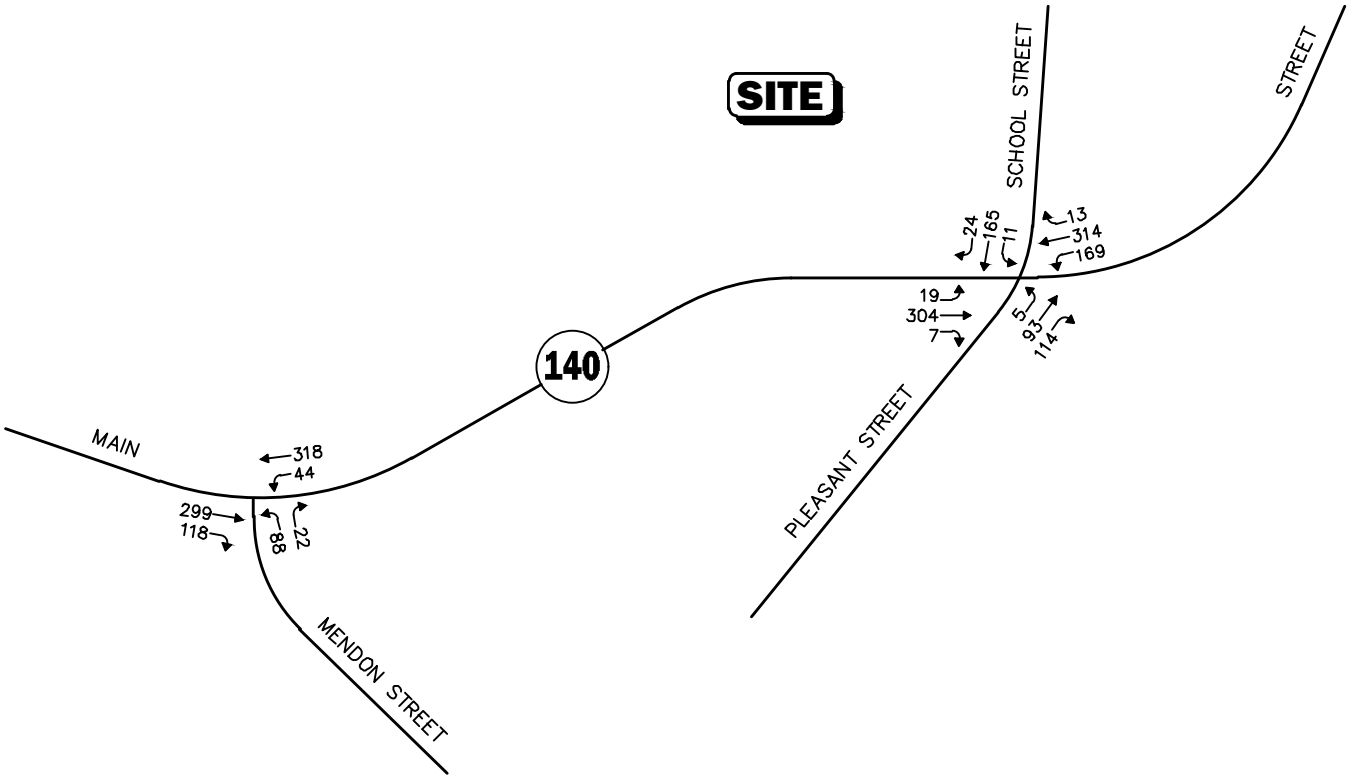
As proposed, the Project will entail the construction of a 68±-unit multifamily residential development. In order to develop the traffic characteristics of the Project, trip-generation statistics published by the Institute of Transportation Engineers (ITE)[7] for a similar land use as that proposed were used. ITE Land Use Code (LUC) 221, *Multifamily Housing (Mid-Rise)*, was used to develop the traffic characteristics of the Project, the results of which are summarized in Table 5.

[7]Ibid 1.

WEEKDAY MORNING PEAK HOUR (7:00 - 8:00)



WEEKDAY EVENING PEAK HOUR (4:00 - 5:00 PM)



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

Not To Scale

Figure 4

2023 No-Build Peak-Hour Traffic Volumes

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Table 5
TRIP GENERATION SUMMARY

Time Period	Vehicle Trips[a]		
	Entering	Exiting	Total
Average Weekday:	155	155	310
Weekday Morning Peak-Hour:	4	14	18
Weekday Evening Peak-Hour:	16	11	27

[a]Based on ITE LUC 221, *Multifamily Housing (Mid-Rise)* (68 units).

Project-Generated Traffic-Volume Summary

As can be seen in Table 5, the Project is expected to generate approximately 310 vehicle trips on an average weekday (two-way, 24-hour volume, or 155 vehicles entering and 155 exiting), with 18 vehicle trips (4 vehicles entering and 14 exiting) expected during the weekday morning peak-hour and 27 vehicle trips (16 vehicles entering and 11 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 U.S. Census Journey-to-Work data for the Town of Upton and then refined based on a review of existing traffic patterns within the study area. The general trip distribution for the Project is graphically depicted on Figure 5, with the additional traffic that is expected to be generated by the Project assigned on the study area roadway network as shown on Figure 6.

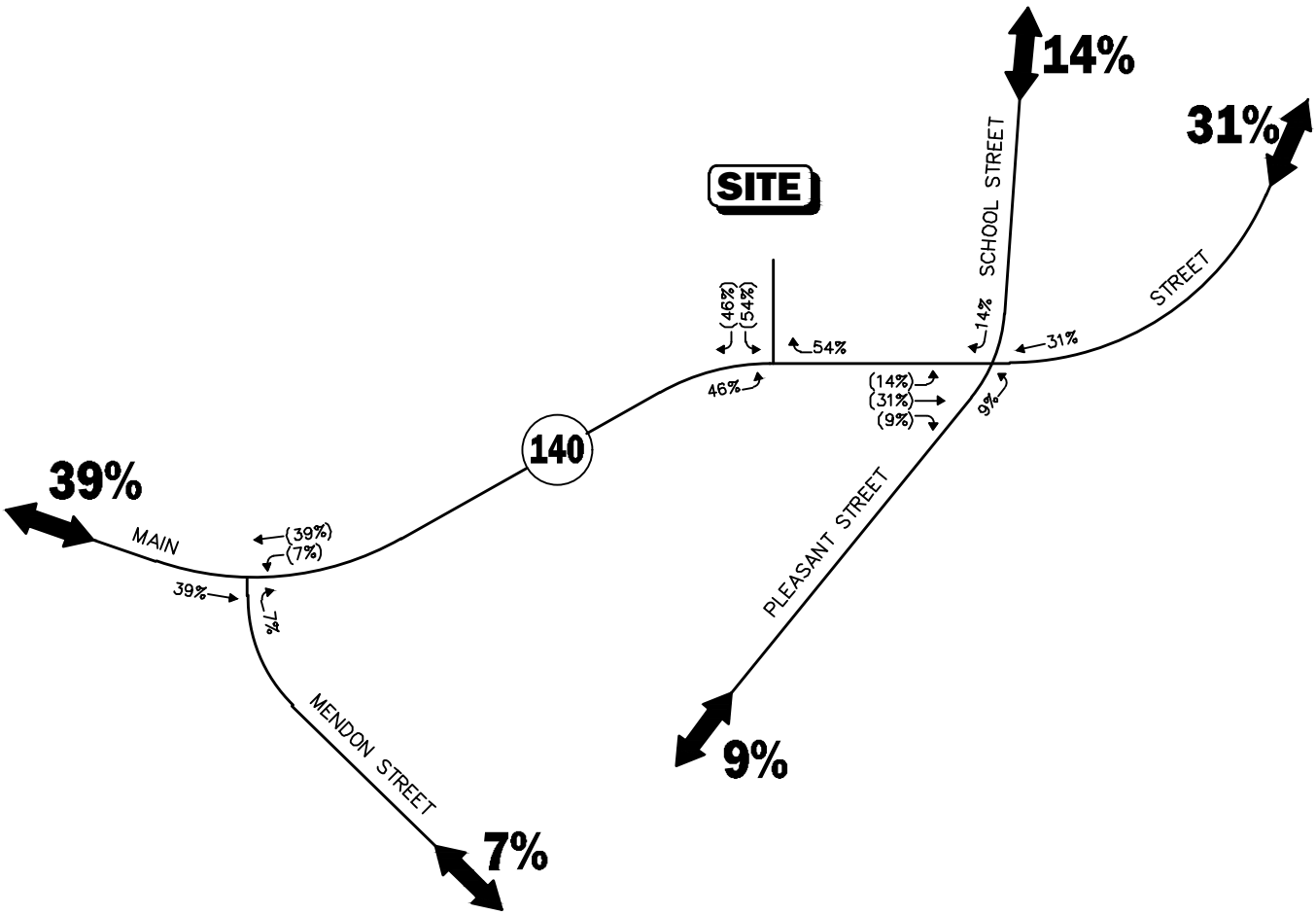
Build Traffic Volumes

The 2030 Build condition traffic volumes consist of the 2030 No-Build traffic volumes with the addition of the traffic expected to be generated by the Project. The 2030 Build weekday morning and evening peak-hour traffic volumes are graphically depicted on Figure 7.

TRAFFIC OPERATIONS ANALYSIS

In order to assess the potential impact of the Project on the roadway network, a detailed traffic operations analysis (motorist delays, vehicle queuing and level-of-service) was performed for the study intersections. Capacity analyses provide an indication of how well transportation 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.

In brief, six levels of service are defined for each type of facility. They are given letter designations ranging from A to F, with LOS "A" representing the best operating conditions and LOS "F" representing congested or constrained operations. An LOS of "E" is representative of a transportation facility that is operating at its design capacity with an LOS of "D" generally defined as the limit of "acceptable" traffic operations. Since the level-of-service of a traffic facility is a function of the 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 the year. The Synchro® intersection capacity analysis software, which is based on the analysis methodologies



Legend:

XX	Entering Trips
(XX)	Exiting Trips

Not To Scale

Figure 5

Trip Distribution Map

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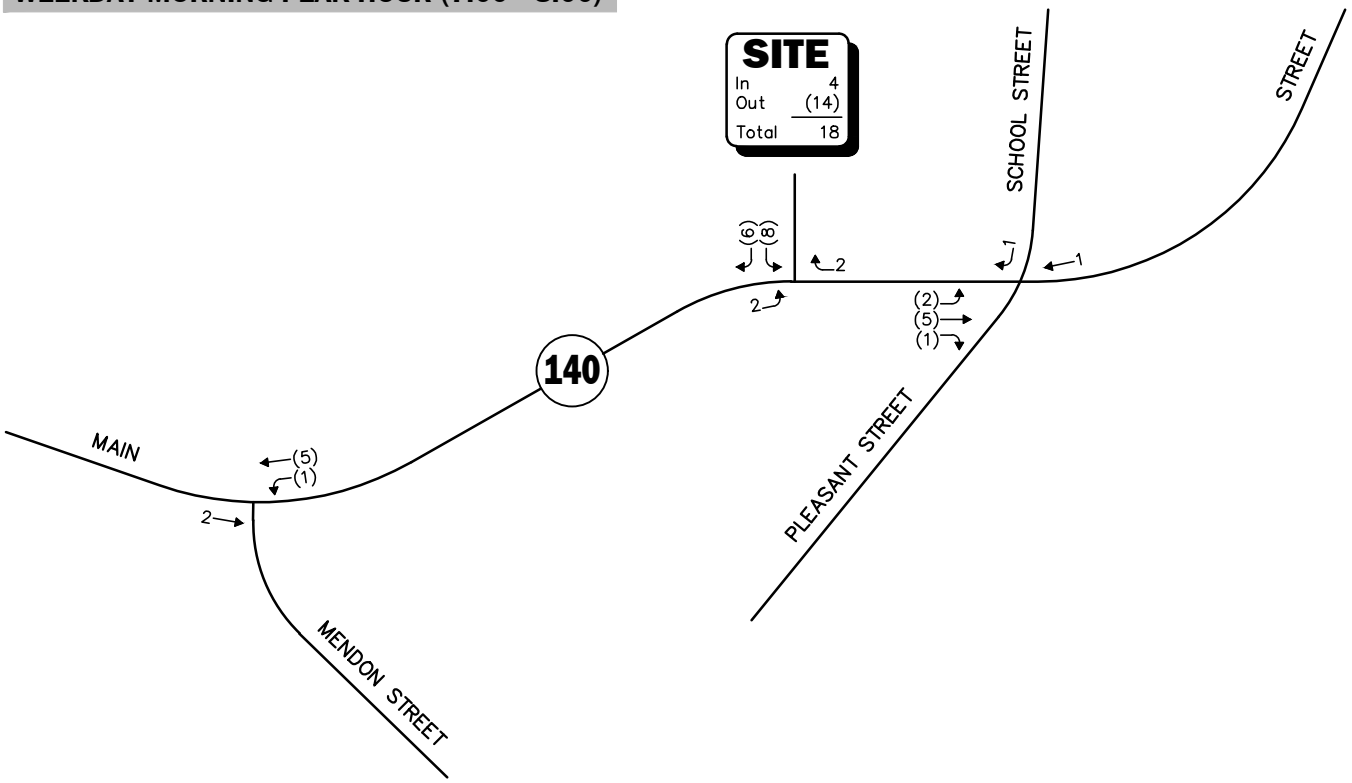
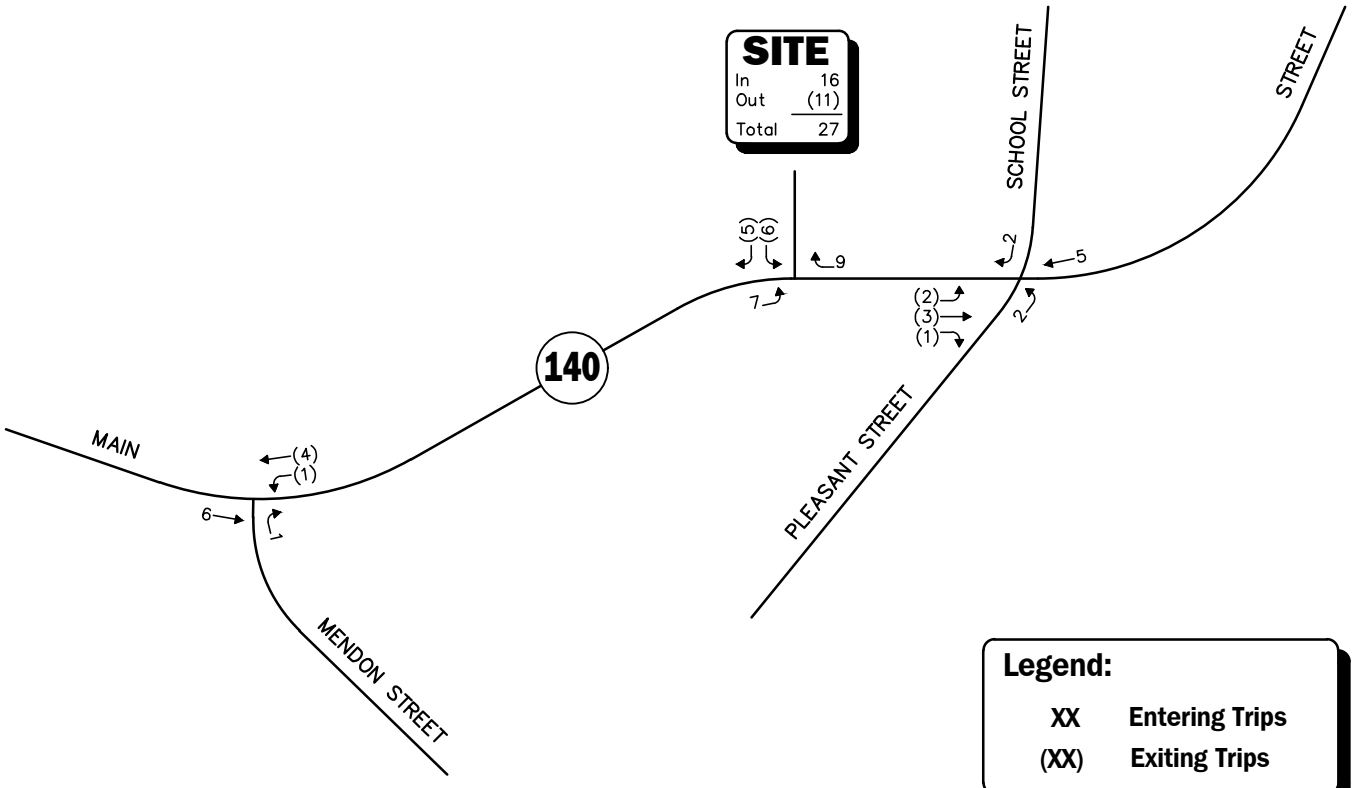
WEEKDAY MORNING PEAK HOUR (7:00 - 8:00)



WEEKDAY EVENING PEAK HOUR (4:00 - 5:00 PM)



Legend:

XX	Entering Trips
(XX)	Exiting Trips

Not To Scale

Figure 6

Project-Generated Peak-Hour Traffic Volumes

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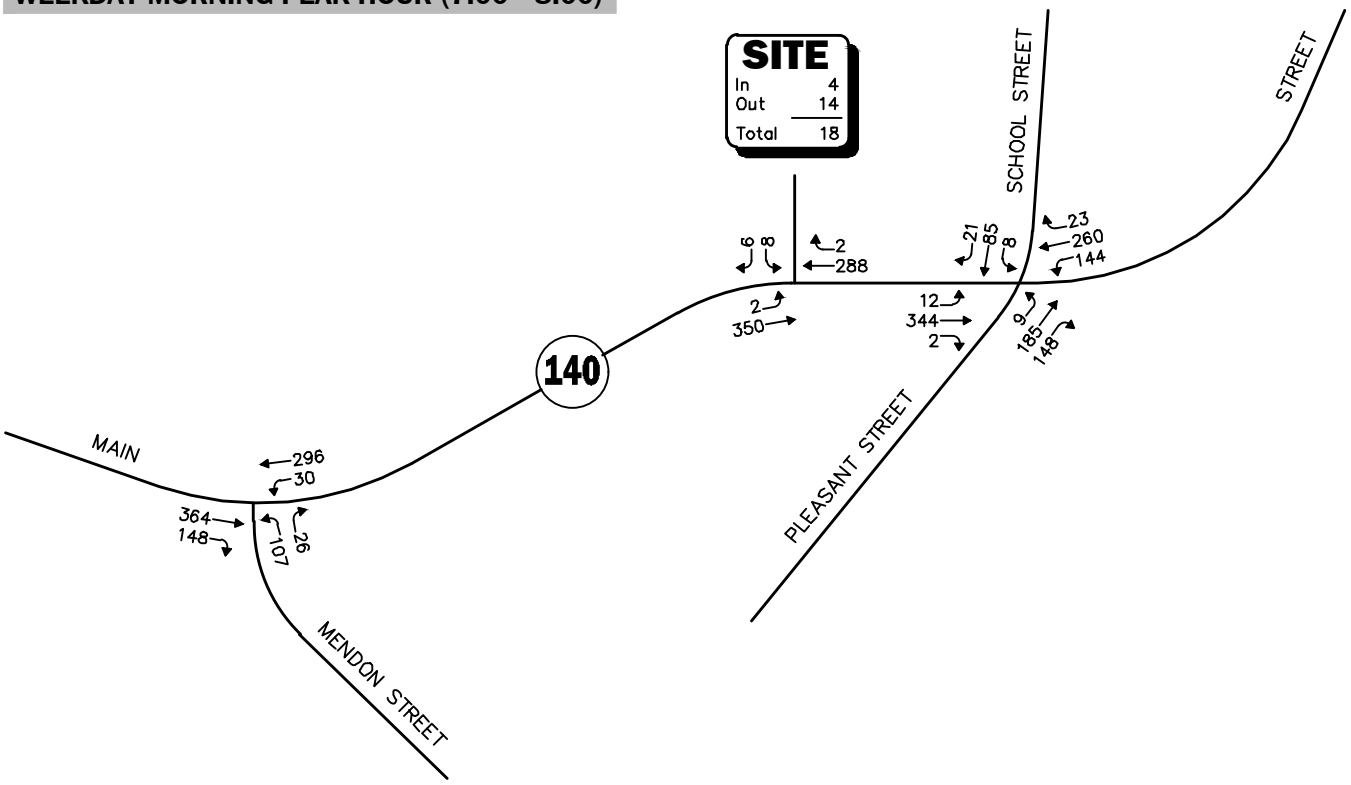
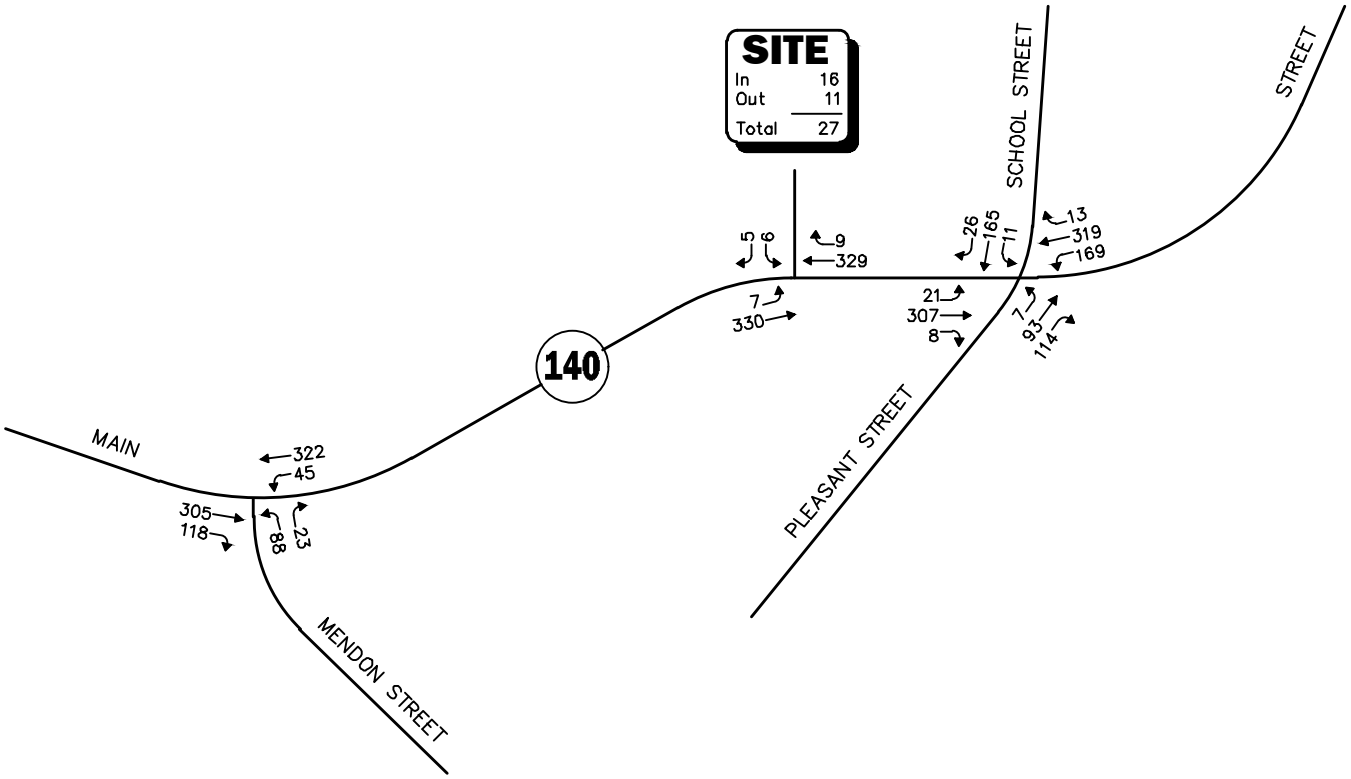
WEEKDAY MORNING PEAK HOUR (7:00 - 8:00)



WEEKDAY EVENING PEAK HOUR (4:00 - 5:00 PM)



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

Not To Scale

Figure 7

2030 Build
Peak-Hour Traffic Volumes

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and procedures presented in the *6th Edition Highway Capacity Manual* (HCM)[8] for unsignalized intersections was used to complete the level-of-service and vehicle queue analyses.

Analysis Results

Level-of-service and vehicle queue analysis were conducted for 2023 Existing, 2030 No-Build, and 2030 Build conditions for the intersections within the study area. The results of the intersection capacity and vehicle queue analyses are summarized in Tables 6, with the detailed analysis results attached.

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

Route 140 at School Street and Pleasant Street

No change in level-of-service is predicted to occur for any movement over No-Build conditions, with Project-related impacts generally defined as a predicted increase in average motorist delay that was not shown to result in an increase in vehicle queuing. Independent of the Project, both side streets (School Street and Pleasant Street) are currently operating over capacity (i.e., LOS "F") during the commuter evening peak hours.

Route 140 at Mendon Street

No change in level-of-service or vehicle queuing is predicted to occur for any movement over No-Build conditions, with Project- related impacts generally defined as a predicted increase in average motorist delay of up to 1.0 seconds. Independent of the Project, the Mendon Street approach is predicted to operate at capacity (i.e., LOS "E") during the weekday morning peak-hour under 2030 No-Build conditions.

Route 140 at the Project Site Driveway

All movements exiting the Project site driveway to Route 140 are predicted to operate at LOS B with negligible vehicle queuing predicted. All movements along Route 140 approaching the Project site driveway were shown to operate at LOS A, also with negligible vehicle queuing predicted.

[8] *Highway Capacity Manual*, Transportation Research Board; Washington, DC; 2016.

Table 6
UNSIGNALIZED INTERSECTION LEVEL-OF-SERVICE AND VEHICLE QUEUE SUMMARY

	2023 Existing				2030 No-Build				2030 Build			
Unsignalized Intersection/Peak-Hour/Movement	Demand[a]	Delay[b]	LOS[c]	Queue[d] 95th	Demand	Delay	LOS	Queue 95th	Demand	Delay	LOS	Queue 95th
Route 140 at School Street and Pleasant Street												
Weekday Morning:												
Route 140 EB LT/TH/RT	322	0.3	A	0	350	0.2	A	0	358	0.3	A	0
Route 140 WB LT/TH/RT	376	3.1	A	1	426	3.1	A	1	427	3.1	A	1
Pleasant Street NB LT/TH/RT	318	>50.0	F	28	342	>50.0	F	40	342	>50.0	F	N/C
School Street SB: LT/TH/RT	104	>50.0	F	N/C	113	>50.0	F	N/C	114	>50.0	F	N/C
Weekday Evening:												
Route 140 EB LT/TH/RT	292	0.5	A	0	330	0.5	A	0	336	0.5	A	0
Route 140 WB LT/TH/RT	445	3.0	A	1	496	3.0	A	1	501	3.0	A	1
Pleasant Street NB LT/TH/RT	195	>50.0	F	N/C	212	>50.0	F	N/C	214	>50.0	F	N/C
School Street SB: LT/TH/RT	181	>50.0	F	12	200	>50.0	F	20	202	>50.0	F	20
Route 140 at Mendon Street												
Weekday Morning:												
Route 140 EB TH/RT	471	0.0	A	0	510	0.0	A	0	512	0.0	A	0
Route 140 WB LT/TH	285	0.8	A	0	320	0.8	A	0	326	0.8	A	0
Mendon Street NB LT/RT	123	26.8	D	3	133	36.0	E	4	133	37.0	E	4
Weekday Evening:												
Route 140 EB TH/RT	376	0.0	A	0	417	0.0	A	0	423	0.0	A	0
Route 140 WB LT/TH	325	1.0	A	0	362	1.0	A	0	367	1.0	A	0
Mendon Street NB LT/RT	101	19.2	C	2	110	22.9	C	2	111	23.5	C	2
Route 140 at the Project Site Driveway												
Weekday Morning:												
Route 140 EB LT/TH	--	--	--	--	--	--	--	--	352	0.0	A	0
Route 140 WB TH/RT	--	--	--	--	--	--	--	--	290	0.0	A	0
Project Site Driveway SB LT/RT	--	--	--	--	--	--	--	--	14	14.7	B	0
Weekday Evening:												
Route 140 EB LT/TH	--	--	--	--	--	--	--	--	337	0.1	A	0
Route 140 WB TH/RT	--	--	--	--	--	--	--	--	338	0.0	A	0
Project Site Driveway SB LT/RT	--	--	--	--	--	--	--	--	11	13.8	B	0

[a]Demand in vehicles per hour.
[b]Average control delay per vehicle (in seconds).
[c]Level of service.
[d]Queue length in vehicles.
NB = northbound, EB = eastbound; SB = southbound; WB = westbound; LT = left-turning movements; TH = through movements; RT = right-turning movements.
N/C = Not Calculated.

SIGHT DISTANCE ASSESSMENT

Sight distance measurements were performed at the Project site driveway intersection with Route 140 in accordance with MassDOT and American Association of State Highway and Transportation Officials (AASHTO)[9] 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 oncoming 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 7 presents the measured SSD and ISD at the subject intersection.

Table 7
SIGHT DISTANCE MEASUREMENTS[a]

Intersection/Sight Distance Measurement	Feet		
	Required Minimum (SSD)	Desirable (ISD)[b]	Measured
Route 140 at the Project Site Driveway			
Stopping Sight Distance:			
Route 140 approaching from the east	305	--	650+
Route 140 approaching from the west	305	--	650+
Intersection Sight Distance:			
Looking to the east from the Project Site Driveway	305	385	650+
Looking to the west from the Project Site Driveway	305	445	650+

[a]Recommended minimum values obtained from *A Policy on Geometric Design of Highways and Streets,* 7th Edition; American Association of State Highway and Transportation Officials (AASHTO); 2018; and based on a 40 mph approach speed on Route 140.
[b]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 7, the available lines of sight to and from the Project site driveway intersection with Route 140 exceed the recommended minimum sight distance to function in a safe (SSD) and efficient (ISD) manner based on a 40 mph approach speed, which is above both the measured 85th percentile vehicle travel speed (34/36 mph) and the posted speed limit (35 mph) in the vicinity of the Project site.

[9]*A Policy on Geometric Design of Highway and Streets,* 7th Edition; American Association of State Highway and Transportation Officials (AASHTO); Washington D.C.; 2018.

SUMMARY

VAI has completed a detailed assessment of the potential impacts on the transportation infrastructure associated with the proposed construction of a multifamily residential development to be located off of Main Street (Route 140) in Upton, 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,[10] the Project is expected to generate approximately 310 vehicle trips on an average weekday (two-way, 24-hour volume), with 18 vehicle trips expected during the weekday morning peak-hour and 27 vehicle trips expected during the weekday evening peak-hour;

2. The Project will not result in 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 operating or are predicted to operate at or over capacity (i.e., LOS "E" or "F", respectively) independent of the Project;

3. All movements exiting the Project site driveway to Route 140 are predicted to operate at LOS B during the peak hours with negligible vehicle queuing predicted. All movements along Route 140 approaching the driveway are predicted to operate at LOS A, also with negligible vehicle queuing;

4. Independent of the Project, the Route 140/School Street/Pleasant Street intersection was found to have a motor vehicle crash rate that is above the MassDOT average crash rate for similar intersections. MassDOT is currently advancing improvements along Route 140 that include improvements at this intersection that will enhance safety and mobility; and

5. Lines of sight at the Project site driveway intersection with Route 140 were found to exceed the recommended minimum distance for the intersection to operate in a safe and efficient manner based on the appropriate approach speed.

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 the 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 as a part of this assessment. 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.

[10] Ibid 1.

Project Access

Access to the Project site will be provided by way of a new drive that will intersect the north side of Route 140 approximately 700 feet west of School Street (between the Pickering & Son Upton Funeral Home and 51 Main Street properties). 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 plan:

- The Project site driveway will be a minimum of 24 feet in width 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 should be placed under STOP-sign control with a marked STOP-line provided.
- All signs and pavement markings to be installed within the Project site should conform to the applicable standards of the *Manual on Uniform Traffic Control Devices* (MUTCD).[11]
- A sidewalk has been provided along the Project site driveway that extends to Route 140 where it will connect to the existing sidewalk along the north side of Route 140.
- Americans with Disabilities Act (ADA)-compliant wheelchair ramps should be provided for crossing the Project site driveway and at pedestrian crossings within the Project site. Alternatively, the Project site driveway can be constructed such that the sidewalk crosses the driveway (i.e., pan-type driveway).
- Signs and landscaping to be installed as a part of the Project within the intersection sight triangle areas of the Project site driveway should be designed and maintained so as not to restrict lines of sight.
- Snow accumulations (windrows) within sight triangle areas should be promptly removed where such accumulations would impede sight lines.
- Secure bicycle parking will be provided proximate to the residential building.

Off-Site

Route 140 at School Street and Pleasant Street

Independent of the Project, one or more movements at the Route 140/School Street/Pleasant Street intersection are currently or are predicted to operate at or over capacity during the peak hours. Absent improvement, motorist delays are expected to further increase in the future, again, independent of the Project. In addition to and also independent of the Project, the intersection was identified to have a motor vehicle crash history that warrants further review and the advancement of specific improvements to enhance safety. As previously discussed, MassDOT is currently advancing improvements along Route 140 that include improvements at this intersection that will enhance safety and mobility. As such, no additional improvements are necessary at this intersection to accommodate the Project.

[11] *Manual on Uniform Traffic Control Devices (MUTCD)*; Federal Highway Administration; Washington, D.C.; 2009.

Transportation Demand Management

In an effort to encourage the use of alternative modes of transportation to single-occupant vehicles (SOVs), the following Transportation Demand Management (TDM) measures should be implemented as part of the Project:

- A transportation coordinator should be assigned for the Project to coordinate the TDM program;
- A "welcome packet" should be provided to residents detailing available transportation options, including those offered by the Council on Aging (COA); and
- Secure bicycle parking will be provided for residents and visitors.

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.

cc: File

ATTACHMENTS

PROJECT SITE PLAN
AUTOMATIC TRAFFIC RECORDER COUNT DATA
TURNING MOVEMENT COUNT DATA
SEASONAL ADJUSTMENT DATA
VEHICLE TRAVEL SPEED DATA
MASSDOT CRASH RATE WORKSHEETS AND HIGH CRASH LOCATION MAPPING
GENERAL BACKGROUND TRAFFIC GROWTH
BACKGROUND DEVELOPMENT NETWORKS
TRIP-GENERATION CALCULATIONS
TRIP-DISTRIBUTION DATA
CAPACITY ANALYSIS WORKSHEETS

PROJECT SITE PLAN

D&L Design Group
CIVIL ENGINEERING & LAND SURVEYING
115 Water Street • Milford, MA 01757
P:(508) 408-2577
www.dandldesigngroup.com

P.E.	P.L.S.

GRAPHIC SCALE

40 0 20 40 80

(IN FEET)
1 inch = 40 feet

REVISIONS

REV.	DATE	DESCRIPTION

PROJECT NO.	J-016
DESIGNED BY	PML
CHECKED BY	MD
DATE	7/5/22
CAD FILE	J-016-MAIN STREET 40B SK1
PLAN NO.	

TITLE:

Upton Apartments

Main Street
in
Upton, Massachusetts

SHEET TITLE

OVERALL SITE PLAN
SHEET 2 OF 6

SHEET NO.

C-2.0

AUTOMATIC TRAFFIC RECORDER COUNT DATA

Accurate Counts

978-664-2565

Location : Main Street 95680001
Location : West of School Street
City/State: Upton, MA

1/11/2023	WB		Hour Totals		EB		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	3	37			3	42				
12:15	2	42			1	39				
12:30	1	38			3	51				
12:45	5	50	11	167	0	23	7	155	18	322
1:00	2	34			1	37				
1:15	1	42			0	54				
1:30	2	45			0	30				
1:45	2	58	7	179	1	48	2	169	9	348
2:00	2	46			0	41				
2:15	2	48			1	54				
2:30	2	56			0	61				
2:45	0	57	6	207	1	41	2	197	8	404
3:00	5	76			1	53				
3:15	2	81			2	73				
3:30	0	70			3	50				
3:45	1	74	8	301	4	58	10	234	18	535
4:00	2	77			5	60				
4:15	0	81			2	61				
4:30	4	69			3	105				
4:45	2	53	8	280	6	52	16	278	24	558
5:00	4	56			9	51				
5:15	7	65			13	44				
5:30	15	71			18	61				
5:45	6	48	32	240	11	43	51	199	83	439
6:00	20	32			17	44				
6:15	18	44			32	33				
6:30	33	40			31	34				
6:45	33	31	104	147	43	31	123	142	227	289
7:00	46	20			58	29				
7:15	82	27			82	31				
7:30	63	33			103	27				
7:45	46	27	237	107	62	20	305	107	542	214
8:00	61	20			68	15				
8:15	52	16			34	20				
8:30	53	26			47	11				
8:45	59	16	225	78	87	10	236	56	461	134
9:00	32	25			52	12				
9:15	33	15			44	8				
9:30	41	13			40	12				
9:45	55	7	161	60	44	4	180	36	341	96
10:00	40	11			52	4				
10:15	34	4			45	9				
10:30	39	9			45	5				
10:45	54	4	167	28	37	8	179	26	346	54
11:00	39	8			46	5				
11:15	48	7			41	7				
11:30	42	11			42	1				
11:45	48	5	177	31	59	1	188	14	365	45
Total	1143	1825			1299	1613			2442	3438
Percent	38.5%	61.5%			44.6%	55.4%			41.5%	58.5%

Accurate Counts
978-664-2565

Location : Main Street 95680001
Location : West of School Street
City/State: Upton, MA

1/12/2023	WB		Hour Totals		EB		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	6	38			0	53				
12:15	6	42			4	45				
12:30	1	46			1	42				
12:45	4	39	17	165	1	56	6	196	23	361
1:00	5	43			0	48				
1:15	3	22			0	35				
1:30	2	39			2	48				
1:45	1	64	11	168	1	45	3	176	14	344
2:00	1	40			3	56				
2:15	0	51			2	53				
2:30	1	55			2	44				
2:45	1	53	3	199	2	55	9	208	12	407
3:00	0	81			0	38				
3:15	1	66			3	72				
3:30	4	57			3	59				
3:45	2	66	7	270	2	50	8	219	15	489
4:00	3	81			1	58				
4:15	1	73			3	68				
4:30	7	62			4	66				
4:45	3	68	14	284	3	57	11	249	25	533
5:00	4	64			5	55				
5:15	14	52			13	57				
5:30	6	60			14	47				
5:45	11	45	35	221	18	40	50	199	85	420
6:00	16	45			22	32				
6:15	25	52			28	45				
6:30	31	33			32	48				
6:45	38	30	110	160	35	33	117	158	227	318
7:00	36	33			58	21				
7:15	71	19			83	19				
7:30	48	29			84	14				
7:45	46	33	201	114	77	19	302	73	503	187
8:00	50	18			66	12				
8:15	55	14			34	22				
8:30	53	19			45	11				
8:45	70	13	228	64	91	11	236	56	464	120
9:00	41	18			57	13				
9:15	41	15			35	10				
9:30	40	14			50	10				
9:45	32	9	154	56	43	9	185	42	339	98
10:00	33	6			42	5				
10:15	43	12			26	12				
10:30	42	6			43	9				
10:45	27	4	145	28	41	6	152	32	297	60
11:00	36	6			38	4				
11:15	47	9			37	3				
11:30	55	10			43	1				
11:45	39	2	177	27	42	1	160	9	337	36
Total	1102	1756			1239	1617			2341	3373
Percent	38.6%	61.4%			43.4%	56.6%			41.0%	59.0%
Grand Total	2245	3581			2538	3230			4783	6811
Percent	38.5%	61.5%			44.0%	56.0%			41.3%	58.7%
ADT		ADT: 5,797		AADT: 5,797						

Accurate Counts

978-664-2565

Location : Main Street 95680001
Location : West of School Street
City/State: Upton, MA

1/9/2023	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday		Week Average	
Time	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB
12:00 AM	*	*	*	*	11	7	17	6	*	*	*	*	*	*	14	6
1:00	*	*	*	*	7	2	11	3	*	*	*	*	*	*	9	2
2:00	*	*	*	*	6	2	3	9	*	*	*	*	*	*	4	6
3:00	*	*	*	*	8	10	7	8	*	*	*	*	*	*	8	9
4:00	*	*	*	*	8	16	14	11	*	*	*	*	*	*	11	14
5:00	*	*	*	*	32	51	35	50	*	*	*	*	*	*	34	50
6:00	*	*	*	*	104	123	110	117	*	*	*	*	*	*	107	120
7:00	*	*	*	*	237	305	201	302	*	*	*	*	*	*	219	304
8:00	*	*	*	*	225	236	228	236	*	*	*	*	*	*	226	236
9:00	*	*	*	*	161	180	154	185	*	*	*	*	*	*	158	182
10:00	*	*	*	*	167	179	145	152	*	*	*	*	*	*	156	166
11:00	*	*	*	*	177	188	177	160	*	*	*	*	*	*	177	174
12:00 PM	*	*	*	*	167	155	165	196	*	*	*	*	*	*	166	176
1:00	*	*	*	*	179	169	168	176	*	*	*	*	*	*	174	172
2:00	*	*	*	*	207	197	199	208	*	*	*	*	*	*	203	202
3:00	*	*	*	*	301	234	270	219	*	*	*	*	*	*	286	226
4:00	*	*	*	*	280	278	284	249	*	*	*	*	*	*	282	264
5:00	*	*	*	*	240	199	221	199	*	*	*	*	*	*	230	199
6:00	*	*	*	*	147	142	160	158	*	*	*	*	*	*	154	150
7:00	*	*	*	*	107	107	114	73	*	*	*	*	*	*	110	90
8:00	*	*	*	*	78	56	64	56	*	*	*	*	*	*	71	56
9:00	*	*	*	*	60	36	56	42	*	*	*	*	*	*	58	39
10:00	*	*	*	*	28	26	28	32	*	*	*	*	*	*	28	29
11:00	*	*	*	*	31	14	6	4	*	*	*	*	*	*	18	9
Total	0	0	0	0	2968	2912	2837	2851	0	0	0	0	0	0	2903	2881
Day	0		0		5880		5688		0		0		0		5784	
AM Peak					7:00	7:00	8:00	7:00							8:00	7:00
Volume					237	305	228	302							226	304
PM Peak					3:00	4:00	4:00	4:00							3:00	4:00
Volume					301	278	284	249							286	264
Comb Total	0		0		5880		5688		0		0		0		5784	
ADT	ADT: 5,797		AADT: 5,797													

TURNING MOVEMENT COUNT DATA

Accurate Counts

978-664-2565

N/S Street : School St / Pleasant St
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680001
Site Code : 95680001
Start Date : 1/11/2023

Groups Printed- Cars - Trucks

	School St From North			Route 140 From East			Pleasant St From South			Route 140 From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	24	0	21	43	5	1	50	21	2	60	0	227
07:15 AM	3	20	7	60	74	6	3	32	33	2	74	0	314
07:30 AM	2	18	8	36	59	3	2	29	43	4	96	1	301
07:45 AM	0	13	3	7	39	2	2	52	32	1	63	0	214
Total	5	75	18	124	215	16	8	163	129	9	293	1	1056
08:00 AM	1	5	3	13	57	7	3	30	24	1	65	0	209
08:15 AM	0	7	3	12	48	5	2	23	22	2	39	1	164
08:30 AM	0	5	2	15	53	6	2	38	19	3	42	3	188
08:45 AM	0	9	11	17	49	1	2	25	20	8	70	3	215
Total	1	26	19	57	207	19	9	116	85	14	216	7	776
Grand Total	6	101	37	181	422	35	17	279	214	23	509	8	1832
Apprch %	4.2	70.1	25.7	28.4	66.1	5.5	3.3	54.7	42	4.3	94.3	1.5	
Total %	0.3	5.5	2	9.9	23	1.9	0.9	15.2	11.7	1.3	27.8	0.4	
Cars	5	100	37	177	415	34	16	276	207	23	506	8	1804
% Cars	83.3	99	100	97.8	98.3	97.1	94.1	98.9	96.7	100	99.4	100	98.5
Trucks	1	1	0	4	7	1	1	3	7	0	3	0	28
% Trucks	16.7	1	0	2.2	1.7	2.9	5.9	1.1	3.3	0	0.6	0	1.5

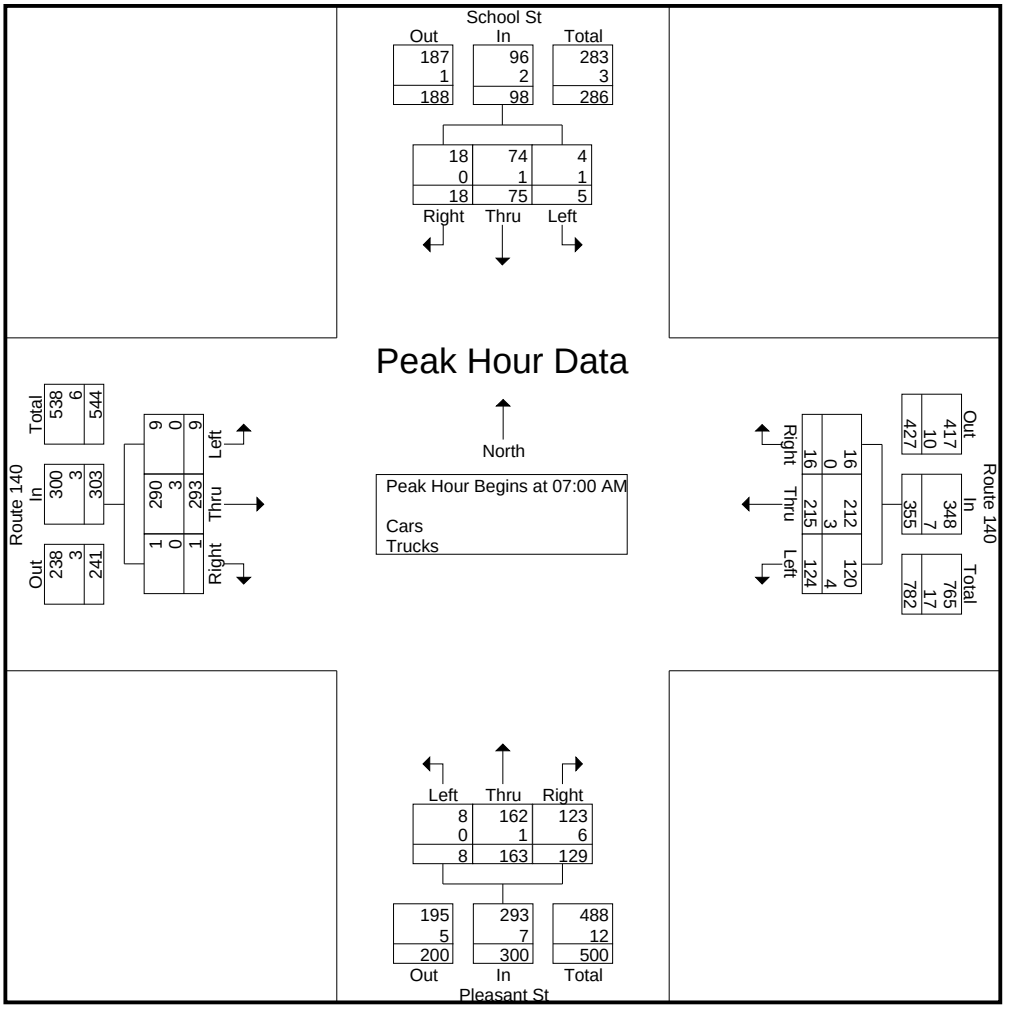
	School St From North				Route 140 From East				Pleasant St From South				Route 140 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	**24**	0	24	21	43	5	69	1	50	21	72	2	60	0	62	227
07:15 AM	**3**	20	7	**30**	**60**	**74**	**6**	**140**	**3**	32	33	68	2	74	0	76	**314**
07:30 AM	2	18	**8**	28	36	59	3	98	2	29	**43**	74	**4**	**96**	**1**	**101**	301
07:45 AM	0	13	3	16	7	39	2	48	2	**52**	32	**86**	1	63	0	64	214
Total Volume	5	75	18	98	124	215	16	355	8	163	129	300	9	293	1	303	1056
% App. Total	5.1	76.5	18.4		34.9	60.6	4.5		2.7	54.3	43		3	96.7	0.3		
PHF	.417	.781	.563	.817	.517	.726	.667	.634	.667	.784	.750	.872	.563	.763	.250	.750	.841
Cars	4	74	18	96	120	212	16	348	8	162	123	293	9	290	1	300	1037
% Cars	80.0	98.7	100	98.0	96.8	98.6	100	98.0	100	99.4	95.3	97.7	100	99.0	100	99.0	98.2
Trucks	1	1	0	2	4	3	0	7	0	1	6	7	0	3	0	3	19
% Trucks	20.0	1.3	0	2.0	3.2	1.4	0	2.0	0	0.6	4.7	2.3	0	1.0	0	1.0	1.8

Accurate Counts

978-664-2565

N/S Street : School St / Pleasant St
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680001
Site Code : 95680001
Start Date : 1/11/2023
Page No : 2



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

Peak Hour for Each Approach Begins at:

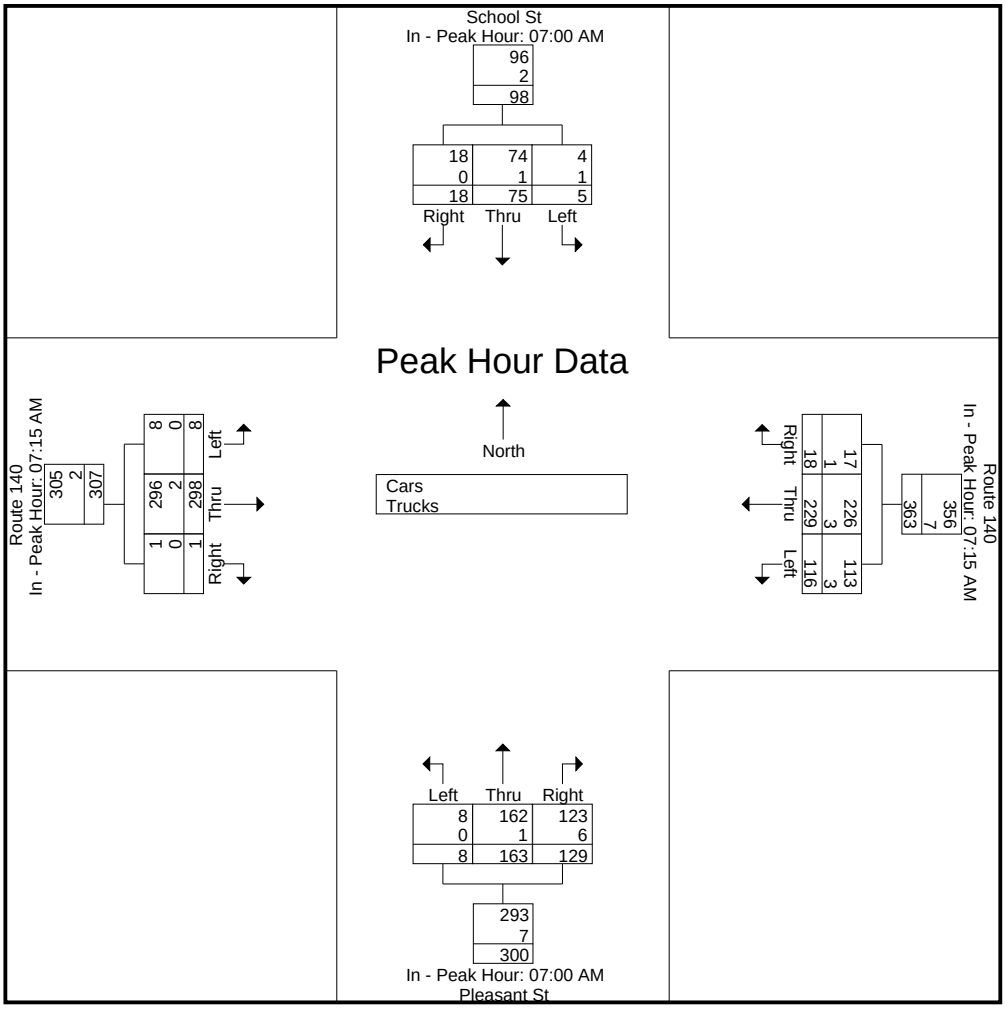
	07:00 AM				07:15 AM				07:00 AM				07:15 AM			
+0 mins.	0	**24**	0	24	**60**	**74**	6	**140**	1	50	21	72	2	74	0	76
+15 mins.	**3**	20	7	**30**	36	59	3	98	**3**	32	33	68	**4**	**96**	**1**	**101**
+30 mins.	2	18	**8**	28	7	39	2	48	2	29	**43**	74	1	63	0	64
+45 mins.	0	13	3	16	13	57	**7**	77	2	**52**	32	**86**	1	65	0	66
Total Volume	5	75	18	98	116	229	18	363	8	163	129	300	8	298	1	307
% App. Total	5.1	76.5	18.4		32	63.1	5		2.7	54.3	43		2.6	97.1	0.3	
PHF	.417	.781	.563	.817	.483	.774	.643	.648	.667	.784	.750	.872	.500	.776	.250	.760
Cars	4	74	18	96	113	226	17	356	8	162	123	293	8	296	1	305
% Cars	80	98.7	100	98	97.4	98.7	94.4	98.1	100	99.4	95.3	97.7	100	99.3	100	99.3
Trucks	1	1	0	2	3	3	1	7	0	1	6	7	0	2	0	2
% Trucks	20	1.3	0	2	2.6	1.3	5.6	1.9	0	0.6	4.7	2.3	0	0.7	0	0.7

Accurate Counts

978-664-2565

N/S Street : School St / Pleasant St
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680001
Site Code : 95680001
Start Date : 1/11/2023
Page No : 3



Accurate Counts

978-664-2565

N/S Street : School St / Pleasant St
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680001
Site Code : 95680001
Start Date : 1/11/2023

Groups Printed- Cars

	School St From North			Route 140 From East			Pleasant St From South			Route 140 From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	23	0	20	43	5	1	49	19	2	59	0	221
07:15 AM	3	20	7	58	73	6	3	32	32	2	74	0	310
07:30 AM	1	18	8	35	57	3	2	29	41	4	94	1	293
07:45 AM	0	13	3	7	39	2	2	52	31	1	63	0	213
Total	4	74	18	120	212	16	8	162	123	9	290	1	1037
08:00 AM	1	5	3	13	57	6	3	29	24	1	65	0	207
08:15 AM	0	7	3	12	47	5	2	23	22	2	39	1	163
08:30 AM	0	5	2	15	50	6	1	38	19	3	42	3	184
08:45 AM	0	9	11	17	49	1	2	24	19	8	70	3	213
Total	1	26	19	57	203	18	8	114	84	14	216	7	767
Grand Total	5	100	37	177	415	34	16	276	207	23	506	8	1804
Apprch %	3.5	70.4	26.1	28.3	66.3	5.4	3.2	55.3	41.5	4.3	94.2	1.5	
Total %	0.3	5.5	2.1	9.8	23	1.9	0.9	15.3	11.5	1.3	28	0.4	

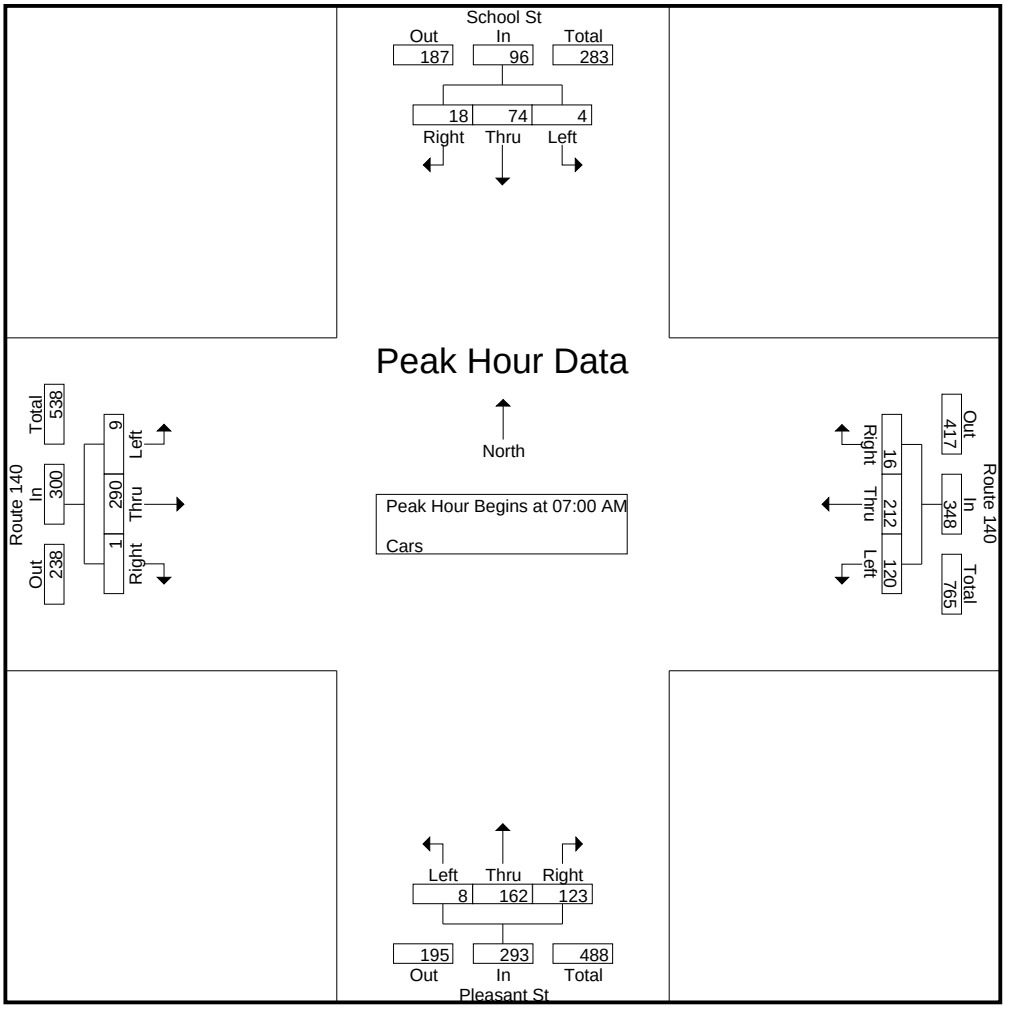
	School St From North				Route 140 From East				Pleasant St From South				Route 140 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	**23**	0	23	20	43	5	68	1	49	19	69	2	59	0	61	221
07:15 AM	**3**	20	7	**30**	**58**	**73**	**6**	**137**	**3**	32	32	67	2	74	0	76	**310**
07:30 AM	1	18	**8**	27	35	57	3	95	2	29	**41**	72	**4**	**94**	**1**	**99**	293
07:45 AM	0	13	3	16	7	39	2	48	2	**52**	31	**85**	1	63	0	64	213
Total Volume	4	74	18	96	120	212	16	348	8	162	123	293	9	290	1	300	1037
% App. Total	4.2	77.1	18.8		34.5	60.9	4.6		2.7	55.3	42		3	96.7	0.3		
PHF	.333	.804	.563	.800	.517	.726	.667	.635	.667	.779	.750	.862	.563	.771	.250	.758	.836

Accurate Counts

978-664-2565

N/S Street : School St / Pleasant St
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680001
Site Code : 95680001
Start Date : 1/11/2023
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:

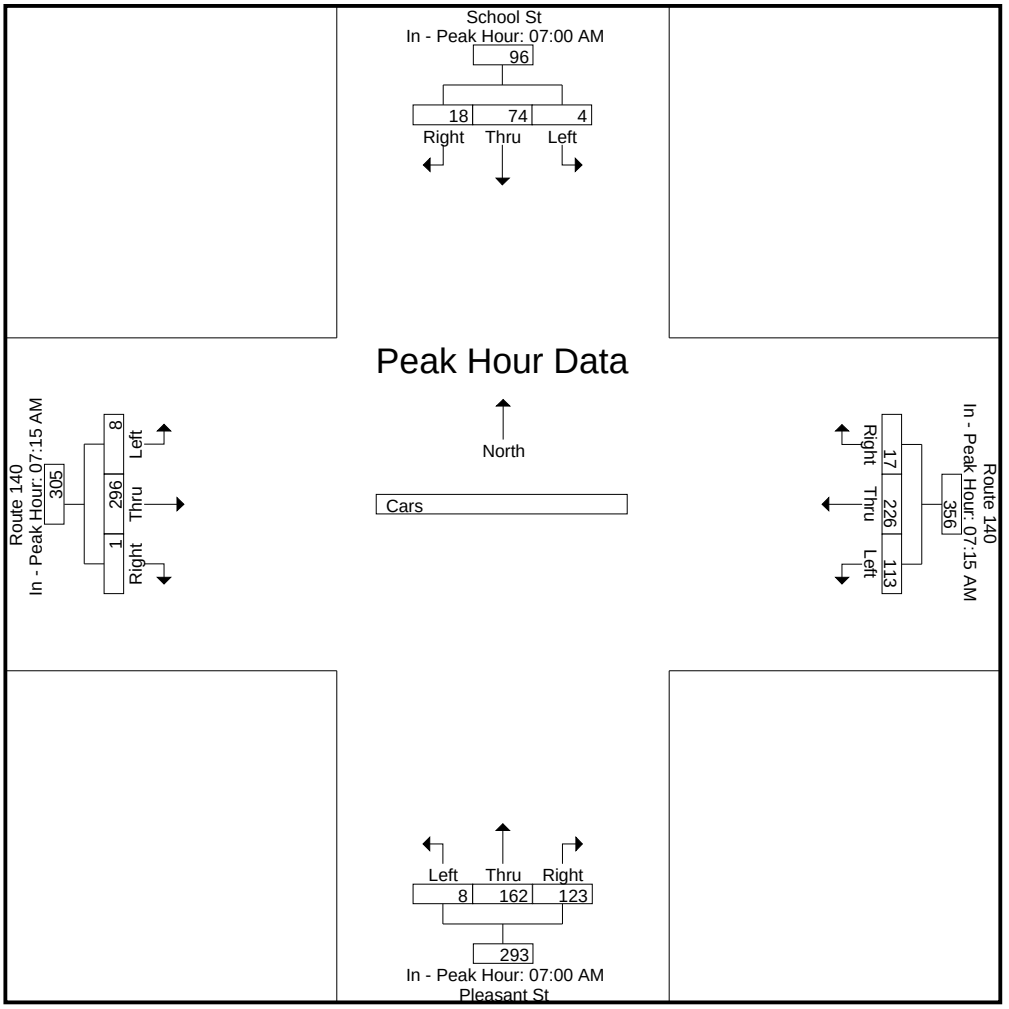
	07:00 AM				07:15 AM				07:00 AM				07:15 AM			
+0 mins.	0	**23**	0	23	**58**	**73**	**6**	**137**	1	49	19	69	2	74	0	76
+15 mins.	**3**	20	7	**30**	35	57	3	95	**3**	32	32	67	**4**	**94**	**1**	**99**
+30 mins.	1	18	**8**	27	7	39	2	48	2	29	**41**	72	1	63	0	64
+45 mins.	0	13	3	16	13	57	6	76	2	**52**	31	**85**	1	65	0	66
Total Volume	4	74	18	96	113	226	17	356	8	162	123	293	8	296	1	305
% App. Total	4.2	77.1	18.8		31.7	63.5	4.8		2.7	55.3	42		2.6	97	0.3	
PHF	.333	.804	.563	.800	.487	.774	.708	.650	.667	.779	.750	.862	.500	.787	.250	.770

Accurate Counts

978-664-2565

N/S Street : School St / Pleasant St
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680001
Site Code : 95680001
Start Date : 1/11/2023
Page No : 6



Accurate Counts

978-664-2565

N/S Street : School St / Pleasant St
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680001
Site Code : 95680001
Start Date : 1/11/2023

Groups Printed- Trucks

	School St From North			Route 140 From East			Pleasant St From South			Route 140 From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
07:00 AM	0	1	0	1	0	0	0	1	2	0	1	0	6
07:15 AM	0	0	0	2	1	0	0	0	1	0	0	0	4
07:30 AM	1	0	0	1	2	0	0	0	2	0	2	0	8
07:45 AM	0	0	0	0	0	0	0	0	1	0	0	0	1
Total	1	1	0	4	3	0	0	1	6	0	3	0	19
08:00 AM	0	0	0	0	0	1	0	1	0	0	0	0	2
08:15 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	3	0	1	0	0	0	0	0	4
08:45 AM	0	0	0	0	0	0	0	1	1	0	0	0	2
Total	0	0	0	0	4	1	1	2	1	0	0	0	9
Grand Total	1	1	0	4	7	1	1	3	7	0	3	0	28
Apprch %	50	50	0	33.3	58.3	8.3	9.1	27.3	63.6	0	100	0	
Total %	3.6	3.6	0	14.3	25	3.6	3.6	10.7	25	0	10.7	0	

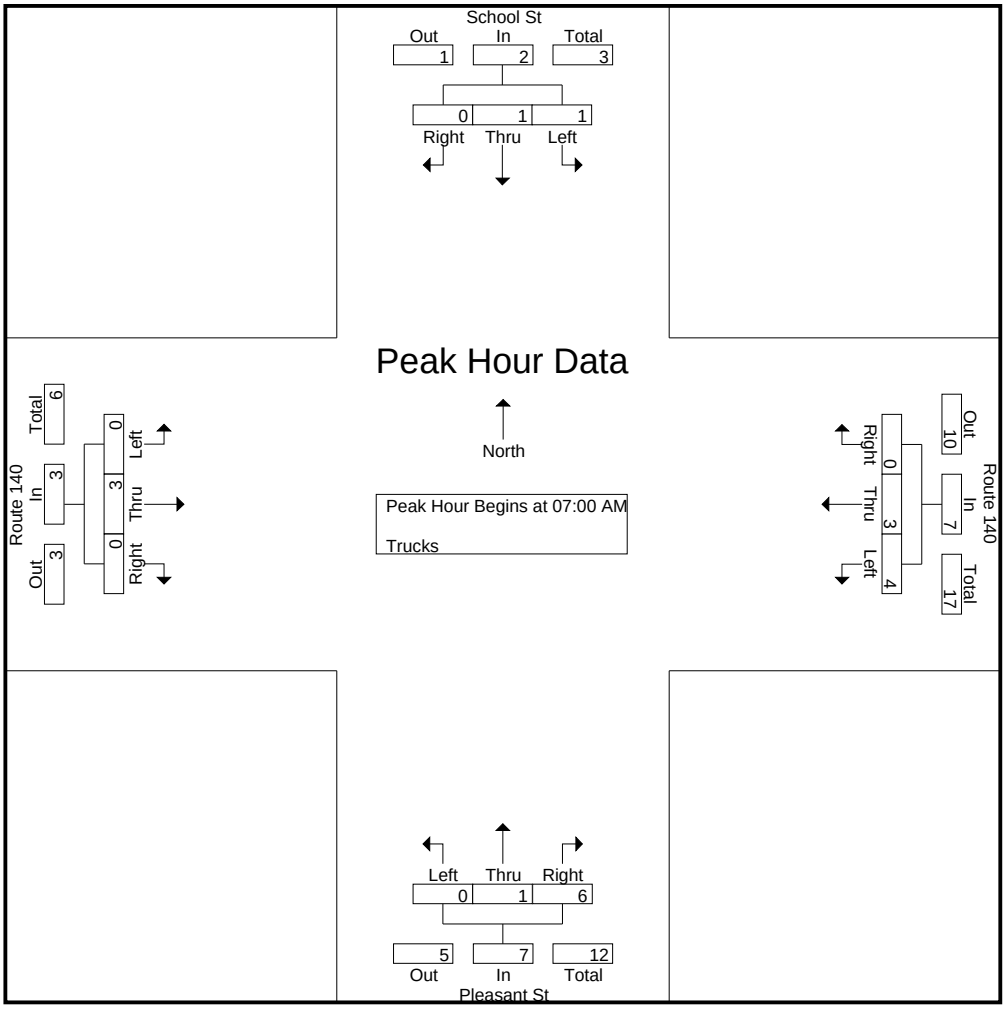
	School St From North				Route 140 From East				Pleasant St From South				Route 140 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	**1**	0	**1**	1	0	0	1	0	**1**	**2**	**3**	0	1	0	1	6
07:15 AM	0	0	0	0	**2**	1	0	**3**	0	0	1	1	0	0	0	0	4
07:30 AM	**1**	0	0	1	1	**2**	0	3	0	0	2	2	0	**2**	0	**2**	**8**
07:45 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
Total Volume	1	1	0	2	4	3	0	7	0	1	6	7	0	3	0	3	19
% App. Total	50	50	0		57.1	42.9	0		0	14.3	85.7		0	100	0		
PHF	.250	.250	.000	.500	.500	.375	.000	.583	.000	.250	.750	.583	.000	.375	.000	.375	.594

Accurate Counts

978-664-2565

N/S Street : School St / Pleasant St
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680001
Site Code : 95680001
Start Date : 1/11/2023
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:

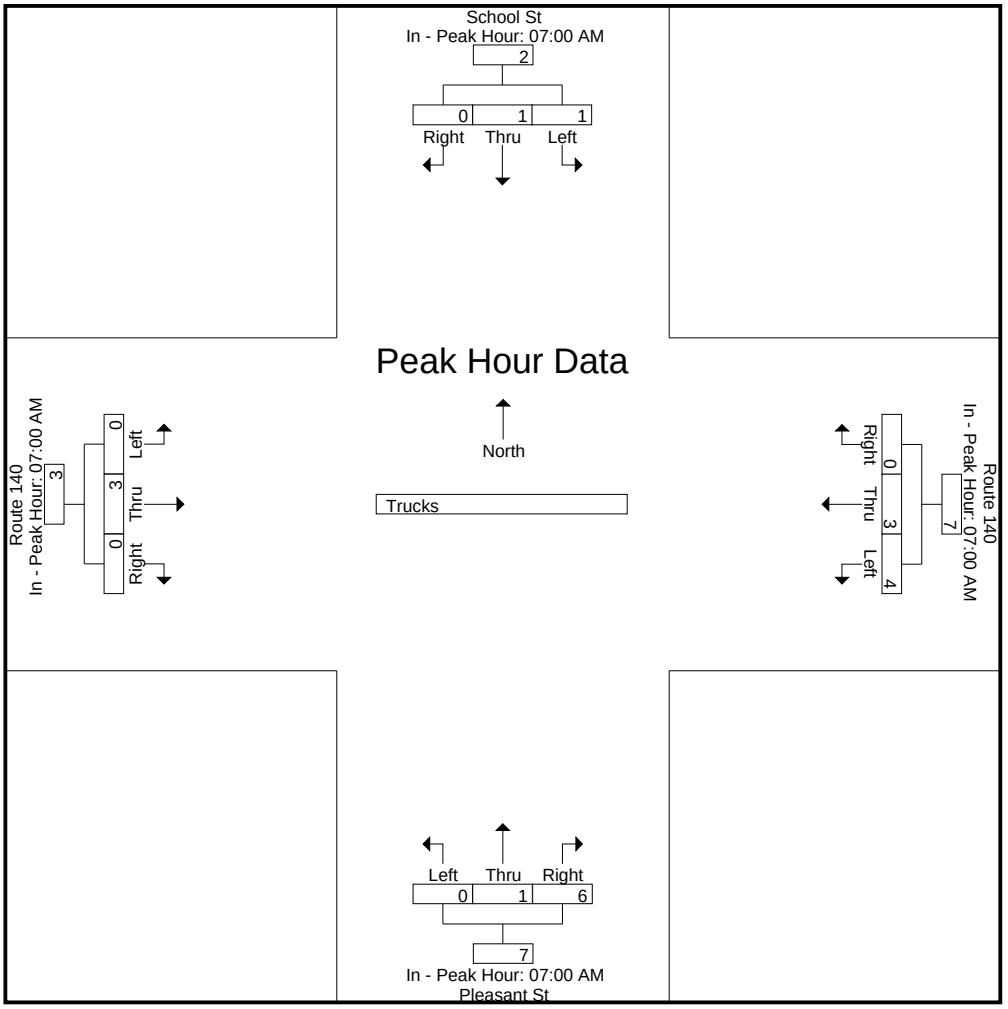
	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	**1**	0	**1**	1	0	0	1	0	**1**	**2**	**3**	0	1	0	1
+15 mins.	0	0	0	0	**2**	1	0	**3**	0	0	1	1	0	0	0	0
+30 mins.	**1**	0	0	1	1	**2**	0	3	0	0	2	2	0	**2**	0	**2**
+45 mins.	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
Total Volume	1	1	0	2	4	3	0	7	0	1	6	7	0	3	0	3
% App. Total	50	50	0		57.1	42.9	0		0	14.3	85.7		0	100	0	
PHF	.250	.250	.000	.500	.500	.375	.000	.583	.000	.250	.750	.583	.000	.375	.000	.375

Accurate Counts

978-664-2565

N/S Street : School St / Pleasant St
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680001
Site Code : 95680001
Start Date : 1/11/2023
Page No : 9



Accurate Counts

978-664-2565

N/S Street : School St / Pleasant St
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680001
Site Code : 95680001
Start Date : 1/11/2023

Groups Printed- Bikes Peds

	School St From North				Route 140 From East				Pleasant St From South				Route 140 From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
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	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
08:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Total	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	3	0	3
Grand Total	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	1	4	0	4
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0				
Total %																	100	0	

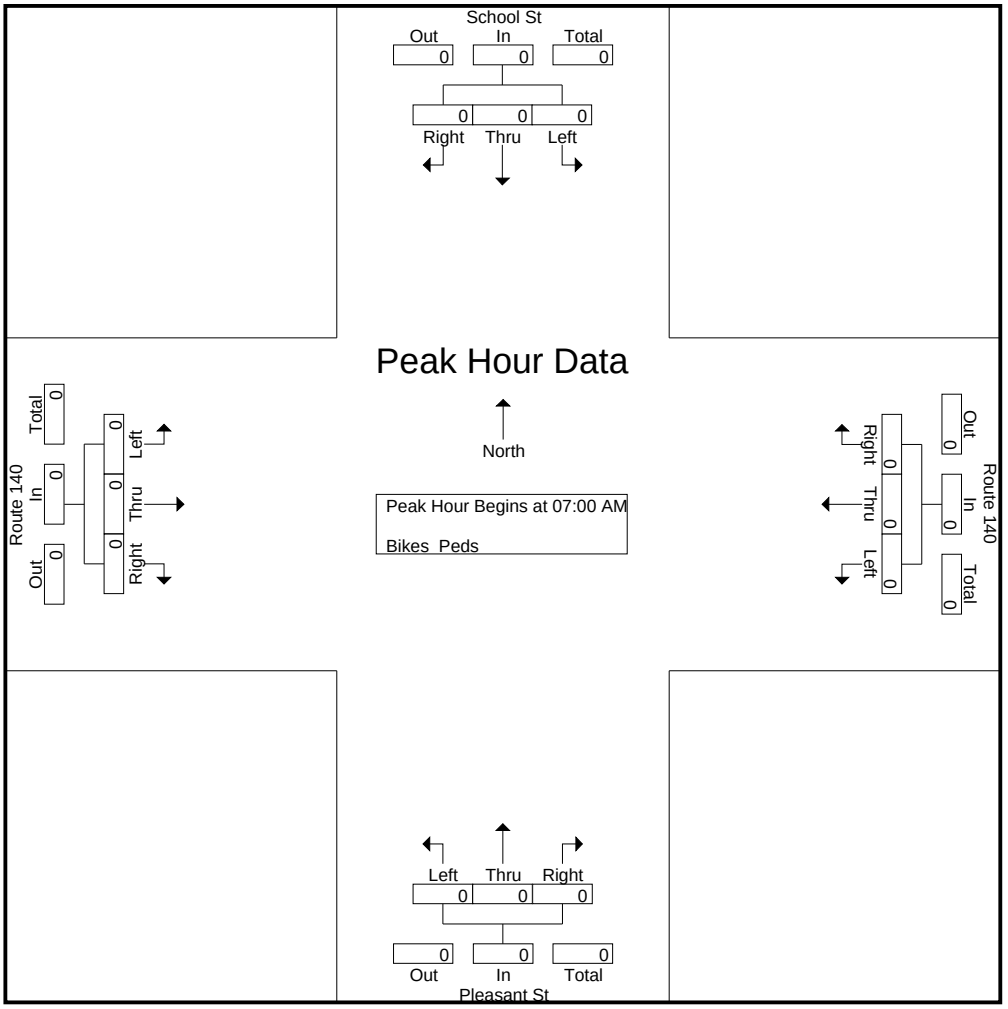
	School St From North				Route 140 From East				Pleasant St From South				Route 140 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : School St / Pleasant St
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680001
Site Code : 95680001
Start Date : 1/11/2023
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:

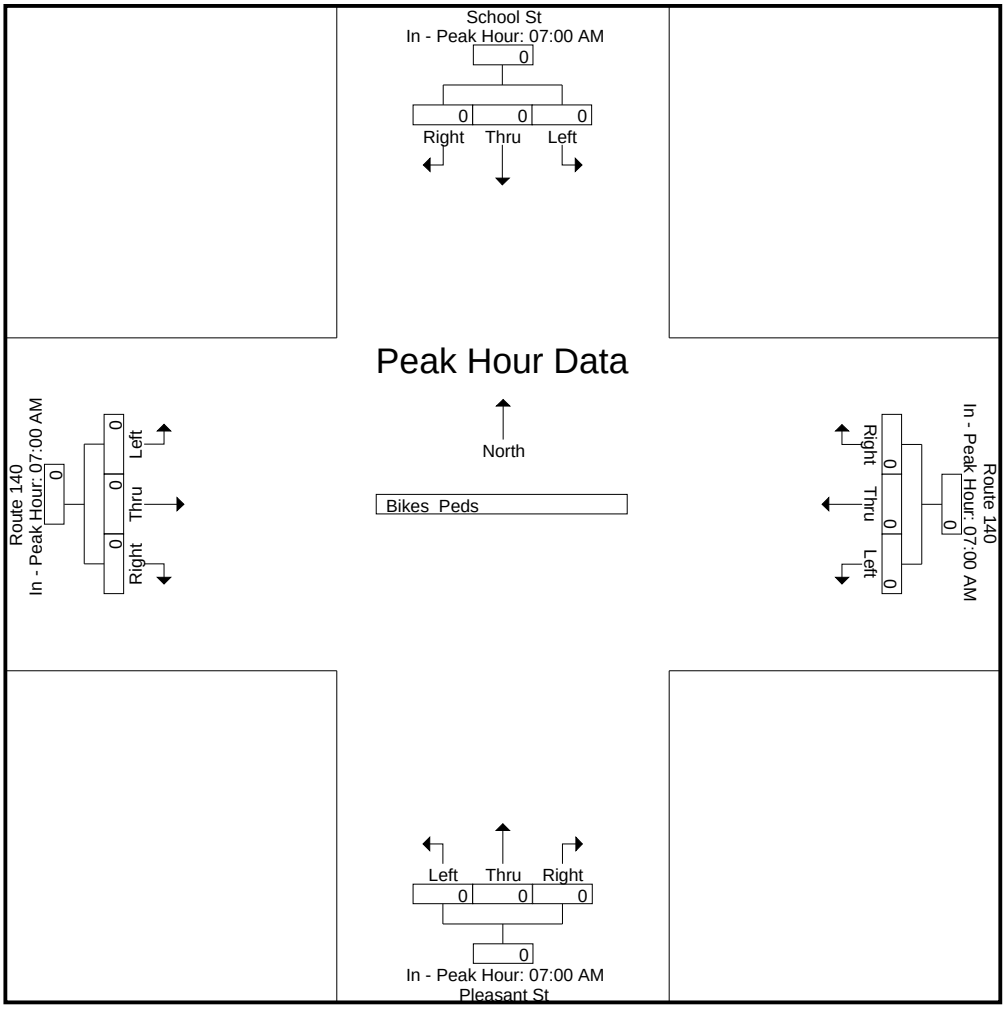
	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	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

Accurate Counts

978-664-2565

N/S Street : School St / Pleasant St
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680001
Site Code : 95680001
Start Date : 1/11/2023
Page No : 12



Accurate Counts

978-664-2565

N/S Street : School St / Pleasant St
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680001
Site Code : 95680001
Start Date : 1/11/2023
Page No : 1

Groups Printed- Cars - Trucks

	School St From North			Route 140 From East			Pleasant St From South			Route 140 From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	2	37	3	32	75	4	2	21	24	2	57	1	260
04:15 PM	1	29	6	31	74	3	1	23	25	5	53	1	252
04:30 PM	0	43	10	40	66	0	0	21	26	6	95	3	310
04:45 PM	2	36	2	44	50	1	1	17	23	4	48	1	229
Total	5	145	21	147	265	8	4	82	98	17	253	6	1051
05:00 PM	2	38	5	31	50	2	1	23	19	3	48	0	222
05:15 PM	3	38	2	31	62	3	2	16	27	1	38	0	223
05:30 PM	5	45	9	27	66	5	2	17	21	2	62	1	262
05:45 PM	2	42	2	31	49	4	2	15	19	1	43	0	210
Total	12	163	18	120	227	14	7	71	86	7	191	1	917
Grand Total	17	308	39	267	492	22	11	153	184	24	444	7	1968
Apprch %	4.7	84.6	10.7	34.2	63	2.8	3.2	44	52.9	5.1	93.5	1.5	
Total %	0.9	15.7	2	13.6	25	1.1	0.6	7.8	9.3	1.2	22.6	0.4	
Cars	17	307	39	266	488	22	11	152	181	24	441	7	1955
% Cars	100	99.7	100	99.6	99.2	100	100	99.3	98.4	100	99.3	100	99.3
Trucks	0	1	0	1	4	0	0	1	3	0	3	0	13
% Trucks	0	0.3	0	0.4	0.8	0	0	0.7	1.6	0	0.7	0	0.7

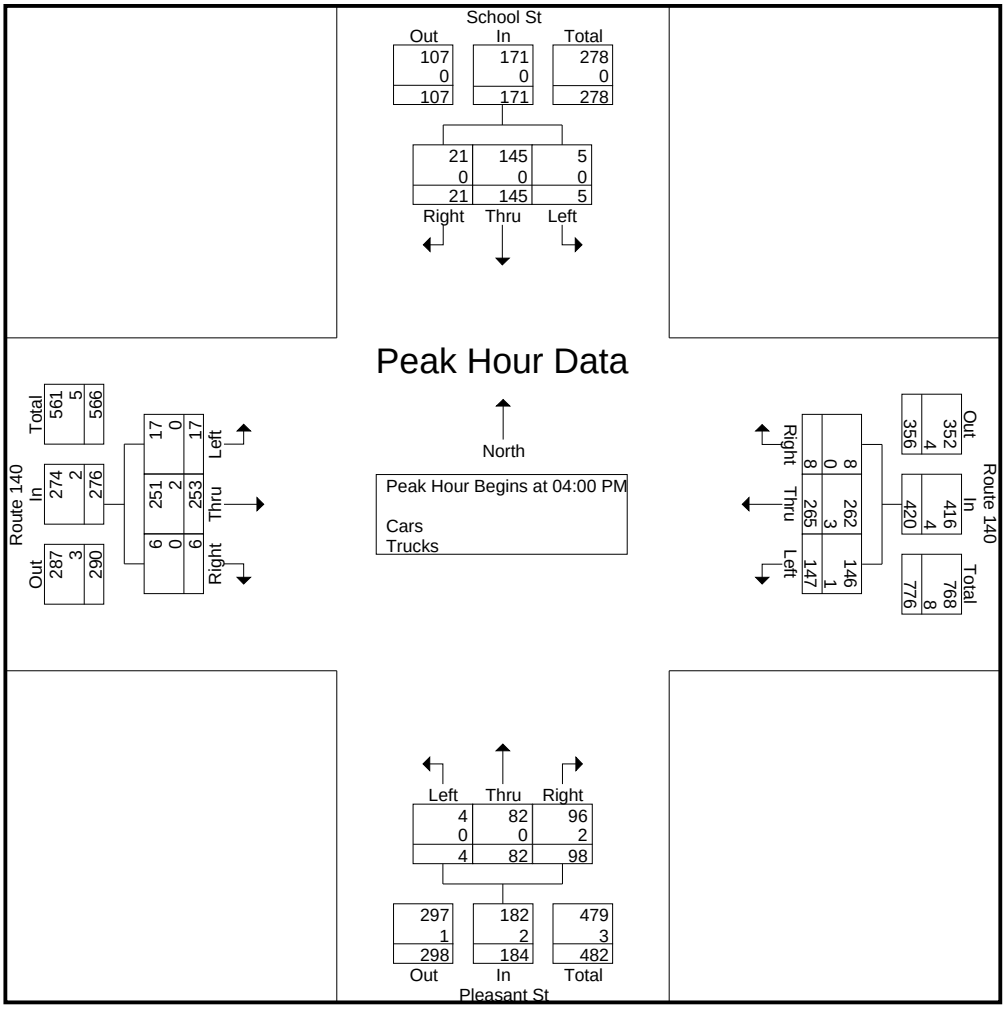
	School St From North				Route 140 From East				Pleasant St From South				Route 140 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**2**	37	3	42	32	**75**	**4**	**111**	**2**	21	24	47	2	57	1	60	260
04:15 PM	1	29	6	36	31	74	3	108	1	**23**	25	**49**	5	53	1	59	252
04:30 PM	0	**43**	**10**	**53**	40	66	0	106	0	21	**26**	47	**6**	**95**	**3**	**104**	**310**
04:45 PM	2	36	2	40	**44**	50	1	95	1	17	23	41	4	48	1	53	229
Total Volume	5	145	21	171	147	265	8	420	4	82	98	184	17	253	6	276	1051
% App. Total	2.9	84.8	12.3		35	63.1	1.9		2.2	44.6	53.3		6.2	91.7	2.2		
PHF	.625	.843	.525	.807	.835	.883	.500	.946	.500	.891	.942	.939	.708	.666	.500	.663	.848
Cars	5	145	21	171	146	262	8	416	4	82	96	182	17	251	6	274	1043
% Cars	100	100	100	100	99.3	98.9	100	99.0	100	100	98.0	98.9	100	99.2	100	99.3	99.2
Trucks	0	0	0	0	1	3	0	4	0	0	2	2	0	2	0	2	8
% Trucks	0	0	0	0	0.7	1.1	0	1.0	0	0	2.0	1.1	0	0.8	0	0.7	0.8

Accurate Counts

978-664-2565

N/S Street : School St / Pleasant St
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680001
Site Code : 95680001
Start Date : 1/11/2023
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:

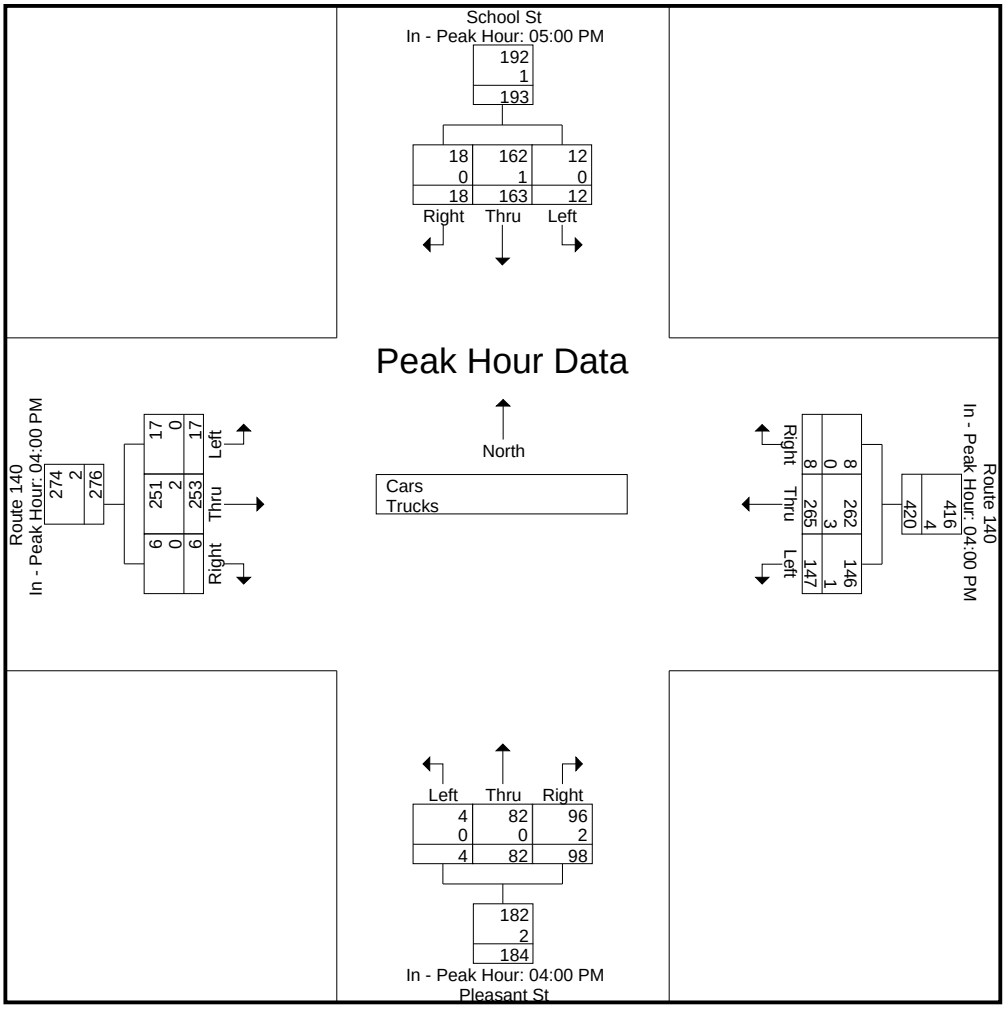
	05:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	2	38	5	45	32	**75**	**4**	**111**	**2**	21	24	47	2	57	1	60
+15 mins.	3	38	2	43	31	74	3	108	1	**23**	25	**49**	5	53	1	59
+30 mins.	**5**	**45**	**9**	**59**	40	66	0	106	0	21	**26**	47	**6**	**95**	**3**	**104**
+45 mins.	2	42	2	46	**44**	50	1	95	1	17	23	41	4	48	1	53
Total Volume	12	163	18	193	147	265	8	420	4	82	98	184	17	253	6	276
% App. Total	6.2	84.5	9.3		35	63.1	1.9		2.2	44.6	53.3		6.2	91.7	2.2	
PHF	.600	.906	.500	.818	.835	.883	.500	.946	.500	.891	.942	.939	.708	.666	.500	.663
Cars	12	162	18	192	146	262	8	416	4	82	96	182	17	251	6	274
% Cars	100	99.4	100	99.5	99.3	98.9	100	99	100	100	98	98.9	100	99.2	100	99.3
Trucks	0	1	0	1	1	3	0	4	0	0	2	2	0	2	0	2
% Trucks	0	0.6	0	0.5	0.7	1.1	0	1	0	0	2	1.1	0	0.8	0	0.7

Accurate Counts

978-664-2565

N/S Street : School St / Pleasant St
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680001
Site Code : 95680001
Start Date : 1/11/2023
Page No : 3



Accurate Counts

978-664-2565

N/S Street : School St / Pleasant St
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680001
Site Code : 95680001
Start Date : 1/11/2023

Groups Printed- Cars

	School St From North			Route 140 From East			Pleasant St From South			Route 140 From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	2	37	3	31	73	4	2	21	23	2	57	1	256
04:15 PM	1	29	6	31	73	3	1	23	24	5	53	1	250
04:30 PM	0	43	10	40	66	0	0	21	26	6	93	3	308
04:45 PM	2	36	2	44	50	1	1	17	23	4	48	1	229
Total	5	145	21	146	262	8	4	82	96	17	251	6	1043
05:00 PM	2	38	5	31	50	2	1	23	19	3	48	0	222
05:15 PM	3	38	2	31	62	3	2	16	27	1	37	0	222
05:30 PM	5	45	9	27	65	5	2	17	21	2	62	1	261
05:45 PM	2	41	2	31	49	4	2	14	18	1	43	0	207
Total	12	162	18	120	226	14	7	70	85	7	190	1	912
Grand Total	17	307	39	266	488	22	11	152	181	24	441	7	1955
Apprch %	4.7	84.6	10.7	34.3	62.9	2.8	3.2	44.2	52.6	5.1	93.4	1.5	
Total %	0.9	15.7	2	13.6	25	1.1	0.6	7.8	9.3	1.2	22.6	0.4	

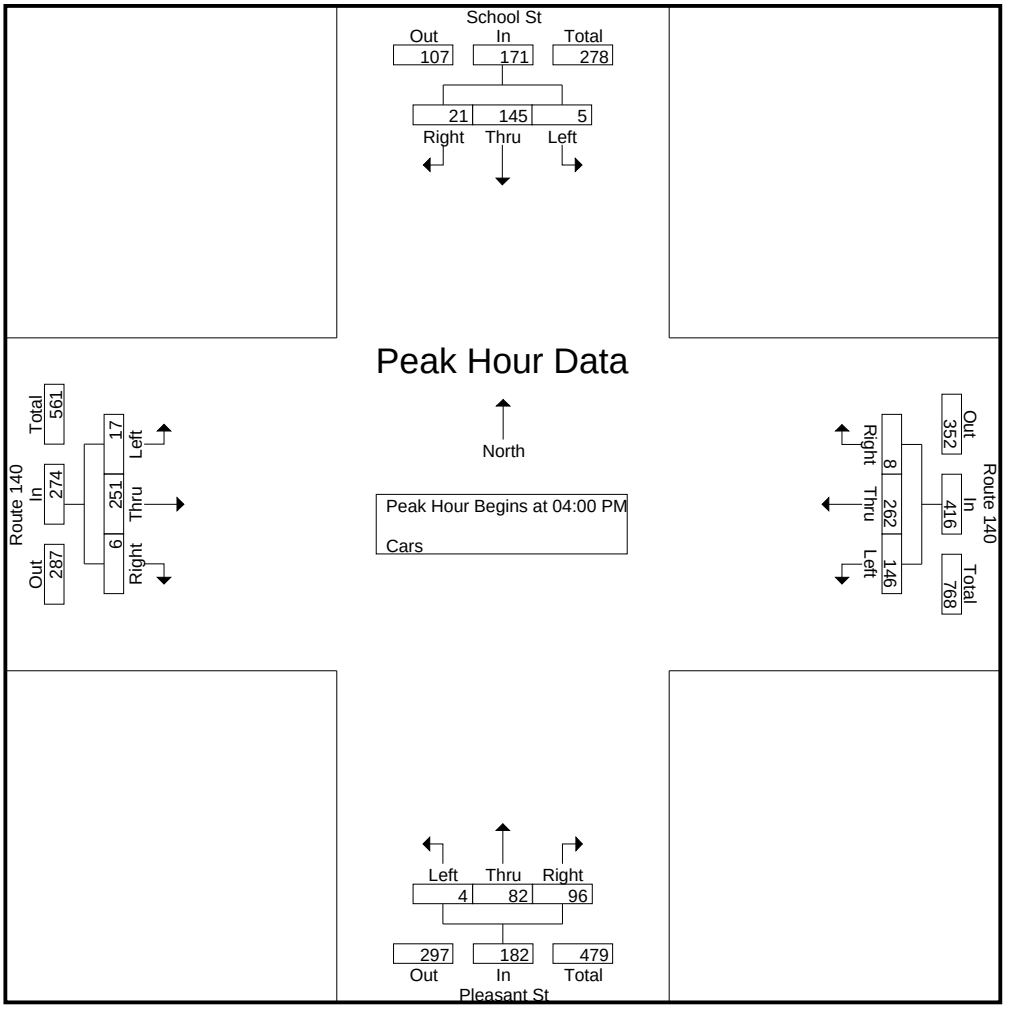
	School St From North				Route 140 From East				Pleasant St From South				Route 140 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**2**	37	3	42	31	**73**	**4**	**108**	**2**	21	23	46	2	57	1	60	256
04:15 PM	1	29	6	36	31	73	3	107	1	**23**	24	**48**	5	53	1	59	250
04:30 PM	0	**43**	**10**	**53**	40	66	0	106	0	21	**26**	47	**6**	**93**	**3**	**102**	**308**
04:45 PM	2	36	2	40	**44**	50	1	95	1	17	23	41	4	48	1	53	229
Total Volume	5	145	21	171	146	262	8	416	4	82	96	182	17	251	6	274	1043
% App. Total	2.9	84.8	12.3		35.1	63	1.9		2.2	45.1	52.7		6.2	91.6	2.2		
PHF	.625	.843	.525	.807	.830	.897	.500	.963	.500	.891	.923	.948	.708	.675	.500	.672	.847

Accurate Counts

978-664-2565

N/S Street : School St / Pleasant St
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680001
Site Code : 95680001
Start Date : 1/11/2023
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:

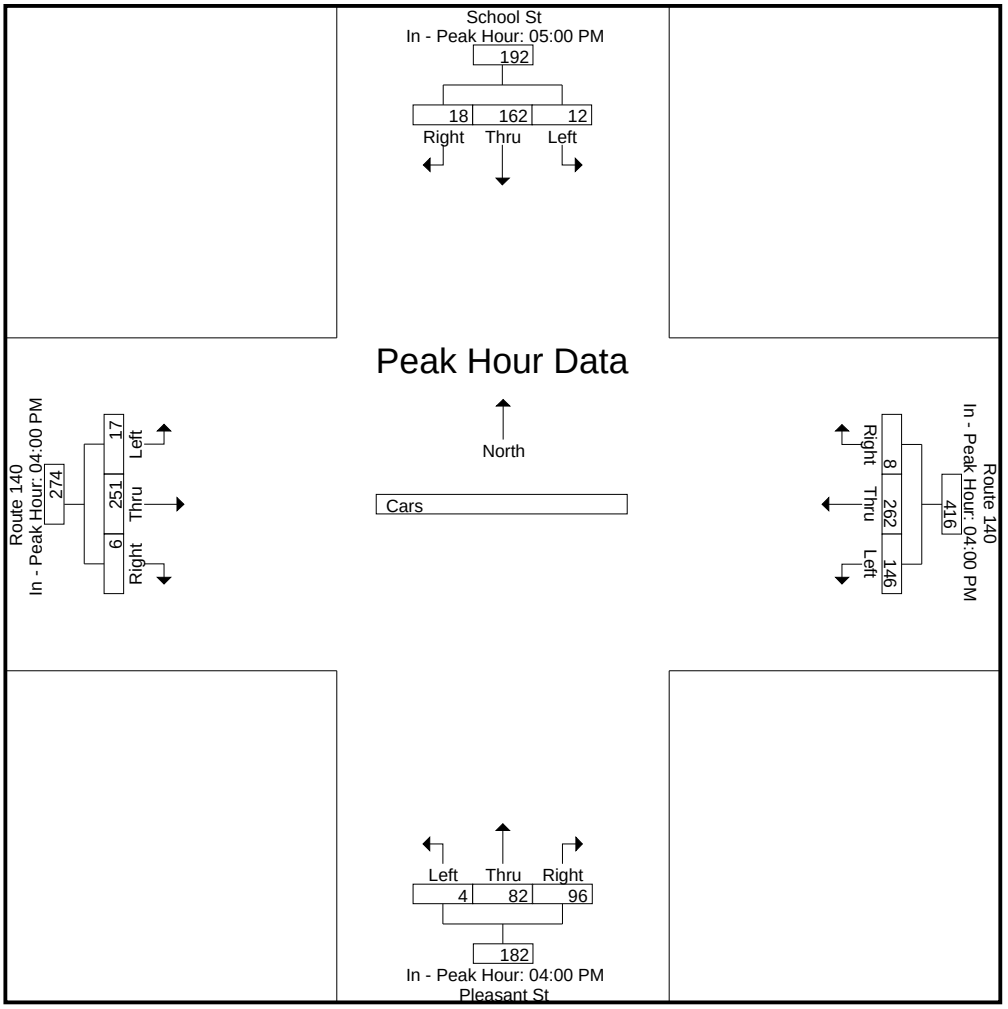
	05:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	2	38	5	45	31	**73**	**4**	**108**	**2**	21	23	46	2	57	1	60
+15 mins.	3	38	2	43	31	73	3	107	1	**23**	24	**48**	5	53	1	59
+30 mins.	**5**	**45**	**9**	**59**	40	66	0	106	0	21	**26**	47	**6**	**93**	**3**	**102**
+45 mins.	2	41	2	45	**44**	50	1	95	1	17	23	41	4	48	1	53
Total Volume	12	162	18	192	146	262	8	416	4	82	96	182	17	251	6	274
% App. Total	6.2	84.4	9.4		35.1	63	1.9		2.2	45.1	52.7		6.2	91.6	2.2	
PHF	.600	.900	.500	.814	.830	.897	.500	.963	.500	.891	.923	.948	.708	.675	.500	.672

Accurate Counts

978-664-2565

N/S Street : School St / Pleasant St
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680001
Site Code : 95680001
Start Date : 1/11/2023
Page No : 6



Accurate Counts

978-664-2565

N/S Street : School St / Pleasant St
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680001
Site Code : 95680001
Start Date : 1/11/2023

Groups Printed- Trucks

	School St From North			Route 140 From East			Pleasant St From South			Route 140 From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	0	0	0	1	2	0	0	0	1	0	0	0	4
04:15 PM	0	0	0	0	1	0	0	0	1	0	0	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	2	0	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	3	0	0	0	2	0	2	0	8
05:00 PM	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	1	0	1
05:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
05:45 PM	0	1	0	0	0	0	0	1	1	0	0	0	3
Total	0	1	0	0	1	0	0	1	1	0	1	0	5
Grand Total	0	1	0	1	4	0	0	1	3	0	3	0	13
Apprch %	0	100	0	20	80	0	0	25	75	0	100	0	
Total %	0	7.7	0	7.7	30.8	0	0	7.7	23.1	0	23.1	0	

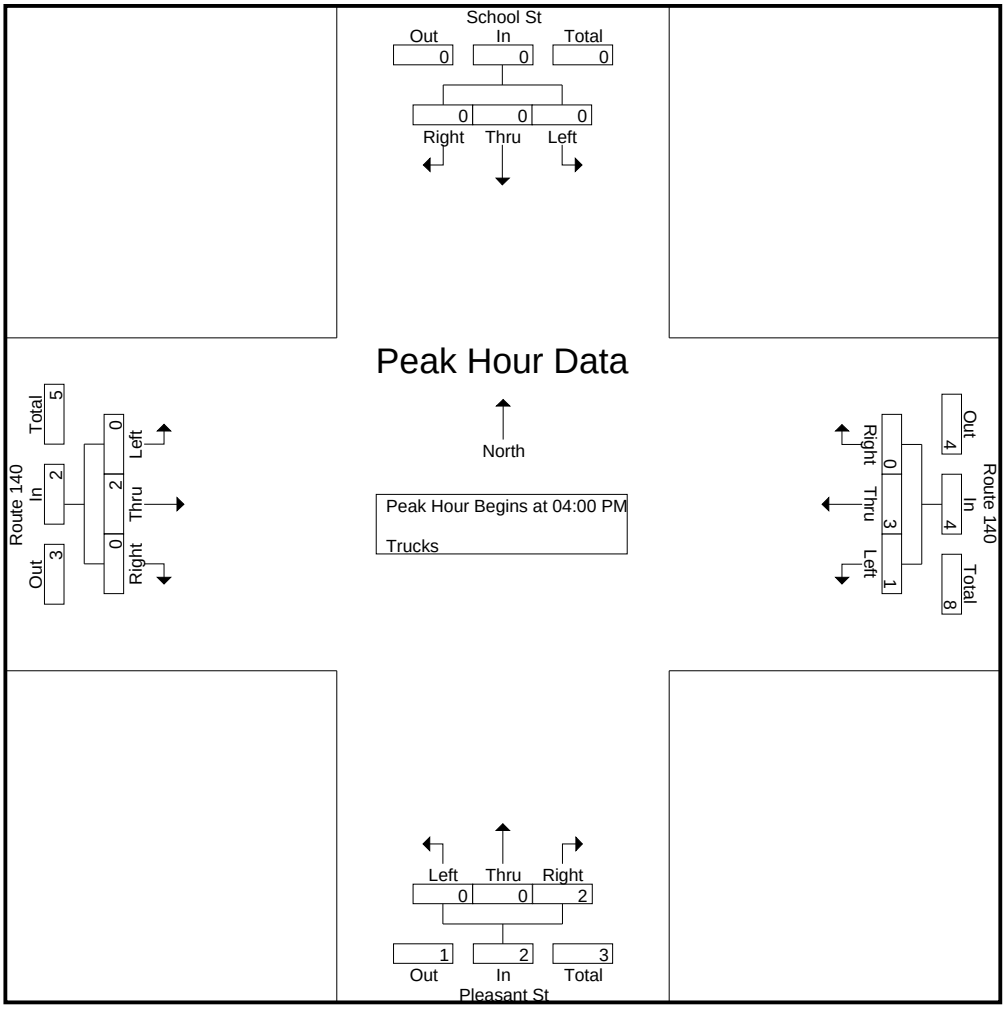
	School St From North				Route 140 From East				Pleasant St From South				Route 140 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	**1**	**2**	0	**3**	0	0	**1**	**1**	0	0	0	0	**4**
04:15 PM	0	0	0	0	0	1	0	1	0	0	1	1	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	0	**2**	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	1	3	0	4	0	0	2	2	0	2	0	2	8
% App. Total	0	0	0		25	75	0		0	0	100		0	100	0		
PHF	.000	.000	.000	.000	.250	.375	.000	.333	.000	.000	.500	.500	.000	.250	.000	.250	.500

Accurate Counts

978-664-2565

N/S Street : School St / Pleasant St
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680001
Site Code : 95680001
Start Date : 1/11/2023
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:

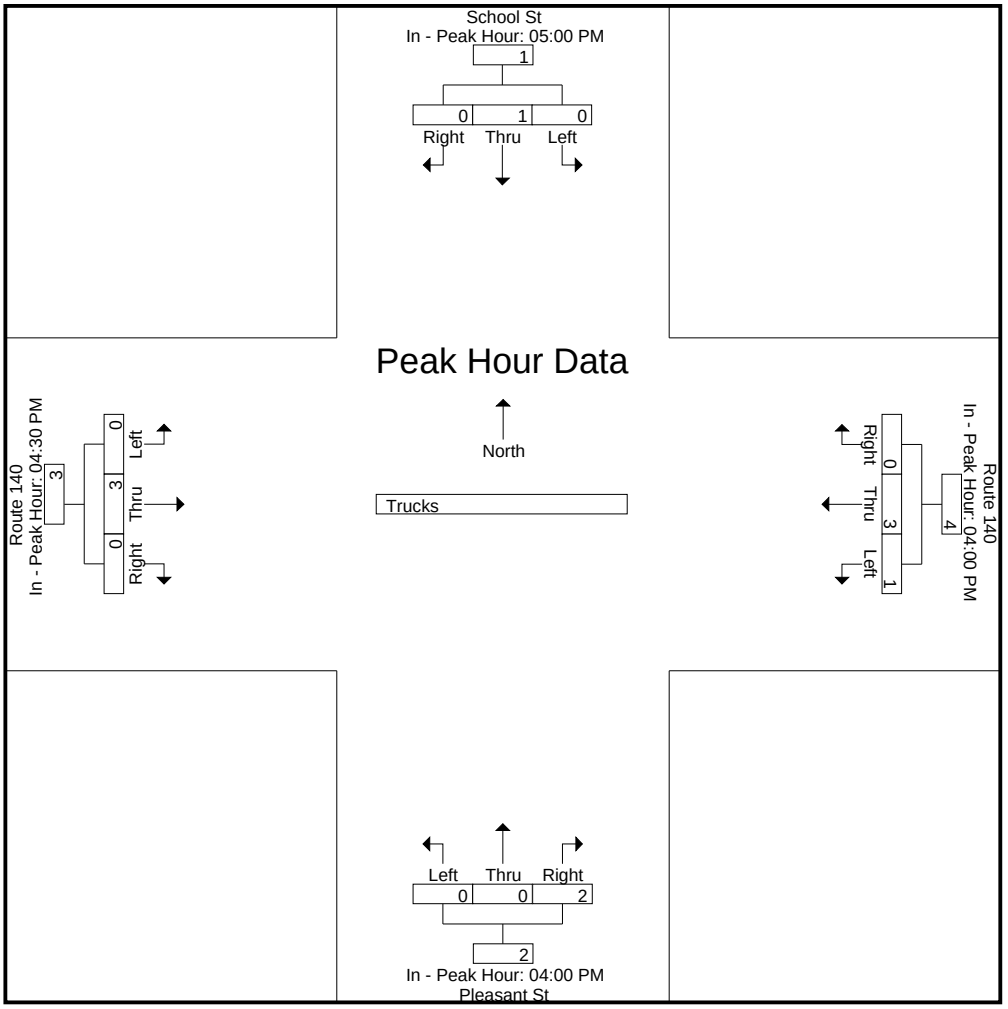
	05:00 PM				04:00 PM				04:00 PM				04:30 PM			
+0 mins.	0	0	0	0	**1**	**2**	0	**3**	0	0	**1**	**1**	0	**2**	0	**2**
+15 mins.	0	0	0	0	0	1	0	1	0	0	1	1	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	1	0	1
Total Volume	0	1	0	1	1	3	0	4	0	0	2	2	0	3	0	3
% App. Total	0	100	0		25	75	0		0	0	100		0	100	0	
PHF	.000	.250	.000	.250	.250	.375	.000	.333	.000	.000	.500	.500	.000	.375	.000	.375

Accurate Counts

978-664-2565

N/S Street : School St / Pleasant St
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680001
Site Code : 95680001
Start Date : 1/11/2023
Page No : 9



Accurate Counts

978-664-2565

N/S Street : School St / Pleasant St
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680001
Site Code : 95680001
Start Date : 1/11/2023

Groups Printed- Bikes Peds

	School St From North				Route 140 From East				Pleasant St From South				Route 140 From West						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2	0	2
Total	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	1	2	2	4
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1
Grand Total	0	0	0	1	0	0	0	0	0	0	0	1	0	2	0	1	3	2	5
Apprch %	0	0	0		0	0	0		0	0	0		0	100	0				
Total %	0	0	0		0	0	0		0	0	0		0	100	0		60	40	

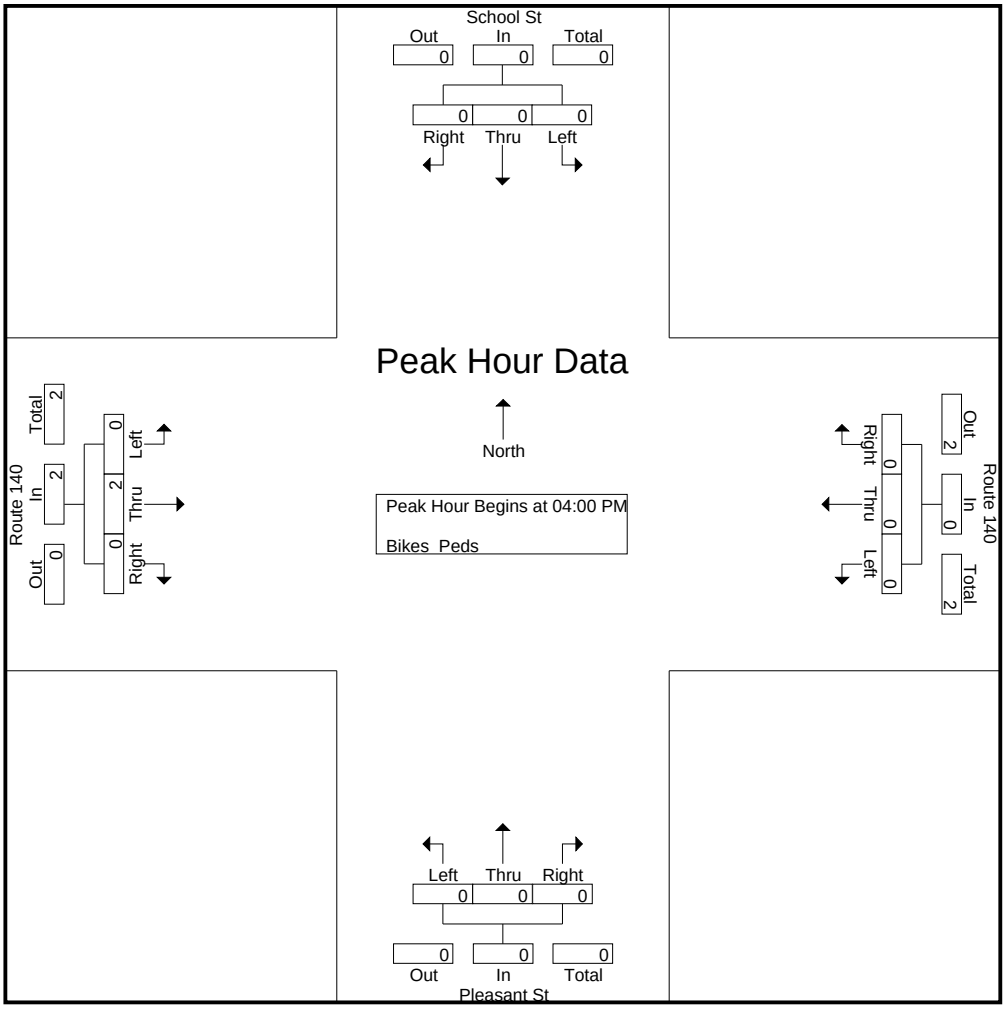
	School St From North				Route 140 From East				Pleasant St From South				Route 140 From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	0	**2**	**2**
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
% App. Total	0	0	0		0	0	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250

Accurate Counts

978-664-2565

N/S Street : School St / Pleasant St
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680001
Site Code : 95680001
Start Date : 1/11/2023
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:

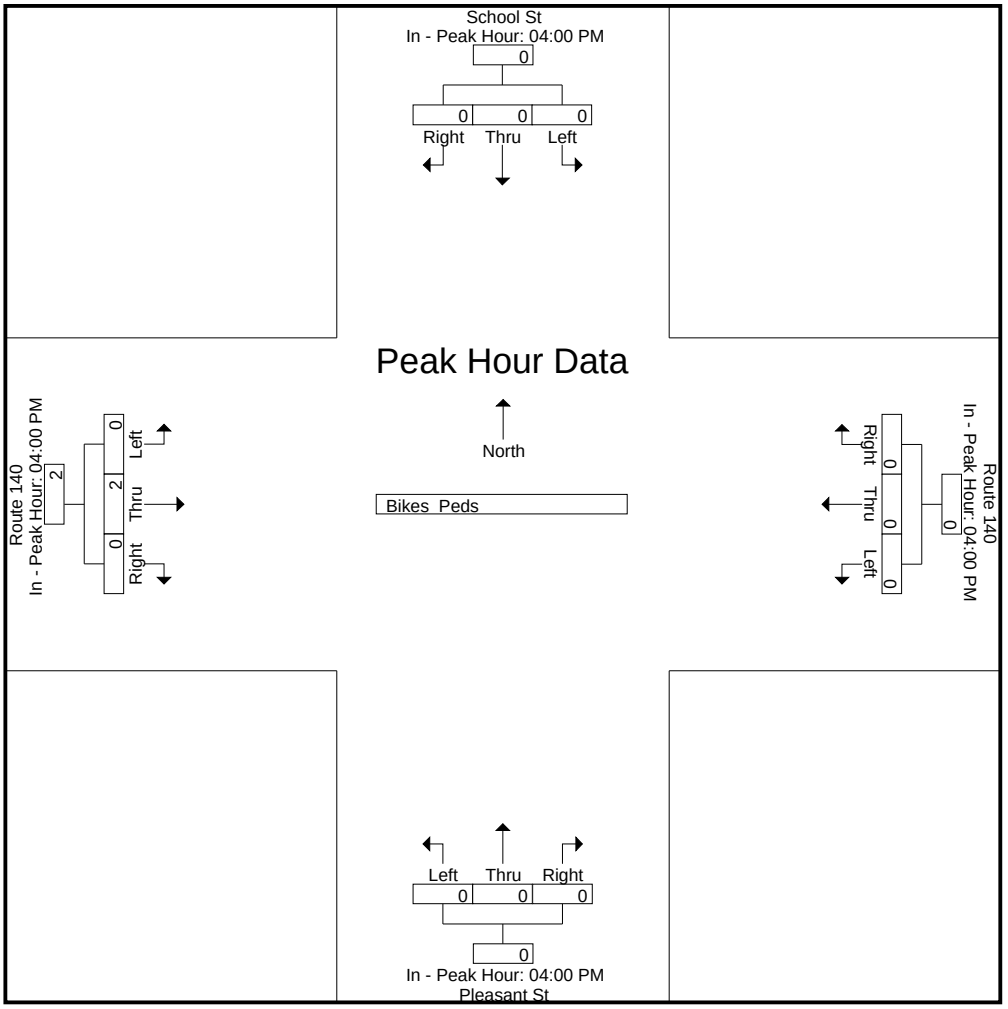
	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	0	**2**
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
% App. Total	0	0	0		0	0	0		0	0	0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

Accurate Counts

978-664-2565

N/S Street : School St / Pleasant St
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680001
Site Code : 95680001
Start Date : 1/11/2023
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Mendon Street
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680002
Site Code : 95680002
Start Date : 1/11/2023
Page No : 1

Groups Printed- Cars - Trucks

	Route 140 From East		Mendon St From South		Route 140 From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	1	40	24	1	57	30	153
07:15 AM	18	67	17	3	83	55	243
07:30 AM	4	75	24	5	96	39	243
07:45 AM	1	40	17	10	69	20	157
Total	24	222	82	19	305	144	796
08:00 AM	1	63	36	4	66	16	186
08:15 AM	0	44	20	4	41	22	131
08:30 AM	0	44	13	18	57	11	143
08:45 AM	9	50	21	9	62	12	163
Total	10	201	90	35	226	61	623
Grand Total	34	423	172	54	531	205	1419
Apprch %	7.4	92.6	76.1	23.9	72.1	27.9	
Total %	2.4	29.8	12.1	3.8	37.4	14.4	
Cars	34	418	172	53	525	199	1401
% Cars	100	98.8	100	98.1	98.9	97.1	98.7
Trucks	0	5	0	1	6	6	18
% Trucks	0	1.2	0	1.9	1.1	2.9	1.3

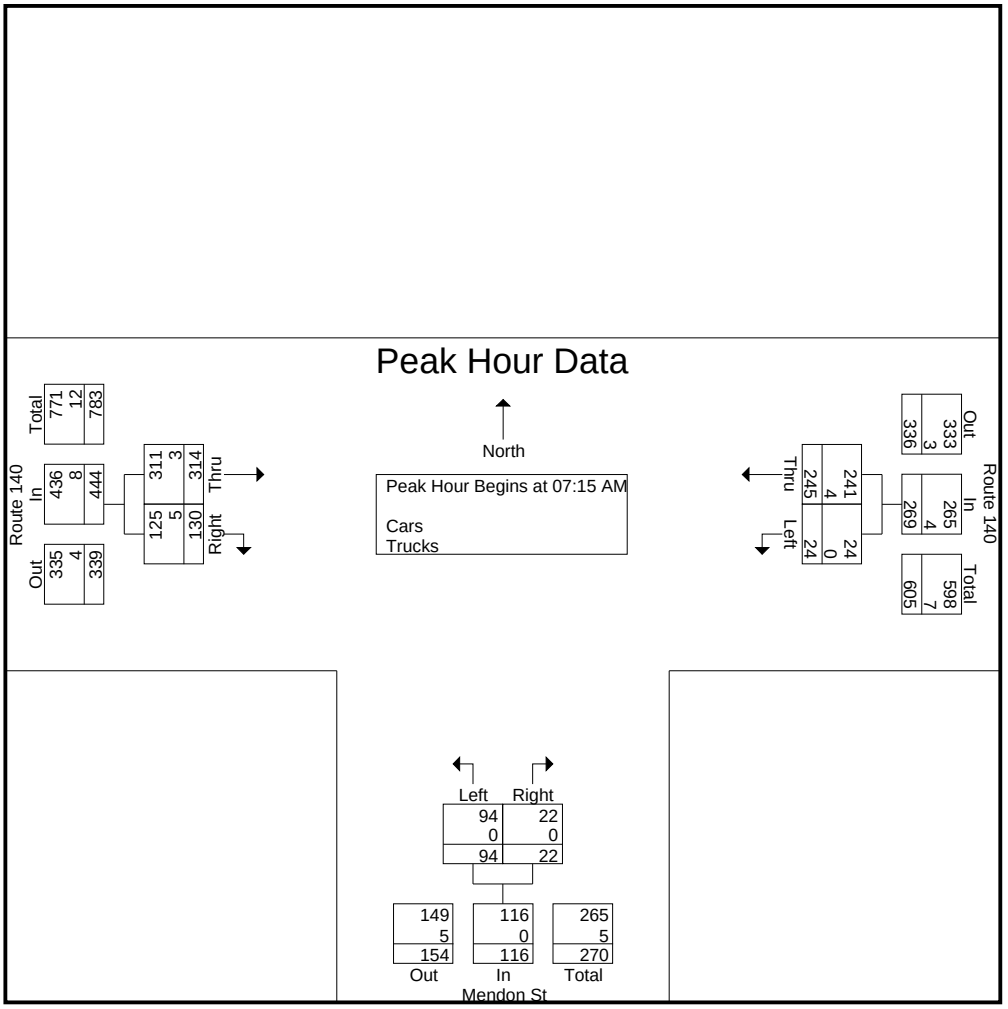
	Route 140 From East			Mendon St From South			Route 140 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	**18**	67	**85**	17	3	20	83	**55**	**138**	**243**
07:30 AM	4	**75**	79	24	5	29	**96**	39	135	243
07:45 AM	1	40	41	17	**10**	27	69	20	89	157
08:00 AM	1	63	64	**36**	4	**40**	66	16	82	186
Total Volume	24	245	269	94	22	116	314	130	444	829
% App. Total	8.9	91.1		81	19		70.7	29.3		
PHF	.333	.817	.791	.653	.550	.725	.818	.591	.804	.853
Cars	24	241	265	94	22	116	311	125	436	817
% Cars	100	98.4	98.5	100	100	100	99.0	96.2	98.2	98.6
Trucks	0	4	4	0	0	0	3	5	8	12
% Trucks	0	1.6	1.5	0	0	0	1.0	3.8	1.8	1.4

Accurate Counts

978-664-2565

N/S Street : Mendon Street
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680002
Site Code : 95680002
Start Date : 1/11/2023
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:

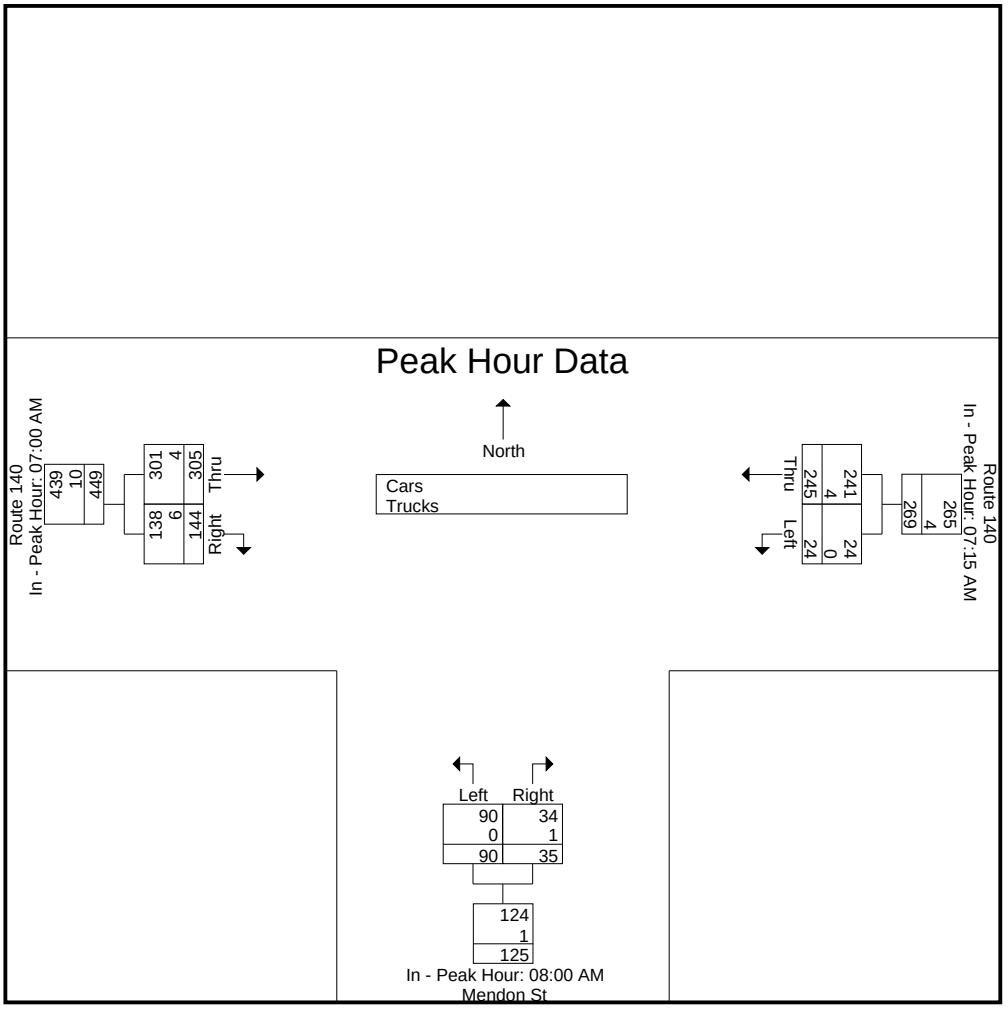
	07:15 AM			08:00 AM			07:00 AM		
+0 mins.	**18**	67	**85**	**36**	4	**40**	57	30	87
+15 mins.	4	**75**	79	20	4	24	83	**55**	**138**
+30 mins.	1	40	41	13	**18**	31	**96**	39	135
+45 mins.	1	63	64	21	9	30	69	20	89
Total Volume	24	245	269	90	35	125	305	144	449
% App. Total	8.9	91.1		72	28		67.9	32.1	
PHF	.333	.817	.791	.625	.486	.781	.794	.655	.813
Cars	24	241	265	90	34	124	301	138	439
% Cars	100	98.4	98.5	100	97.1	99.2	98.7	95.8	97.8
Trucks	0	4	4	0	1	1	4	6	10
% Trucks	0	1.6	1.5	0	2.9	0.8	1.3	4.2	2.2

Accurate Counts

978-664-2565

N/S Street : Mendon Street
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680002
Site Code : 95680002
Start Date : 1/11/2023
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Mendon Street
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680002
Site Code : 95680002
Start Date : 1/11/2023
Page No : 4

Groups Printed- Cars

	Route 140 From East		Mendon St From South		Route 140 From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	1	40	24	1	56	29	151
07:15 AM	18	66	17	3	82	52	238
07:30 AM	4	72	24	5	94	37	236
07:45 AM	1	40	17	10	69	20	157
Total	24	218	82	19	301	138	782
08:00 AM	1	63	36	4	66	16	186
08:15 AM	0	43	20	4	41	22	130
08:30 AM	0	44	13	17	55	11	140
08:45 AM	9	50	21	9	62	12	163
Total	10	200	90	34	224	61	619
Grand Total	34	418	172	53	525	199	1401
Apprch %	7.5	92.5	76.4	23.6	72.5	27.5	
Total %	2.4	29.8	12.3	3.8	37.5	14.2	

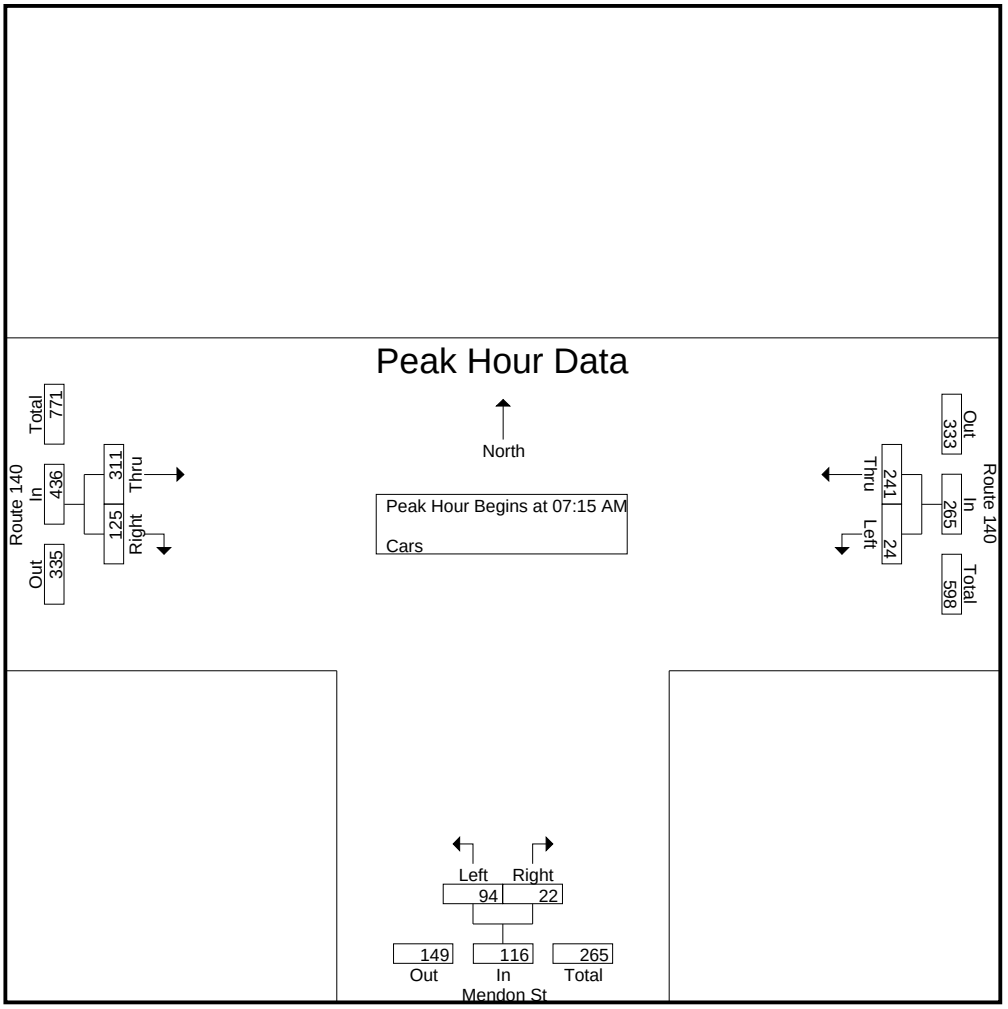
	Route 140 From East			Mendon St From South			Route 140 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	**18**	66	**84**	17	3	20	82	**52**	**134**	**238**
07:30 AM	4	**72**	76	24	5	29	**94**	37	131	236
07:45 AM	1	40	41	17	**10**	27	69	20	89	157
08:00 AM	1	63	64	**36**	4	**40**	66	16	82	186
Total Volume	24	241	265	94	22	116	311	125	436	817
% App. Total	9.1	90.9		81	19		71.3	28.7		
PHF	.333	.837	.789	.653	.550	.725	.827	.601	.813	.858

Accurate Counts

978-664-2565

N/S Street : Mendon Street
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680002
Site Code : 95680002
Start Date : 1/11/2023
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:

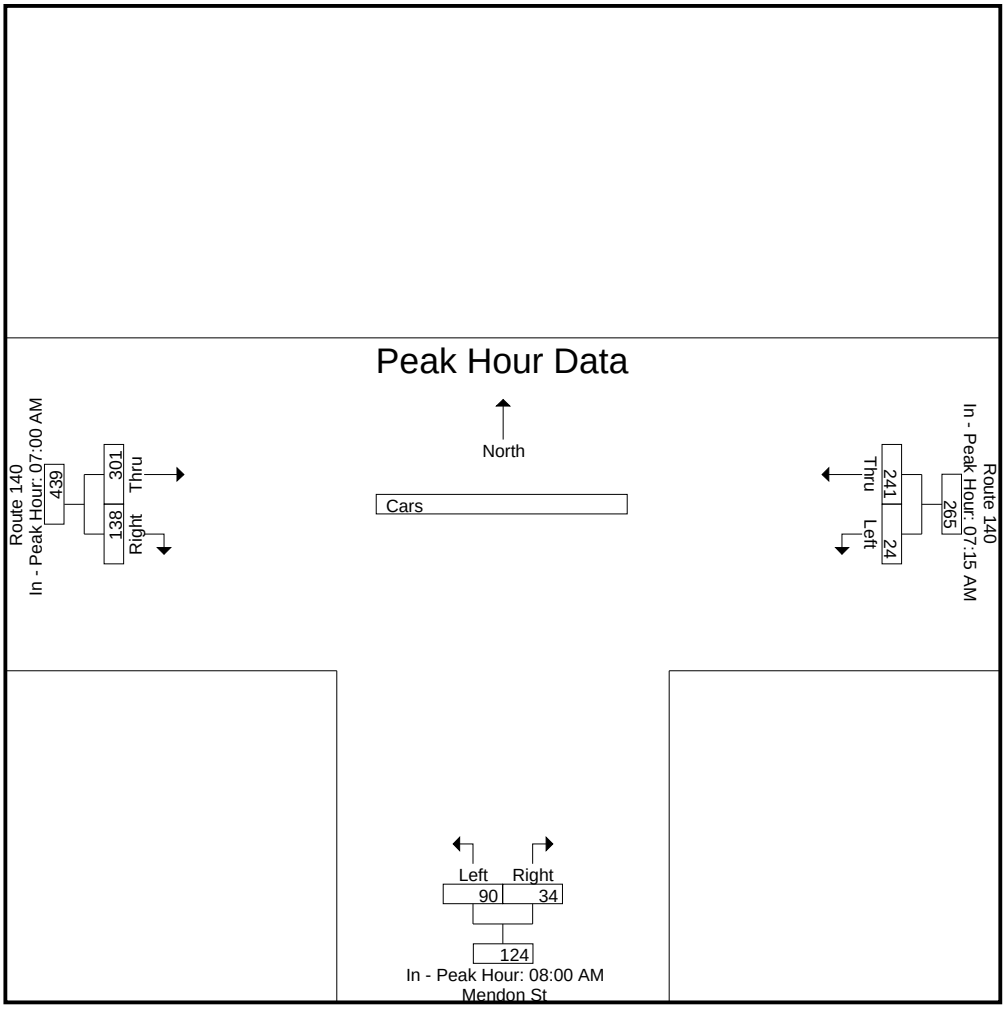
	07:15 AM			08:00 AM			07:00 AM		
+0 mins.	**18**	66	**84**	**36**	4	**40**	56	29	85
+15 mins.	4	**72**	76	20	4	24	82	**52**	**134**
+30 mins.	1	40	41	13	**17**	30	**94**	37	131
+45 mins.	1	63	64	21	9	30	69	20	89
Total Volume	24	241	265	90	34	124	301	138	439
% App. Total	9.1	90.9		72.6	27.4		68.6	31.4	
PHF	.333	.837	.789	.625	.500	.775	.801	.663	.819

Accurate Counts

978-664-2565

N/S Street : Mendon Street
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680002
Site Code : 95680002
Start Date : 1/11/2023
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Mendon Street
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680002
Site Code : 95680002
Start Date : 1/11/2023
Page No : 7

Groups Printed- Trucks

	Route 140 From East		Mendon St From South		Route 140 From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
07:00 AM	0	0	0	0	1	1	2
07:15 AM	0	1	0	0	1	3	5
07:30 AM	0	3	0	0	2	2	7
07:45 AM	0	0	0	0	0	0	0
Total	0	4	0	0	4	6	14
08:00 AM	0	0	0	0	0	0	0
08:15 AM	0	1	0	0	0	0	1
08:30 AM	0	0	0	1	2	0	3
08:45 AM	0	0	0	0	0	0	0
Total	0	1	0	1	2	0	4
Grand Total	0	5	0	1	6	6	18
Apprch %	0	100	0	100	50	50	
Total %	0	27.8	0	5.6	33.3	33.3	

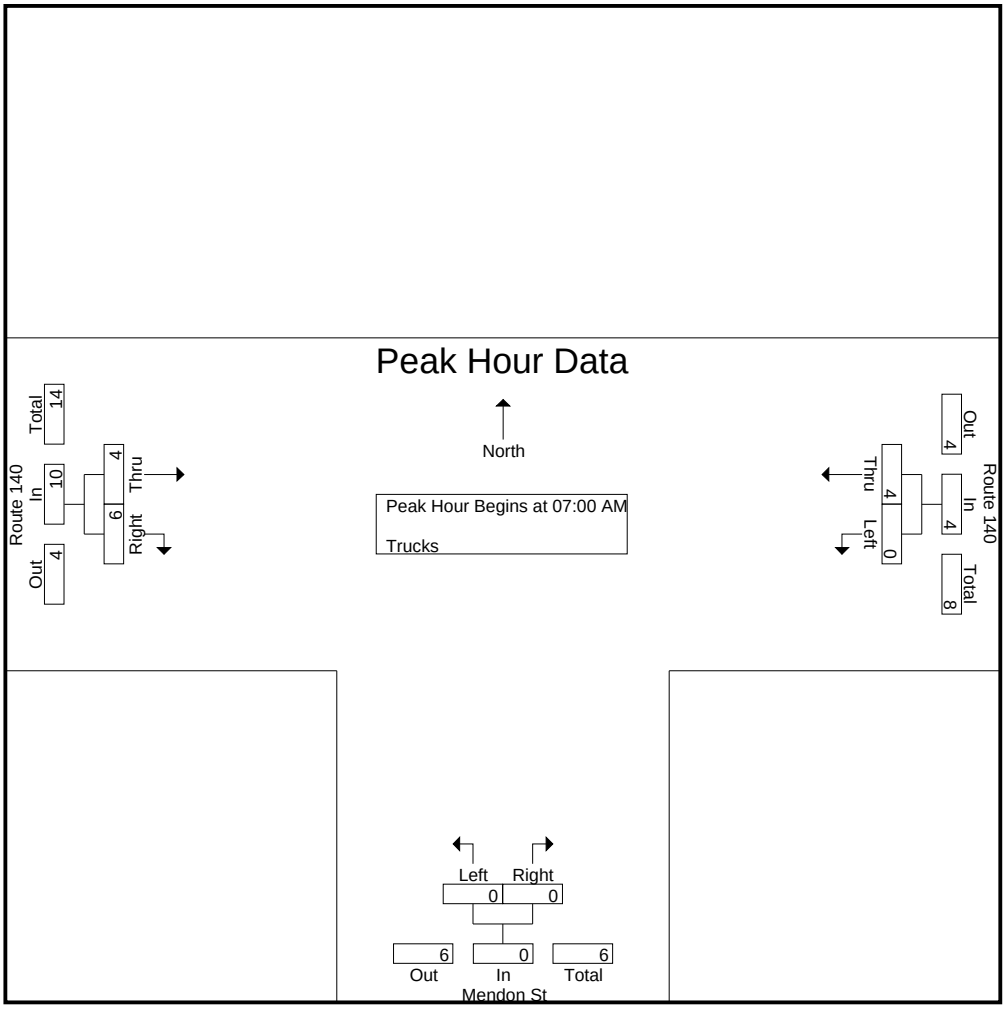
	Route 140 From East			Mendon St From South			Route 140 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	1	1	2	2
07:15 AM	0	1	1	0	0	0	1	**3**	**4**	5
07:30 AM	0	**3**	**3**	0	0	0	**2**	2	4	**7**
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	4	4	0	0	0	4	6	10	14
% App. Total	0	100		0	0		40	60		
PHF	.000	.333	.333	.000	.000	.000	.500	.500	.625	.500

Accurate Counts

978-664-2565

N/S Street : Mendon Street
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680002
Site Code : 95680002
Start Date : 1/11/2023
Page No : 8



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

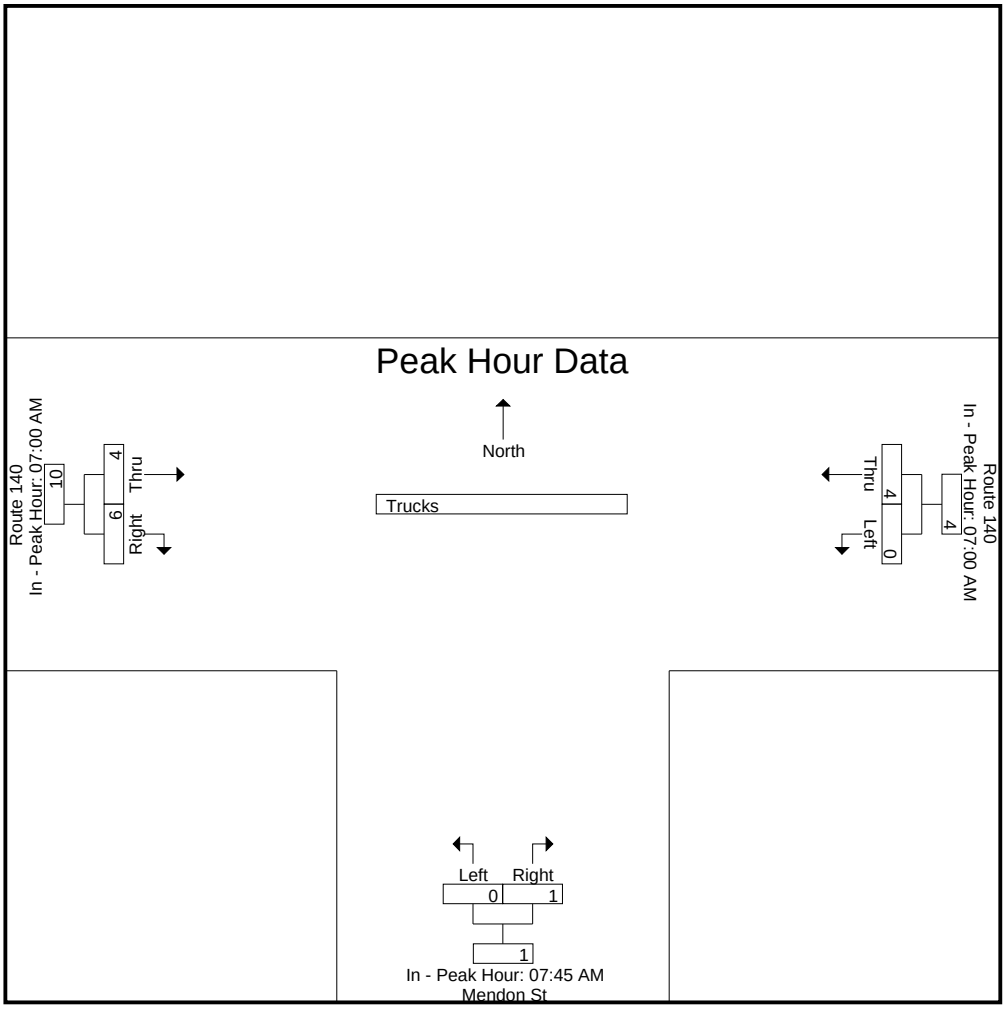
Peak Hour for Each Approach Begins at:

	07:00 AM			07:45 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	1	1	2
+15 mins.	0	1	1	0	0	0	1	**3**	**4**
+30 mins.	0	**3**	**3**	0	0	0	**2**	2	4
+45 mins.	0	0	0	0	**1**	**1**	0	0	0
Total Volume	0	4	4	0	1	1	4	6	10
% App. Total	0	100		0	100		40	60	
PHF	.000	.333	.333	.000	.250	.250	.500	.500	.625

Accurate Counts
978-664-2565

N/S Street : Mendon Street
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680002
Site Code : 95680002
Start Date : 1/11/2023
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Mendon Street
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680002
Site Code : 95680002
Start Date : 1/11/2023

Groups Printed- Bikes Peds

	Route 140 From East			Mendon St From South			Route 140 From West					
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	1	0	0	0	1	0	1
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	0	0	1	0	1
Grand Total	0	0	0	0	0	1	0	0	0	1	0	1
Apprch %	0	0		0	0		0	0				
Total %										100	0	

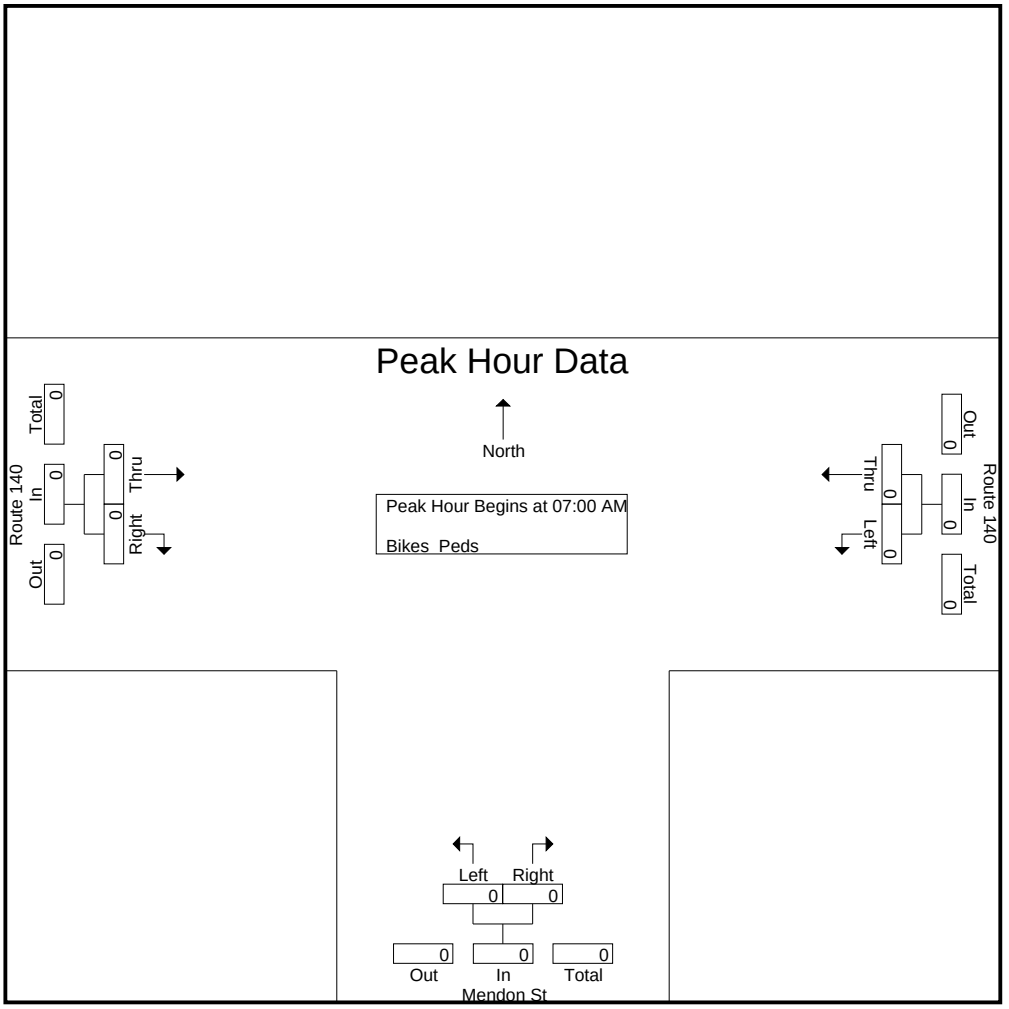
	Route 140 From East			Mendon St From South			Route 140 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : Mendon Street
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680002
Site Code : 95680002
Start Date : 1/11/2023
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:

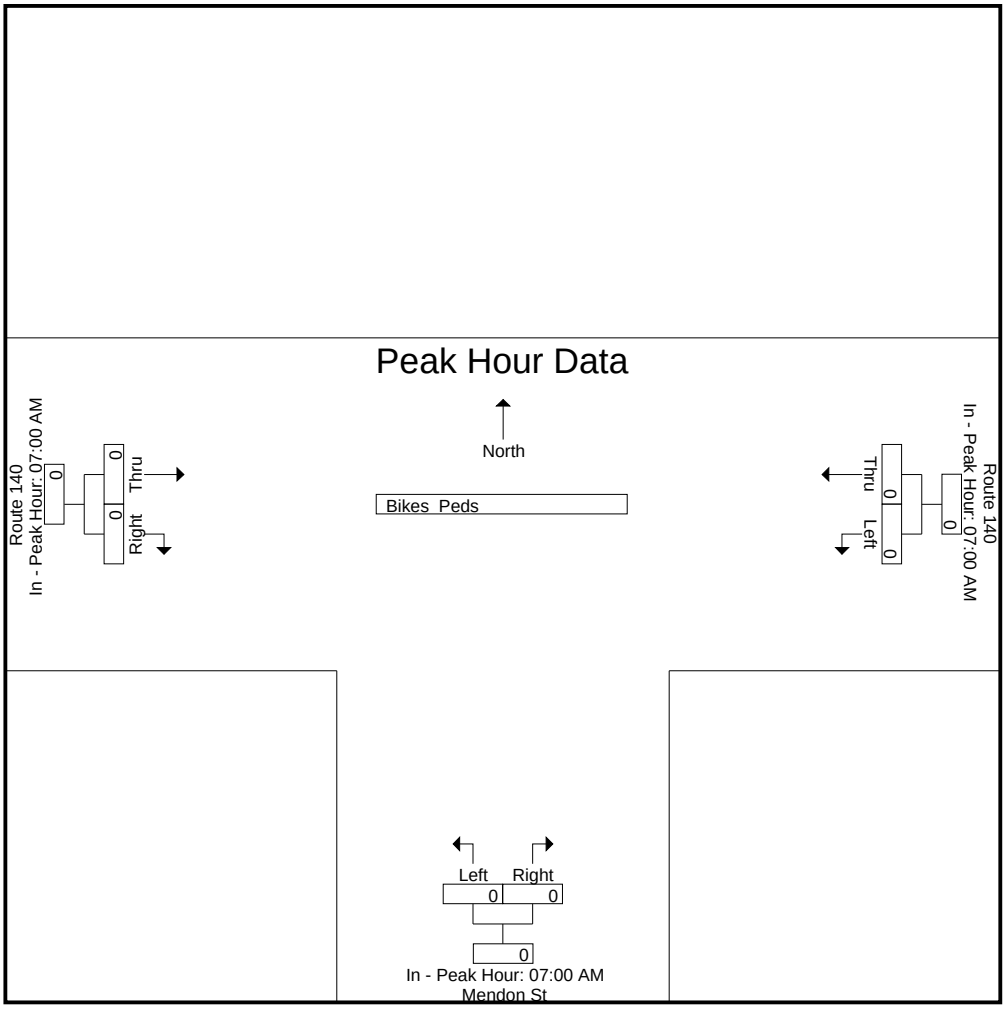
	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Accurate Counts

978-664-2565

N/S Street : Mendon Street
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680002
Site Code : 95680002
Start Date : 1/11/2023
Page No : 12



Accurate Counts

978-664-2565

N/S Street : Mendon Street
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680002
Site Code : 95680002
Start Date : 1/11/2023
Page No : 1

Groups Printed- Cars - Trucks

	Route 140 From East		Mendon St From South		Route 140 From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	8	83	19	0	61	28	199
04:15 PM	3	57	14	13	65	22	174
04:30 PM	20	71	22	2	77	29	221
04:45 PM	6	59	22	3	48	25	163
Total	37	270	77	18	251	104	757
05:00 PM	0	49	18	2	46	19	134
05:15 PM	3	58	23	1	43	32	160
05:30 PM	3	66	22	1	62	14	168
05:45 PM	3	53	20	0	44	18	138
Total	9	226	83	4	195	83	600
Grand Total	46	496	160	22	446	187	1357
Apprch %	8.5	91.5	87.9	12.1	70.5	29.5	
Total %	3.4	36.6	11.8	1.6	32.9	13.8	
Cars	46	493	158	22	445	186	1350
% Cars	100	99.4	98.8	100	99.8	99.5	99.5
Trucks	0	3	2	0	1	1	7
% Trucks	0	0.6	1.2	0	0.2	0.5	0.5

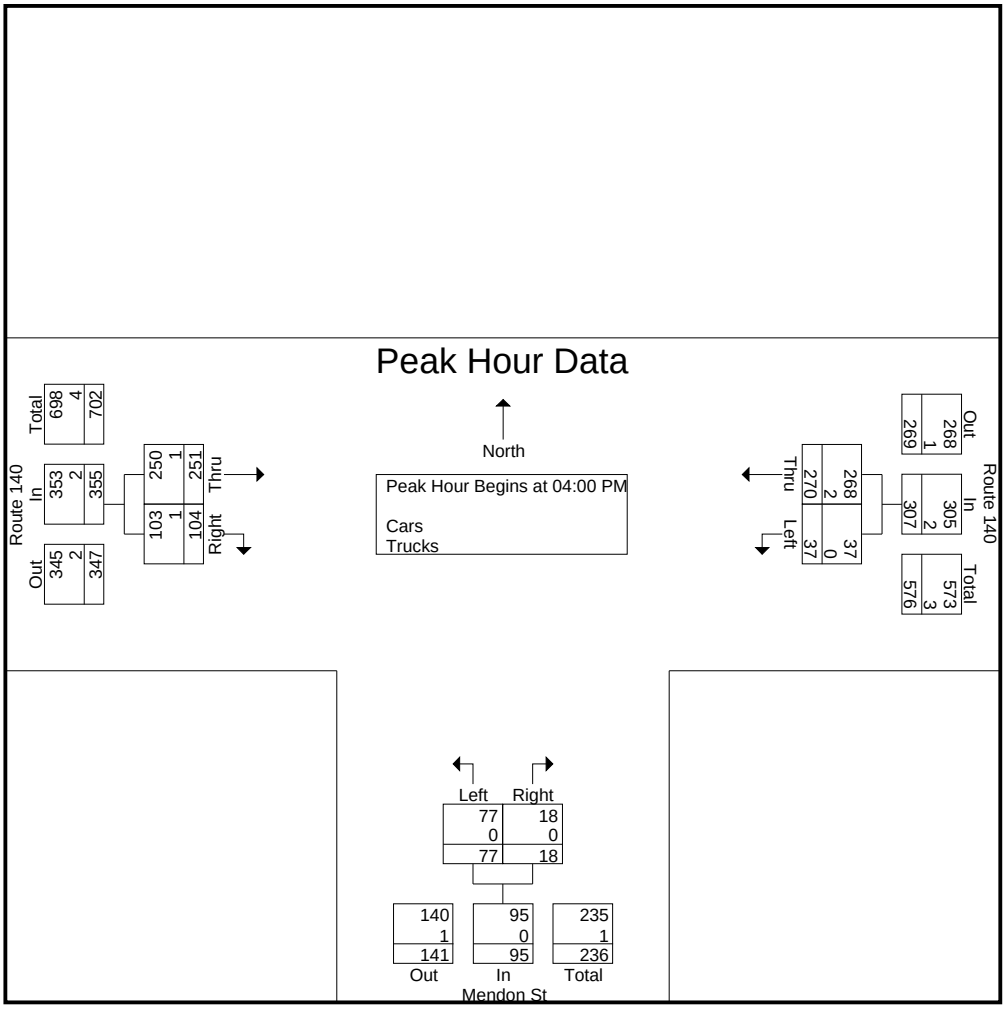
	Route 140 From East			Mendon St From South			Route 140 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	8	**83**	**91**	19	0	19	61	28	89	199
04:15 PM	3	57	60	14	**13**	**27**	65	22	87	174
04:30 PM	**20**	71	91	**22**	2	24	**77**	**29**	**106**	**221**
04:45 PM	6	59	65	22	3	25	48	25	73	163
Total Volume	37	270	307	77	18	95	251	104	355	757
% App. Total	12.1	87.9		81.1	18.9		70.7	29.3		
PHF	.463	.813	.843	.875	.346	.880	.815	.897	.837	.856
Cars	37	268	305	77	18	95	250	103	353	753
% Cars	100	99.3	99.3	100	100	100	99.6	99.0	99.4	99.5
Trucks	0	2	2	0	0	0	1	1	2	4
% Trucks	0	0.7	0.7	0	0	0	0.4	1.0	0.6	0.5

Accurate Counts

978-664-2565

N/S Street : Mendon Street
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680002
Site Code : 95680002
Start Date : 1/11/2023
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:

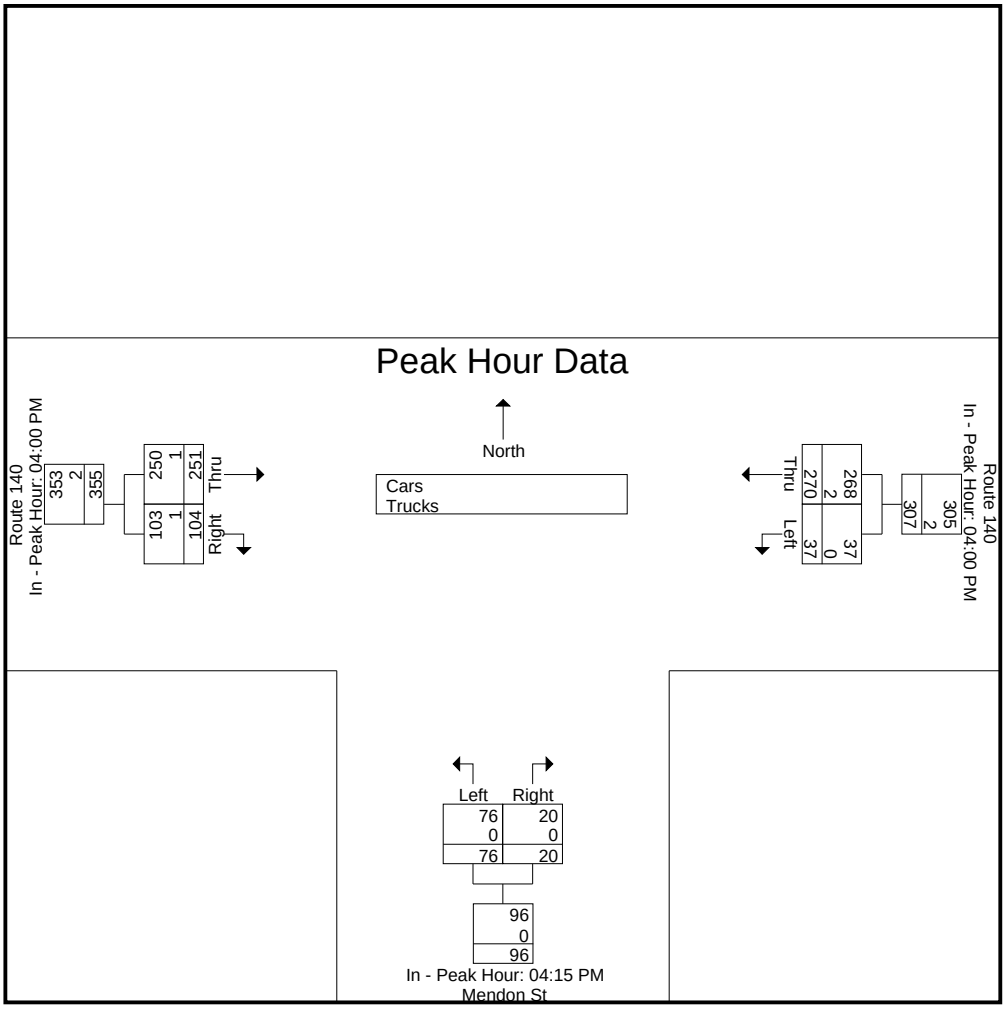
	04:00 PM			04:15 PM			04:00 PM		
+0 mins.	8	**83**	**91**	14	**13**	**27**	61	28	89
+15 mins.	3	57	60	**22**	2	24	65	22	87
+30 mins.	**20**	71	91	22	3	25	**77**	**29**	**106**
+45 mins.	6	59	65	18	2	20	48	25	73
Total Volume	37	270	307	76	20	96	251	104	355
% App. Total	12.1	87.9		79.2	20.8		70.7	29.3	
PHF	.463	.813	.843	.864	.385	.889	.815	.897	.837
Cars	37	268	305	76	20	96	250	103	353
% Cars	100	99.3	99.3	100	100	100	99.6	99	99.4
Trucks	0	2	2	0	0	0	1	1	2
% Trucks	0	0.7	0.7	0	0	0	0.4	1	0.6

Accurate Counts

978-664-2565

N/S Street : Mendon Street
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680002
Site Code : 95680002
Start Date : 1/11/2023
Page No : 3



Accurate Counts

978-664-2565

N/S Street : Mendon Street
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680002
Site Code : 95680002
Start Date : 1/11/2023
Page No : 4

Groups Printed- Cars

	Route 140 From East		Mendon St From South		Route 140 From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	8	82	19	0	61	27	197
04:15 PM	3	56	14	13	65	22	173
04:30 PM	20	71	22	2	76	29	220
04:45 PM	6	59	22	3	48	25	163
Total	37	268	77	18	250	103	753
05:00 PM	0	49	18	2	46	19	134
05:15 PM	3	58	22	1	43	32	159
05:30 PM	3	65	22	1	62	14	167
05:45 PM	3	53	19	0	44	18	137
Total	9	225	81	4	195	83	597
Grand Total	46	493	158	22	445	186	1350
Apprch %	8.5	91.5	87.8	12.2	70.5	29.5	
Total %	3.4	36.5	11.7	1.6	33	13.8	

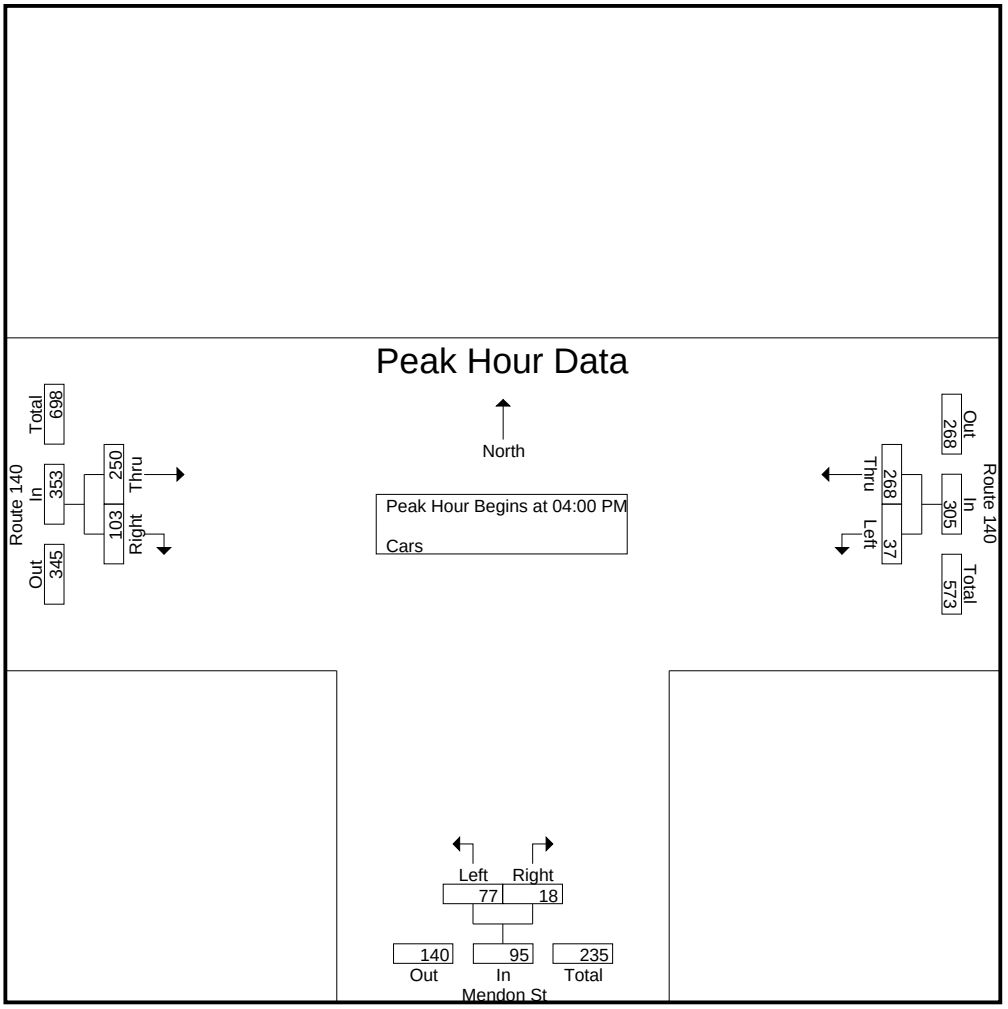
	Route 140 From East			Mendon St From South			Route 140 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	8	**82**	90	19	0	19	61	27	88	197
04:15 PM	3	56	59	14	**13**	**27**	65	22	87	173
04:30 PM	**20**	71	**91**	**22**	2	24	**76**	**29**	**105**	**220**
04:45 PM	6	59	65	22	3	25	48	25	73	163
Total Volume	37	268	305	77	18	95	250	103	353	753
% App. Total	12.1	87.9		81.1	18.9		70.8	29.2		
PHF	.463	.817	.838	.875	.346	.880	.822	.888	.840	.856

Accurate Counts

978-664-2565

N/S Street : Mendon Street
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680002
Site Code : 95680002
Start Date : 1/11/2023
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:

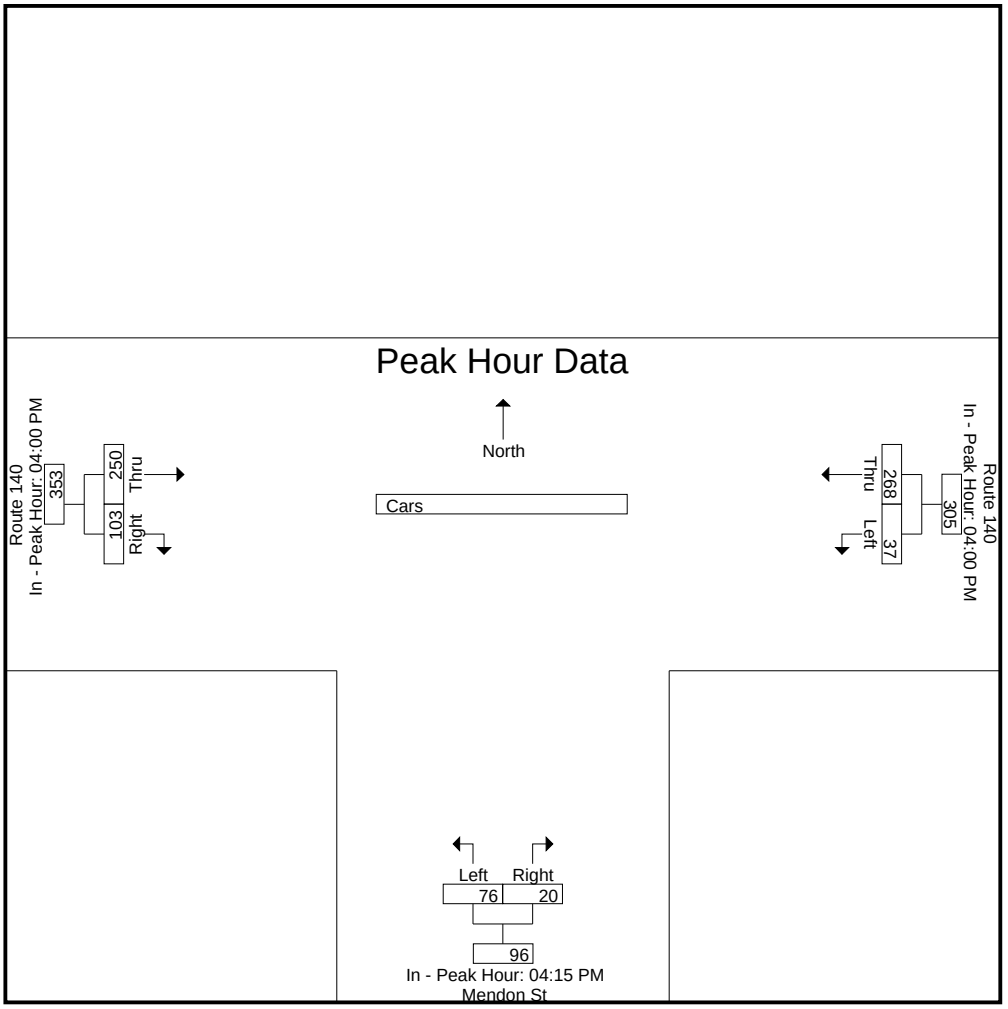
	04:00 PM			04:15 PM			04:00 PM		
+0 mins.	8	**82**	90	14	**13**	**27**	61	27	88
+15 mins.	3	56	59	**22**	2	24	65	22	87
+30 mins.	**20**	71	**91**	22	3	25	**76**	**29**	**105**
+45 mins.	6	59	65	18	2	20	48	25	73
Total Volume	37	268	305	76	20	96	250	103	353
% App. Total	12.1	87.9		79.2	20.8		70.8	29.2	
PHF	.463	.817	.838	.864	.385	.889	.822	.888	.840

Accurate Counts

978-664-2565

N/S Street : Mendon Street
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680002
Site Code : 95680002
Start Date : 1/11/2023
Page No : 6



Accurate Counts

978-664-2565

N/S Street : Mendon Street
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680002
Site Code : 95680002
Start Date : 1/11/2023
Page No : 7

Groups Printed- Trucks

	Route 140 From East		Mendon St From South		Route 140 From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	0	1	0	0	0	1	2
04:15 PM	0	1	0	0	0	0	1
04:30 PM	0	0	0	0	1	0	1
04:45 PM	0	0	0	0	0	0	0
Total	0	2	0	0	1	1	4
05:00 PM	0	0	0	0	0	0	0
05:15 PM	0	0	1	0	0	0	1
05:30 PM	0	1	0	0	0	0	1
05:45 PM	0	0	1	0	0	0	1
Total	0	1	2	0	0	0	3
Grand Total	0	3	2	0	1	1	7
Apprch %	0	100	100	0	50	50	
Total %	0	42.9	28.6	0	14.3	14.3	

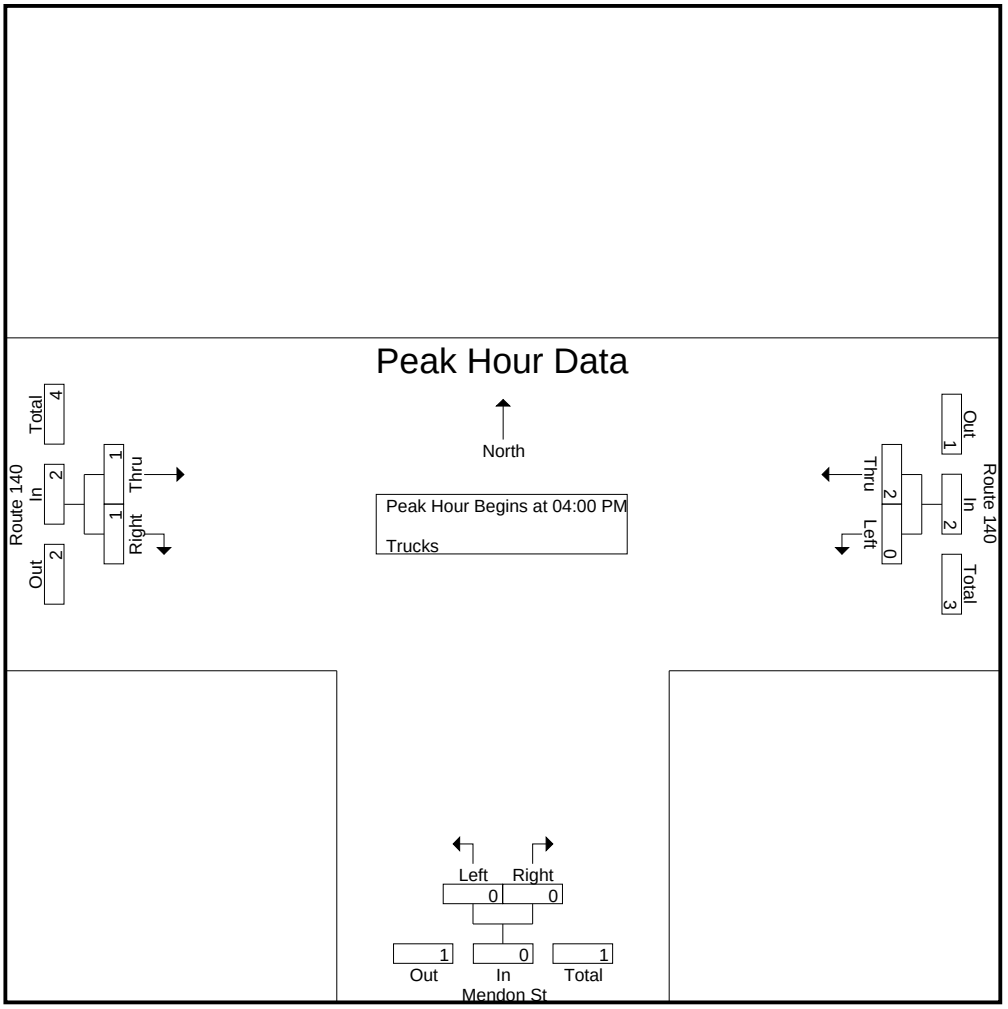
	Route 140 From East			Mendon St From South			Route 140 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	**1**	**1**	0	0	0	0	**1**	**1**	**2**
04:15 PM	0	1	1	0	0	0	0	0	0	1
04:30 PM	0	0	0	0	0	0	**1**	0	1	1
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	2	2	0	0	0	1	1	2	4
% App. Total	0	100		0	0		50	50		
PHF	.000	.500	.500	.000	.000	.000	.250	.250	.500	.500

Accurate Counts

978-664-2565

N/S Street : Mendon Street
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680002
Site Code : 95680002
Start Date : 1/11/2023
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:

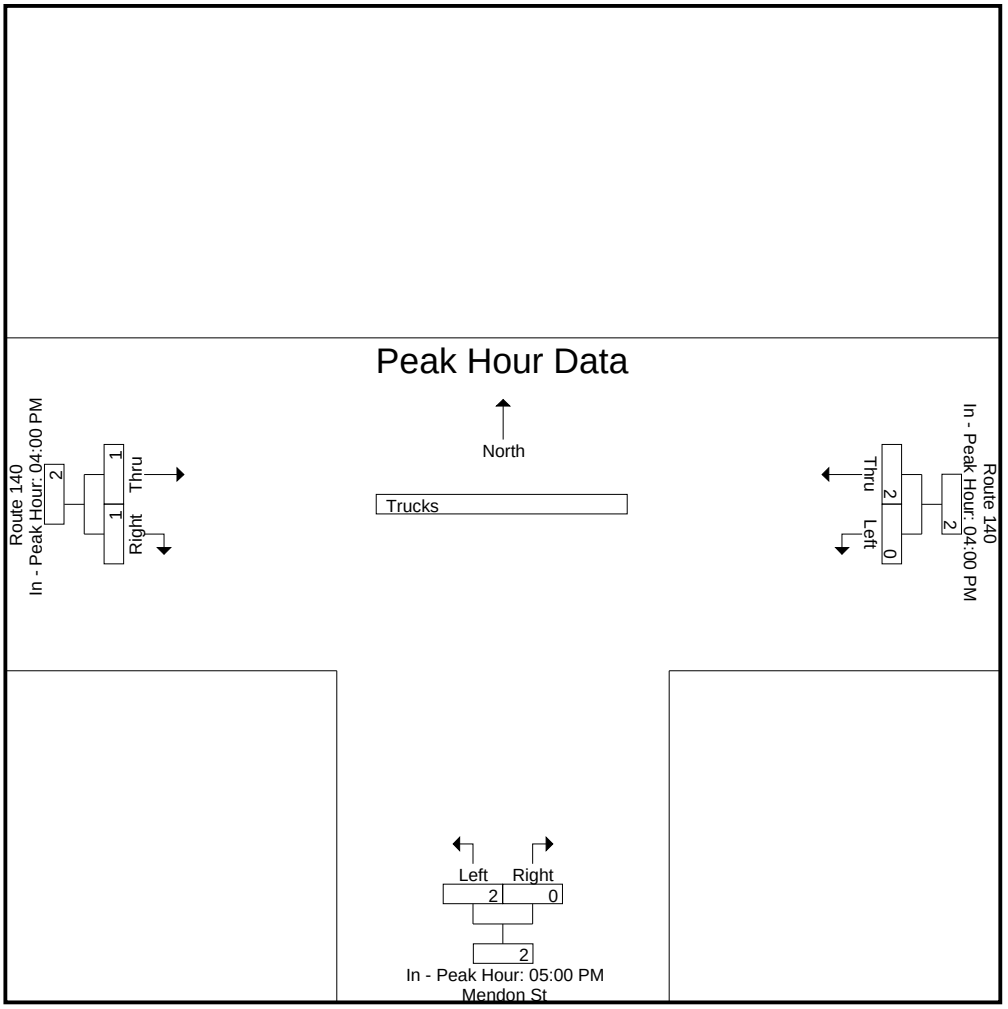
	04:00 PM			05:00 PM			04:00 PM		
+0 mins.	0	**1**	**1**	0	0	0	0	**1**	**1**
+15 mins.	0	1	1	**1**	0	**1**	0	0	0
+30 mins.	0	0	0	0	0	0	**1**	0	1
+45 mins.	0	0	0	1	0	1	0	0	0
Total Volume	0	2	2	2	0	2	1	1	2
% App. Total	0	100		100	0		50	50	
PHF	.000	.500	.500	.500	.000	.500	.250	.250	.500

Accurate Counts

978-664-2565

N/S Street : Mendon Street
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680002
Site Code : 95680002
Start Date : 1/11/2023
Page No : 9



Accurate Counts

978-664-2565

N/S Street : Mendon Street
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680002
Site Code : 95680002
Start Date : 1/11/2023

Groups Printed- Bikes Peds

	Route 140 From East			Mendon St From South			Route 140 From West					
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	

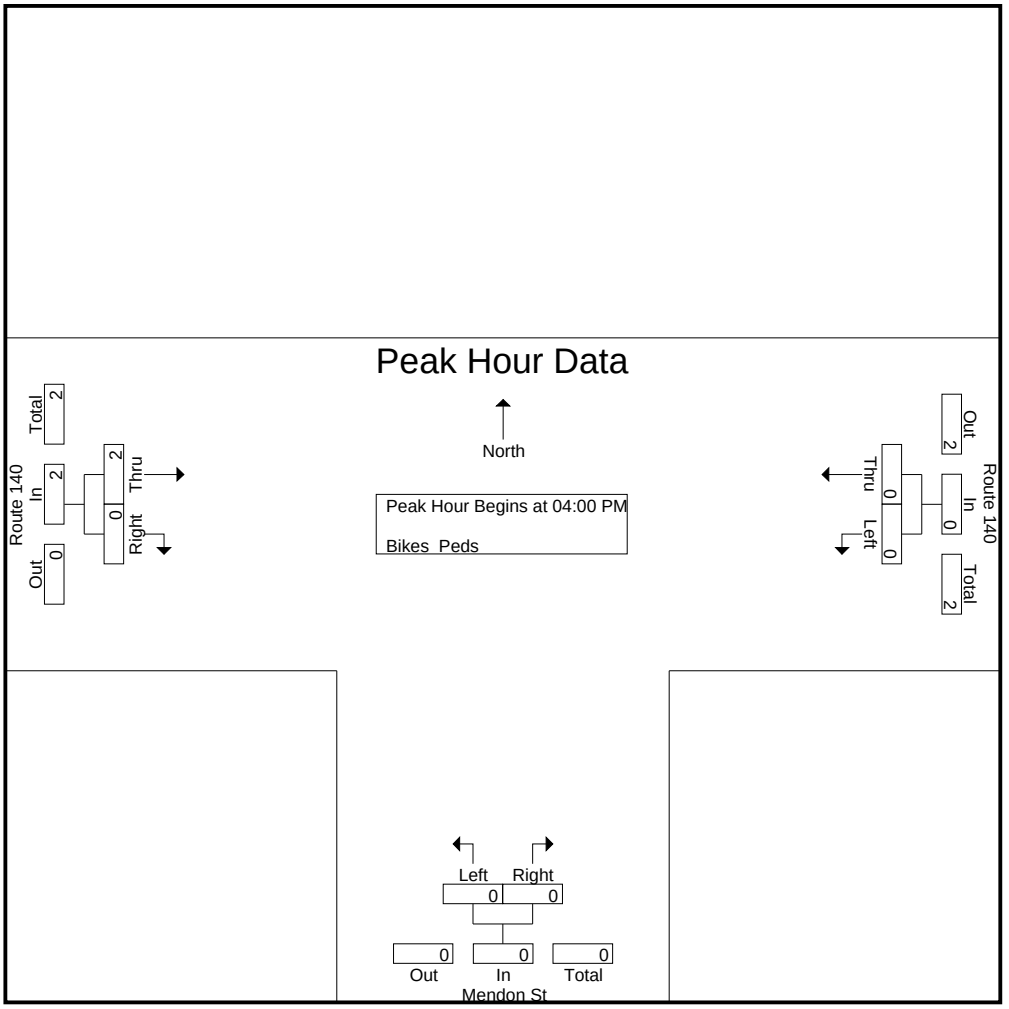
	Route 140 From East			Mendon St From South			Route 140 From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	0	0	0	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

Accurate Counts

978-664-2565

N/S Street : Mendon Street
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680002
Site Code : 95680002
Start Date : 1/11/2023
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:

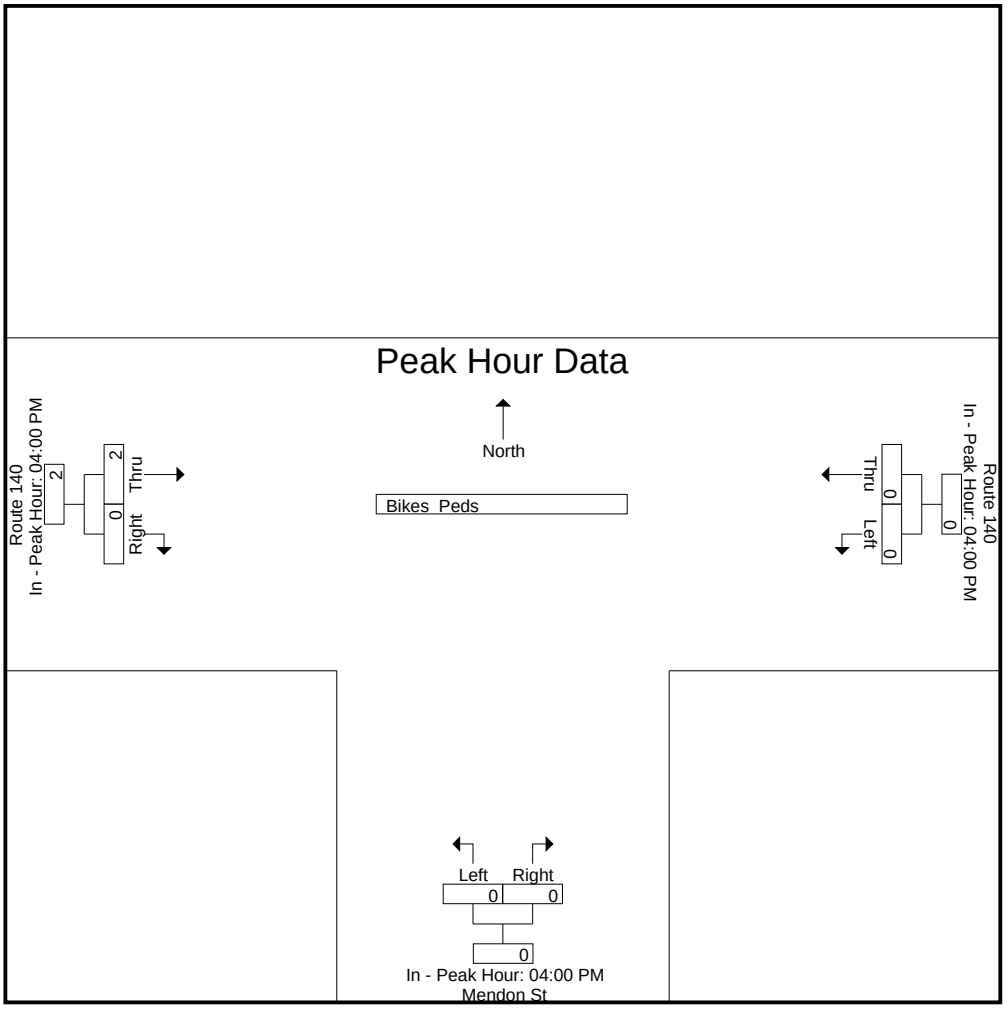
	04:00 PM			04:00 PM			04:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	**2**	0	**2**
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	2	0	2
% App. Total	0	0		0	0		100	0	
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.250

Accurate Counts

978-664-2565

N/S Street : Mendon Street
E/W Street : Route 140
City/State : Upton, MA
Weather : Clear

File Name : 95680002
Site Code : 95680002
Start Date : 1/11/2023
Page No : 12



SEASONAL ADJUSTMENT DATA

Massachusetts Highway Department
Statewide Traffic Data Collection
2019 Weekday Seasonal Factors

Factor Group	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Axle Factor
R1	1.22	1.14	1.12	1.06	1.00	0.96	0.87	0.85	0.96	0.99	1.04	1.12	0.85
R2	0.95	0.96	0.98	0.97	0.97	0.93	0.97	0.94	0.96	0.90	0.92	0.93	0.96
R3	1.15	1.06	1.07	1.00	0.89	0.88	0.89	0.89	0.95	0.92	1.02	1.01	0.97
R4-R7	1.09	1.09	1.11	1.02	0.96	0.92	0.89	0.89	0.99	0.98	1.09	1.13	0.98
U1-Boston	1.03	1.01	0.98	0.94	0.94	0.92	0.95	0.93	0.94	0.94	0.97	1.04	0.96
U1-Essex	1.09	1.06	1.03	0.99	0.94	0.90	0.88	0.86	0.93	0.94	0.99	1.06	0.93
U1-Southeast	1.06	1.05	1.01	0.97	0.95	0.93	0.93	0.90	0.94	0.94	0.98	1.04	0.98
U1-West	1.19	1.14	1.09	0.95	0.92	0.89	0.89	0.86	0.91	0.95	0.97	1.07	0.84
U1-Worcester	1.02	1.04	0.97	0.94	0.93	0.91	0.95	0.91	0.93	0.92	0.95	1.10	0.88
U2	1.01	1.00	0.94	0.93	0.91	0.89	0.93	0.90	0.90	0.91	0.94	1.02	0.99
U3	1.06	1.03	0.98	0.94	0.93	0.91	0.95	0.91	0.92	0.93	0.97	1.00	0.98
U4-U7	1.01	1.00	0.95	0.92	0.88	0.86	0.92	0.91	0.92	0.94	0.99	1.04	0.99
Rec - East	1.04	1.16	1.12	0.98	0.92	0.88	0.77	0.81	0.94	1.02	1.08	1.12	0.99
Rec - West	1.30	1.23	1.32	1.18	0.95	0.82	0.70	0.69	0.97	0.96	1.16	1.15	0.98

Round off:
0-999 = 10
>1000 = 100

U = Urban
R = Rural

1 - Interstate
2 - Freeway and Expressway
3 - Other Principal Arterial
4 - Minor Arterial
5 - Major Collector
6 - Minor Collector
7 - Local Road and Street

Recreational - East Group - Cape Cod (all towns) including the town of Plymouth south of Route 3A (stations 7014,7079,7080,7090,7091,7092,7093,7094,7095,7096,7097,7108 and 7178), Martha's Vineyard and Nantucket.

Recreational - West Group - Continuous Stations 2 and 189 including stations 1066,1067,1083,1084,1085,1086,1087,1088,1089,1090,1091,1092,1093,1094,1095,1096,1097,1098,1099,1100,1101,1102,1103,1104,1105,1106,1107,1108,1113,1114,1116,2196,2197 and 2198.

VEHICLE TRAVEL SPEED DATA

Accurate Counts

978-664-2565

Location : Main Street 95680001
Location : West of School Street
City/State: Upton, MA
Direction: WB

1/11/2023 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	3	1	6	1	0	0	0	0	0	0	0	11
1:00	0	1	0	3	1	1	1	0	0	0	0	0	0	7
2:00	0	1	0	2	0	1	2	0	0	0	0	0	0	6
3:00	0	2	2	1	2	1	0	0	0	0	0	0	0	8
4:00	0	0	0	1	5	1	1	0	0	0	0	0	0	8
5:00	0	1	1	4	14	7	4	1	0	0	0	0	0	32
6:00	0	2	4	34	39	23	2	0	0	0	0	0	0	104
7:00	5	5	16	59	111	36	4	1	0	0	0	0	0	237
8:00	2	2	18	53	103	45	2	0	0	0	0	0	0	225
9:00	0	6	19	45	70	19	1	1	0	0	0	0	0	161
10:00	0	2	13	55	72	24	1	0	0	0	0	0	0	167
11:00	1	2	14	49	76	32	3	0	0	0	0	0	0	177
12:00 PM	0	1	14	47	73	30	2	0	0	0	0	0	0	167
1:00	0	8	8	47	83	32	1	0	0	0	0	0	0	179
2:00	0	2	11	64	101	25	4	0	0	0	0	0	0	207
3:00	1	4	23	88	134	49	2	0	0	0	0	0	0	301
4:00	0	4	18	91	122	43	2	0	0	0	0	0	0	280
5:00	1	2	13	99	107	18	0	0	0	0	0	0	0	240
6:00	0	1	10	42	74	20	0	0	0	0	0	0	0	147
7:00	0	1	7	29	57	13	0	0	0	0	0	0	0	107
8:00	1	0	4	20	39	12	2	0	0	0	0	0	0	78
9:00	0	0	1	13	30	15	1	0	0	0	0	0	0	60
10:00	0	0	1	10	14	2	1	0	0	0	0	0	0	28
11:00	0	0	2	3	15	11	0	0	0	0	0	0	0	31
Total	11	47	202	860	1348	461	36	3	0	0	0	0	0	2968

Percentile	15th	50th	85th	95th
Speed	27	32	36	38

Mean Speed (Average)	31.0
10 MPH Pace Speed	25-34
Number in Pace	2185
Percent in Pace	73.6%
Number > 30 MPH	1848
Percent > 30 MPH	62.3%

Accurate Counts
978-664-2565

Location : Main Street 95680001
Location : West of School Street
City/State: Upton, MA
Direction: WB

1/12/2023 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	2	1	6	6	1	1	0	0	0	0	0	0	17
1:00	0	2	0	6	2	0	1	0	0	0	0	0	0	11
2:00	0	0	1	0	1	1	0	0	0	0	0	0	0	3
3:00	0	0	0	0	5	2	0	0	0	0	0	0	0	7
4:00	0	1	0	3	6	3	1	0	0	0	0	0	0	14
5:00	0	0	2	7	16	10	0	0	0	0	0	0	0	35
6:00	0	1	7	33	46	22	1	0	0	0	0	0	0	110
7:00	1	1	23	59	91	22	4	0	0	0	0	0	0	201
8:00	2	7	24	69	88	34	4	0	0	0	0	0	0	228
9:00	0	6	13	42	63	27	3	0	0	0	0	0	0	154
10:00	0	4	4	51	59	23	4	0	0	0	0	0	0	145
11:00	0	1	12	50	79	32	3	0	0	0	0	0	0	177
12:00 PM	1	2	11	43	79	23	6	0	0	0	0	0	0	165
1:00	0	3	6	52	82	24	1	0	0	0	0	0	0	168
2:00	0	1	22	70	84	20	2	0	0	0	0	0	0	199
3:00	1	1	19	105	119	24	1	0	0	0	0	0	0	270
4:00	0	2	23	116	119	22	2	0	0	0	0	0	0	284
5:00	2	1	35	91	79	12	1	0	0	0	0	0	0	221
6:00	0	0	13	53	80	11	3	0	0	0	0	0	0	160
7:00	0	1	7	45	54	7	0	0	0	0	0	0	0	114
8:00	0	3	7	18	28	6	2	0	0	0	0	0	0	64
9:00	0	2	6	23	22	2	1	0	0	0	0	0	0	56
10:00	0	0	1	15	9	3	0	0	0	0	0	0	0	28
11:00	0	0	0	1	5	0	0	0	0	0	0	0	0	6
Total	7	41	237	958	1222	331	41	0	0	0	0	0	0	2837
			Percentile	15th	50th	85th	95th							
			Speed	27	31	35	38							
			Mean Speed (Average)	30.5										
			10 MPH Pace Speed	25-34										
			Number in Pace	2160										
			Percent in Pace	76.1%										
			Number > 30 MPH	1594										
			Percent > 30 MPH	56.2%										
Grand Total	18	88	439	1818	2570	792	77	3	0	0	0	0	0	5805
			Percentile	15th	50th	85th	95th							
			Speed	27	31	36	38							
			Mean Speed (Average)	30.7										
			10 MPH Pace Speed	25-34										
			Number in Pace	4345										
			Percent in Pace	74.8%										
			Number > 30 MPH	3442										
			Percent > 30 MPH	59.3%										

Accurate Counts
978-664-2565

Location : Main Street 95680001
Location : West of School Street
City/State: Upton, MA
Direction: EB

1/11/2023 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	1	4	1	0	1	0	0	0	0	0	0	7
1:00	0	0	0	0	1	1	0	0	0	0	0	0	0	2
2:00	0	0	0	1	1	0	0	0	0	0	0	0	0	2
3:00	0	0	1	4	4	0	1	0	0	0	0	0	0	10
4:00	0	0	1	8	6	1	0	0	0	0	0	0	0	16
5:00	2	0	3	16	21	8	1	0	0	0	0	0	0	51
6:00	0	2	10	49	54	8	0	0	0	0	0	0	0	123
7:00	2	4	38	131	102	26	1	1	0	0	0	0	0	305
8:00	0	4	37	96	74	22	3	0	0	0	0	0	0	236
9:00	0	4	27	64	76	7	2	0	0	0	0	0	0	180
10:00	2	2	35	74	52	13	1	0	0	0	0	0	0	179
11:00	0	12	22	69	67	18	0	0	0	0	0	0	0	188
12:00 PM	0	3	16	71	55	10	0	0	0	0	0	0	0	155
1:00	0	0	16	71	64	14	3	1	0	0	0	0	0	169
2:00	0	2	23	96	60	16	0	0	0	0	0	0	0	197
3:00	8	15	59	93	54	5	0	0	0	0	0	0	0	234
4:00	3	13	48	106	92	14	2	0	0	0	0	0	0	278
5:00	0	4	27	107	55	6	0	0	0	0	0	0	0	199
6:00	0	1	25	58	48	10	0	0	0	0	0	0	0	142
7:00	0	1	11	43	42	9	1	0	0	0	0	0	0	107
8:00	0	0	7	29	15	5	0	0	0	0	0	0	0	56
9:00	0	1	4	16	12	2	1	0	0	0	0	0	0	36
10:00	0	0	1	11	11	3	0	0	0	0	0	0	0	26
11:00	0	0	1	4	6	2	1	0	0	0	0	0	0	14
Total	17	68	413	1221	973	200	18	2	0	0	0	0	0	2912

Percentile	15th	50th	85th	95th
Speed	25	30	34	36

Mean Speed (Average)	29.0
10 MPH Pace Speed	25-34
Number in Pace	2183
Percent in Pace	75.0%
Number > 30 MPH	1193
Percent > 30 MPH	41.0%

Accurate Counts
978-664-2565

Location : Main Street 95680001
Location : West of School Street
City/State: Upton, MA
Direction: EB

1/12/2023 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	0	2	3	1	0	0	0	0	0	0	0	6
1:00	0	0	0	1	1	1	0	0	0	0	0	0	0	3
2:00	0	0	0	5	3	1	0	0	0	0	0	0	0	9
3:00	0	0	0	3	2	2	1	0	0	0	0	0	0	8
4:00	0	0	2	1	3	5	0	0	0	0	0	0	0	11
5:00	0	0	5	21	15	9	0	0	0	0	0	0	0	50
6:00	0	1	15	40	47	14	0	0	0	0	0	0	0	117
7:00	0	7	53	134	84	24	0	0	0	0	0	0	0	302
8:00	0	2	41	103	77	10	3	0	0	0	0	0	0	236
9:00	0	1	26	84	59	15	0	0	0	0	0	0	0	185
10:00	0	0	14	64	56	16	2	0	0	0	0	0	0	152
11:00	0	3	29	61	57	8	2	0	0	0	0	0	0	160
12:00 PM	0	3	31	82	58	18	3	1	0	0	0	0	0	196
1:00	0	6	20	73	62	12	3	0	0	0	0	0	0	176
2:00	2	2	25	88	71	19	1	0	0	0	0	0	0	208
3:00	5	4	38	86	72	14	0	0	0	0	0	0	0	219
4:00	0	3	40	116	75	13	2	0	0	0	0	0	0	249
5:00	0	1	33	88	65	11	1	0	0	0	0	0	0	199
6:00	0	3	22	60	59	8	6	0	0	0	0	0	0	158
7:00	0	2	9	30	30	1	1	0	0	0	0	0	0	73
8:00	0	0	6	17	26	6	1	0	0	0	0	0	0	56
9:00	0	0	3	15	17	7	0	0	0	0	0	0	0	42
10:00	0	0	1	14	11	6	0	0	0	0	0	0	0	32
11:00	0	0	1	1	1	1	0	0	0	0	0	0	0	4
Total	7	38	414	1189	954	222	26	1	0	0	0	0	0	2851
			Percentile	15th	50th	85th	95th							
			Speed	25	30	34	37							
		Mean Speed (Average)		29.2										
		10 MPH Pace Speed		25-34										
		Number in Pace		2132										
		Percent in Pace		74.8%										
		Number > 30 MPH		1203										
		Percent > 30 MPH		42.2%										
Grand Total	24	106	827	2410	1927	422	44	3	0	0	0	0	0	5763
			Percentile	15th	50th	85th	95th							
			Speed	25	30	34	37							
		Mean Speed (Average)		29.1										
		10 MPH Pace Speed		25-34										
		Number in Pace		4315										
		Percent in Pace		74.9%										
		Number > 30 MPH		2396										
		Percent > 30 MPH		41.6%										

Accurate Counts
978-664-2565

Location : Main Street 95680001
Location : West of School Street
City/State: Upton, MA
Direction: Combined

1/11/2023 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	0	4	5	7	1	1	0	0	0	0	0	0	18
1:00	0	1	0	3	2	2	1	0	0	0	0	0	0	9
2:00	0	1	0	3	1	1	2	0	0	0	0	0	0	8
3:00	0	2	3	5	6	1	1	0	0	0	0	0	0	18
4:00	0	0	1	9	11	2	1	0	0	0	0	0	0	24
5:00	2	1	4	20	35	15	5	1	0	0	0	0	0	83
6:00	0	4	14	83	93	31	2	0	0	0	0	0	0	227
7:00	7	9	54	190	213	62	5	2	0	0	0	0	0	542
8:00	2	6	55	149	177	67	5	0	0	0	0	0	0	461
9:00	0	10	46	109	146	26	3	1	0	0	0	0	0	341
10:00	2	4	48	129	124	37	2	0	0	0	0	0	0	346
11:00	1	14	36	118	143	50	3	0	0	0	0	0	0	365
12:00 PM	0	4	30	118	128	40	2	0	0	0	0	0	0	322
1:00	0	8	24	118	147	46	4	1	0	0	0	0	0	348
2:00	0	4	34	160	161	41	4	0	0	0	0	0	0	404
3:00	9	19	82	181	188	54	2	0	0	0	0	0	0	535
4:00	3	17	66	197	214	57	4	0	0	0	0	0	0	558
5:00	1	6	40	206	162	24	0	0	0	0	0	0	0	439
6:00	0	2	35	100	122	30	0	0	0	0	0	0	0	289
7:00	0	2	18	72	99	22	1	0	0	0	0	0	0	214
8:00	1	0	11	49	54	17	2	0	0	0	0	0	0	134
9:00	0	1	5	29	42	17	2	0	0	0	0	0	0	96
10:00	0	0	2	21	25	5	1	0	0	0	0	0	0	54
11:00	0	0	3	7	21	13	1	0	0	0	0	0	0	45
Total	28	115	615	2081	2321	661	54	5	0	0	0	0	0	5880

Percentile	15th	50th	85th	95th
Speed	26	31	35	38

Mean Speed (Average)	30.0
10 MPH Pace Speed	25-34
Number in Pace	4368
Percent in Pace	74.3%
Number > 30 MPH	3041
Percent > 30 MPH	51.7%

Accurate Counts
978-664-2565

Location : Main Street 95680001
Location : West of School Street
City/State: Upton, MA
Direction: Combined

1/12/2023 Time	0 - 15 MPH	> 15 - 20 MPH	> 20 - 25 MPH	> 25 - 30 MPH	> 30 - 35 MPH	> 35 - 40 MPH	> 40 - 45 MPH	> 45 - 50 MPH	> 50 - 55 MPH	> 55 - 60 MPH	> 60 - 65 MPH	> 65 - 70 MPH	> 70 MPH	Total
12:00 AM	0	2	1	8	9	2	1	0	0	0	0	0	0	23
1:00	0	2	0	7	3	1	1	0	0	0	0	0	0	14
2:00	0	0	1	5	4	2	0	0	0	0	0	0	0	12
3:00	0	0	0	3	7	4	1	0	0	0	0	0	0	15
4:00	0	1	2	4	9	8	1	0	0	0	0	0	0	25
5:00	0	0	7	28	31	19	0	0	0	0	0	0	0	85
6:00	0	2	22	73	93	36	1	0	0	0	0	0	0	227
7:00	1	8	76	193	175	46	4	0	0	0	0	0	0	503
8:00	2	9	65	172	165	44	7	0	0	0	0	0	0	464
9:00	0	7	39	126	122	42	3	0	0	0	0	0	0	339
10:00	0	4	18	115	115	39	6	0	0	0	0	0	0	297
11:00	0	4	41	111	136	40	5	0	0	0	0	0	0	337
12:00 PM	1	5	42	125	137	41	9	1	0	0	0	0	0	361
1:00	0	9	26	125	144	36	4	0	0	0	0	0	0	344
2:00	2	3	47	158	155	39	3	0	0	0	0	0	0	407
3:00	6	5	57	191	191	38	1	0	0	0	0	0	0	489
4:00	0	5	63	232	194	35	4	0	0	0	0	0	0	533
5:00	2	2	68	179	144	23	2	0	0	0	0	0	0	420
6:00	0	3	35	113	139	19	9	0	0	0	0	0	0	318
7:00	0	3	16	75	84	8	1	0	0	0	0	0	0	187
8:00	0	3	13	35	54	12	3	0	0	0	0	0	0	120
9:00	0	2	9	38	39	9	1	0	0	0	0	0	0	98
10:00	0	0	2	29	20	9	0	0	0	0	0	0	0	60
11:00	0	0	1	2	6	1	0	0	0	0	0	0	0	10
Total	14	79	651	2147	2176	553	67	1	0	0	0	0	0	5688
			Percentile	15th	50th	85th	95th							
			Speed	26	30	35	37							
			Mean Speed (Average)	29.9										
			10 MPH Pace Speed	25-34										
			Number in Pace	4292										
			Percent in Pace	75.5%										
			Number > 30 MPH	2797										
			Percent > 30 MPH	49.2%										
Grand Total	42	194	1266	4228	4497	1214	121	6	0	0	0	0	0	11568
			Percentile	15th	50th	85th	95th							
			Speed	26	31	35	37							
			Mean Speed (Average)	29.9										
			10 MPH Pace Speed	25-34										
			Number in Pace	8660										
			Percent in Pace	74.9%										
			Number > 30 MPH	5838										
			Percent > 30 MPH	50.5%										

MASSDOT CRASH RATE WORKSHEETS AND HIGH CRASH LOCATION MAPPING

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Upton | COUNT DATE : 1/11/2023

DISTRICT : 3 | UNSIGNALIZED : X | SIGNALIZED :

~ INTERSECTION DATA ~

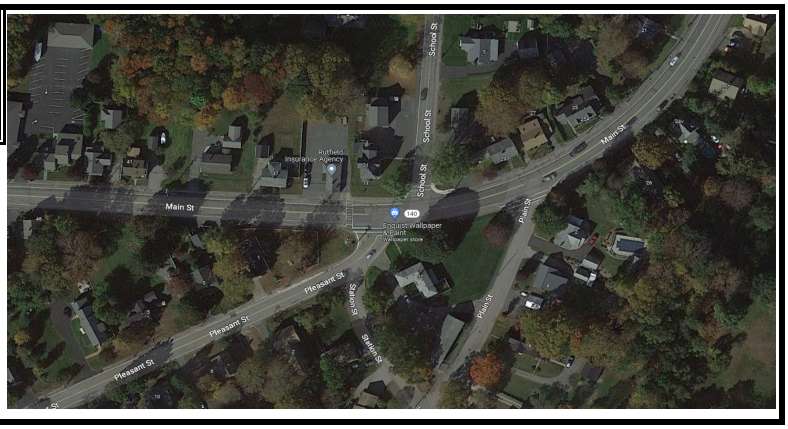
MAJOR STREET : Main Street (Route 140)

MINOR STREET(S) : School Street

Pleasant Street

INTERSECTION DIAGRAM (Label Approaches)

↑ *North*



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (AM) :	318	104	322	376		**1,120**

" K " FACTOR : **0.090** | INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **12,444**

TOTAL # OF CRASHES : 22 | # OF YEARS : 5 | AVERAGE # OF CRASHES PER YEAR (**A**) : **4.40**

CRASH RATE CALCULATION : **0.97**

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

Comments : Above MassDOT Statewide and District Average Crash Rates

Project Title & Date: 9568 - Proposed Multifamily Residential Development

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Upton | COUNT DATE : 1/11/2023

DISTRICT : 3 | UNSIGNALIZED : X | SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Main Street (Route 140)

MINOR STREET(S) : Mendon Street

INTERSECTION DIAGRAM
(Label Approaches)

↑ *North*

PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB	WB		
PEAK HOURLY VOLUMES (AM) :	123		471	285		**879**

" K " FACTOR : **0.090**

INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **9,767**

TOTAL # OF CRASHES : 4

OF YEARS : 5

AVERAGE # OF CRASHES PER YEAR (**A**) : **0.80**

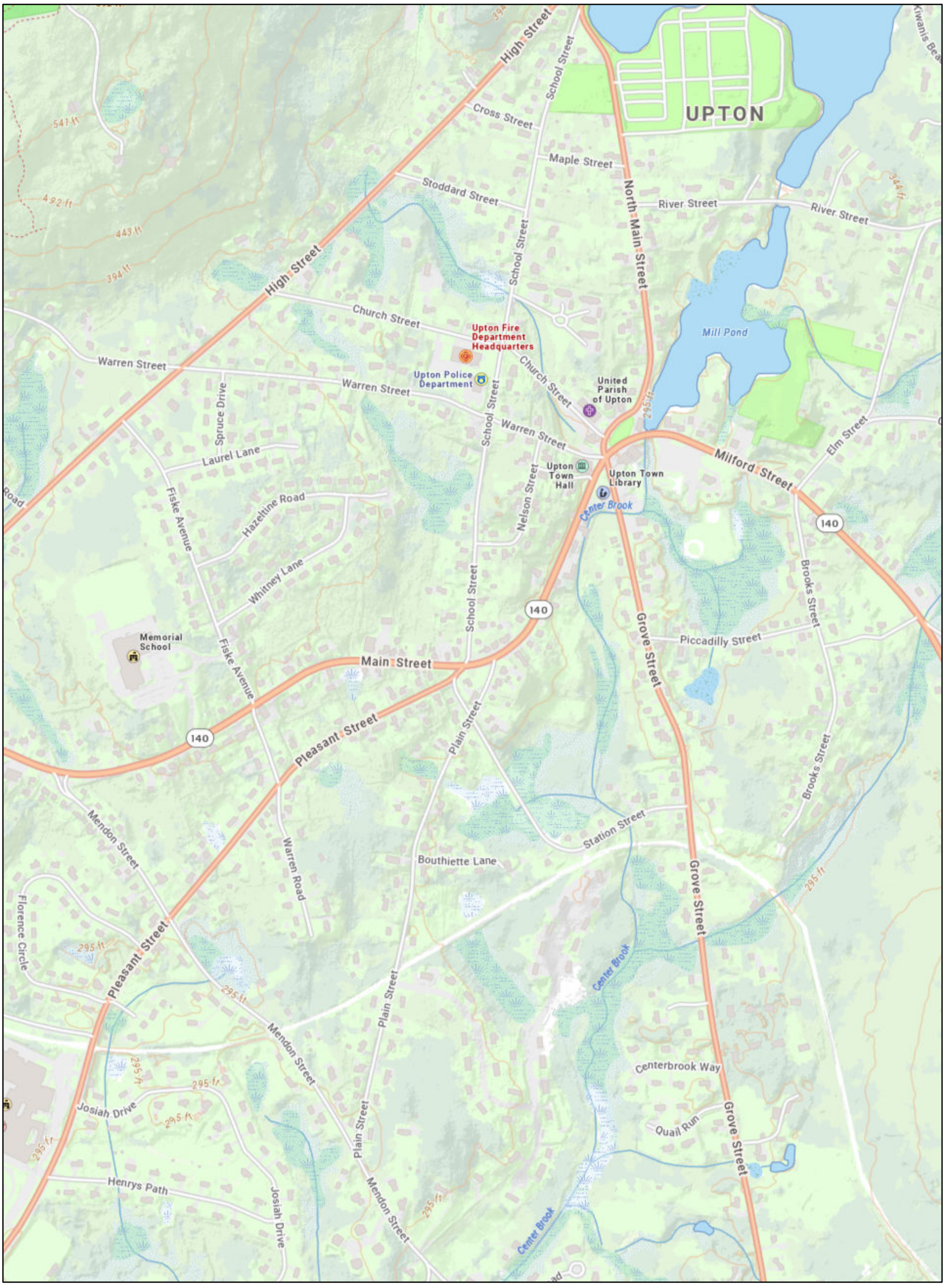
CRASH RATE CALCULATION : **0.22**

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

Comments : Below MassDOT Statewide and District Average Crash Rates

Project Title & Date: 9568 - Proposed Multifamily Residential Development

MassDOT Top Crash Locations



4/12/2023, 10:49:20 AM

1:9,028

0 0.05 0.1 0.2 mi

0 0.1 0.2 0.4 km

MassDOT

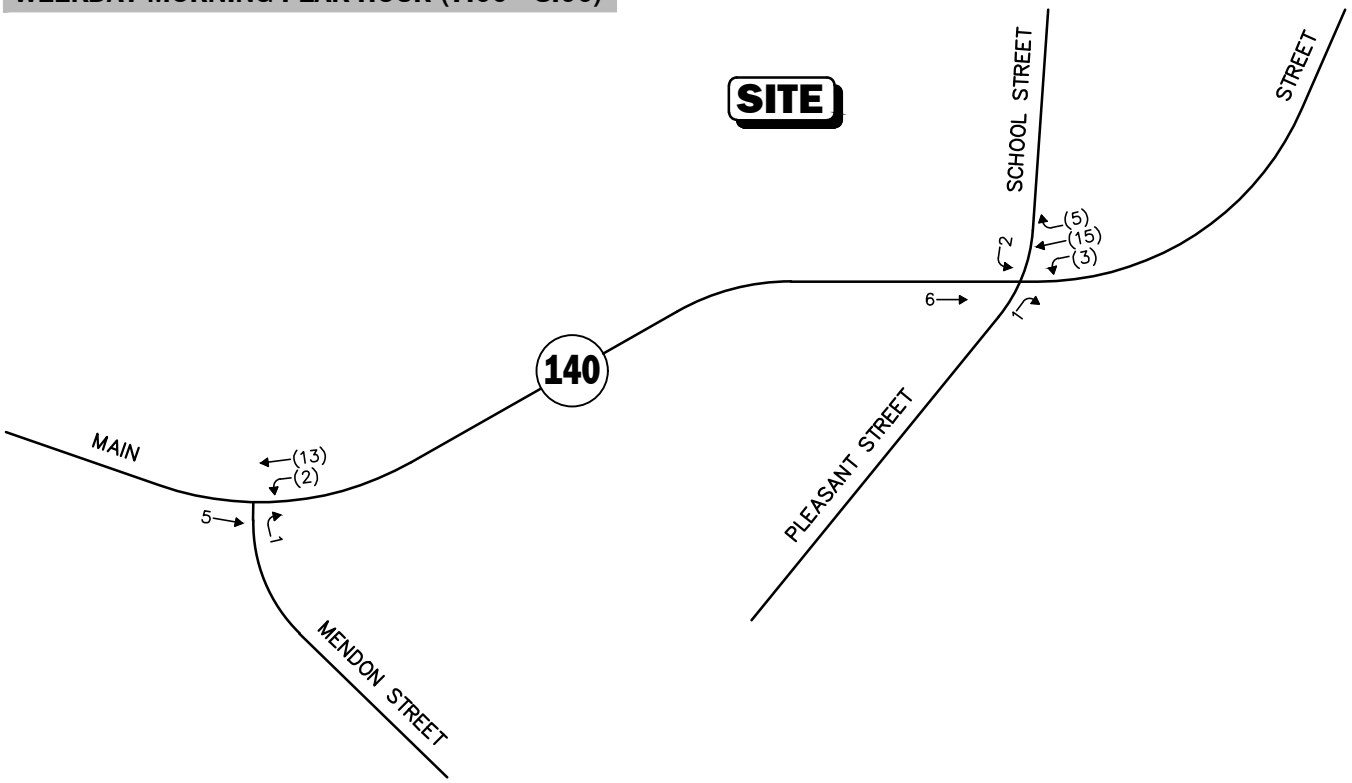
GENERAL BACKGROUND TRAFFIC GROWTH

General Background Traffic Growth - Daily Traffic Volumes

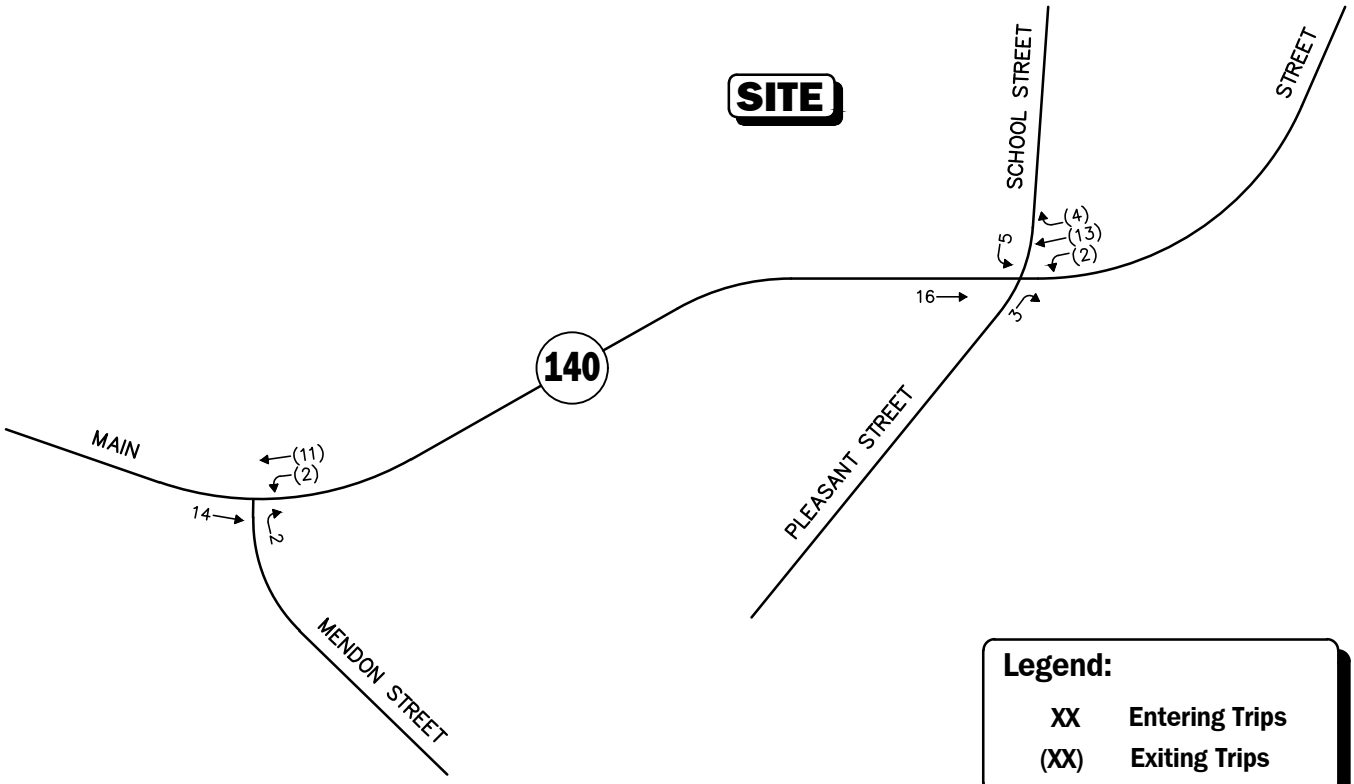
CITY/TOWN	ROUTE/STREET	LOCATION	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Annual Growth
Upton	Maple Avenue	west of Route 140 (Main Street)						6,040	6,179	6,562	6,409	6,428	6,402	**1.21%**
Upton	Mendon Street	east of Pleasant Street										5,365	5,344	**-0.39%**
Upton	Williams Street	west of West Main Street						3,773	3,860	4,099	4,169	4,182	4,165	**2.02%**
Upton	Pleasant Street	east of Maple Street										5,015	4,995	**-0.40%**
Upton	School Street	noth of Route 140									2,620	2,628	2,617	**-0.06%**
Upton	Hartford Avenue	east of Route 140						11,379	11,641	12,363	12,573	12,611	12,531	**1.97%**
Upton	Pleasant Street	south of Route 140						4,212	4,309	4,576	4,654	4,668	4,649	**2.02%**
Upton	Main Street	south of Williams Street						10,179	10,291	10,425	10,540	10,688	10,731	**1.06%**
Upton	Grove Street	south of Main Street						1,914	1,958	2,079	2,114	2,120	2,112	**2.01%**
Upton	Main Street	west of Grove Street						6,567	6,639	6,725	6,799	6,894	6,922	**1.06%**
Upton	Westboro Road	north of Hopkington Road						4,014	4,106	4,361	4,435	4,448	4,430	**2.02%**
Upton	Milford Street (Route 140)	west of Elm Street	8,665	9,000	9,116	9,266	9,062	8,780	8,877	9,395	9,498	9,361	9,670	**1.14%**
Upton	Main Street	south of Maple Avenue									7,921	8,032	8,064	**0.90%**
Upton	High Street	west of School Street										13,862	13,807	**-0.40%**
Upton	North Main Street	south of School Street										2,688	2,677	**-0.41%**
Upton	Mendon Street	south of Route 140						2,333	2,387			2,544	2,534	**0.96%**
														0.92%

BACKGROUND DEVELOPMENT NETWORKS

WEEKDAY MORNING PEAK HOUR (7:00 - 8:00)



WEEKDAY EVENING PEAK HOUR (4:00 - 5:00 PM)



Legend:

XX	Entering Trips
(XX)	Exiting Trips

Not To Scale

Figure A-1

Vanasse & Associates inc

Proposed Residential Development
Governor's Landing
Peak-Hour Traffic Volumes

TRIP-GENERATION CALCUALTIONS

Graph Look Up

ITETripGen Web-based App

- Graph Look Up
- How to Use *ITETripGen*
- TGM Desk Reference
- TGM Appendices
- Support Documents
- Add Users
- Comments

Add-ons to do more

Try OTISS Pro

Query | Filter

DATA SOURCE: Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE: 221

LAND USE GROUP: (200-299) Residential

LAND USE : 221 - Multifamily Housing (Mid-Rise)

LAND USE SUBCATEGORY: Not Close to Rail Transit

SETTING/LOCATION: General Urban/Suburban

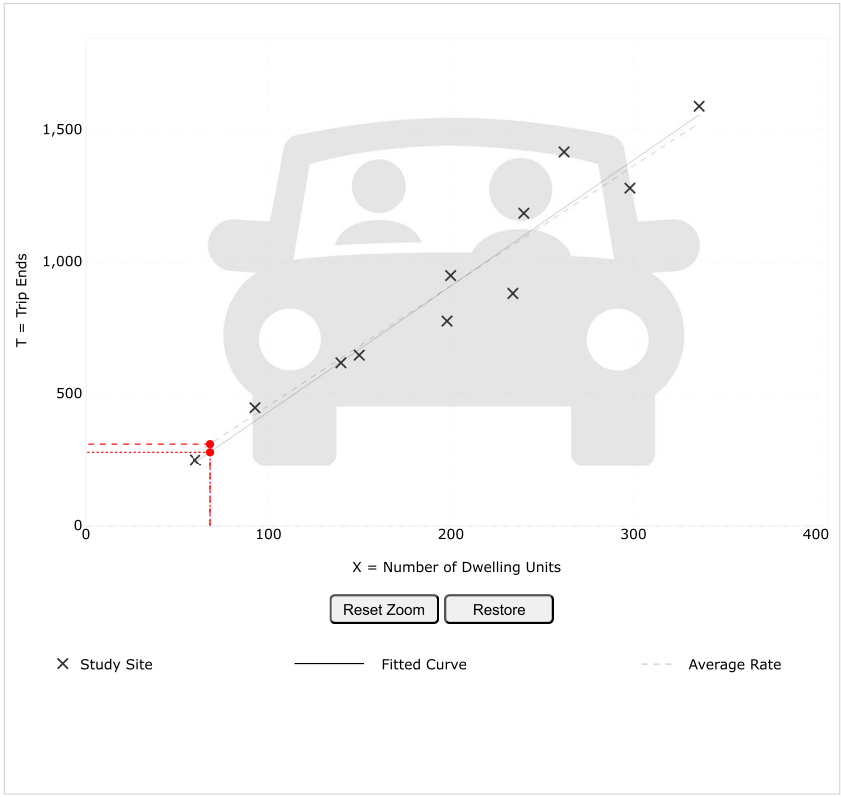
INDEPENDENT VARIABLE (IV): Dwelling Units

TIME PERIOD: Weekday

TRIP TYPE: Vehicle

ENTER IV VALUE TO CALCULATE TRIPS: 68 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Multifamily Housing (Mid-Rise) - Not Close to Rail Transit (221) Click for Description and Data Plots

Independent Variable:
Dwelling Units

Time Period:
Weekday

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
11

Avg. Num. of Dwelling Units:
201

Average Rate:
4.54

Range of Rates:
3.76 - 5.40

Standard Deviation:
0.51

Fitted Curve Equation:
T = 4.77(X) - 46.46

R^2:
0.93

Directional Distribution:
50% entering, 50% exiting

Calculated Trip Ends:
Average Rate: 309 (Total), 154 (Entry), 155 (Exit)
Fitted Curve: 278 (Total), 139 (Entry), 139 (Exit)

Graph Look Up

ITETripGen Web-based App

- Graph Look Up
- How to Use ITETripGen
- TGM Desk Reference
- TGM Appendices
- Support Documents
- Add Users
- Comments

Add-ons to do more

Try OTISS Pro

Query | Filter

DATA SOURCE: Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE: 221

LAND USE GROUP: (200-299) Residential

LAND USE : 221 - Multifamily Housing (Mid-Rise)

LAND USE SUBCATEGORY: Not Close to Rail Transit

SETTING/LOCATION: General Urban/Suburban

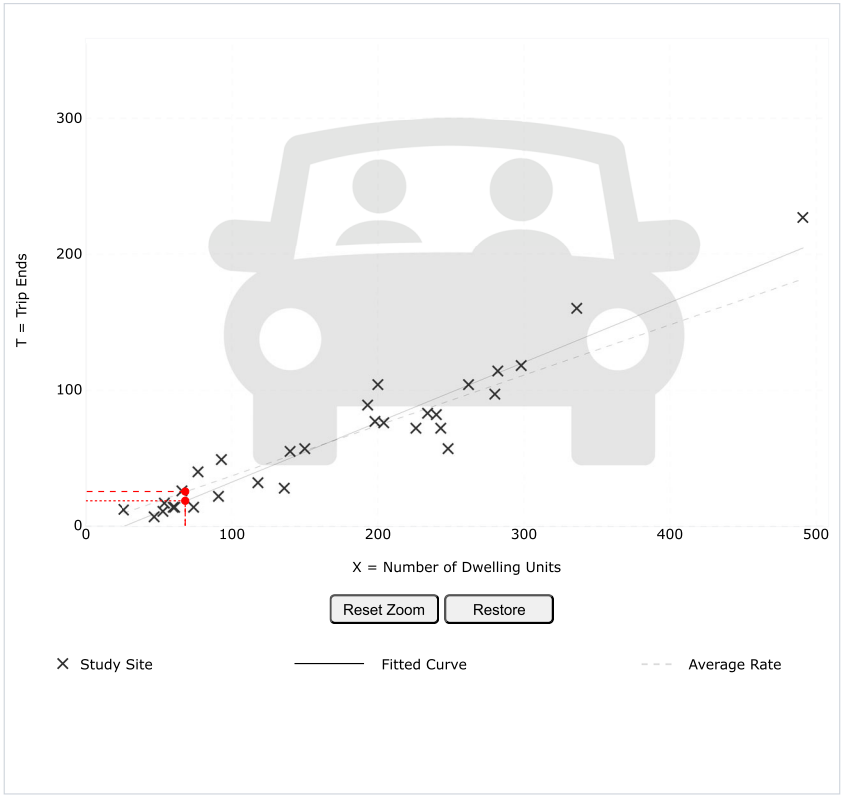
INDEPENDENT VARIABLE (IV): Dwelling Units

TIME PERIOD: Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE: Vehicle

ENTER IV VALUE TO CALCULATE TRIPS: 68 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Multifamily Housing (Mid-Rise) - Not Close to Rail Transit (221) Click for Description and Data Plots

Independent Variable:
Dwelling Units

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

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
30

Avg. Num. of Dwelling Units:
173

Average Rate:
0.37

Range of Rates:
0.15 - 0.53

Standard Deviation:
0.09

Fitted Curve Equation:
T = 0.44(X) - 11.61

R^2:
0.91

Directional Distribution:
23% entering, 77% exiting

Calculated Trip Ends:
Average Rate: 25 (Total), 6 (Entry), 19 (Exit)
Fitted Curve: 18 (Total), 4 (Entry), 14 (Exit)

Graph Look Up

ITETripGen Web-based App

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- Support Documents
- Add Users
- Comments

Add-ons to do more

Try OTISS Pro

Query | Filter

DATA SOURCE: Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE: 221

LAND USE GROUP: (200-299) Residential

LAND USE : 221 - Multifamily Housing (Mid-Rise)

LAND USE SUBCATEGORY: Not Close to Rail Transit

SETTING/LOCATION: General Urban/Suburban

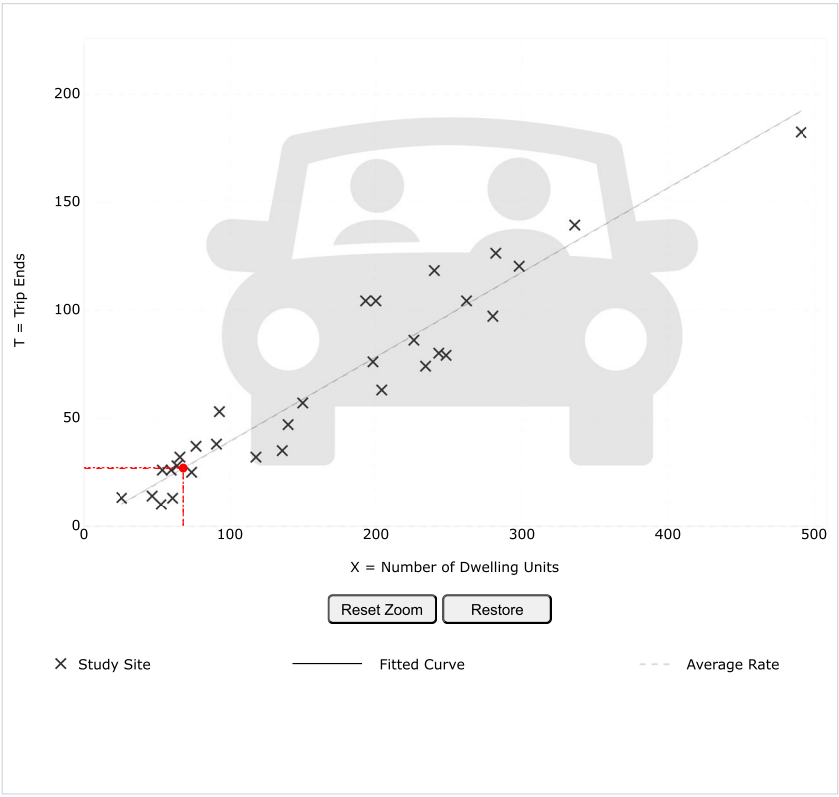
INDEPENDENT VARIABLE (IV): Dwelling Units

TIME PERIOD: Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE: Vehicle

ENTER IV VALUE TO CALCULATE TRIPS: 68 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Multifamily Housing (Mid-Rise) - Not Close to Rail Transit (221) Click for Description and Data Plots

Independent Variable:
Dwelling Units

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
31

Avg. Num. of Dwelling Units:
169

Average Rate:
0.39

Range of Rates:
0.19 - 0.57

Standard Deviation:
0.08

Fitted Curve Equation:
T = 0.39(X) + 0.34

R^2:
0.91

Directional Distribution:
61% entering, 39% exiting

Calculated Trip Ends:
Average Rate: 27 (Total), 16 (Entry), 11 (Exit)
Fitted Curve: 27 (Total), 16 (Entry), 11 (Exit)

TRIP-DISTRIBUTION DATA

Proposed Multifamily Residential Development
Upton, Massachusetts

Residence	Workplace	Number	Route 140 (East)		Route 140 (West)		Mendon Street (South)		School Street (North)		Pleasant Street (South)	
Upton town	Upton town	688	40%	275		0	20%	138		0	40%	275
Upton town	Boston city	363	25%	91	50%	182		0	25%	91		0
Upton town	Framingham town	281	25%	70	50%	141		0	25%	70		0
Upton town	Milford town	269	75%	202		0	25%	67		0		0
Upton town	Worcester city	236		0	100%	236		0		0		0
Upton town	Hopkinton town	188	25%	47	50%	94		0	25%	47		0
Upton town	Westborough town	164	25%	41	50%	82		0	50%	82		0
Upton town	Natick town	162	25%	41	50%	81		0	25%	41		0
Upton town	Marlborough city	152	25%	38	50%	76		0	25%	38		0
Upton town	Franklin Town city	116	100%	116		0		0		0		0
Upton town	Ashland town	111	25%	28	50%	56		0	25%	28		0
Upton town	Holliston town	69	25%	17	50%	35		0	25%	17		0
Upton town	Sudbury town	69	25%	17	50%	35		0	25%	17		0
Upton town	Grafton town	64		0	100%	64		0		0		0
Upton town	Hopedale town	57	75%	43		0	25%	14		0		0
Upton town	Burlington town	49	25%	12	50%	25		0	25%	12		0
Upton town	Foxborough town	49	25%	12	50%	25		0	25%	12		0
Upton town	Mendon town	45		0		0	100%	45		0		0
Upton town	Northbridge town	41		0		0		0		0	100%	41
Upton town	Waltham city	39	25%	10	50%	20		0	25%	10		0
Upton town	Leominster city	38		0	100%	38		0		0		0
Upton town	Auburn town	36		0	100%	36		0		0		0
Upton town	Littleton town	35	25%	9	50%	18		0	25%	9		0
Upton town	Shrewsbury town	35	25%	9	75%	26		0		0		0
Upton town	Newton city	33	25%	8	50%	17		0	25%	8		0
Upton town	Holden town	33		0	100%	33		0		0		0
Upton town	Southborough town	33	25%	8	50%	17		0	25%	8		0
Upton town	Billerica town	29	25%	7	50%	15		0	25%	7		0
Upton town	Northborough town	28	25%	7	75%	21		0		0		0
Upton town	Charlton town	25		0	50%	13		0		0	50%	13
Upton town	North Attleborough tow	24	100%	24		0		0		0		0
Upton town	Cambridge city	24	25%	6	50%	12		0	25%	6		0
Upton town	Bedford town	21	25%	5	50%	11		0	25%	5		0
Upton town	Gardner city	21		0	100%	21		0		0		0
Upton town	Wellesley town	20	25%	5	50%	10		0	25%	5		0
Upton town	Fitchburg city	20	50%	10	50%	10		0		0		0
Upton town	Haverhill city	19	25%	5	50%	10		0	25%	5		0
		3,686		1,163		1,453		264		519		329
				31.6%		39.4%		7.2%		14.1%		8.9%
		SAY		**31%**		**39%**		**7%**		**14%**		**9%**

CAPACITY ANALYSIS WORKSHEETS

Route 140 at School Street and Pleasant Street
Route 140 at Mendon Street
Route 140 at the Project Site Driveway

Route 140 at School Street and Pleasant Street

Intersection	
Int Delay, s/veh	120.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	10	311	1	131	228	17	8	173	137	5	80	19
Future Vol, veh/h	10	311	1	131	228	17	8	173	137	5	80	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	63	63	63	87	87	87	82	82	82
Heavy Vehicles, %	0	1	0	3	1	0	0	1	5	20	1	0
Mvmt Flow	13	415	1	208	362	27	9	199	157	6	98	23

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	389	0	0	416	0	0	1294	1247	416	1412	1234	376
Stage 1	-	-	-	-	-	-	442	442	-	792	792	-
Stage 2	-	-	-	-	-	-	852	805	-	620	442	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.1	6.51	6.25	7.3	6.51	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.51	-	6.3	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.51	-	6.3	5.51	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.5	4.009	3.345	3.68	4.009	3.3
Pot Cap-1 Maneuver	1181	-	-	1138	-	-	141	~ 174	630	106	177	675
Stage 1	-	-	-	-	-	-	598	578	-	357	402	-
Stage 2	-	-	-	-	-	-	357	397	-	446	578	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1181	-	-	1138	-	-	47	~ 131	630	-	134	675
Mov Cap-2 Maneuver	-	-	-	-	-	-	47	~ 131	-	-	134	-
Stage 1	-	-	-	-	-	-	590	570	-	352	308	-
Stage 2	-	-	-	-	-	-	180	304	-	215	570	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	3.1	$ 495	
HCM LOS			F	-

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	186	1181	-	-	1138	-	-	-
HCM Lane V/C Ratio	1.965	0.011	-	-	0.183	-	-	-
HCM Control Delay (s)	$ 495	8.1	0	-	8.9	0	-	-
HCM Lane LOS	F	A	A	-	A	A	-	-
HCM 95th %tile Q(veh)	27.4	0	-	-	0.7	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	33.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	18	268	6	156	281	8	4	87	104	5	154	22
Future Vol, veh/h	18	268	6	156	281	8	4	87	104	5	154	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	66	66	66	95	95	95	94	94	94	81	81	81
Heavy Vehicles, %	0	1	0	1	1	0	0	0	2	0	0	0
Mvmt Flow	27	406	9	164	296	8	4	93	111	6	190	27

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	304	0	0	415	0	0	1202	1097	411	1195	1097	300
Stage 1	-	-	-	-	-	-	465	465	-	628	628	-
Stage 2	-	-	-	-	-	-	737	632	-	567	469	-
Critical Hdwy	4.1	-	-	4.11	-	-	7.1	6.5	6.22	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.209	-	-	3.5	4	3.318	3.5	4	3.3
Pot Cap-1 Maneuver	1268	-	-	1149	-	-	163	215	641	165	215	744
Stage 1	-	-	-	-	-	-	581	566	-	474	479	-
Stage 2	-	-	-	-	-	-	413	477	-	512	564	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1268	-	-	1149	-	-	-	173	641	68	~ 173	744
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	173	-	68	~ 173	-
Stage 1	-	-	-	-	-	-	565	550	-	461	397	-
Stage 2	-	-	-	-	-	-	172	395	-	342	548	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	3		192.5
HCM LOS			-	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1268	-	-	1149	-	-	182
HCM Lane V/C Ratio	-	0.022	-	-	0.143	-	-	1.228
HCM Control Delay (s)	-	7.9	0	-	8.7	0	-	192.5
HCM Lane LOS	-	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	-	0.1	-	-	0.5	-	-	12.1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	323.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	10	339	1	144	259	23	9	185	148	8	85	20
Future Vol, veh/h	10	339	1	144	259	23	9	185	148	8	85	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	63	63	63	87	87	87	82	82	82
Heavy Vehicles, %	0	1	0	3	1	0	0	1	5	20	1	0
Mvmt Flow	13	452	1	229	411	37	10	213	170	10	104	24

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	448	0	0	453	0	0	1431	1385	453	1558	1367	430
Stage 1	-	-	-	-	-	-	479	479	-	888	888	-
Stage 2	-	-	-	-	-	-	952	906	-	670	479	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.1	6.51	6.25	7.3	6.51	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.51	-	6.3	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.51	-	6.3	5.51	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.5	4.009	3.345	3.68	4.009	3.3
Pot Cap-1 Maneuver	1123	-	-	1102	-	-	113	~ 144	601	83	148	629
Stage 1	-	-	-	-	-	-	571	557	-	315	363	-
Stage 2	-	-	-	-	-	-	314	356	-	418	557	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1123	-	-	1102	-	-	~ 7	~ 102	601	-	105	629
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 7	~ 102	-	-	105	-
Stage 1	-	-	-	-	-	-	562	549	-	310	262	-
Stage 2	-	-	-	-	-	-	132	257	-	181	549	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	3.1	$ 1370.6	
HCM LOS			F	-

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	102	1123	-	-	1102	-	-	-
HCM Lane V/C Ratio	3.854	0.012	-	-	0.207	-	-	-
HCM Control Delay (s)	$ 1370.6	8.2	0	-	9.1	0	-	-
HCM Lane LOS	F	A	A	-	A	A	-	-
HCM 95th %tile Q(veh)	40.1	0	-	-	0.8	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	78.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	19	304	7	169	314	13	5	93	114	11	165	24
Future Vol, veh/h	19	304	7	169	314	13	5	93	114	11	165	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	66	66	66	95	95	95	94	94	94	81	81	81
Heavy Vehicles, %	0	1	0	1	1	0	0	0	2	0	0	0
Mvmt Flow	29	461	11	178	331	14	5	99	121	14	204	30

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	345	0	0	472	0	0	1336	1226	467	1329	1224	338
Stage 1	-	-	-	-	-	-	525	525	-	694	694	-
Stage 2	-	-	-	-	-	-	811	701	-	635	530	-
Critical Hdwy	4.1	-	-	4.11	-	-	7.1	6.5	6.22	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.209	-	-	3.5	4	3.318	3.5	4	3.3
Pot Cap-1 Maneuver	1225	-	-	1095	-	-	132	180	596	133	~ 181	709
Stage 1	-	-	-	-	-	-	540	533	-	436	447	-
Stage 2	-	-	-	-	-	-	376	444	-	470	530	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1225	-	-	1095	-	-	-	139	596	38	~ 140	709
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	139	-	38	~ 140	-
Stage 1	-	-	-	-	-	-	523	516	-	422	357	-
Stage 2	-	-	-	-	-	-	124	355	-	293	513	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	3		$ 469.2
HCM LOS			-	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1225	-	-	1095	-	-	133
HCM Lane V/C Ratio	-	0.024	-	-	0.162	-	-	1.856
HCM Control Delay (s)	-	8	0	-	8.9	0	-	$ 469.2
HCM Lane LOS	-	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	-	0.1	-	-	0.6	-	-	19.1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	12	344	2	144	260	23	9	185	148	8	85	21
Future Vol, veh/h	12	344	2	144	260	23	9	185	148	8	85	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	63	63	63	87	87	87	82	82	82
Heavy Vehicles, %	0	1	0	3	1	0	0	1	5	20	1	0
Mvmt Flow	16	459	3	229	413	37	10	213	170	10	104	26

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	450	0	0	462	0	0	1448	1401	461	1574	1384	432
Stage 1	-	-	-	-	-	-	493	493	-	890	890	-
Stage 2	-	-	-	-	-	-	955	908	-	684	494	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.1	6.51	6.25	7.3	6.51	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.51	-	6.3	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.51	-	6.3	5.51	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.5	4.009	3.345	3.68	4.009	3.3
Pot Cap-1 Maneuver	1121	-	-	1094	-	-	110	~ 141	594	81	144	628
Stage 1	-	-	-	-	-	-	562	549	-	314	362	-
Stage 2	-	-	-	-	-	-	313	356	-	411	548	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1121	-	-	1094	-	-	-	~ 100	594	-	~ 102	628
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	~ 100	-	-	~ 102	-
Stage 1	-	-	-	-	-	-	551	539	-	308	261	-
Stage 2	-	-	-	-	-	-	130	256	-	174	538	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	3.1		
HCM LOS			-	-

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1121	-	-	1094	-	-	-
HCM Lane V/C Ratio	-	0.014	-	-	0.209	-	-	-
HCM Control Delay (s)	-	8.3	0	-	9.2	0	-	-
HCM Lane LOS	-	A	A	-	A	A	-	-
HCM 95th %tile Q(veh)	-	0	-	-	0.8	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	84.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	21	307	8	169	319	13	7	93	114	11	165	26
Future Vol, veh/h	21	307	8	169	319	13	7	93	114	11	165	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	66	66	66	95	95	95	94	94	94	81	81	81
Heavy Vehicles, %	0	1	0	1	1	0	0	0	2	0	0	0
Mvmt Flow	32	465	12	178	336	14	7	99	121	14	204	32

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	350	0	0	477	0	0	1352	1241	471	1344	1240	343
Stage 1	-	-	-	-	-	-	535	535	-	699	699	-
Stage 2	-	-	-	-	-	-	817	706	-	645	541	-
Critical Hdwy	4.1	-	-	4.11	-	-	7.1	6.5	6.22	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.209	-	-	3.5	4	3.318	3.5	4	3.3
Pot Cap-1 Maneuver	1220	-	-	1090	-	-	128	176	593	130	~ 177	704
Stage 1	-	-	-	-	-	-	533	527	-	434	445	-
Stage 2	-	-	-	-	-	-	373	442	-	464	524	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1220	-	-	1090	-	-	-	135	593	35	~ 136	704
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	135	-	35	~ 136	-
Stage 1	-	-	-	-	-	-	514	508	-	418	355	-
Stage 2	-	-	-	-	-	-	121	352	-	287	505	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	3		$ 504.3
HCM LOS			-	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1220	-	-	1090	-	-	129
HCM Lane V/C Ratio	-	0.026	-	-	0.163	-	-	1.933
HCM Control Delay (s)	-	8	0	-	8.9	0	-	$ 504.3
HCM Lane LOS	-	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	-	0.1	-	-	0.6	-	-	19.8

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Route 140 at Mendon Street

Intersection	
Int Delay, s/veh	4.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	333	138	25	260	100	23
Future Vol, veh/h	333	138	25	260	100	23
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	80	80	79	79	73	73
Heavy Vehicles, %	1	4	0	2	0	0
Mvmt Flow	416	173	32	329	137	32

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	589	0	896	503
Stage 1	-	-	-	-	503	-
Stage 2	-	-	-	-	393	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	996	-	313	573
Stage 1	-	-	-	-	612	-
Stage 2	-	-	-	-	686	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	996	-	301	573
Mov Cap-2 Maneuver	-	-	-	-	301	-
Stage 1	-	-	-	-	612	-
Stage 2	-	-	-	-	659	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	26.8
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	330	-	-	996	-
HCM Lane V/C Ratio	0.511	-	-	0.032	-
HCM Control Delay (s)	26.8	-	-	8.7	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	2.8	-	-	0.1	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	266	110	39	286	82	19
Future Vol, veh/h	266	110	39	286	82	19
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	84	84	84	84	88	88
Heavy Vehicles, %	0	1	0	1	0	0
Mvmt Flow	317	131	46	340	93	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	448	0	815	383
Stage 1	-	-	-	-	383	-
Stage 2	-	-	-	-	432	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1123	-	350	669
Stage 1	-	-	-	-	694	-
Stage 2	-	-	-	-	659	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1123	-	332	669
Mov Cap-2 Maneuver	-	-	-	-	332	-
Stage 1	-	-	-	-	694	-
Stage 2	-	-	-	-	625	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	19.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	367	-	-	1123	-
HCM Lane V/C Ratio	0.313	-	-	0.041	-
HCM Control Delay (s)	19.2	-	-	8.3	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.3	-	-	0.1	-

Intersection	
Int Delay, s/veh	5.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	362	148	29	291	107	26
Future Vol, veh/h	362	148	29	291	107	26
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	80	80	79	79	73	73
Heavy Vehicles, %	1	4	0	2	0	0
Mvmt Flow	453	185	37	368	147	36

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	638	0	988	546
Stage 1	-	-	-	-	546	-
Stage 2	-	-	-	-	442	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	956	-	276	541
Stage 1	-	-	-	-	584	-
Stage 2	-	-	-	-	652	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	956	-	262	541
Mov Cap-2 Maneuver	-	-	-	-	262	-
Stage 1	-	-	-	-	584	-
Stage 2	-	-	-	-	620	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	36
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	291	-	-	956	-
HCM Lane V/C Ratio	0.626	-	-	0.038	-
HCM Control Delay (s)	36	-	-	8.9	0
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	3.9	-	-	0.1	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	299	118	44	318	88	22
Future Vol, veh/h	299	118	44	318	88	22
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	84	84	84	84	88	88
Heavy Vehicles, %	0	1	0	1	0	0
Mvmt Flow	356	140	52	379	100	25

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	496	0	909	426
Stage 1	-	-	-	-	426	-
Stage 2	-	-	-	-	483	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1078	-	308	633
Stage 1	-	-	-	-	663	-
Stage 2	-	-	-	-	625	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1078	-	289	633
Mov Cap-2 Maneuver	-	-	-	-	289	-
Stage 1	-	-	-	-	663	-
Stage 2	-	-	-	-	587	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	22.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	324	-	-	1078	-
HCM Lane V/C Ratio	0.386	-	-	0.049	-
HCM Control Delay (s)	22.9	-	-	8.5	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.8	-	-	0.2	-

Intersection	
Int Delay, s/veh	5.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	364	148	30	296	107	26
Future Vol, veh/h	364	148	30	296	107	26
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	80	80	79	79	73	73
Heavy Vehicles, %	1	4	0	2	0	0
Mvmt Flow	455	185	38	375	147	36

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	640	0	999	548
Stage 1	-	-	-	-	548	-
Stage 2	-	-	-	-	451	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	954	-	272	540
Stage 1	-	-	-	-	583	-
Stage 2	-	-	-	-	646	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	954	-	258	540
Mov Cap-2 Maneuver	-	-	-	-	258	-
Stage 1	-	-	-	-	583	-
Stage 2	-	-	-	-	614	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	37
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	287	-	-	954	-
HCM Lane V/C Ratio	0.635	-	-	0.04	-
HCM Control Delay (s)	37	-	-	8.9	0
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	4	-	-	0.1	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	305	118	45	322	88	23
Future Vol, veh/h	305	118	45	322	88	23
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	84	84	84	84	88	88
Heavy Vehicles, %	0	1	0	1	0	0
Mvmt Flow	363	140	54	383	100	26

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	503	0	924	433
Stage 1	-	-	-	-	433	-
Stage 2	-	-	-	-	491	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1072	-	302	627
Stage 1	-	-	-	-	658	-
Stage 2	-	-	-	-	619	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1072	-	283	627
Mov Cap-2 Maneuver	-	-	-	-	283	-
Stage 1	-	-	-	-	658	-
Stage 2	-	-	-	-	579	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	23.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	319	-	-	1072	-
HCM Lane V/C Ratio	0.395	-	-	0.05	-
HCM Control Delay (s)	23.5	-	-	8.5	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.8	-	-	0.2	-

Route 140 at the Project Site Driveway

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	350	288	2	8	6
Future Vol, veh/h	2	350	288	2	8	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	75	65	92	92	92
Heavy Vehicles, %	2	1	1	2	2	2
Mvmt Flow	2	467	443	2	9	7

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	445	0	-	0	915	444
Stage 1	-	-	-	-	444	-
Stage 2	-	-	-	-	471	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1115	-	-	-	303	614
Stage 1	-	-	-	-	646	-
Stage 2	-	-	-	-	628	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1115	-	-	-	302	614
Mov Cap-2 Maneuver	-	-	-	-	302	-
Stage 1	-	-	-	-	645	-
Stage 2	-	-	-	-	628	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	14.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1115	-	-	-	386
HCM Lane V/C Ratio	0.002	-	-	-	0.039
HCM Control Delay (s)	8.2	0	-	-	14.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	330	329	9	6	5
Future Vol, veh/h	7	330	329	9	6	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	66	94	92	92	92
Heavy Vehicles, %	2	1	1	2	2	2
Mvmt Flow	8	500	350	10	7	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	360	0	-	0	871	355
Stage 1	-	-	-	-	355	-
Stage 2	-	-	-	-	516	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1199	-	-	-	322	689
Stage 1	-	-	-	-	710	-
Stage 2	-	-	-	-	599	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1199	-	-	-	319	689
Mov Cap-2 Maneuver	-	-	-	-	319	-
Stage 1	-	-	-	-	704	-
Stage 2	-	-	-	-	599	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	13.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1199	-	-	-	422
HCM Lane V/C Ratio	0.006	-	-	-	0.028
HCM Control Delay (s)	8	0	-	-	13.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1